

# The Association Between Social Determinants of Health and 1-Year Survival Among Patients with Heart Failure in a Real-World Cohort

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## Disclosures

This study was initiated and internally funded by OM1, Inc. Ms. Probst, Dr. Jung, Dr. Curhan, and Dr. Paulus are employees of OM1, Inc. Dr. Su was an employee of OM1, Inc. at the time of study conduct. Dr. Curhan is also affiliated with Brigham and Women's Hospital and Harvard Medical School.

## Background

Cardiovascular disease remains the leading cause of death globally, and nearly one million patients are newly diagnosed with heart failure (HF) in the United States each year.

There is increased interest in the role social determinants of health (SDoH) have in morbidity and mortality from chronic conditions such as HF.

## Objective

To describe the social and medical characteristics of patients diagnosed with HF in a U.S. real-world cohort and to identify characteristics associated with 1-year survival.

## Methods

Data were derived from the PremiOM™ Heart Failure Dataset (OM1, Boston, MA), a multi-source real-world dataset with linked healthcare claims, social determinants of health, and electronic medical records data on U.S. patients with HF from all 50 states, beginning in 2013. Patients were included if they were alive, with all data elements available, at the beginning of the study period (6/30/2021 - 6/30/2022).

Patient characteristics by sex were described at baseline, which include age, race, New York Heart Association (NYHA) classification for HF severity, Charlson comorbidity index (CCI), and OM1 Medical Burden Index (OMBI™). The OMBI™ is a standardized measure of the combined medical burden, on a 0 - 1000 scale, generated from extensive analysis of OM1's longitudinal patient cohort. Measures of SDoH included home ownership status, highest education level, and household income.

Logistic regression was used to quantify the association between patient and disease characteristics and 1-year survival.

## Results

The analysis included 11,010 adult patients with HF (Table 1):

- 4,840 women, average age 74.6 years (SD 10.4)
- 6,170 men, average age 73.7 years (SD 10.0)

A lower medical burden was observed in women relative to men.

- OMBI mean (SD): 644.9 (243.8) vs 653.4 (243.0)
- CCI mean (SD): 3.5 (2.4) vs 3.7 (2.5)

## Results (continued)

### 1-Year Survival

After one year, 364 (3.3%) of patients had died of any cause.

Characteristics associated with lower odds of survival at one year (Table 2, Figure 1; presented with adjusted odds ratio, [95% confidence interval]) were:

- Age, per 5 years: 0.7 (0.7, 0.8)
- Higher NYHA class: 0.7 (0.6, 0.8)
- OMBI (per 100 points): 0.9 (0.8, 0.9)
- Higher CCI: 0.9 (0.8, 0.9)

In contrast, characteristics associated with increased odds of survival at one year were:

- Higher annual income, per \$10,000: 1.1 (1.0, 1.1)
- Female sex: 1.5 (1.2, 1.8)
- Home ownership: 1.5 (1.1, 2.1)

## Conclusions

- In a real-world cohort of patients with HF, SDoH including higher household income and home ownership were independently associated with increased odds of all-cause 1-year survival.

- Further research is needed to understand the ways in which SDoH may impact morbidity and mortality for patients with HF.

Figure 1. Adjusted Odds Ratio (95% CI) of One Year Survival

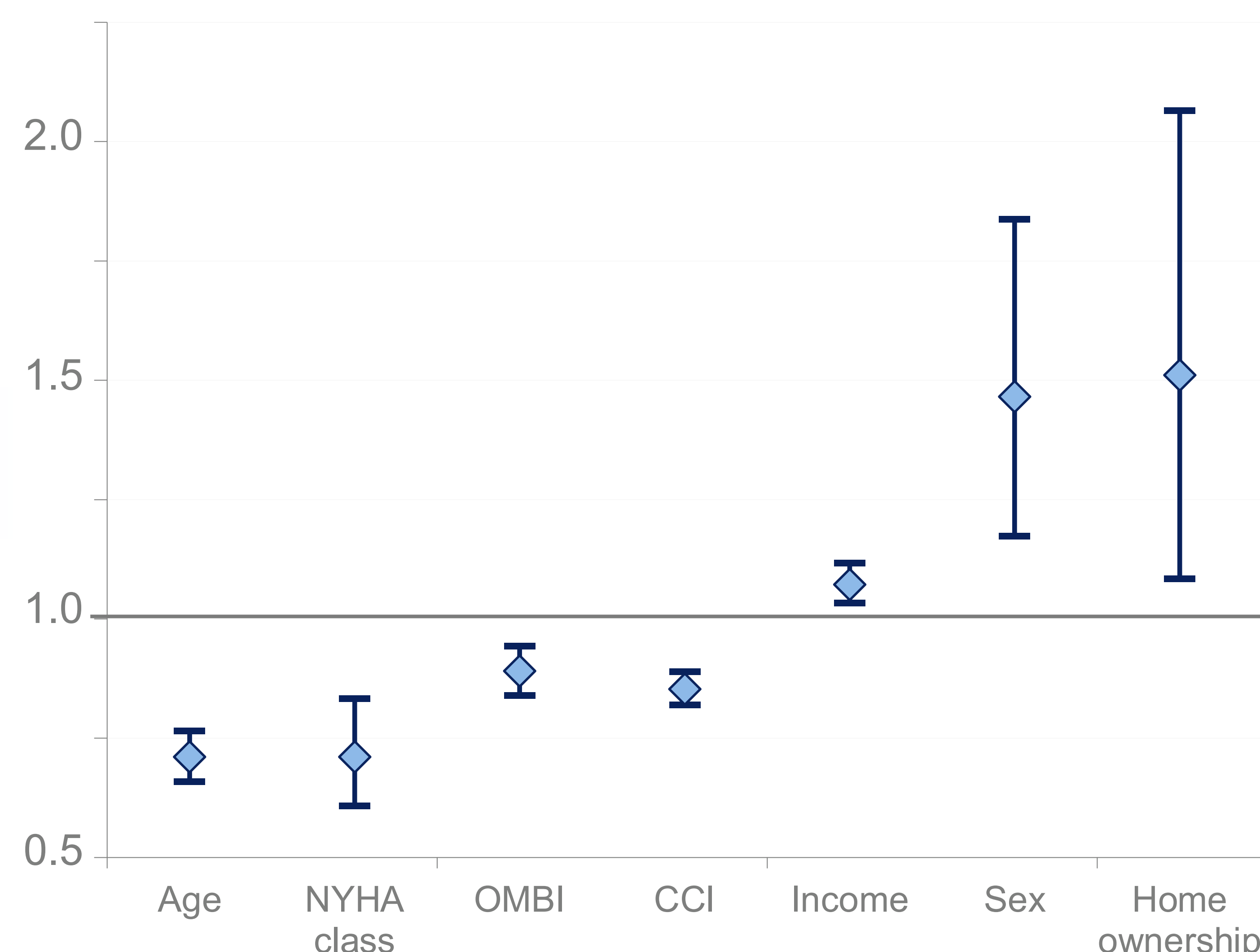


Table 1. Patient Characteristics at Baseline

		Female (N=4,840)	Male (N=6,170)
<b>Age</b>	Mean (SD)	74.6 (10.4)	73.7 (10.0)
<b>Race</b>	White	4,501 (93.0%)	5,792 (93.9%)
	Black	284 (5.9%)	291 (4.7%)
	Asian	20 (0.4%)	41 (0.7%)
	Other	35 (0.7%)	46 (0.7%)
<b>Ethnicity</b>	Hispanic / Latino	95 (2.0%)	151 (2.4%)
<b>Medical Burden</b>			
<b>OMBI</b>	Mean (SD)	644.9 (243.8)	653.4 (243.0)
<b>CCI</b>	Mean (SD)	3.5 (2.4)	3.7 (2.5)
<b>NYHA</b>	1	2,416 (49.9%)	3,219 (52.2%)
	2	2,056 (42.5%)	2,472 (40.1%)
	3	353 (7.3%)	453 (7.3%)
	4	15 (0.3%)	26 (0.4%)
<b>Social Determinants of Health</b>			
<b>Education</b>	Graduate Degree	588 (12.1%)	905 (14.7%)
	Bachelor's Degree	1,700 (35.1%)	2,440 (39.5%)
	Some College	165 (3.4%)	209 (3.4%)
	Vocational / Tech	68 (1.4%)	58 (0.9%)
	HS Degree	2,252 (46.5%)	2,500 (40.5%)
	Less Than HS	67 (1.4%)	58 (0.9%)
<b>Household Income</b>	Mean (SD)	\$57K (\$51K)	\$63K (\$54K)
	Median (Q1-Q3)	\$42K (\$29-67K)	\$48K (\$31-76K)
<b>Home ownership</b>	Own	4,322 (89.3%)	5,759 (93.3%)
	Rent	518 (10.7%)	411 (6.7%)
<b>1-Year Survival</b>	Survived	4,705 (97.2%)	5,941 (96.3%)
	Died	135 (2.8%)	229 (3.7%)

Table 2. Adjusted Odds Ratios (95% CI) of One Year Survival

		Adjusted Odds Ratio	95% CI
<b>Age</b>	per 5 years	0.7	0.7 - 0.8
<b>Race</b>	White	1	Ref
	Black	1.4	0.8 - 2.5
	Asian	0.7	0.2 - 4.2
	Other	1.0	0.4 - 4.4
<b>Ethnicity</b>	Hispanic / Latino	2.1	0.9 - 6.9
<b>Sex</b>	Female vs Male	1.5	1.2 - 1.8
<b>Medical Burden</b>			
<b>OMBI</b>	per 100	0.9	0.8 - 0.9
<b>CCI</b>	per 1	0.9	0.8 - 0.9
<b>NYHA</b>	per 1	0.7	0.6 - 0.8
<b>Social Determinants of Health</b>			
<b>Education</b>	Graduate Degree	1.0	0.7 - 1.4
	Bachelor's Degree	1	Ref
	Some College	0.9	0.5 - 1.8
	Vocational / Tech	1.0	0.4 - 3.4
	HS Degree	0.8	0.6 - 1.0
	Less Than HS	0.9	0.4 - 3.2
<b>HH Income</b>	per \$10K	1.1	1.0 - 1.1
<b>Home ownership</b>		1.5	1.1 - 2.1