

# Depressive symptoms and health services utilization in the HIV-Hepatitis C co-infected population in Canada

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## BACKGROUND

- Depression is common in people co-infected with HIV-Hepatitis C (HCV).
- The 2<sup>nd</sup> generation direct acting antiviral (DAA) regimens have minimal side-effects and >95% cure rates in real-world settings.
- High health services utilization (HSU) is an indication of lower health status.
- Studies suggest HSU is higher among people living with HIV as compared to those not and is even higher among those co-infected with HCV.
- However, studies quantifying the impact on HSU of specific psychiatric illnesses including depression in the co-infected population are scarce.
- Additionally, HCV cure have benefits in preventing liver disease and mental health outcomes, which have an impact on HSU.

## OBJECTIVE

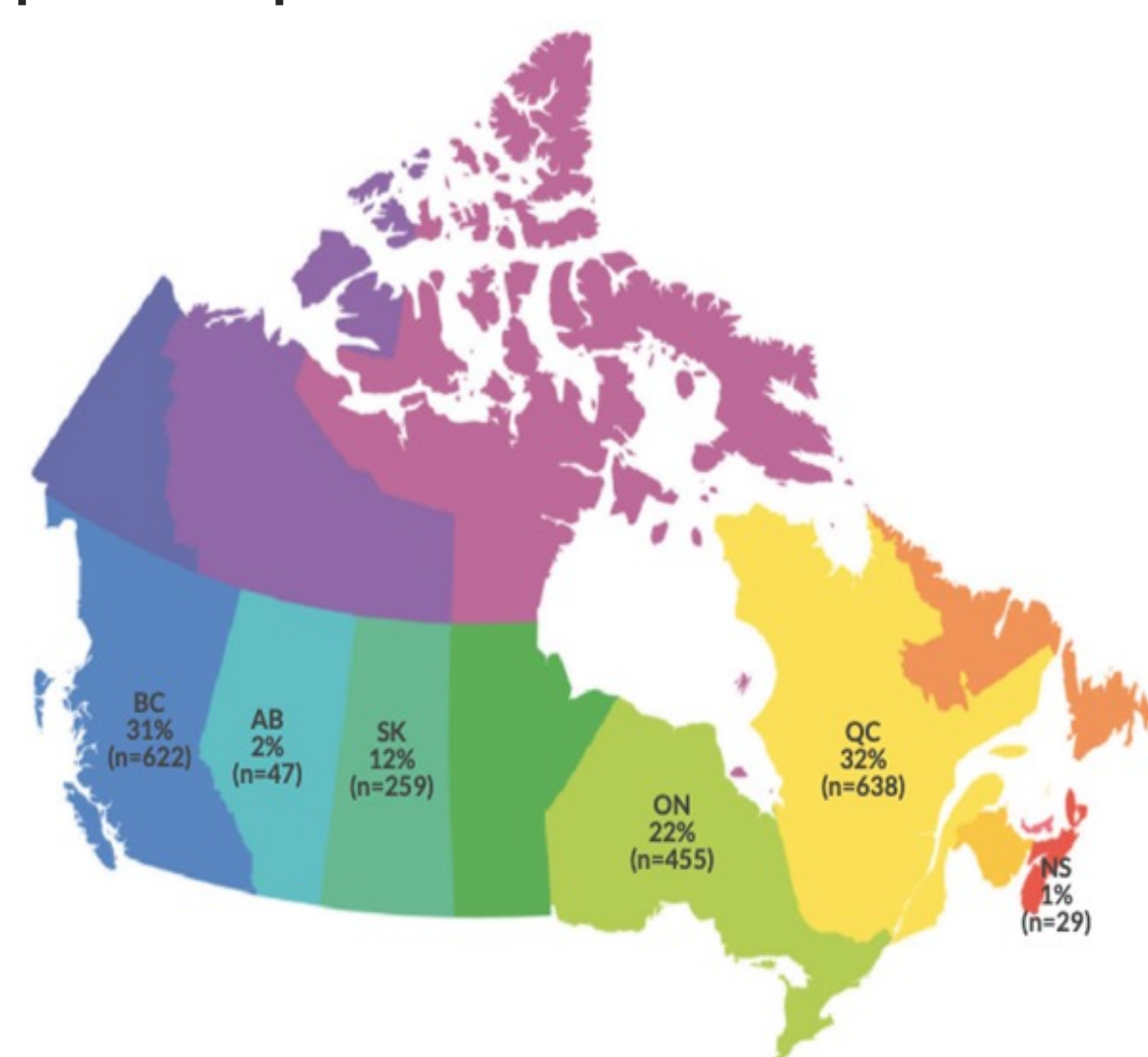
To examine the effect of depressive symptoms on HSU and how it is affected by sustained virologic response (SVR) in the HIV-HCV co-infected population in Canada during the second-generation DAA era (2013-2020).

## DATA SOURCES

### Canadian Co-infection Cohort (CCC)

- Multicenter prospective cohort study ongoing since 2003.
- As of February 2022, 2,057 participants were enrolled.

**Figure 1:** CCC participant numbers across provinces



### Food Security (FS) sub-study

- 725 CCC participants were followed up for 5 CCC visits.
- Depression screening was performed using Center for Epidemiologic Studies Depression Scale-10 (CES-D-10).
- 10-item scale, score range of 0-30;  $\geq 10$  for depressive symptoms indicative of risk of clinical depression.

## METHODS

### Outcomes

- Self-reported inpatient visits (hospital stays, emergency room) in the past 6 months
- Self-reported outpatient visits (general practitioner, HIV clinic, specialist, walk-ins) in the past 6 months

### Exposure

- Depressive symptoms (CES-D-10  $\geq 10$ ), predicted by a random forest classifier developed using FS sub-study data.
- Corrected for misclassification using predictive value-based record-level correction.

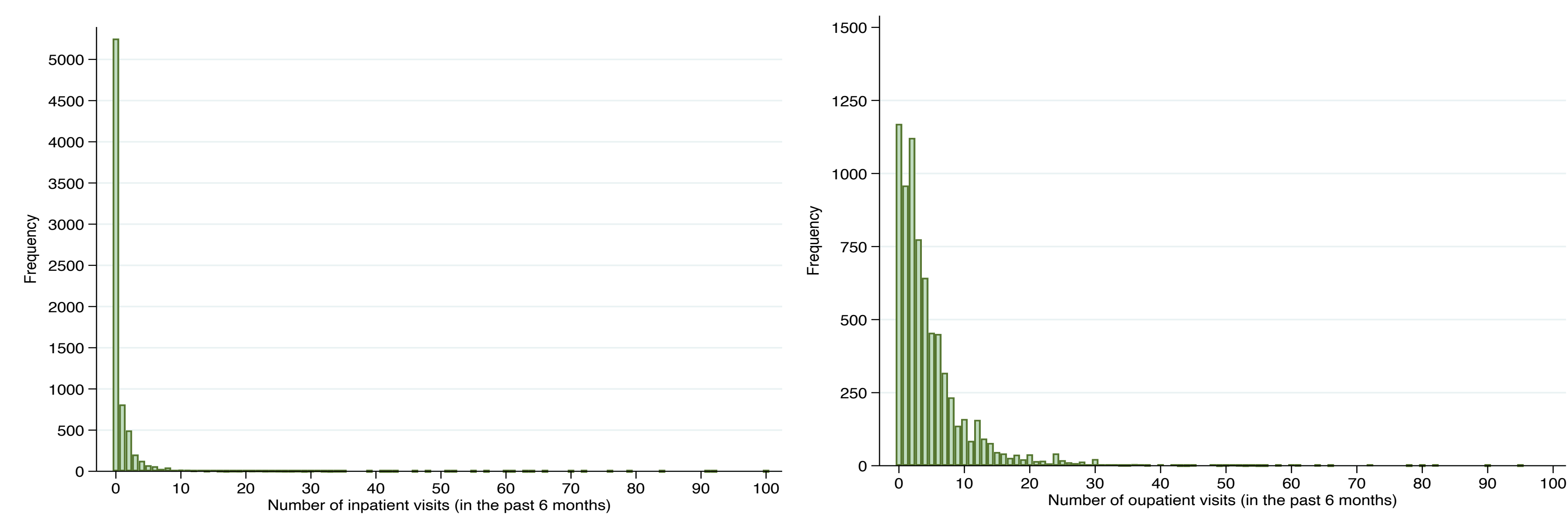
## METHODS

- Effect modifier:** SVR i.e., treated with DAAs and had undetectable HCV viral load at 12 weeks post-end of treatment.
- Confounders:** Baseline- Age, gender, race/ethnicity, education level, immigration, province, employment, monthly income, injection drug use, incarceration, fibrosis stage, HIV viral load, CD4 count; Time-varying- HCV RNA status
- We included HCV RNA+ participants in the second-generation DAA era, and followed them until death, withdrawal, or end of study period (July 2020).
- We used zero-inflated negative binomial models accounting for overdispersion and excess zeroes.

## RESULTS

- Of the 1,153 included participants, 530 initiated treatment and of them, 504 (95%) achieved SVR.
- The participants were predominantly male (70%) with a median baseline age of 45 years (IQR: 38-51).
- At baseline, 66% were unemployed, 73% had no post-secondary education, and 38% were injection drug users.
- The median number of inpatient visits in the past 6 months was 0 (IQR: 0-1) and for outpatient visits was 3 (IQR: 1-6).

**Figure 2:** Distribution of number of self-reported inpatient and outpatient visits



**Table 1:** Model Results for Effect of depressive symptoms and SVR on HSU

Outcomes	Depressive symptoms - Among those who had not achieved SVR		SVR		Depressive symptoms - Among those who achieved SVR	
	IRR	95% CI	IRR	95% CI	IRR	95% CI
Inpatient visits	1.17	1.06-1.29	0.76	0.70-0.84	1.03	0.89-1.19
Outpatient visits	1.05	1.02-1.08	1.00	0.97-1.02	1.01	0.97-1.05

## CONCLUSION

- Depressive symptoms were associated with a modest increase in HSU and SVR appeared to attenuate this effect.
- SVR was associated with a substantial reduction in inpatient visits.
- The possible lowering of health systems burden due to HCV cure could lead to system-level economic benefits.
- This further supports universal treatment of HCV among people co-infected with HCV and HIV.

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