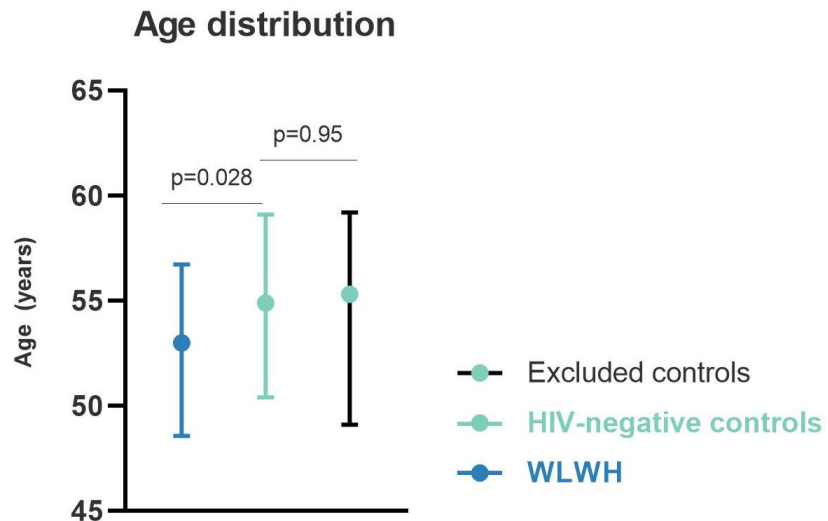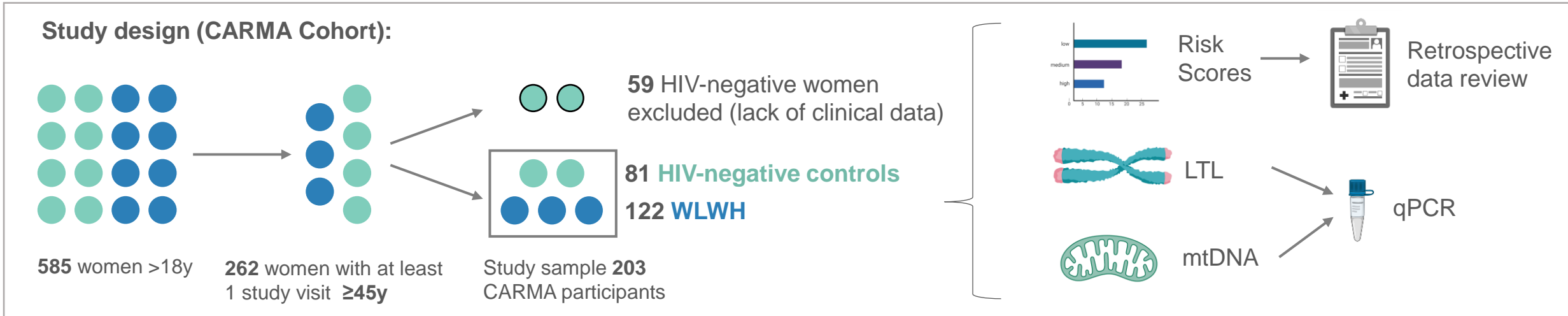# Preliminary Analysis of **Comorbidity Risk Scores** and Immune Aging Markers in Women over 45 Years old Living with or without HIV in the **CARMA Cohort** in British Columbia

Tetiana Povshedna, Maya Rosenkrantz, Anthony Y.Y. Hsieh, Jonathan Steif, Arianne Albert, Evelyn J. Maan, Beheroze Sattha, Ariel Nesbitt, Shanlea Gordon, Jerilynn Prior, Deborah M. Money, Melanie C.M. Murray, Neora Pick; **Hélène C.F. Côté**,
for the CIHR Team Grant on Cellular Aging and HIV Comorbidities in Women and Children and the CARMA (Children and Women: AntiRetrovirals and Markers of Aging) cohort

Introduction

RATIONALE: People living with HIV are at higher risk of age-related comorbidities, even when treated with cART. There are limited data describing **multiple comorbidity scores** for risk prediction in women living with HIV (**WLWH**).

Study design (CARMA Cohort):

59 HIV-negative women excluded (lack of clinical data)

81 HIV-negative controls

122 WLWH

585 women >18y

262 women with at least 1 study visit **≥45y**

Study sample **203** CARMA participants

Risk Scores → Retrospective data review

LTL

mtDNA

qPCR

Age distribution

p=0.95

p=0.028

Age (years)

Excluded controls

HIV-negative controls

WLWH

OBJECTIVE**: to compare, between **WLWH** and **HIV-negative control women**, the risk scores and immune aging markers - **leukocyte telomere length** (LTL) and **mitochondrial DNA** (mtDNA) content.

◄ **Figure 1**. Age distribution of study participants (median, IQR). **WLWH** were **younger** than **HIV-negative controls**. The age of 59 excluded **controls** did not significantly differ from the 81 **HIV-negative controls** included in the study.
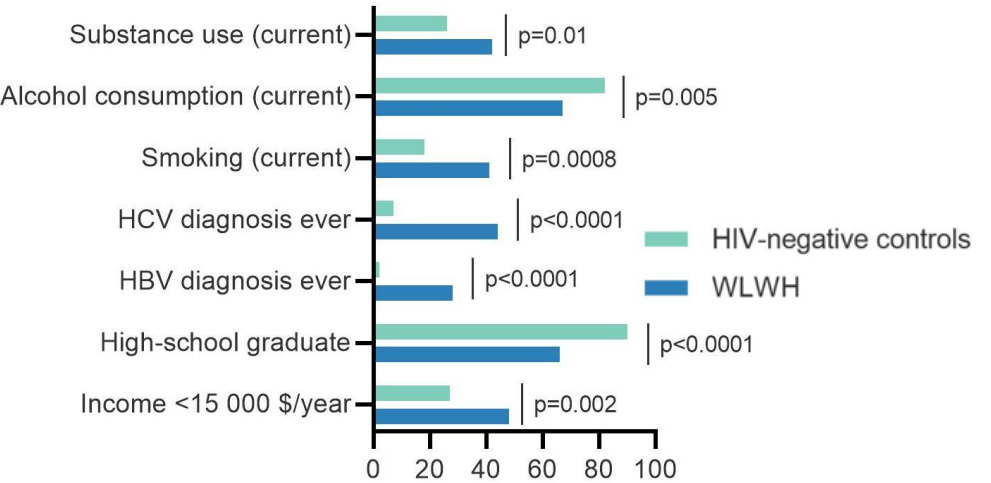
Study measures and demographics

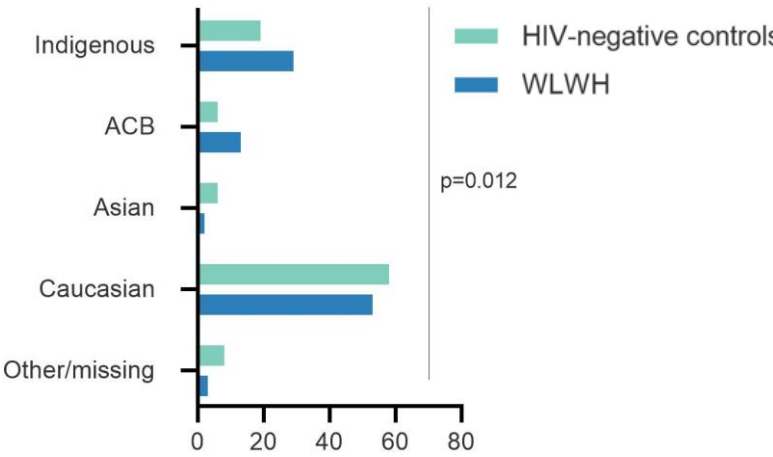| Risk Score	Definition	Number of participants with score, n (%) *	
		WLWH n=122	HIV-negative controls n=81
Framingham Risk Score (FRS)	10-year risk of cardiovascular event (n=197)	108 (93)	64 (79)
Aspartate aminotransferase-to-platelet ratio (APRI)	Marker of liver fibrosis	119 (98)	73 (90)
Canadian Association of Radiologists and Osteoporosis Canada (CAROC)	10-year risk of a fragility fracture for women >50y (n=145)	72 (89)	52 (81)
Liver-related death risk (LRD) score	Liver-related death risk in HIV/HCV co-infected individuals (n=53)	49 (92)	
Chronic Kidney Disease (CKD) prediction score	Risk of chronic kidney disease (n=115)	115 (100)	
Veterans Aging Cohort Study (VACS) index	5-year risk of all-cause mortality	119 (98)	

Risk scores were calculated for **different subsets** of participants based on the clinical data available.

LTL and mtDNA were measured for **WLWH** n=120 (98%) and **HIV-negative controls** n=78 (96%)

Demographic characteristics of study participants (%)

Substance use (current) — p=0.01
Alcohol consumption (current) — p=0.005
Smoking (current) — p=0.0008
HCV diagnosis ever — p<0.0001
HBV diagnosis ever — p<0.0001
High-school graduate — p<0.0001
Income <15 000 $/year — p=0.002

HIV-negative controls
WLWH

Ethnicity (%)

Indigenous
ACB
Asian
Caucasian
Other/missing

p=0.012

HIV-negative controls
WLWH

* Updated with more risk score data compared to the abstract

Results *
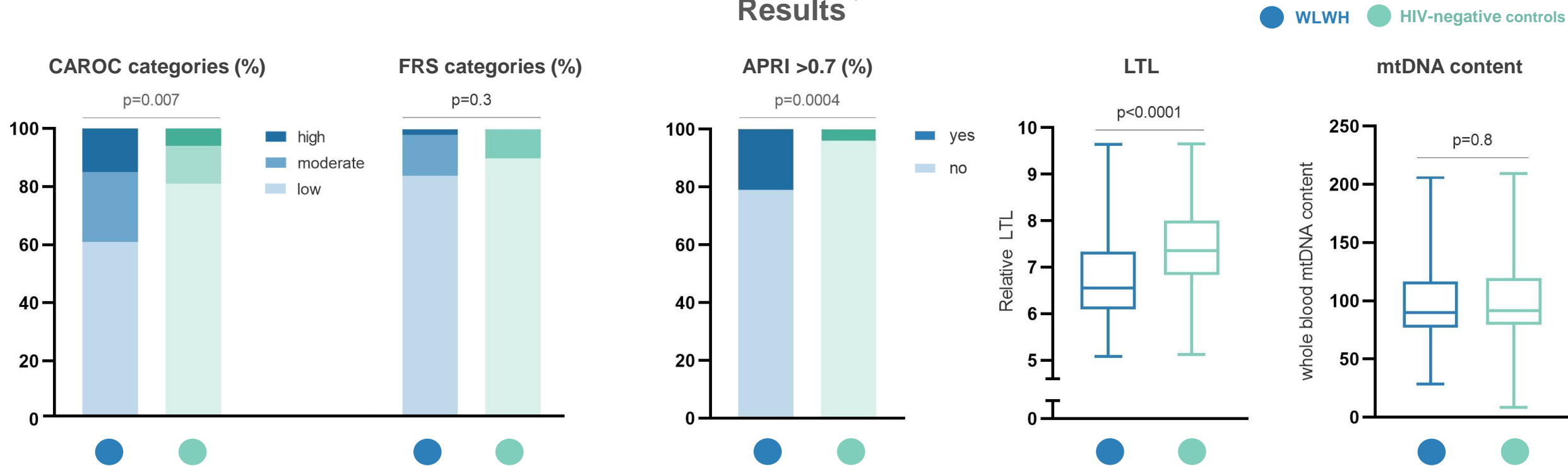
Table 2. Risk scores specific for **WLWH**

Liver-related death risk score, median [IQR]	5.5 [4.5-6.5]
low (<5.5), n (%)	20 (40.8)
medium-low (5.5-8.5), n (%)	20 (40.8)
medium-high (8.5-10.5), n (%)	6 (12.2)
high (>10.5), n (%)	3 (6.2)
Chronic kidney disease risk, median [IQR]	7.0 [3.0 – 12.0]
low (<0), n (%)	7 (6)
medium (0-4), n (%)	27 (23)
high (≥5), n (%)	81 (71)
VACS 5-year mortality risk (%), median [IQR]	10.8 [6.6 – 21.2]

- A larger proportion of **WLWH** had APRI>0.7 compared to **controls**, indicating **higher risk for hepatic fibrosis**

- A larger proportion of **WLWH** had moderate/high CAROC scores compared to **controls**, indicating **higher risk for 10-year fracture**

- FRS, which estimates 10-year risk of cardiovascular disease, **did not differ** between groups

- **WLWH** had shorter LTL than **controls**, but **no difference** in mtDNA content was detected

- Among **WLWH**, 18.4% were at medium-to-high risk of liver-related death

- Among **WLWH**, 71% were at high risk of chronic kidney disease

- Among **WLWH**, the VACS index predicted a 10.8 [6.6-21.2]% risk of 5-year all-cause mortality

* Updated with more risk score data compared to the abstract

Conclusions

In our study, despite the fact that **WLWH** were younger than **HIV-negative controls**, we observed:

Among **WLWH** vs. **HIV-negative controls**:

- shorter LTL
- higher risk scores for liver disease
- higher risk scores for bone disease

In addition, for **WLWH** only:

- 18.4% at medium-to-high risk of liver-related death
- 71% at high risk of chronic kidney disease
- 10.8% median risk of 5-year all-cause mortality

No differences in cardiovascular risk and mtDNA content were detected.

Further research is needed to determine how to better predict and prevent aging comorbidities in this population.