

# INSOMNIA AND RISK OF INCIDENT MYOCARDIAL INFARCTION AMONG PEOPLE LIVING WITH HIV



Bridget M. Whitney<sup>1</sup>, Robin M. Nance<sup>1</sup>, Joseph Delaney<sup>2</sup>, Stephanie A. Ruderman<sup>1</sup>, Matthew Budoff<sup>3</sup>, W. C. Mathews<sup>4</sup>, Richard D. Moore<sup>5</sup>, Matthew Feinstein<sup>6</sup>, Greer Burkholder<sup>7</sup>, Michael J. Mugavero<sup>7</sup>, Joseph J. Eron<sup>8</sup>, Michael Saag<sup>7</sup>, Mari M. Kitahata<sup>1</sup>, Heidi M. Crane<sup>1</sup>, for the CNICS Cohort

<sup>1</sup>University of Washington, Seattle, WA, USA; <sup>2</sup>University of Manitoba, Winnipeg, MB, Canada; <sup>3</sup>University of California Los Angeles, Los Angeles, CA, USA; <sup>4</sup>University of California San Diego, San Diego, CA, USA; <sup>5</sup>Johns Hopkins University, Baltimore, MD, USA; <sup>6</sup>Northwestern University, Chicago, IL, USA; <sup>7</sup>University of Alabama at Birmingham, Birmingham, AL, USA; <sup>8</sup>University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

## BACKGROUND

- Current research suggests that people living with HIV (PLWH) suffer from a substantially higher burden of sleep disturbances, including insomnia, compared to the general population<sup>1,2</sup>
- Insomnia is associated with increased risk of incident cardiovascular disease (CVD)<sup>3-5</sup> and may play a role in the increased incidence of myocardial infarctions (MIs) seen among PLWH
- Type 1 MIs (T1MI) are due to atherothrombotic coronary plaque rupture, whereas type 2 MIs (T2MI) are from supply-demand mismatch, such as with sepsis or cocaine use
  - T2MIs are more common in PLWH than in the general population
- The disaggregated risk of MI by type due to insomnia in PLWH is not currently well understood

## METHODS

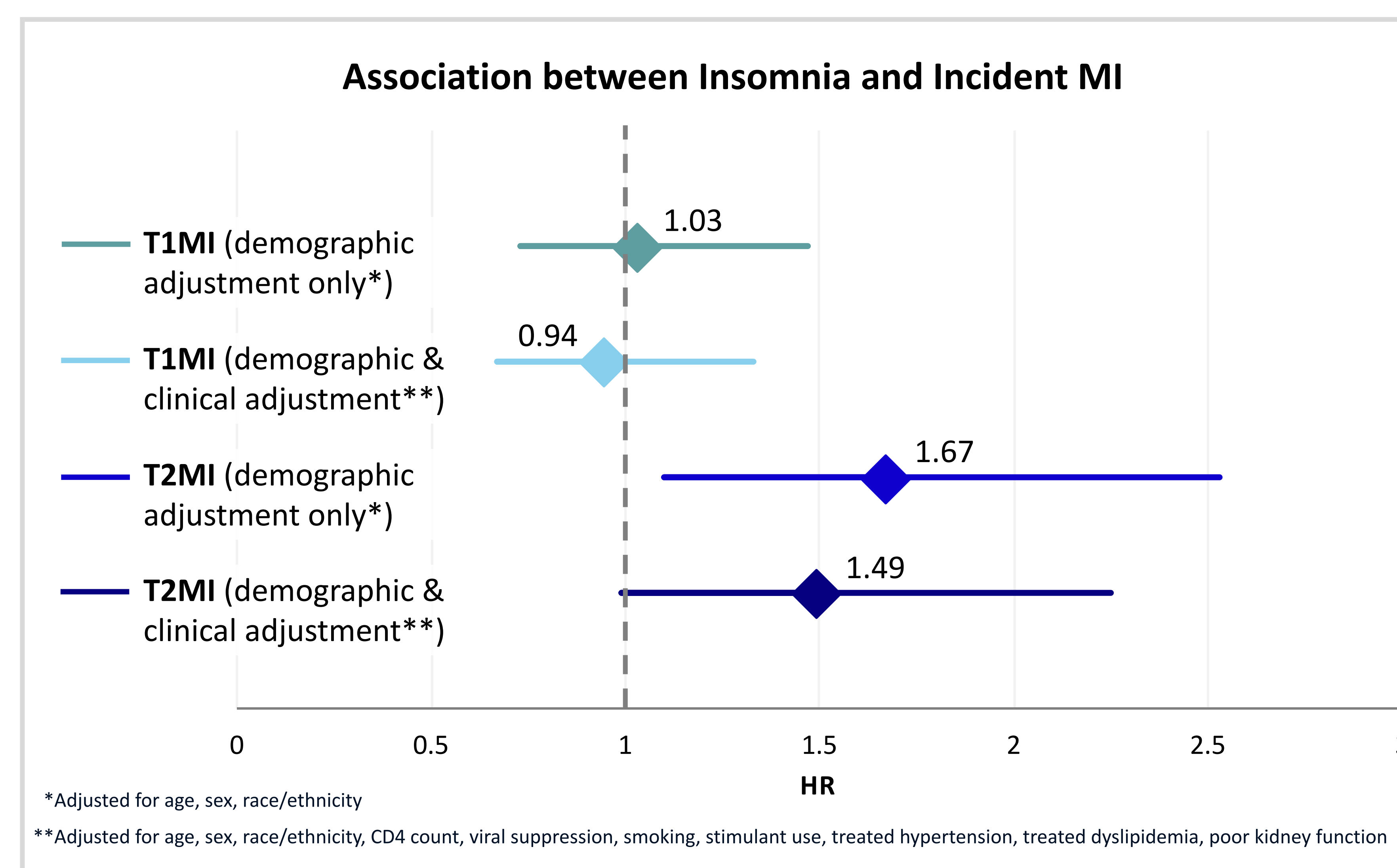
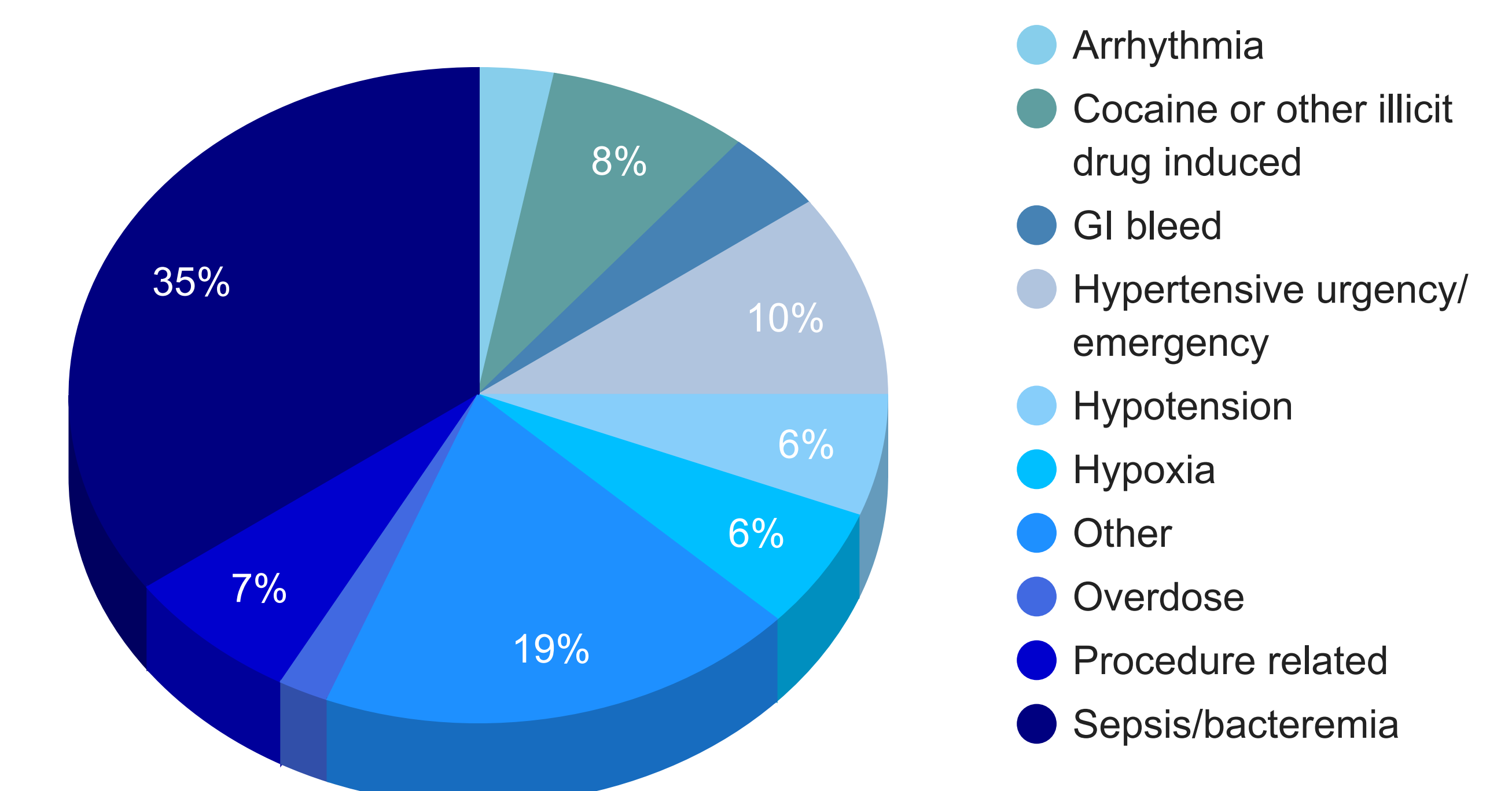
- The multisite Centers for AIDS Research Network of Integrated Clinical Systems (CNICS) cohort includes clinical data, patient-reported outcomes and measures (PROs), and centrally adjudicated MIs with distinction between T1MIs and T2MIs
- Using data from PLWH in care at five CNICS sites between 2005-2019, we evaluated the relationship between insomnia and first incident MI
- Insomnia, defined as having difficulty falling or staying asleep with symptoms that are bothersome, was measured at baseline via PRO as part of the HIV symptom index
- The associations between insomnia and incident MI by type were evaluated using separate Cox models adjusted for age, sex, race/ethnicity, baseline CD4 count, baseline viral suppression (VL<400), and traditional CVD risk factors (treated hypertension, treated dyslipidemia, poor kidney function (eGFR<30), and smoking)

## RESULTS

Characteristic	No MI	T1MI	T2MI	Overall
N	10,948 (98%)	141 (1%)	100 (1%)	11,189
Age	43 (11)	51 (8)	49 (11)	43 (11)
Female	1,653 (15%)	10 (7%)	22 (22%)	1,685 (15%)
Race/Ethnicity				
White	5,208 (48%)	78 (55%)	41 (41%)	5,327 (48%)
Black	3,332 (30%)	34 (24%)	48 (48%)	3,414 (31%)
Hispanic	1,801 (16%)	24 (17%)	9 (9%)	1,834 (16%)
Other race	607 (6%)	5 (4%)	2 (2%)	614 (5%)
CD4	532 (304)	499 (317)	387 (288)	530 (304)
VL ≥400	2250 (21%)	31 (22%)	33 (33%)	2314 (21)
Treated hypertension	2339 (21%)	77 (55%)	51 (51%)	2467 (22)
Treated dyslipidemia	1687 (15%)	57 (40%)	25 (25%)	1769 (16)
eGFR <30	95 (1%)	9 (6%)	12 (12%)	116 (1%)
Current smoking	4091 (37%)	70 (50%)	47 (47%)	4208 (38%)
Insomnia	5,290 (48%)	66 (47%)	59 (59%)	5,415 (48%)

- Sleep disturbance was common among CNICS participants
  - 6,405 (57%) reported some difficulty falling or staying asleep
  - 5,415 (48%) reported insomnia symptoms were bothersome
- 241 incident MIs (n=141 T1MIs and n=100 T2MIs) among 11,189 PLWH over an average of 4.3 years of follow-up

T2MI Causes (N=100)



## CONCLUSIONS

- Approximately half of PLWH reported insomnia, an estimate consistent with the 50-70% prevalence reported in the literature
- We found that PLWH with insomnia were not at increased risk of T1MI compared to PLWH without insomnia
- Insomnia appeared to be associated with a substantial increased risk of T2MI among PLWH
- These findings highlighting the importance of distinguishing MI types, especially among PLWH
- Further investigation into the relationship between insomnia and T2MIs by T2MI cause may elucidate mechanisms underlying this association

References: 1. Taibi DM. Sleep disturbances in persons living with HIV. *J Assoc Nurses AIDS Care*. 2013 Jan; 24(1 Suppl): S72-S85. 2. Ren J, et al. Factors associated with sleep quality in HIV. *J Assoc Nurses AIDS Care*. 2018 Nov - Dec;29(6):924-931. 3. Polanka BM, et al. Insomnia as an independent predictor of incident cardiovascular disease in HIV: data from the Veterans Aging Cohort Study. *J Acquir Immune Defic Syndr*. 2019 May 1;81(1):110-117. 4. Javaheri S, Redline S. Insomnia and risk of cardiovascular disease. *Chest*. 2017 Aug; 152(2): 435-444. 5. Sofi F, et al. Insomnia and risk of cardiovascular disease: a meta-analysis. *Eur J Prev Cardiol*. 2014 Jan;21(1):57-64.

### Acknowledgments

Patients, providers, and staff of the CNICS Cohort. This work was supported by NIAID (CNICS R24 AI067039), NIA (R24 AG044325), and NHLBI (R01 HL126538).

