Heart Failure Risk and Events in People with HIV in the REPRIEVE Trial

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Gerald S. Bloomfield[1], **Maya G. Watanabe**[2], Sara M. McCallum[3], Heather J. Ribaudo[2], Judith A. Aberg[4], Aya Awwad[3], Sarah M. Chu[3], Judith S. Currier[5], Carl J. Fichtenbaum[6], Michael T. Lu[3], Carlos D. Malvestutto[7], Sophia Zhao[3], Markella V. Zanni[3], Steven Grinspoon[3], Pamela S. Douglas[1] for REPRIEVE Investigators

[1]Duke University School of Medicine, Durham, NC, USA, [2]Harvard TH Chan School of Public Health, Boston, MA, USA, [3]Massachusetts General Hospital, Boston, MA, USA, [4]Icahn School of Medicine at Mt Sinai, New York, NY, USA, [5]University of California Los Angeles, Los Angeles, CA, USA, [6]University of Cincinnati, Cincinnati, OH, USA, [7]The Ohio State University, Columbus, OH, USA

BACKGROUND

- People with HIV (PWH) have 2x higher risk of heart failure (HF).
- HF risk prediction is not well characterized in PWH due to lack of risk algorithm testing in this group.
- The AHA PREVENT HF 10-year risk score uses prior ASCVD risk equation components but performance has not been reported in PWH.
- REPRIEVE captured the prespecified and adjudicated outcome of HF in PWH allowing an opportunity to evaluate incidence of and factors associated with HF in a global cohort with low-moderate risk of cardiovascular disease.

METHODS

- Confirmed HF events included both hospitalized and non-hospitalized events:
  - Hospitalized events were independently adjudicated.
  - Non-hospitalized events were ascertained via the narrow standardized MedDRA query (SMQ) for heart failure.
- HF incidence rate (IR) (events/1000 person years) was described overall and by demographic, HF and HIV-specific factors.
- Average PREVENT HF 10-year risk scores were summarized overall and by risk factors.
  - Risk score components include sex, age, blood pressure, BMI, eGFR, diabetes, smoking, and anti-hypertensive medications.
- Expected number of HF events per participant per 1 year were calculated with 95% confidence intervals computed using 5,000 bootstrap samples.
- The PREVENT risk score was assessed using $\frac{observed}{expected}$ events ratio.

Among a global cohort of PWH with low-moderate ASCVD risk: age, sex, GBD region, race, obesity, and hypertension contributed to higher incidence of heart failure events

CONCLUSIONS

- In a global cohort of PWH with low-moderate ASCVD risk, the observed number of HF events with and without hospitalization was relatively low.
- Risk factors for HF events with and without hospitalization included older age, female sex, HIC, Black or African American race, high BMI, and hypertension (both controlled and uncontrolled).
- Expected events calculated using the AHA PREVENT HF risk score were similar to observed numbers of events overall and by participant characteristics.
- The PREVENT HF score provides a reasonable estimate of HF risk in PWH.

RESULTS

- Participant demographics are reported in **Table 1.**
- Overall IR of confirmed HF was 1.65/1000PY (median follow-up 5.6 years).
- Higher incidence of confirmed HF among: older age, female sex, high-income country (HIC) region, Black/African American race, current cigarette smoking, controlled/uncontrolled HTN (BP </>140/90 mmHg), obesity (BMI ≥30 kg/m²), and HIV-1 RNA ≥400 copies/mL **(Figure 1A)**.
- There was no apparent difference in HF IR by randomized treatment group.
- In HIC, the IR of confirmed HF was 2.32/1000PY compared to IR <0.8/1000PY in other GBD regions except Sub-Saharan Africa which was 1.67/1000PY.
- Among those in HIC, Black or African American participants had the highest IR of 3.68/1000PY compared to 1.46/1000PY for White participants.
- Among those with controlled hypertension, IR of HF was 3.31/1000PY compared to 1.97 and 1.13/1000PY for uncontrolled and no hypertension, respectively.
- There was higher incidence of HF in those with former or current smoking (2.09 and 2.35/1000PY) compared to never smoking.
- Most risk factors had observed/expected (O/E) events ratios close to or with confidence intervals spanning 1 with an overall O/E of 0.93 (95% CI: 0.71, 1.16) **(Figure 1B)**.

Table 1. Participant Demographics

Demographics	N=7,769
Age, mean	50 (years)
Female Sex (%)	2419 (31%)
Non-White Race (%)	5065 (65%)
Current smoking (%)	1933 (25%)
Hypertension (HTN)* (%)	2780 (36%)
10-year ASCVD risk (%), median	4.5%
CD4, mean	659.8 cells/mm³

** Includes HTN diagnosis or BP>140/90 mmHg at entry*

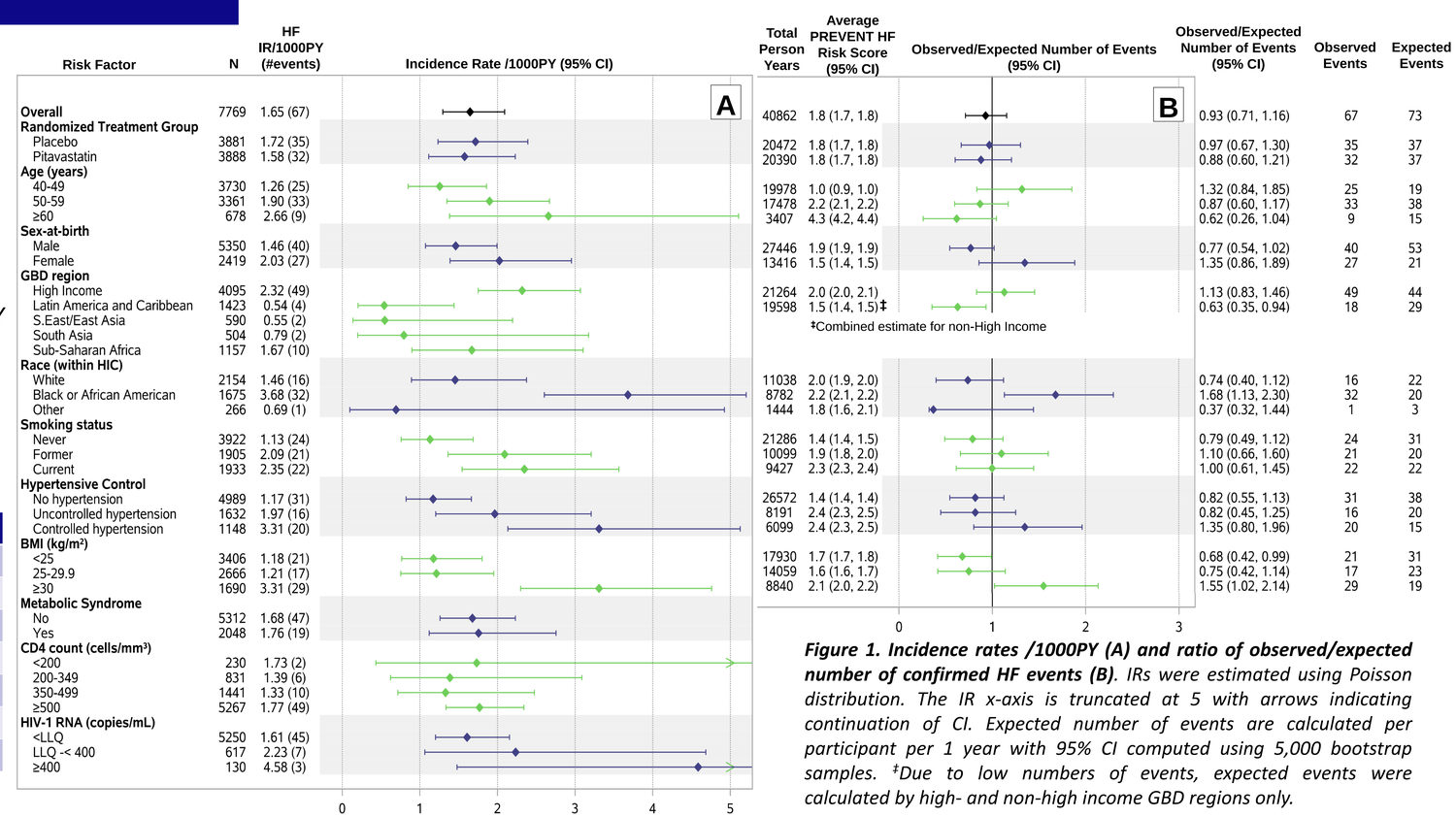

Figure 1. Incidence rates /1000PY (A) and ratio of observed/expected number of confirmed HF events (B). *IRs were estimated using Poisson distribution. The IR x-axis is truncated at 5 with arrows indicating continuation of CI. Expected number of events are calculated per participant per 1 year with 95% CI computed using 5,000 bootstrap samples. ‡Due to low numbers of events, expected events were calculated by high- and non-high income GBD regions only.*

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