



# Overdose Prevention and Housing: a Qualitative Study Examining Drug Use, Overdose Risk, and Access to Safer Supply in Permanent Supportive Housing in Vancouver, Canada

Andrew Ivsins · Laura MacKinnon ·  
Jeanette M. Bowles · Amanda Slaunwhite ·  
Geoff Bardwell

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**Abstract** The majority of overdose deaths in British Columbia (BC) occur among people using illicit substances alone in private residences. Some supportive housing in BC includes on-site access to a variety of health and substance use-related services. More recently, a number of supportive housing locations have started offering prescribed safer supply medications to people at high overdose risk, though these remain limited and under-evaluated. In this study, we describe the drug use practices — including access to and use of on-site supervised consumption, OAT, and prescribed safer supply medications — of study participants living in permanent supportive housing with integrated primary care, substance use treatment

services, and supervised consumption spaces. Qualitative interviews were conducted with 30 residents of a permanent supportive housing site in Vancouver, Canada. Data were analyzed using a sequential process to identify both a priori (e.g., low-barrier substance use treatment, pandemic effects on service access) and emerging themes (e.g., using alone). Most ( $N=27$ ) study participants reported using alone in their rooms, despite having access to an on-site supervised consumption area. Reasons for using alone include the following: preference for being alone, discretion/stigma, and restrictive housing policies. Less than half ( $N=12$ ) of the study participants accessed on-site prescribed safer supply medications.

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A. Ivsins (✉) · L. MacKinnon · G. Bardwell  
British Columbia Centre On Substance Use, 400-1045  
Howe Street, Vancouver, BC V6Z 2A9, Canada  
e-mail: andrew.ivsins@bccsu.ubc.ca

A. Ivsins · G. Bardwell  
Department of Medicine, University of British Columbia,  
St. Paul's Hospital, 608-1081 Burrard Street, Vancouver,  
BC V6Z 1Y6, Canada

L. MacKinnon  
Department of Family Practice, University of British  
Columbia, 5950 University Boulevard, Vancouver,  
BC V6T 1Z3, Canada

J. M. Bowles  
Centre On Drug Policy Evaluation, Li Ka Shing  
Knowledge Institute, St. Michael's Hospital, 209 Victoria  
St, Toronto, ON M5B 3M6, Canada

A. Slaunwhite  
BC Centre for Disease Control, 655 W 12th Avenue,  
Vancouver, BC V5Z 4R4, Canada

A. Slaunwhite  
Centre for Health Evaluation & Outcome Sciences,  
620B-1081 Burrard Street, Vancouver, BC V6Z 1Y6,  
Canada

A. Slaunwhite  
School of Population and Public Health, University  
of British Columbia, 2206 E Mall, Vancouver,  
BC V6T 1Z3, Canada

Participants receiving on-site prescribed safer supply described positive benefits including reduced use of illicit opioids, and less reliance on illicit income generation activities. On-site prescribed safer supply programs within supportive housing environments are an important tool in addressing overdose risk.

**Keywords** Housing · Overdose · Safer supply · Qualitative methods

## Introduction

North America remains in the grip of an unprecedented overdose crisis, driven by a highly toxic drug supply and exacerbated by the COVID-19 pandemic [1]. There were 6306 opioid-related overdose deaths in Canada in 2020, and 3515 in the first half of 2021 alone, 87% of which involved illicit fentanyl [1]. In 2021, the Canadian province of British Columbia (BC) reported an illicit drug toxicity (overdose) mortality rate of almost 43 deaths per 100,000 persons (up from 34.3 deaths per 100,000 in 2020), with 83% involving illicit fentanyl [2]. While the overdose crisis is fueled by an unregulated lethal drug supply — including increasing adulteration with novel substances like etizolam and xylazine [3, 4] — growing evidence demonstrates the relationship between housing and overdose risk [5–12]. For instance, in BC, 84% of overdose deaths in 2021 occurred indoors (56% in private residences, and 28% in other private locations including social and supportive housing), with the most recent statistics for 2022 showing near identical patterns [2]. Similarly, a study of 3326 overdose events in the USA found 66% occurred in residences and 8.7% in other indoor public settings [12].

A number of overdose response measures have been implemented across Canada in efforts to curb the ongoing overdose crisis. These include implementation and expansion of supervised consumption services (SCS), drug checking services, take home naloxone, injectable and oral opioid agonist treatments (iOAT/OAT, e.g., methadone, slow-release morphine, injectable hydromorphone, and diacetylmorphine), and safer supply programs [13–16]. Prescriber- and community-based safer supply programs, which provide regulated alternatives (of known quality and quantity) to criminalized drugs, have been suggested as a key strategy to limit peoples' use of

illicit drugs and reduce overdose events and mortality [17–20]. Currently, a limited number of safer supply programs operate in Canada, primarily distributing hydromorphone tablets through medical prescriber-based models.

In response to the intersecting overdose crisis and COVID-19 pandemic, the BC provincial government introduced Risk Mitigation Guidance that allowed physicians to prescribe selective opioids, stimulants, and benzodiazepines to support physical distancing and self-isolation among people at high overdose/COVID-19 risk [21]. These guidelines were recently expanded under the new provincial “Prescribed Safer Supply” policy directive to include pharmaceutical fentanyl products (i.e., sublingual, injectable, and transdermal fentanyl) [22]. However, the majority of these programs remain limited in scope and reach, operating within clinical and social/health service settings, and should be explored and evaluated in other community settings, including various housing environments where people are at high risk of overdose [23].

Low-barrier supportive housing has been implemented across BC to address structural vulnerabilities among marginally housed people who use drugs, with some offering integrated primary care and substance use-related services [9]. These programs provide medical support through on-site clinics, nurse, physician, and social work outreach/support; medication dispensation/delivery; and access to various OAT medications (e.g., methadone, slow-release oral morphine, transdermal fentanyl). A limited number of supportive housing buildings offer harm reduction and overdose prevention services, including access to drug use supplies (e.g., sterile injection and smoking equipment), naloxone training and distribution, supervised consumption areas, and provision of safer supply medications (e.g., hydromorphone tablets) [5, 6, 9, 24, 25]. Expanding overdose prevention interventions in housing environments, including access to safer supply, is urgently needed.

In this qualitative study, we explore the drug use practices — including access to and use of on-site SCS, OAT, and prescribed safer supply medications — of study participants living in a permanent supportive housing building in Vancouver, BC. This study will fill an important gap in knowledge of why people choose to use drugs alone in the midst of an ongoing overdose crisis. Furthermore, our study adds

**Table 1** Participant demographics

		<i>N</i> (total = 30)
Age: median (range)		48 (34–74)
Ethnicity	Indigenous	10
	White	17
	Other	3
Gender	Ciswoman	12
	Cisman	16
	Two-spirit	1
	Transgender	1
Income generation (past 30 days)*	Part-time work	12
	Drug selling	6
	Sex work	3
	Recycling/binning	11
	Panhandling	5
	Reselling goods	4
	Social assistance	28
Drug use (past 30 days)*	Cocaine (powder)	7
	Crack	7
	Heroin	20
	Fentanyl	21
	Crystal meth	16
	Alcohol	16
Prescribed OAT or safer supply medications*	Methadone	14
	Kadian	9
	Hydromorphone	6
	Suboxone	1
	Transdermal fentanyl	1

\*Multiple responses possible

to the growing body of literature on the importance of embedding overdose response and prevention interventions within housing environments where people are at high risk of fatal overdose.

## Methods

This study is part of a larger qualitative study examining primary care access among residents of a supportive housing building in Vancouver's Downtown Eastside neighborhood. We chose a qualitative approach to gain deeper insights into peoples' experiences, for example, understanding participant's reasons for using drugs alone, subjective accounts of unique drug use practices, or their experiences accessing and using safer supply medications. Semi-structured

interviews were conducted between October 2020 and January 2021 with 30 residents living in the supportive housing site. As the study was carried out during the COVID-19 pandemic, in-person recruitment and data collection were prohibited at the time. Specific safety protocols were utilized for remote recruitment and data collection. Recruitment posters were placed in the building's common areas and clinic, and interested residents were provided the consent form and available interviews dates/times by front desk and clinic staff. A sign-up sheet of potential participants was then faxed to the research team, who phoned participants to screen for eligibility. To be eligible, participants were required to be residents of the housing site who were 18 years or older. The consent form was then reviewed with eligible participants, who provided verbal consent and were interviewed by

telephone. Interviews were conducted by GB and LM using a semi-structured interview guide. Interviews lasted 30–60 min, were audio-recorded, and covered demographics (Table 1), health and drug use history, experiences with health and substance use care, and impacts of the COVID-19 pandemic. Participants were provided a \$30 honorarium distributed by on-site staff.

Audio recordings were transcribed verbatim and imported into NVivo 12 for data storage and analysis. After independently reviewing several transcripts, GB and LM developed a coding framework to guide analysis. Coding and analysis was guided by content analysis to identify common themes within and across the data [26, 27]. In particular, as this was intended to be an applied paper, manifest content analysis was utilized which emphasizes “staying close” to the data (as opposed to more interpretive latent content analysis) [27]. Line-by-line coding of transcripts was conducted by GB and LM, and data were analyzed using a sequential process to identify both a priori (e.g., low-barrier substance use treatment, pandemic effects on service access) and emerging themes (e.g., using alone, using in rooms). The two authors met regularly to discuss coding and analysis to ensure consistency and validity of findings. For this paper, AI and GB conducted a secondary analysis of the data to explore themes around participants’ drug use practices, including using drugs in their rooms, and their experiences with safer supply medications. From this secondary analysis, AI and GB identified the themes (e.g., social and structural contexts of using in rooms) presented below. Participant and place names have been anonymized for confidentiality. The study was approved by the University of British Columbia/Providence Health Care Research Ethics Boards.

## Results

### Study Setting

“The Bellevue” is a permanent supportive housing building for people with physical, mental health, and substance use issues. Tenants have access to a variety of education, training, and other programs including art and music therapy, a food program which provides nutritional information and meal preparation skills, gardening, and Indigenous healing. Primary care and

substance use services (e.g., OAT, prescribed safer supply) are available to all residents, and include on-site nurses, physicians, and mental health and social support workers. The building also contains a supervised drug consumption area and a managed alcohol program.

Participants spoke favorably about living at the Bellevue, describing positive impacts related to on-site access to healthcare, meal provision, and the variety of programming offered. Speaking about why she participated in the on-site programming, Farah stated, “You know, it makes you feel confident in yourself, you know, and you’re doing something with your life, making it better. It calms you down and gives, you know, clean – it clears your mind.” When asked what she liked about living at the Bellevue, Aisyah explained:

I like it because there is that clinic here if there’s anything that’s wrong or anything. There’s some place that I can go and ask for help. I get my medication from the clinic here. And they’re very... they’re very helpful I guess in a lot of ways. Like they tell me about things that are happening in the community and if there’s some other like information sessions or whatever that I can go in and check it out. And there’s an art program that was here... well it’s not here now because of the COVID, but yeah, I really enjoyed that on Tuesdays and Thursdays. I would go to it.

While many participants described feeling comfortable and more secure at the Bellevue when compared to previous housing situations (e.g., other public or private housing, experiencing homelessness), a number of participants voiced concerns about safety. When asked if she felt safe at the Bellevue, Anika replied:

No, I don’t feel safe living here. We don’t even answer our door anymore because we know the nurses have keys because we’re like hey man, just let yourself in, because we’re not going to answer the door.

Similarly, Leif described some of the challenges living in a supportive housing environment, not feeling comfortable with the “mix of people” and that, “it’s just sometimes overwhelming some of the things that I have to not necessarily go through but like at

4:00 in the morning there could be people screaming at each other for next to no reason in the hallway.” These safety concerns may shape drug use practices like avoiding common rooms and supervised consumption areas and using alone in their rooms, which increases overdose risk. For example, when asked why he uses alone, Lewis replied, “well because sometimes a lot of people are just about the dope and you know they just rob you.”

### Using in Their Rooms

Despite an on-site supervised consumption room, and drug use being permitted in the shared common areas, most study participants reported using drugs alone in their rooms. Reasons for using alone included the following: preference for being alone, discretion, stigma, and restrictive rules, including those that prohibit drug smoking in common areas and strict guest policies. Some participants described specific safety measures when using drugs in their rooms, such as calling the front desk to inform staff they were going to use (who would then check up on the person within a few minutes), or using with friends/partners. As Iveta explained, “I just phone down to the staff and I tell them I’m going to be using [drugs] and ask them to call me back in five minutes and they’re usually pretty good with that.” However, most participants who reported using in their rooms while alone did not discuss personal strategies for reducing risk of overdose.

#### (i) Social context of using in rooms

Most commonly, participants simply described a preference for being alone when using drugs. For instance, when asked why she uses by herself Sarah replied simply “I like to. I like to be alone,” while Aisyah stated she enjoyed “being by myself right now.” Other participants similarly referred to privacy or not wanting to use drugs around other people. As Hira described, “I’m more of an introvert, so I just like staying home.” It was also common for participants to use in their rooms to avoid having to share drugs with others, as Sarah elaborated:

You do a hoot [i.e., inhale drugs] and everybody’s all of a sudden staring at you. Like, they’ll be, like, “What, you got one for me?” And it’s, like, “F off.” You know, what are you staring at me for? You ruining my... Or else,

“Can I have your seconds?” It’s, like, “Fuck off.” You know, they’re just, like...or everybody’s always up to something, squeezing up to you, moving up to you, um, sneaking up to you.

When asked why they used drugs in their rooms instead of the common area, a number of participants described not wanting to use drugs in front of other people for discretion, or to avoid stigma. Rueben explained he stayed in his room when using because “I figure like if there’s kids around or something like that I wouldn’t want them to see it.” When asked why she chose not to use in the common area, Anika stated “we have some class” and that “not everybody wants to see people shooting up in the common room.” She went on to describe keeping their drug use private to avoid shame, suggesting that “I certainly can’t have any friends or any relatives or anything here that I have any respect for. I’d be too ashamed. I am too ashamed.” Matt similarly described keeping his drug use private to avoid stigma:

I’m pretty private about my use. Not, not private to the point that I do it in an unsafe way or make unsafe choices. Just private that I don’t like, you know, to showcase what I’m doing, you know. I’m, maybe I guess it’s my certain amount of shame I may feel because I’m still using or you know or just because I, you know, I’m also considerate of other people’s, um, you know, morals or what they consider to be right and you know and they don’t want to see that. You don’t, you don’t want to see people using.

#### (ii) Structural context of using in rooms

Similar to most supportive housing in BC (e.g., single room accommodations), the Bellevue has strict guest policies regulating non-resident access to the building and private rooms (e.g., prohibiting overnight guests, non-residents only permitted in common areas). Many of these policies were expanded at the onset of the COVID-19 pandemic to reduce transmission such as entirely prohibiting non-residents from entering buildings.

At the time of data collection, guest policy prohibited Bellevue residents from having non-resident guests in their rooms, which was discussed as a reason for using alone. Felix noted that “since COVID-19,

no one has been allowed to visit, and eight or ten people have died because they did drugs and they were by themselves because they couldn't bring anybody in." When asked why she tends to use drugs alone in her room, Iveta stated:

Because like we had plans to come up to my [place] and get high whatever, right, and then all of a sudden now they can't come in. Now they're out there in alleys using alone and I'm up here using by myself. Kind of silly. Actually, the other night though, they did let my friend come into the using room downstairs and we did that. That worked all right. So I want to be able to bring my friends up here, right?

Restrictive visiting policies led some participants to use drugs alone in their rooms while also limiting access to these facilities to guests who may not have housing. Being able to use with other people, whether in rooms or common areas, is a crucial safety mechanism to avoid fatal overdose, especially for people who do not use SCS.

A number of participants reported smoking drugs in their rooms as Bellevue policy does not permit smoking in common areas. However, there was a perception among some participants that smoking drugs was less risky than injecting, and as a result less risky to use alone in their rooms. When asked if they ever used in their room, Aisyah explained she uses smaller amounts when smoking her drugs, stating "Yeah, sometimes I do... When I smoke it, I do it in parts but if I was to like do it intravenously, then I'd be doing like half of it and then... or the whole thing of it." Likewise, Leif described why he uses alone when smoking:

It's just at 4:00 in the morning if I'm up and I need some [drugs] and nobody's around I'm not gonna go looking for somebody. And again I'm not really sticking needles in my arm at 4:00 in the morning either, I'm just having a few hoots.

#### Access to and Use of Safer Supply Medications

Twelve participants received prescribed opioids on-site, including morphine (both slow- and immediate-release), transdermal fentanyl, and safer supply hydromorphone tablets. Medications were delivered

daily to individuals in their rooms, or available for pickup from the on-site medical clinic. Initially (at the time of data collection), safer supply medications were made available to residents to help with COVID-19 safety protocols requiring physical distancing and isolation. Amado explained:

Like basically I get my Dilaudids [i.e., hydromorphone] because the building didn't want us going out when the pandemic first started. And the building I guess he didn't want any of the tenants going out to pick up because of this COVID thing, right. When it was pretty, pretty serious. And what they were doing is giving a safe supply for people if people wanted Dilaudids or whatever, right.

A number of participants receiving safer supply medications described positive benefits of the program, including feeling safer and using less illicit opioids. When asked how receiving slow-release morphine had affected his life, Elias replied, "It has made it better. I don't have to look for heroin that often unless they somehow forget my prescription and I forget to renew it, I'll have to go out and get some heroin instead." Other participants described feeling safer having access to prescribed medications as Iveta, who was prescribed hydromorphone, explained, "I just think it's more safe, safer and that way I know exactly what I'm putting into my body and I just seem to think it's okay because it's prescribed by a doctor." Dahlia, who was also prescribed hydromorphone, similarly elaborated:

Well the positives I guess would be that you know it's clean and consistent, and so you know what you're doing and you know how much you're doing, and I think that would cut down all around on problems, especially with overdose.

While not an intended outcome of the safer supply program, a number of participants spoke about additional benefits such as improved quality of life and reduced reliance on criminalized forms of income generation. Participants suggested that having access to safer supply medications reduced their need to purchase illicit street-acquired drugs, thereby limiting the necessity to engage in the "hustle", that is, the constant cycle of searching for money and drugs. When asked how receiving oral hydromorphone on-site was helpful, Hira elaborated:

It's helping me like not run around and commit crime to maybe get dope, because I'm not sick anymore. And so I'm able to like set realistic goals towards getting it out of my – getting it out of my life.

## Discussion

Our findings demonstrate that social and structural factors shaped residents' drug use practices, limiting their use of the on-site SCS and subsequently using alone in their rooms. Reasons for using alone included the following: preference for being alone, desiring discretion, evading drug-sharing, avoiding stigma and shame, and restrictive policies, including those that prohibit drug smoking in common areas and strict guest policies. That almost half of the study participants were receiving some form of safer supply medication on-site, which directly addresses overdose risk in housing settings, is encouraging (with 11 residents receiving similar medications offsite, or delivered from an offsite pharmacy, primarily due to extant healthcare relationships prior to moving into the Bellevue) [28]. Participants who were receiving these medications on-site spoke about positive benefits including not having to access and worry about using street-acquired drugs, and improvements to overall quality of life. It is important to note that this study was conducted during the early stages of the COVID-19 pandemic at a time of heightened safety protocols, including social isolation and physical distancing measures, which impacted housing policies and safer supply medication access.

Our study illustrates the importance of embedded substance use and harm reduction services within supportive housing environments, including on-site access to safer supply medications. A variety of overdose response and prevention interventions, such as take home naloxone, SCS, and drug checking services, have proven useful in reducing overdose mortality [29]. In BC, a number of these measures have also been established in various housing environments to address ongoing overdose. These include peer-led naloxone training and distribution, supervised consumption rooms/areas, mobile emergency response technologies, and more recently on-site access to and dispensation of opioid agonist treatments and safer supply medications [5, 6, 9, 30]. However, these harm

reduction services are not widely available within housing environments and many interventions are not appropriate for these settings (for instance, naloxone is not effective for people who use alone as it cannot be self-administered after an overdose). Implementing supervised smoking spaces and knowledge translation activities around the risks of smoking criminalized drugs is especially important given the increase in smoking-related drug toxicity deaths (from 31% in 2016 to 56% in 2020) [31].

Most participants reported using alone in their rooms. This finding is supported by research documenting that using drugs alone is common [32–35]. For instance, a recent study of harm reduction service clients from 22 communities across BC found 75.8% of people reported using drugs alone in the previous week [34]. Similarly, a study in Norway found 84.4% of study participants reported having injected alone [33]. The importance of considering contextual influences on drug consumption practices (such as using drugs alone) when designing and implementing harm reduction and overdose prevention measures cannot be overstated. Efforts should be made, for example, to expand and encourage further use of mobile technologies (e.g., mobile phone overdose response applications such as Lifeguard application, virtual “spotting”) or staff check-ins to reduce overdose mortality [36, 37]. Research shows that drug use is shaped by a variety of socio-structural/contextual factors including, for example, physical spaces, social settings, organizational/bureaucratic policies, and individual preferences and desires [38–42]. Participants in this study articulated a variety of reasons for choosing not to use the on-site SCS, and instead use in their rooms, that were shaped by personal preferences (e.g., wanting to be alone, using in the middle of the night), avoiding others (and potential “grinding” or violence), shame/stigma, and organizational policies (e.g., rules prohibiting guests and smoking in common areas). These findings are consistent with previous qualitative work demonstrating that socio-structural contexts and experiences of structural vulnerability (e.g., exploitation, stigma, violence) lead people to use drugs alone, thereby increasing risk of fatal overdose [32, 34, 43]. While the implementation and scale-up of SCS in supportive housing is a positive step in reducing overdose mortality, there are clear opportunities to alter/design these spaces to take into consideration privacy/

confidentiality, sociality of drug use (including revising guest policies), and preferred drug consumption methods (especially those that accommodate smoking). While not explicitly discussed by study participants, research demonstrates that both using alone and access to appropriate harm reduction services are shaped by experiences of gendered violence [24, 43–45], pointing to the need to expand safer environment interventions capable of addressing broader socio-structural and contextual factors (e.g., those related to poverty, criminalization, gendered and racialized violence), while also increasing knowledge around potential strategies and drug use practices to reduce the risk of using alone [44, 46–48].

The findings of this study demonstrate the critical need to evaluate and expand access to safer supply medications within housing environments for people at high risk of overdose. Furthermore, rising stimulant and polysubstance use, increasing adulteration of the drug supply with benzodiazepines such as etizolam, and resultant complex overdose presentations support the expansion of safer supply medication beyond opioids [18, 49, 50]. Existing qualitative evidence suggests such programs have significant potential to reduce overdose events and mortality [51]. However, the majority of safer supply programs in Canada operate in clinical settings or within social/health services (e.g., SCS), require on-site access to and use of medications (with select programs permitting offsite autonomous use), and are therefore unable to address overdose risk within housing environments [52–54]. Supportive housing-embedded safer supply programs have the potential to reduce overdose events and mortality among people who choose to use alone indoors. On-site access to safer supply also reduced harms such as having to engage in criminalized forms of income generation or seek out drugs from the illicit drug supply (thereby reducing overdose risk and their chances of experiencing violence) [45, 55].

The study has several limitations. First, our study was conducted in the Downtown Eastside neighborhood of Vancouver, an area characterized by poverty, an open drug market, high prevalence of drug use, and extensive supportive housing and health services, and therefore may not be generalizable to other settings. Furthermore, we recruited residents from a single supportive housing building in this neighborhood, and as such our findings may not be representative of people living in other forms of supportive housing in

Vancouver and elsewhere. However, we feel our study meets the criteria for trustworthiness [56], and therefore, our findings may be transferable to other very similar contexts such as supportive housing buildings offering primary care and safer supply medications. Second, COVID-19 safety measures required us to modify recruitment strategies and data collection methods, which may have affected participant recruitment and quality of our data (e.g., participation in the study was limited to people with access to phones). It is also possible, for example, that involving staff (who retained sign-up sheets and provided participants with consent forms) may have impacted participant recruitment (e.g., potential participants not wanting to self-identify to staff as someone who uses drugs). However, involving staff may have also been beneficial in terms of gaining trust of study participants. Finally, the main objective of this study was to examine primary care access among residents (which we describe elsewhere) [28], and analysis for this paper used secondary data which was limited. Further research is needed to better understand overdose risk in housing environments, and in particular to evaluate the growing number of on-site safer supply programs.

Our study makes an important contribution to the limited but growing body of work on why people choose to use drugs alone in the midst of an ongoing overdose crisis. These findings demonstrate the important role of embedded overdose response and prevention interventions within supportive housing environments where people are at high overdose risk. In particular, providing residents of supportive housing buildings on-site access to safer supply medications is critically needed to reduce overdose events and mortality, and should be expanded and scaled up.

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## References

1. Special Advisory Committee on the Epidemic of Opioid Overdoses. Opioid and stimulant-related harms in Canada.



- Ottawa: Public Health Agency of Canada; December 2021. Available from: <https://health-infobase.canada.ca/substance-related-harms/opioids-stimulants/>. Accessed 8 Feb 2022.
- British Columbia Coroners Service. Illicit drug toxicity deaths in BC January 1, 2011 – May 31, 2022. 2021. Available from: <https://www2.gov.bc.ca/assets/gov/birth-adoption-death-marriage-and-divorce/deaths/coroners-service/statistical/illicit-drug.pdf>. Accessed 14 Jul 2022.
  - Bowles JM, McDonald K, Maghsoudi N, Thompson H, Stefan C, Beriault DR, et al. Xylazine detected in unregulated opioids and drug administration equipment in Toronto, Canada: clinical and social implications. *Harm Reduct J*. 2021;18(1):104.
  - Pursell R, Buxton J, Godwin J, Moe J. Potent sedatives in opioids in BC: implications for resuscitation, and benzodiazepine and etizolam withdrawal | British Columbia Medical Journal. 2021. Available from: <https://bcmj.org/bccdc/potent-sedatives-opioids-bc-implications-resuscitation-and-benzodiazepine-and-etizolam>. Accessed 7 Mar 2022.
  - Bardwell G, Collins AB, McNeil R, Boyd J. Housing and overdose: an opportunity for the scale-up of overdose prevention interventions? *Harm Reduct J*. 2017;14(1):77.
  - Bardwell G, Fleming T, Collins AB, Boyd J, McNeil R. Addressing intersecting housing and overdose crises in Vancouver, Canada: opportunities and challenges from a tenant-led overdose response intervention in single room occupancy hotels. *J Urban Health*. 2018. Available from: <https://doi.org/10.1007/s11524-018-0294-y>
  - Bardwell G, Kerr T, McNeil R. The opioid overdose epidemic and the urgent need for effective public health interventions that address men who use drugs alone. *Am J Mens Health*. 2019;13(3):1557988319859113.
  - Davidson PJ, McLean RL, Kral AH, Gleghorn AA, Edlin BR, Moss AR. Fatal heroin-related overdose in San Francisco, 1997–2000: a case for targeted intervention. *J Urban Health*. 2003;80(2):261–73.
  - MacKinnon L, Socias ME, Bardwell G. COVID-19 and overdose prevention: challenges and opportunities for clinical practice in housing settings. *J Subst Abuse Treat*. 2020;1(119): 108153.
  - Schneider S, Richter C, Niethammer R, Beisel L. Fatal and non-fatal heroin-related overdoses: circumstances and patterns. *Subst Use Misuse*. 2021;56(13):1997–2006.
  - Tinland A, Loubiere S, Cantiello M, Boucekine M, Girard V, Taylor O, et al. Mortality in homeless people enrolled in the French housing first randomized controlled trial: a secondary outcome analysis of predictors and causes of death. *BMC Public Health*. 2021;21(1):1294.
  - Treitler PC, Gilmore Powell K, Morton CM, Peterson NA, Hallcom D, Borys S. Locational and contextual attributes of opioid overdoses in New Jersey. *J Soc Work Pract Addict*. 2021;0(0):1–12.
  - Fairbairn N, Coffin PO, Walley AY. Naloxone for heroin, prescription opioid, and illicitly made fentanyl overdoses: challenges and innovations responding to a dynamic epidemic. *Int J Drug Policy*. 2017;1(46):172–9.
  - Fairbairn N, Ross J, Trew M, Meador K, Turnbull J, MacDonald S, et al. Injectable opioid agonist treatment for opioid use disorder: a national clinical guideline. *CMAJ*. 2019;191(38):E1049–56.
  - Karamouzian M, Dohoo C, Forsting S, McNeil R, Kerr T, Lysyshyn M. Evaluation of a fentanyl drug checking service for clients of a supervised injection facility, Vancouver, Canada. *Harm Reduct J*. 2018;15(1):46.
  - Strike C, Watson TM. Losing the uphill battle? Emergent harm reduction interventions and barriers during the opioid overdose crisis in Canada. *Int J Drug Policy*. 2019;1(71):178–82.
  - Canadian Association of People Who Use Drugs. Safe supply concept document. 2019. Available from: <http://capud.ca/images/files/CAPUD%20safe%20supply%20Feb%2020%202019.pdf>. Accessed 10 Sep 2019.
  - Fleming T, Barker A, Ivsins A, Vakharia S, McNeil R. Stimulant safe supply: a potential opportunity to respond to the overdose epidemic. *Harm Reduct J*. 2020;17(1):6.
  - Ivsins A, Boyd J, Beletsky L, McNeil R. Tackling the overdose crisis: the role of safe supply. *Int J Drug Policy*. 2020;1(80):102769.
  - Kolla G, Touesnard N, Gomes T. Addressing the overdose crisis in North America with bold action. *Addiction*. 2022;117(5):1194–6.
  - British Columbia Centre on Substance Use. Risk mitigation in the context of dual public health emergencies. 2020. Available from: <https://www.bccsu.ca/wp-content/uploads/2020/04/Risk-Mitigation-in-the-Context-of-Dual-Public-Health-Emergencies-v1.5.pdf>. Accessed 12 Apr 2020.
  - British Columbia. Access to prescribed safer supply in British Columbia: policy direction. 2021. Available from: [https://www2.gov.bc.ca/assets/gov/overdose-awareness/prescribed\\_safer\\_supply\\_in\\_bc.pdf](https://www2.gov.bc.ca/assets/gov/overdose-awareness/prescribed_safer_supply_in_bc.pdf). Accessed 9 Feb 2022.
  - Nosyk B, Slaunwhite A, Urbanoski K, Hongdilokkul N, Palis H, Lock K, et al. Evaluation of risk mitigation measures for people with substance use disorders to address the dual public health crises of COVID-19 and overdose in British Columbia: a mixed-method study protocol. *BMJ Open*. 2021;11(6):e048353.
  - Collins AB, Boyd J, Hayashi K, Cooper HLF, Goldenberg S, McNeil R. Women’s utilization of housing-based overdose prevention sites in Vancouver, Canada: an ethnographic study. *Int J Drug Policy*. 2020;1(76):102641.
  - Tyndall M. Safer opioid distribution in response to the COVID-19 pandemic. *Int J Drug Policy*. 2020;1(83):102880.
  - Robson C, McCartan K. *Real world research*. John Wiley & Sons; 2016. p. 560
  - Kleinheksel AJ, Rockich-Winston N, Tawfik H, Wyatt TR. Demystifying content analysis. *Am J Pharm Educ*. 2020;84(1):127–37.
  - MacKinnon L, Kerman N, Socias ME, Brar R, Bardwell G. Primary care embedded within supportive housing for people who use substances: a qualitative study examining healthcare access in Vancouver, Canada. *Health Soc Care Community*. 2022.
  - Irvine MA, Kuo M, Buxton JA, Balshaw R, Otterstatter M, Macdougall L, et al. Modelling the combined impact of interventions in averting deaths during a synthetic-opioid overdose epidemic. *Addiction*. 2019;0(0). Available from: <http://onlinelibrary.wiley.com/doi/abs/10.1111/add.14664>. Accessed 11 Jul 2019.
  - Bardwell G, Fleming T, McNeil R, Boyd J. Women’s multiple uses of an overdose prevention technology to mitigate risks and harms within a supportive housing environment: a qualitative study. *BMC Womens Health*. 2021;21(1):51.

31. British Columbia Coroners Service. Illicit drug toxicity deaths in BC knowledge update: Mode of Consumption. 2022. Available from: <https://www2.gov.bc.ca/assets/gov/birth-adoption-death-marriage-and-divorce/deaths/coroners-service/statistical/mode-of-consumption.pdf>. Accessed 26 Feb 2022.
32. Bardwell G, Boyd J, Kerr T, McNeil R. Negotiating space & drug use in emergency shelters with peer witness injection programs within the context of an overdose crisis: a qualitative study. *Health Place*. 2018;1(53):86–93.
33. Gjersing L, Helle MK. Injecting alone is more common among men, frequent injectors and polysubstance users in a sample of people who inject drugs. *Subst Use Misuse*. 2021;56(14):2214–20.
34. Papamihali K, Yoon M, Graham B, Karamouzian M, Slaunwhite AK, Tsang V, et al. Convenience and comfort: reasons reported for using drugs alone among clients of harm reduction sites in British Columbia, Canada. *Harm Reduct J*. 2020;17(1):NA-NA.
35. Winiker AK, Tobin KE, Gicquelais RE, Owczarzak J, Latkin C. “When you’re getting high... you just don’t want to be around anybody.” A qualitative exploration of reasons for injecting alone: perspectives from young people who inject drugs. *Subst Use Misuse*. 2020;55(13):2079–86.
36. Wynton M. An app designed to curb drug overdose deaths has saved 15 lives. The Tyee. 2021. Available from: <https://thetyee.ca/News/2021/03/18/App-Curbing-Drug-Overdose-Deaths-Saves-15-Lives/>. Accessed 15 July 2022.
37. Perri M, Kaminski N, Bonn M, Kolla G, Guta A, Bayoumi AM, et al. A qualitative study on overdose response in the era of COVID-19 and beyond: how to spot someone so they never have to use alone. *Harm Reduct J*. 2021;18(1):85.
38. Duff C. The pleasure in context. *Int J Drug Policy*. 2008;19(5):384–92.
39. Duff C. Accounting for context: exploring the role of objects and spaces in the consumption of alcohol and other drugs. *Soc Cult Geogr*. 2012;13(2):145–59.
40. Duncan T, Duff C, Sebar B, Lee J. ‘Enjoying the kick’: locating pleasure within the drug consumption room. *Int J Drug Policy*. 2017;1(49):92–101.
41. Ivsins A, Marsh S. Exploring what shapes injection and non-injection among a sample of marginalized people who use drugs. *Int J Drug Policy*. 2018;1(57):72–8.
42. Ivsins A, Yake K. Looking beyond harm: meaning and purpose of substance use in the lives of marginalized people who use drugs. *Drugs Educ Prev Policy*. 2018;0(0):1–10.
43. Collins AB, Boyd J, Czechaczek S, Hayashi K, McNeil R. (Re)shaping the self: an ethnographic study of the embodied and spatial practices of women who use drugs. *Health Place*. 2020;1(63):102327.
44. Boyd J, Collins AB, Mayer S, Maher L, Kerr T, McNeil R. Gendered violence and overdose prevention sites: a rapid ethnographic study during an overdose epidemic in Vancouver, Canada. *Addiction*. 2018;113(12):2261–70.
45. Harris MTH, Bagley SM, Maschke A, Schoenberger SF, Sampath S, Walley AY, et al. Competing risks of women and men who use fentanyl: “the number one thing I worry about would be my safety and number two would be overdose.” *J Subst Abuse Treat*. 2021;125:108313.
46. McNeil R, Small W. ‘Safer environment interventions’: a qualitative synthesis of the experiences and perceptions of people who inject drugs. *Soc Sci Med*. 2014;1(106):151–8.
47. Project SAFE & Vital Strategies. Survival strategies while using drugs alone from people who use drugs. 2021. Available from: <https://www.vitalstrategies.org/wp-content/uploads/PWUD-ServiceProvider-Guide-07142021.pdf>. Accessed 21 Apr 2022.
48. Project SAFE & Vital Strategies. Do you ever use drug alone? A guide for people who use drugs by people who use drugs about using alone. 2021. Available from: [https://www.vitalstrategies.org/wp-content/uploads/OPP\\_ProjectSafe-Using-Drugs-Alone.pdf](https://www.vitalstrategies.org/wp-content/uploads/OPP_ProjectSafe-Using-Drugs-Alone.pdf). Accessed 21 Apr 2022.
49. Bonn M, Palayew A, Bartlett S, Brothers TD, Touesnard N, Tyndall M. Addressing the syndemic of HIV, hepatitis C, overdose, and COVID-19 among people who use drugs: the potential roles for decriminalization and safe supply. *J Stud Alcohol Drugs*. 2020;81(5):556–60.
50. Mansoor M, McNeil R, Fleming T, Barker A, Vakharia S, Sue K, et al. Characterizing stimulant overdose: a qualitative study on perceptions and experiences of “overamping.” *Int J Drug Policy*. 2022;1(102):103592.
51. Ivsins A, Boyd J, Mayer S, Collins A, Sutherland C, Kerr T, et al. “It’s helped me a lot, just like to stay alive”: a qualitative analysis of outcomes of a novel hydromorphone tablet distribution program in Vancouver, Canada. *J Urban Health* 2020 [cited 2020 Nov 19]; Available from <https://doi.org/10.1007/s11524-020-00489-9>
52. Ivsins A, Boyd J, Mayer S, Collins A, Sutherland C, Kerr T, et al. Barriers and facilitators to a novel low-barrier hydromorphone distribution program in Vancouver, Canada: a qualitative study. *Drug Alcohol Depend*. 2020;15:108202.
53. Palis H, MacDonald S, Jun J, Oviedo-Joekes E. Use of sustained release dextroamphetamine for the treatment of stimulant use disorder in the setting of injectable opioid agonist treatment in Canada: a case report. *Harm Reduct J*. 2021;18(1):NA-NA.
54. Young S, Kolla G, McCormack D, Campbell T, Leece P, Strike C, et al. Characterizing safer supply prescribing of immediate release hydromorphone for individuals with opioid use disorder across Ontario, Canada. *Int J Drug Policy*. 2022;1(102):103601.
55. Richardson LA, Long C, DeBeck K, Nguyen P, Milloy MJS, Wood E, et al. Socioeconomic marginalisation in the structural production of vulnerability to violence among people who use illicit drugs. *J Epidemiol Community Health* 1979-. 2015;69(7):686–92.
56. Elo S, Kääriäinen M, Kanste O, Pölkki T, Utriainen K, Kyngäs H. Qualitative content analysis: a focus on trustworthiness. *SAGE Open*. 2014;4(1):2158244014522633.

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