SUPPLEMENTAL MATERIAL

Table S1. Estimation of race- and gender-specific ASCVD risk using the ASCVD Pooled Cohort risk equations.[1]

	Equations parameters*			
	$S_0(t)$ at 5 years[2]	**$S_0(t)$ at 10 years**	**Mean score**	**Individual score**
Participants not taking antihypertensive medications				
Black women	0.98194	0.9533	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) (+ 0.874 if diabetes)
Black men	0.95726	0.8954	19.54	= 2.469 × ln(age) + 0.302 × ln(TC) - 0.307 × ln(HDL-C) + 1.809 × ln(SBP) (+ 0.549 if current smoker) (+ 0.645 if diabetes)
Participants taking antihypertensive medications				
Black women	0.98194	0.9533	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) (+ 0.874 if diabetes)
Black men	0.95726	0.8954	19.54	= 2.469 × ln(age) + 0.302 × ln(TC) - 0.307 × ln(HDL-C) + 1.916 × ln(SBP) (+ 0.549 if current smoker) (+ 0.645 if diabetes)

ASCVD: atherosclerotic cardiovascular disease; HDL-C: high-density lipoprotein cholesterol; SBP: systolic blood pressure; TC: total cholesterol.

* Final risk estimation is calculated as:

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

Table S2. Increase in mean 10-year predicted ASCVD risk (%) between visits 1 and 3, overall, and attributable to aging and changes in modifiable risk factors among participants age ≥ 40 years at visit 1 (n=798).

		Increase in 10-year ASCVD risk (visit 3 – visit 1) due to changes in each risk factor		
Risk Factor	**Mean 10-year predicted ASCVD Risk (95% CI)**	**Increase* (95% CI)**	**Percentage of overall increase (95% CI)**	**Ratio as compared to aging (95% CI)**
Observed risk at visit 1	3.01 (2.86, 3.15)			
Observed risk at visit 3	7.31 (6.97, 7.67)			
Overall increase (visit 3 minus visit 1)	4.31 (4.05, 4.61)		100 (reference)	
Risk factor at visit 1 used for prediction				
Age	4.34 (4.10, 4.59)	2.98 (2.84, 3.14)	69.1 (66.8, 71.7)	100 (reference)
SBP or initiation of antihypertensive medication	5.84 (5.57, 6.16)	1.47 (1.30, 1.66)	34.2 (31.1, 37.6)	49.5 (44.1, 55.2)
Smoking	7.31 (6.98, 7.65)	0.00 (-0.08, 0.09)	ǂ	ǂ
Diabetes	6.54 (6.27, 6.86)	0.78 (0.61, 0.97)	18.0 (14.8, 21.5)	26.1 (20.9, 31.5)
Total and HDL cholesterol	7.55 (7.22, 7.91)	-0.24 (-0.32, -0.15)	ǂ	ǂ

ASCVD= atherosclerotic cardiovascular disease, CI= confidence interval, HDL= high-density lipoprotein, SBP = systolic blood pressure.
*The overall increase in 10-year predicted ASCVD risk attributable to aging and the change in each risk factor, separately, calculated as the 10-year predicted ASCVD risk at visit 3 minus the re-calculated 10-year predicted ASCVD risk at visit 3 assuming a risk factor hadn't changed from visit 1.
The equations used to calculate percentage of overall increase and the ratio as compared to aging are shown in Figure S1.
ǂ Smoking and cholesterol did not contribute to the increase mean 10-year predicted ASCVD risk increase.
Bootstrapping was used to quantify the 95% CIs of the 10-year predicted ASCVD risk estimates.
The percentages in the column labeled "Percentage of overall increase (95% CI)" do not add up to 100% because they are not mutually exclusive.

Table S3. Percentage of participants ≥ 40 years of age developing high predicted ASCVD risk between Jackson Heart Study visits 1 and 3, overall, and attributable to aging and modifiable risk factors.

		High 10-year predicted ASCVD Risk (95% CI)		
Risk Factor	**High 10-year predicted ASCVD Risk (95% CI)**	**Percent (95% CI)**	**Percent over observed high risk (95% CI)**	**Ratio as compared to aging (95% CI)**
Observed				
Visit 1	0			
Visit 3	41.6 (38.2, 45.1)			
Overall increase (visit 3 minus visit 1)	41.6 (38.2, 45.1)		100 (reference)	
Risk factor at visit 1 used for prediction				
Age	16.9 (14.4, 19.3)	24.7 (21.6, 27.8)	59.3 (54.0, 64.4)	100 (reference)
SBP or initiation of antihypertensive medication	28.9 (25.9, 32.0)	12.7 (10.0, 15.2)	30.4 (24.9, 36.2)	51.3 (42.5, 60.0)
Smoking	41.9 (38.6, 45.3)	-0.3 (-1.1, 0.5)	ǂ	ǂ
Diabetes	36.3 (33.2, 39.9)	5.3 (3.6, 6.8)	12.7 (8.9, 16.2)	21.3 (15.2, 27.8)
Total and HDL cholesterol	42.7 (39.5, 46.1)	-1.1 (-2.8, 0.4)	ǂ	ǂ

The equations used to calculate the percent over observed high risk and the ratio as compared to aging are shown in Figure S1.
ASCVD= atherosclerotic cardiovascular disease, CI= confidence interval, HDL= high-density lipoprotein, SBP = systolic blood pressure.
ǂ Percentage of overall change due to smoking and cholesterol not contributing to the development of high 10-year predicted ASCVD risk.
Bootstrapping was used to quantify the 95% CIs of the percentage developing a high 10-year ASCVD predicted risk.
High predicted ASCVD risk is defined at ≥ 7.5%.
The percentages in the column labeled “Percent over observed high risk (95% CI)” do not add up to 100% because they are not mutually exclusive.

Table S4. Participant characteristics at visit 1 (top panel) and visit 3 (bottom panel) overall and by 10-year predicted ASCVD risk at visit 3 among those age < 50 years (n=771).

	All participants N=771	10-year ASCVD risk at visit 3		P Value
		<7.5% N=652	≥7.5% N=119	
Characteristics at visit 1				
Age, years	40.3 (6.6)	39.5 (6.7)	44.4 (3.9)	<0.001
Age group, years				
<30	70 (9.1)	69 (10.6)	1 (0.8)	<0.001
30 – 39	247 (32.0)	235 (36.0)	12 (10.1)	
40 – 49	454 (58.9)	348 (53.4)	106 (89.1)	
50 – 59	0 (0.0)	0 (0.0)	0 (0.0)	
≥60	0 (0.0)	0 (0.0)	0 (0.0)	
Male sex, %	277 (35.9)	191 (29.3)	86 (72.3)	<0.001
Less than high school education, %	43 (5.6)	32 (4.9)	11 (9.2)	0.08
Current smoker, %	82 (10.6)	50 (7.7)	32 (26.9)	<0.001
BMI, kg/m^2	30.9 (7.2)	31.0 (7.5)	30.5 (5.7)	0.50
SBP, mm Hg	116.1 (10.2)	115.0 (9.9)	121.9 (9.4)	<0.001
DBP, mm Hg	74.4 (7.2)	73.7 (7.1)	78.1 (6.5)	<0.001
Total cholesterol, mg/dL	189.3 (37.9)	187.1 (37.0)	201.2 (40.8)	<0.001
HDL cholesterol, mg/dL	50.5 (12.9)	51.5 (13.0)	45.0 (10.7)	<0.001
LDL cholesterol, mg/dL	121.9 (36.2)	119.9 (35.4)	133.0 (38.7)	<0.001
Statin use, %	6 (0.8)	3 (0.5)	3 (2.7)	0.05
Characteristics at visit 3				
Age, years	48.4 (6.6)	47.6 (6.7)	52.6 (3.7)	<0.001
Age group, years				
<30	7 (0.9)	7 (1.1)	0 (0.0)	<0.001
30 – 39	81 (10.5)	79 (12.1)	2 (1.7)	
40 – 49	316 (41.0)	293 (44.9)	23 (19.3)	
50 – 59	366 (47.5)	272 (41.7)	94 (79.0)	
60 – 69	1 (0.1)	1 (0.2)	0 (0.0)	
≥70	0 (0.0)	0 (0.0)	0 (0.0)	
Male sex, %	277 (35.9)	191 (29.3)	86 (72.3)	<0.001
Less than high school education, %	38 (5.0)	29 (4.5)	9 (7.7)	0.16
Current smoker, %	78 (10.1)	45 (6.9)	33 (27.7)	<0.001
BMI, kg/m^2	32.7 (7.7)	32.8 (7.9)	31.9 (6.2)	0.25
SBP, mm Hg	120.2 (13.8)	118.3 (12.7)	130.8 (15.1)	<0.001
DBP, mm Hg	77.4 (10.0)	76.3 (9.4)	83.5 (11.1)	<0.001
Antihypertensive medication, %	232 (30.1)	159 (24.4)	73 (61.3)	<0.001
Hypertension, %	299 (38.8)	209 (32.1)	90 (75.6)	<0.001
Diabetes, %	68 (8.8)	27 (4.1)	41 (34.5)	<0.001
Total cholesterol, mg/dL	197.4 (37.5)	195.6 (36.3)	207.4 (42.3)	0.002
HDL cholesterol, mg/dL	56.5 (15.2)	57.7 (15.4)	50.1 (12.6)	<0.001
LDL cholesterol, mg/dL	123.0 (34.7)	121.0 (33.4)	133.8 (39.5)	<0.001
Statin use, %	72 (10.4)	54 (9.2)	18 (17.5)	0.02

Numbers in the table are mean (standard deviation) or n (percentage). BMI=body mass index, HDL= high-density lipoprotein, ASCVD= atherosclerotic cardiovascular disease, SBP =systolic blood pressure, DBP= diastolic blood pressure.

Table S5. Participant characteristics at visit 1 (top panel) and visit 3 (bottom panel) overall and by 10-year predicted ASCVD risk at visit 3 among those age ≥ 50 years (n=344).

	All participants N=344	10-year ASCVD Risk at Visit 3		P Value
		<7.5% N=118	≥7.5% N=226	
Characteristics at visit 1				
Age, years	56.1 (4.4)	53.3 (2.7)	57.6 (4.4)	<0.001
Age group, years				
<30	0 (0.0)	0 (0.0)	0 (0.0)	
30 – 39	0 (0.0)	0 (0.0)	0 (0.0)	<0.001
40 – 49	0 (0.0)	0 (0.0)	0 (0.0)	
50 – 59	266 (77.3)	114 (96.6)	152 (67.3)	
≥60	78 (22.7)	4 (3.4)	74 (32.7)	
Male sex, %	98 (28.5)	16 (13.6)	82 (36.3)	<0.001
Less than high school education, %	23 (6.7)	3 (2.5)	20 (8.9)	0.02
Current smoker, %	23 (6.7)	7 (5.9)	16 (7.1)	0.82
BMI, kg/m^2	30.6 (7.2)	30.8 (6.9)	30.5 (7.3)	0.75
SBP, mm Hg	118.2 (10.2)	116.3 (10.9)	119.2 (9.6)	0.01
DBP, mm Hg	73.5 (7.2)	72.6 (6.7)	74.0 (7.5)	0.11
Total cholesterol, mg/dL	202.2 (35.8)	198.5 (35.2)	204.2 (36.0)	0.16
HDL cholesterol, mg/dL	54.1 (13.8)	55.5 (13.4)	53.4 (14.1)	0.17
LDL cholesterol, mg/dL	129.8 (33.8)	126.1 (33.5)	131.7 (33.8)	0.14
Statin use, %	13 (4.1)	3 (2.6)	10 (4.9)	0.39
Characteristics at visit 3				
Age, years	64.0 (4.5)	61.2 (2.9)	65.5 (4.5)	<0.001
Age group, years				
<30	0 (0.0)	0 (0.0)	0 (0.0)	
30 – 39	0 (0.0)	0 (0.0)	0 (0.0)	
40 – 49	0 (0.0)	0 (0.0)	0 (0.0)	<0.001
50 – 59	73 (21.2)	44 (37.3)	29 (12.8)	
60 – 69	221 (64.2)	72 (61.0)	149 (65.9)	
≥70	50 (14.5)	2 (1.7)	48 (21.2)	
Male sex, %	98 (28.5)	16 (13.6)	82 (36.3)	<0.001
Less than high school education, %	26 (7.6)	3 (2.6)	23 (10.2)	0.01
Current smoker, %	22 (6.4)	1 (0.8)	21 (9.3)	0.002
BMI, kg/m^2	30.8 (6.4)	31.1 (6.8)	30.6 (6.1)	0.55
SBP, mm Hg	123.4 (14.8)	117.3 (12.9)	126.6 (14.7)	<0.001
DBP, mm Hg	73.9 (9.5)	72.4 (9.2)	74.7 (9.6)	0.03
Antihypertensive medication, %	123 (35.8)	23 (19.5)	100 (44.2)	<0.001
Hypertension, %	164 (47.7)	32 (27.1)	132 (58.4)	<0.001
Diabetes, %	37 (10.8)	1 (0.8)	36 (15.9)	<0.001
Total cholesterol, mg/dL	205.0 (35.9)	200.5 (31.8)	207.3 (37.7)	0.09
HDL cholesterol, mg/dL	61.2 (14.9)	63.6 (14.8)	59.9 (14.9)	0.03
LDL cholesterol, mg/dL	125.9 (32.5)	120.2 (28.5)	128.9 (34.0)	0.02
Statin use, %	61 (18.7)	19 (17.4)	42 (19.4)	0.76

Numbers in the table are mean (standard deviation) or n (percentage). BMI=body mass index, HDL= high-density lipoprotein, ASCVD= atherosclerotic cardiovascular disease, SBP =systolic blood pressure, DBP= diastolic blood pressure.

Table S6. Increase in mean 10-year predicted ASCVD risk between visits 1 and 3, overall, and attributable to aging and changes in modifiable risk factors among those age < 50 years (top panel) and ≥ 50 years (bottom panel).

Risk Factor	Mean 10-year predicted ASCVD Risk (95% CI)	Increase in 10-year ASCVD risk (visit 3 – visit 1) due to changes in each risk factor		
		Increase* (95% CI)	Percentage of overall increase (95% CI)	Ratio as compared to aging (95% CI)
Age < 50 years				
Observed risk at visit 1	1.60 (1.50, 1.72)			
Observed risk at visit 3	4.02 (3.77, 4.31)			
Overall increase (visit 3 minus visit 1)	2.42 (2.22, 2.62)		100 (reference)	
Risk factor at visit 1 used for prediction				
Age	2.34 (2.17, 2.54)	1.68 (1.59, 1.77)	69.3 (66.8, 72.1)	100 (reference)
SBP or initiation of antihypertensive medication	2.99 (2.82, 3.19)	1.02 (0.89, 1.17)	42.4 (38.9, 45.8)	61.1 (55.0, 67.9)
Smoking	4.05 (3.81, 4.33)	-0.03 (-0.08, 0.01)	ǂ	ǂ
Diabetes	3.60 (3.39, 3.82)	0.42 (0.32, 0.54)	17.5 (13.8, 20.9)	25.2 (19.6, 31.2)
Total and HDL cholesterol	4.24 (3.98, 4.53)	-0.22 (-0.28, -0.16)	ǂ	ǂ
Age ≥ 50 years				
Observed risk at Visit 1	4.22 (4.00, 4.41)			
Observed risk at Visit 3	10.02 (9.48, 10.62)			
Overall increase (visit 3 minus visit 1)	5.81 (5.31, 6.34)		100 (reference)	
Risk factor at visit 1 used for prediction				
Age	5.94 (5.52, 6.36)	4.08 (3.87, 4.33)	70.3 (66.8, 73.9)	100 (reference)
SBP or initiation of antihypertensive medication	8.35 (7.92, 8.82)	1.67 (1.33, 2.03)	28.8 (24.1, 33.3)	40.9 (33.3, 49.1)
Smoking	9.97 (9.45, 10.55)	0.05 (-0.11, 0.23)	0.9 (-1.9, 3.9)	1.3 (-2.7, 5.7)
Diabetes	9.03 (8.57, 9.48)	1.00 (0.71, 1.37)	17.2 (12.7, 22.2)	24.4 (17.8, 32.4)
Total and HDL cholesterol	10.26 (9.69, 10.90)	-0.24 (-0.40, -0.08)	ǂ	ǂ

ASCVD= atherosclerotic cardiovascular disease, CI= confidence interval, HDL= high-density lipoprotein, SBP = systolic blood pressure.
*The overall increase in 10-year predicted ASCVD risk attributable to aging and the change in each risk factor, separately, calculated as the 10-year predicted ASCVD risk at visit 3 minus the re-calculated 10-year predicted ASCVD risk at visit 3 assuming a risk factor hadn't changed from visit 1.
The equations used to calculate percentage of overall increase and the ratio as compared to aging are shown in Figure S1.
ǂ Smoking and cholesterol did not contribute to the increase mean 10-year predicted ASCVD risk increase.
Bootstrapping was used to quantify the 95% CIs of the 10-year predicted ASCVD risk estimates.
The percentages in the column labeled "Percentage of overall increase (95% CI)" do not add up to 100% because they are not mutually exclusive.

Table S7. Percentage of participants age < 50 years (top panel) and ≥ 50 years (bottom panel) developing high predicted ASCVD risk between Jackson Heart Study visits 1 and 3 attributable to aging and modifiable risk factors.

		High 10-year predicted ASCVD Risk (95% CI)		
Risk Factor	**High 10-year predicted ASCVD Risk (95% CI)**	**Percent (95% CI)**	**Percent over observed high risk (95% CI)**	**Ratio as compared to aging (95% CI)**
	Age < 50 years			
Observed				
Visit 1	0			
Visit 3	15.4 (12.8, 17.8)			
Overall increase (visit 3 minus visit 1)	15.4 (12.8, 17.8)		100 (reference)	
Risk factor at visit 1 used for prediction				
Age	5.3 (3.9, 6.9)	10.1 (8.0, 12.2)	65.5 (56.7, 73.6)	100 (reference)
SBP or initiation of antihypertensive medication	6.4 (4.5, 7.9)	9.1 (7.1, 11.2)	58.8 (49.2, 68.8)	89.7 (75.8, 104.5)
Smoking	15.8 (13.4, 18.3)	-0.4 (-1.2, 0.1)	ǂ	ǂ
Diabetes	11.8 (9.6, 13.7)	3.6 (2.5, 4.9)	23.5 (16.7, 31.7)	35.9 (25.7, 49.7)
Total and HDL cholesterol	16.2 (13.6, 18.7)	-0.8 (-2.1, 0.0)	ǂ	ǂ
	Age ≥ 50 years			
Observed				
Visit 1	0.0			
Visit 3	65.7 (60.2, 70.3)			
Overall increase (visit 3 minus visit 1)	65.7 (60.2, 70.3)		100 (reference)	
Risk factor at visit 1 used for prediction				
Age	28.5 (23.5, 33.1)	37.2 (32.0, 42.2)	56.6 (50.5, 63.5)	100 (reference)
SBP or initiation of antihypertensive medication	53.2 (47.7, 58.4)	12.5 (8.4, 16.6)	19.0 (13.2, 25.0)	33.6 (24.0, 44.8)
Smoking	66.0 (60.8, 70.6)	-0.3 (-1.7, 0.6)	ǂ	ǂ
Diabetes	61.0 (55.2, 66.0)	4.7 (2.6, 6.7)	7.1 (4.0, 10.6)	12.5 (6.9, 18.6)
Total and HDL cholesterol	66.6 (61.4, 71.2)	-0.9 (-4.1, 1.7)	ǂ	ǂ

The equations used to calculate the percent over observed high risk and the ratio as compared to aging are shown in Figure S1.
ASCVD= atherosclerotic cardiovascular disease, CI= confidence interval, HDL= high-density lipoprotein, SBP = systolic blood pressure.
ǂ Percentage of overall change due to smoking and cholesterol not contributing to the development of high 10-year predicted ASCVD risk.
Bootstrapping was used to quantify the 95% CIs of the percentage developing a high 10-year ASCVD predicted risk.
High predicted ASCVD risk is defined at ≥ 7.5%.
The percentages in the column labeled “Percent over observed high risk (95% CI)” do not add up to 100% because they are not mutually exclusive.

Figure S1. Equations used to calculate the percentage of overall change in 10-year predicted ASCVD risk due to risk factors and ratio as compared to aging.

Equations used to calculate contribution of risk factors on mean 10-year ASCVD predicted risk increase.

Equation 1

Increase in 10-year predicted ASCVD risk due to change in risk factor = 10-year predicted ASCVD risk at visit 3 – 10-year predicted ASCVD risk at visit 3 if no change in risk factor

Equation 2

Percentage of overall change in 10-year predicted ASCVD risk due to risk factor = $\frac{\text{Increase in 10-year predicted ASCVD risk due to change in risk factor (Equation 1)}}{\text{10-year predicted ASCVD risk at visit 3 – 10-year predicted ASCVD risk visit 1}} \times 100$

Equation 3

Ratio comparing change in 10-year predicted ASCVD risk due to risk factor versus aging = $\frac{\text{Percentage of overall change due to risk factor (Equation 2)}}{\text{Percentage of overall change due to aging (Equation 2 for age)}} \times 100$

Equations used to calculate contribution of risk factors on the development of high 10-year predicted ASCVD risk.

Equation 4

High 10-year predicted ASCVD risk due to change in risk factor = Percent with high 10-year predicted ASCVD risk at visit 3 – Percent with high 10-year predicted ASCVD risk if no change in risk factor

Equation 5

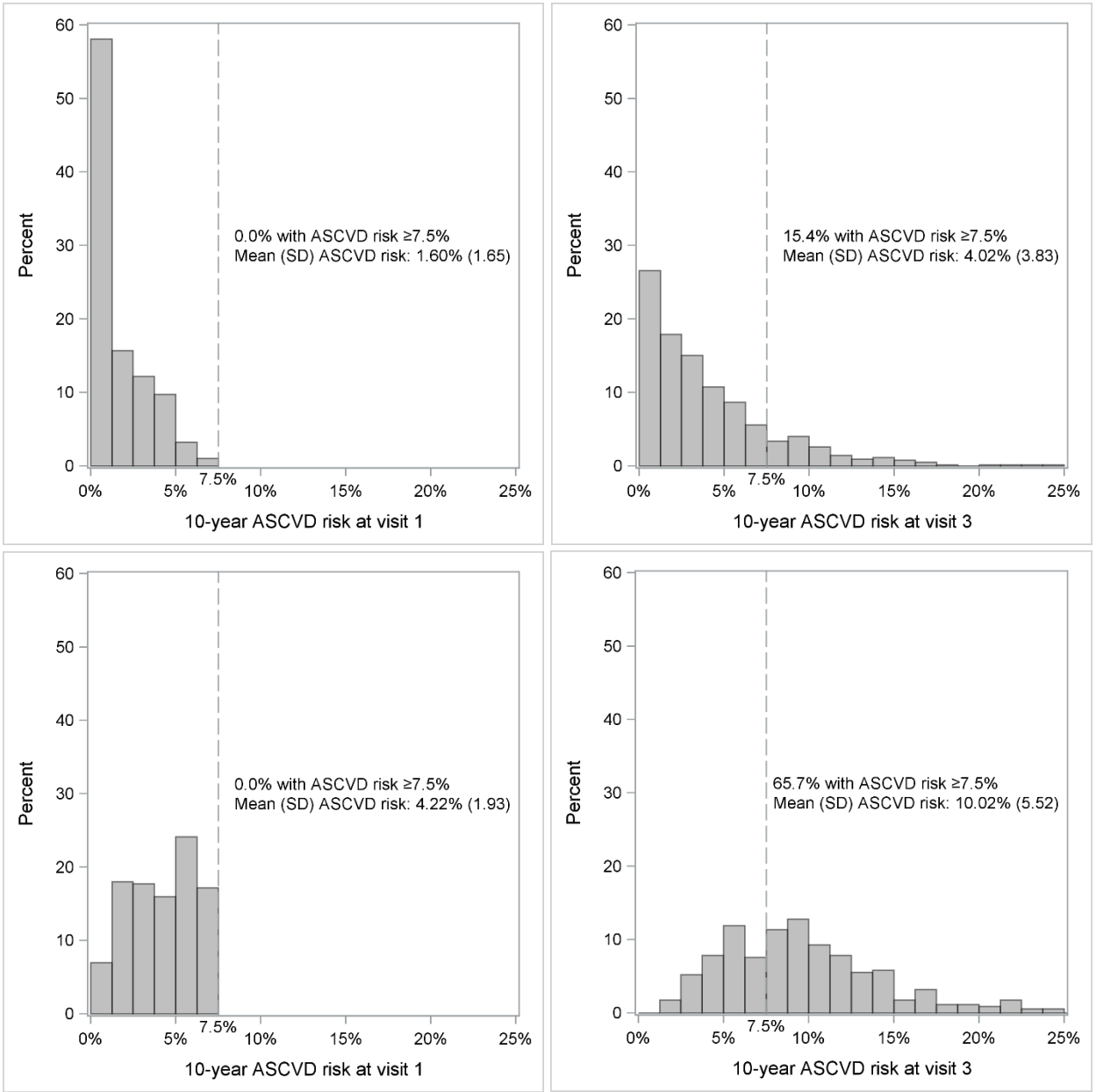
Percent high 10-year ASCVD risk due to risk factor = $\frac{\text{High 10-year predicted ASCVD risk due to change in risk factor (Equation 4)}}{\text{Percent high 10-year predicted ASCVD risk at}} \times 100$

Equation 6

Ratio comparing change due to risk factor versus aging = $\frac{\text{Percent with high 10-year predicted ASCVD risk due to risk factor (Equation 5)}}{\text{Percent with high 10-year predicted ASCVD risk due to aging (Equation 5 for age)}} \times 100$

ASCVD= atherosclerosis cardiovascular disease.

Figure S2. Histograms of 10-year ASCVD risk at visit 1 and visit 3 among participants < 50 years of age (top panel, n=771) and ≥ 50 years of age (bottom panel, n=344).



ASCVD: atherosclerotic cardiovascular disease, SD: standard deviation

Supplemental References:

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