Supplemental Material

Table S1. Estimation of race- and sex-specific risk for atherosclerosis cardiovascular disease using the Pooled Cohort risk equations.[1]

	$S_0(t)$ at 5 years†	Mean score	Equations parameters*
			Individual score‡
Participants not taking antihypertensive medications			
Black women	0.98194	86.61	= 17.114 × ln(age) + 0.94 × ln(TC) - 18.92 × ln(HDL-C) + 4.475 × ln(age) × ln(HDL-C) + 27.82 × ln(SBP) - 6.087 × ln(age) × ln(SBP) (+ 0.691 if current smoker)
White women	0.98898	-29.18	= - 29.799 × ln(age) + 4.884 × ln(age)^2 + 13.54 × ln(TC) - 3.114 × ln(age) × ln(TC) -13.578 × ln(HDL-C) + 3.149 × ln(age) × ln(HDL-C) + 1.957 × ln(SBP) (+ 7.574 - 1.665 × ln(age) if current smoker)
Black men	0.95726	19.54	= 2.469 × ln(age) + 0.302 × ln(TC) - 0.307 × ln(HDL-C) + 1.809 × ln(SBP) (+ 0.549 if current smoker)
White men	0.96254	61.18	= 12.344 × ln(age) + 11.853 × ln(TC) - 2.664 × ln(age) × ln(TC) - 7.99 × ln(HDL-C) + 1.769 × ln(age) × ln(HDL-C) + 1.764 × ln(SBP) (+ 7.837 - 1.795 × ln(age) if current smoker)
Participants taking antihypertensive medications			
Black women	0.98194	86.61	= 17.114 × ln(age) + 0.94 × ln(TC) - 18.92 × ln(HDL-C) + 4.475 × ln(age) × ln(HDL-C) + 29.291 × ln(SBP) - 6.432 × ln(age) × ln(SBP) (+ 0.691 if current smoker)
White women	0.98898	-29.18	= - 29.799 × ln(age) + 4.884 × ln(age)^2 + 13.54 × ln(TC) - 3.114 × ln(age) × ln(TC) -13.578 × ln(HDL-C) + 3.149 × ln(age) × ln(HDL-C) + 2.019 × ln(SBP) (+ 7.574 - 1.665 × ln(age) if current smoker)
Black men	0.95726	19.54	= 2.469 × ln(age) + 0.302 × ln(TC) - 0.307 × ln(HDL-C) + 1.916 × ln(SBP) (+ 0.549 if current smoker)
White men	0.96254	61.18	= 12.344 × ln(age) + 11.853 × ln(TC) - 2.664 × ln(age) × ln(TC) - 7.99 × ln(HDL-C) + 1.769 × ln(age) × ln(HDL-C) + 1.797 × ln(SBP) (+ 7.837 - 1.795 × ln(age) if current smoker)

* Final risk estimation is calculated as:

$$Predicted\ ASCVD\ risk = 1 - S_0(t)^{e^{(Individual\ score - Mean\ score)}}$$

† Obtained from the ACC/AHA Guideline on the Assessment of Cardiovascular Risk working group.[2]
‡ For clarity, coefficients for diabetes are not shown because REGARDS study participants with diabetes were excluded from the analysis.
ACC: American College of Cardiology; AHA: American Heart Association; HDL-C: high-density lipoprotein cholesterol; REGARDS: REasons for Geographic And Racial Differences in Stroke; SBP: systolic blood pressure; TC: total cholesterol.

Table S2. Calibration of the atherosclerotic cardiovascular disease Pooled Cohort risk equations by the cumulative number of indicators showing deprivation.

Cumulative number of indicators showing deprivation*	5-year incidence rate per 1,000 person-years by quintile of predicted risk					Hosmer-Lemeshow χ^2 (p-value)
	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	
0 (less deprivation)						
Observed (95% CI)†	0.84 (0.32, 2.24)	2.30 (1.28, 4.14)	5.97 (4.14, 8.59)	7.23 (5.19, 10.04)	14.83 (11.81, 18.60)	12.43 (0.01)
Predicted‡	0.98	3.05	6.02	10.22	19.80	
1						
Observed (95% CI)†	1.35 (0.44, 4.16)	3.96 (2.07, 7.54)	4.77 (2.66, 8.54)	5.64 (3.29, 9.62)	17.35 (12.87, 23.29)	6.60 (0.09)
Predicted‡	1.37	3.37	6.03	10.03	19.46	-
2-3 (more deprivation)						
Observed (95% CI)†	4.29 (1.93, 9.44)	5.66 (2.84, 11.19)	7.74 (4.42, 13.44)	13.84 (9.03, 21.08)	25.97 (19.13, 35.01)	5.77 (0.12)
Predicted‡	2.10	4.90	8.07	12.26	21.82	-

* The cumulative number of indicators showing deprivation is calculated by adding 1 for being in each of the following 3 categories: annual household income less than $25,000 dollars; less than high school education, and living without a partner. Possible values for the cumulative number of indicators showing deprivation range from 0 to 3.

† Adjusted using the Kaplan-Meier method.

‡ Determined using the atherosclerotic cardiovascular disease Pooled Cohort risk equations.

The category with more deprivation is shown in **bold** in the table.

CI: confidence interval.

Table S3. Calibration of the atherosclerotic cardiovascular disease Pooled Cohort risk equations by annual household income.

Annual household income (US$)	5-year incidence rate per 1,000 person-years by quintile of predicted risk					Hosmer-Lemeshow χ^2 (p-value)
	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	
≥$50,000						
Observed (95% CI)*	0.85 (0.27, 2.61)	2.48 (1.29, 4.74)	4.42 (2.72, 7.17)	6.07 (4.02, 9.15)	11.93 (8.91, 15.92)	10.91 (0.01)
Predicted†	0.84	2.46	5.04	8.75	17.48	-
$25,000 to <$50,000						
Observed (95% CI)*	1.34 (0.50, 3.54)	3.76 (2.09, 6.74)	6.87 (4.46, 10.56)	6.74 (4.37, 10.35)	18.79 (14.55, 24.20)	8.09 (0.04)
Predicted†	1.51	4.02	7.07	11.56	21.63	-
<$25,000						
Observed (95% CI)*	3.89 (1.86, 8.09)	4.87 (2.54, 9.27)	8.07 (4.98, 13.03)	12.37 (8.36, 18.20)	24.58 (18.73, 32.09)	4.74 (0.19)
Predicted†	2.01	4.74	7.97	12.10	21.78	-

* Adjusted using the Kaplan-Meier method.
† Determined using the atherosclerotic cardiovascular disease Pooled Cohort risk equations.
The category used to define deprivation is shown in **bold** in the table.
CI: confidence interval; US$: United States dollars.

Table S4. Calibration of the atherosclerotic cardiovascular disease Pooled Cohort risk equations by education.

Education	5-year incidence rate per 1,000 person-years by quintile of predicted risk					Hosmer-Lemeshow χ² (p-value)
	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	
College graduate and above						
Observed (95% CI)*	0.85 (0.27, 2.62)	3.04 (1.69, 5.46)	3.84 (2.28, 6.44)	8.12 (5.68, 11.58)	14.34 (10.99, 18.66)	9.01 (0.03)
Predicted†	0.96	2.88	5.71	9.75	19.40	-
High school/Some college						
Observed (95% CI)*	1.20 (0.50, 2.88)	4.58 (2.93, 7.13)	6.12 (4.19, 8.94)	7.12 (5.03, 10.05)	16.96 (13.57, 21.14)	8.62 (0.03)
Predicted†	1.37	3.62	6.49	10.51	19.64	-
Less than high school						
Observed (95% CI)*	5.00 (1.62, 15.20)	3.20 (0.81, 12.49)	11.63 (5.59, 23.77)	14.76 (7.78, 27.51)	40.04 (27.43, 57.41)	8.92 (0.03)
Predicted†	2.67	6.23	10.08	14.71	25.71	-

* Adjusted using the Kaplan-Meier method.
† Determined using the atherosclerotic cardiovascular disease Pooled Cohort risk equations.
The category used to define deprivation is shown in **bold** in the table.
CI: confidence interval.

Table S5. Calibration of the atherosclerotic cardiovascular disease Pooled Cohort risk equations by relationship status.

Relationship status	5-year incidence rate per 1,000 person-years by quintile of predicted risk					Hosmer-Lemeshow χ^2 (p-value)
	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	
Living with a partner						
Observed (95% CI)*	1.08 (0.49, 2.40)	2.53 (1.50, 4.25)	6.57 (4.76, 9.05)	7.39 (5.47, 9.97)	17.10 (14.08, 20.74)	11.45 (0.01)
Predicted†	1.08	3.32	6.42	10.77	20.52	-
Living without a partner						
Observed (95% CI)*	1.39 (0.52, 3.68)	5.84 (3.65, 9.32)	4.71 (2.80, 7.90)	7.82 (5.23, 11.66)	19.48 (15.15, 24.96)	7.49 (0.06)
Predicted†	1.51	3.67	6.35	10.21	19.40	-

* Adjusted using the Kaplan-Meier method.

† Determined using the atherosclerotic cardiovascular disease Pooled Cohort risk equations.

The category used to define deprivation is shown in **bold** in the table.

CI: confidence interval.

Table S6. Observed and predicted incidence rates of atherosclerotic cardiovascular disease and calibration and discrimination of the Pooled Cohort risk equations by social deprivation status (using multiple imputation with 12 imputed data sets, n = 10,768).

	Events / Person-years	Events in 5 years		5-year incidence rate*		Calibration Hosmer-Lemeshow χ^2, range across 12 imputations	p-value, range across 12 imputations	Discrimination
		Observed†	Predicted‡	Observed (95% CI)†	Predicted‡			C-index (95% CI)
Cumulative number of indicators showing deprivation								
0 (less deprived)	252 / 39,078	172	232	5.89 (4.97, 6.80)	7.94	17.77, 20.98	All <0.001	0.722 (0.690, 0.753)
1	136 / 19,154	96	119	6.57 (5.24, 7.96)	8.11	6.22, 10.88	0.01, 0.10	0.728 (0.684, 0.772)
2-3 (more deprived)	**139 / 12,301**	**112**	**99**	**11.18 (9.07, 13.56)**	**9.87**	**4.64, 9.72**	**0.02, 0.20**	**0.693 (0.647, 0.740)**
Indicators of social deprivation status								
Annual household income (US$)								
≥$50,000	160 / 29,883	109	155	4.88 (4.00, 5.80)	6.92	13.86, 19.06	<0.001, 0.003	0.724 (0.684, 0.765)
$25,000 to <$50,000	190 / 24,470	133	167	7.20 (6.02, 8.46)	9.06	8.82, 14.21	0.003, 0.03	0.711 (0.673, 0.748)
<$25,000	**178 / 16,179**	**137**	**127**	**10.52 (8.59, 12.44)**	**9.76**	**6.75, 11.68**	**0.01, 0.08**	**0.702 (0.663, 0.742)**
Education								
College graduate and above	187 / 29,662	128	168	5.90 (4.91, 6.93)	7.73	10.58, 11.98	0.01, 0.01	0.725 (0.688, 0.763)
High school/Some college	270 / 35,609	194	230	7.00 (6.01, 8.01)	8.29	10.70, 12.75	0.01, 0.01	0.706 (0.675, 0.737)
Less than high school	**70 / 5,260**	**57**	**51**	**13.11 (9.73, 16.88)**	**11.78**	**3.84, 10.72**	**0.01, 0.28**	**0.728 (0.666, 0.790)**
Relationship status								
Living with a partner	328 / 46,128	227	291	6.52 (5.67, 7.41)	8.37	17.86, 19.62	All <0.001	0.722 (0.695, 0.750)
Living without a partner	**199 / 24,403**	**150**	**158**	**7.87 (6.60, 9.24)**	**8.30**	**2.90, 4.81**	**0.19, 0.41**	**0.718 (0.681, 0.755)**

* Incidence rates are expressed per 1,000 person-years.
† Adjusted using the Kaplan-Meier method.
‡ Determined using the atherosclerotic cardiovascular disease Pooled Cohort risk equations.
Categories used to define deprivation within each indicator of social deprivation status are shown in **bold** in the table.
The median and maximum follow-up among participants included in the present analysis were 7.0 and 9.9 years, respectively.
For analyses in this table, we imputed 12 data sets using chained equations in Stata/I.C. version 12.1 (Stata Corporation, College Station, TX). We calculated the mean number of events, person-years of follow-up, observed and predicted number of events in 5 years, observed and predicted 5-year incidence rates, and C-index across the 12 imputed data sets. We calculated 95% confidence intervals for the observed 5-year incidence rate and C-index as described by White et al.[3]
For calibration, we report the range of Hosmer-Lemeshow χ^2 statistics and the corresponding p-value across the 12 imputed data sets.
CI: confidence interval; US$: United States dollars.

Table S7. Observed and predicted incidence rates of atherosclerotic cardiovascular disease and calibration and discrimination of the Pooled Cohort risk equations by area deprivation index.

Area deprivation index in participants' census tract†	Events / Person-years	Events in 5 years		5-year incidence rate*		Calibration Hosmer-Lemeshow χ^2	p-value	Discrimination
		Observed‡	Predicted§	Observed (95% CI)‡	Predicted§			C-index (95% CI)
-47.0 to <96.7	87 / 13,794	62	79	6.08 (4.72, 7.81)	7.73	4.51	0.21	0.74 (0.69, 0.80)
96.7 to <106.5	108 / 13,675	76	83	7.46 (5.95, 9.36)	8.15	8.68	0.03	0.71 (0.66, 0.76)
106.5 to <112.8	106 / 13,572	77	88	7.49 (5.96, 9.41)	8.59	3.91	0.27	0.75 (0.71, 0.79)
112.8 to 127.2	**106 / 12,945**	**79**	**93**	**7.69 (6.11, 9.66)**	**9.08**	**4.91**	**0.18**	**0.69 (0.64, 0.74)**

* Incidence rates are expressed per 1,000 person-years.
† Categories of area deprivation index were defined using quartiles of distribution.
‡ Adjusted using the Kaplan-Meier method.
§ Determined using the atherosclerotic cardiovascular disease Pooled Cohort risk equations.
The category with more deprivation is shown in **bold** in the table.
Data used to calculate the Hosmer-Lemeshow χ^2 are shown in **Table S7**.
The median and maximum follow-up among participants included in the present analysis were 7.0 and 9.9 years, respectively.
CI: confidence interval.

Table S8. Calibration of the atherosclerotic cardiovascular disease Pooled Cohort risk equations by area deprivation index.

Area deprivation index in participants' census tract*	5-year incidence rate per 1,000 person-years by quintile of predicted risk					Hosmer-Lemeshow χ² (p-value)
	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	
-47.0 to <96.7						
Observed (95% CI)†	1.06 (0.26, 4.19)	2.54 (1.06, 6.05)	3.64 (1.74, 7.57)	7.08 (4.22, 11.81)	16.15 (11.49, 22.58)	4.51 (0.21)
Predicted‡	0.92	2.78	5.59	9.91	19.44	-
96.7 to <106.5						
Observed (95% CI)†	0.50 (0.07, 3.54)	5.68 (3.16, 10.14)	7.18 (4.28, 11.98)	6.79 (3.97, 11.55)	17.31 (12.45, 23.93)	8.68 (0.03)
Predicted‡	1.18	3.16	6.15	10.28	19.96	-
106.5 to <112.8						
Observed (95% CI)†	1.07 (0.27, 4.26)	1.59 (0.51, 4.91)	5.70 (3.17, 10.17)	8.48 (5.24, 13.67)	20.45 (15.14, 27.48)	3.91 (0.27)
Predicted‡	1.34	3.69	6.58	10.77	20.57	-
112.8 to 127.2						
Observed (95% CI)†	2.82 (1.18, 6.72)	4.34 (2.18, 8.59)	5.90 (3.29, 10.54)	9.01 (5.65, 14.30)	16.54 (11.70, 23.26)	4.91 (0.18)
Predicted‡	1.70	4.47	7.44	11.28	20.49	-

* Categories of area deprivation index were defined using quartiles of distribution.
† Adjusted using the Kaplan-Meier method.
‡ Determined using the atherosclerotic cardiovascular disease Pooled Cohort risk equations.
The category with more deprivation is shown in **bold** in the table.
CI: confidence interval.

Table S9. Hazard ratios for atherosclerosis cardiovascular disease associated with categories of area deprivation index.

Area deprivation index in participants' census tract*	Hazard ratio (95% CI)		
	Crude	**Model 1**	**Model 2**
-47.0 to <96.7	1 (reference)	1 (reference)	1 (reference)
96.7 to <106.5	1.25 (0.94-1.66)	1.28 (0.97-1.70)	1.17 (0.88-1.55)
106.5 to <112.8	1.24 (0.93-1.65)	1.27 (0.95-1.69)	1.08 (0.81-1.44)
112.8 to 127.2	**1.30 (0.98-1.73)**	**1.37 (1.01-1.84)**	**1.14 (0.85-1.55)**

* Categories of area deprivation index were defined using quartiles of distribution.
The category with more deprivation is shown in **bold** in the table.
CI: confidence interval; HDL-C: high-density lipoprotein cholesterol; SBP: systolic blood pressure.

Model 1 adjusts for age, sex and race.
Model 2 adjusts for age, sex and race, smoking status, total cholesterol, HDL-C, SBP and use of antihypertensive medications.

Figure S1. Flow-chart of REGARDS study participants included in the analysis.
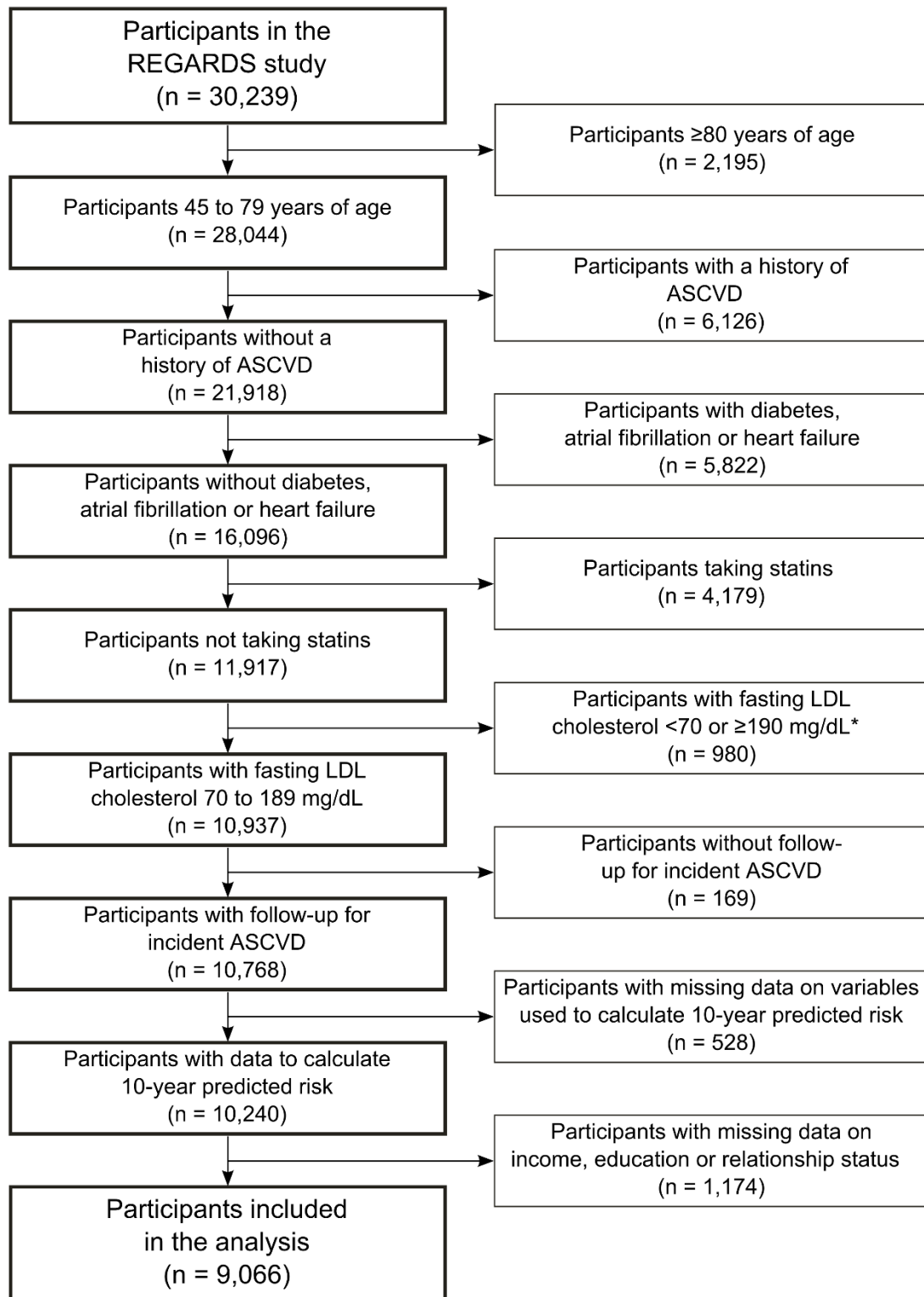
ASCVD: atherosclerotic cardiovascular disease; HDL-C: high-density lipoprotein cholesterol; LDL-C: low-density lipoprotein cholesterol; REGARDS: REasons for Geographic And Racial Differences in Stroke.
* Or non-HDL-C <100 or ≥220 mg/dL if fasting LDL cholesterol was not available.

Supplemental References:

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2. Muntner P, Colantonio LD, Cushman M, Goff DC Jr, Howard G, Howard VJ, Kissela B, Levitan EB, Lloyd-Jones DM, Safford MM. Validation of the atherosclerotic cardiovascular disease Pooled Cohort risk equations. *JAMA.* 2014;311:1406-15.

3. White IR, Royston P, Wood AM. Multiple imputation using chained equations: Issues and guidance for practice. *Stat Med.* 2011;30:377-99.