Racial and Ethnic Disparities in Treatment and Survival Outcomes in Out-of-Hospital Cardiac Arrest Witnessed by 9-1-1 Responders

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Introduction

- In the U.S., patients of Black race and Hispanic ethnicity have lower survival than White patients for out-of-hospital cardiac arrest (OHCA) that is not witnessed by 9-1-1 responders than White patients.
- We hypothesize that these racial and ethnic differences also exist for OHCAs witnessed by 9-1-1 responders (first responders and EMS).

Methods

- We performed a retrospective analysis of 9-1-1 responder-witnessed OHCA from 2013-2022 using a national registry.
- Descriptive differences by race and ethnicity were assessed by estimates by absolute standardized difference (%), with ≥10% indicating a meaningful difference.
- Multivariable logistic regression models with generalized estimating equations were used to quantify the association between race or ethnicity and survival outcomes.

### Figure 1: Study Population Inclusions and Exclusions
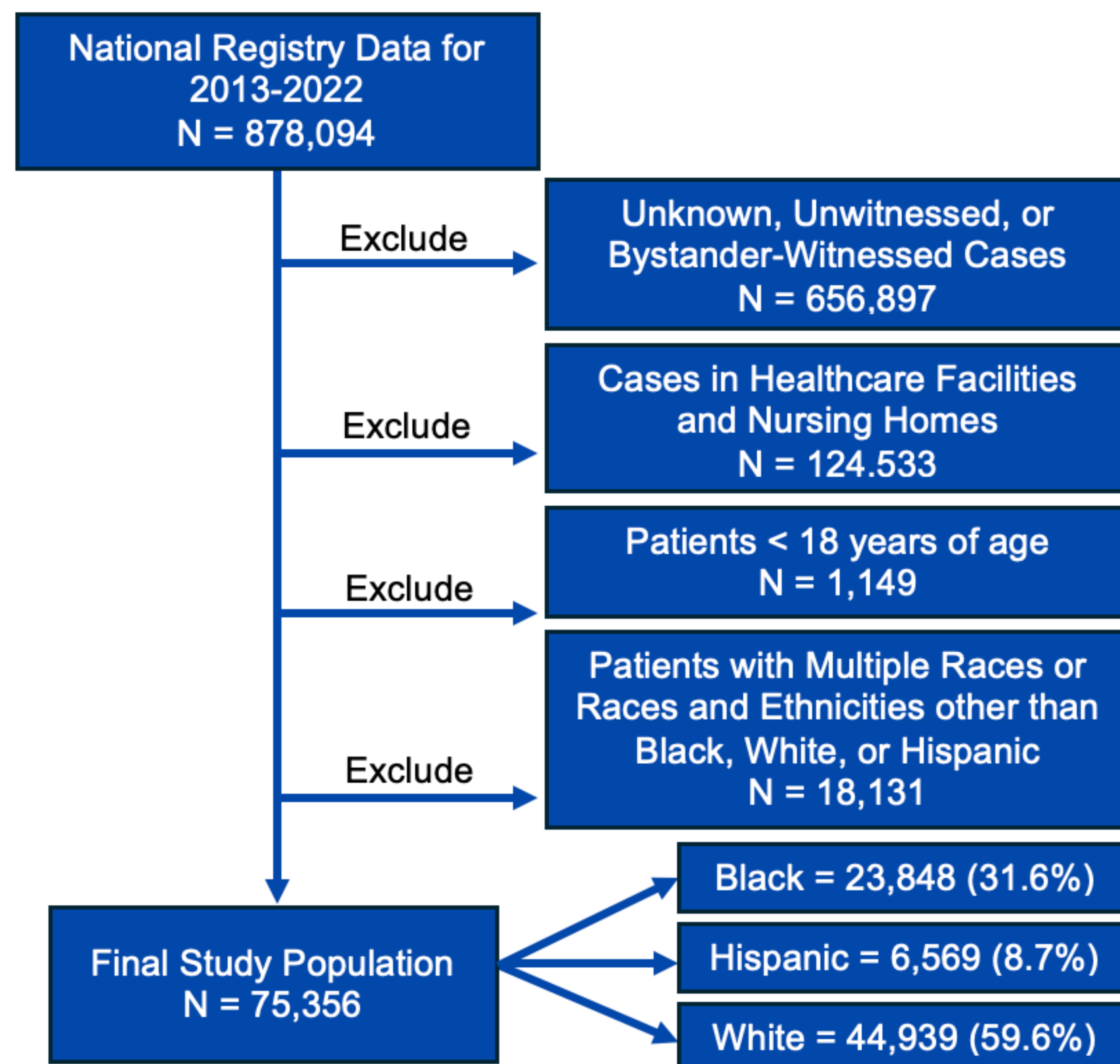
Results

### Figure 2: Baseline Clinical and Treatment Characteristics

Clinical Characteristics	Overall	Black	Hispanic	White	Std Diff B vs W	Std Diff H vs W
Age, Years Median (Q1, Q3)	65.0 (54.0, 75.0)	62.0 (52.0, 73.0)	61.0 (49.0, 73.0)	67.0 (56.0, 77.0)	23.2%	30.8%
Female, %	42.4%	48.2%	39.0%	39.7%	17.1%	1.5%
Initial Rhythm Type: Shockable, %	17.6%	12.7%	13.8%	20.7%	21.7%	18.5%
Arrest location: Public, %	14.0%	14.2%	15.5%	13.6%	1.6%	5.4%
Percent Rural ≥50%, %	11.3%	4.4%	4.0%	16.0%	39.2%	40.8%
Median Household income (Q1, Q3)	54866 (39412, 75625)	43235 (30643, 62195)	50139 (36667, 68482)	61320 (46189, 81683)	58.5%	39.7%
Neighborhood Race >50% Black or Hispanic, %	29.4%	58.3%	58.2%	9.9%	118.9%	118.5%

Treatment Characteristics	Overall	Black	Hispanic	White	Std Diff B vs W	Std Diff H vs W
EMS Initiated CPR, %	82.3%	83.9%	78.9%	81.9%	5.2%	7.5%
First Applied AED, %					2.7%	2.8%
EMS	93.4%	93.8%	93.8%	93.1%		
FR	6.6%	6.2%	6.2%	6.9%		
Received defibrillation, %	29.1%	26.0%	26.0%	31.3%	11.6%	11.7%

Figure 3: Race and Survival to Hospital Discharge
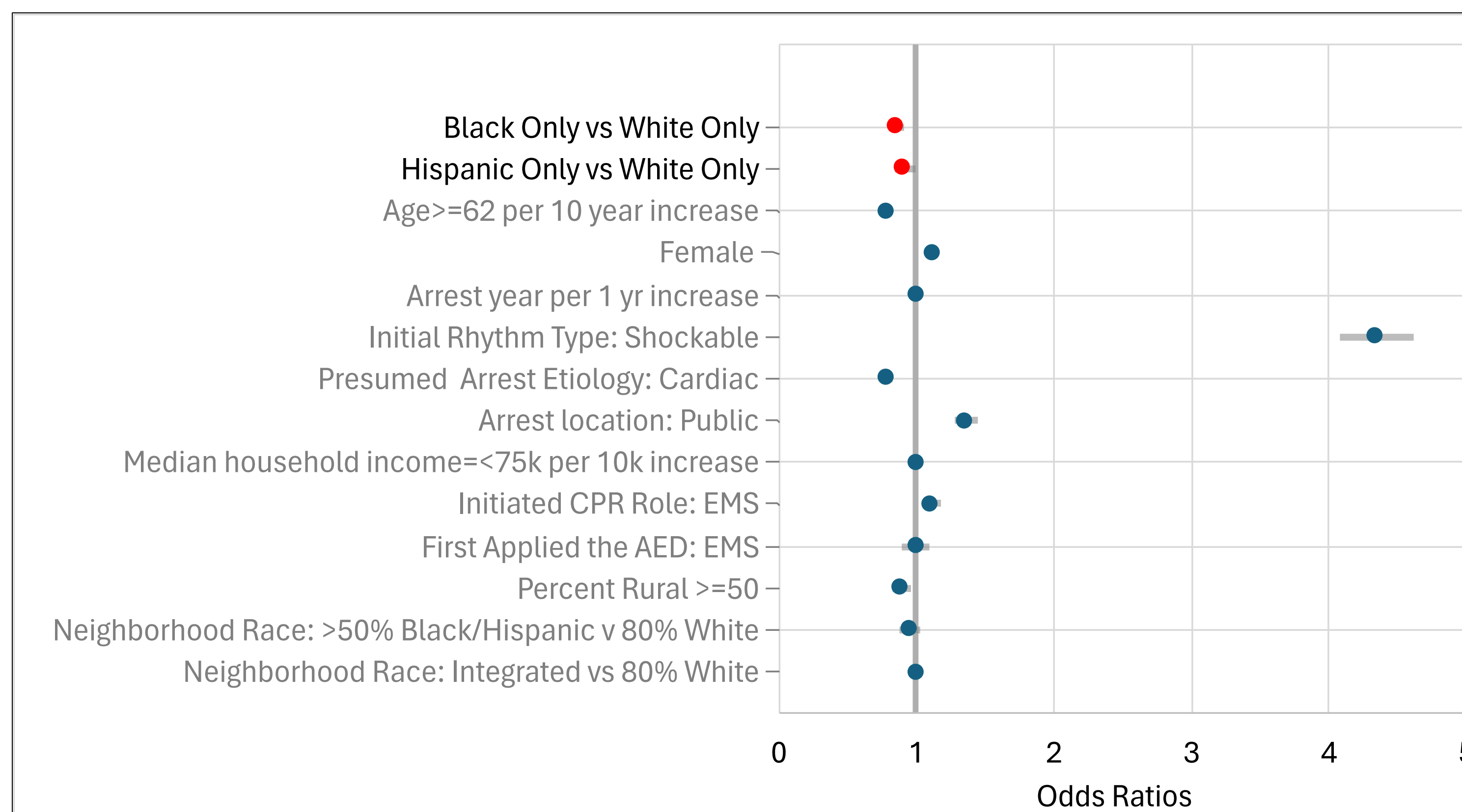
Results

Figure 4: Race and Other Survival Outcomes*
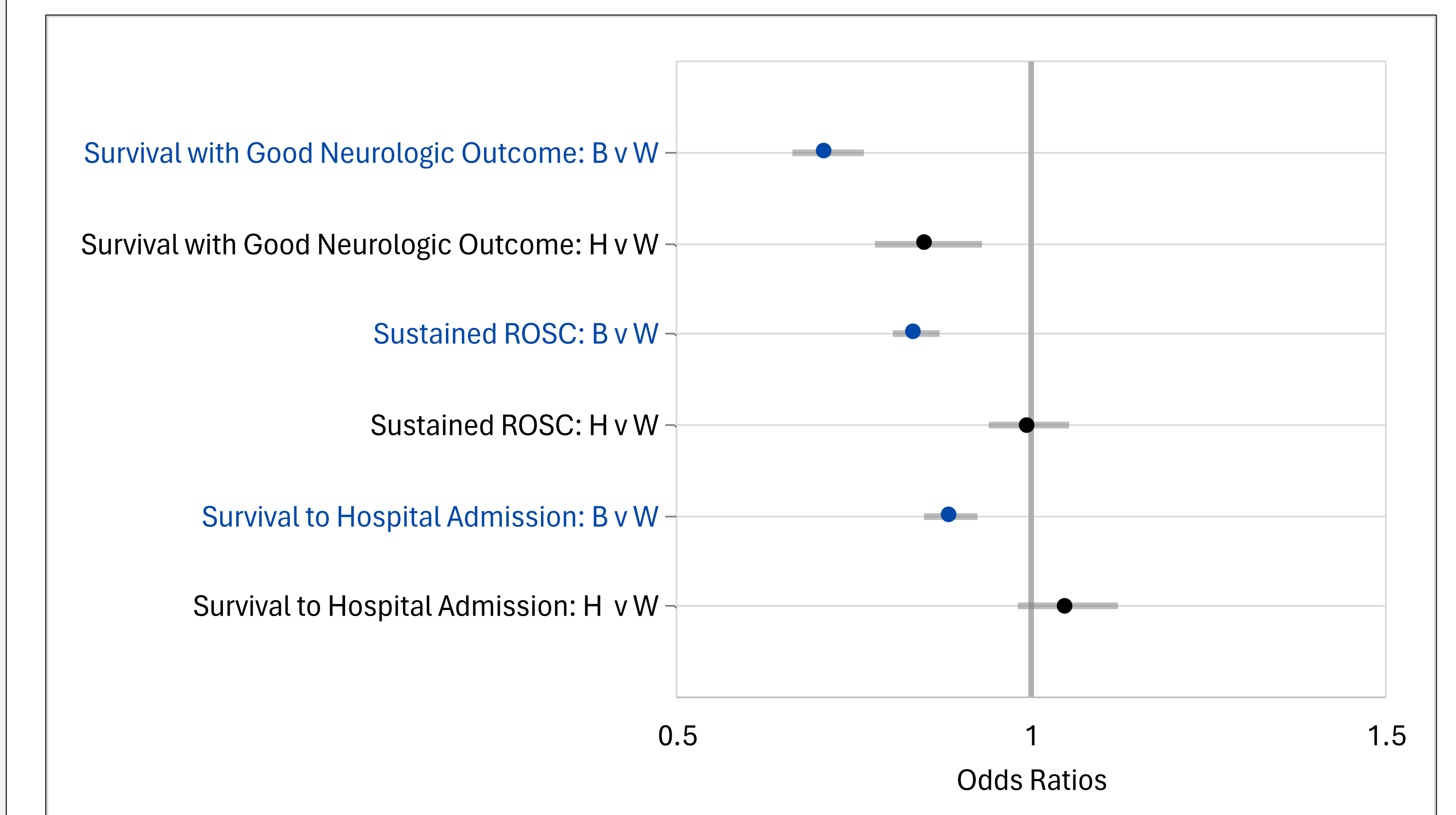
*adjusted for the same variables as in Figure 3

Conclusion

- Despite 9-1-1 responders witnessing a patient arrest and applying CPR and AED at similar rates, **Black and Hispanic patients are less likely to survive to hospital discharge and with good neurologic function**.
- Improving CPR and AED training and access are certainly important in reducing the racial and ethnic disparities in OHCA survival, but they are not the whole picture.
- Future research should be dedicated to exploring patient clinical characteristics and comorbidities that could be contributing to the difference in survival.

Acknowledgments