

Supplemental Material

Table S1. Definition and scoring approach for quantifying CVH of LE8.

Domain	CVH metric	Method of measurement	Quantification of CVH metric		
Health behaviors	Diet	Measurement: Self-reported intake of salt, fatty foods, and tea	Metric: Surrogate measurement of diet quality, calculated as the unweighted average of salt, fatty food, and tea scoring.		
		Scoring:			
		Points	Levels/Frequency		
		Salt intake			
		100	< 6g/day		
		50	6–12 g/day		
		0	> 12 g/day		
		Fatty food intake			
		100	< 1 time/week		
		50	1–3 times/week		
0	>3 times/week				
Tea consumption					
100	>3 times/week				
75	1–3 times/week				
50	1–3 times/month				
25	< 1 time/month				
0	Never				

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Domain	Metric	Method of measurement	Quantification of CVH metrics	
Health behaviors	Physical activity	Measurements: Self-reported minutes of physical activity per week.	Metric: Minutes of physical activity per week	
		Example tools for measurement: How many times did you usually spend on physical activity (Note: It took at least 20 minutes each time)?	Scoring: Points	Minutes
			100	≥ 80
			50	20–60
			0	< 20
Health behaviors	Tobacco/ Nicotine exposure	Measurements: Self-reported use of cigarettes	Metric: Smoking	
		Example tools for measurement: Do you currently smoke cigarettes? (Never smoker, former smoker, some days, every day)	Scoring: Points	Status
			100	Never smoker
			50	Former smoker, quit ≥ 1 year
			25	Current smoker, < 1 cigarette/d
			0	Current smoker, ≥ 1 cigarette/d

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Domain	Metric	Method of measurement	Quantification of CVH metrics	
			Metric: Average hours of sleep per night	
			Scoring:	
		Measurements:	Points	Level
Health behaviors	Sleep health	Self-reported average hours of sleep per night	100	7–< 9
			90	9–< 10
		Example tools for measurement:	70	6–< 7
		On average, how many hours of sleep do you get per night?	40	5–< 6 or ≥ 10
			20	4–< 5
			0	< 4
			Metric: BMI (kg/m ²) *	
			Scoring:	
		Measurements:	Points	Level
Health factors	Body mass index	Body weight (kg) divided by height squared(m ²)	100	< 23.0
			70	23.0–24.9
		Example tools for measurement:	30	25.0–29.9
		Objective measurement of height and weight	15	30.0–34.9
			0	≥ 35.0

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Domain	Metric	Method of measurement	Quantification of CVH metrics	
Health factors	Blood lipids	Measurements: Plasma total and HDL cholesterol with the calculation of non-HDL cholesterol.	Metric: Non-HDL cholesterol (mmol/L)	
		Example tools for measurement: Fasting blood sample. Non-HDL cholesterol unit conversion: 1 mg/dL=0.02586 mmol/L	Scoring: Points	Level
			100	< 3.36
			60	3.36–4.13
			40	4.13–4.90
			20	4.90–5.68
			0	≥ 5.69
			If drug-treated level, subtract 20 points	
			Metric: FBG (mmol/L)	
		Measurements: FBG	Scoring:	
			Points	Level
			100	No history of diabetes and FBG < 5.6
			60	No diabetes and FBG 5.6–6.9
	Blood glucose	Example tools for measurement: Fasting blood sample.	40	Diabetes with FBG < 8.6
		FBG unit conversion: 1 mg/dL = 0.056 mmol/L	30	Diabetes with FBG 8.6–10.1
			20	Diabetes with FBG 10.2–11.6
			10	Diabetes with FBG 11.7–13.2
			0	Diabetes with FBG ≥ 13.3

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Domain	Metric	Method of measurement	Quantification of CVH metrics	
			Metric: Systolic and diastolic BPs (mmHg)	
			Scoring:	
		Measurements:	Points	Level
Health factors	Blood pressure	Appropriately measured systolic and diastolic BP	100	<120/<80 (Optimal)
			75	120–129/<80 (Elevated)
		Example tools for measurement:	50	130–139 or 80–89 (Stage I hypertension)
		Corrected Mercury sphygmomanometer	25	140–159 or 90–99
			0	≥160 or ≥100
			Subtract 20 points if treated level	

BP, blood pressure; CVH, cardiovascular health; FBG, fasting blood glucose; HDL, high-density lipoprotein; LE8, Life's Essential 8.

* The scoring algorithm of BMI was modified with a lower cutting-off point for each score to better adapt to Chinese population. The original American Heart Association cut points for BMI was <25 kg/m² for 100 points, 25.0–29.9 kg/m² for 70 points, 30.0–34.9 kg/m² for 30 points, 35.0–39.9 kg/m² for 15 points, and ≥ 40.0 kg/m² for 0 point, respectively.

Table S2. HR (95%CI) of CVH scores of LE8 for CVD.

CVH score	No. of cases/Total	HR (95% CI)	
		Unadjusted	Age-and sex-adjusted
0-29 points	39/150	1.00	1.00
30-39 points	284/1,397	0.78 (0.55, 1.08)	0.75 (0.54, 1.05)
40-49 points	1,229/6,762	0.64 (0.47, 0.88)	0.64 (0.46, 0.88)
50-59 points	2,676/18,261	0.46 (0.33, 0.63)	0.49 (0.36, 0.67)
60-69 points	3,428/29,278	0.35 (0.25, 0.48)	0.39 (0.28, 0.53)
70-79 points	1,899/24,739	0.24 (0.18, 0.34)	0.27 (0.20, 0.37)
80-89 points	406/8,814	0.20 (0.14, 0.27)	0.21 (0.15, 0.30)
90-100 points	16/354	0.17 (0.09, 0.30)	0.20 (0.11, 0.36)

CVD, cardiovascular disease; CVH, cardiovascular health; CI, confidence interval; HR, hazard ratio; LE8, Life's Essential 8.

Table S3. HR (95%CI) of overall and domain-specific CVH statuses of LE8 for CVD and its major subtypes.

CVH status	No. of cases/Total	HR (95% CI)	
		Unadjusted	Age-and sex-adjusted
Overall			
Low (0-49 points)	1,552/8,309	1.00	1.00
Moderate (50-79 points)	8,003/72,278	0.51 (0.48, 0.54)	0.57 (0.54, 0.61)
High (80-100 points)	422/9,168	0.29 (0.26, 0.33)	0.33 (0.29, 0.37)
By individual domains			
Health behaviors			
Low (0-49 points)	2,569/22,143	1.00	1.00
Moderate (50-79 points)	6,971/63,549	0.76 (0.73, 0.80)	0.93 (0.89, 0.97)
High (80-100 points)	437/4,063	0.51 (0.46, 0.57)	0.74 (0.67, 0.82)
Health factors			
Low (0-49 points)	2,191/10,414	1.00	1.00
Moderate (50-79 points)	5,972/49,101	0.62 (0.59, 0.65)	0.59 (0.56, 0.62)
High (80-100 points)	1,814/30,240	0.39 (0.37, 0.42)	0.35 (0.33, 0.38)
For major CVD subtypes			
Stroke			
Low (0-49 points)	988/8,309	1.00	1.00
Moderate (50-79 points)	4,810/72,278	0.49 (0.46, 0.53)	0.57 (0.55, 0.60)
High (80-100 points)	233/9,168	0.26 (0.23, 0.30)	0.43 (0.40, 0.46)
Heart diseases			
Low (0-49 points)	678/8,309	1.00	1.00
Moderate (50-79 points)	3,696/72,278	0.49 (0.46, 0.53)	0.60 (0.55, 0.65)
High (80-100 points)	203/9,168	0.26 (0.23, 0.30)	0.36 (0.31, 0.42)

CVD, cardiovascular disease; CVH, cardiovascular health; CI, confidence interval; HR, hazard ratio; LE8, Life's Essential 8.

Table S4. Estimated numbers of CVD-free life years by component-specific CVH status of LE8.

CVH status	No. of cases/Total	CVD-free life years from age 30 to 80 years (95%CI)		HR (95%CI)	
		Unadjusted	Age-and sex- adjusted	Unadjusted	Age-and sex- adjusted
Diet					
Low (0-49 points)	7,584/67,038	46.7 (46.7, 46.8)	43.4 (43.1, 43.6)	1.00	1.00
Moderate (50-79 points)	2,158/20,743	46.9 (46.8, 47.0)	43.6 (43.3, 43.9)	0.94 (0.90, 0.99)	0.94 (0.89, 0.98)
High (80-100 points)	235/1,974	47.2 (46.8, 47.5)	43.7 (43.1, 44.3)	0.85 (0.75, 0.97)	0.92 (0.81, 1.05)
Physical activity					
Low (0-49 points)	743/7,915	46.2 (45.9, 46.4)	43.5 (43.0, 43.9)	1.00	1.00
Moderate (50-79 points)	7,331/68,298	46.7 (46.6, 46.8)	43.4 (43.0, 43.6)	0.86 (0.80, 0.93)	1.03 (0.95, 1.11)
High (80-100 points)	1,903/13,542	47.3 (47.2, 47.4)	43.7 (43.4, 44.0)	0.68 (0.62, 0.74)	0.94 (0.86, 1.03)
Tobacco/nicotine exposure					
Low (0-49 points)	3,626/30,785	46.1 (46, 46.2)	43.1 (42.7, 43.3)	1.00	1.00
Moderate (50-79 points)	649/4,633	47.2 (47, 47.4)	43.6 (43.1, 44.0)	0.68 (0.63, 0.74)	0.89 (0.82, 0.97)
High (80-100 points)	5,702/54,337	47.1 (47, 47.1)	43.5 (43.2, 43.7)	0.72 (0.69, 0.75)	0.91 (0.87, 0.95)
Sleep health					
Low (0-49 points)	1,140/8,574	47.1 (46.9, 47.3)	43.4 (43.0, 43.8)	1.00	1.00

CVH status	No. of cases/Total	CVD-free life years from age 30 to 80 years (95%CI)		HR (95%CI)	
		Unadjusted	Age-and sex- adjusted	Unadjusted	Age-and sex- adjusted
Moderate (50-79 points)	2,039/17,207	46.9 (46.8, 47.0)	43.6 (43.2, 43.9)	1.08 (1.01, 1.16)	0.97 (0.90, 1.04)
High (80-100 points)	6,798/63,974	46.7 (46.6, 46.8)	43.4 (43.1, 43.6)	1.16 (1.09, 1.24)	1.01 (0.95, 1.07)
BMI					
Low (0-49 points)	1,085/7,122	45.5 (45.2, 45.7)	41.6 (41.2, 41.9)	1.00	1.00
Moderate (50-79 points)	6,717/56,639	46.6 (46.5, 46.7)	43.3 (43.0, 43.5)	0.71 (0.67, 0.76)	0.69 (0.65, 0.74)
High (80-100 points)	2,175/25,994	47.6 (47.5, 47.7)	44.5 (44.2, 44.8)	0.49 (0.46, 0.53)	0.52 (0.48, 0.55)
Blood lipids					
Low (0-49 points)	2,703/19,948	46.3 (46.1, 46.4)	42.7 (42.4, 43.0)	1.00	1.00
Moderate (50-79 points)	2,977/25,998	46.7 (46.5, 46.8)	43.4 (43.0, 43.6)	0.87 (0.83, 0.92)	0.87 (0.82, 0.91)
High (80-100 points)	4,297/43,809	47.1 (47.0, 47.2)	43.9 (43.6, 44.2)	0.74 (0.70, 0.77)	0.76 (0.73, 0.80)
Blood glucose					
Low (0-49 points)	1,681/8,073	45.5 (45.2, 45.6)	40.9 (40.5, 41.2)	1.00	1.00
Moderate (50-79 points)	2,200/18,650	46.6 (46.4, 46.7)	43.2 (42.9, 43.5)	0.72 (0.68, 0.77)	0.61 (0.57, 0.65)
High (80-100 points)	6,096/63,032	47.1 (47.0, 47.2)	43.8 (43.5, 44.1)	0.60 (0.57, 0.63)	0.53 (0.50, 0.56)
Blood pressure					

CVH status	No. of cases/Total	CVD-free life years from age 30 to 80 years (95%CI)		HR (95%CI)	
		Unadjusted	Age-and sex- adjusted	Unadjusted	Age-and sex- adjusted
Low (0-49 points)	4,714/25,586	45.9 (45.8, 46.0)	41.4 (41.0, 41.7)	1.00	1.00
Moderate (50-79 points)	4,273/45,335	47.2 (47.1, 47.3)	43.9 (43.6, 44.2)	0.65 (0.62, 0.67)	0.57 (0.55, 0.60)
High (80-100 points)	990/18,834	47.6 (47.5, 47.7)	45.1 (44.7, 45.4)	0.55 (0.51, 0.59)	0.43 (0.40, 0.46)

BMI, body mass index; CVD, cardiovascular disease; CVH, cardiovascular health; CI, confidence interval; LE8, Life's Essential 8; HR, hazard ratio.

Table S5. Estimated numbers of CVD-free life years by CVH status of LE8 for CVD subtypes.

CVH status	No. of cases/Total	CVD-free life years from age 30 to 80 years (95%CI)		HR (95%CI)	
		Unadjusted	Age-and sex- adjusted	Unadjusted	Age-and sex- adjusted
Cerebral infarction					
Low (0-49 points)	878/8,309	46.7 (46.5, 46.9)	43.2 (42.7, 43.7)	1.00	1.00
Moderate (50-79 points)	4,118/72,278	48.3 (48.3, 48.4)	45.5 (45.2, 45.8)	0.47 (0.44, 0.51)	0.55 (0.51, 0.59)
High (80-100 points)	193/9,168	49.1 (48.9, 49.2)	47.3 (46.9, 47.6)	0.25 (0.21, 0.29)	0.29 (0.25, 0.34)
Intracranial hemorrhage					
Low (0-49 points)	122/8,309	49.4 (49.4, 49.5)	49.2 (49.0, 49.4)	1.00	1.00
Moderate (50-79 points)	760/72,278	49.6 (49.6, 49.6)	49.4 (49.3, 49.5)	0.66 (0.55, 0.80)	0.74 (0.61, 0.90)
High (80-100 points)	38/9,168	49.7 (49.7, 49.8)	49.6 (49.5, 49.7)	0.36 (0.25, 0.52)	0.40 (0.28, 0.58)
Subarachnoid hemorrhage					
Low (0-49 points)	20/8,309	49.8 (49.8, 49.9)	49.7 (49.6, 49.8)	1.00	1.00
Moderate (50-79 points)	125/72,278	49.8 (49.8, 49.9)	49.8 (49.7, 49.8)	0.67 (0.42, 1.08)	0.71 (0.44, 1.14)
High (80-100 points)	13/9,168	49.8 (49.8, 49.9)	49.8 (49.7, 49.8)	0.76 (0.38, 1.53)	0.68 (0.33, 1.40)
Myocardial infarction					
Low (0-49 points)	244/8,309	49.0 (48.9, 49.1)	48.5 (48.2, 48.7)	1.00	1.00

CVH status	No. of cases/Total	CVD-free life years from age 30 to 80 years (95%CI)		HR (95%CI)	
		Unadjusted	Age-and sex- adjusted	Unadjusted	Age-and sex- adjusted
Moderate (50-79 points)	1,304/72,278	49.4 (49.4, 49.4)	49.0 (48.8, 49.1)	0.55 (0.48, 0.63)	0.64 (0.56, 0.73)
High (80-100 points)	43/9,168	49.7 (49.7, 49.8)	49.5 (49.4, 49.6)	0.20 (0.15, 0.28)	0.25 (0.18, 0.34)
Atrial fibrillation					
Low (0-49 points)	132/8309	49.4 (49.3, 49.5)	48.1 (47.7, 48.6)	1.00	1.00
Moderate (50-79 points)	865/72278	49.6 (49.6, 49.6)	48.6 (48.4, 48.9)	0.63 (0.53, 0.76)	0.70 (0.58, 0.84)
High (80-100 points)	73/9168	49.6 (49.5, 49.7)	48.7 (48.4, 49.0)	0.60 (0.45, 0.79)	0.65 (0.49, 0.87)
Heart failure					
Low (0-49 points)	390/8,309	48.5 (48.4, 48.6)	46.0. (45.5, 46.5)	1.00	1.00
Moderate (50-79 points)	2,051/72,278	49.2 (49.1, 49.2)	47.5 (47.2, 47.8)	0.51 (0.46, 0.57)	0.56 (0.50, 0.62)
High (80-100 points)	118/9,168	49.4 (49.3, 49.5)	48.3 (48.0, 48.6)	0.32 (0.26, 0.40)	0.35 (0.28, 0.43)

CVD, cardiovascular disease; CVH, cardiovascular health; CI, confidence interval; LE8, Life's Essential 8; HR, hazard ratio.

Table S6. Estimated numbers of CVD-free life years by CVH status of LE8, excluding 20,644 individuals exposed to dust in underground coal mines.

CVH status	No. of cases/Total	CVD-free life years from age 30 to 80 years (95%CI)	
		Unadjusted	Age-and sex- adjusted
Low (0-49 points)	983/4,992	44.7 (44.4, 45.0)	40.6 (40.2, 41.1)
Moderate (50-79 points)	6,268/55,915	47.0 (46.9, 47.0)	43.3 (43.0, 43.6)
High (80-100 points)	349/8,204	48.2 (48.0, 48.4)	45.7 (45.2, 46.1)

CVD, cardiovascular disease; CVH, cardiovascular health; CI, confidence interval; LE8, Life's Essential 8.

Table S7. Estimated numbers of CVD-free life years by CVH status of LE8, excluding 1,025 incident CVD occurred within the initial two-year follow-up.

CVH status	No. of cases/Total	CVD-free life years from age 30 to 80 years (95%CI)	
		Unadjusted	Age-and sex- adjusted
Low (0-49 points)	1,396/8,153	45.0 (44.7, 45.2)	40.2 (39.8, 40.5)
Moderate (50-79 points)	7,169/71,444	47.2 (47.1, 47.3)	42.6 (42.3, 42.9)
High (80-100 points)	387/9,133	48.3 (48.1, 48.4)	44.7 (44.3, 45.1)

CVD, cardiovascular disease; CVH, cardiovascular health; CI, confidence interval; LE8, Life's Essential 8.

Table S8. Estimated numbers of CVD-free life years by CVH status of LE8, with the redefined CVD excluding subarachnoid hemorrhage and atrial fibrillation.

CVH status	No. of cases/Total	CVD-free life years from age 30 to 80 years (95%CI)	
		Unadjusted	Age-and sex- adjusted
Low (0-49 points)	1,451/8,309	44.8 (44.6, 45.1)	39.9 (39.5, 40.2)
Moderate (50-79 points)	7,344/72,278	47.2 (47.1, 47.2)	42.7 (42.4, 42.9)
High (80-100 points)	363/9,168	48.4 (48.2, 48.5)	45.2 (44.8, 45.6)

CVD, cardiovascular disease; CVH, cardiovascular health; CI, confidence interval; LE8, Life's Essential 8.

Table S9. Estimated numbers of CVD-free life years by CVH status of LE8, excluding 8,253 individuals who died without a diagnosis of CVD.

CVH status	No. of cases/Total	CVD-free life years from age 30 to 80 years (95%CI)	
		Unadjusted	Age-and sex- adjusted
		Low (0-49 points)	983/4,992
Moderate (50-79 points)	6,268/55,915	46.4 (46.3, 46.5)	42.4 (42.2, 42.6)
High (80-100 points)	349/8,204	47.8 (47.6, 48.0)	44.8 (44.4, 45.2)

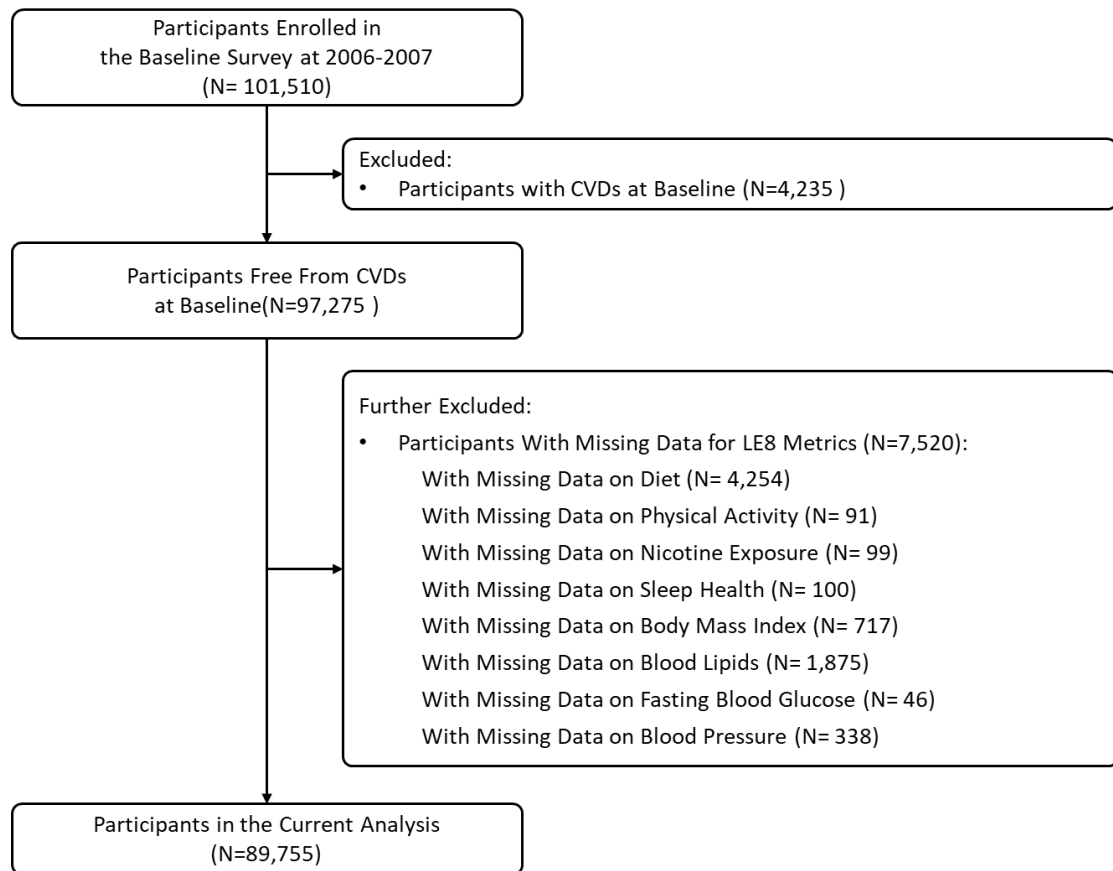
CVD, cardiovascular disease; CVH, cardiovascular health; CI, confidence interval; LE8, Life's Essential 8.

Table S10. Estimated numbers of CVD-free life years by CVH status of LE8, further adjusted for education and income.

CVH status	No. of cases/Total	CVD-free life years from age 30 to 80 years (95%CI)
Low (0-49 points)	1,552/8,309	39.5 (39.2, 39.8)
Moderate (50-79 points)	8,003/72,278	42.3 (42.0, 42.5)
High (80-100 points)	422/9,168	44.6 (44.2, 45.0)

CVD, cardiovascular disease; CVH, cardiovascular health; CI, confidence interval; LE8, Life's Essential 8.

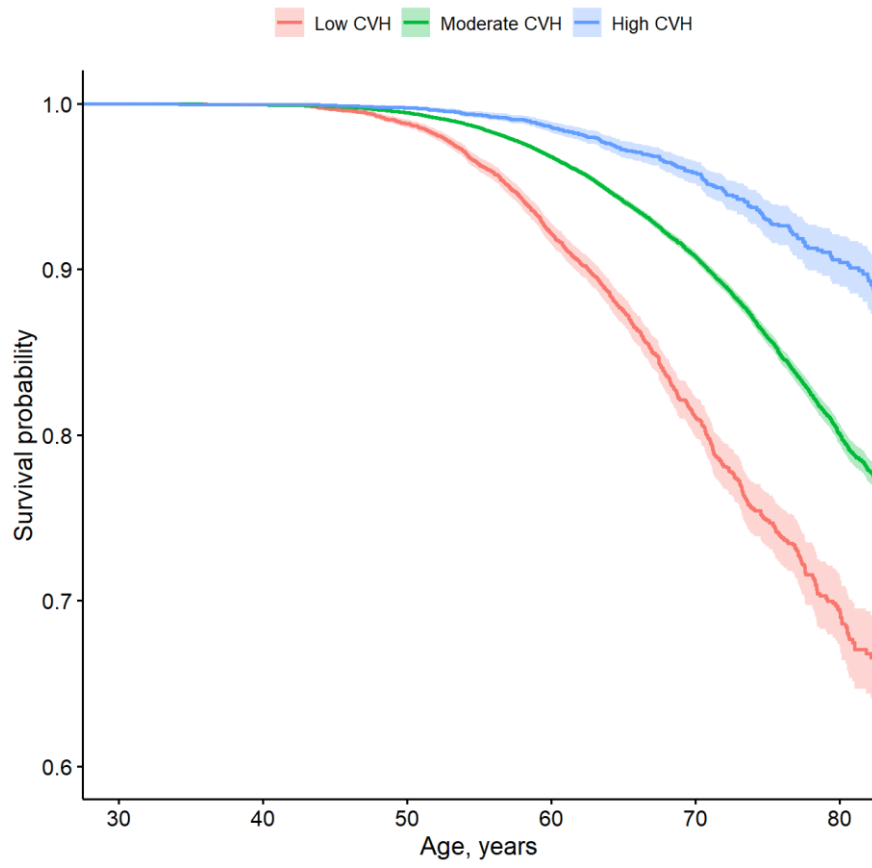
Figure S1. Flow chart of participants included and excluded in the analyses.



Participants were included in the analyses if they did not have a history of CVD at baseline, had valid information on metrics of LE8, and had follow-up for incident CVD.

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

Figure S2. The Kaplan Meier plot of CVH groups.



CVH, cardiovascular health.