

SUPPLEMENTAL MATERIAL

Table S1. Overall and sex stratified distribution of coronary artery calcium by race/ethnicity.

Overall	Total (N=42224)	White (N=38,277)	Asian (N=1,621)	Black (N=977)	Hispanic (N=1,349)	p- value
CAC 0	18776, 44.5%	16933, 44.2%	794, 49.0%	429, 43.9%	620, 46.0%	0.004
CAC 1-99	12971, 30.7%	11757, 30.7%	463, 28.6%	321, 32.9%	430, 31.9%	
CAC 100- 399	5842, 13.8%	5363, 14.0%	200, 12.3%	125, 12.8%	154, 11.4%	
CAC ≥ 400	4635, 11.0%	4224, 11.0%	164, 10.1%	102, 10.4%	145, 10.8%	
Women	(N=14788)	(N=13288)	(N=589)	(N=391)	(N=520)	<0.001
CAC 0	8818, 59.6%	7929, 59.7%	380, 64.5%	193, 49.4%	316, 60.8%	
CAC 1-99	3805, 25.7%	3427, 25.8%	125, 21.2%	124, 31.7%	129, 24.8%	
CAC 100- 399	1412, 9.6%	1279, 9.6%	51, 8.7%	39, 9.97%	43, 8.3%	
CAC ≥400	753, 5.1%	653, 4.9%	33, 5.6%	35, 8.95%	32, 6.2%	
Men	(N= 27436)	(N=24989)	(N=1032)	(N=586)	(N=829)	0.01
CAC 0	9,958, 36.3%	9004, 36.0%	414, 40.1%	236, 40.3%	304, 36.7%	
CAC 1-99	9,166, 33.4%	8330, 33.3%	338, 32.8%	197, 33.6%	301, 36.3%	
CAC 100- 399	4,430, 16.2%	4084, 16.3%	149, 14.4%	86, 14.7%	111, 13.4%	
CAC ≥400	3,882, 14.2%	3571, 14.3%	131, 12.7%	67, 11.4%	113, 13.6%	

P-values derived from chi-square tests of the association of coronary artery calcium (CAC) and race/ethnicity.

Table S2. Cumulative incidence and incidence rates of all-cause and CVD-specific mortality rates by CAC group and race/ethnicity, in women.

	CAC 0	CAC 1-99	CAC 100-399	CAC ≥ 400
White women				
Death (n, %)	177, 2.2%	171, 5.0%	114, 8.9%	121, 18.5%
Per 1000	2.0 (1.7, 2.3)	4.5 (3.9, 5.2)	8.3 (6.9, 10.0)	18.9 (15.8, 22.6)
CVD Death (n, %)	25, 0.32%	34, 0.99%	37, 2.9%	52, 8.0%
Per 1000	0.29 (0.19, 0.42)	0.89 (0.64, 1.3)	2.7 (2.0, 3.7)	8.1 (6.2, 10.7)
Asian women				
Death (n, %)	4, 1.1%	6, 4.8%	5, 9.8%	4, 12.1%
Per 1000	0.87 (0.33, 2.3)	4.2 (1.9, 9.4)	9.6 (4.0, 23.0)	12.9 (4.9, 34.5)
CVD Death (n, %)	0, 0%	1, 0.80%	3, 5.9%	2, 6.1%
Per 1000	-	0.70 (0.10, 5.0)	5.8 (1.9, 17.8)	6.5 (1.6, 25.9)
Black women				
Death (n, %)	6, 3.1%	8, 6.5%	9, 23.1%	13, 37.1%
Per 1000	3.3 (1.5, 7.2)	6.4 (3.2, 12.8)	24.3 (12.7, 46.8)	57.3 (33.3, 98.7)
CVD Death (n, %)	3, 1.6%	2, 1.6%	5, 12.8%	7, 20.0%
Per 1000	1.6 (0.53, 5.0)	1.6 (0.40, 6.4)	13.5 (5.6, 32.5)	30.9 (14.7, 64.7)
Hispanic women				
Death (n, %)	3, 0.95%	8, 6.2%	8, 18.6%	7, 21.9%
Per 1000	0.82 (0.26, 2.5)	5.5 (2.8, 11.0)	20.0 (10.0, 40.0)	24.3 (11.6, 51.0)
CVD Death (n, %)	2, 0.63%	4, 3.1%	2, 4.7%	5, 15.6%
Per 1000	0.55 (0.14, 2.2)	2.8 (1.0, 7.3)	5.0 (1.3, 20.0)	17.4 (7.2, 41.7)

Table S3. Cumulative incidence and incidence rates of all-cause and CVD-specific mortality rates by CAC group and race/ethnicity, in men.

	CAC 0	CAC 1-99	CAC 100-399	CAC ≥400
White men				
Death (n, %)	148, 1.6%	271, 3.3%	251, 6.2%	465, 13.0%
Per 1000	1.5 (1.3, 1.7)	2.9 (2.5, 3.2)	5.5 (4.8, 6.2)	12.1 (11.1, 13.3)
CVD Death (n, %)	33, 0.37%	80, 0.96%	81, 2.0%	170, 4.8%
Per 1000	0.33 (0.23, 0.46)	0.84 (0.68, 1.1)	1.8 (1.4, 2.2)	4.4 (3.8, 5.2)
Asian men				
Death (n, %)	5, 1.2%	9, 2.7%	5, 3.4%	18, 13.7%
Per 1000	0.98 (0.41, 2.4)	2.2 (1.1, 4.2)	2.9 (1.2, 6.8)	12.6 (7.9, 20.0)
CVD Death (n, %)	0, 0%	0, 0%	1, 0.67%	9, 6.9%
Per 1000	-	-	0.57 (0.08, 4.0)	6.3 (3.3, 12.1)
Black men				
Death (n, %)	10, 4.2%	18, 9.1%	14, 16.3%	19, 28.4%
Per 1000	3.9 (2.1, 7.3)	8.7 (5.5, 13.9)	17.8 (10.5, 30.1)	34.8 (22.2, 54.6)
CVD Death (n, %)	7, 3.0%	5, 2.5%	6, 7.0%	11, 16.4%
Per 1000	2.8 (1.3, 5.8)	2.4 (1.01, 5.8)	7.6 (3.4, 17.0)	20.2 (11.2, 36.4)
Hispanic men				
Death (n, %)	10, 3.3%	15, 5.0%	9, 8.1%	22, 19.5%
Per 1000	2.9 (1.6, 5.5)	4.3 (2.6, 7.2)	7.5 (3.9, 14.4)	20.5 (13.5, 31.1)
CVD Death (n, %)	4, 1.3%	4, 1.3%	3, 2.7%	10, 8.9%
Per 1000	1.2 (0.44, 3.1)	1.2 (0.43, 3.1)	2.5 (0.81, 7.7)	9.3 (5.0, 17.3)

Table S4. Risk of all-cause death associated with CAC for each race/ethnic group, showing unadjusted and minimally adjusted results.†

	Unadjusted HR (95% CI)	Model 1 HR (95% CI)	Model 2 HR (95% CI)
White			
CAC 0	1.0	1.0	1.0
CAC 1 -99	1.9 (1.7 - 2.2)	1.2 (1.1 - 1.4)	1.2(1.0 - 1.4)
CAC 100-399	3.6 (3.1 - 4.1)	1.5 (1.3 - 1.8)	1.5 (1.2 - 1.7)
CAC ≥ 400	7.6 (6.7 - 8.7)	2.4 (2.0 - 2.8)	2.2 (1.9 - 2.6)
❖ Log(CAC+1)	1.4 (1.3 - 1.4)	1.1 (1.1 - 1.2)	1.1 (1.1 - 1.2)
❖ CAC (Yes/No)	3.4 (3.0 - 3.8)	1.5 (1.3 - 1.7)	1.4 (1.2 - 1.6)
Asian			
CAC 0	1.0	1.0	1.0
CAC 1-99	2.9 (1.3 - 6.6)	1.7 (0.7 - 4.1)	1.8 (0.7 - 4.2)
CAC 100-399	4.7 (1.9 - 11.5)	1.7 (0.6 - 4.5)	1.7 (0.6 - 4.6)
CAC ≥ 400	13.4 (6.2 - 29.2)	3.7 (1.5 - 9.2)	3.3 (1.3 - 8.6)
❖ Log (CAC+1)	1.5 (1.3 - 1.7)	1.3 (1.1 - 1.4)	1.2 (1.1 - 1.4)
❖ CAC (Yes/No)	5.2 (2.6 - 10.7)	2.0 (0.9 - 4.5)	2.0 (0.9 - 4.4)
Blacks			
CAC 0	1.0	1.0	1.0
CAC 1-99	2.2 (1.2 - 4.1)	1.9 (1.0 - 3.6)	1.6 (0.8 - 3.0)
CAC 100-399	5.4 (2.9 - 10.2)	3.9 (2.0 - 7.6)	3.0 (1.5 - 6.0)
CAC ≥ 400	10.8 (5.9 - 19.6)	7.7 (4.1 - 14.6)	5.2 (2.7 - 10.0)
❖ Log (CAC+1)	1.4 (1.3 - 1.5)	1.3 (1.2 - 1.5)	1.3 (1.2 - 1.4)
❖ CAC (Yes/No)	4.2 (2.5 - 7.2)	3.1 (1.8 - 5.5)	2.4 (1.4 - 4.3)
Hispanics			
CAC 0	1.0	1.0	1.0
CAC 1-99	2.5 (1.3 - 5.0)	2.0 (0.99 - 4.0)	1.8 (0.9 - 3.6)
CAC 100-399	5.7 (2.8 - 11.7)	3.7 (1.7 - 8.0)	3.0 (1.3 - 6.5)
CAC ≥ 400	11.1 (5.7 - 21.3)	6.5 (3.1 - 13.6)	4.8 (2.3 - 10.3)
❖ Log (CAC+1)	1.4 (1.3 - 1.5)	1.3 (1.2 - 1.5)	1.3 (1.1 - 1.4)
❖ CAC (Yes/No)	4.7 (2.6 - 8.5)	3.0 (1.6 - 5.6)	2.4 (1.3 - 4.5)

†- Model 1 estimates are adjusted for study site, age and sex, while model 2 estimates are adjusted for model 1 variables and hypertension, hyperlipidemia, cigarette smoking, family history of CVD and diabetes mellitus.

Table S5. Risk of CVD mortality associated with CAC by race/ethnic group, showing unadjusted and minimally adjusted results.†

	Unadjusted SHR (95% CI)	Model 1 SHR (95% CI)	Model 2 SHR (95% CI)
Whites			
CAC 0	1.0	1.0	1.0
CAC 1-99	2.8 (2.0 – 3.8)	1.7 (1.2 – 2.3)	1.6 (1.1 – 2.2)
CAC 100-399	6.4 (4.6 – 8.7)	2.4 (1.7 – 3.4)	2.2 (1.6 – 3.1)
CAC ≥ 400	15.6 (11.6 – 20.8)	4.1 (2.9 – 5.8)	3.6 (2.5 – 5.1)
❖ Log(CAC+1)	1.5 (1.5 – 1.6)	1.3 (1.2 – 1.3)	1.2 (1.2 – 1.3)
❖ CAC (Yes/No)	6.1 (4.7 – 8.1)	2.3 (1.7 – 3.0)	2.1 (1.5 – 2.8)
Asians §			
CAC 0	1.0	1.0	1.0
CAC 1-99	-	-	-
CAC 100-399	-	-	-
CAC ≥ 400	-	-	-
❖ Log (CAC+1)	2.3 (1.8 – 3.0)	2.2 (1.7 – 2.9)	2.3 (1.8 – 2.9)
❖ CAC (Yes/No)	-	-	-
Blacks			
CAC 0	1.0	1.0	1.0
CAC 1-99	0.9 (0.4 – 2.4)	0.9 (0.3 – 2.4)	0.7 (0.3 – 2.0)
CAC 100-399	3.9 (1.7 – 9.3)	3.3 (1.2 – 9.4)	2.5 (0.9 – 7.6)
CAC ≥ 400	8.8 (5.9 – 18.9)	7.3 (2.8 – 19.4)	4.7 (1.8 – 12.8)
❖ Log (CAC+1)	1.4 (1.3 – 1.6)	1.4 (1.2 – 1.7)	1.3 (1.1 – 1.6)
❖ CAC (Yes/No)	2.9 (1.4 – 5.8)	2.2 (1.0 – 4.9)	1.7 (0.8 – 3.8)
Hispanics			
CAC 0	1.0	1.0	1.0
CAC 1-99	1.9 (0.65 – 5.4)	1.7 (0.6 – 5.0)	1.8 (0.9 – 3.6)
CAC 100-399	3.5 (1.1 – 11.3)	2.7 (0.8 – 9.7)	3.0 (1.3 – 6.5)
CAC ≥ 400	11.7 (4.5 – 30.1)	8.9 (2.8 – 28.3)	4.8 (2.3 – 10.3)
❖ Log (CAC+1)	1.4 (1.2 – 1.6)	1.4 (1.2 – 1.6)	1.3 (1.1 – 1.4)
❖ CAC (Yes/No)	4.0 (1.7 – 9.7)	2.9 (1.1 – 7.4)	2.4 (1.3 – 4.5)

† - Model 1 estimates were adjusted for study site, age and sex, while model 2 estimates were adjusted for model 1 variables and hypertension, hyperlipidemia, cigarette smoking, family history of CVD and diabetes mellitus.

§ - No CVD deaths noted in Asians with CAC=0, analysis by CAC group and dichotomous CAC not possible.

Table S6. C-statistics for the overall and sex-specific ROC curves for all-cause and CVD mortality using the Framingham risk scores with and without accounting for CAC, by race/ethnicity.

C-statistic	All	Women	Men
	ALL-CAUSE MORTALITY		
Whites			
FRS + CAC	0.699	0.679	0.736
FRS (No CAC)	0.649	0.549	0.705
	<0.001	<0.001	<0.001
Asians			
FRS + CAC	0.781	0.770	0.821
FRS (No CAC)	0.719	0.674	0.756
	<0.001	0.02	0.006
Blacks			
FRS + CAC	0.740	0.747	0.732
FRS (No CAC)	0.681	0.677	0.691
	<0.001	0.004	0.03
Hispanics			
FRS + CAC	0.721	0.757	0.692
FRS (No CAC)	0.632	0.679	0.600
	<0.001	0.01	0.002
	CVD MORTALITY		
Whites			
FRS + CAC	0.740	0.786	0.774
FRS (No CAC)	0.680	0.515	0.745
	<0.001	<0.001	<0.001
Asians			
FRS + CAC	0.852	0.763	0.855
FRS (No CAC)	0.655	0.676	0.662
	<0.001	0.60	0.004
Blacks			
FRS + CAC	0.752	0.786	0.734
FRS (No CAC)	0.698	0.734	0.694
	0.02	0.09	0.17
Hispanics			
FRS + CAC	0.723	0.791	0.690
FRS (No CAC)	0.670	0.739	0.631
	0.05	0.25	0.11

Corresponding p-values testing the differences between AUC c-statistics derived with and without CAC are highlighted in bold-type.

Table S7. C-statistics for the overall and sex-specific AUC curves for all-cause and CVD mortality using risk factors with and without accounting for CAC, by race/ethnicity.

	All	Women	Men
	ALL-CAUSE DEATH		
Whites			
Risk factors + CAC	0.785	0.778	0.791
Risk factors (No CAC)	0.781	0.774	0.786
	<0.001	0.001	<0.001
Asians			
Risk factors + CAC	0.831	0.822	0.838
Risk factors (No CAC)	0.823	0.813	0.827
	0.22	0.31	0.30
Blacks			
Risk factors + CAC	0.782	0.771	0.796
Risk factors (No CAC)	0.757	0.742	0.772
	0.003	0.02	0.03
Hispanics			
Risk factors + CAC	0.785	0.888	0.742
Risk factors (No CAC)	0.763	0.873	0.715
	0.007	0.16	0.02
	CVD MORTALITY		
Whites			
Risk factors + CAC	0.819	0.871	0.797
Risk factors (No CAC)	0.814	0.865	0.791
	<0.001	0.005	<0.001
Asians			
Risk factors + CAC	0.818	0.781	0.891
Risk factors (No CAC)	0.790	0.782	0.848
	0.04	0.81	0.07
Blacks			
Risk factors + CAC	0.790	0.740	0.778
Risk factors (No CAC)	0.753	0.694	0.746
	0.04	0.21	0.23
Hispanics			
Risk factors + CAC	0.770	0.871	0.729
Risk factors (No CAC)	0.745	0.861	0.686
	0.05	0.46	0.04

Corresponding p-values testing the differences between AUCs derived with and without CAC are highlighted in bold-type.