652

Factors Associated with Cardiovascular Disease in Pre- and Post-HIV Acquisition in South Carolina

Haoyuan Gao[1], Monique J. Brown[1,2,3], Samuel Gavi[1], Bankole Olatosi[2,4], Jiajia Zhang[1,2]

[1]Department of Epidemiology and Biostatistics, Arnold School of Public Health, University of South Carolina, Columbia, SC
[2]South Carolina SmartState Center for Healthcare Quality, Arnold School of Public Health, University of South Carolina, Columbia, SC
[3]Rural Health Research Center, Arnold School of Public Health, University of South Carolina, Columbia, SC
[4]Department of Health Services Policy and Management, Arnold School of Public Health, University of South Carolina, Columbia, SC

UNIVERSITY OF South Carolina
Arnold School of Public Health

Background & Objective

- Cardiovascular disease (CVD) is a leading cause of morbidity among people with HIV (PWH).
- Prior studies typically compare HIV-negative individuals with PWH, but underlying population differences may confound such comparisons. Longitudinal data that track the same individuals before and after HIV diagnosis can better isolate the impact of HIV acquisition on CVD.

Study Objective: This study examined demographic, HIV-related factors, and comorbidities associated with CVD in a South Carolina (SC) cohort.

Methods

Study Design: A retrospective longitudinal cohort study of SC adult residents diagnosed with HIV between January 2005 and December 2023. The cohort includes individuals diagnosed from January 2008 to December 2020, allowing ≥ 3 years of pre-diagnosis records and ≥ 3 years of post-diagnosis follow-up.

Data Source: An integrated electronic health record system in SC, USA

Measures:

- **Exposure**: HIV diagnosis
- **Outcome**: CVD incident
- **Demographics**: Age (time-varying), sex, race, area of residence
- **HIV-related factors:** HIV risk acquisition activity, AIDS diagnosis
- **Covariates** (time-varying): diabetes mellitus, chronic kidney disease, hypertension, dyslipidemia, obesity, arthritis, liver disease, tobacco use, alcohol use, illicit drug use, and mental health disease.

Analysis: Crude and fully adjusted generalized linear mixed models (GLMMs) with random intercepts to evaluate associations with CVD, and with interaction terms assessing interaction effects between sex and race with HIV status.

Statewide longitudinal EHR data show HIV acquisition sharply increases CVD risk across sex and race, especially with cardiometabolic comorbidities.

Results

- A total of **9,404** PWH were included, of whom 1,922 (20.4%) had an AIDS diagnosis during follow-up.
- The cohort was predominantly male (77.7%) and Black (64.2%), with 43.2% aged 18–30 years at HIV diagnoses.

Figure 1: Forest plot for full adjusted GLMM (significant predictors)

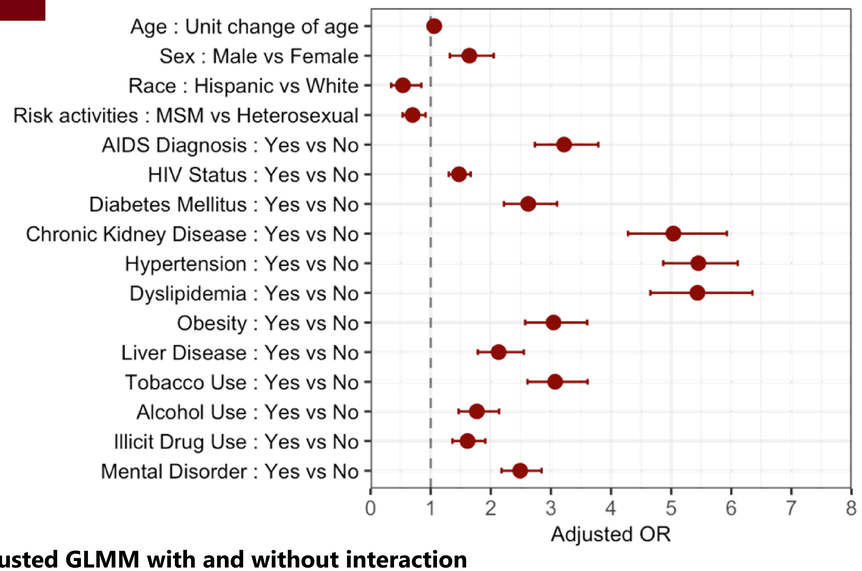


Table 1: Crude and full adjusted GLMM with and without interaction

Variable	Crude OR without interaction (95% CI)	Adjusted OR without interaction (95%CI)	Crude OR of HIV Positive vs. Negative	Adjusted OR of HIV Positive vs. Negative
HIV status				
HIV Negative	Ref.	Ref.	--	--
HIV Positive	**9.87 (8.92; 10.92)**	**1.47 (1.30; 1.66)**		
Sex				
Female	Ref.	Ref.	**8.45 (7.16; 9.98)**	**1.37 (1.13; 1.67)**
Male	**0.44 (0.35; 0.55)**	**1.64 (1.32; 2.05)**	**10.62 (9.36; 12.05)**	**1.53 (1.32; 1.77)**
Race				
White	Ref.	Ref.	**8.00 (6.55; 9.77)**	**1.48 (1.18; 1.85)**
Black	0.97 (0.77; 1.22)	1.03 (0.85; 1.27)	**10.23 (903; 11.59)**	**1.38 (1.19; 1.59)**
Hispanic	**0.31 (0.19; 0.52)**	**0.54 (0.34; 0.84)**	**22.37 (10.16; 49.28)**	**3.14 (1.46; 6.75)**
Other	0.86 (0.58; 1.27)	1.02 (0.73; 1.42)	**10.72 (7.52; 15.29)**	**2.01 (1.31; 3.08)**

Note: The bolded estimates represent significant OR.

Conclusions

- HIV is associated with a higher risk of incident CVD, even after accounting for demographics and comorbidities.
- The elevated CVD risk is similar for men and women and across racial groups.
- AIDS diagnosis and cardiometabolic/renal conditions (e.g., diabetes, chronic kidney disease, hypertension, dyslipidemia) are strong predictors of CVD among PWH.
- Early CVD risk assessment and aggressive management of comorbidities should be integrated into routine HIV care, especially soon after diagnosis.

Additional Key Information

- Author Contact Information: Haoyuang@email.sc.edu
- Acknowledgements: The authors thank the South Carolina Department of Public Health and other SC agencies for contributing the data in South Carolina.

Plain Language Summary

We followed more than 9,000 adults in South Carolina before and after they were diagnosed with HIV and found that their chance of developing heart and blood vessel disease increased after acquiring HIV, especially if they also had high blood pressure, diabetes, or kidney problems. These results show that heart health should be checked and protected as part of regular HIV care.