Earlier Age of Onset and Higher Prevalence of Comorbidities in People Living with HIV: A Population-Based Cohort Study in British Columbia, Canada

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Introduction

As people living with HIV (PLWH) are living longer, premature morbidity and mortality from age-associated comorbidities are more common.

Objective: To evaluate and compare: (i) trends in prevalence of chronic age-associated and mental health-related comorbidities, and (ii) age at diagnosis for the aforementioned comorbidities in PLWH and HIV-negative comparison population in BC.

Methods

Data: Comparative Outcomes and Service Utilization Trends (COAST) cohort comprises longitudinal individual-level data on all PLWH in BC and a 10% random representative of HIV-negative population.

Design: Population-based cohort study; eligible participants were ≥19 years old and followed for at least one year from Jan 1, 2000 until the first occurrence of death, last contact date, or Dec 31, 2012 whichever came first. PLWH were ART-naïve at baseline. Established case-finding algorithms using ICD 9/10 codes identified comorbidities from the provincial hospital and physician billing databases.

Outcomes: Of selected comorbidities (**Table 1**): (i) Annual age-sex-standardized prevalence using Canada's 2006 census as reference; and (ii) Age at (new) diagnosis, stratified by frequency of prior healthcare encounters.

Statistical Analysis: Beta regression modeled the non-linear trends of the age-sex-standardized prevalence over the years. The Kruskal-Wallis test compared the distribution of age at diagnosis stratified by rate of healthcare encounters. Analyses were performed in SAS version 9.4 and R version 3.5.2.

Table 1. Selected comorbidities

Chronic age-associated

1. Cardiovascular: acute myocardial infarction; congestive heart failure; ischaemic heart disease; stroke; cerebrovascular syndrome
2. Kidney: chronic kidney disease; end-stage renal disease
3. Lung: chronic obstructive pulmonary disease; chronic asthma
4. Liver: chronic liver disease; end-stage liver disease; viral & non-viral hepatitis
5. Non-AIDS-defining cancers: all cancers except Kaposi sarcoma, cervical cancer and Non-Hodgkin's lymphoma
6. Diabetes mellitus
7. Osteoarthritis
8. Chronic hypertension
9. Organic mental disorders: Alzheimer's and non-HIV-associated dementia

Mental-health-related

1. Mood & anxiety disorders
2. Schizophrenia
3. Personality disorders

Results

- Analysis included 4,223 PLWH and 454,092 HIV-negative individuals (median age at baseline 41 vs. 38 years, 80% vs. 50% men, median follow-up 5 vs. 13 years).

- Increasing annual trends in the prevalence of all comorbidities in both populations (p-value <0.0001) (**Figure 1**).

- Prevalence of diabetes, lung, liver, kidney and all mental health diseases were higher among PLWH (p-value<0.05) (**Figure 1**).

- PLWH had higher healthcare encounter rates: more encounters in a shorter time before comorbidity diagnosis.

- The difference in age at diagnosis for mental disorders across HIV status was minor and inconsistent (**Figure 2A** & **2B**).

- Adjusted for healthcare encounters, PLWH were diagnosed with chronic diseases between 5 (hypertension) and 28 years (kidney) earlier than HIV-negative (p-value<0.05) (**Figure 2B**).

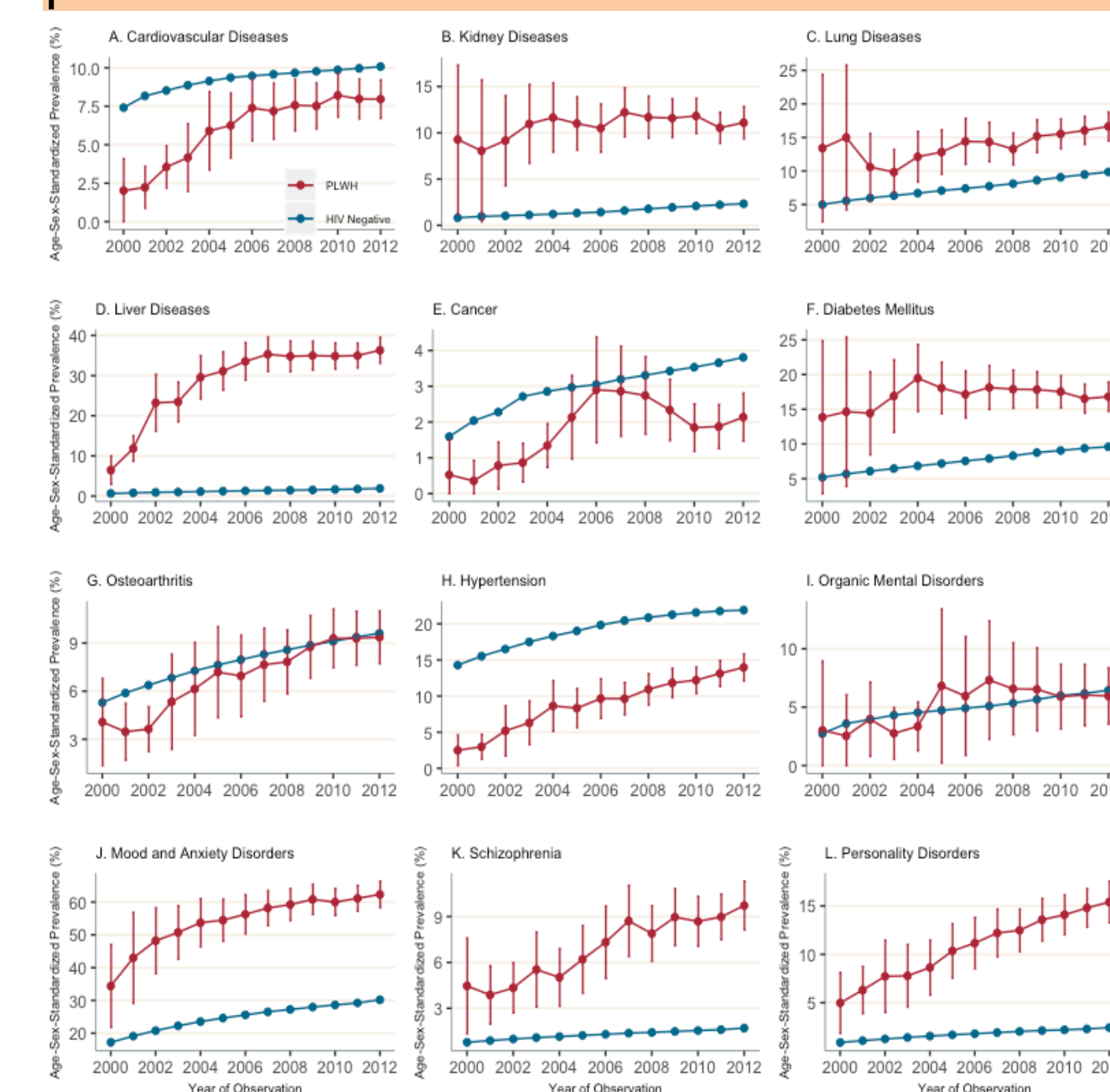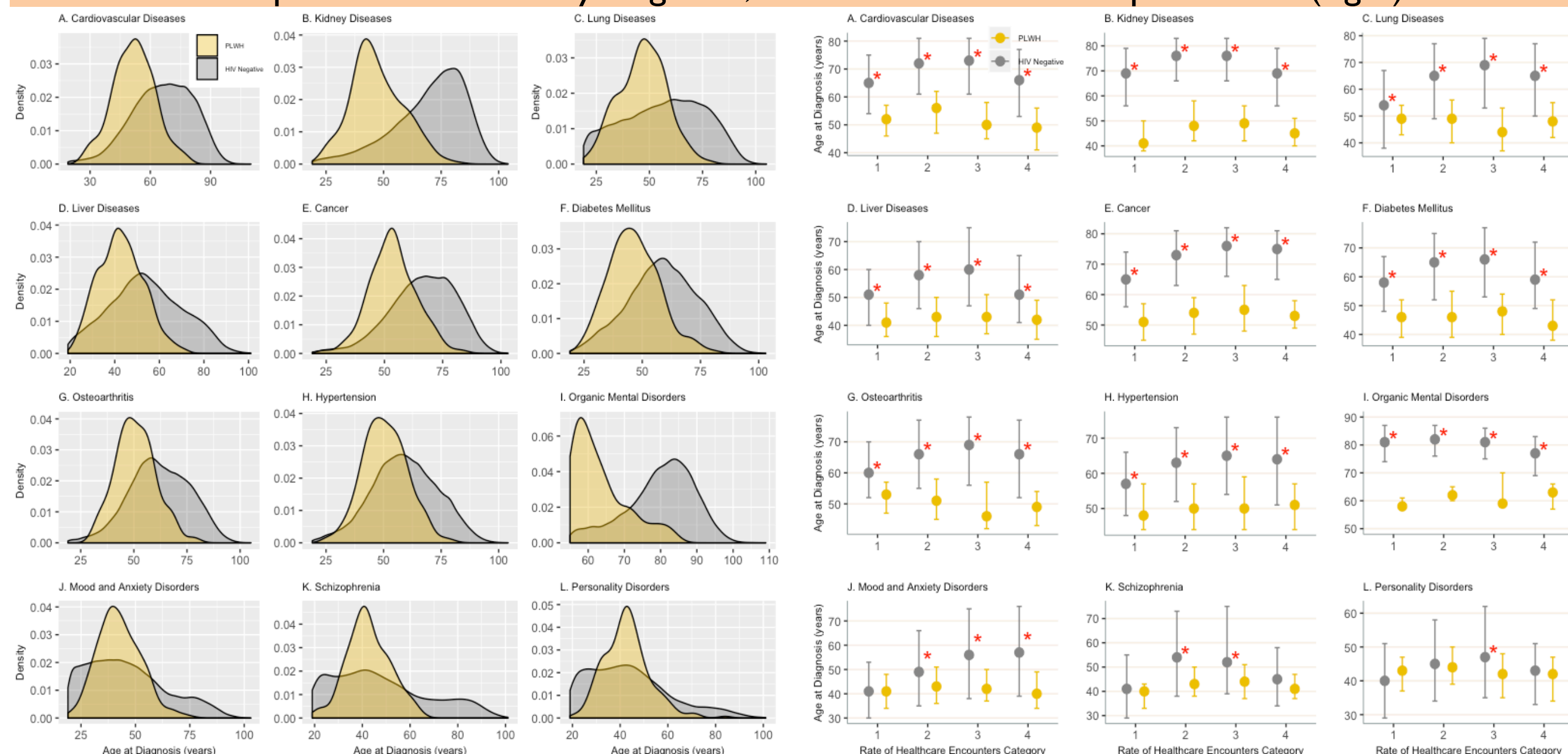## Figure 1. Annual age-sex-standardized prevalence with 95% confidence interval

Figure 2A. Unadjusted distribution of age at diagnosis: (left); Figure 2B. Adjusted by rate of health care encounters prior to comorbidity diagnosis, median with 25th & 75th percentiles (right).

Note: PLWH's rates of healthcare encounters prior to comorbidity diagnosis (measured in number of encounters/person-year) were categorized: from minimum value to 25th percentile (Category 1); 25th percentile to median (2); median to 75th percentile (3); and 75th percentile to maximum value (4). Only HIV-negative individuals whose rates matched into these categories were included; *: Median age at diagnosis for PLWH and HIV-negative population were significantly different (p-value <0.05).

Discussions

After adjusting for differential population distribution and healthcare encounters, PLWH experienced higher prevalence of most age-associated and all mental health-related comorbidities, and substantially earlier diagnosis of all chronic comorbidities.

Our findings inform the evolving healthcare needs of aging PLWH and suggest implications for optimized general clinical screening of comorbidities at an earlier age and a more integrated HIV care services in this population.

Disclaimer: All inferences, opinions, and conclusions drawn in this poster are those of the authors, and do not reflect the opinions of policies of the Data Stewards or funders.