Hyperthermia and Hypothermia Detection Inconsistencies Across Racial and Ethnic Groups

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How Do Thermometry Discrepancies Affect Diagnosis and Treatment Equity?

Accurate body temperature measurement is critical for diagnosis

Missed diagnoses can delay critical treatment

Discrepancies in temporal thermometry may disproportionately affect certain racial/ethnic groups.

Device readings can be affected by **many variables**

Temperature readings can vary depending on the **measurement site**

Skin emissivity can influence infrared sensor performance (Bhavani et al., 2022)

Pulse oximetry readings are affected by **race and ethnicity** (Wong et al., 2021)

Do racial/ethnic disparities exist in **hidden hyperthermia or hypothermia (HHH)**?

Assess the likelihood of HHH across racial/ethnic groups using paired temporal and contact temperature measurements

Patients with darker skin pigmentation, as proxied by self-identified race/ethnicity, are at higher risk of missed fever or hypothermia

Harmonizing Data to Uncover Disparities in Thermometry

01	EHR Databases Collection	**PhysioNet**
02	Patient Selection	
03	List Relevant Variables	
04	Parse and Submit Query	
05	Harmonize Datasets and Run Statistical Analysis	pandas statsmodels

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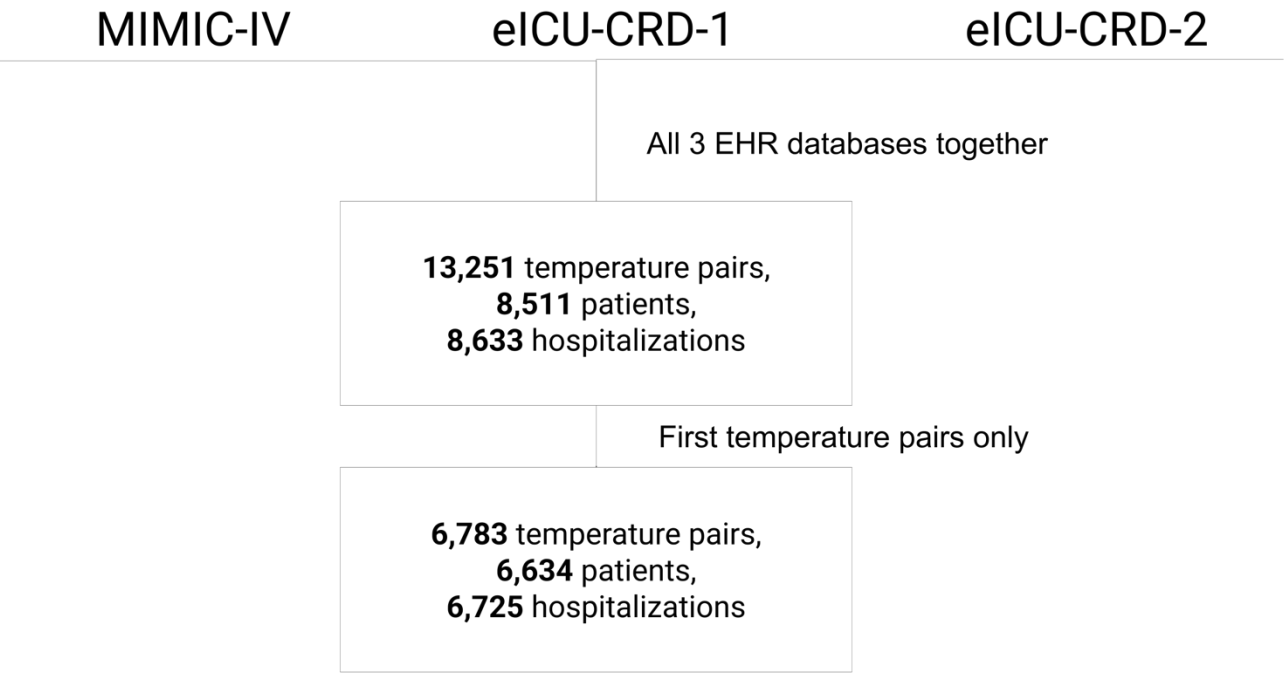
Defining Cohort to Reveal Thermometry Disparities



Retrospective cohort analysis

- 2008 - 2022

EHR Databases:

- MIMIC-IV, eICU-CRD-1, eICU-CRD-2

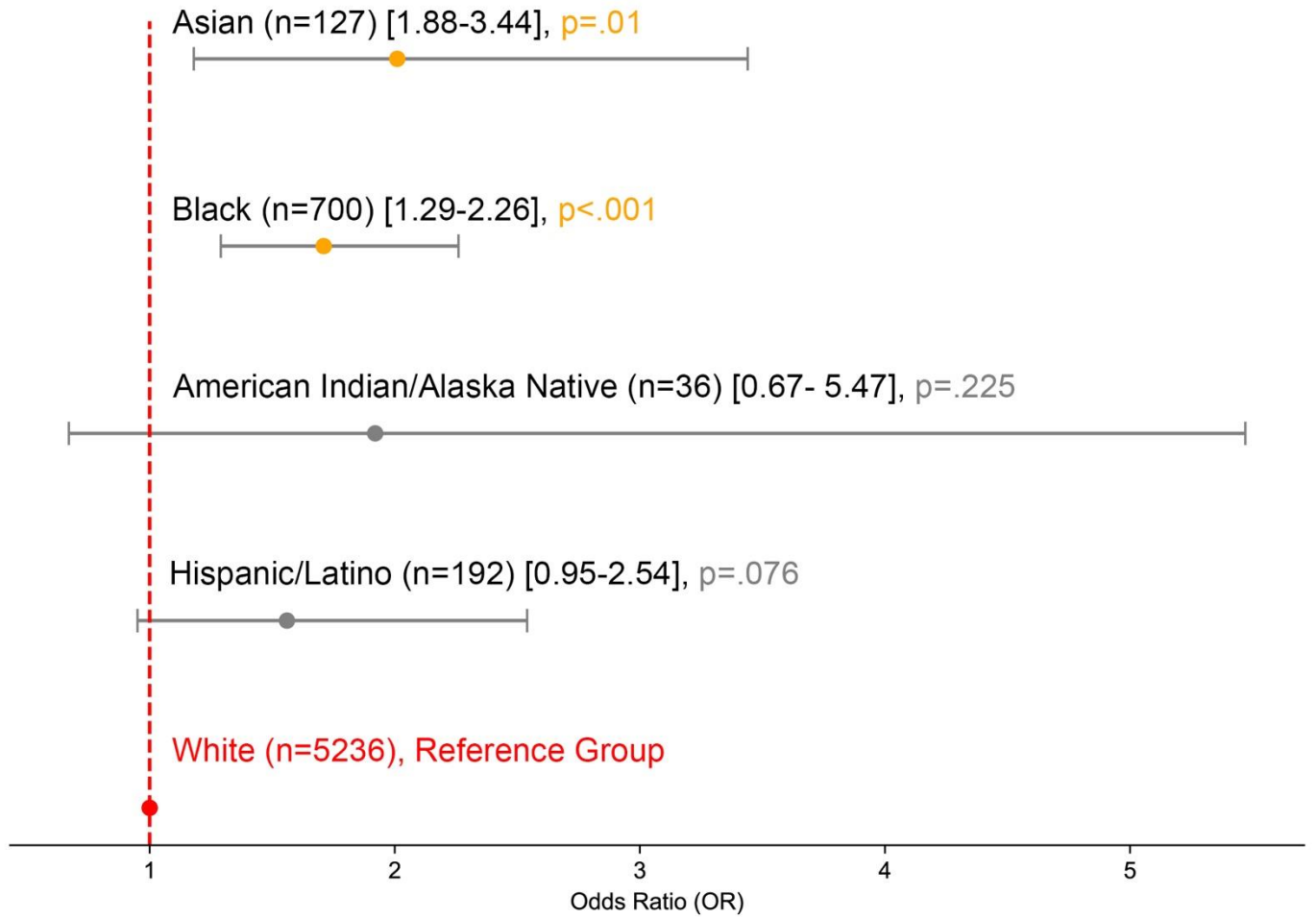
Exclusion Criteria:

- Missing pairs, extreme temperatures (<30°C, >45°C), or < 18 years old

Statistical Analysis

- Generalized estimating equations adjusting for covariates

Asian and Black Patients have **significantly** higher adjusted odds [95% CI] of HHH



Translating Findings Into Action for Diagnostic Equity

Asian and Black patients face significantly higher risks of HHH

Implications

Potential misdiagnosis risks for these populations	Need for equitable diagnostic tools

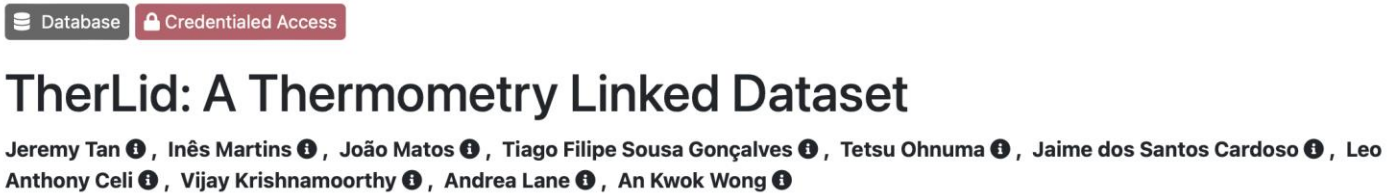
Improving Diagnostic Equity: Challenges and Next Steps

Challenges

- Retrospective design
- Proxies for skin pigmentation (self-identified race/ethnicity)
- Limited window of 60 minutes for temperature pairs (standard set by Bhavani et al.)

Next Steps

- Incorporate more EHR databases using current methodology
- Advocate for researchers to utilize the published PhysioNet dataset



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