

“Everybody living with a chronic disease is entitled to be cured”: Challenges and opportunities in scaling up access to direct-acting antiviral hepatitis C virus treatment among people who inject drugs

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ABSTRACT

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Background: Recent advances in the safety, tolerability, and efficacy of hepatitis C virus (HCV) treatments have led to the introduction of policy changes that include, in some settings, universal coverage of direct-acting antiviral (DAA) treatment for people living with HCV. However, people who inject drugs (PWID), a population with disproportionately high rates of HCV, often experience significant social and structural barriers to care, including when seeking treatment and care for blood-borne viruses. The objective of this study is to identify implementation challenges and opportunities for improving HCV-related care and scaling up DAA treatment for PWID living with HCV in a setting with universal DAA coverage since 2018.

Methods: Informed by a critical interpretive framework, this study thematically analyzes data from in-depth, semi-structured interviews conducted between October 2018 and February 2019 with a purposive sample of 15 expert stakeholders (e.g., clinicians, community-based organization representatives, policy makers) related to HCV care provision, design, or research in British Columbia, Canada.

Results: Our analysis revealed two key thematics: First, participants described existing challenges for scaling up DAA treatment, including how contextual factors (e.g., housing, stigma) restrict opportunities for PWID to engage in care. Participants also described how strained and compartmentalized health services are onerous to navigate for patients. Second, participants described opportunities for improving HCV-related care through various structural interventions (e.g., improved housing, decriminalization of substance use), and enhanced and more accessible models of care (e.g., decentralized, integrated, outreach-focused, and peer- and nurse-led services).

Conclusions: These findings emphasize that several key service delivery and system-level adaptations are required in order to equitably scale up access of DAAs to PWID living with HCV, including policies and programs that are responsive to socio-structural determinants of health.

Keywords [3-6]: Hepatitis C, direct-acting antivirals, people who inject drugs, substance use, qualitative research, treatment

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Introduction

The advent of highly-effective and tolerated hepatitis C virus (HCV) direct-acting antiviral (DAA) treatment is poised to treat and cure (i.e., to a point of sustained virologic response) millions of people living with HCV. DAA treatment regimens are highly effective in achieving HCV cure in 8-16 weeks, with far fewer side effects than the previous interferon-based therapies, which have a recommended treatment duration of up to 48 weeks (Botterill, 2018; D'Ambrosio, Degaspero, Colombo, & Aghemo, 2017; Spengler, 2018). As such, the World Health Organization's Global Health Sector Strategy on Viral Hepatitis 2016-2021 recently established the goal to eliminate HCV as a major public health threat by 2030 (World Health Organization, 2016). To reach this target, reductions in HCV incidence and prevalence must be achieved under challenging “real-world” conditions among key populations – and, concerted efforts to avoid reinfection must be sustained over the long term. The global burden of HCV disproportionately impacts people who inject drugs (PWID), a population that experiences high rates of HCV infection and – variably across subpopulations of PWID – reinfection (Rossi et al., 2018), in addition to a variety of social and structural inequities which may restrict access to HCV care (e.g., perceived and enacted stigma, including mistreatment by healthcare providers; criminalization; poverty, precarious housing; intersecting oppressions) (Bulterys & Sadiq Hamid, 2018; Heffernan, Cooke, Nayagam, Thursz, & Hallett, 2019; Pearce et al., 2019; Simha, Maria Webb, Prasad, Kolb, & Veldkamp, 2018; World Health Organization, 2016).

The successful and equitable scale-up of DAAs among PWID requires the widespread enhancement of efforts to screen and identify people living with HCV, timely uptake of treatments, and optimal adherence. To do so, it has been argued that widespread and systems-level changes may be required in various international settings to improve HCV care and service delivery, including prevention (e.g., through education and harm reduction interventions), enhanced diagnostic and surveillance services, and treatment and retention strategies (Botterill, 2018; Cousien et al., 2017; Day et al., 2019; Harris et al., 2016; Saeed et al., 2019; Talal, Thomas, Reynolds, & Khalsa, 2017; van Driel, Lim, & Clark, 2017; Zelenev, Li, Mazhnaya, Basu, & Altice, 2018). Nevertheless, a series of complex implementation challenges exist. For example, within the context of limited healthcare resources, the capacity to effectively and efficiently deliver new models of treatment and care may be further impeded by a lack of care provider knowledge, competency, and training; an already overburdened healthcare workforce; requirements for and limited availability of specialist support and oversight; onerous diagnostic and eligibility requirements for initiating DAAs; and services and settings that are often specialized, siloed and challenging to navigate (Asher et al., 2016; Botterill, 2018; Harris et al., 2018; Litwin et al., 2019; Skeer, Ladin, Wilkins, Landy, & Stopka, 2018). Existing care models are also often further constrained by rigid and brief appointment structures (e.g., fee-for-service payment models), compartmentalized and fragmented services that feature extended wait times and complex referral processes, inadequate psychosocial supports for service-users, limited

support for on-site phlebotomy for HCV testing and follow-up in certain clinical settings (e.g., primary care), and finite resources to develop a comprehensive HCV cascade of care that is responsive to the needs of its service users (Harris & Rhodes, 2013; Litwin et al., 2019; Marshall, Grebely, Dore, & Treloar, 2020; Skeer et al., 2018). Furthermore, and importantly, the high cost of DAAs has led many payers (i.e., private and public insurers) across global contexts to limit access to DAAs through coverage-related restrictions (e.g., with regards to provider or patient reimbursement, HCV genotype, sobriety, and liver fibrosis staging), thereby further inhibiting the equitable scale-up of DAAs (Saeed et al., 2019).

There are also a variety of individual obstacles that deter PWID from engaging in care and initiating HCV testing and/or DAA treatment. These ongoing barriers include, for instance, disinclination to seek treatment due to being asymptomatic of HCV, concerns about having to undergo phlebotomy (e.g., due to poor vein health), hesitancy related to treatment side effects, and the prioritization of other health and social concerns over one's HCV status (Harris et al., 2018; Litwin et al., 2019; Madden, Hopwood, Neale, & Treloar, 2018; Marshall et al., 2020). It is also well documented that healthcare providers have historically been overly paternalistic in their approach to providing HCV treatment to PWID, with previous research across Interferon- and DAA-based HCV treatment eras indicating that care providers have raised concerns about: capacity for optimal adherence among PWID (Grebely et al., 2017; Krook, Stokka, Heger, & Nygaard, 2007); the potential for HCV re-infection in the context of costly treatment regimens (Asher et al., 2016; Grebely et al., 2017; Lazarus et al., 2017); a presumed lack of motivation or capacity among PWID living with HCV (Litwin et al., 2019; Treloar, Newland, Rance, & Hopwood, 2010); and the negative impact of co-morbid human immunodeficiency virus (HIV) co-infection (Panagiotoglou et al., 2017; Scott et al., 2009), and past, current, or anticipated substance use (Boerekamps et al., 2018; Litwin et al., 2019). Despite these concerns, a growing body of clinical and behavioural evidence indicates that PWID are able to be successfully cured of HCV with DAAs at rates comparable to other populations (Asher et al., 2016; Chan, Young, Cox, Nitulescu, & Klein, 2018; Harris, 2017). For instance, in a recent sample ($n=291$) of people living with HCV in British Columbia (BC), Canada, among whom 88% were PWID, 90% of participants were cured of HCV after completion of DAA treatment (Alimohammadi, Holeksa, Thiam, Truong, & Conway, 2018).

While the scale-up of DAAs occurs in various regions across the globe, a variety of implementation “gaps” are restricting opportunities to optimize DAA treatment and models of care in for people living with and being cured of HCV, including PWID. Therefore, the objective of this study, conducted in a setting with universal DAA coverage since 2018, is to describe the implementation challenges and opportunities identified by a sample of care providers and policy makers about how the scale-up of DAAs can be optimized to best meet the needs of PWID living with HCV.

Methods

Study overview

We draw on a critical framework underpinned by values of health equity and social justice (Varcoe, Browne, & Cender, 2014), and a thematic analysis approach informed by aspects of social constructivist grounded theory (e.g., acknowledgment of the complexities of particular participant contexts and actions, co-construction of findings based on participant experiences and researcher interpretations) (Charmaz, 2014; Creswell & Poth, 2018). This study design provides us with opportunities to explore how DAA treatment needs and experiences are structurally embedded within intersecting systems of oppression that influence both access to and uptake of DAA treatment among PWID living with HCV. This critical analytic framework featured extensively in our study procedures, wherein data collection and analysis methods were designed to elicit the identification of how various features of study participants' social contexts shaped their experiences and impressions related to DAAs. Through this lens, our study aims are to advocate for strengths-based and transformative opportunities to optimize evolving practice and policy efforts in ways that will promote equitable DAA access for all people living with HCV.

Study setting

This research was conducted in BC – the westernmost province in Canada, where the majority of healthcare services are publicly funded and universally offered, but medication coverage is not; rather, provincial authorities regulate which medications are reimbursed and under what circumstances. In 2017, the province of BC removed fibrosis-related restrictions to DAA access and approved the universal coverage of some DAA treatment formulations for all British Columbians living with HCV (Lazatin & Little, 2018). Within this province, linked population-level data from the BC Hepatitis Testers Cohort, which includes all individuals ever tested for or diagnosed with HCV in BC, estimated there were 61,127 individuals living with HCV (i.e., including untested and undiagnosed individuals) in 2018; of those who were HCV diagnosed ($n=53,441$), 18,609 (34.8%) reported current or past injection drug use (Bartlett et al., 2019). Moreover, in 2018, among this estimated population of 18,609 PWID living with HCV in BC, only 5,200 (27.9%) individuals initiated HCV treatment (with either DAAs or Interferon-based therapies), among whom a further 3,141 (60.4%) individuals were cured (Bartlett et al., 2019).

BC is currently experiencing intersecting housing and opioid overdose crises (Bardwell, Fleming, Collins, Boyd, & McNeil, 2019). Within the context of these crises and unprecedented increases in their associated harms (e.g., overdose, death), enhanced harm reduction efforts (e.g., expanded availability and accessibility of safer injection supply and distribution, OAT [opioid agonist therapy] programs, peer-led and in-reach services, and supervised consumption sites) have contributed to sustained reductions in incident HCV rates among PWID in BC (British Columbia Drug Overdose & Alert Partnership, 2014; British Columbia Ministry of Mental Health and Addictions, 2019; Kendall, 2011). Nevertheless, HCV prevalence among PWID remains high. Indeed, although recent and BC-specific data is unavailable at this time, country-level estimates place the prevalence of HCV among PWID in Canada at 52.9% (95% uncertainty interval: 44.5, 61.2) (Grebely et al., 2019). Furthermore, despite experiencing the highest overall

rates of HCV testing in BC, PWID have the lowest proportional DAA treatment uptake, revealing a critical gap in the HCV cascade of care for this priority population (Bartlett et al., 2019).

Sampling and recruitment procedures

Ethics approval for this study was obtained from the University of British Columbia's Behavioural Research Ethics Board (#H16-02943). To obtain a comprehensive and multifaceted account of DAA scale up efforts in BC, we drew on a purposive sampling strategy (Palinkas et al., 2015) to recruit a heterogeneous sample of "expert" participants from across BC who had diverse perspectives and experiences related to the implementation and scale-up of DAAs, as well as HCV service delivery more broadly. Study participants were recruited using the contact information of expert stakeholders that were publicly available (e.g., online) and via our team's existing networks. We supplemented this approach to recruitment with snowball sampling (Polit & Beck, 2018b), whereby, via referrals from participants during/after the interviews, we identified additional prospective participants who had extensive experience and/or expertise related to evolving HCV care landscapes. Data collection and initial phases of analysis were conducted iteratively, with later interviews helping to identify gaps in our sample and inform subsequent data collection, as well as informing our assessments of data saturation.

Prospective participants were invited to the study over email and were informed of the study purpose and protocol. Participants were eligible for inclusion in the study if they were able to speak and understand English, 18 years of age or older, and involved in any facet of HCV care provision, design, or research (e.g., clinicians, public health officials, representatives from community-based organizations). Participants who took part in this study via their institutional roles (i.e., as part of their routine job duties during regular working hours, for which they were being compensated) were not provided an honorarium; all other participants were offered a CDN\$30 honorarium. All participants were provided informed consent documents prior to the interview.

Data collection

Between October 2018 and February 2019, we conducted 15 in-depth, semi-structured interviews that lasted 30-90 minutes each. All interviews were conducted by the study research coordinator or the senior author, RK, and interviews were held in person and by phone, depending on participant availability and preference. Interview guides were developed by co-authors WS and RK, and were informed by preliminary analysis from a related and ongoing study of the DAA-related experiences of PWID in BC. Interview guides were designed to prompt participants to describe their current roles in relation to HCV care, and elicit discussion of their perspectives regarding various aspects (e.g., barriers, facilitators, impacts) of the scale-up of DAA treatments to PWID living with HCV in BC. Interview guides were tailored to specific stakeholder categories to elicit discussion of the key considerations relevant to their experiences with DAA policy and/or service delivery. For example, policy makers were asked to describe their involvement in the ongoing implementation of the evolving provincial DAA treatment program, community-based organization representatives were asked to describe impacts of

DAA-related policy changes on their organizations and clients, and clinicians were asked to describe influences of evolving HCV care landscape on their clinical practice. Following the interviews, reflexive field notes were completed by research staff in order to provide opportunities for theoretical memoing, critical reflections (e.g., related to unanswered questions, as well as confirming and contradictory findings), and rich contextual description to support our analysis.

Data analysis

Interviews were audio-recorded, transcribed verbatim, accuracy checked, anonymized and securely and digitally stored with identifying details removed. We used NVivo 12 software to manage our analytic process. First, the lead and senior authors, TG and RK, read and re-read the data set, conceptualizing it into distinct patterns, which were then organized into substantive open codes that provided a foundational schematic for our analysis (Polit & Beck, 2018a). Open codes broadly reflected major categories of information related to DAAs; these codes included, for example, participant roles in HCV care, DAA-related policy changes and perceived impacts, practice-based and organizational barriers DAA treatment, and aspects of the HCV care continuum (e.g., prevention, testing, treatment, reinfection).

Once our major open codes were identified, we inductively analysed data associated with various assemblages of these codes to identify the central phenomenon of interest (i.e., DAA scale-up), which we further explored through critical interpretations of the various conditions and contexts in which the optimal implementation of DAAs was occurring (or not occurring). Discrepancies between our initial codes and emerging themes were addressed during regular review and debriefing processes with our broader research team. To further our analysis, we inductively posed the following guiding questions: 1) How do participants describe DAA implementation and scale-up challenges? 2) How can opportunities and strategies identified by participants be implemented or enhanced to optimize the scale-up of DAAs? 3) How are these challenges and opportunities situated within and influenced by intersecting contexts (e.g., healthcare encounters, health systems- and services-related factors, socio-structural conditions)? We then employed a combination of additional deductive and inductive approaches (e.g., revisiting the data for nuance and context, reviewing relevant empirical and theoretical literature to compare emerging themes against what is already documented in this area, returning to the content and questions posed in our field notes) to our analytic strategy to identify and refine central themes (Creswell & Poth, 2018). Finally, we further stratified our themes into a corresponding set of sub-themes that reflect the multiple socially and structurally embedded aspects of DAA treatment implementation and scale-up, which we present below.

Results

In total, we interviewed a sample of ($n=15$) participants, including primary care physicians ($n=2$), specialist physicians ($n=1$), registered nurses ($n=1$), community-based organization representatives ($n=6$), policy makers ($n=1$), public health officials ($n=1$), and researchers ($n=3$). A subset of participants ($n=3$) disclosed having lived experience with HCV and/or HCV treatment. The majority of participants had professional backgrounds that differed from their

current roles (e.g. nursing, social work, lived experience), or fit into more than one of the somewhat crude classifications listed above (e.g., one participant classified as a community-based organization is also a clinician; one participant classified as a researcher also has a leadership role with an HCV-related community-based organization; one researcher is a clinician-scientist); nevertheless, we have placed participants into the stakeholder categories that most accurately reflect their current and primary roles related to HCV care. Collectively, participants had decades of experience across healthcare, community, and policy/governmental sectors that spanned across Interferon- and DAA-based treatment eras, as well as evolving healthcare and socio-political contexts more broadly. Below, we present our findings in two thematic sections (*challenges* and *opportunities*) and use quotes to illustrate key aspects of our analysis. A researcher-assigned identifier code for the participant follows each quotation.

Challenges

Contextual factors

As our interviews began, participants described a series of perceived contextual obstacles that PWID face in relation to HCV care, including a variety of social and structural barriers to DAA treatment specifically and healthcare broadly. For example, several participants emphasized how existing policies and laws could potentially link people living with HCV to a corresponding set of experiences of marginalization and discrimination, including from the stigmatization and criminalization associated with illicit drug use. For example, one community-based organization representative described:

The stigma related to hepatitis C is fundamentally rooted in the stigma and discrimination about people who use drugs and criminalization. [. . .] There's a permission within the healthcare system that people who use drugs can be treated poorly (Expert_008).

Participants also described how, based on their experiences, they had seen instances in which HCV was not prioritized by PWID, largely due to a variety of contextual factors, including the housing and opioid overdose crises affecting BC. As one researcher described, PWID living with HCV were perceived to have competing priorities which may supersede DAA treatment uptake:

I imagine that it [accessing DAAs] can get pretty frustrating for people, particularly if, you know, they have inadequate housing, or you know, they're struggling with income or whatever other issues that people are often dealing with. I can really understand why Hep C sort of falls to the bottom of the pile (Expert_003).

As a corollary, participants also described how contextual factors like the ongoing opioid overdose crisis affecting BC broadly and PWID specifically contributes to the deprioritization of resources required to effectively scale up DAAs within the healthcare delivery system. One community-based organization representation described how, in the context of limited resources,

almost all of their time as a peer navigator working with PWID is now exclusively focused on offering education on responding to and preventing overdoses:

Because of the overdose crisis, I used to be, like, slamming with HIV 101, hepatitis C education, prevention education, and STIs [sexually transmitted infections]. And now it's, like, all [healthcare providers] want to talk about is naloxone and overdoses (Expert_013).

In describing healthcare delivery system influences more generally, participants perceived the experiences of HCV care among PWID as being heavily impacted by strained health systems and services. These participants described how the availability and quality of HCV-related services is undermined by long wait times, inefficient service delivery practices (e.g., lack of centralized access to patient information and laboratory results, burdensome documentation practices; clinical, administrative and bureaucratic requirements/processes for prescribing DAAs), and limited financial and personnel resources. Furthermore, within the context of the ongoing opioid overdose and housing crises, participants described how funding for HCV services is often deprioritized and/or reallocated to other competing health priorities. For instance, one community-based organization representative described how:

Well, we don't fund Hep C work anymore. [. . .] There's not a whole lot of information around this at all. It gets skipped because, I mean, in the middle of an overdose crisis, a housing crisis, you know, it's not something that people are talking about or being funded to talk about. [. . .] I even hear, you know, agencies, "Well, we're not being paid to do that work." And it's too much. We can't do everything (Expert_010).

Navigating health systems and services

As our interviews continued, participants elaborated on the perceived complexity and inherent challenges of navigating the existing – often overly centralized (i.e., specialist-based and not available through primary care services) – HCV cascade of care. For example, participants described how navigating the system not only requires substantial systems-level awareness, but how, for PWID, HCV care trajectories are frequently disrupted by transitions via their engagement with other facets of the healthcare delivery system (e.g., hospitalization due to other health issues, referrals to other healthcare specialists), as well as broader experiences of dislocation (e.g., incarceration, evictions). Several participants perceived the healthcare system in which they operate as highly compartmentalized and poorly linked; within this context, participants described potential gaps in follow-up care for PWID living with HCV. For example, one primary care and one specialist physician described key challenges associated with referral processes and care coordination in navigating a healthcare system that they viewed as being centralized towards specialist (e.g., hepatologist) prescribing of DAAs:

There's still a lot of sort of organizational work that has to happen and getting the medications and having them figure out where they're gonna be dispensed and working with the pharmacy and whether you're linking it with their OAT or not and then if the

patient is up in hospital in treatment, they end up in jail, they end up, you know, they miss a week, so there's a huge amount of care coordination and somebody needs to be overseeing every person on treatment. [. . .] There's still these centralized prescribers and I think we do need to move into, like, if you're doing addiction care that you need to get comfortable doing Hep C treatment (Expert_001).

People who use drugs who have hepatitis C experience a lot of barriers in terms of following up with the specialist. So, once that primary care doc[tor] or Emerg[ency] doc[tor] or whoever has made the referral to the hepatologist who can treat the hepatitis C, there's a lot of chances for those patients to fall through the cracks and not make it through the treatment (Expert_015).

In summary, participants postulated that access to DAA treatments is mediated by a series of service-related and socio-structural barriers. In considering the proposed challenges PWID experience navigating clinical interactions, highly centralized and strained HCV systems of care, and the broader contexts in which these experienced are embedded (e.g., housing crisis, criminalization, opioid overdose crisis), we continue our analysis below by identifying some of the opportunities for optimizing the scale-up of DAAs.

Opportunities

Socio-structural intervention: Decriminalization, housing, outreach

Across our interviews, we also asked participants to describe how some of the aforementioned barriers to DAAs could be addressed. Several participants described how structural interventions, including the advancement of policies and laws that focus on remediating the marginalization and socioeconomic deprivation of PWID, are needed. For example, several participants described how they felt the decriminalization of substance use is a priority for improving the health of PWID, and how doing so could potentially also improve DAA treatment outcomes. Many participants described how the redistribution of public funding from the criminal justice system to the healthcare system could both provide funding for strengthening health and social services for PWID living with HCV, as well as offset the financial strain on overburdened health systems and services. For instance, one community-based organization representative who has lived experience with HCV described how:

As long as we criminalize people who use drugs and we put more onus and funding on creating institutions of a punitive nature, of corrections for people who use substances, then that money that could be going to supporting this kind of work is taken away. [. . .] Are we putting it [funding] into the criminal justice system approach? Or are we putting in a healthcare or public health approach? (Expert_010).

Several participants also viewed improved housing for PWID who need DAAs as a key factor for promoting successful DAA treatment trajectories. Participants described how safe housing

could provide PWID living with HCV with a place to access and/or store their medications. As posited by one primary care physician, housing is thus an important barrier and facilitator to DAA access:

[It's when] they [PWID] have no secure place on their body or their bag to keep it [DAAs] that we're really stuck. And I think if there could be, I guess, some outreach program where someone, you know, checks daily or delivers their meds every day. But, otherwise it's just really hard. Or sometimes we've even said, "Is there anywhere you hang out every day where we could also link dispensing?" [. . .] It's housing. We need housing. We need all these people to have somewhere where they can just be and then we can just give them their meds so they can keep their dosette in their room (HCV-DAA-Expert_001).

Within the context of the ongoing housing crisis in BC, a subset of participants described how outreach-based strategies could facilitate access to DAAs to subpopulations of so-called “hard-to-reach” PWID living with HCV. Participants suggested that engaging PWID living with HCV through peer navigators in social networks and community spaces could offer opportunities to promote linkages to care – particularly because they felt PWID living with HCV may already feel comfortable and safe if engaged in their preferred community spaces. Amidst these descriptions, participants elaborated on the perceived need to prioritize peer engagement and leadership within outreach-based strategies, as several participants indicated they have seen the value in peer-led services – that is, services provided by people with lived experience of substance use and/or HCV, who can provide nuanced insights into the lived realities of PWID and their local risk environments, as well as the appropriateness and applicability of programs and services (Greer, Amlani, Buxton, & the PEEP team, 2017). Additionally, some participants described how peer- and outreach-based strategies could facilitate the micro-elimination of HCV among social networks of HCV-seropositive PWID who might share injection supplies. For example, one researcher described how:

If you want to actually get into, you know, a population of people who are injection drug users, to, you know, use the structures that we have around housing and the supports around housing to do micro-elimination [of HCV]. And that when people are, you know, within their own spaces, and if they're seeing, you know, like, some sort of peer connection around. [. . .] Especially if you have patterns of sharing [injection supplies] within those buildings or within those social networks. And people's social networks are also able to do the treatment as well (Expert_001).

Optimizing models of care: Integrated, holistic, and nurse-led approaches

Participants described various opportunities to enhance how DAA-related care is provided to PWID living with HCV. Participants described how the increased tolerability and simplicity of DAA regimens present the health system and care providers with new opportunities to decentralize specialist-based DAA care models, while continuing to have the option to solicit specialist involvement for clinically complex cases (i.e., which may be beyond the scope of practice of some primary care providers). As participants continued to think about the new

possibilities presented by DAAs, many described how the provision of DAAs needed to transition into more accessible healthcare settings, including the integration of DAA care into primary and holistic care settings. On this subject, one specialist physician contrasted the benefits of an integrated model of DAA care with the current approach that relies on referrals to specialist care providers, such as hepatologists:

We need to move away from having specialized hepatitis C treatment. . . but instead make sure we're integrating it into the holistic care of the patient. Because this episode . . . like, treating one disease, like treating just their opioid use disorder or just their hepatitis C or just their mental health problem – you miss out on doing all the rest and you risk poorer engagement than if you are having them get holistic primary care (Expert_015).

As participants elaborated on opportunities to provide holistic care, a subset described how various aspects of HCV-related care (e.g., prevention, screening, treatment, follow-up) could be integrated into other existing services frequented by some PWID living with HCV. For example, participants described integrating HCV-related care and DAA service delivery into diverse settings, such as OAT provision, mental health care, HIV care, correctional health services, and – as described above – housing and community outreach programs. These participants also described how holistic and comprehensive services could potentially improve continuity of care, as participants can choose to engage with healthcare providers with whom they have already established rapport. For instance, one researcher described how:

It sure is easy if someone is already coming to see them and finding them every day to throw a Hep C treatment on there. [. . .] Definitely OST [opioid substitution therapy] is a great place. [. . .] [Homeless] shelters. Right? And other ways that we are, you know, connecting with people to ensure that we have enough of a relationship and are able to find people in order to actually get the treatment done for them (Expert_007).

Almost all participants emphasized the role of nursing in providing HCV care, and several elaborated on how nurses and nurse practitioners working in HCV-related care are well positioned to lead and strengthen the scale-up of DAAs. These participants described how nursing is actively involved in supporting PWID living with HCV through all aspects of the HCV care cascade and with regard to many other health conditions. Moreover, participants described how the large number of nurses in the healthcare workforce, the intimate nature of their work with PWID living with HCV, and the frontline- and outreach-based nature of much of their practice positions nurses as being ideally suited to engage and support PWID living with HCV throughout DAA treatment and care. Furthermore, while some participants felt that prescriptive authority for DAAs should be restricted to nurse practitioners only, the majority described how nurses are also knowledgeable and competent care providers who could prescribe DAAs. For example, one public health official and one primary care physician described how:

Nurses do a lot of the case finding, they work people up, they support them through treatment, they do the follow-up. Like, it's all with a physician [i.e., oversight], but the

vast, vast, vast bulk of the work is done by the nurses. [. . .] I think they absolutely should look at nurse prescribing. There should be some kind of training and certification that allows RNs [registered nurses] to do uncomplicated Hep C treatment (Expert_012).

I'm supportive [of nurse-prescribing for DAAs]. I work collaboratively with nurses and nurse practitioners in a variety of clinical settings, so I'm comfortable with delegated tasks to other disciplines, and, yeah, the Hep C nurses I work with are very knowledgeable so they kind of tell me what needs to happen and that works well (Expert_005).

In summary, participants described the ways in which HCV care landscapes could be optimized to more fulsomely meet the needs of PWID. Specifically, participants described various opportunities for reforming models of care to facilitate access to DAAs, including through outreach-based, peer-driven, and nurse-led approaches. In addition to these prospective interventions, however, participants expressed palpable concern regarding the need to reshape socio-structural contexts in ways that are equity-promoting with respect to PWID wellbeing generally and DAA treatments specifically.

Discussion

As DAAs are scaled up in settings with universal coverage, including BC, Canada, there are pivotal opportunities to address the HCV epidemic experienced among historically disadvantaged populations, including PWID (Richmond & Mason, 2016). Nevertheless, as our findings identify, there are a series of intersecting contextual and healthcare system-related challenges that need to be addressed. Drawing on their extensive experiences interacting with the healthcare delivery system and with PWID living with HCV, participants in our sample perceived that PWID face a series of difficulties when navigating health systems and services, which participants frequently described as compartmentalized and challenging for service users to navigate. More broadly, participants viewed interrelated contextual factors (e.g., stigma, drug criminalization, housing and opioid overdose crises) as key determinants which may serve to both deprioritize HCV-related care and restrict opportunities for PWID to access DAAs.

As we have previously argued (Knight & Ti, 2019), the equitable scale-up of DAAs among PWID requires an awareness of existing challenges and a concerted effort to identify and implement strategies to mitigate these challenges. Participants in the current study offered several key strategies that they viewed as opportunities to streamline and improve the accessibility of DAAs. For instance, participants described how – in addition to specialists – family physicians, nurse practitioners, and nurses are each well-positioned to provide DAA-related care, the feasibility and implementation of which has also been previously described in detail elsewhere (Day et al., 2019; Kattakuzhy et al., 2017; Marshall et al., 2020; van Driel et al., 2017). Indeed, generalist and community-based approaches (e.g., linked with primary care or OAT) to DAA provision are known to be safe, effective and efficient alternatives to traditional specialist- and hospital-based HCV services (Kattakuzhy et al., 2017; Marshall et al., 2020). Further, at a population level, evidence suggests that expanding the capacity and scope of practice of primary care providers (e.g., family physicians and nurse practitioners) to lead and

decentralize HCV care delivery will facilitate closing the gaps in the HCV care cascade, while simultaneously reducing the strain on healthcare systems who have scarce and poorly accessible specialist resources (Cousien et al., 2017; Falade-Nwulia et al., 2016; Grebely et al., 2017; Harris & Rhodes, 2018; Kattakuzhy et al., 2017; Litwin et al., 2019). Within this context, further research is needed to identify the proportion, experiences, and insights of primary care providers who are prescribing DAA therapies.

Our findings provide a critical glimpse into the view of a sample of HCV expert stakeholders regarding future opportunities to provide nurses involved in HCV care with opportunities to prescribe DAAs. Participants described how – in addition to nurse practitioners, who have been authorized to prescribe DAAs in BC since 2019 – expanding the role of other classes of nurses (e.g., registered nurses, registered psychiatric nurses) to have prescribing privileges for DAA treatment may enhance public health capacity to reach historically “hard-to-reach” populations for HCV care, including PWID. The potential for an enhanced nursing role in HCV care is significant, given that equitable DAA scale-up efforts will require a decentralized and multipronged approach that improves all facets of the cascade of care for people living with HCV, including prevention and harm reduction, testing and diagnosis, linkage to care, treatment provision, and follow-up (Falade-Nwulia et al., 2017; Marshall et al., 2020; van Driel et al., 2017; Wallace et al., 2018) – i.e., a comprehensive approach that is beyond the intended purview of specialists (who have *specific* clinical expertise), but that is well within the scope and means of what nurses are already positioned to do. Within this context, further research into the feasibility and potential impact of an expanded nursing role in relation to decentralized HCV care is needed.

To further optimize HCV care, expert stakeholders described how providing low-threshold and accessible services is also needed. For example, participants emphasized a need to better integrate DAA treatment into other contexts and interventions taken up by PWID (e.g., housing, OAT). Thus, our findings add to the emerging evidence base on the potential for incorporating the provision of DAAs into existing services that many PWID already access, including screening and diagnostic programs (Falade-Nwulia et al., 2016; Moore, Bocour, Laraqe, & Winters, 2018), OAT services (Butner et al., 2017; Christensen et al., 2018; Cousien et al., 2017; Litwin et al., 2019; Panagiotoglou et al., 2017; Talal et al., 2017), HIV care (Chuah et al., 2017; Falade-Nwulia et al., 2017), and – due to the criminalization of substance use and disproportionate incarceration rates among PWID – correctional health services (Harris et al., 2016; Talal et al., 2017). Similarly, as described by participants and elsewhere (Falade-Nwulia et al., 2016; Lazarus et al., 2014; Read et al., 2017; Sims et al., 2017; Trabut et al., 2018), improving DAA treatment delivery capacity among interdisciplinary primary care teams could scale up access to treatment among PWID, and simultaneously offer opportunities for addressing other health and social concerns (i.e., as described by participants, “all the rest” that goes alongside HCV care).

Across our findings, participants described how socio-structural barriers limit opportunities for PWID to access and complete DAA treatment. For instance, expert stakeholders described the perceived added challenge of undergoing DAA treatment when an individual is homeless or does

not have a place to store their medications, or when they have co-morbidities which require prioritization. Similar to other research with PWID (Chan et al., 2018; Harris & Rhodes, 2013; Harrison et al., 2019; Lazarus et al., 2014; Mah et al., 2017), these findings highlight how HCV treatment needs and realities are structurally embedded, and that PWID may experience competing health and social concerns which could supersede and/or deter HCV treatment uptake. Within this context, HCV-related services should be tailored such that they are as low-threshold as possible and responsive to the needs and concerns of PWID, which will increase opportunities for treatment uptake (Day et al., 2019; Evon et al., 2017; Wallace et al., 2018). However, caution is needed to ensure that efforts to improve treatment access and the overall cascade of care do not obfuscate the many contextual challenges and inequities related to HCV treatment trajectories (Paparini & Rhodes, 2016). Given the complexity of the socio-structural issues experienced by PWID living with HCV and the social capital and resources needed to address them, we argue that HCV-related health service delivery and policy changes (including expanded access to DAAs) alone will not result in the equitable scale-up of DAAs to this population. As argued in the Interferon era, “the promotion of universal treatment uptake in the absence of developing concomitant social and structural interventions is a fragile and at best medium-term strategy” (Harris & Rhodes, 2013, p. 7). Therefore, amid efforts to scale up DAAs, we continue to call on HCV-related programs and policies to consider and advocate for broader interventions that address the socio-structural factors that systematically disadvantage PWID in relation to opportunities for health and healthcare access.

This study has several strengths and limitations. First, our study offers insights from other expert stakeholders in HCV-related care, among whom, a subset disclosed having lived experience with HCV and/or substance use. Nevertheless, we acknowledge that the perspectives of PWID living with HCV, who are experts in their own care, were not captured in this data. Further research with PWID participants is needed to provide critical insights into remaining implementation barriers in the DAA era. Second, while our sample size was relatively small, participants offered rich and highly contextualized descriptions about the challenges and opportunities associated with DAA-related care. Third, although our initial purposive sampling strategy led to a diverse group of participants with years of experience in HCV-related care that transcended disciplines and healthcare sectors, our findings do not represent the perspectives of *all* stakeholders involved in HCV-related care in BC, nor those in other jurisdictions and/or healthcare contexts. Similarly, we did not fully explore how challenges and opportunities related to the scale-up of DAAs vary across and within subpopulations of PWID living with HCV (e.g., people who are Indigenous and/or racialized, various sexual and gender identities, people with alcohol dependence), as well as across regional contexts (e.g., urban, suburban, rural). Further research is needed to explore how intersecting contexts and systems of oppression (e.g., racism, colonialism, heteropatriarchy, classism) interact with the social identities and environments of PWID in ways that may influence experiences with DAAs.

Conclusion

Our findings reveal the extent to which overly biomedically-oriented DAA scale-up efforts alone will not sufficiently achieve population-level benefits for PWID living with HCV. To ensure the successful scale-up of DAAs among PWID under challenging “real-world” conditions,

comprehensive and context-sensitive approaches to HCV care are urgently needed. Our findings also emphasize that several key service delivery and system-level adaptations are required in order to equitably scale up access of DAAs to PWID, including via policies and programs that enhance HCV-related care through various structural interventions (e.g., improved housing; decriminalization of substance use), and optimize models of care (e.g., decentralized, integrated, outreach-focused, and peer- and nurse-led services).

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Authors' Contributions

TG led the analysis of data, and conceptualized, wrote, and revised the manuscript. RK conceptualized the study, obtained study funding, contributed to data collection and analysis, and provided mentorship in writing and revising the manuscript. LT, WS, and PM edited and revised the manuscript. All authors read and approved the final manuscript.

Conflict of Interest

The authors declare no conflicts of interest.

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