Opioid Use Disorder Treatment Disruptions during the COVID-19 Pandemic and Other Disasters: A Scoping Review Addressing Dual Public Health Emergencies

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Abstract

Background: During public health emergencies, disruptions to social landscapes and amplification of inequities for people with opioid use disorder raise important questions about reducing harms and providing treatment accountability to support this population during disasters including COVID-19. This research aims to a) identify how disasters impact persons with opioid use disorder (OUD) and their access to healthcare, with specific attention to COVID-19, and b) inform ongoing responses to the pandemic and future disaster-mitigation plans related to healthcare disruptions affecting persons with opioid use disorder (PWOUD).

Methods: We conducted knowledge synthesis based on a 6-stage scoping review framework methodology. Stakeholder consultation was completed using a Nominal Group Technique with two groups, each composed of including providers in primary, emergency and community-based care. One group (n=7) represented voices from urban services, and the other (n=4) Indigenous contexts allowing for attention to healing the whole person, beyond OAT.

Results: 61 scientific journal articles and 72 grey literature resources were included after full-text screening. Stakeholder NGT process revealed three contextual factors affecting system and service accountability for responsive OUD care during disaster-driven disruptions: (1) disasters focus attention on single risks and generalized solutions; (2) data-poor decision-making perpetuates stigma and produces policy inattentive to social determinants of health; and (3) harm reduction and contextually-tailored care prepare a system for future disasters.

Conclusion: COVID-19 public health efforts require a coordinated systemic approach to serving PWOUD, based on accountability to patients and support for providers.

Background

This review presents literature on disruptions to Opioid Agonist Treatment (OAT) and other supports for people with opioid use disorder (PWOUD), with attention to the COVID-19 pandemic. Disruptions to social landscapes and amplification of inequities for PWOUD— through increased social stressors, changes in daily environments, drug supply shifts, or altered service delivery— raise important questions about reducing harms and providing treatment accountability to support this population during disasters. When COVID-19 arrived in Canada in March 2020, the opioid crisis was already impacting communities across the country, prompting some jurisdictions (e.g. British Columbia) to declare it a public health emergency (1). PWOUD may have a more severe disease course if infected with COVID-19 due to higher incidences of existing health issues and increased risk of transmission due primarily to socially structured inequities (e.g., food insecurity, lack of stable income/housing) that often affect PWOUD (2). For persons relying on daily in-person OAT, COVID-19 physical distancing measures have disrupted care and stirred important challenges for providers and public health decision-makers. OAT is the recommended treatment for OUD and increased morbidity and mortality are observed when OAT is interrupted (3). Notably, within Canada,

there has been a surge of overdose and overdose related deaths during the current pandemic, as individuals are more likely to use alone, with less access to services and supports (4). Pandemic-driven healthcare changes may be sustained for the foreseeable future, with unintended or untracked consequences for PWOUD.

Following a literature summary, team members including providers in primary, emergency and community-based care engaged in a consensus-building process using the Nominal Group Technique (NGT) to contextualize the literature to care setting (5). The objective of the knowledge synthesis is to identify how disasters impact PWOUD and their care, with specific attention to COVID-19 to mitigate pandemic adversities for PWOUD and inform future disaster-mitigation plans.

Methods

We conducted a scoping review of relevant international scientific literature since 2000, and grey literature from Canada during 2020 employing a 6-stage scoping review framework methodology (6) to: i) identify research question; ii) identify relevant sources; iii) select sources; iv) chart data; v) collect, summarize; and report results; and vi) consult stakeholders via NGT for data synthesis (5). NGT attendees are co-investigators and co-interpreters of the data, and so did not sign consent forms. Not all investigators met authorship criteria for the final manuscript and not all co-authors attended the NGTs.

Literature Search and Selection

To identify scientific literature, a librarian (XXX) and research assistant searched 10 electronic databases in May/June 2020 with search terms related to: disease outbreaks or disasters; opioid and substance use disorder; health care services and access (Table 1; full search strategy available in Additional File 1).

Table 1
Scientific literature search strategy

Databases searched	Search terms
Ovid Medline, APA PsycINFO, CINAHL Complete, LitCOVID, WHO COVID-19 database, TripPro, Science Direct (which included searches in Science Direct Covid – 19 Research database & Elsevier 1Science Coronavirus Research Repository), Embase, Web of Science, and Ovid Cochrane Database of Systematic Reviews	COVID-19, Coronavirus, MERS-CoV, Middle East Respiratory Syndrome Coronavirus, Severe Acute Respiratory Syndrome, disease outbreak, influenza, opioid, opioid use disorder, substance use disorder, disaster, natural disaster or mass disaster, health care access, community mental health service, primary health care, community care, telehealth, health care disparity

Duplicates were removed and results screened for inclusion criteria through title, abstract, and full text review (Fig. 1). Scientific literature inclusion criteria were that sources: (i) provide insight on OUD; (ii) inform changes to service delivery, care and access to treatment; (iii) examine a natural disaster, pandemic or crisis situation; and (iv) had full text available. Since English search terms were used, only English results were identified. Three reviewers were involved in each screening step, with at least 10% of sources evaluated for inclusion by at least two reviewers at each step to develop consensus.

To gather grey literature (i.e., non-academic sources), a librarian (XXX) completed Google searches using six search strings in June 2020, limiting results to 2020 and the first 100 results of each search string (see Additional File 1). Websites identified by the study team were also searched for key words (e.g., "COVID-19" OR coronavirus AND opioids OR "opioid use disorder" OR "substance use disorder"). Grey literature inclusion criteria were: (i) Canadian source; (ii) related to opioid use, services and supports; and (iii) specific to COVID-19. Two reviewers evaluated 10% of sources for inclusion until reaching consensus, then one reviewer continued evaluating sources independently. The grey literature was limited to Canada to make findings more relevant to NGT stakeholders.

Data Extraction

We extracted aims and methodology (when applicable), country, health service, disaster examined, disaster impacts (including affected populations and service disruptions), service adaptations, as well as resource type for grey literature (e.g. policy document, practice guidelines, news articles). Three reviewers were involved in extraction, with 100% of scientific literature and 20% of grey literature extraction cross-checked by a second reviewer to confirm agreement. Discrepancies were resolved through discussion and document review until consensus was reached.

Data Synthesis

Literature review results were thematically outlined in information sheets provided to NGT participants. NGT groups were composed of care providers, systems-level decision-makers, and patient advocates from Alberta, Canada. The first group (n = 7) represented voices from urban services, and the second (n = 4) represented voices from Indigenous contexts including First Nations reserve settings. This approach supported a broad view of the healthcare system integrated with Indigenous ways of knowing, namely attention to healing the whole person (see (7). Key themes presented to the stakeholders were: 1) increased risks during disasters for PWOUD, 2) models of care adaptations, and 3) cross-systems implications. Stakeholders identified where the literature was reflective of their own experiences in service settings during COVID-19 and where the literature could go further, contributing ideas and engaging in moderated discussions to prioritize core insights from the data (5). The NGT is valuable for building recommendations that cross-cut systems while remaining clinically relevant, and promoting consensus across health systems and social services around topics with high potential for stigma and partisanship.

Analytical Framework

Literature is presented according to a realist structure to draw attention to the disaster-specific: context of OUD and OAT, mechanisms behind interventions to address risk for PWOUD, and outcomes of OUD care. A realist approach highlights the complex and contextually specific systems in which interventions play out (8), orienting analysis to how strategic measures might shift outcomes—or consequences—of disruptions to OUD care. Aligned with the broader context of the social realities of PWOUD, we engage with the term ‘relapse’ critically, emphasizing the broader intensification of substance use and heightened

adversities that occurs during disasters. Unlike a realist review, we do not test any candidate theory, but rather draw on the approach to reach actionable insights for OUD care during disasters.

Results

After full text screening, 61 scientific sources met inclusion criteria, which were primarily commentaries (n = 42, 60%). As such, the term 'scientific' rather than 'peer-reviewed' is used to differentiate this body of editorially-selected and academically-grounded, though not peer-reviewed, literature from the grey literature. Peer-reviewed literature included 11 qualitative, three quantitative, and five mixed methods sources (n = 19). Seventy-two grey literature results met inclusion criteria (See Additional File 2 for a full list of included scientific sources; Additional File 3 for a grey literature summary).

From the full scientific literature, 40 sources pertained to COVID-19, 12 focused on OUD treatment during hurricanes and nine focused on OUD treatment during other disasters (e.g., 9/11, heatwaves, riots, earthquakes and disasters in general). Only one article discussing COVID-19 was an empirical study (Table 2). Scientific sources were primarily from the United States (n = 39), eight global in scope, one focused on Canada and 13 were located in other countries including Australia, India, Iran, Ireland, Kosovo, New Zealand, and South Africa. Scientific sources included diverse healthcare services: 31 discussed substance use and opioid treatment programs, 19 discussed the general health system or public health measures, four sources focused on cross-systems analyses (e.g. health, justice and social service systems), and seven discussed opioid treatment within specific healthcare settings, including primary care, pharmacies, and outreach or community-based settings. We synthesize COVID-specific scientific and grey literature within the text below and showcase lessons learned from previous disasters in textboxes to distinguish COVID-19 contexts from other disasters.

Table 2
Scientific source overview

	COVID-19 Focus	Other Disaster	Total
Methodology			
Qualitative	1	10	11
Quantitative	0	3	3
Mixed Methods	0	5	5
Commentary	39	3	42
Region			
United States	24	15	39
Global	7	1	8
Canada	1	0	1
Other	8	5	13
Health System			
General	13	6	19
Specialty or Addiction-focused	20	11	31
Cross-Systems	3	1	4
Other	4	3	7
Total	40	21	61

Context of COVID-19 disruptions: Social realities of PWOUD

Stress from both COVID-19 and its public health measures appears to have increased fear-driven behaviours—such as panic buying and substance use—across all populations (9). For PWOUD, COVID-19 stressors may include loss of income, housing instability fear and anxiety, threats to drug supplies, and closure of substance use treatment centres (10) which were not widely deemed essential services. Stress is likely to worsen substance use issues and increase high risk or undesired use of substances. This may be acutely felt by those accessing OAT or who consider themselves to be in recovery, particularly for low income and marginalized groups (10). COVID-19-induced adversities, especially financial challenges, can lead to instability in daily environments that damages pathways to exercising agency in substance use or non-use (11). Further, public health measures intended to reduce COVID-19 transmission across the population ignore the social realities in which many PWOUD live (12). There is growing concern that physical distancing causes isolation and lack of rewarding activities, possible risk factors for increased

substance use, self-harm, domestic violence, and other mental health problems (11). Stressors can lead to substance use disorder development, intensification of substance use, or renewed high risk or undesired use of substances for those whose OUD was stably managed through treatment (9, 13, 14). PWOUD may also experience increased difficulty obtaining sufficient supplies (e.g. food, substances and clean supplies for substance use) to shelter in place for extended periods, heightening risks (2). For instance, needle shortages may result in reuse or sharing, and in turn transmission of bloodborne diseases such as HIV and Hepatitis C (2). These stressors were also common themes in peer-reviewed sources on previous disasters (see Table 3).

Table 3

Summary of findings from peer-reviewed sources on previous disasters

Amplified Risk for PWOUD during Disasters	Efforts to Mitigate Risk for PWOUD and their Essential Services During and After Disasters

Amplified Risk for PWOUD during Disasters	Efforts to Mitigate Risk for PWOUD and their Essential Services During and After Disasters
• Disasters create high-risk environments that exacerbate substance use and risk of infectious disease spread (39) • After disasters, people who resume illicit drug use after a period of abstinence or use of safe supply do so in a higher risk context. Decreased purity of illicit supply has been noted after disasters and fears of scarce supply can result in high risk behaviour like sharing of needles (39,40) • Personal impacts such as decreased employment, difficulty accessing basic needs, homelessness, lack of transportation, lack of information on how to access OAT and other supports, discrimination and stigma may result in the use of substances to cope with disaster contexts (39,40) • Systems issues such as decreases or redirection in public health spending towards disaster relief, disruption to substance use treatment and disruption to harm reduction services increase risks for PWOUD after disasters (41) • During and after disasters, psychological and emotional distress increases for both PWOUD and staff of support programs who are also personally experiencing the disaster (42) • Disruption of services after disasters and increase in homelessness associated with some disasters cause psychiatric distress and may increase substance use (41), and displaced populations that rely on shelters can be met with unprepared or untrained staff (43) • Disruptions in OAT services, inadequate take home dosing, lack of guest-dosing information at alternate clinic sites put PWOUD at increased risk for negative outcomes after a disaster (42,44) • When OAT care is disrupted, people turn to emergency departments for access to OAT medications. However emergency clinicians sometimes face barriers prescribing OAT or lack access to patient dosing information, resulting in inadequate or unsafe prescriptions (44)	• Efforts to ensure access to OAT include: Provision of take home dosing, guest dosing at clinics other than the patients' usual clinic, delivering/mailing of medication to patients, mobile units and communication strategies (e.g., individual phone calls, hotlines and social media) to keep people informed on how to access treatment (44,45) Other supports include: • Mental health support for fear & anxiety after disasters: lack of increase in illicit drug use attributed to availability of mental health professionals, support groups, and counsellors (46) • Internet-based modules providing psychoeducation and motivational feedback focused on mental health and substance use issues after a disaster (47) • Disaster planning that values cultural specificity and needs of people who have disabilities, mental health issues, use substances, or are on OAT to ensure providers, first responders, organizations, and emergency managers are prepared for disaster scenarios (45) • Formal disaster plans and a central database containing dosing information (44,45) and coordinated emergency laws (43)

A concurrent concern for PWOUD is the heightened risk of COVID-19 transmission and adverse impacts of COVID-19 infection (15, 16). PWOUD are more likely to have coexisting health conditions including immunosuppression, making them vulnerable to COVID-19 infection (12). Though many sources outline measures to decrease risk of COVID-19 transmission while in treatment centres (17–19), outside of care settings PWOUD often face difficulties complying with COVID-19 public health messaging (2, 16). Physical distancing is especially difficult if under-housed, incarcerated, living in recovery houses, or shelters; facilities that may also have inadequate access to hand hygiene supplies and masks (15).

Reduced access to addiction treatment, recovery supports, and harm reduction services also increase health and safety risks for PWOUD (13). COVID-19 disruptions in care due to clinic closures, staff shortages, reduced hours and reduced face-to-face care can increase riskier substance use (10). Disruptions in OAT access can cause withdrawal symptoms, leading some to seek illicit supplies (20) and increasing the risk of overdose due to more toxic or new and unfamiliar products in circulation (13). As well, periodic voluntary or involuntary abstinence also increases risk of withdrawal and overdose, and may be more common during COVID-19 due to interruptions in treatment, efforts to shelter in place and changes in the drug supply (21). Decreased access to supervised consumption sites (SCS) and increase of drug use in isolation increases risk of overdose (13). Additionally, decreased access and availability of naloxone during COVID-19 (14), and fears of COVID-19 transmission through nasal naloxone and due to a lack of personal protective equipment (PPE) may result in less overdose rescue (13). COVID-19 also intensifies already-existing barriers to care for underserved populations (17). Discontinuity of care within health services and between health and social services may be exacerbated as patients experience increased difficulties navigating systems that are even less coordinated than before the pandemic (22).

Stigma-induced healthcare inequities may be exposed or heightened during COVID-19, especially in strained care settings (16). For instance, Salisbury-Afshar et al. note “if there is 1 remaining ventilator and several patients in need, will the individual who is experiencing homelessness and using illicit drugs be the one selected?” (16)(p. 893–894). The literature discussed stigma towards people who use substances generally, but rarely beyond that: one source discussed systemic discrimination against individuals with sexual minority identities (23), however there was no discussion of structural racism in the sources.

Discussing contextualization of the literature to social disruptions from COVID-19 (see Table 4), NGT providers found social isolation and stigma against PWOUD reflected their experience. Isolation was noted to significantly increase with reduced access to SCS. Providers suspected their clientele were more frequently using substances alone and turning more to illicit supplies, especially worrying given greater risk for toxicity in drugs obtained from unfamiliar sources. NGT stakeholders felt that the intersectionality of multiple stigmatized identities should be acknowledged, noting the literature missed differential impacts of COVID-19 disruptions on Indigenous people, who are impacted by racist stereotypes that link Indigeneity to problematic substance use (see also (24)). Stakeholders emphasized that COVID-19 disruptions intensify stigmatized adversities for people in precarious circumstances and increase risk-taking to meet basic needs, such as sex work or participation in other informal (often criminalized)

economies. Stakeholders warned that anecdotes about income supports during the initial months of COVID-19 driving the use of illicit substances work to frame substance using populations as undeserving of support while blaming them for negative substance use outcomes. They worried that such claims may deepen oppression of already stigmatized populations. Providers expressed concern that increased overdoses were partially due to responder uncertainty about the risk of contracting COVID-19 during an overdose response, though guidance documents were available in some jurisdictions (25).

Table 4
Stakeholder Contextualization of Literature to Social Disruptions from COVID-19

SOCIAL CONTEXT OF DISRUPTION		
What resonates from the literature?		**Paraphrase of Stakeholder Comments**
Social isolation	• Greater substance use in isolation; scarcer spaces & disrupted networks to more safely use drugs in groups • Increased illicit substance use from unfamiliar sources; drug supply shifts potentially increasing toxicity • Amplified quality of life vulnerabilities for PWOUD; “relapse” part of broader substance use intensification • Sudden income loss and difficulties to secure basic needs driving increased stress & risk taking	*People coming out of incarceration or hospitals are finding their map of where to access normal services have changed, and many don’t know how to navigate not just what is available, but don’t have means via available transportation.*
Where could the literature go further?		**Paraphrase of Stakeholder Comments**

1. See (48)

SOCIAL CONTEXT OF DISRUPTION		
Intensified adversities	• Decreased overall support from social and health services due to closures for physical distancing and planning needed to prepare for a communicable disease pandemic • Pandemic Income assistance disrupted eligibility for other social assistance, which sometimes led to loss of medication coverage and new barriers • Disparate approaches to mitigate risk, with pandemic efforts emphasizing COVID-induced barriers to care without sufficient attention to pre-existing gaps in care • Disruptions differentially impact racialized, gender minority, housing insecure, and other vulnerable groups in specific ways that need to be better understood and addressed	*The crisis for people experiencing OUD is worse than COVID* *We have to compare these two epidemics locally* (COVID & overdose), *we must call it a dual public health emergency. It 100% affects all, just as infectious diseases do.* *Need to look disparity in the eye, why treat COVID with urgency and take away resources and increase risks elsewhere?*

1. See (48)

SOCIAL CONTEXT OF DISRUPTION		
Stigma	• Disruptions aggravate existing adversities & decrease access to care for already underserved groups • While focus on stigma facing PWOUD is important, it may limit attention to intersectionality of multiple stigmatized identities, especially racial & gender inequities	*It's like Maslow's hierarchy of needs: when on treatment for addiction, you're a bit tied to healthcare and there's a razor's edge of needs to satisfy at the same time, to eat and drink and stay alive in a toxic environment. We're seeing the system not meet those needs and being politicized. For Indigenous PWOUD, you have 500 years of colonization, then this pandemic that isolates and incarcerates people for trying to meet basic needs.* *They're not bad people but the stigma that they face… people are dying because of racism.*
1. See (48)		

Table 4

Stakeholder Contextualization of Literature to Mechanisms to Mitigate Harm from COVID-19

EFFORTS TO MITIGATE HARMS FROM DISASTER-DRIVEN DISRUPTIONS		
What resonates from the literature?		**Paraphrase of Stakeholder Comments**
Disconnected systems	• Lack of adequately resourced formal structures to sustain communication and coordination between distinct health systems and social services • Amplified care gaps, where providers unaware of increased hazards of disrupting events for PWOUD may take actions with deleterious consequences for patients	*We maintained regular buprenorphine/naloxone starts and referral patterns, but had relatively few tools to give patients other than a number to call to follow-up in community care and no idea if it was even still functional.* *Someone in this population with COVID symptoms has to go elsewhere to get swabbed, socially distance. It's not realistic and causes additional issues regarding access to care.* *In the Emergency Department, I don't know if my resources for opioid use disorder are up to date. I am giving the patient a phone number and I don't know if it works.* *The new training requirements on us during COVID are tremendous. We can't keep up.*
Innovation through necessity	• Development of mobile teams to increase outreach; e.g., bring medications to client homes, seeing clients in their homes • Treatment flexibility in some clinical settings for virtual appointments, longer carries • Increased outreach and creativity with no increase in resources	*Allow front-line people to do what they know they need to do, giving credit to people on the front-line who are all professionals and participating in regulatory bodies, to support and trust them to know how to make decisions.* *There should be more bend to the system than patients are expected to do. Patients shouldn't have to jump through multiple points of service, or to know where to go, rather providers should have more insight in how to get them to the next dot on their path.* *Virtual care is okay. The people who use it like it, as with anything else. But what about people who don't use it? It's one part of the toolbox.* *Who triages it? Who determines who needs to be seen when?*
Where could the literature go further?		**Paraphrase of Stakeholder Comments**

1. See (50)

EFFORTS TO MITIGATE HARMS FROM DISASTER-DRIVEN DISRUPTIONS		
Inconsistent or unreliable data & guidance	• Infrequent public health updates addressing population-specific realities; felt to ignore growing uncertainty around causes of increased overdoses observed • Unclear direction for clinical interactions; e.g., Unknown/outdated contact information for transitions in care; PWOUD facing loss of disability & housing supports, and policy changes happening at same time as public health disruptions • Uneven political will across jurisdictions; Alberta providers looked to BC for data updates and guidelines; closure of busiest SCS in Lethbridge (49)	*It's hard to see the downstream effects and know what causal factors are going on (e.g. changes in illicit supply, care disruptions, increased stressors driving risk-taking), and have a sense of what are the effects of interventions or what is most important to act on.* *You don't need an exemption to provide safe supply; some people have always been doing this, so this is now bringing more clinicians into harm reduction, building capacity in our system to do that*
Lack of attention to patients' social lives and contexts	• Little attention to individual patient needs and contexts; what is really needed is services that attend to the patient as a whole person with needs beyond addiction care and avoidance of COVID-19. • Little attention to patient role in determining their care or defining what constitutes a high quality of life.	*The system doesn't attend to criminal justice system involvement, or COVID-19 isolation impacting with other health and social needs.* *The literature review misses the idea that the health system doesn't address all a substance using persons' needs.*

1. See (50)

EFFORTS TO MITIGATE HARMS FROM DISASTER-DRIVEN DISRUPTIONS		
Policy attention geared to one crisis at a time	• Conflicting public health messaging seen to ignore overdose crisis; e.g., around safe physical proximity with others when using substances alone vs. being in company of others • Inconsistencies in public health messaging weakened to suit the contexts of underserved individuals rather than enhancing supports to ensure everyone can meet public health guidelines • Emergency departments left as safety nets, with little clarity around whether effective in meeting multiple public health crisis needs and without being provided additional resources to do so.	*Communication is so important from the province, and public health messaging has not matched this patient population at all, around getting tested and distancing. Daily updates completely miss this population.* *Public health messaging was very disrespectful, even offensive. People were really scared. Public health directives were 2m and figuring that out in spaces like shelters is hard. Nobody had answers. Then public health directives changed to 1m in shelters[1]. People aren't stupid. Messaging of "we're all in this together" is BS. How is it we all think we're in it together when different standards are applied for different groups.*

1. See (50)

Mechanisms to mitigate harms: Clinical settings during COVID-19

Sources suggested a tension between harm reduction messaging (e.g. never use substances alone) and physical distancing measures (2), recommending that COVID-19 public health messaging shift to support harm reduction (12). Recommendations to mitigate substance use risks during COVID-19 include clinical guidelines for prescribing safe supply and for reducing the risk of COVID-19 transmission (25), through changing to telehealth, physical distancing inside clinics, smaller patient numbers in group therapy, and hand sanitizer provision (9, 18). Other sources noted barriers to telehealth for underserved groups, suggesting peer support as a means to mitigate these barriers (23). Health Canada published exemptions to make OAT-prescribing more flexible and decrease in-person visits though virtual initiation of OAT, longer length of prescriptions, reduction of urine tests and witnessed dosing, verbal prescription transfers to pharmacies closest to the patient, delivery of OAT by pharmacies, and allowing friends and family to pick up OAT doses (26). Many sources argued that such shifts are simply good practice and should be sustained post-pandemic (e.g. (27)). Similar shifts in care and the argument to maintain disaster-driven shifts as good practice, as well as the need for disaster planning, were common themes in peer-reviewed sources on previous disasters (see Table 3).

Some sources noted that healthcare resources have focused on the physical health impacts of COVID-19 with less attention to the mental health impacts of the pandemic (9). Most sources included some

discussion of psychosocial supports and harm reduction measures during COVID-19, but focused on improving OAT access amidst reduced services and physical distancing measures that create barriers to care (27, 28). One source suggested telemedicine combined with street outreach as a holistic approach, noting that tailored care has been shown to improve housing stability and mental health along with care access (28). One source included stress management, normalizing emotional responses, keeping a routine and sleep hygiene as psychosocial recommendations (23).

Contextualizing the literature to mechanisms to mitigate harms from COVID-19 (see Table 4), NGT stakeholders noted that networks that cross-cut health and social services systems were rendered even more tenuous than usual due to the closure of on-site addictions services not deemed essential during COVID-19. Without disaster plans in place, some services were unprepared to manage a communicable disease outbreak and had to close for a number of days to plan for care provision in this context (e.g. acquire PPE and infrastructure supplies, determine patient/clinic flow, train staff in infection prevention and control). Stakeholders reported were many unknowns and very little support for community providers and pharmacies, with most of the initial resources directed to acute care. This was perceived to increase gaps in care, particularly for PWOUD who lack telephones or accessible transportation to sustain contact with their providers (e.g., pharmacists, physicians, social workers) during a disaster. Stakeholders described quick steps taken by their care teams to meet the urgent needs of their clientele. Some spoke carefully about innovative care adaptations, expressing concern that if innovations came to light without context, they could be opposed by stakeholders outside the health system. Providers emphasized that their regulated professional bodies require them to respond to the needs of their clientele and maintain high standards of practice. They noted that a neighboring jurisdiction had access to data and practice guidelines and seemed to engage in decision-making informed by the breadth of information available across social and health systems. They reported they would value this richness of information in Alberta. Many providers noted they turned to data and guidelines that emerge more regularly from British Columbia to guide their practice and understanding of the needs of PWOUD in their care. Stakeholders described uneven political will across jurisdictions, noting that health authorities in British Columbia increased capacity for safe supply whereas Alberta moved in the opposite direction. Some stakeholders were concerned for what they perceived as “outright hostility” against PWOUD within Alberta.

Stakeholders took issue with public health’s tendency to prepare for and respond to crises one at a time, with limited capacity to tailor public health responses to the unique needs of PWOUD, who will be predictably affected in unique ways by emergent disasters. For these stakeholders, system disconnections, the necessity for innovation, the dearth of information and guidance, and the need for public health to balance multiple crises at once, all converge in the need for systems and service accountability to PWOUD. Such accountability requires interconnection between health and social services, and structures that do not force uniform responses on all populations, but rather direct attention to those most vulnerable to structural disruptions. Accountability entails utilizing knowledge gained through social systems to address healthcare inequities, and better integrated social and health systems. During disruptions supports are needed to transition patients across multiple levels of the health system, and between the health and social systems. Transitions to telehealth requires accountability to patient

groups with unstable housing and lack of access to phone and internet. Stakeholders noted that for some Indigenous PWOUD, access to OAT during the pandemic is extremely difficult, but only one of many heightened barriers to healing. For many individuals, not having a phone or a physical address affected their ability to access supports for income and housing, as well as to connect with family and community. Transportation service closures made it difficult for providers to help people connect to supports such as Elders, or to return to their communities. During the dual crisis, public health responses focused on keeping people from contracting COVID-19 without valuing different types of lives or supporting people through a range of heightened adversities.

Discussion: Outcomes Of Covid-19 Disruptions

Disasters increase burden on PWOUD by intensifying adversities in meeting basic needs (such as shelter, food, substances, and healthcare), and aggravating risk behaviour by intensifying reliance on informal economies, and more frequent (and dangerous) substance use in isolation. Disaster literature pre-COVID shows that the intensification of adversities faced by PWOUD during disasters is predictable, particularly for those with relatively poorer quality of life due to poverty, racialization and other forms of oppression. Public health has little reason not to anticipate the unique consequences of disasters for medically underserved or socially vulnerable groups. Preparation for how disasters will impact vulnerable populations, including PWOUD, should involve nurturing relationships between providers across complex health and social services systems that patients access (e.g., establishing lines of contact, mandating coordinated care). As shown by our review of grey literature, COVID-19 public health guidelines generally did not attend to the social realities of PWOUD. In future, public health should anticipate negative effects of public health measures and new hazards for populations at risk for catastrophic results of combined crises, rather than focusing attention on single risks and generalized solutions.

Early public health responses to the pandemic identified COVID-19 as the primary threat to life, yet local outcomes raise questions about this assumption. An Alberta Health opioid deaths report from that time outlines that Spring 2020 saw the highest ever number of opioid-related deaths in a single three month period in Alberta (29). From April to June 2020, 301 persons in Alberta died of opioid use (29), while as of September 23 2020, COVID-19 had claimed 261 lives (30). In March 2020, OAT clinic operations were disrupted due to the pandemic, with the result that “only emergency and new patients who were not stabilized accessed the clinic services” (29)(p. 4). SCS data indicates a fall in service uptake in Spring 2020 following capacity reduction measures in adherence with public health guidelines (31). While the COVID-19 death rate would almost certainly have been higher without the public health measures, avoiding COVID-19 deaths and preventing overdose deaths need not be opposed goals. The dual pubic health crises could be equally addressed through evidence-based measures that anticipate and address patient needs. Imperfect early responses to emerging health risks may be unavoidable without disaster-specific data. Without data that informs on social determinants of health, attention and resources are unlikely to be turned to the needs of underserved groups, and from one crisis while addressing another. Worse, public health decision-making that does not reflect the full scope of evidence from both social and

medical systems easily results in decision-making without information transparency, a practice that may perpetuate stigma and produce policy inattentive to social determinants of health.

Systems that are more attentive to social determinants of health and that prioritize contextually-tailored care are better prepared for disruptions. Predicting the needs of diverse populations and their providers can prevent systems from becoming overwhelmed, especially when whole new sets of skills and protocols may be required. Systems can be supported and funded, to be more ready and less reactionary when the unexpected happens. While some components of the healthcare system maintain contingency planning and business continuity for a variety of disaster scenarios, many have not. COVID-19 has emphasized the importance such planning as a core responsibility. COVID-19 adaptations to OAT access have focused on flexibility measures (e.g. take-home dosing, telehealth, mobile clinics) that may have helped many, but have largely relied on individual patient and provider adaptations, without systemic supports. This lack of system and service accountability to address emergent patient needs during disruptive events burdens patients and providers (Table 5). Systems that are grounded in evidence-informed practice, harm reduction and contextually tailored care support a system to be prepared for disruptions.

Table 5
System & Service Accountability for Responsive OUD Care during Disaster-Driven Disruptions

Context of Disruption	Public Health Mechanisms to Mitigate Risks	Expected Outcomes
Disasters focus attention on single risks & generalized solutions	Prepare cross-systems protocols & coordinate to anticipate how disruptions affect populations rendered at risk	Mitigate multiple sources of risk by attending to patients' as whole persons & diverse populations in widely varying social contexts Engage in theoretically and historically-informed planning to anticipate risk & project implementation to mitigate future risks Avoid using emergency departments as universal safety nets during disasters
	Anticipate, track, and address risks from emergent disasters as they interact with risks from associated social and health systems disruptions (e.g., impacts of pandemic as well as of distancing measures)	
	Orient health system data analytics to generate & circulate knowledge on multiple sources of risk and population groups.	
Lack of information transparency in decision-making perpetuates stigma & produces policy inattentive to social determinants	Address social determinants of population health inequities (including racism) by tailoring public health guidelines for socially vulnerable groups (e.g., feasible, accessible, effective measures)	Prevent misinformation and reduce stigma by grounding policy and service decisions in evidence around what drives increased risk from disasters (e.g., that disruption in financial situations of people in poverty increases negative outcomes)
	Enhance supports linking social & medical systems for vulnerable populations during disasters to prevent predictable intensification of adversities & treat addictions services equitably with other chronic/pre-existing diseases services that received additional tools and guidelines	
Harm reduction & contextually-tailored care	Ensure safe supply of opioids and supplies to help PWOUD through an emergency, while helping them to access other components of care	The system accommodates more change than individual patients are expected to accommodate The burden of trying to determine what constitutes high quality care or appropriate attention to patient needs is not put on individual, unsupported, providers or care settings acting in isolation, and is instead achieved through a collaborative public health system
	Empower systems & service providers; shift burden to the system to minimize strain on patients.	
	Support providers with informed order sets, care pathways, lists of resources, and links to social service and community partners to enable them to provide high quality and contextually-tailored care.	

Systemic responses to disasters require public health leadership that is oriented to lateral relationships across health and social systems and committed to overcoming deficit driven decision making. Such an orientation requires more than an influx of resources but a shift towards dealing with dual public health

crises through services mandated to support cross system relationships. Practical measures to address disruptions are often already in place. At a clinical level, the Educating for Equity framework (E4E) supports refocusing from attention on single risks and generalized solutions through an evidence-informed care framework that re-centers power dynamics that shape clinical relationships and engages with the patient's social reality (i.e. minimizes burden put on patients for continuity in care) (32). At the service level, health system navigation and case management for chronically ill and unstably housed patients has shown promise in addressing social determinants of health (33). At the system level, Alberta's Strategic Clinical Networks are mandated to address cross-systems issues with evidence-based solutions in collaboration with diverse stakeholders, to support data-driven decision making, improve population health and catalyze health equity (34). For instance, the Emergency Strategic Clinical Network built referral pathways between s emergency departments and addiction treatment clinics prior to the pandemic (35). At a provincial level, systems can embrace harm reduction and contextually tailored care with decriminalization of people who use substances (15, 36) and clinical guidelines for safe supply (25) that systemically addresses stigma. Collaboration across systems to link patients with individualized health care and social supports is also needed (37). Public health as a discipline should advance new ways of interacting across services and systems whilst encouraging providers to view their actions as one component of many that create a system accountable to patient needs during disasters and usual care interactions.

Conclusions

This knowledge synthesis highlights that informed approaches to addressing social determinants of health and patient needs are required for greater accountability to PWOUD during disasters. Stakeholder contextualization of the literature highlights gaps in multi-risk management, data and decision-making, and public health organizing to respond to heightened adversities for PWOUD. It is critical to support service providers to make accommodations to reduce the burden of disaster-driven changes on patients and provide contextually tailored care (38). The NGT highlighted that responses to COVID-19 disruptions for PWOUD tended to be ad hoc, poorly coordinated, and hampered by lack of timely and comprehensive information. Providers outlined gaps in their ability to provide contextually tailored care without systems-level support (including budget, space, implementation leads, policy writers, planners, case managers, and social workers). This undermines accountability to patients and providers, who are susceptible to burnout without the resources necessary to support their patients. Through coordination between diverse services that PWOUD may access, public health may more effectively respond to multiple crises simultaneously. Providers should be supported to coordinate patient transitions in care and link patients to appropriate social services, to assist patients in connecting to their communities. Relying on timely information from, and building connections between, both health and social systems is crucial to public health responses that consistently recognize and attend to the needs of diverse populations.

Abbreviations

NGT Nominal Group Technique

OAT Opioid Agonist Therapy

OUD Opioid Use Disorder

PPE Personal Protective Equipment

PWOUD People with Opioid Use Disorder

SCS Supervised Consumption Site

Declarations

Ethics approval and consent to participate This article does not contain any studies with human participants or animals performed by any of the authors. NGT attendees are co-investigators, and so did not sign consent forms.

Consent for publication Not applicable

Availability of data and material All data generated or analysed during this study are included in this published article and its supplementary information files (methods, results 1 & 2 and literature summary sheets). No other datasets were generated during this study.

Competing Interests The authors declare that they have no competing interests.

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Authors' contributions RH and PM conceptualized the research, led the analysis and contributed to writing the manuscript. AM and LM performed the literature reviews and contributed to writing the manuscript. All authors contributed to analysis and knowledge synthesis. All authors read and approved the final manuscript.

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Figures

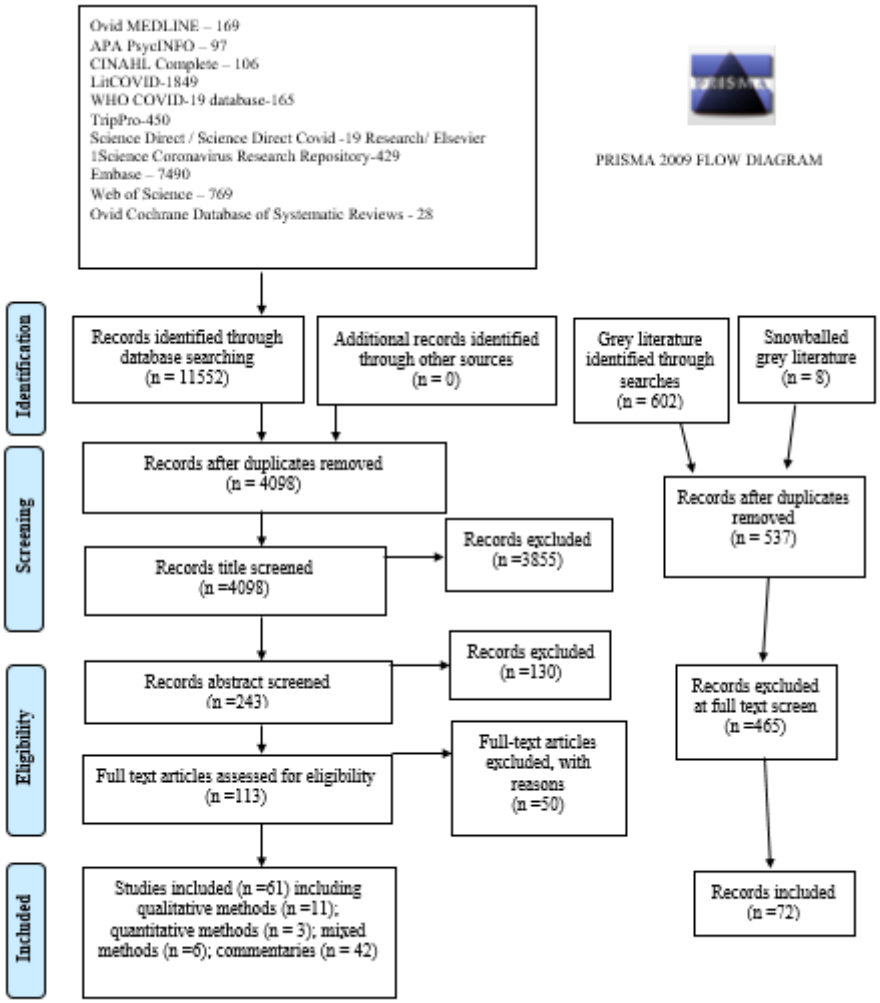

Figure 1

Literature search and study selection.

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