

Reinfection following successful direct-acting antiviral therapy for HCV infection among people attending an inner-city community health centre in Victoria, Canada

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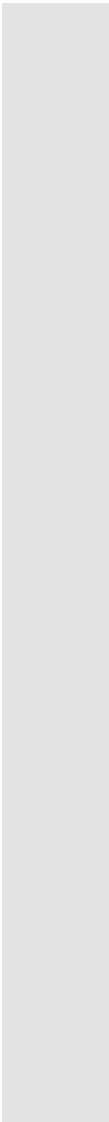


Disclosure of interests:

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World Health Organization 2030 Goal

HCV eliminated as public health threat by 2030¹:

71 million people living with chronic HCV infection throughout the world

~1.75 million new cases in 2015

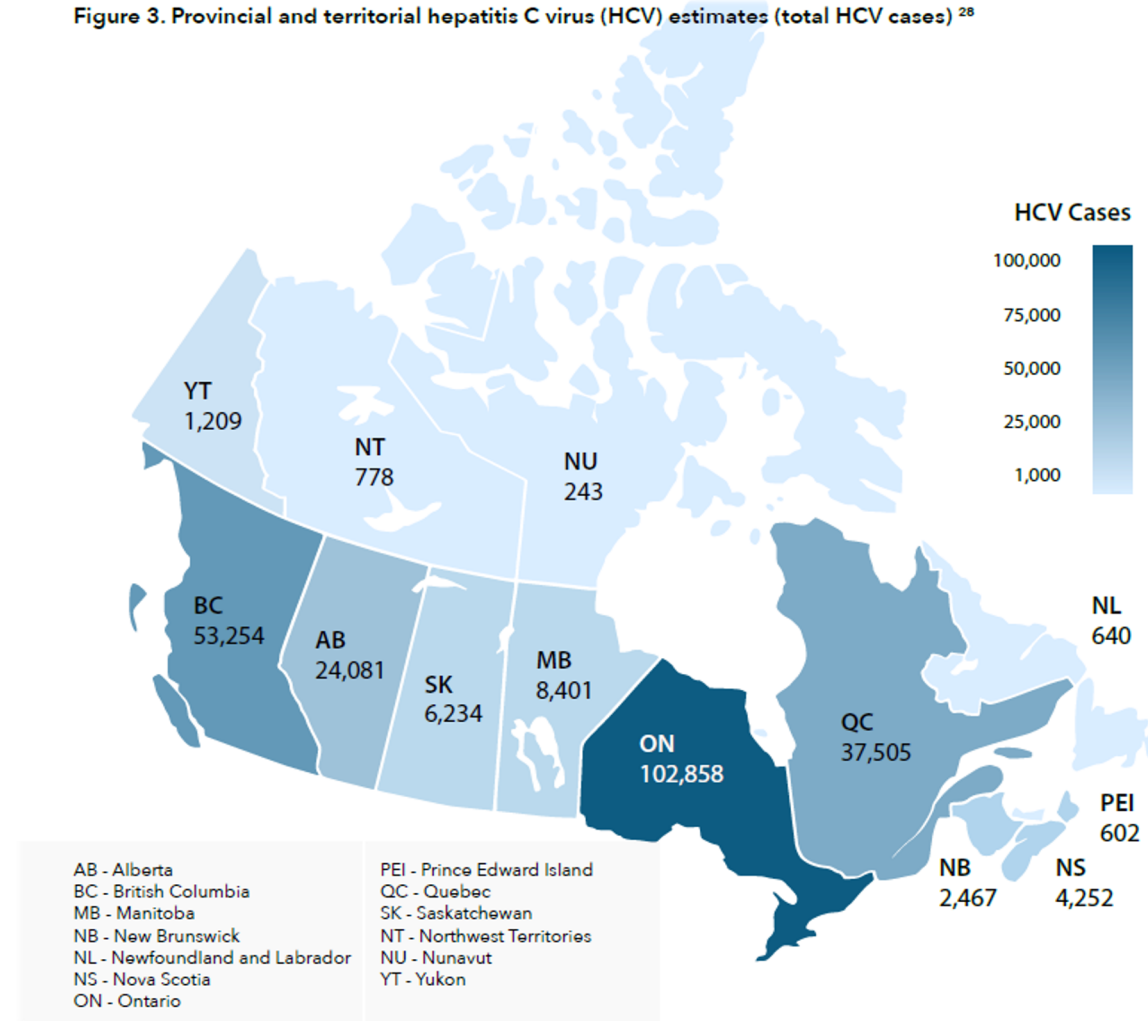
Canada:

~250,000 living with chronic HCV infection

Over 178,000 not yet treated

Over 50,000 untreated in British Columbia

Figure 3. Provincial and territorial hepatitis C virus (HCV) estimates (total HCV cases) ²⁸



1. WHO. Global Health Sector Strategy on Viral Hepatitis. 2016-2021. 2016.

Figure: The Canadian Network on Hepatitis C Blueprint Writing Committee and Working Groups. Blueprint to inform hepatitis C elimination efforts in Canada. 2019.

Cool Aid Community Health Centre



The Victoria Cool Aid Society is a non-profit organisation acting to end homelessness by providing safe and affordable housing, employment education services and community health services

Housing



Currently houses 550+ people in Greater Victoria who were previously homeless

Shelters



4 shelters: 165 beds, meals, wellness programmes, harm reduction and counselling

Health & Dental



Cool Aid Health Centre: inner-city, primary care medical practice

Support



Recreation, employment & volunteer jobs, holiday meals, education, referrals, paperwork help

CACHC provides healthcare to over 5000 people experiencing homelessness, mental health issues, infectious disease, problematic substance use and chronic illnesses

Multidisciplinary Nurse-led HCV team



5 Registered nurses



1 Dietician



1 Coordinating physician (**10** referring physicians)



Peer led weekly group



1 Research coordinator



1 Outreach worker



3 Pharmacists



2 Counselors

Key features of the CACHC service model:

- Multidisciplinary, inner-city, primary care clinic
- HIV, mental health and substance use care
- HCV screening, linkage to care and treatment
- Equity-based, harm reduction framework, striving to provide culturally safe, competent, flexible, low barrier access to care.
- **Nurse-led 'Seek & Treat' HCV micro-elimination programme**
 - Targets typically 'hard to reach' populations in VCAS housing (CITE), shelters, local OAT pharmacies (EPIC), and COVID sheltering sites

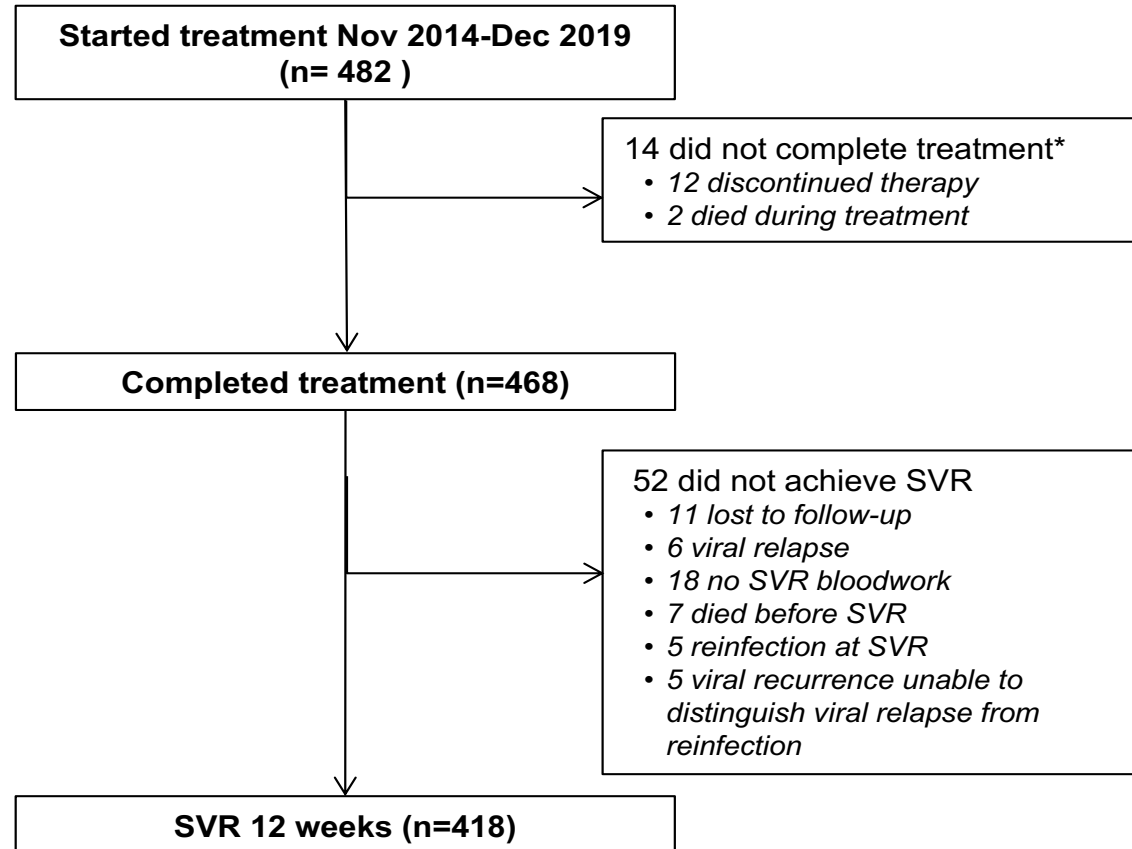
Methods

- Case management database
- Retrospective chart review of electronic medical record - prescriptions on file and clinician documentation
- Primary endpoint
 - HCV reinfection
- Secondary endpoints
 - proportion of patients who achieved SVR
 - incidence of mortality during and following DAA therapy.

Patients
initiating DAA
therapy
Nov 2014 to
Dec 31, 2019:
Demographic
and behavioural
characteristics

Variables	Overall (n=482) n (%)
Mean age (SD)	54 (11)
Median age (IQR)	56 (47-62)
Age (categorized into quartiles)	
<48	122 (25)
48-56	127 (26)
56-62	115 (24)
>62	118 (24)
Sex	
Male	335 (70)
Female	146 (30)
Transgender	1 (0)
HIV	74 (15)
History of injection drug use	450 (94)
Recent injection drug use	232 (48)
Recent drug use	295 (61)
Opioid agonist therapy	221 (46)
Methadone	162 (73)
Buprenorphine	25 (11)
Extended-release morphine	34 (15)
HCV genotype	
1	295 (61)
2	31 (6)
3	151 (31)
4	1 (0)
5	1 (0)
Mixed	3 (1)
Histological stage	
F0/1	217 (45)
F2/3	157 (33)
F4	106 (22)

HCV Treatment Outcomes



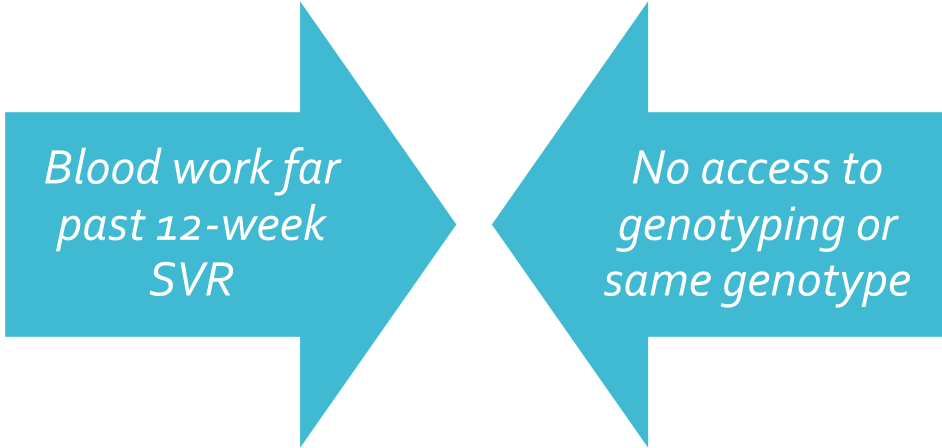
*2 of the 12 who discontinued achieved SVR and are included in the SVR total.

Community Health Clinic: Real World Setting

Reinfection vs.

Viral recurrence

(unable to distinguish viral relapse from reinfection)



*Blood work far
past 12-week
SVR*

*No access to
genotyping or
same genotype*

In 482 HCV Treatments 22 cases of Reinfection

Significant
factors:
recent IDU

- **22 cases of HCV reinfection**
 - (603 person-years of follow-up; 3.6 cases per 100 person-years, 95% CI 2.4-5.5)
- **91% (n=20) of reinfections** occurred in people with known **recent injection drug use** at the time of treatment initiation.
- Reinfection was higher among people with recent injection drug use (IDU) at the time of treatment initiation
 - **(6.6/100 person-years; 95% CI 4.3-10.3)** vs. no recent IDU **(0.7/100 person-years; 95% CI 0.2-2.7)**.
- In recent studies the rate of HCV reinfection was higher among people with recent injection drug use (Hajarizadeh et al., 2020; Martinello et al., 2017).
- Younger age, daily injection drug use, and needle and syringe sharing (Cunningham et al., 2020), high-frequency injection drug use (Young et al, 2017), a lack of confidence in the ability to avoid contracting HCV, homelessness, and living with someone who injects drugs (Akiyama et al., 2020).

In 482 HCV
Treatments
22 cases of
Reinfection

Significant
factors:
living with HIV

- Reinfection was higher among those with HIV
 - (7.6/100 person-years; 95% CI 4.2-13.7) vs. no HIV (2.4/100 person-years; 95% CI 1.3-4.3).
- In recent studies higher rates of HCV reinfection were found among people living with HIV (Simmons et al., 2016; Islam et al, 2017; Martinello et al., 2017).

Why does living with HIV increase HCV reinfection risk?

1. People who inject drugs with HIV/HCV often have **higher risk behaviours** than people with HCV alone (Miller et al., 2004; Michel et al., 2020; Toro-Tobón et al., 2020; Zhang et al., 2015; Ruiseñor-Escudero et al., 2014).
2. HIV infection associated with a reduction in the proportion with spontaneous clearance following acute HCV infection (Thomas et al., 2000; Mehta et al., 2002) .
 - PlwHIV similar rates of HCV reinfection compared to HIV-uninfected people but **less likely to spontaneously clear these reinfections**, thus more likely to have reinfections detected (Falade-Nwulia et al., 2018)
3. PlwHIV have **more follow up surveillance** as are required to have consistent CD4 cell count and plasma HIV-RNA level monitoring as part of anti-retroviral adherence protocol (Montaner et al., 2015)

Overdose and other deaths

- Since starting treatment **55 patients have died**
 - mortality of 7.4 deaths per 100 person-years (95% CI 5.6-9.6)
- 19 deaths were due to **drug overdose**
 - (2.5 deaths per 100 person-years, 95% CI 1.6-4.0)
- Other causes: **cardiac disease** (n=8), **liver disease** (n=5), **liver cancer** (n=3), **COPD** (n=3), suicide (n=2), **lung cancer** (2), subarachnoid hemorrhage (n=1), breast cancer (1), upper gastrointestinal bleed (1), pregnancy complication (1) and unknown (n=9).

Conclusions

- HCV reinfection should not be considered “treatment failure,” but the inevitable consequence of expanded treatment access and a sign that high-risk individuals are being reached
- Critical need to integrate services and develop new strategies to address other co-morbidities, such as opioid overdose, and improve the overall health of people who use drugs.

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Thank you!