

# Socioeconomic determinants of Prenatal Diagnosis of Tetralogy of Fallot (ToF) and Long-Term Imaging Surveillance of ToF following Repair



Children's National

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## INTRO

- Repaired Tetralogy of Fallot (rTOF) patients benefit from surveillance imaging with cardiac magnetic resonance (CMR) imaging to identify abnormal cardiac function
- Socioeconomic status (SES) and geographic factors may reduce access to CMR
- We studied association between SES, geographic factors and race/ethnicity on access to CMR utilization and biventricular function

## METHODS

### STUDY CHARACTERISTICS

- Retrospective, single-center cohort study
- **CMR cohort:** rTOF patients >2 years of age referred for diagnostic CMR imaging from 2010-2021
- **Surgical/Control cohort:** rTOF patients <2 years of age referred for surgery
- Global/International Referrals were excluded
- Chart review to obtain self-Reported racial demographics, street address, and CMR measurements including left ventricular ejection fraction (LVEF). Cardiac dysfunction was defined as LVEF <55%.

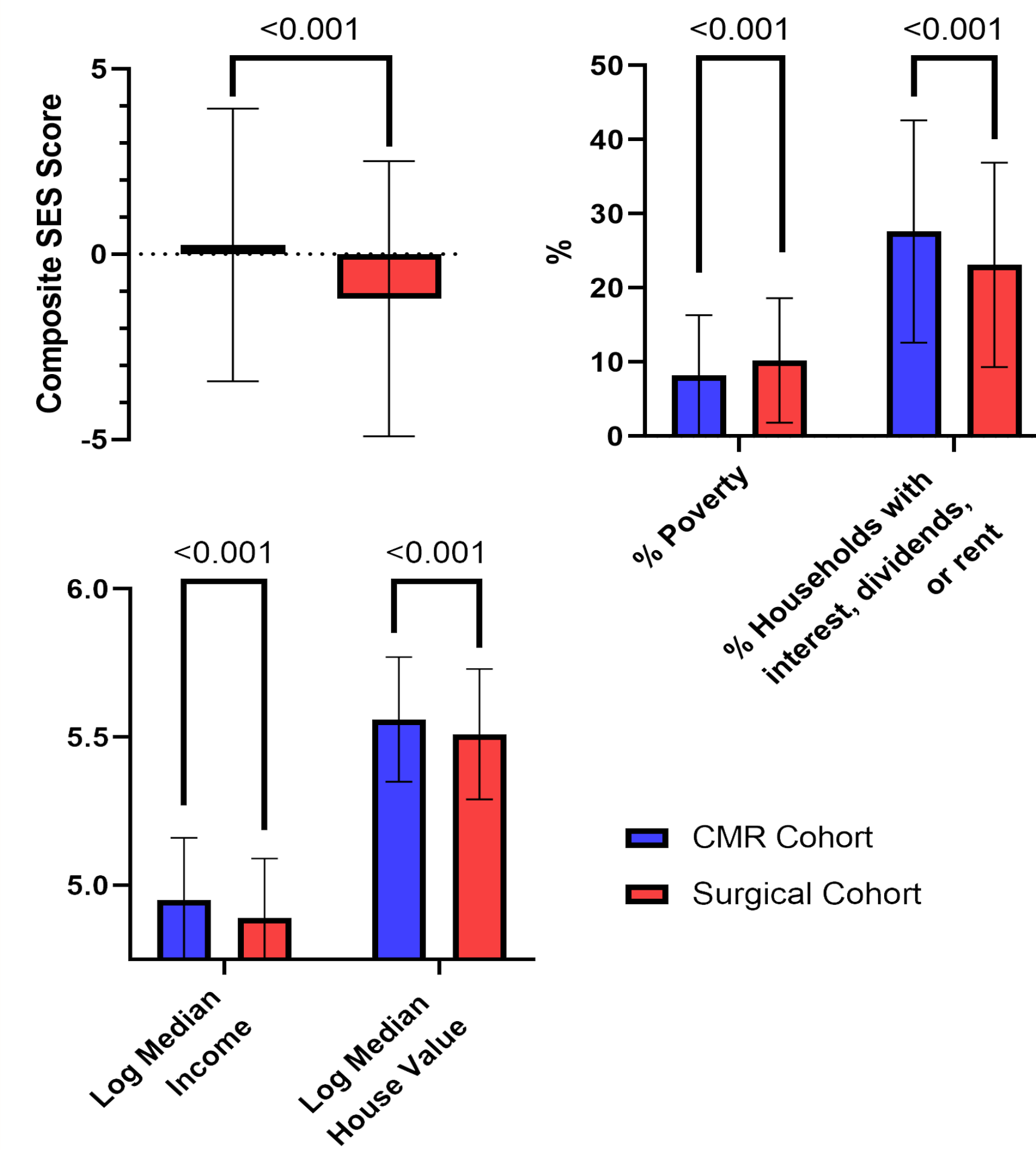
### DETERMINING COMPOSITE SES SCORE

- Street address used to derive obtain census tract characteristics with census tract software (cdxzipstream)
- Census tract variables are based on 2010 Census reflecting wealth, income, education and occupation
- Composite SES score is derived from 6 z-scores reflecting income, wealth and education<sup>1</sup>.

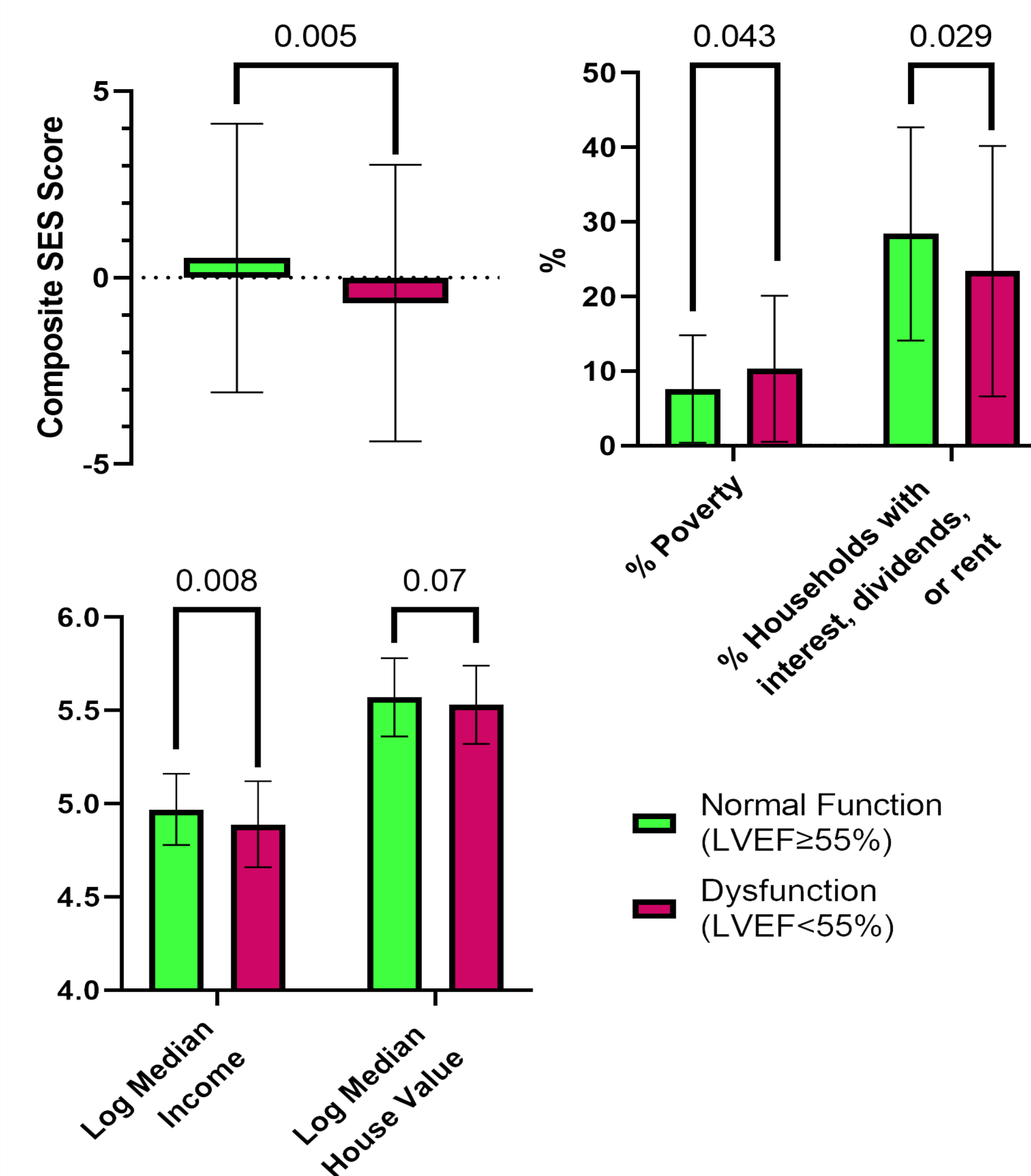
1. Peiris et al. Association of Socioeconomic Position and Medical Insurance With Fetal Diagnosis of Critical Congenital Heart Disease. *Circulation: Cardiovascular Quality and Outcomes*. 2009;2:354-360. <https://doi.org/10.1161/CIRCOUTCOMES.108.802868>

## RESULTS

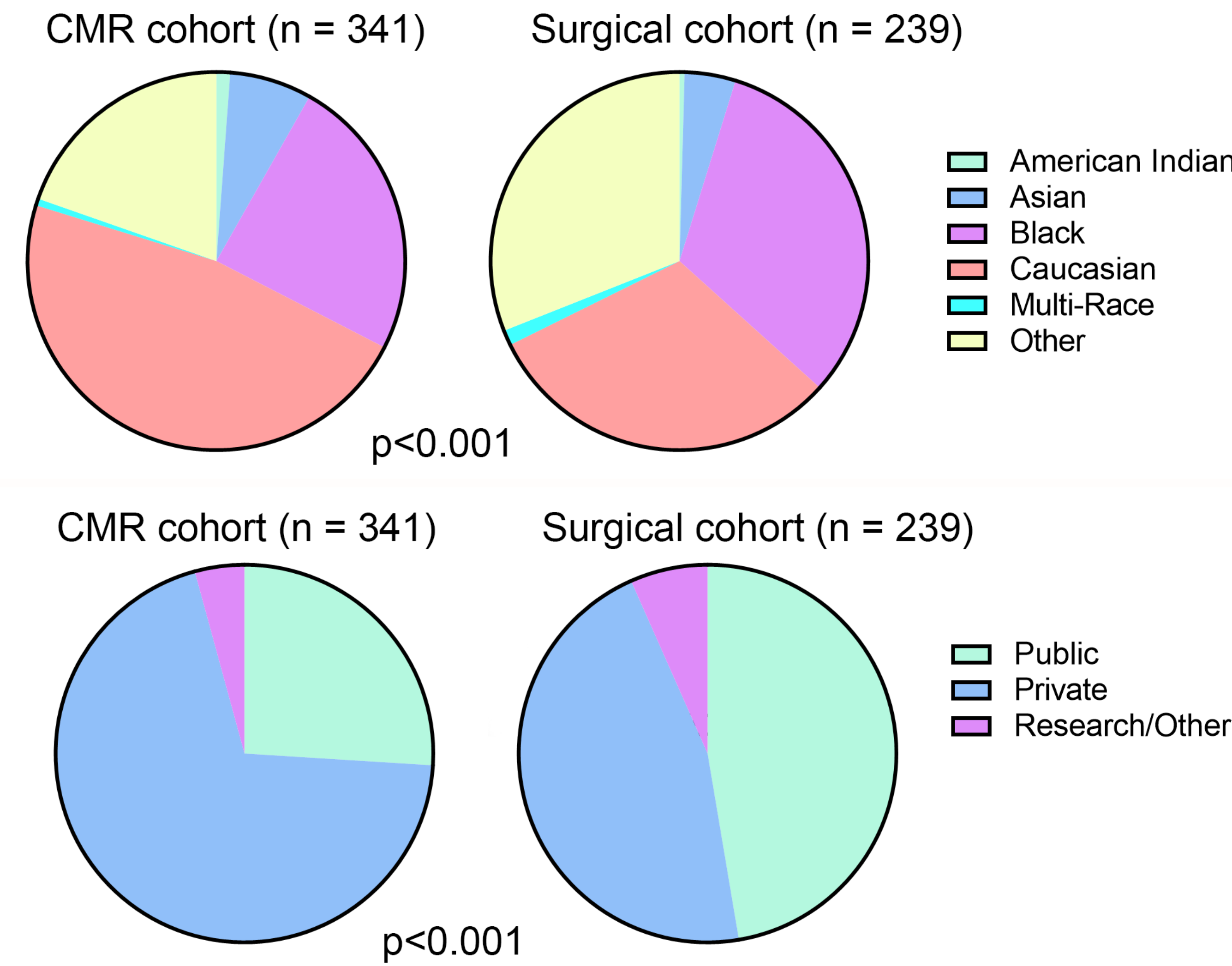
**FIGURE 1. SES and geographic factors between CMR and Surgical Cohort**



**FIGURE 3. SES and geographic factors within CMR cohort**



**FIGURE 2. Self-Reported Racial Demographics and Insurance Status between CMR and Surgical Cohort**



**Table 1. Descriptive Statistics of SES factors and comparisons between those receiving 1 MRI study and those receiving more than 1 MRI study, within CMR cohort**

SES factor	1 MRI Study	More than 1 MRI Study	P-value
	N	N	
	Mean ± SD	Mean ± SD	
<b>Log Median Income</b>	255	128	0.019
<b>Race</b>			p=0.023
<b>White</b>	97 (43%)	64 (53.8%)	
<b>Non-white*</b>	125 (57%)	55 (46.2%)	
American Indian	1 (0.5%)	3 (2.5%)	
Asian	12 (5.4%)	12 (10.1%)	
Black	63 (28.4%)	20 (16.8%)	
Multi-race	2 (0.9%)	0 (0.0%)	
Other	47 (21.2%)	20 (16.8%)	

- Significant differences in SES, geographical factors and self-reported racial demographics were found between CMR cohort (n=383) and surgical cohort (n=239)
- **Figure 1** - CMR cohort lived in areas with less poverty (p<0.001), higher median income (p<0.001), and higher composite SES score (p<0.001)
- **Figure 2** - CMR cohort had different racial demographics, and higher use of private insurance (p<0.001)
- **Figure 3** - Those with LVEF <55% had lower composite SES scores compared to those with normal LVEF (p=0.005).
- **Table 1:** Patients who received >1 MRI study lived in areas with a higher median income than those who received 1 MRI study (p=0.019). More white patients and fewer Black patients received >1 MRI study (p=0.023).

## DISCUSSION

- CMR utilization and metrics of cardiac function may have SES and racial/ethnic disparities in rTOF patients.
- The results have implications in healthcare equity and long-term outcomes for this growing population of patients.
- Limitations include single-center, retrospective nature of study.
- Further study is needed to identify the underlying mechanisms and the role of race.

