

Supplemental Material

Table S1. Life's Simple 7 Scoring Guidelines.

Poor Cardiovascular Health (0 points)	Intermediate Cardiovascular Health (1 point)	Ideal Cardiovascular Health (2 points)
Metric Physical Activity Definition None	Metric Physical Activity Definition 1-149 min/week moderate intensity exercise or 1-74 min/week vigorous intensity exercise	Metric Physical Activity Definition ≥150 min/week moderate intensity exercise or ≥75 min/week vigorous intensity exercise
Metric Body Mass Index Definition ≥30 kg/m ²	Metric Body Mass Index Definition 25-29.9 kg/m ²	Metric Body Mass Index Definition <25 kg/m ²
Metric Blood Pressure Definition SBP ≥140 mm Hg or DBP ≥90 mm Hg	Metric Blood Pressure Definition SBP 120-139 mm Hg or DBP 80-89 mm Hg or treated to ideal	Metric Blood Pressure Definition SBP <120 mm Hg and DBP <80 mm Hg
Metric Fasting Blood Glucose Definition ≥126 mg/dL	Metric Fasting Blood Glucose Definition 100-125 mg/dL or treated to ideal	Metric Fasting Blood Glucose Definition <100 mg/dL
Metric Total Cholesterol Definition ≥240 mg/dL	Metric Total Cholesterol Definition 200-239 mg/dL or treated to ideal	Metric Total Cholesterol Definition <200 mg/dL
Metric Current smoking Definition Current smoker	Metric Current smoking Definition Former smoker ≤12 months	Metric Current smoking Definition Never or quit >12 months
Metric Healthy Diet Score* Definition 0-1 healthy dietary components	Metric Healthy Diet Score* Definition 2-3 healthy dietary components	Metric Healthy Diet Score* Definition 4-5 healthy dietary components

AHA, American Heart Association; BMI, body mass index; DBP, diastolic blood pressure; HR, heart rate; mg/dL, milligrams per deciliter; min, minutes; mm Hg, millimeters of mercury; SBP, systolic blood pressure. *Diet scores based on presence of 5 healthy dietary components: ≥4.5 cups fruits or vegetables/day, ≥2 3.5-oz servings of fish/week, ≥3 1-oz servings fiber-rich whole grains/day, <1500 mg sodium/day, ≤450 kcal sugar-sweetened beverages/week.

Table S2. Life’s Essential 8 Scoring Guidelines at the 2nd and 6th examination cycles.

LE8 Component	AHA Guidelines	Data Discrepancy	Solution
Physical Activity	<p>Metric Minutes of moderate- (or greater) intensity activity per week</p> <p>Scoring</p> <p>Points Minutes Classification</p> <p>100 ≥150 Ideal CVH</p> <p>90 120 – 149</p> <p>80 90 – 119</p> <p>60 60 – 89 Intermediate CVH</p> <p>40 30 – 59 Poor CVH</p> <p>20 1 – 29</p> <p>0 0</p>	<p>Exam 2</p> <p>All participants self-report >150 minutes of moderate/intense exercise per week</p> <p>Exam 6</p> <p>Exercise is measured in the “number of times engaged in intense physical exercise per week”, “number of flights of stairs climbed per week”, and “number of city blocks walked per week”</p>	<p>Exam 2</p> <p>Calculate Physical Activity Index based on hours spent sitting, standing, low/moderate/intense exercise</p> <p>Exam 6</p> <p>Estimate Kcal expenditure per week using the Paffenbarger equation</p> <p>Both Exams Scoring</p> <p>7th septile → 100</p> <p>6th septile → 90</p> <p>5th septile → 80</p> <p>4th septile → 60</p> <p>3rd septile → 40</p> <p>2nd septile → 20</p> <p>1st septile → 0</p>
Body Mass Index	<p>Metric BMI (kg/m²)</p> <p>Scoring</p> <p>Points BMI Classification</p> <p>100 <25 Ideal CVH</p> <p>70 25 – 29.9 Intermediate CVH</p> <p>30 30 – 34.9 Poor CVH</p> <p>15 35 – 39.9</p> <p>0 ≥40</p>	N/A	Adhered to AHA Guidelines
Blood Pressure	<p>Metric Systolic BP / Diastolic BP (mmHg)</p> <p>Scoring</p> <p>Points Level Classification</p> <p>100 <120/<80 Ideal CVH</p> <p>75 120 – 129/<80 Intermediate CVH</p> <p>50 130 – 139 or 80 – 89</p> <p>25 140 – 159 or 90 – 99 Poor CVH</p> <p>0 ≥160 or ≥100</p> <p>Subtract 20 points for blood pressure medication</p>	N/A	Adhered to AHA Guidelines
Glucose/Diabetes	<p>Metric Diabetes Mellitus, Fasting Blood Glucose</p> <p>Scoring</p> <p>Points Level Classification</p> <p>100 No history of diabetes and FBG <100 (or HbA1c <5.7) Ideal CVH</p> <p>60 No diabetes and FBG Intermediate CVH</p>	<p>Both Exams</p> <p>No HbA1c lab data</p>	<p>Both Exams</p> <p>-Classify 100 and 60 points along AHA guidelines (based on blood glucose)</p> <p>-Participants with diabetes were assigned 30 points</p>

	<p>100–125 (or HbA1c 5.7–6.4)</p> <p>40 Diabetes with HbA1c <7.0 Poor CVH</p> <p>30 Diabetes with HbA1c 7.0–7.9</p> <p>20 Diabetes with HbA1c 8.0–8.9</p> <p>10 Diabetes with Hb A1c 9.0–9.9</p> <p>0 Diabetes with HbA1c ≥10.0</p>		
Blood Lipids	<p>Metric Non-HDL Cholesterol (mg/dL)</p> <p>Scoring</p> <p>Points Level Classification</p> <p>100 <130 Ideal CVH</p> <p>60 130 – 159 Intermediate CVH</p> <p>40 160 – 189 Poor CVH</p> <p>20 190 – 219</p> <p>0 ≥220</p> <p>Subtract 20 points for cholesterol medication</p>	N/A	Adhered to AHA Guidelines
Nicotine Exposure	<p>Metric Self-reported smoking status</p> <p>Scoring</p> <p>Points Status Classification</p> <p>100 Never smoker Ideal CVH</p> <p>75 Former smoker, quit ≥5 yr Intermediate CVH</p> <p>50 Former smoker, quit 1 - <5 yr</p> <p>25 Former smoker, quit < 1 yr Poor CVH</p> <p>0 Current smoker</p> <p>Subtract 20 points for secondhand smoke</p>	<p>Exam 2</p> <p>-“Years since quitting” is a discrete value, so no one can be classified in the 25-point category</p> <p>-No secondhand smoking data for a penalty (exam 2)</p> <p>Exam 6</p> <p>Missing “Years since quitting smoking” variable, only “current smoking” status at each exam</p>	<p>Exam 2</p> <p>Updated scoring guidelines:</p> <p>Never smoked → 100</p> <p>≥ 5 years → 75</p> <p>2-4 years → 50</p> <p>1 year → 25</p> <p>Smoker → 0</p> <p>Exam 6</p> <p>Use previous smoking status, estimate years since quitting, and classify with guidelines</p>
Sleep Health	<p>Metric Self-reported average hours of sleep per night</p> <p>Scoring</p> <p>Points Hours Classification</p> <p>100 7 – 8 Ideal CVH</p> <p>90 9</p> <p>70 6 Intermediate CVH</p> <p>40 5 or ≥10 Poor CVH</p> <p>20 4</p> <p>0 <4</p>	N/A	Adhered to AHA Guidelines
Diet	<p>Metric Quantiles of DASH-style diet adherence or HEI-2015 (population)</p> <p>Scoring</p> <p>Points Level</p> <p>100 ≥95th percentile</p> <p>80 75th – 94th percentile</p> <p>50 50th – 74th percentile</p>	N/A	Adhered to AHA Guidelines

	25	25 th – 49 th percentile		
	0	1 st – 24 th percentile		

AHA, American Heart Association; BMI, body mass index; BP, blood pressure; CVH, cardiovascular health; DASH, Dietary Approaches to Stop Hypertension; FBG, fasting blood glucose; HbA1c, hemoglobin A1c; HDL, high-density lipoprotein cholesterol; HEI, healthy eating index; HR, heart rate; Kcal, kilocalorie; mmHg, millimeters of mercury; N/A, not available.

Note: Non-HDL cholesterol = Total Cholesterol – HDL Cholesterol.

Table S3. Associations of LS7 and LE8 with risk of CVD and All-Cause Mortality, examination cycle 2 (1979-1982) as baseline.

	Outcome	CVD			Mortality		
		No. Events/No. At-risk	966/2888 (33%)		1195/2888 (41%)		
<i>CVH Status Exposures</i>	<i>Model Adjustments</i>	<i>HR (95% CI)</i>	<i>P Value</i>	<i>C Statistic</i>	<i>HR (95% CI)</i>	<i>P Value</i>	<i>C Statistic</i>
LS7 – Ideal	Age, Sex	0.29 (0.21, 0.40)	<0.001	0.74	0.34 (0.25, 0.45)	<0.001	0.78
LS7 – Intermediate	Age, Sex	0.52 (0.38, 0.71)	<0.001	--	0.53 (0.40, 0.70)	<0.001	--
LE8 – Ideal	Age, Sex	0.21 (0.15, 0.28)	<0.001	0.74	0.36 (0.28, 0.46)	<0.001	0.78
LE8 – Intermediate	Age, Sex	0.47 (0.40, 0.56)	<0.001	--	0.51 (0.44, 0.60)	<0.001	--

LE8 status was defined as ideal if LE8 ≥80, intermediate if LE8 was 50-79, and poor if LE8<50. LS7 status was defined as ideal (10-14), intermediate (5-9), and poor (0-4).

Note: Hazard ratios are reported per CVH status, with poor CVH status as referent, C Statistics are Harrell’s Concordance Statistics.

CI, confidence interval; CVD, cardiovascular disease; HR, hazard ratio; LE8, Life’s Essential 8; LS7, Life’s Simple 7; No., Number.

Table S4. Associations of LS7 and LE8 with risk of CVD and All-Cause Mortality, examination cycle 6 (1995-1998) as baseline.

	Outcome	CVD			Mortality		
	No. Events/No. At-risk	406/1667 (24%)			485/1667 (29%)		
<i>CVH Status Exposures</i>	<i>Model Adjustments</i>	<i>HR (95% CI)</i>	<i>P Value</i>	<i>C Statistic</i>	<i>HR (95% CI)</i>	<i>P Value</i>	<i>C Statistic</i>
LS7 – Ideal	Age, Sex	0.51 (0.33, 0.78)	0.002	0.70	0.64 (0.44, 0.93)	0.02	0.77
LS7 – Intermediate	Age, Sex	0.77 (0.42, 1.13)	0.18	--	0.71 (0.51, 1.01)	0.05	--
LE8 – Ideal	Age, Sex	0.35 (0.23, 0.52)	<0.001	0.71	0.47 (0.33, 0.67)	<0.001	0.77
LE8 – Intermediate	Age, Sex	0.56 (0.43, 0.71)	<0.001	--	0.60 (0.48, 0.75)	<0.001	--

LE8 status was defined as ideal if LE8 ≥80, intermediate if LE8 was 50-79, and poor if LE8<50. LS7 status was defined as ideal (10-14), intermediate (5-9), and poor (0-4).

Note: Hazard ratios are reported per CVH status, with poor CVH status as referent, C Statistics are Harrell's Concordance Statistics.

CI, confidence interval; CVD, cardiovascular disease; HR, hazard ratio; LE8, Life's Essential 8; LS7, Life's Simple 7; No., Number.

Table S5. Associations of LS7 and LE8 with risk of CVD and All-Cause Mortality, examination cycle 6 (1995-1998) as baseline, adjusted for change in CVH scores from Exam 2 to Exam 6.

	Outcome	CVD			Mortality		
	No. Events/No. At-risk	311/1211 (26%)			364/1211 (30%)		
<i>Continuous Variables</i>	<i>Model Adjustments</i>	<i>HR (95% CI)</i>	<i>P Value</i>	<i>C Statistic</i>	<i>HR (95% CI)</i>	<i>P Value</i>	<i>C Statistic</i>
Life's Simple 7	Age, Sex, Change in LS7	0.66 (0.57, 0.76)	<0.001	0.71	0.75 (0.66, 0.86)	<0.001	0.78
Life's Essential 8	Age, Sex, Change in LE8	0.61 (0.53, 0.70)	<0.001	0.72	0.76 (0.67, 0.86)	<0.001	0.78

* Models run on continuous CVH scores, adjusting for change in CVH from exam 2 to exam 6 (N = 1211 participants with CVH scores at both exam cycles)

Note: Hazard ratios are reported per 1-standard deviation increase in continuous LS7 and LE8 score, C Statistics are Harrell's Concordance Statistics.

C, concordance; CI, confidence interval; CVD, cardiovascular disease; HR, hazard ratio; LE8, Life's Essential 8; LS7, Life's Simple 7; No., Number.

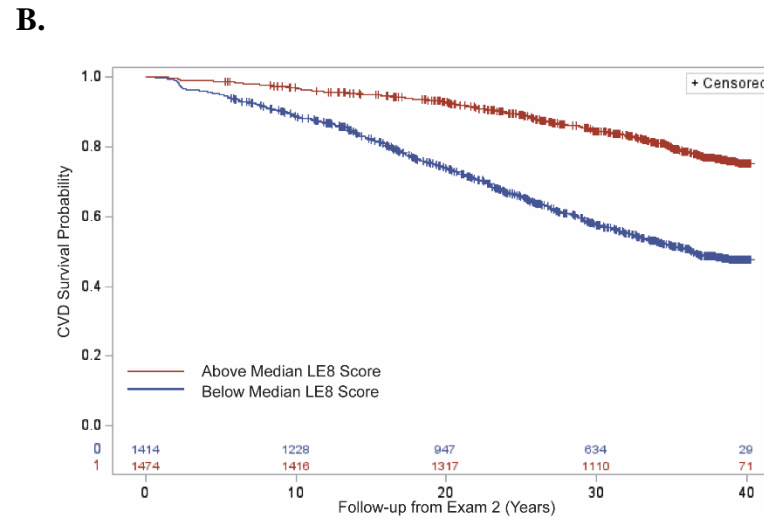
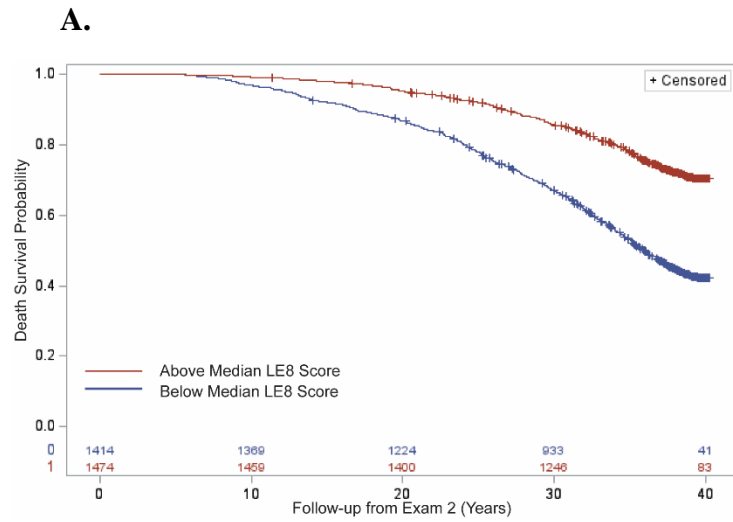
Figure S1. Kaplan Meier Plots for CVD and Death at Exams 2 and 6.

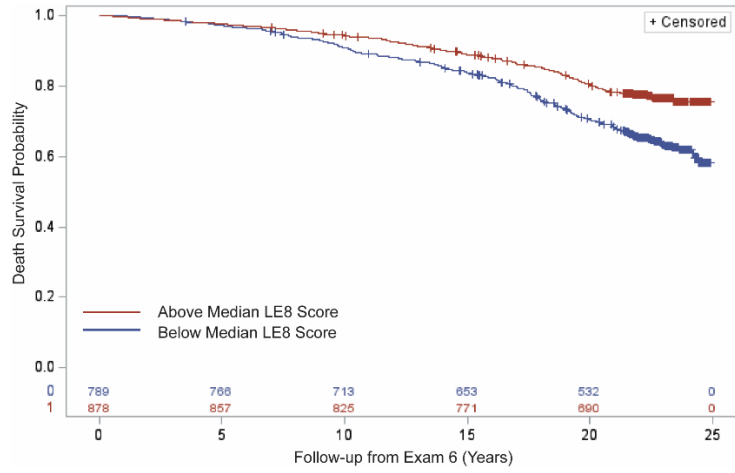
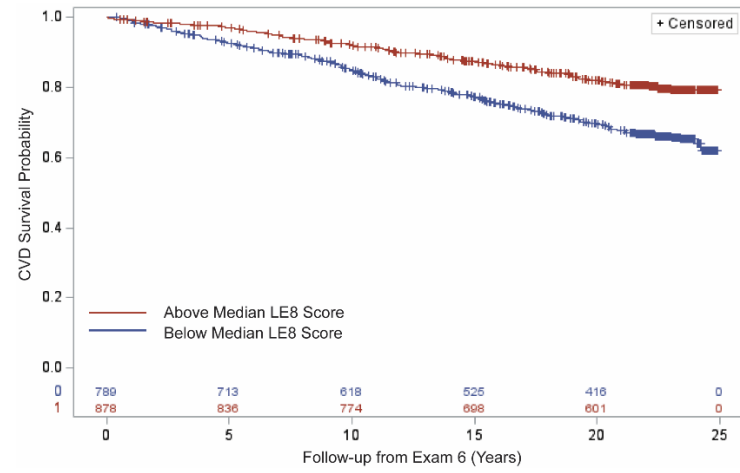
A. Kaplan Meier Plots for LE8 and Death at Exams 2

B. Kaplan Meier Plots for LE8 and CVD at Exams 2

C. Kaplan Meier Plots for LE8 and Death at Exams 6

D. Kaplan Meier Plots for LE8 and CVD at Exams 6



C.**D.**

CVD, cardiovascular disease; LE8, Life's Essential 8.