

The Syndemic of HCV Co-infection and Mental Health Disorders among People Living with HIV: The Impact on Acute Care Hospitalizations

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Background

- Hepatitis C virus (HCV) is the most prevalent co-infection among people living with HIV (PLW-HIV); HIV/HCV co-infection rates are particularly elevated among people who inject drugs (PWID).
- The interaction between HCV and HIV may alter the pathogenesis of both diseases.
- The majority of healthcare utilization among people living with HIV and HCV (PLW-HIV/HCV) are due to extrahepatic conditions, such as mental health disorders (MHD) and substance use.
- PLW-HIV are also disproportionately afflicted by co-occurring MHD.
 - MHD impacts antiretroviral therapy (ART) adherence and virologic response, resulting in morbidity and mortality.
- “Syndemic” refers to two or more conditions that not only co-exist, but impact one another, resulting in the exacerbation of outcomes.
- Given the syndemic of HCV/HIV co-infection and MHD, we examined the combined impact of HIV/HCV co-infection and MHD on the trends of acute care hospitalization rates among PLW-HIV in British Columbia (BC), from 2000-2014.

Methods

- This retrospective cohort study was conducted using data from the British Columbia Seek and Treat for Optimal Prevention of HIV/AIDS (STOP HIV/AIDS) population-based cohort:
- Eligible individuals were ART-naïve, ≥18 years old, had initiated ART between 1 January 2000 and 31 December 2013, and were followed for ≥6 months until the earliest of the following: 31 December 2014, the last contact date, or the death date.
- The primary outcome was the acute care hospitalization rate (calculated every 6-month interval) for each individual, presented per 100 Person-Years (PY).
- The main exposure was a four-level variable incorporating the interaction between HIV/HCV co-infection and the presence of MHD (at any point of the study period):
 - PLW-HIV without MHD; PLW-HIV/HCV without MHD; PLW-HIV with MHD; and PLW-HIV/HCV with MHD.
- Four types of MHD were identified: i) anxiety disorders, ii) mood disorders, iii) personality disorders and iv) schizophrenia-related disorders (SRD).
- Poisson non-linear mixed-effects confounder model and generalized linear mixed-effects explanatory models were built, adjusting for sex, age, cohort effect, time-varying treatment-related factors and number of comorbidities.

Results

- Of the 4246 individuals, 1474 (35%) were PLW-HIV without MHD, 653 (15%) were PLW-HIV/HCV without MHD, 1052 (25%) were PLW-HIV with MHD, and 1067 (25%) were PLW-HIV/HCV with MHD.
- PLW-HIV/HCV with MHD were more likely to be female, PWID, aged between 30-49, to have a lower CD4 cell count at ART initiation, initiated ART before 2008, have more comorbidities and to maintain sub-optimal levels of adherence (i.e., <40%).
- The confounder model confirmed that HIV/HCV co-infection, MHD, and HIV/HCV co-infection concomitant with MHD increased the acute care hospitalization rate by 78%, 51%, and 172%, respectively.
- PLW-HIV/HCV with MHD had the highest predicted probability (PP) of acute care hospitalization (for every six-month interval) over the study period; but also had the most notable downward trend (PP=0.204 to PP=0.102; 50% decrease) (Figure 1A).

Results (cont.)

- Among individuals with MHD:
 - PLW-HIV/HCV with SRD had the highest PP of acute care hospitalization; PP associated with PLW-HIV/HCV with non-SRD MHD had decreased the most overall (55%) (Figure 1B).
 - The highest 14-year age-standardized rate was observed among PLW-HIV/HCV with SRD who are PWID (88/100PY (95% CI 83-93) (Figure 2).

Table. Results from the multivariable confounder model for the acute care hospitalization rate in British Columbia, 2000-2014.

Exposure	Acute Care Hospitalizations
PLW-HIV without MHD	1.00 (REF)
PLW-HIV/HCV without MHD	1.78 (1.49-2.12)
PLW-HIV with MHD	1.51 (1.28-1.77)
PLW-HIV/HCV with MHD	2.72 (2.33-3.18)

Figure 1. Predicted probability of acute care hospitalization (every 6-month interval) from 2000-2014, based on the fully adjusted explanatory models. (A) By main exposure group (B) Among those with MHD, stratified by HIV/HCV co-infection and type of MHD (SRD/Non-SRD)

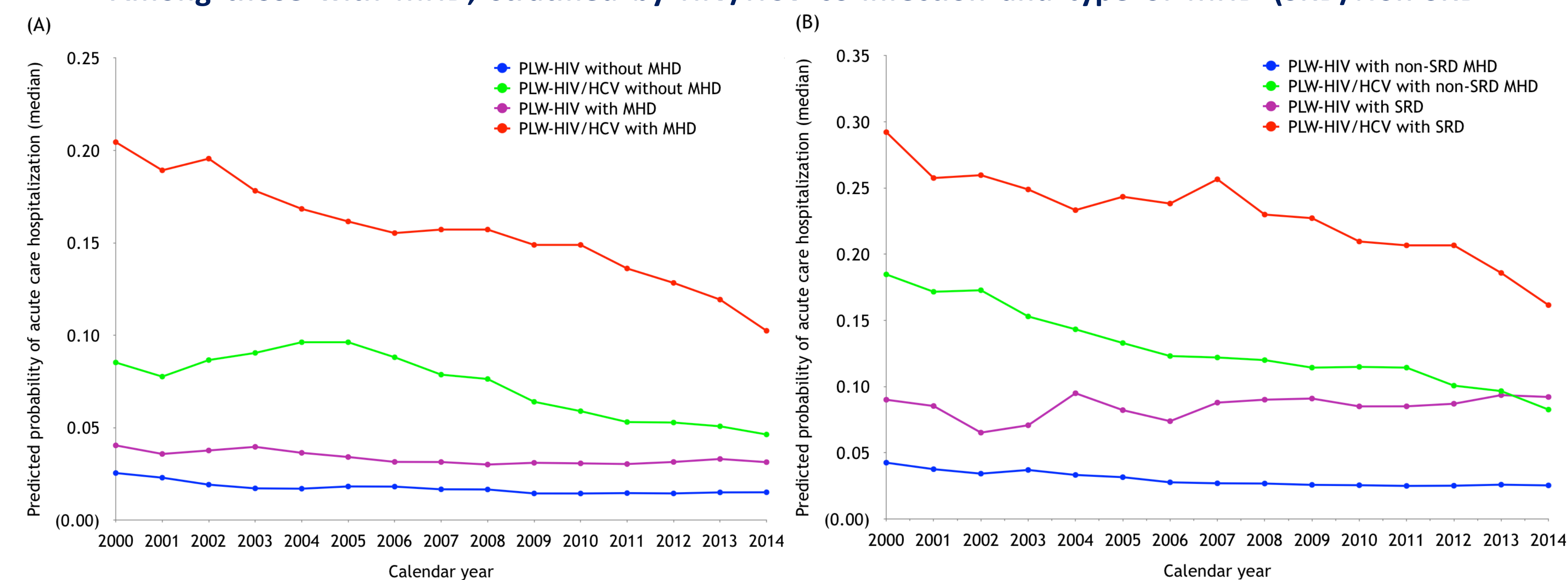
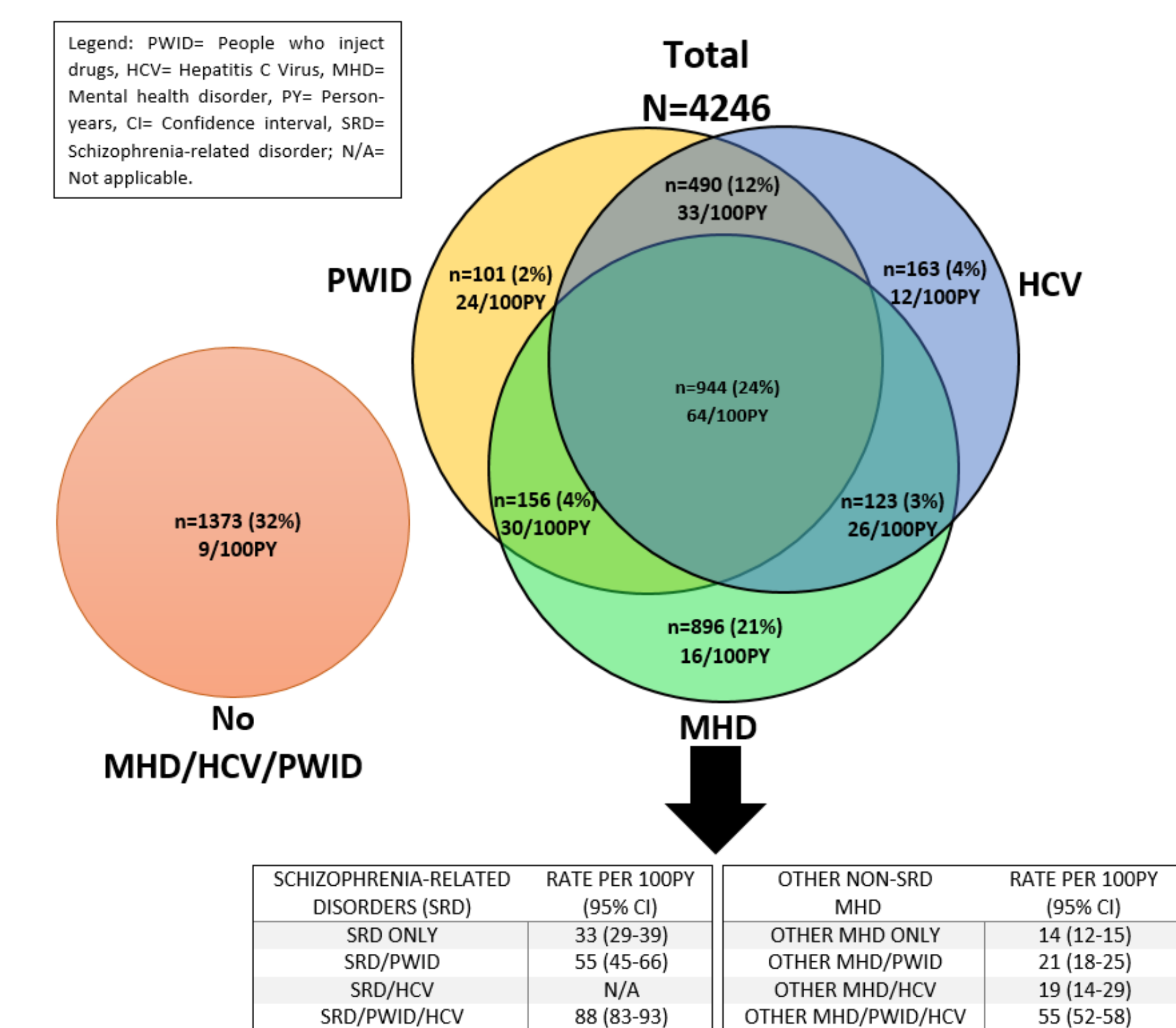


Figure 2. The syndemic impact of HCV Infection, MHD and PWID among PLW-HIV on the 14-year age-standardized acute care hospitalization rate.



Discussion

- A strong syndemic exists between HIV/HCV co-infection and MHD among PLW-HIV as evidenced by the multiplicative interaction.
- Disparities in acute care hospitalization rates persist among the sub-populations examined; acute care hospitalization rates are especially problematic among PLW-HIV/HCV with SRD who are PWID.
- Further reductions in the disparities observed may require a multi-faceted, cohesive and integrated system of service delivery, specifically targeting the components of this syndemic.