

## Supplementary data

**Supplemental Table 1. Definitions and distribution of Life's Essential 8 components**

<b>LE8 components</b>	<b>Points</b>	<b>EPIC-NL definition</b>	<b>EPIC-NL participants, n (%)</b>
<b>Diet</b>	100	≥95 <sup>th</sup> percentile of DASH score	2270 (6.0)
	80	75 <sup>th</sup> -94 <sup>th</sup> percentile	9561 (25.3)
	50	50 <sup>th</sup> -74 <sup>th</sup> percentile	8788 (23.2)
	25	25 <sup>th</sup> -49 <sup>th</sup> percentile	8187 (21.7)
	0	1 <sup>st</sup> -24 <sup>th</sup> percentile	9001 (23.8)
<b>Physical activity</b>	100	≥150 min/wk OR heavy manual work OR manual work and some (≥1 min) physical activity	37562 (99.35)
	90	120-149 min/wk	149 (0.39)
	80	90-119 min/wk	11 (0.03)
	60	60-89 min/wk	21 (0.06)
	40	30-59 min/wk	11 (0.03)
	20	1-29 min/wk	40 (0.11)
	0	0 min/wk	13 (0.03)
<b>Smoking</b>	100	Never smoker	10137 (26.8)
	80	Never smoker exposed to secondhand smoke	6440 (17.0)
	75	Former smoker, quit ≥5 years	1752 (4.6)
	55	Former smoker, quit ≥5 years and exposed to secondhand smoke	1677 (4.4)
	50	Former smoker, quit 1-<5 years	2902 (7.7)
	30	Former smoker, quit 1-<5 years and exposed to secondhand smoke	1917 (5.1)
	25	Former smoker, quit <1 year	688 (1.8)
	5	Former smoker, quit <1 year and exposed to secondhand smoke	691 (1.8)
	0	Current smoker	11603 (30.7)
<b>Sleeping</b>	100	7-<9 hours/night	10167 (26.9)
	90	9-<10 hours/night	17451 (46.2)
	70	6-<7 hours/night	8733 (23.1)
	40	5-<6 OR ≥10 hours/night	1117 (3.0)

	20	4-<5 hours/night	267 (0.7)
	0	<4 hours/night	72 (0.2)
<b>BMI</b>	100	<25 kg/m <sup>2</sup>	18244 (48.3)
	70	25-29.9 kg/m <sup>2</sup>	14612 (38.6)
	30	30-34.9 kg/m <sup>2</sup>	3968 (10.5)
	15	35-39.9 kg/m <sup>2</sup>	772 (2.0)
	0	≥40 kg/m <sup>2</sup>	211 (0.6)
<b>Blood lipids</b>	100	Non-HDL <130 mg/dL	9760 (25.8)
	80	Treated non-HDL <130 mg/dL	238 (0.6)
	60	Non-HDL 130-159 mg/dL	9960 (26.3)
	40	Non-HDL 160-189 mg/dL or treated non-HDL 130-159 mg/dL	9426 (24.9)
	20	Non-HDL 190-219 mg/dL or treated non-HDL 160-189 mg/dL	5261 (13.9)
	0	Non-HDL ≥220 mg/dL or treated non-HDL 190-219 mg/dL	3162 (8.4)
<b>Blood glucose</b>	100	No diabetes and FBG <100 mg/dL OR HbA1c <5.7%	20554 (54.4)
	60	No diabetes and FBG 100-125 mg/dL OR HbA1c 5.7-6.4 %	7772 (20.6)
	40	HbA1c <7.0%	6461 (17.1)
	30	HbA1c 7-7.9%	2094 (5.5)
	20	HbA1c 8-8.9%	706 (1.9)
	10	HbA1c 9-9.9%	125 (0.3)
	0	HbA1c ≥10	95 (0.3)
<b>Blood pressure</b>	100	<120/<80 mm Hg	13312 (35.2)
	80	Treated <120/<80 mm Hg	437 (1.2)
	75	120-129/<80 mm Hg	4409 (11.7)
	55	Treated 120-129/<80 mm Hg	332 (0.9)
	50	SBP 130-139 mm Hg OR DBP 80-89 mm Hg	13486 (35.7)
	30	Treated SBP 130-139 mm Hg OR DBP 80-89 mm Hg	2255 (6.0)
	25	SBP 140-159 mm Hg OR DBP 90-99 mm Hg	2241 (5.9)
	5	Treated SBP 140-159 mm Hg OR DBP 90-99 mm Hg	693 (1.8)

0	SBP $\geq$ 160 mm Hg OR DBP $\geq$ 100 mm Hg	642 (1.7)
<p>BMI = body mass index; DASH = Dietary Approaches to Stop Hypertension; DASH = dietary approaches to stop hypertension; DBP = diastolic blood pressure; EPIC-NL = European Prospective Investigation Into Cancer and Nutrition-Netherlands; FBG = fasting blood glucose; HbA1c = hemoglobin A1c; non-HDL = non-high-density lipoprotein; SBP = systolic blood pressure.</p>		

**Supplemental Table 2. Numbers and percentages of missing values**

	<b>Number of missing in study population</b>	<b>Percentage of missing in study population</b>
<b>Age</b>	0	0
<b>Sex</b>	0	0
<b>Education</b>	234	0.6
<b>Diet score</b>	178	0.5
<b>Physical activity score</b>	5050	13.4
<b>Nicotine exposure score</b>	8306	22.0
<b>Sleep score</b>	24554	64.9
<b>BMI score</b>	28	0.07
<b>Blood lipids score</b>	1569	4.2
<b>Blood glucose score</b>	22602	59.8
<b>Blood pressure score</b>	28	0.07
<b>Alcohol consumption</b>	178	0.5
<b>History of heart failure</b>	24	0.06
<b>History of coronary heart disease</b>	3	0.008
BMI = body mass index.		

**Supplemental Table 3. Association between Life's Essential 8 and incident atrial fibrillation using quartiles**

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>
	HR (95% CI)	HR (95% CI)	HR (95% CI)
<b>Grouped LE8 score</b>			
<b>Quartile 1 (<math>\leq 61.8</math>)</b>	2.31 (1.90 – 2.80)	1.60 (1.31 – 1.96)	1.40 (1.14 – 1.72)
<b>Quartile 2 (<math>&gt; 61.8 - 69.9</math>)</b>	1.42 (1.15 – 1.75)	1.10 (0.88 – 1.36)	1.04 (0.84 – 1.29)
<b>Quartile 3 (<math>&gt; 69.9 - 77.6</math>)</b>	1.11 (0.89 – 1.38)	0.94 (0.75 – 1.18)	0.92 (0.73 – 1.15)
<b>Quartile 4 (<math>&gt; 77.6</math>)</b>	Reference	Reference	Reference
Model 1: crude model; model 2: adjusted for age, sex, and education level; model 3: additionally adjusted for heart failure, coronary heart disease, and alcohol consumption. CI = confidence interval; HR = hazard ratio; LE8 = Life's Essential 8.			

**Supplemental Table 4. Association between Life’s Essential 8 and incident atrial fibrillation in a subset of participants with complete data for the sleep health component (13,253)**

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>
	HR (95% CI)	HR (95% CI)	HR (95% CI)
<b>Grouped LE8 score</b>			
<b>High CVH (≥80)</b>	Reference	Reference	Reference
<b>Moderate CVH (50-79)</b>	1.08 (0.81 – 1.45)	0.86 (0.64 – 1.15)	0.81 (0.60 – 1.09)
<b>Low CVH (&lt;50)</b>	2.15 (1.29 – 3.56)	1.47 (0.87 – 2.47)	1.19 (0.70 – 2.02)
<b>Ideal component decrease</b>	1.21 (1.11 – 1.32)	1.10 (1.01 – 1.21)	1.07 (0.97 – 1.17)
Model 1: crude model; model 2: adjusted for age, sex, and education level; model 3: additionally adjusted for heart failure, coronary heart disease, and alcohol consumption. CI = confidence interval; HR = hazard ratio; LE8 = Life’s Essential 8.			

**Supplemental Table 5. Association between Life's Essential 8 and incident atrial fibrillation in a subset of participants with complete data for the blood glucose component (15,205)**

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>
	HR (95% CI)	HR (95% CI)	HR (95% CI)
<b>Grouped LE8 score</b>			
<b>High CVH (<math>\geq 80</math>)</b>	Reference	Reference	Reference
<b>Moderate CVH (50-79)</b>	1.99 (1.40 – 2.81)	1.35 (0.95 – 1.93)	1.29 (0.91 – 1.85)
<b>Low CVH (&lt;50)</b>	3.67 (2.26 – 5.94)	2.36 (1.45 – 3.85)	2.01 (1.23 – 3.30)
<b>Ideal component decrease</b>	1.51 (1.38 – 1.66)	1.29 (1.17 – 1.42)	1.24 (1.13 – 1.37)
Model 1: crude model; model 2: adjusted for age, sex, and education level; model 3: additionally adjusted for heart failure, coronary heart disease, and alcohol consumption. CI = confidence interval; HR = hazard ratio; LE8 = Life's Essential 8.			

**Supplemental Table 6. Association between Life's Essential 8 and incident atrial fibrillation excluding atrial fibrillation events within the first two years of follow-up**

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>
	HR (95% CI)	HR (95% CI)	HR (95% CI)
<b>Grouped LE8 score</b>			
<b>High CVH (<math>\geq 80</math>)</b>	Reference	Reference	Reference
<b>Moderate CVH (50-79)</b>	1.55 (1.26 – 1.91)	1.17 (0.95 – 1.45)	1.10 (0.89 – 1.36)
<b>Low CVH (&lt;50)</b>	3.65 (2.75 – 4.85)	2.37 (1.77 – 3.17)	1.90 (1.41 – 2.56)
<b>Ideal component decrease</b>	1.31 (1.25 – 1.39)	1.15 (1.09 – 1.22)	1.11 (1.04 – 1.17)
Model 1: crude model; model 2: adjusted for age, sex, and education level; model 3: additionally adjusted for heart failure, coronary heart disease, and alcohol consumption. AF = atrial fibrillation; CI = confidence interval; HR = hazard ratio; LE8 = Life's Essential 8.			