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## SUPPLEMENTAL TABLES

**Supplemental Table 1. Characteristics of participants in the Jackson Heart Study (JHS) and Multi-Ethnic Study of Atherosclerosis (MESA) by categories of urine albumin-to-creatinine-ratio (UACR)**

Covariate	JHS		MESA	
	uACR < 30 mg/g	uACR ≥ 30 mg/g	uACR < 30 mg/g	uACR ≥ 30 mg/g
N	2782	396	6015	633
<b>Demographics:</b>				
Age (years)	53.5 (12.7)	58.3 (13.1)	61.6 (10.1)	66.6 (10.0)
Male sex	1051 (38)	156 (39)	2824 (47)	316 (50)
Race/ethnicity				
White	0 (0)	0 (0)	2399 (40)	151 (24)
Black	2782 (100)	396 (100)	1621 (27)	213 (34)
Chinese	0 (0)	0 (0)	701 (12)	93 (15)
Hispanic	0 (0)	0 (0)	1294 (22)	176 (28)
Highest level of education completed				
High school or less	915 (33)	188 (47)	2100 (35)	299 (47)
Some college/technical school	653 (23)	80 (20)	1714 (28)	178 (28)
College graduate	1210 (43)	125 (32)	2181 (36)	153 (24)
<b>Physical characteristics:</b>				
Height (cm)	169.3 (9.4)	168.4 (9.5)	166.5 (9.9)	165.0 (10.5)
Weight (kg)	89.9 (20.6)	95.3 (24.7)	78.4 (17.1)	81.0 (19.4)
Systolic blood pressure (mmHg)	125.1 (15.4)	137.3 (20.5)	124.9 (20.5)	142.4 (23.9)
Diastolic blood pressure (mmHg)	75.9 (8.4)	78.3 (9.8)	71.6 (10.0)	75.7 (11.5)
<b>Medical history and lifestyle:</b>				
Current smoker	320 (12)	52 (13)	780 (13)	84 (13)
Anti-hypertensive medications	1213 (44)	269 (68)	2059 (34)	392 (62)
Renin-Angiotensin-Aldosterone System (RAAS) inhibitor use	600 (22)	159 (40)	971 (16)	227 (36)
Angiotensin converting enzyme inhibitor (ACEi) use	392 (14)	99 (25)	683 (11)	180 (28)
Angiotensin receptor blocker (ARB) use	214 (8)	62 (16)	294 (5)	53 (8)
Statin use	284 (10)	65 (16)	860 (14)	119 (19)
History of myocardial infarction	119 (4)	33 (8)	0 (0)	0 (0)

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History of heart failure	162 (6)	53 (13)	0 (0)	0 (0)
History of stroke	88 (3)	25 (6)	0 (0)	0 (0)
Diabetes mellitus	467 (17)	178 (45)	596 (10)	231 (36)
<b>Laboratory data:</b>				
LDL (mg/dL)	126.3 (35.8)	129.1 (38.5)	117.5 (31.0)	115.1 (35.5)
HDL (mg/dL)	51.0 (14.0)	49.6 (14.1)	51.3 (14.9)	47.6 (13.3)
Triglycerides (mg/dL), median (IQR)	88.0 (63.0-121.0)	100.0 (74.0-146.5)	109.0 (77.0-158.0)	128.0 (89.0-196.0)
Estimated glomerular filtration rate (mL/min/1.73m <sup>2</sup> )	100.4 (17.7)	86.5 (27.8)	85.8 (16.6)	77.0 (23.2)
Albumin/creatinine ratio, median	5.3 (3.7-8.8)	78.9 (44.4-277.8)	4.9 (3.2-8.4)	75.9 (42.2-172.0)
Albumin/creatinine ratio				
< 30	2782 (100)	0 (0)	6015 (100)	0 (0)
≥ 30	0 (0)	396 (100)	0 (0)	633 (100)
Missing	0 (0)	0 (0)	0 (0)	0 (0)
Left ventricular mass (g)	142.9 (37.4)	169.6 (54.1)	143.6 (38.1)	163.1 (46.8)
Missing	823 (30)	174 (44)	1543 (26)	207 (33)
Left ventricular ejection fraction				
< 45%	22 (1)	12 (3)	24 (0)	9 (1)
45-<55%	240 (9)	45 (11)	135 (2)	17 (3)
≥55%	2437 (88)	330 (83)	4313 (72)	400 (63)
Missing	83 (3)	9 (2)	1543 (26)	207 (33)
PR duration	169.8 (30.8)	170.9 (32.1)	165.5 (24.4)	168.6 (28.2)
Missing	3 (0)	0 (0)	47 (1)	8 (1)

Mean (SD) for continuous covariates; N (%) for categorical covariates; median (IQR), where noted

Note: UACR not measured in CHS at baseline

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**Supplemental Table 2. Association of estimated glomerular filtration rate (eGFR) and urine albumin to creatinine ratio (uACR) with risk of incident atrial fibrillation in participants from the JHS**

	JHS		Model 1 HR (95% CI)	Model 2 HR (95% CI)	Model 3 HR (95% CI)
	N at risk	N events			
<b>eGFR (mL/min/1.73m<sup>2</sup>)</b>					
≥ 90	3473	97	1.0 (Ref.)	1.0 (Ref.)	1.0 (Ref.)
60 - 89	1342	113	1.41 (1.05, 1.88)	1.33 (1.00, 1.78)	1.32 (0.98, 1.76)
45 - 59	142	12	1.22 (0.65, 2.29)	0.99 (0.53, 1.86)	0.97 (0.51, 1.83)
30 - 44	69	11	3.23 (1.63, 6.41)	2.26 (1.11, 4.60)	1.86 (0.84, 4.13)
< 30	40	5	3.32 (1.27, 8.71)	2.34 (0.87, 6.31)	1.06 (0.32, 3.50)
Per 20 ml/min/1.73 m <sup>2</sup> lower eGFR			1.31 (1.12, 1.53)	1.20 (1.03, 1.40)	1.12 (0.96, 1.30)
p-value			0.0007	0.02	0.17
<b>uACR (mg/g)*</b>					
< 15	2511	84	1.0 (Ref.)	1.0 (Ref.)	1.0 (Ref.)
15 - 29	271	17	1.49 (0.92, 2.42)	1.39 (0.85, 2.26)	1.21 (0.76, 1.95)
30 - 299	307	27	1.41 (0.92, 2.16)	1.29 (0.83, 2.00)	1.16 (0.74, 1.82)
≥ 300	89	10	1.64 (0.82, 3.28)	1.45 (0.73, 2.88)	1.18 (0.56, 2.46)
Per doubling			1.10 (1.02, 1.18)	1.07 (0.99, 1.15)	1.04 (0.96, 1.12)
p-value			0.01	0.07	0.34

Model 1: age, age<sup>2</sup>, sex, education (high school/some college/college), height, weight, current smoking, history of diabetes

Model 2: model 1 + history of heart failure, history of myocardial infarction, history of stroke, systolic blood pressure, diastolic blood pressure, and antihypertension medications

Model 3: model 2 + left ventricular mass, left ventricular ejection fraction (continuous), PR duration

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**Supplemental Table 3. Association of estimated glomerular filtration rate (eGFR) and urine albumin to creatinine ratio (uACR) with risk of incident atrial fibrillation in participants from the MESA study**

	MESA				
	N at risk	N events	Model 1 HR (95% CI)	Model 2 HR (95% CI)	Model 3 HR (95% CI)
<b>eGFR (mL/min/1.73m<sup>2</sup>)</b>					
≥ 90	2742	154	1.0 (Ref.)	1.0 (Ref.)	1.0 (Ref.)
60 - 89	3381	432	1.08 (0.89, 1.32)	1.08 (0.88, 1.31)	1.09 (0.89, 1.34)
45 - 59	426	95	1.37 (1.03, 1.83)	1.32 (0.99, 1.75)	1.33 (1.00, 1.77)
30 - 44	95	27	1.78 (1.14, 2.76)	1.67 (1.07, 2.59)	1.62 (1.05, 2.51)
< 30	33	12	3.35 (1.69, 6.65)	3.03 (1.51, 6.08)	2.94 (1.48, 5.83)
Per 20 ml/min/1.73 m <sup>2</sup> lower eGFR			1.24 (1.12, 1.38)	1.22 (1.09, 1.35)	1.21 (1.09, 1.35)
p-value			< 0.0001	0.0003	0.0003
<b>uACR (mg/g)*</b>					
< 15	5415	521	1.0 (Ref.)	1.0 (Ref.)	1.0 (Ref.)
15 - 29	600	72	1.00 (0.78, 1.28)	0.97 (0.75, 1.24)	0.91 (0.71, 1.18)
30 - 299	538	102	1.59 (1.27, 1.98)	1.52 (1.21, 1.90)	1.44 (1.15, 1.82)
≥ 300	95	20	2.11 (1.30, 3.42)	1.94 (1.19, 3.16)	1.60 (0.97, 2.64)
Per doubling			1.13 (1.08, 1.18)	1.12 (1.07, 1.17)	1.10 (1.05, 1.15)
p-value			< 0.0001	< 0.0001	< 0.0001

Model 1: age, age<sup>2</sup>, race/ethnicity, sex, education (high school/some college/college), height, weight, current smoking, history of diabetes

Model 2: model 1 + systolic blood pressure, diastolic blood pressure, and antihypertension medications

Model 3: model 2 + left ventricular mass, left ventricular ejection fraction (continuous in MESA), PR duration

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**Supplemental Table 4. Association of estimated glomerular filtration rate (eGFR) and urine albumin to creatinine ratio (UACR) with risk of incident atrial fibrillation in participants from the CHS study**

	CHS		<b>Model 1 HR (95% CI)</b>	<b>Model 2 HR (95% CI)</b>	<b>Model 3 HR (95% CI)</b>
	N at risk	N events			
<b>eGFR (mL/min/1.73m<sup>2</sup>)</b>					
≥ 90	528	143	1.0 (Ref.)	1.0 (Ref.)	1.0 (Ref.)
60 - 89	3031	949	1.07 (0.89, 1.28)	1.03 (0.86, 1.23)	1.03 (0.86, 1.24)
45 - 59	1049	336	1.26 (1.03, 1.55)	1.12 (0.91, 1.38)	1.12 (0.91, 1.38)
30 - 44	331	119	1.78 (1.36, 2.33)	1.49 (1.13, 1.95)	1.48 (1.12, 1.94)
< 30	87	22	2.30 (1.45, 3.63)	1.60 (0.98, 2.63)	1.57 (0.94, 2.60)
Per 20 ml/min/1.73 m <sup>2</sup> lower eGFR			1.21 (1.12, 1.30)	1.13 (1.05, 1.22)	1.13 (1.05, 1.21)
p-value			< 0.0001	0.0009	0.001

Model 1: age, age<sup>2</sup>, race/ethnicity, sex, education (high school/some college/college), height, weight, current smoking, history of diabetes

Model 2: model 1 + history of heart failure, history of myocardial infarction, history of stroke, systolic blood pressure, diastolic blood pressure, and antihypertension medications

Model 3: model 2 + left ventricular mass, left ventricular ejection fraction (categorized as normal, borderline, or abnormal in CHS), PR duration

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**Supplemental Table 5. Association of estimated glomerular filtration rate (eGFR) and urine albumin to creatinine ratio (UACR) with risk of incident atrial fibrillation in three community-based cohorts, allowing for different effects before and after 5 years follow-up (follow-up truncated to 11 years in each cohort)**

	N events (JHS)	N events (MESA)	N events (CHS)	Model 1	Model 2	Model 3
<b>eGFR (mL/min/1.73m<sup>2</sup>)</b>						
<b>0-5 years:</b>						
≥ 90	34	30	25	1.0 (Ref.)	1.0 (Ref.)	1.0 (Ref.)
60 - 89	49	81	207	1.25 (0.98, 1.61)	1.21 (0.94, 1.55)	1.20 (0.93, 1.53)
45 - 59	5	32	109	1.70 (1.24, 2.34)	1.50 (1.09, 2.06)	1.46 (1.06, 2.02)
30 - 44	8	15	52	3.04 (2.13, 4.33)	2.48 (1.73, 3.55)	2.37 (1.64, 3.41)
< 30	4	7	10	3.50 (2.09, 5.84)	2.64 (1.57, 4.44)	2.15 (1.27, 3.64)
Per 20 mL/min/1.73 m <sup>2</sup> decrement				1.41 (1.28, 1.55)	1.30 (1.19, 1.43)	1.26 (1.15, 1.38)
p-value				< 0.0001	< 0.0001	< 0.0001
<b>5-11 years:</b>						
≥ 90	61	61	49	1.0 (Ref.)	1.0 (Ref.)	1.0 (Ref.)
60 - 89	62	158	318	1.06 (0.88, 1.28)	1.03 (0.85, 1.25)	1.05 (0.87, 1.27)
45 - 59	7	27	119	1.09 (0.84, 1.43)	0.98 (0.75, 1.28)	0.98 (0.75, 1.28)
30 - 44	3	9	50	1.75 (1.24, 2.47)	1.46 (1.03, 2.07)	1.46 (1.02, 2.07)
< 30	1	2	10	2.49 (1.35, 4.62)	1.62 (0.84, 3.14)	1.50 (0.77, 2.92)
Per 20 mL/min/1.73 m <sup>2</sup> decrement				1.22 (1.12, 1.33)	1.15 (1.05, 1.25)	1.14 (1.04, 1.24)
p-value				< 0.0001	0.002	0.003
<b>uACR (mg/g)</b>						
<b>0-5 years:</b>						
< 15	31	106	NA	1.0 (Ref.)	1.0 (Ref.)	1.0 (Ref.)
15 - 29	10	19	NA	1.46 (0.99, 2.16)	1.35 (0.91, 2.00)	1.19 (0.80, 1.78)
30 - 299	13	28	NA	1.78 (1.26, 2.53)	1.63 (1.14, 2.31)	1.43 (1.00, 2.05)
≥ 300	7	8	NA	3.17 (1.84, 5.44)	2.76 (1.60, 4.74)	2.02 (1.14, 3.56)
Per doubling				1.19 (1.12, 1.26)	1.16 (1.10, 1.23)	1.12 (1.05, 1.19)
p-value				< 0.0001	< 0.0001	0.0004

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<b>5-11 years:</b>						
< 15	51	187		1.0 (Ref.)	1.0 (Ref.)	1.0 (Ref.)
15 - 29	7	28		1.20 (0.86, 1.69)	1.13 (0.81, 1.59)	1.03 (0.73, 1.45)
30 - 299	14	36		1.53 (1.13, 2.09)	1.42 (1.03, 1.94)	1.31 (0.95, 1.81)
≥ 300	3	6		1.53 (0.80, 2.93)	1.32 (0.69, 2.54)	1.02 (0.52, 2.00)
Per doubling				1.10 (1.05, 1.17)	1.08 (1.02, 1.14)	1.05 (0.99, 1.11)
p-value				0.0004	0.005	0.09

Model 1: age, age<sup>2</sup>, race/ethnicity (where appropriate), sex, education (high school/some college/college), height, weight, current smoking, history of diabetes

Model 2: model 1 + history of heart failure (where appropriate), history of myocardial infarction (where appropriate), history of stroke (where appropriate), systolic blood pressure, diastolic blood pressure, and antihypertension medications

Model 3: model 2 + left ventricular mass, left ventricular ejection fraction (continuous in MESA/JHS; categorized as normal, borderline, or abnormal in CHS), PR duration

HRs are from a fixed effects meta-analysis combining all three cohorts (eGFR), or JHS and MESA cohorts only (uACR).

p-values are for continuous comparisons

Multiple imputation used to account for missingness.

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**Supplemental Table 6. Association of estimated glomerular filtration rate (eGFR) and urine albumin to creatinine ratio (UACR) with risk of incident atrial fibrillation in participants from community-based cohorts, adjusting for echocardiogram and electrocardiogram measures**

	Model 2 HR (95% CI)	Model 2+ (sensitivity analysis) HR (95% CI)
<b>eGFR (mL/min/1.73m<sup>2</sup>)</b>		
≥ 90	1.0 (Ref.)	1.0 (Ref.)
60 - 89	1.09 (0.97, 1.24)	1.10 (0.97, 1.24)
45 - 59	1.17 (1.00, 1.38)	1.17 (0.99, 1.38)
30 - 44	1.59 (1.28, 1.98)	1.54 (1.23, 1.92)
< 30	2.03 (1.40, 2.96)	1.84 (1.25, 2.70)
Per 20 ml/min/1.73 m <sup>2</sup> lower eGFR	1.16 (1.10, 1.23)	1.15 (1.09, 1.22)
p-value	< 0.0001	< 0.0001
<b>UACR (mg/g)*</b>		
< 15	1.0 (Ref.)	1.0 (Ref.)
15 - 29	1.04 (0.83, 1.30)	0.97 (0.78, 1.22)
30 - 299	1.47 (1.20, 1.79)	1.38 (1.13, 1.69)
≥ 300	1.76 (1.18, 2.62)	1.45 (0.96, 2.20)
Per doubling	1.11 (1.07, 1.15)	1.08 (1.04, 1.13)
p-value	< 0.0001	< 0.0001

Model 2: model 1 + history of heart failure (where appropriate), history of myocardial infarction (where appropriate), history of stroke (where appropriate), systolic blood pressure, diastolic blood pressure, and antihypertension medications

Model 2+: model 2 + left ventricular mass, left ventricular ejection fraction (continuous in MESA/JHS; categorized as normal, borderline, or abnormal in CHS), PR duration

\*based on data from JHS and MESA only

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**Supplemental Table 7. Association of estimated glomerular filtration rate (eGFR) and urine albumin to creatinine ratio (UACR) with risk of incident atrial fibrillation in two community-based cohorts, adjusting for interim/concurrent heart failure (HF) and myocardial infarction (MI) events**

	MESA		CHS		Meta-analyzed study population	
	N at risk	N events	N at risk	N events	Model 2	Model 2+ interim/concurrent HF or MI
eGFR (mL/min/1.73m <sup>2</sup> )					HR (95% CI)	HR (95% CI)
≥ 90	2742	154	528	143	1.0 (Ref.)	1.0 (Ref.)
60 - 89	3381	432	3031	949	1.09 (0.97, 1.24)	1.01 (0.89, 1.15)
45 - 59	426	95	1049	336	1.17 (1.00, 1.38)	1.18 (1.00, 1.38)
30 - 44	95	27	331	119	1.59 (1.28, 1.98)	1.41 (1.13, 1.74)
< 30	33	12	87	22	2.03 (1.40, 2.96)	1.90 (1.26, 2.86)
Per 20 ml/min/1.73 m <sup>2</sup> decrement					1.16 (1.10, 1.23)	1.14 (1.08, 1.21)
p-value					< 0.0001	< 0.0001
UACR (mg/g)*						
< 15	5415	521			1.0 (Ref.)	1.0 (Ref.)
15 - 29	600	72			1.04 (0.83, 1.30)	1.04 (0.81, 1.33)
30 - 299	538	102			1.47 (1.20, 1.79)	1.52 (1.23, 1.90)
≥ 300	95	20			1.76 (1.18, 2.62)	1.81 (1.12, 2.95)
Per doubling					1.11 (1.07, 1.15)	1.12 (1.07, 1.17)
p-value					< 0.0001	< 0.0001

Model 2: age, age<sup>2</sup>, race/ethnicity (where appropriate), sex, education (high school/some college/college), height, weight, current smoking, history of diabetes, history of heart failure (where appropriate), history of myocardial infarction (where appropriate), history of stroke (where appropriate), systolic blood pressure, diastolic blood pressure, antihypertension medications

Model 2+: model 2 + **interim/concurrent myocardial infarction or heart failure**

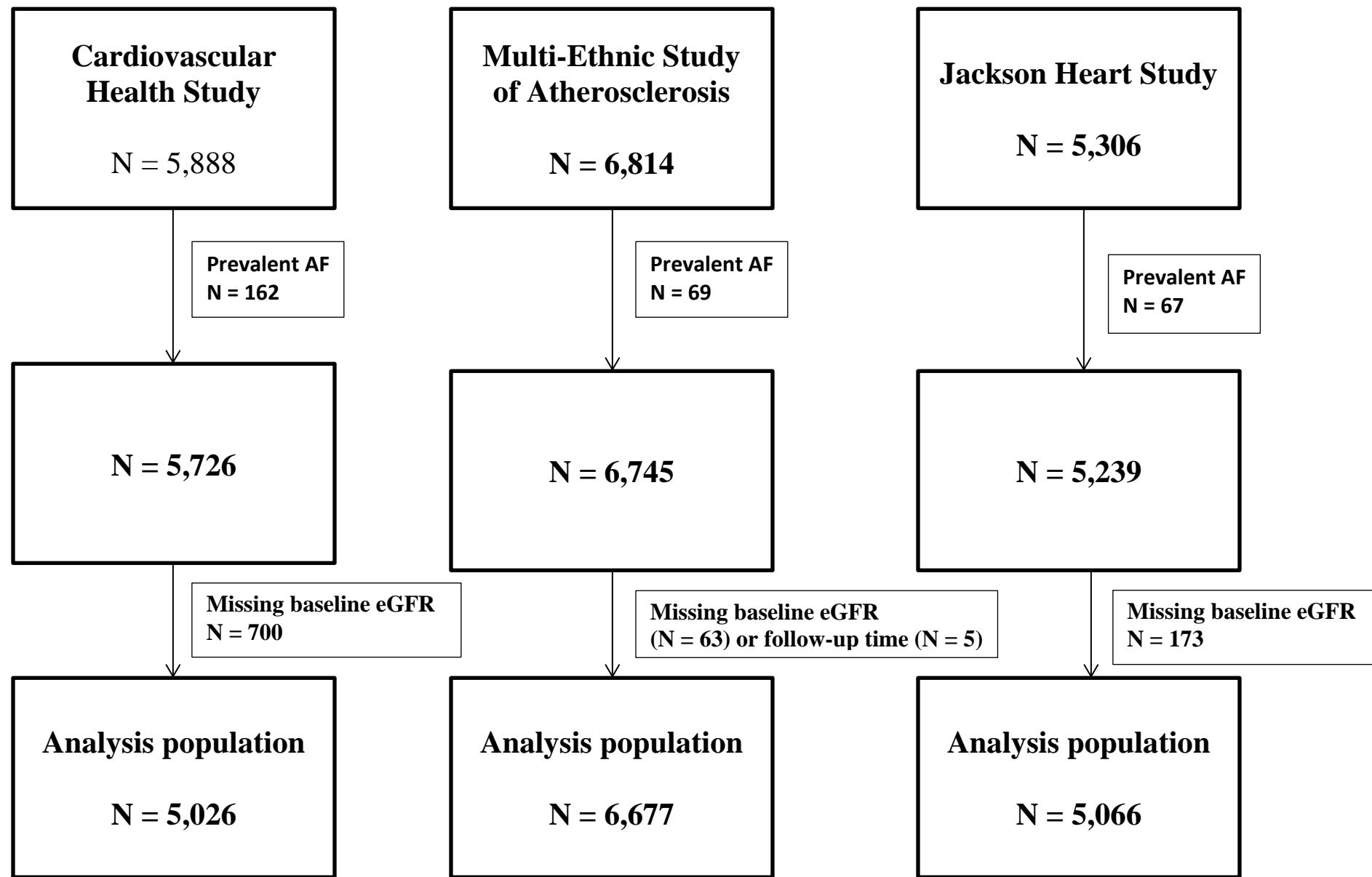
HRs are from a fixed effects meta-analysis combining MESA and CHS (eGFR), or from MESA cohort only (UACR).

p-values are for continuous comparisons

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## SUPPLEMENTAL FIGURES

Supplemental Figure 1. Consort diagram of derivation of study population in three community-based cohorts



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**Supplemental Figure 2. Adjusted splines for the association of estimated glomerular filtration rate (eGFR) and urine albumin-to-creatinine-ratio (UACR) with incident atrial fibrillation in each study cohort (Ordering of splines from top to bottom is JHS, MESA, and CHS: adjusted for age, age<sup>2</sup>, sex, and black race)**

