

## Online Appendix

**Online Table 1. Baseline characteristics and risk factor profile of Black and White Men and Women in the PC Derivation and External Validation Samples**

	Black Men		Black Women		White Men		White Women	
	PC	JHS	PC	JHS	PC	PREVEND	PC	PREVEND
	Derivation	Validation	Derivation	Validation	Derivation	Validation	Derivation	Validation
	N=933	N=1066	N=1628	N=1704	N=3997	N=3206	N=5213	N=3493
<b>Mean age, years (SD)</b>	48.9 (13.1)	49.4 (11.7)	49.6 (12.7)	50.2 (11.5)	53.1 (11.7)	50.3 (12.4)	53.9 (11.6)	48.4 (12.0)
<b>Diabetes, n (%)</b>	106 (11)	102 (10)	184 (11)	200 (12)	271 (7)	126 (4)	251 (5)	106 (3)
<b>Mean fasting glucose, mg/dL (SD)</b>	102 (33)	98 (31)	102 (36)	96 (31)	101 (25)	90 (22)	97 (25)	85 (20)
<b>Diabetes treatment, n (%)</b>	66 (7)	69 (7)	110 (7)	156 (10)	98 (2)	46 (1)	95 (2)	53 (2)
<b>Current smoking, n (%)</b>	269 (29)	190 (18)	387 (24)	159 (9)	806 (20)	1216 (38)	1067 (20)	1336 (38)
<b>Mean systolic blood pressure, mm Hg (SD)</b>	124 (19)	127 (16)	124 (21)	124 (16)	122 (17)	134 (18)	119 (19)	124 (21)
<b>Hypertension treatment, n (%)</b>	312 (33)	330 (34)	623 (38)	727 (45)	932 (23)	440 (14)	1268 (24)	493 (14)
<b>Mean total cholesterol, mg/dL (SD)</b>	193 (43)	197 (40)	200 (44)	197 (38)	204 (38)	221 (43)	211 (42)	218 (45)
<b>Mean HDL cholesterol, mg/dL (SD)</b>	49 (14)	45 (12)	57 (16)	54 (14)	44 (12)	45 (12)	58 (16)	58 (16)
<b>Mean BMI, kg/m<sup>2</sup></b>	28.4 (5.0)	30.0 (6.1)	30.6 (6.8)	33.2 (7.8)	27.3 (3.9)	26.3 (3.6)	26.3 (5.3)	25.9 (4.7)
<b>Mean QRS duration, msec (SD)</b>	93 (14)	97 (14)	86 (12)	91 (12)	93 (15)	103 (13)	85 (12)	93 (12)

PC indicates pooled cohort, which includes ARIC, CARDIA, CHS, FOF, and MESA; JHS indicates Jackson Heart Study; PREVEND indicates Prevention of RENal and Vascular ENd-stage Disease cohort

**Online Table 2: Baseline characteristics of the Pooled Cohort Validation sample**

	<b>White Men</b>	<b>White Women</b>	<b>Black Men</b>	<b>Black Women</b>
	<b>N=1075</b>	<b>N=1631</b>	<b>N=4011</b>	<b>N=5053</b>
<b>Mean age, years (SD)</b>	49.0 (13.0)	50.2 (12.4)	53.2 (11.5)	53.9 (13.0)
<b>Diabetes, n (%)</b>	131 (12)	200 (12)	265 (7)	256 (5)
<b>Mean fasting glucose, mg/dL (SD)</b>	103 (35)	103 (38)	101 (23)	97 (24)
<b>Diabetes treatment, n (%)</b>	85 (8)	120 (7)	93 (2)	86 (2)
<b>Current smoking, n (%)</b>	311 (29)	367 (23)	783 (20)	1077 (21)
<b>Mean systolic blood pressure, mm Hg (SD)</b>	124 (18)	124 (21)	122 (17)	119 (18)
<b>Hypertension treatment, n (%)</b>	337 (31)	651 (40)	905 (23)	1234 (24)
<b>Mean total cholesterol, mg/dL (SD)</b>	194 (42)	199 (42)	204 (39)	211 (41)
<b>Mean HDL cholesterol, mg/dL (SD)</b>	49 (14)	57 (16)	44 (12)	58 (16)
<b>Mean BMI, kg/m<sup>2</sup></b>	28.2 (5.0)	30.7 (6.7)	27.2 (3.9)	26.3 (5.4)
<b>Mean QRS duration, msec (SD)</b>	92 (13)	86 (12)	92 (15)	85 (12)

**Online Table 3. Equation coefficients and p-values for the Pooled Cohort Equations to Prevent Heart Failure**

	White Male		White Female		Black Male		Black Female	
	Coefficient	P value	Coefficient	P value	Coefficient	P value	Coefficient	P value
<b>Ln Age (y)</b>	41.94	< .01	20.55	0.05	2.88	< .01	51.75	< .01
<b>Ln Age, Squared</b>	-0.88	0.05	N/A	N/A	N/A	N/A	N/A	N/A
<b>Ln Treated Systolic BP (mm Hg)</b>	1.03	< .01	12.95	0.13	2.31	< .01	29.0	0.02
<b>Ln Age×Ln Treated Systolic BP</b>	N/A	N/A	-2.96	0.16	N/A	N/A	-6.59	0.03
<b>Ln Untreated Systolic BP (mm Hg)</b>	0.91	< .01	11.86	0.18	2.17	< .01	28.18	0.03
<b>Ln Age×Ln Untreated Systolic BP</b>	N/A	N/A	-2.73	0.20	N/A	N/A	-6.42	0.04
<b>Current Smoker (1=Yes, 0=No)</b>	0.74	<.01	11.02	<.01	1.66	0.69	0.76	< .01
<b>Ln Age×Current Smoker</b>	N/A	N/A	-2.50	<.01	-0.25	0.81	N/A	N/A
<b>Ln Treated glucose (mg/dL)</b>	0.90	<.01	1.04	<.01	0.64	0.10	0.97	< .01
<b>Ln Untreated glucose (mg/dL)</b>	0.78	<.01	0.91	<.01	0.58	0.19	0.80	< .01
<b>Ln Total Cholesterol (mg/dL)</b>	0.49	0.04	N/A	N/A	N/A	N/A	0.32	0.40
<b>Ln HDL-C (mg/dL)</b>	-0.44	0.02	-0.07	0.67	-0.81	0.03	N/A	N/A
<b>Ln BMI (Kg/m<sup>2</sup>)</b>	37.2	<.01	1.33	<.01	1.16	0.09	21.24	0.01
<b>Ln Age× Ln BMI</b>	-8.83	<.01	N/A	N/A	N/A	N/A	-5.0	0.02
<b>Ln QRS duration (msec)</b>	0.63	0.02	1.06	<.01	0.73	0.25	1.27	0.04

**Online Table 4: Comparison of Model Performance for HF risk estimation with existing Cardiovascular Risk Scores and the Pooled Cohort Equations to Prevent Heart Failure for each race and sex group**

	D'Agostino 2008 CVD		FRS-ATPIII		PCE-ASCVD		PCP-HF Score	
	C statistics	GND Chi-sq, P value	C statistics	GND Chi-sq, P value	C statistics	GND Chi-sq, P value	C statistics	GND Chi-sq, P value
White Male	0.80 (0.77, 0.83)	572.6 ( $<.01$ )	0.77 (0.74, 0.81)	233.3 ( $<.01$ )	0.79 (0.75, 0.82)	211.3 ( $<.01$ )	0.83 (0.80, 0.86)	9.45 (0.15)
White Female	0.90 (0.76, 0.83)	259.2 ( $<.01$ )	0.78 (0.74, 0.82)	97.2 ( $<.01$ )	0.83 (0.79, 0.86)	109.8 ( $<.01$ )	0.84 (0.81, 0.88)	7.64 (0.17)
Black Male	0.78 (0.71, 0.84)	103.7 ( $<.01$ )	0.72 (0.65, 0.79)	44.1 ( $<.01$ )	0.76 (0.69, 0.83)	34.9 ( $<.01$ )	0.83 (0.78, 0.87)	3.12 (0.68)
Black Female	0.75 (0.68, 0.82)	82.9 ( $<.01$ )	0.75 (0.69, 0.82)	53.2 ( $<.01$ )	0.73 (0.66, 0.80)	34.8 ( $<.01$ )	0.80 (0.73, 0.86)	3.45 (0.75)

**Online Table 5: Characteristics, Risk Factors, and Endpoints of Previously Published HF Risk Scores and the PCP-HF Risk Score**

Risk Score Information							Risk Factors/Covariates/Endpoint																		
Risk Equation	Cohorts and Countries	Participants' Race/Ethnic Background	Participants' Hx of CVD	Participant Age Range	Data Collection Years	Risk Window (Years)	Age	Sex	Race	Hx of CHD	SBP	BP Tx	Total Chol	LDL Chol	HDL Chol	DM	Fasting Glucose	DM Tx	Smoking	BMI	Heart Rate	ECG	Biomarkers (e.g. Albumin, BNP)	Endpoint	
Framingham Global	Framingham USA	European-American	Free of CHD and stroke at baseline	30-74 years	1968-1987	12	X	X			X	X	X		X	X			X						CHD, Stroke, HF
Framingham HF	Framingham USA	European-American	All had history of coronary heart disease, valvular disease, or htn	45-94 years	1949-1987	4	X	X		X	X					X					X	X (LVH)			HF
Health ABC	Health ABC USA	European-American and African-American	Included participants with hx of CHD or stroke	70-79 years	1997-2002	5	X			X	X						X		X		X	X (LVH)	X		HF
MESA	MESA USA	European-American, Hispanic, African-American, Chinese-American	Free of CHD and stroke at baseline	45-84 years	2000-2007	5	X	X			X					X			X	X	X		X		HF
ARIC	ARIC USA	European-American, African-American	Included participants with hx of CHD	45-64 years	1987-1998	15.5	X	X	X														X		HF
International Collaboration on HF Subtypes	Framingham CHS, and PREVENT	European-American, European, and African-American	Included participants with hx of CHD and stroke	30-84 years	1979-2010	12	X	X		X	X	X				X			X	X		X (LVH, LBBB)			HFpEF, HFpEF
PCP-HF (Current Score)	FOF, CHS, ARIC, CARDIA, MESA	European-American, African-American	Free of CHD and stroke at baseline	30-80 years	1985-2002	10	X	X	X		X	X	X		X		X	X	X	X		X (QRS)			HF

**Online Table 6. Baseline Characteristics of Lowest and Highest Decile Risk Group in the Derivation Sample of the PC**

	Black Men		Black Women		White Men		White Women	
	Lowest decile	Highest decile	Lowest decile	Highest decile	Lowest decile	Highest decile	Lowest decile	Highest decile
<b>Mean age, years (SD)</b>	32.3 (2.4)	64.1 (8.5)	32.5 (2.2)	60.2 (8.4)	33.4 (2.5)	68.3 (6.9)	34.0 (2.6)	70.0 (6.5)
<b>Mean fasting glucose, mg/dL (SD)</b>	86 (9)	127 (48)	83 (7)	157 (72)	90 (10)	123 (47)	85.6 (14.5)	120 (53)
<b>Mean systolic blood pressure, mm Hg (SD)</b>	108 (9)	148 (21)	101 (8)	148 (25)	110 (11)	137 (21)	102 (9)	137 (19)
<b>Mean total cholesterol, mg/dL (SD)</b>	176 (33)	185 (40)	170 (32)	214 (48)	179 (35)	200 (39)	174 (32)	222 (43)
<b>Mean HDL cholesterol, mg/dL (SD)</b>	58 (13)	42 (11)	58 (13)	52 (13)	48 (11)	42 (12)	58 (12)	54 (15)
<b>Mean BMI, kg/m<sup>2</sup></b>	24.3 (3.7)	31.1 (5.1)	23.5 (3.2)	34.5 (7.4)	24.3 (2.5)	28.2 (4.5)	23.7 (4.7)	29.4 (5.0)
<b>Mean QRS duration, msec (SD)</b>	84 (7)	104 (21)	79 (7)	96 (20)	84 (11)	101 (20)	80 (8)	92 (16)

PC indicates pooled cohort, which includes ARIC, CARDIA, CHS, FOF, and MESA

**Online Table 7. Varying Risk Factor Profiles and Estimated 10-year HF Risk**

Demographics	Age	Smoking	SBP	RISK FACTOR LEVELS							Predicted
				BP treatment	Fasting glucose	Diabetes treatment	Body mass index	Total cholesterol	HDL cholesterol	QRS Duration	HF Risk %
<b>White Male (Optimal RF profile)</b>	50	Never	120	No	90	No	22	180	55	90	0.4%
<b>White Male (Intermediate RF profile)</b>	50	Never	130	No	100	No	28	200	50	120	1.0%
<b>White Male (High RF profile)</b>	50	Current	150	Yes	126	Yes	35	250	30	120	22.5%
<b>Black Male (Optimal RF profile)</b>	50	Never	120	No	90	No	22	180	55	90	0.8%
<b>Black Male (Intermediate RF profile)</b>	50	Never	130	No	100	No	28	200	50	120	1.7%
<b>Black Male (High RF profile)</b>	50	Current	150	Yes	126	Yes	35	250	30	120	24.8%
<b>White Female (Optimal RF profile)</b>	50	Never	120	No	90	No	22	180	55	90	0.3%
<b>White Female (Intermediate RF profile)</b>	50	Never	130	No	100	No	28	200	50	120	0.6%
<b>White Female (High RF profile)</b>	50	Current	150	Yes	126	Yes	35	250	30	120	14.2%
<b>Black female (Optimal RF profile)</b>	50	Never	120	No	90	No	22	180	55	90	0.4%
<b>Black female (Intermediate RF profile)</b>	50	Never	130	No	100	No	28	200	50	120	1.2%
<b>Black female (High RF profile)</b>	50	Current	150	Yes	126	Yes	35	250	30	120	26.0%



**Online Table 8.** An example calculation of risk for each race and sex group for an individual 50-years of age (for which the Ln[Age]=3.91 with a fasting glucose of 100mg/dL, total cholesterol of 200mg/dL, HDL-cholesterol of 50mg/dL, BMI of 28kg/m<sup>2</sup>, systolic blood pressure of 130mm Hg, and QRS of

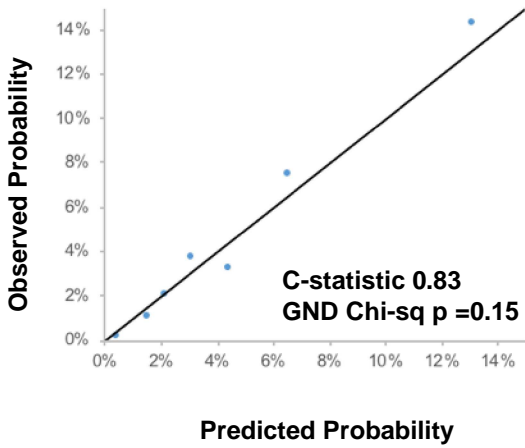
	White Men	White Women	Black Men	Black Women
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120ms. This individual is not a current smoker and is not currently treated for hypertension or diabetes. For the equations, the values for age, lipids, BMI, fasting glucose, systolic BP, and QRS duration are Ln transformed. Interactions use the natural log of each variable. Regression coefficients from Table 2 are used to calculate risk using the formula  $1 - S_0 e^{(IndX - MeanCV)}$  where  $S_0$  represents baseline survival for the appropriate race-sex group, IndX represents the sum of the coefficient x value for each individual following log transformation where appropriate, and MeanCV represents the Mean (Coefficient x value) for the appropriate race-sex group.

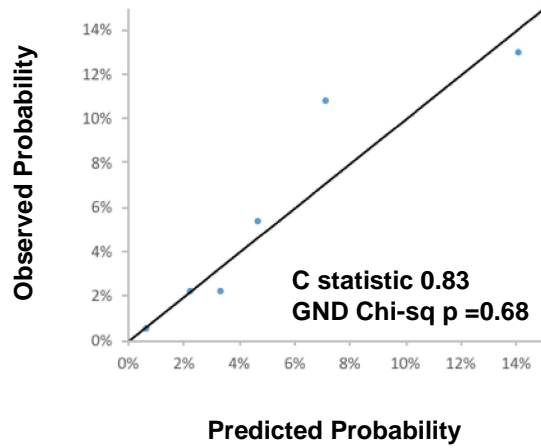
	Coefficient	Individual Example Value	Coefficient x Value	Coefficient	Individual Example Value	Coefficient x Value	Coefficient	Individual Example Value	Coefficient x Value	Coefficient	Individual Example Value	Coefficient x Value
<b>Hypothetical Profile: 50-year-old with a systolic blood pressure of 130mm Hg (not on treatment), non-smoker, fasting glucose of 100 mg/dL (not on treatment), BMI of 28 kg/m<sup>2</sup>, total cholesterol of 200mg/dL, HDL of 50 mg/dL, and QRS duration of 120ms</b>												
Ln Age (y)	41.94101	3.912023005	164.074196	20.54973	3.912023005	80.39101652	2.88334	3.912023005	11.2796924	51.75667	3.912023005	202.473284
Ln Age, Squared	-0.88115	15.30392399	-13.48505263	N/A	15.30392399	0	N/A	15.30392399	0	N/A	15.30392399	0
Ln Treated Systolic BP (mm Hg)	1.030508	0	0	12.94937	0	0	2.31106	0	0	28.97791	0	0
Ln Age x Ln Treated Systolic BP	N/A	0	0	-2.96923	0	0	N/A	0	0	-6.59777	0	0
Ln Untreated Systolic BP (mm Hg)	0.91252	4.86753445	4.441722537	11.86273	4.86753445	57.74224695	2.17229	4.86753445	10.5736964	28.1853	4.86753445	137.192919
Ln Age x Ln Untreated Systolic BP	N/A	19.04190675	0	-2.72538	19.04190675	-51.89643182	N/A	19.04190675	0	-6.42425	19.04190675	-122.329969
Current Smoker (1=Yes, 0=No)	0.73839	0	0	11.01752	0	0	1.65337	0	0	0.76532	0	0
Ln Age x Current Smoker	N/A	0	0	-2.50777	0	0	-0.24665	0	0	N/A	0	0
Ln Treated glucose (mg/dL)	0.90072	0	0	1.04503	0	0	0.64704	0	0	0.96695	0	0
Ln Untreated glucose (mg/dL)	0.77805	4.605170186	3.583052663	0.91807	4.605170186	4.227868593	0.57891	4.605170186	2.66597907	0.79561	4.605170186	3.66391945
Ln Total Cholesterol (mg/dL)	0.49323	5.298317367	2.613289075	N/A	5.298317367	0	N/A	5.298317367	0	0.32646	5.298317367	1.72968869
Ln HDL-C (mg/dL)	-0.43683	3.912023005	-1.708889009	-0.07455	3.912023005	-0.291641315	-0.80691	3.912023005	-3.1566505	N/A	3.912023005	0
Ln BMI (Kg/m <sup>2</sup> )	37.21577	3.33220451	124.0105566	1.32948	3.33220451	4.430099252	1.16289	3.33220451	3.8749873	21.24763	3.33220451	70.8014485
Ln Age x Ln BMI	-8.83278	13.0356607	-115.1411231	N/A	13.0356607	0	N/A	13.0356607	0	-5.00068	13.0356607	-65.1871678
Ln QRS duration (msec)	0.63224	4.787491743	3.026843779	1.06089	4.787491743	5.079002115	0.72646	4.787491743	3.47792125	1.27475	4.787491743	6.1028551
Individual Sum	N/A	N/A	171.4145959	N/A	N/A	99.68216029	N/A	N/A	28.715626	N/A	N/A	234.446977
Mean (Coefficient x Value)	N/A	N/A	171.59	N/A	N/A	99.7321	N/A	N/A	28.7369	N/A	N/A	233.978
Baseline Survival	N/A	N/A	0.98752	N/A	N/A	0.99348	N/A	N/A	0.98295	N/A	N/A	0.9926
Estimated 10-y risk of HF (%)	N/A	N/A	1.048275525%	N/A	N/A	0.620337702%	N/A	N/A	1.66941215%	N/A	N/A	1.18016393%

**Online Figure 1. Sex- and Race-Specific Calibration Plots in Derivation Sample of the Pooled Cohort (n=11,771) with Discrimination and Calibration\* Statistics.**

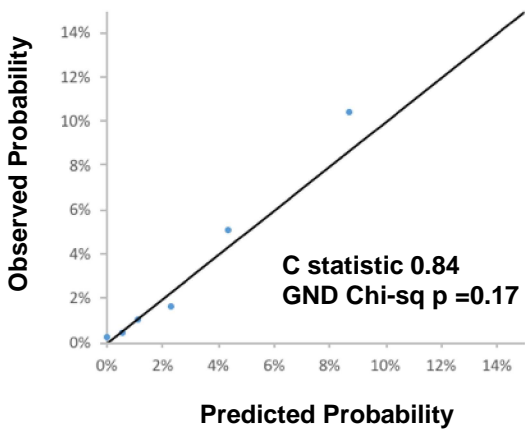
**A. White Male, N=3997**



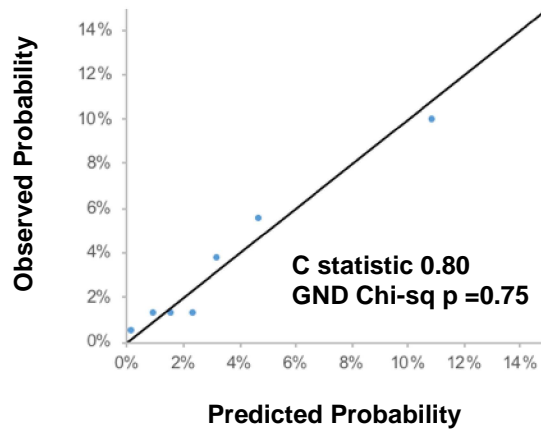
**B. Black Male, N=933**



**C. White Female, N=5213**



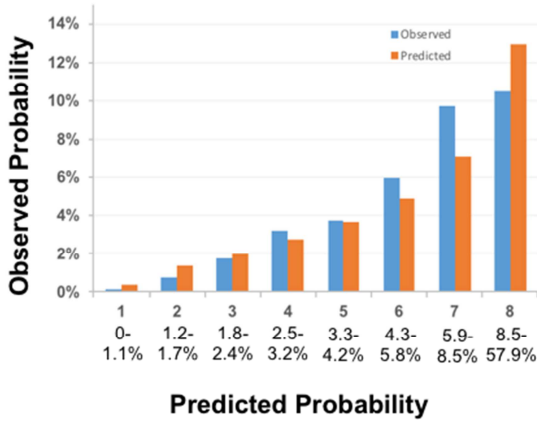
**D. Black Female, N=1628**



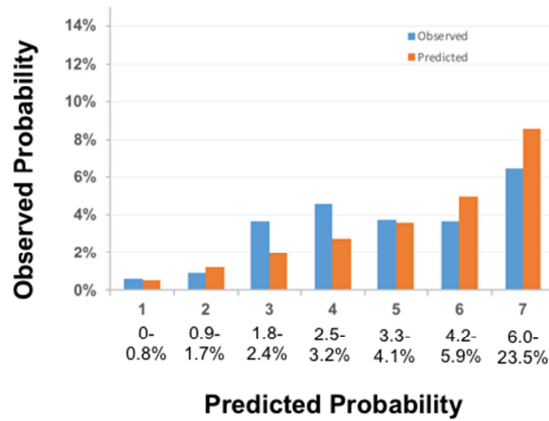
\*Deciles of risk were collapsed when fewer than 2 events were observed in any group

**Online Figure 2. Sex- and Race-Specific Calibration Plots\* in Derivation Sample of the Pooled Cohort (n=11,770) Demonstrating Observed (Blue) and Predicted (Orange) mean 10-year risk of HF, stratified by Predicted Risk.**

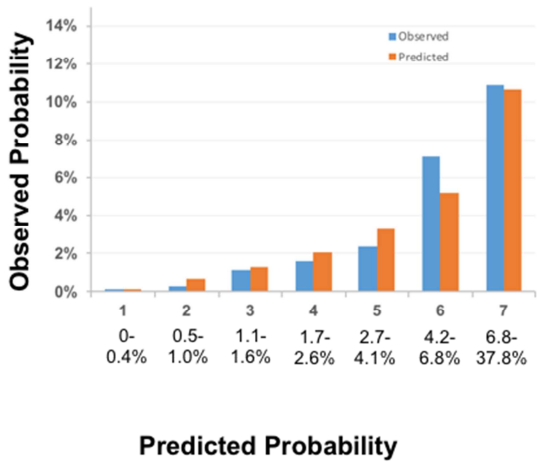
**A. White Male, N=3997**



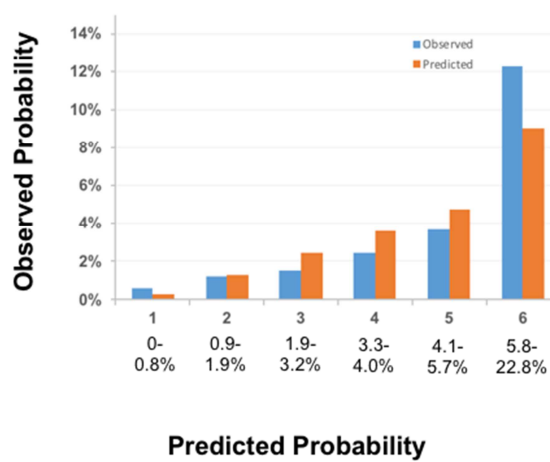
**B. Black Male, N=933**



**C. White Female, N=5213**



**D. Black Female, N=1628**



\*Deciles of risk were collapsed when fewer than 2 events were observed in any group

## **Online Supplemental Methods: Cohort Descriptions and Outcome Ascertainment**

### **Derivation Study Samples**

#### Framingham Offspring Study

The Framingham Heart Study offspring cohort recruited participants in 1971 and detailed methods have been previously published.(1) Briefly, participants have been followed with physical examinations and blood tests every 2 to 4 years. At each visit, HF events were identified, all hospital records reviewed, and diagnosis of HF confirmed by a panel of three physicians.(1) After excluding individuals due to prevalent CVD or HF, age < 30 years, and due to missing covariates, 1881 individuals were included in the derivation cohort and 1892 were included in the internal validation cohort.

#### Multi-Ethnic Study of Atherosclerosis (MESA)

The MESA cohort recruited asymptomatic participants ages 45 to 84 years from six US communities between 2000-2002, and included white, black, Hispanic, and Asian individuals with detailed methods previously described.(2). All participants were contacted by telephone every 6 to 9 months to inquire about interim hospitalizations and medical records were obtained. HF events were adjudicated by two physicians after review of all available study visits and medical records. Any disagreements were classified by full review committee as previously published.(3) After exclusions due to age>80 and due to missing covariates, 1787 individuals were included in the derivation cohort and 1860 in the internal validation cohort.

#### Atherosclerosis Risk in Communities Study

The ARIC Study recruited men and women ages 45 to 64 years sampled from 4 US communities with detailed methods previously published.(4) Three methods were used for ascertainment of events: 1) participants were contacted annually by phone and records were obtained for any hospitalizations, 2) local hospitals provided lists of hospital discharges with cardiovascular diagnoses, and 3) health department death certificate files were surveyed. Incident HF was defined as the first HF hospitalization or presence of HF code on the death certificate in any position using the *International Classification of Diseases Code, Ninth Revision (ICD-9)* code 428.x and deaths with *ICD-9/10* codes of either 428.x or I50. After excluding individuals due to prevalent CVD or HF and due to missing covariates, 5059 individuals were included in the derivation cohort and 5132 were included in the internal validation cohort.

### Coronary Artery Risk Development in Young Adults Study

The CARDIA study recruited 5115 blacks and whites in 1985-1986 from Birmingham, Alabama; Chicago; Minneapolis; and Oakland, California with full details previously described.(5) All participants were contacted annually by telephone and during scheduled study examinations to report interim hospitalizations. Two members of the endpoint committee adjudicated all hospitalizations and deaths with disagreements resolved by consensus. Hospitalization for heart failure required both that a final diagnosis of heart failure had been made by a physician and that medical treatment for heart failure had been administered during the hospitalization. Death was considered to be due to heart failure if the adjudicated cause was cardiovascular and if an *International Classification of Diseases, Ninth Revision (ICD-9)* code for heart failure (428) or cardiomyopathy (425) was noted as a contributory cause. Deaths were reported to the field centers every 6 months, and records were requested after consent had been obtained from the next of kin. After excluding participants with age<30 and due to missing covariates, 1805 individuals were included in the derivation cohort and 1706 individuals were included in the internal validation cohort.

### Cardiovascular Health Study

The CHS cohort recruited participants from four locations—Forsyth County, North Carolina; Sacramento County, California; Allegheny County, Pennsylvania; and Washington County, Maryland and detailed methods have been previously described(6). CHS participants were classified at baseline according to the presence or absence of preexisting disease for the six cardiovascular outcomes using hospital records and physician confirmation as previously published(7). Ascertainment of HF events and deaths were performed during clinic visits and surveillance calls and records were subsequently obtained. HF was subsequently adjudicated by the CHS Events Subcommittee(8). After excluding individuals with baseline prevalent CVD and missing covariates, 1239 individuals were included in the derivation cohort and 1180 individuals were included in the internal validation cohort.

### **Validation Cohort Descriptions**

#### Jackson Heart Study

The Jackson Heart Study has been previously described in detail.(9) Briefly, participants were recruited in 2000 from the Jackson, MI cohort of the ARIC study and from the overall tricounty population. Participants from the

ARIC study were excluded from the validation analysis as they had already been included in the pooled cohort derivation and internal validation samples. The Jackson Heart Study cohort surveillance system collects follow-up data on all participants, including deaths, study terminations (from 2000 through 2010), and heart failure hospitalizations (from 2005). Because adjudication for HF hospitalizations did not start until 2005, self-reported HF hospitalization status from annual follow-up data was utilized. Heart failure hospitalizations after 2005 were adjudicated by trained and certified abstractors and required (1) a discharge diagnosis of *International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM)* code 428 and/or underlying cause of death code I50 and (2) radiographic, hemodynamic, or ECG findings of heart failure or (3) autopsy finding of pulmonary edema or heart failure. After exclusion for overlap with ARIC, history of prevalent CVD, and missing covariates, 2770 individuals were included in the analysis. Given median follow-up time did not reach 10 years (approximately 8 years), we estimated 8-year risk to achieve a more robust calibration assessment.

#### Prevention of Renal and Vascular End-stage Disease (PREVEND)

The PREVEND cohort was recruited in 1997-1998 and has been previously described(10). In brief, all inhabitants of the city of Groningen, the Netherlands, were invited to participate and among those who responded, individuals with urinary albumin excretion  $> 10$  mg/L and a randomly selected control group with urinary albumin excretion  $\leq 10$  mg/L were enrolled. Initial cardiovascular events were adjudicated by review of all hospital records and incident cases were deemed to be HF based on an endpoint adjudication committee consensus utilizing the European Society of Heart Failure Guidelines, as previously published.(11) Participants were included in this analysis if they were between the ages of 30-80 years and had available data on all covariates needed to calculate PCP-HF risk score. Individuals with a prior history of coronary heart disease, stroke, or heart failure were excluded. Of 8592 individuals who attended PREVEND exam 1 (1997-1998), 6699 met criteria for this study and were included in the analysis.

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