

SUPPLEMENTAL MATERIAL:

Supplementary Table 1. Baseline characteristics of ARIC, DHS, and MESA participants.

	Atherosclerosis Risk in Communities Study (ARIC) (N = 9363)	Dallas Heart Study (DHS) (N = 2008)	Multi-Ethnic Study of Atherosclerosis (MESA) (N = 4339)	Pooled Cohort (ARIC, DHS, and MESA) (N = 15710)
Age – years	56.6 (52, 61)	44.6 (37, 52)	62.4 (54, 70)	56.7 (51, 63)
Men – n (%)	3979 (42.5)	876 (43.6)	2028 (46.7)	6883 (43.8)
Race/Ethnicity				
Black – n (%)	1995 (21.3)	1184 (59)	1818 (41.9)	4997 (31.8)
White – n (%)	7368 (78.7)	824 (41)	2521 (58.1)	10713 (68.2)
Hypertension – n (%)	2977 (31.9)	677 (34.2)	2046 (47.2)	5700 (36.3)
Systolic Blood Pressure (mm Hg)	120.3 (108, 130)	125 (112.3, 134.3)	127.4 (112.3, 140)	122.8 (109.3, 134)
Diastolic Blood Pressure (mm Hg)	71.9 (65, 78)	78.6 (72, 84.3)	72.4 (65.3, 79)	72.9 (66, 79)
Anti-hypertensive therapy prescribed – n (%)	2639 (28.2)	405 (20.2)	1734 (40)	4778 (30.4)
Diabetes – n (%)	841 (9)	193 (9.6)	469 (10.8)	1503 (9.6)
Current Smoker – n (%)	1812 (19.4)	556 (27.7)	612 (14.1)	2980 (19)
Estimated GFR ml/min/1.73 m ²	60.3 (53, 66)	98.6 (84.2, 109.9)	80.4 (69, 91)	70.8 (57, 80.5)
Total Cholesterol (mg/dL)	209.5 (184, 232)	182.1 (156, 205)	193.1 (170, 215)	201.5 (175, 225)
HDL Cholesterol (mg/dL)	50.1 (38, 59)	50.8 (41, 59)	52.3 (41, 61)	50.8 (40, 59)
Statin therapy prescribed – n (%)	511 (5.4)	113 (5.6)	697 (16.1)	1321 (8.4)
Body Mass Index (BMI), kg/m ²	28 (24.3, 30.6)	29.7 (24.5, 33.5)	28.7 (24.8, 31.7)	28.4 (24.5, 31.2)
Waist-hip ratio	0.92 (0.87, 0.98)	0.9 (0.84, 0.96)	0.92 (0.87, 0.98)	0.92 (0.87, 0.98)
10-year PCE Risk Score	7.4 (2.6, 10)	4.9 (0.7, 6)	13.6 (4.1, 19.7)	8.8 (2.5, 11.8)
LV mass, gm	148.8 (117.1, 171.7)	164.5 (132.5, 189.7)	123.4 (101.2, 141.3)	143.6 (112.6, 166.6)
LV mass/BSA (g/m ²)	79.5 (65.9, 88.7)	82.4 (69.7, 92.9)	64.6 (56.2, 71.2)	75.2 (62.2, 84.6)
LV wall thickness (mm)	9.9 (8.9, 10.6)	11.6 (10.4, 12.7)	9.4 (8.1, 10.5)	10.1 (8.8, 11.1)
LV ejection fraction (%)	65.3 (62, 69.3)	72 (67.9, 77.2)	62.1 (58.4, 66.4)	65.5 (61.3, 70.1)
ECG with LVH – n (%)	799 (8.5)	198 (9.9)	424 (9.8)	1421 (9.1)
Hs-c-Tn-T ≥ 6 ng/l - n(%)	2396 (25.6)	222 (11.1)	1674 (38.6)	4292 (27.3)
NT-proBNP ≥ 100 pg/ml - n (%)	1836 (20.2)	220 (11)	1258 (29)	3314 (21.1)
High-sensitivity C-reactive protein (hsCRP), mg/L	4 (1, 4.4)	5.1 (1.1, 6.7)	4 (0.9, 4.5)	4.1 (1, 4.7)

Supplementary Table 2. Baseline characteristics among men and women in the pooled cohort stratified by race/ethnicity.

	Black Men (N = 2007)	White Men (N = 4876)	Black Women (N = 2990)	White Women (N = 5837)
Age – years	55.9 (49, 64)	57.4 (52, 63)*	55.2 (49, 62)	57.1 (51, 63)†
Hypertension – n (%)	983 (49.3)	1484 (30.5)*	1584 (53.3)	1649 (28.3)†
Systolic Blood Pressure (mm Hg)	128.9 (114.7, 140.7)	121.8 (110, 131.7)*	128.3 (113.7, 139.3)	118.8 (106, 129.7)†
Diastolic Blood Pressure (mm Hg)	78.2 (71, 84.3)	73.8 (67.7, 80)*	75.1 (68, 81.7)	69.2 (63, 75.3)†
Anti-hypertensive therapy prescribed – n (%)	734 (36.3)	1209 (24.8)*	1321 (44.1)	1526 (26.1)†
Diabetes – n (%)	310 (15.5)	359 (7.4)*	482 (16.1)	352 (6)†
Current Smoker – n (%)	535 (26.7)	850 (17.4)*	573 (19.2)	1022 (17.5)
Estimated GFR ml/min/1.73 m ²	85 (69.1, 98)	67.9 (57.3, 75.9)*	81.7 (64.3, 94.6)	62.7 (52.2, 69.1)†
Total Cholesterol (mg/dL)	189.4 (163, 213)	198.6 (174, 222)*	199.5 (171, 225)	209.1 (184, 232)†
HDL Cholesterol (mg/dL)	47.5 (38, 54)	42.8 (34, 49)*	56 (45, 64)	56 (44, 65)†
Statin therapy prescribed – n (%)	158 (7.8)	419 (8.6)	253 (8.4)	491 (8.4)
Body Mass Index (BMI), kg/m ²	28.5 (25.1, 31.1)	27.8 (25, 30)*	31.4 (26.6, 35.3)	27.3 (23.2, 30.2)†
Waist-hip ratio	0.94 (0.91, 1)	0.97 (0.93, 1)*	0.9 (0.84, 0.95)	0.88 (0.82, 0.94)†
10-year PCE Risk Score	13.1 (5.7, 17.4)	11.3 (4.9, 14.9)*	8.8 (1.9, 12)	5.2 (1.4, 6)
LV mass, gm	170 (137.3, 194)	163.2 (132.5, 185.5)*	134.2 (108.9, 152.8)	123 (100.4, 139.3)†
LV mass/BSA (g/m ²)	83.3 (68.8, 94.2)	80.6 (66.8, 90.3)*	71 (59.8, 79.4)	70.1 (58.4, 78.1)†
LV wall thickness (mm)	11.4 (10, 12.7)	10.5 (9.3, 11.4)*	10.1 (8.9, 11.1)	9.2 (8.4, 10)†
LV ejection fraction (%)	63.7 (58.8, 69.4)	63.8 (60.1, 68.3)	67.8 (62.7, 73.1)	66.4 (62.6, 70.5)†
ECG with LVH – n (%)	432 (21.5)	340 (7)*	438 (14.7)	211 (3.6)†
Hs-c-Tn-T ≥ 6 ng/l - n(%)	973 (48.5)	1817 (37.3)*	563 (18.8)	939 (16.1)†
NT-proBNP ≥ 100 pg/ml - n (%)	245 (12.7)	632 (13.4)	573 (19.5)	1864 (32.1)†
High-sensitivity C-reactive protein (hsCRP), mg/L	3.8 (0.95, 4.2)	2.7 (0.8, 3)*	6.1 (1.6, 8.1)	4.4 (1, 5.1)†

* p < 0.05 versus black men † p < 0.05 versus black women

Supplementary Table 3. Prevalence of left ventricular hypertrophy (LVH) with and without abnormal biomarkers, stratified by body mass index (BMI) categories.

	< 25kg/m²	25 - < 30	≥ 30	P trend
LVH-	4295 (93.6%)	5561 (90.9%)	4433 (88.8%)	<.0001
LVH+, either+	157 (3.4%)	302 (4.9%)	298 (6.0%)	<.0001
LVH+, both-	142 (3.1%)	262 (4.3%)	260 (5.2%)	<.0001
LVH+, hs-cTnT+	108 (2.4%)	250 (4.1%)	249 (5.0%)	<.0001
LVH+, hs-cTnT-	195 (4.2%)	327(5.3%)	319 (6.4%)	<.0001
LVH+, NT-proBNP+	95 (2.1%)	135 (2.2%)	133 (2.7%)	0.049
LVH+, NT-proBNP-	201 (4.4%)	422 (6.9%)	419 (8.4%)	<.0001

Supplementary Table 4. Multivariable adjusted associations of race and risk factors with prevalence of malignant left ventricular hypertrophy (LVH).

Variable	Men Adjusted OR (95% CI)	Women Adjusted OR (95% CI)
Black Race	2.84 (2.26-3.56)	2.46 (1.88-3.23)
Age (per 10 years)	1.20 (1.07-1.34)	1.24 (1.08-1.42)
Average Systolic BP (per 10 mm Hg)	1.34 (1.27-1.41)	1.32 (1.25-1.39)
Anti-hypertensive medications (yes/no)	1.90 (1.53-2.36)	1.92 (1.48-2.48)
Diabetes (yes/no)	1.10 (0.83-1.47)	0.94 (0.68-1.32)
Current smoking (yes/no)	0.76 (0.58-1.01)	1.04 (0.75-1.44)
Total cholesterol (per SD increment)	1.07 (0.97-1.19)	1.03 (0.92-1.16)
HDL cholesterol (per SD increment)	1.05 (0.95-1.15)	1.00 (0.88-1.13)
Estimated glomerular filtration rate (per SD increment)	0.89 (0.79-1.00)	0.88 (0.77-1.01)

Supplementary Table 5. Adjusted hazard ratios (with 95% CI) for development of heart failure (HF) in patients with benign and malignant left ventricular hypertrophy (LVH), stratified by body mass index (BMI) category.

Adjusted HR	< 25kg/m²	25- < 30	≥ 30	<u>P interaction</u>
LVH-	Ref	Ref	Ref	
LVH+, either+	1.6 (0.8-3.2)	3.2 (2.0-4.9)	2.9 (2.1-4.1)	0.24
LVH+, both-	0.3 (0.04-2.5)	1.8 (0.9-3.4)	0.6 (0.3-1.4)	
LVH+, hs-cTnT+	2.0 (0.96-4.1)	3.2 (2.0-5.1)	2.8 (1.9- 4.0)	0.18
LVH+, hs-cTnT-	0.4 (0.1-1.8)	2.3 (1.4-3.8)	1.1 (0.6-1.9)	
LVH+, NT-proBNP+	1.5 (0.6-3.4)	4.1 (2.4-7.1)	4.6 (3.0-7.0)	0.20
LVH+, NT-proBNP-	0.8 (0.3-2.6)	2.0 (1.2-3.2)	1.1 (0.7-1.7)	

Supplementary Table 6. Unadjusted and multivariate adjusted hazard ratios for development of heart failure (HF) in patients with and without left ventricular hypertrophy (LVH), further stratified by biomarker status.

	Unadjusted Hazard Ratio (95% Confidence Limits)	Adjusted Hazard Ratio (95% Confidence Limits)
LVH (+) Either Biomarker (+)	9.1 (7.0-11.9)	4.3 (3.2-5.9)
LVH (+) Biomarker (-)	1.8 (1.1-2.9)	1.4 (0.8-2.3)
LVH (-) Either Biomarker (+)	3.0 (2.4-3.7)	2.0 (1.5-2.5)
LVH (-) Biomarker (-)	<i>-- Reference Group --</i>	

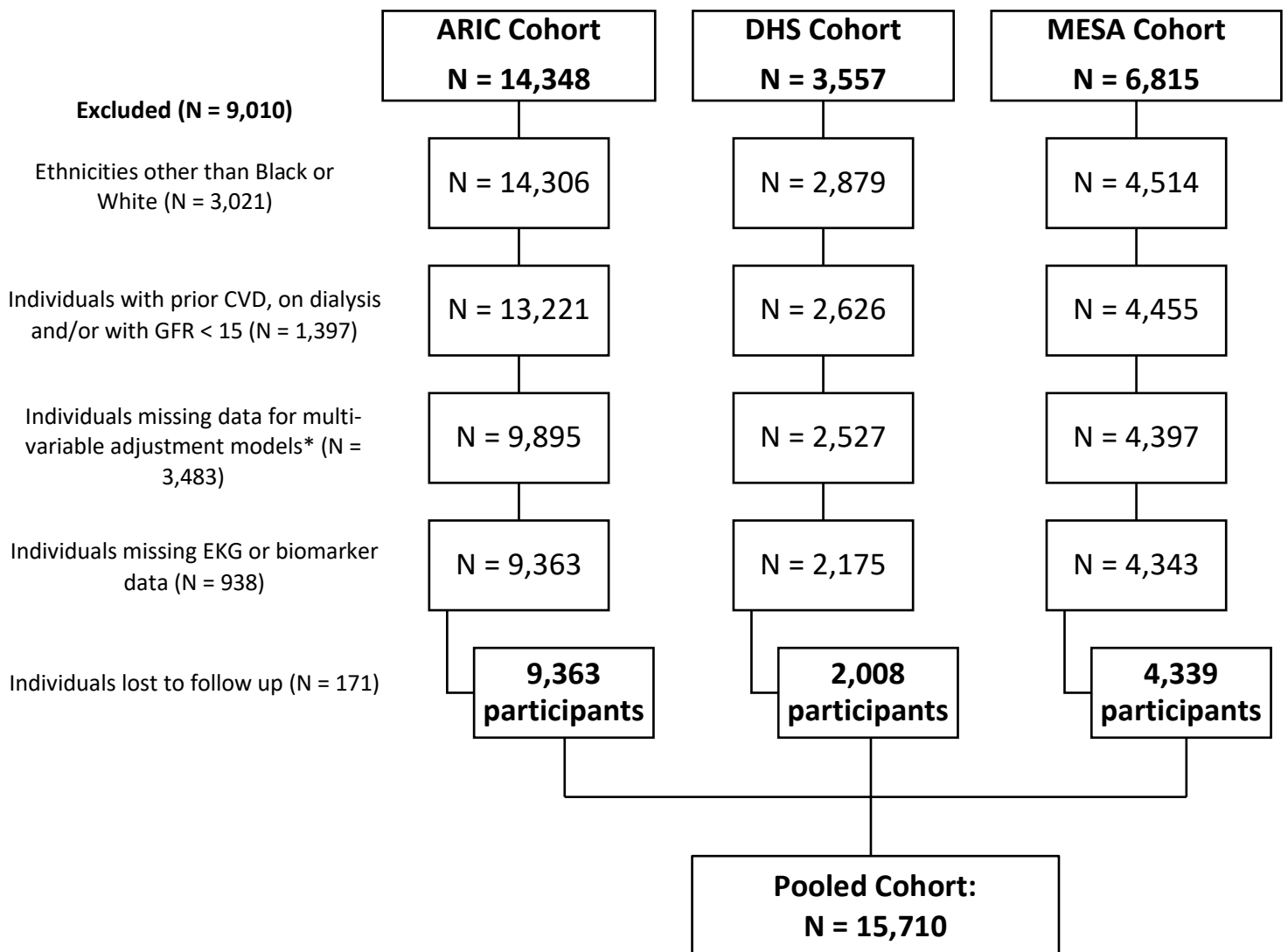
Supplementary Table 7. Unadjusted and multivariate adjusted hazard ratios for development of heart failure (HF) in patients with and without left ventricular hypertrophy (LVH), evaluating abnormal high-sensitivity cardiac troponin-T (hs-cTnT) and N-terminal pro-brain natriuretic peptide (NT-proBNP) individually.

	Unadjusted Hazard Ratios (95% HR Confidence Limits)	Adjusted Hazard Ratios (95% HR Confidence Limits)
LVH (+) Hs-cTnT (+)	5.4 (4.3-6.8)	2.7 (2.1-3.6)
LVH (+) Hs-cTnT (-)	1.5 (1.1-2.2)	1.4 (0.95-2.0)
LVH (+) NT-proBNP (+)	7.4 (5.7-9.6)	3.7 (2.7-5.1)
LVH (+) NT-proBNP (-)	1.7 (1.3-2.3)	1.3 (0.96-1.8)
LVH (-)	<i>-- Reference Group --</i>	

Supplementary Table 8. Prevalence of baseline magnetic resonance imaging (MRI)-defined left ventricular hypertrophy (LVH) and abnormal biomarkers (High-sensitivity cardiac troponin-T (hs-cTnT) ≥ 6 and N-terminal pro-brain natriuretic peptide (NT-proBNP) ≥ 100), among men and women in the Dallas Heart Study (DHS) and the Multiethnic Study of Atherosclerosis (MESA), stratified by race/ethnicity.

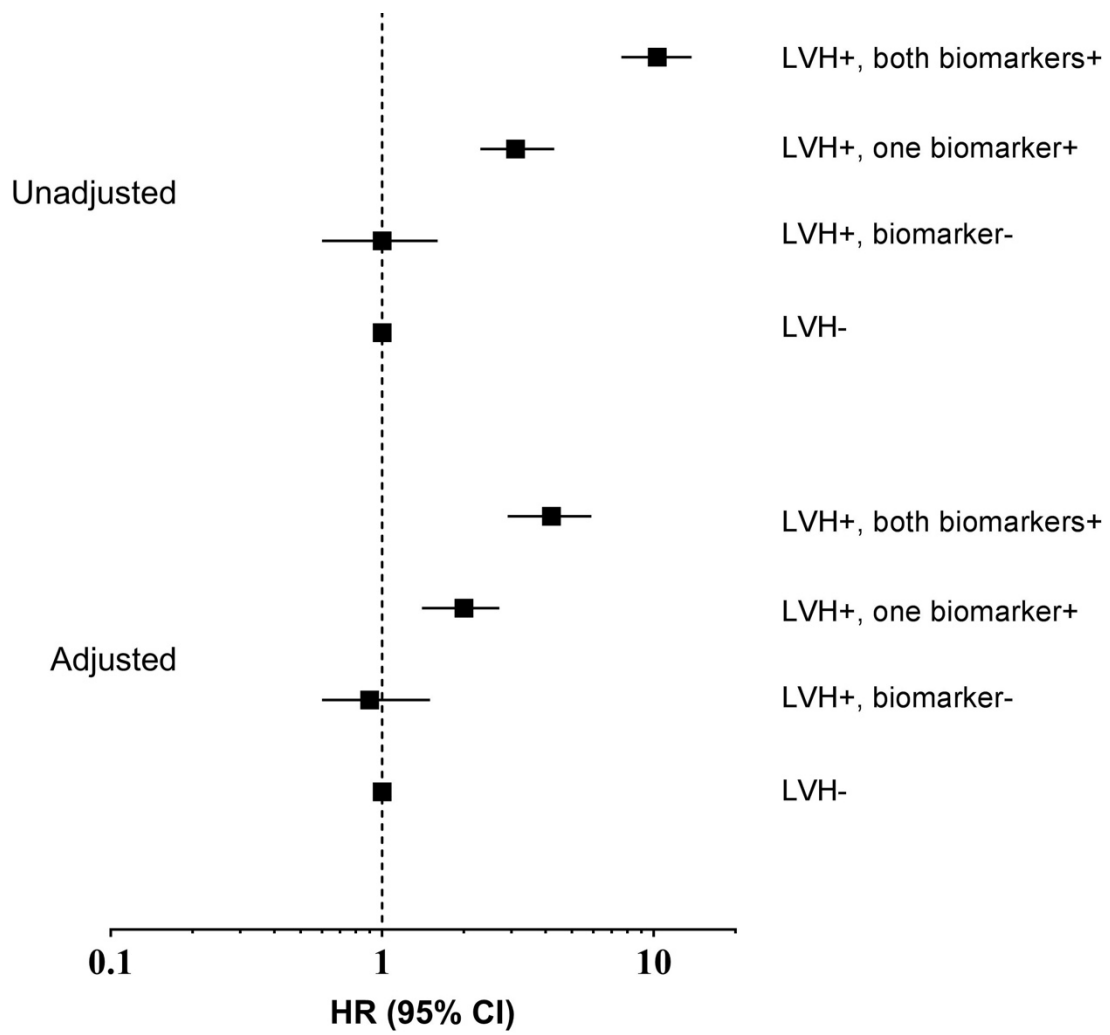
Men				Women		
	Black (N = 999)	White (N = 1281)	P value	Black (N = 1312)	White (N = 1401)	P value
MRI-LVH (+) Biomarker (+) (Malignant LVH) n (%)	106 (10.6)	52 (4.1)	<0.0001	102 (7.8)	56 (4.0)	<0.0001
MRI-LVH (+) Biomarker (-) n (%)	57 (5.7)	31 (2.4)	<0.0001	99 (7.6)	44 (3.1)	<0.0001
MRI-LVH (-) n (%)	836 (83.7)	1198 (93.5)	<0.0001	1111 (84.7)	1301 (92.9)	<0.0001

Supplementary Figure 1. Flow Diagram for Participant Inclusion/Exclusion.

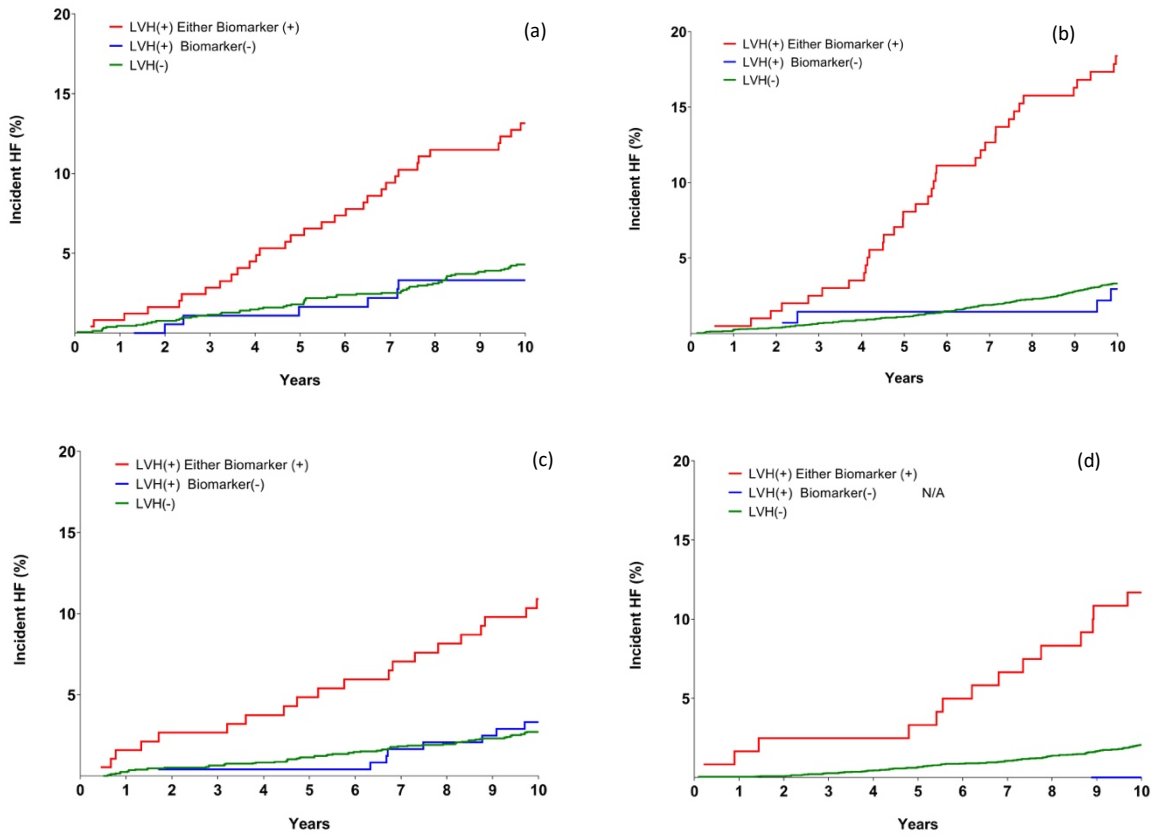


*Models included age, sex, total and HDL cholesterol, smoking, systolic blood pressure, antihypertensive and statin therapy, diabetes, creatinine and BMI

Supplementary Figure 2. Unadjusted and adjusted associations between electrocardiography (ECG)-defined left ventricular hypertrophy (LVH) and chronic myocardial injury-based categories and risk of heart failure stratified by number of abnormal biomarkers.



Supplementary Figure 3. Unadjusted Kaplan-Meier curves for incident heart failure (HF) in black men (a), white men (b), black women (c), and white women (d).



Supplementary Figure 4. Unadjusted Kaplan-Meier curves for incident heart failure (HF) overall, replacing electrocardiography (ECG)-defined left ventricular hypertrophy (LVH) with magnetic resonance imaging (MRI)-defined LVH (DHS and MESA only).

