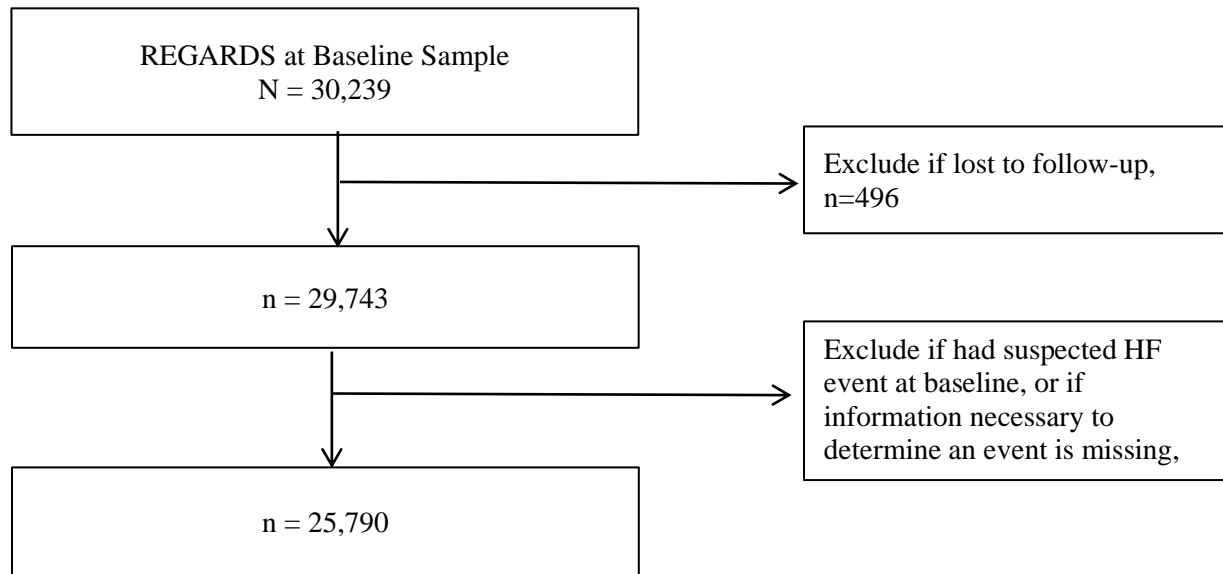


**Supplementary Figure 1.** Exclusion Cascade for Multiple Socially Determined Vulnerabilities and Incident Heart Failure



HF (Heart Failure)

**Supplementary Table 1.** Participant Characteristics by Number of Socially Determined Vulnerabilities to Health Disparities and Incident Heart Failure, Age Group 65-74 years old.

N	Groups by Number of Vulnerabilities				p-value
	0	1	2	3 or more	
	1,404	2,297	1,792	1,676	
<b>Vulnerability Factors</b>					
Black race, N (%)	0 (0.0%)	549 (23.9%)	853 (47.6%)	1453 (86.7%)	<0.001
Low education (< <i>High school</i> ), N (%)	0 (0.0%)	27 (1.2%)	181 (10.1%)	790 (47.1%)	<0.001
Low annual household income (< \$35,000), N (%)	0 (0.0%)	896 (39.0%)	1395 (77.8%)	1468 (87.6%)	<0.001
Zip code level poverty (25% residents living below Federal poverty line), N (%)	0 (0.0%)	77 (3.4%)	305 (17.0%)	1059 (63.2%)	<0.001
Residence in the worst ranked states for public health infrastructure, N (%) <sup>a</sup>	0 (0.0%)	742 (32.3%)	836 (46.7%)	993 (59.2%)	<0.001
No health insurance, N (%)	0 (0.0%)	6 (0.3%)	14 (0.8%)	68 (4.1%)	<0.001
<b>Sociodemographic factors</b>					
Age, Mean (SD)	68.9 (2.8)	68.9 (2.8)	69.2 (2.9)	69.1 (2.8)	0.096
Female, N (%)	518 (36.9%)	1083 (47.1%)	1029 (57.4%)	1026 (61.2%)	<0.001
Southeast region ( <i>Stroke Belt or Stroke Buckle</i> ), N (%) <sup>b</sup>	594 (42.3%)	1200 (52.2%)	1061 (59.2%)	1033 (61.6%)	<0.001
<b>Medical Conditions</b>					
Hypertension, N (%)	753 (53.6%)	1413 (61.5%)	1161 (64.8%)	1254 (74.8%)	<0.001
Dyslipidemia, N (%)	865 (61.6%)	1413 (61.5%)	1075 (60.0%)	927 (55.3%)	0.002
Diabetes, N (%)	175 (12.5%)	409 (17.8%)	398 (22.2%)	523 (31.2%)	<0.001
<b>Use of Medications</b>					
Antihypertensive medications, N (%)	766 (54.6%)	1405 (61.2%)	1148 (64.1%)	1204 (71.8%)	<0.001
Statins, N (%)	544 (38.7%)	838 (36.5%)	607 (33.9%)	546 (32.6%)	0.001
Insulin, N (%)	34 (2.4%)	82 (3.6%)	90 (5.0%)	129 (7.7%)	<0.001
<b>Functional Status</b>					
SF-12 physical component score, Median (IQR) <sup>c</sup>	53.1 (46.9, 55.9)	51.5 (43.8, 55.3)	49.7 (41.0, 54.8)	47.8 (39.2, 53.4)	<0.001
SF-12 mental component score, Median (IQR) <sup>d</sup>	57.8 (55.1, 59.8)	57.8 (54.5, 59.8)	57.3 (52.9, 59.8)	56.6 (50.5, 59.7)	<0.001
<b>Health Behaviors</b>					
Current cigarette Smoking, N (%)	89 (6.3%)	227 (9.9%)	258 (14.4%)	320 (19.1%)	<0.001
Risky alcohol consumption, N (%)	85 (6.1%)	109 (4.7%)	60 (3.3%)	44 (2.6%)	<0.001
Physical activity, N (%)	1034 (73.6%)	1613 (70.2%)	1144 (63.8%)	1030 (61.5%)	<0.001

High adherence to Mediterranean diet, N (%)	376 (26.8%)	567 (24.7%)	340 (19.0%)	229 (13.7%)	<0.001
<b>Physiological Factors</b>					
Body mass index, Mean (SD) <sub>e</sub>	27.6 (4.7)	28.3 (5.0)	28.9 (5.7)	29.9 (6.1)	<0.001
Systolic blood pressure, Mean (SD)	126.8 (14.9)	128.1 (15.2)	128.9 (16.4)	132.6 (17.7)	<0.001
Diastolic blood pressure, Mean (SD)	75.3 (8.7)	75.9 (9.1)	76.1 (9.2)	77.9 (9.8)	<0.001
Total cholesterol, Mean (SD)	188.9 (37.6)	190.0 (39.2)	191.8 (39.7)	193.0 (41.6)	0.019
High density lipoprotein cholesterol, Median (IQR)	48.0 (40.0, 60.0)	49.0 (40.0, 60.0)	50.0 (40.0, 62.0)	51.0 (42.0, 61.0)	0.005
C-reactive protein $\geq$ 3, N (%)	370 (26.4%)	734 (32.0%)	703 (39.2%)	735 (43.9%)	<0.001
Urinary Albumin/Creatinine ratio $\geq$ 30 (mg/g), N (%)	145 (10.3%)	291 (12.7%)	247 (13.8%)	313 (18.7%)	<0.001
Estimated GFR from the CKD-Epi equation, Median (IQR)	84.8 (71.3, 90.6)	84.3 (71.3, 90.9)	85.5 (69.3, 92.8)	86.8 (70.8, 100.3)	<0.001

**Supplementary Table 2.** Participant Characteristics by Number of Socially Determined Vulnerabilities to Health Disparities and Incident Heart Failure, Age Group 75+ years old.

	Groups by Number of Vulnerabilities				p-value
	0	1	2	3 or more	
N	554	1,095	898	941	
<b>Vulnerability Factors</b>					
Black race, N (%)	0 (0.0%)	141 (12.9%)	357 (39.8%)	752 (79.9%)	<0.001
Low education (< High school), N (%)	0 (0.0%)	17 (1.6%)	115 (12.8%)	531 (56.4%)	<0.001
Low annual household income (< \$35,000), N (%)	0 (0.0%)	641 (58.5%)	744 (82.9%)	809 (86.0%)	<0.001
Zip code level poverty (25% residents living below Federal poverty line), N (%)	0 (0.0%)	20 (1.8%)	153 (17.0%)	570 (60.6%)	<0.001
Residence in the worst ranked states for public health infrastructure, N (%) <sup>a</sup>	0 (0.0%)	274 (25.0%)	415 (46.2%)	510 (54.2%)	<0.001
No health insurance, N (%)	0 (0.0%)	2 (0.2%)	12 (1.3%)	37 (3.9%)	<0.001
<b>Sociodemographic factors</b>					
Age, Mean (SD)	79.12 (3.73)	79.24 (3.74)	79.25 (3.82)	79.51 (4.02)	0.22
Female, N (%)	165 (29.8%)	536 (48.9%)	482 (53.7%)	568 (60.4%)	<0.001
Southeast region (Stroke Belt or Stroke Buckle), N (%) <sup>b</sup>	183 (33.0%)	492 (44.9%)	499 (55.6%)	519 (55.2%)	<0.001
<b>Medical Conditions</b>					
Hypertension, N (%)	331 (59.7%)	710 (64.8%)	614 (68.4%)	695 (73.9%)	<0.001
Dyslipidemia, N (%)	326 (58.8%)	649 (59.3%)	505 (56.2%)	506 (53.8%)	0.16
Diabetes, N (%)	55 (9.9%)	141 (12.9%)	178 (19.8%)	239 (25.4%)	<0.001
<b>Use of Medications</b>					
Antihypertensive medications, N (%)	359 (64.8%)	735 (67.1%)	611 (68.0%)	687 (73.0%)	0.004
Statins, N (%)	217 (39.2%)	393 (35.9%)	292 (32.5%)	287 (30.5%)	0.002
Insulin, N (%)	6 (1.1%)	21 (1.9%)	27 (3.0%)	62 (6.6%)	<0.001
<b>Functional Status</b>					
SF-12 physical component score, Median (IQR) <sup>c</sup>	51.9 (44.2, 55.5)	49.4 (40.4, 54.8)	46.9 (38.2, 53.1)	46.4 (36.1, 52.8)	<0.001
SF-12 mental component score, Median (IQR) <sup>d</sup>	57.9 (54.9, 59.8)	57.8 (53.8, 60.0)	57.3 (52.4, 60.1)	56.0 (49.9, 59.8)	<0.001
<b>Health Behaviors</b>					
Current cigarette Smoking, N (%)	21 (3.8%)	59 (5.4%)	72 (8.0%)	73 (7.8%)	0.002
Risky alcohol consumption, N (%)	35 (6.3%)	44 (4.0%)	18 (2.0%)	14 (1.5%)	<0.001
Physical activity, N (%)	358 (64.6%)	672 (61.4%)	518 (57.7%)	523 (55.6%)	0.007
High adherence to Mediterranean diet, N (%)	151 (27.3%)	265 (24.2%)	152 (16.9%)	112 (11.9%)	0.002
<b>Physiological Factors</b>					
Body mass index, Mean (SD) <sup>e</sup>	26.1 (3.9)	26.7 (4.4)	26.9 (5.0)	28.0 (5.5)	<0.001

Systolic blood pressure, Mean (SD)	129.3 (15.2)	130.8 (17.4)	131.8 (16.3)	133.5 (18.3)	<0.001
Diastolic blood pressure, Mean (SD)	73.4 (8.9)	74.6 (9.5)	74.5 (9.7)	75.2 (9.9)	0.005
Total cholesterol, Mean (SD)	179.7 (34.7)	186.3 (38.3)	187.9 (39.8)	190.5 (42.1)	<0.001
High density lipoprotein cholesterol, Median (IQR)	48.0 (39.0, 61.0)	49.0 (39.0, 61.0)	51.0 (41.0, 62.0)	51.0 (43.0, 63.0)	<0.001
C-reactive protein $\geq$ 3, N (%)	164 (29.6%)	364 (33.2%)	319 (35.5%)	364 (38.7%)	<0.001
Urinary Albumin/Creatinine ratio $\geq$ 30 (mg/g), N (%)	90 (16.2%)	205 (18.7%)	171 (19.0%)	219 (23.3%)	0.002
Estimated GFR from the CKD-Epi equation, Median (IQR)	72.8 (61.9, 82.8)	72.7 (60.8, 83.5)	73.8 (60.0, 85.1)	73.6 (58.2, 87.5)	0.028

<sup>a</sup>Public Health Infrastructure is calculated based on the America's Health Ranking data, and flags nine states (Louisiana, New Mexico, Mississippi, Nevada, South Carolina, Florida, Arkansas, Texas, Tennessee) that belonged to the states with the worst public health infrastructure for at least 8 years during the ten-year period prior REGARDS enrollment (1993-2002).

<sup>b</sup>REGARDS study oversampled residents from the stroke belt (Alabama, Arkansas, Louisiana, Mississippi, Tennessee, and the noncoastal regions in North Carolina, South Carolina, and Georgia) and the stroke buckle (the coastal regions within North Carolina, South Carolina, and Georgia).

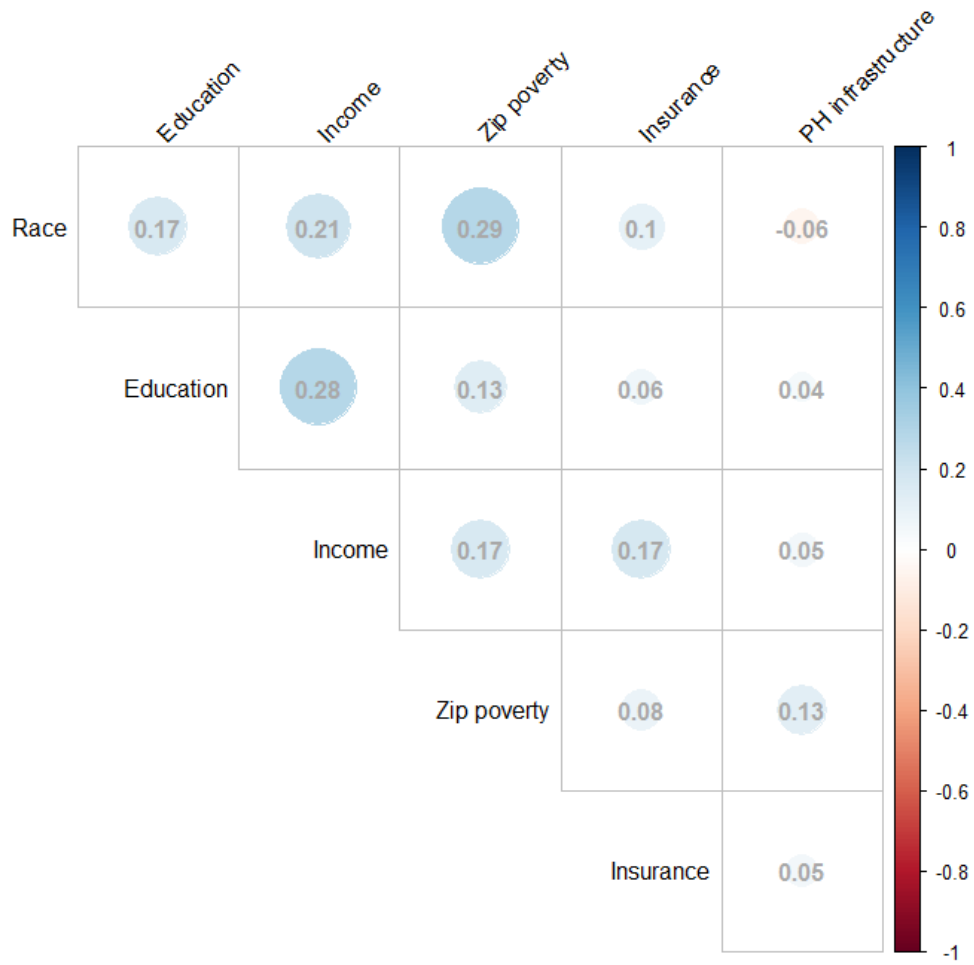
<sup>c</sup>Ranges from 0 to 100, and a higher score indicates better physical health.

<sup>d</sup>Ranges from 0 to 100, and a higher score indicates better mental health.

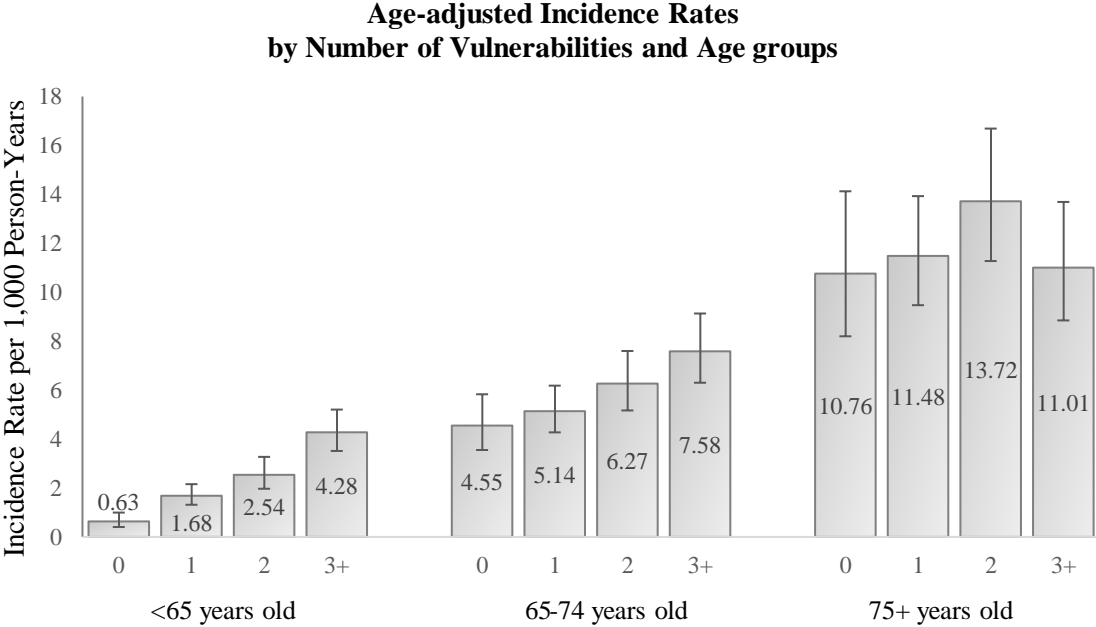
<sup>e</sup>Calculated as weight in kilograms divided by height in meters squared.

Note. *p*-values correspond with ANOVA for continuous variables that are normally distributed, Wilcoxon rank-sum (2 groups) or Kruskal-Wallis (>2 groups) for continuous variables that are skewed, and Pearson's chi-squared or Fisher's exact test for binary and categorical variables

**Supplementary Figure 2.** Bivariate Associations of Socially Determined Vulnerabilities ( $\phi$  coefficients)



**Supplementary Figure 3.** Age-adjusted Heart Failure Incidence Rates by Age Strata and Socially Determined Vulnerability Count



**Supplementary Figure 4.** Crude Estimates for Associations Between Socially Determined Vulnerabilities and Incident Heart Failure

