

SUPPLEMENTAL MATERIAL

Table S1. Definition and scoring approach for quantifying cardiovascular health, as per the American Heart Association’s Life’s Essential 8 score, as applied in the National Health and Nutrition Examination Surveys.

<p>Health behaviors</p>	<p>Physical activity</p>	<p>Measurement: Self-reported minutes of moderate or vigorous physical activity per week.</p> <p>Example tools for measurement: NHANES PAQ-K questionnaire.</p>	<p>Metric: Minutes of moderate (or greater) intensity activity per week.</p> <p>Scoring:</p> <table border="1"> <thead> <tr> <th>Points</th> <th>Minutes</th> </tr> </thead> <tbody> <tr> <td>100</td> <td>>150</td> </tr> <tr> <td>90</td> <td>120-149</td> </tr> <tr> <td>80</td> <td>90-119</td> </tr> <tr> <td>60</td> <td>60-89</td> </tr> <tr> <td>40</td> <td>30-59</td> </tr> <tr> <td>20</td> <td>1-29</td> </tr> <tr> <td>0</td> <td>0</td> </tr> </tbody> </table>	Points	Minutes	100	>150	90	120-149	80	90-119	60	60-89	40	30-59	20	1-29	0	0
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100	>150																		
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80	90-119																		
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20	1-29																		
0	0																		
	<p>Nicotine exposure</p>	<p>Measurement: Self-reported use of cigarettes or inhaled nicotine delivery system.</p> <p>Example tools for measurement: NHANES SMQ questionnaire.</p>	<p>Metric: Combustible tobacco use and/or inhaled NDS use; or secondhand smoke exposure</p> <p>Scoring:</p> <table border="1"> <thead> <tr> <th>Points</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>100</td> <td>Never smoker</td> </tr> <tr> <td>75</td> <td>Former smoker, quit ≥5 yrs</td> </tr> <tr> <td>50</td> <td>Former smoker, quit 1 -</td> </tr> <tr> <td>25</td> <td>Former smoker, quit <1 year, or currently using inhaled NDS</td> </tr> <tr> <td>0</td> <td>Current smoker</td> </tr> </tbody> </table> <p>Subtract 20 points (unless score is 0) for living with active indoor smoker in home</p>	Points	Status	100	Never smoker	75	Former smoker, quit ≥5 yrs	50	Former smoker, quit 1 -	25	Former smoker, quit <1 year, or currently using inhaled NDS	0	Current smoker				
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	<p>Sleep health</p>	<p>Measurement: Self-reported average hours of sleep per night.</p> <p>Example tools for measurement: “On average, how many hours of sleep do you get per night?”</p>	<p>Metric: Average hours of sleep per night</p> <p>Scoring:</p> <table border="1"> <thead> <tr> <th>Points</th> <th>Hours</th> </tr> </thead> <tbody> <tr> <td>100</td> <td>7-<9</td> </tr> <tr> <td>90</td> <td>9-<10</td> </tr> <tr> <td>70</td> <td>6-<7</td> </tr> <tr> <td>40</td> <td>5-<6 or ≥10</td> </tr> <tr> <td>20</td> <td>4-<5</td> </tr> <tr> <td>0</td> <td><4</td> </tr> </tbody> </table>	Points	Hours	100	7-<9	90	9-<10	70	6-<7	40	5-<6 or ≥10	20	4-<5	0	<4		
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	<p>Healthy Diet</p>	<p>Measurement: Self-assessment of healthy diet.</p> <p>Example tools for measurement: NHANES DBQ questionnaire.</p>	<p>Metric: Self-assessment of diet</p> <p>Scoring:</p> <table border="1"> <thead> <tr> <th>Points</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>100</td> <td>Excellent</td> </tr> <tr> <td>75</td> <td>Very good</td> </tr> <tr> <td>50</td> <td>Good</td> </tr> <tr> <td>25</td> <td>Fair</td> </tr> <tr> <td>0</td> <td>Poor</td> </tr> </tbody> </table>	Points	Status	100	Excellent	75	Very good	50	Good	25	Fair	0	Poor				
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Health Factors	Body mass Index	<p>Measurement: Body weight (kg) divided by height squared (m^2)</p> <p>Example tools for measurement: Objective measurement of height and weight</p>	<p>Metric: Body mass index (kg/m^2)</p> <p>Scoring:</p> <table border="1"> <thead> <tr> <th>Points</th> <th>BMI</th> </tr> </thead> <tbody> <tr> <td>100</td> <td><25.0</td> </tr> <tr> <td>70</td> <td>25.0-29.9</td> </tr> <tr> <td>30</td> <td>30.0-34.9</td> </tr> <tr> <td>15</td> <td>35.0-39.9</td> </tr> <tr> <td>0</td> <td>≥ 40.0</td> </tr> </tbody> </table>	Points	BMI	100	<25.0	70	25.0-29.9	30	30.0-34.9	15	35.0-39.9	0	≥ 40.0			
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0	≥ 40.0																	
Blood lipids	<p>Measurement: Plasma total and HDL-cholesterol with calculation of non-HDL-cholesterol.</p> <p>Example tools for measurement: Fasting or non-fasting blood sample</p>	<p>Metric: Non-HDL-cholesterol (mg/dL).</p> <p>Scoring:</p> <table border="1"> <thead> <tr> <th>Points</th> <th>Level</th> </tr> </thead> <tbody> <tr> <td>100</td> <td><130</td> </tr> <tr> <td>60</td> <td>130-159</td> </tr> <tr> <td>40</td> <td>160-189</td> </tr> <tr> <td>20</td> <td>190-219</td> </tr> <tr> <td>0</td> <td>≥ 220</td> </tr> </tbody> </table> <p>If drug-treated level, subtract 20 points</p>	Points	Level	100	<130	60	130-159	40	160-189	20	190-219	0	≥ 220				
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Blood glucose	<p>Measurement: Fasting blood glucose or casual hemoglobin A1c.</p> <p>Example tools for measurement: Fasting (FBG, HbA1c) or non fasting (HbA1c) blood sample</p>	<p>Metric: Fasting blood glucose (mg/dL) or Hemoglobin A1c (%)</p> <p>Scoring:</p> <table border="1"> <thead> <tr> <th>Points</th> <th>Level</th> </tr> </thead> <tbody> <tr> <td>100</td> <td>No diabetes and FBG <100 (or HbA1c < 5.7)</td> </tr> <tr> <td>60</td> <td>No diabetes and FBG 100 – 125 (or HbA1c 5.7-6.4) (Pre-diabetes)</td> </tr> <tr> <td>40</td> <td>Diabetes with HbA1c <7.0</td> </tr> <tr> <td>30</td> <td>Diabetes with HbA1c 7.0-7.9</td> </tr> <tr> <td>20</td> <td>Diabetes with HbA1c 8.0-8.9</td> </tr> <tr> <td>10</td> <td>Diabetes with HbA1c 9.0-9.9</td> </tr> <tr> <td>0</td> <td>Diabetes with HbA1c ≥ 10.0</td> </tr> </tbody> </table>	Points	Level	100	No diabetes and FBG <100 (or HbA1c < 5.7)	60	No diabetes and FBG 100 – 125 (or HbA1c 5.7-6.4) (Pre-diabetes)	40	Diabetes with HbA1c <7.0	30	Diabetes with HbA1c 7.0-7.9	20	Diabetes with HbA1c 8.0-8.9	10	Diabetes with HbA1c 9.0-9.9	0	Diabetes with HbA1c ≥ 10.0
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Blood pressure	<p>Measurement: Appropriately measured systolic and diastolic blood pressure.</p> <p>Example tools for measurement: Appropriately sized blood pressure cuff</p>	<p>Metric: Systolic and diastolic blood pressure (mm Hg).</p> <p>Scoring:</p> <table border="1"> <thead> <tr> <th>Points</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>100</td> <td><120/<80 (Optimal)</td> </tr> <tr> <td>75</td> <td>120-129/<80 (Elevated)</td> </tr> <tr> <td>50</td> <td>130-139 or 80-89 (Stage I HTN)</td> </tr> <tr> <td>25</td> <td>140-159 or 90-99</td> </tr> <tr> <td>0</td> <td>≥ 160 or ≥ 100</td> </tr> </tbody> </table> <p>If drug-treated level, subtract 20 points</p>	Points	Status	100	<120/<80 (Optimal)	75	120-129/<80 (Elevated)	50	130-139 or 80-89 (Stage I HTN)	25	140-159 or 90-99	0	≥ 160 or ≥ 100				
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Table S2. Prevalence of LE8 Scores for Health Factors and Health Behaviors in Individuals with and without cancer.

	No Cancer (n=20,215)	Any Cancer (n=1,752)	P value
Overall LE8 scores			
Low LE8 Score, %(N)	12.9% (2,608)	15.4% (270)	<0.001
Moderate LE8 Score, %(N)	70.1% (14,171)	74.8% (1,310)	
High LE8 Score, %(N)	17.0% (3,437)	9.8% (172)	
Health factors score			
Low health factors score, %(N)	29.3% (5,931)	38.0% (666)	<0.001
Moderate health factors score, %(N)	51.2% (10,356)	52.3% (916)	
High health factors score, %(N)	19.4% (3,928)	9.7% (170)	
Health behaviours score			
Low health behaviours score, %(N)	19.7% (3,982)	21.3% (373)	0.02
Moderate health behaviours score, %(N)	56.3% (11,381)	56.8% (995)	
High health behaviours score, %(N)	24.0% (4,852)	21.9% (384)	

Table S3. HR of overall, CV, and cancer mortality by Overall CVH, health factors, and health behaviors score categories, univariate analysis. LE8: Life's Essential 8 score.

		Overall (n=21,967)	No Cancer (n=20,215)	Any Cancer (n=1,752)	P interaction
Overall CVH	All causes mortality*				
	Low LE8 Score	1	1	1	
	Moderate LE8 Score	0.52 (0.48-0.57) p<0.001	0.48 (0.44-0.51) p<0.001	0.73 (0.61-0.87) P<0.001	<0.001
	High LE8 Score	0.14 (0.11-0.18) p<0.001	0.12 (0.09-0.16) p<0.001	0.36 (0.22-0.58) P<0.001	
	CV mortality*				
	Low LE8 Score	1	1	1	
	Moderate LE8 Score	0.51 (0.43-0.60) p<0.001	0.50 (0.41-0.61) p<0.001	0.58 (0.41-0.83) p=0.003	0.09
	High LE8 Score	0.12 (0.07-0.20) p<0.001	0.10 (0.06-0.19) P<0.001	0.37 (0.15-0.93) p=0.03	
	Cancer mortality*				
	Low LE8 Score	1	1	1	
	Moderate LE8 Score	0.61 (0.50-0.73) p<0.001	0.57 (0.45-0.72) p<0.001	0.76 (0.65-1.03) p=0.08	0.19
	High LE8 Score	0.20 (0.13-0.31) P<0.001	0.20 (0.12-0.34) P<0.001	0.40 (0.18-0.87) p=0.02	
All causes mortality*					
Health factors	Low Health factors Score	1	1	1	
	Moderate Health factors Score	0.66 (0.61-0.72) p<0.001	0.58 (0.53-0.64) P<0.001	1.14 (0.95-1.36) P=0.15	<0.001
	High Health factors Score	0.32 (0.27-0.37) p<0.001	0.27 (0.22-0.33) P<0.001	1.07 (0.79-1.46) P=0.65	
	CV mortality*				
	Low Health factors Score	1	1	1	
	Moderate Health factors Score	0.55 (0.47-0.66) P<0.001	0.52 (0.43-0.63) p<0.001	0.80 (0.56-1.16) p=0.24	0.002
	High Health factors Score	0.17 (0.12-0.26) P<0.001	0.14 (0.09-0.23) P<0.001	0.61 (0.29-1.28) p=0.19	
	Cancer mortality*				
	Low Health factors Score	1	1	1	
	Moderate Health factors Score	0.79 (0.66-0.95) P=0.01	0.72 (0.57-0.9) p=0.004	1.16 (0.85-1.58) p=0.35	<0.001
	High Health factors Score	0.43 (0.32-0.59) P<0.001	0.30 (0.19-0.45) p<0.001	1.68 (1.07-2.63) P=0.02	
	All causes mortality*				
Health behaviors	Low Health behaviors Score	1	1	1	
	Moderate Health behaviors Score	0.65 (0.59-0.71) P<0.001	0.62 (0.56-0.68) p<0.001	0.78 (0.65-0.93) p=0.006	0.02
	High Health behaviors Score	0.26 (0.22-0.30) P<0.001	0.23 (0.19-0.28) p<0.001	0.36 (0.27-0.47) p<0.001	
	CV mortality*				
	Low Health behaviors Score	1	1	1	
	Moderate Health behaviors Score	0.75 (0.63-0.90) p=0.002	0.73 (0.59-0.89) p=0.002	0.88 (0.59-1.30) p=0.52	0.44
	High Health behaviors Score	0.32 (0.25-0.43) P<0.001	0.30 (0.21-0.41) p<0.001	0.45 (0.25-0.79) p=0.006	
	Cancer mortality*				
	Low Health behaviors Score	1	1	1	
	Moderate Health behaviors Score	0.64 (0.53-0.76) P<0.001	0.56 (0.45-0.71) P<0.001	0.82 (0.60-1.12) p=0.21	0.14
	High Health behaviors Score	0.31 (0.24-0.42) P<0.001	0.3 (0.21-0.42) p<0.001	0.37 (0.23-0.59) p<0.001	

*Reference – Low score groups; P value for PH assumption >0.05 – no significant deviation from proportionality.

Figure S1. Study flowchart.

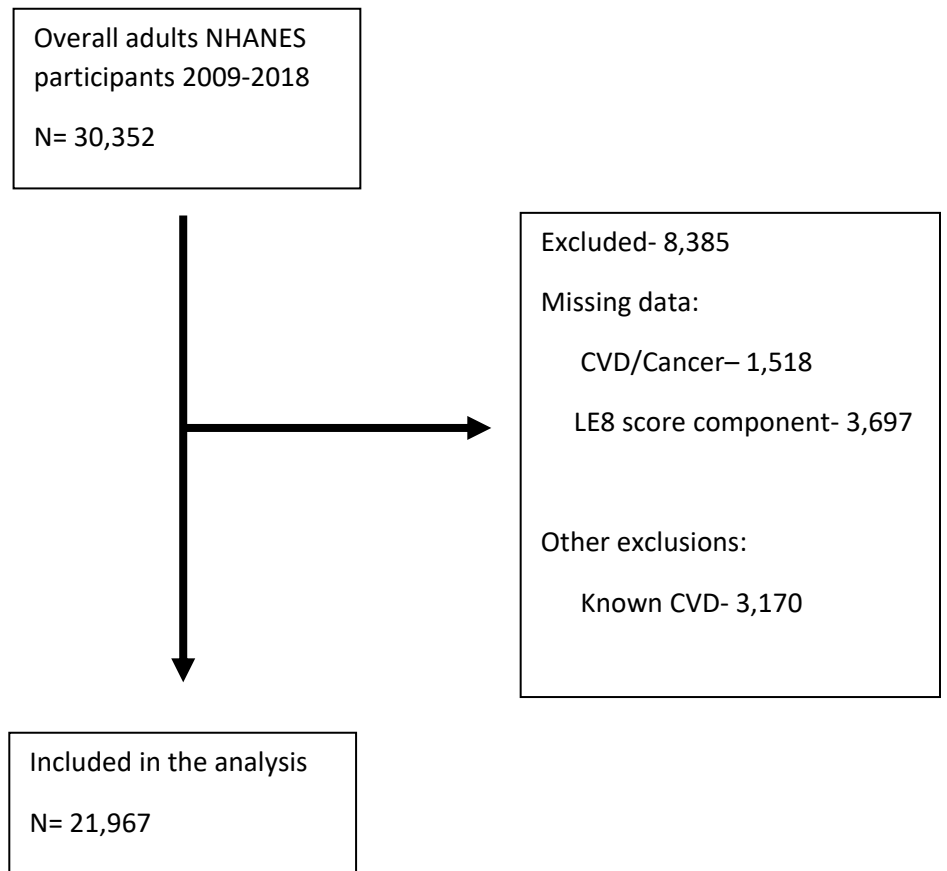
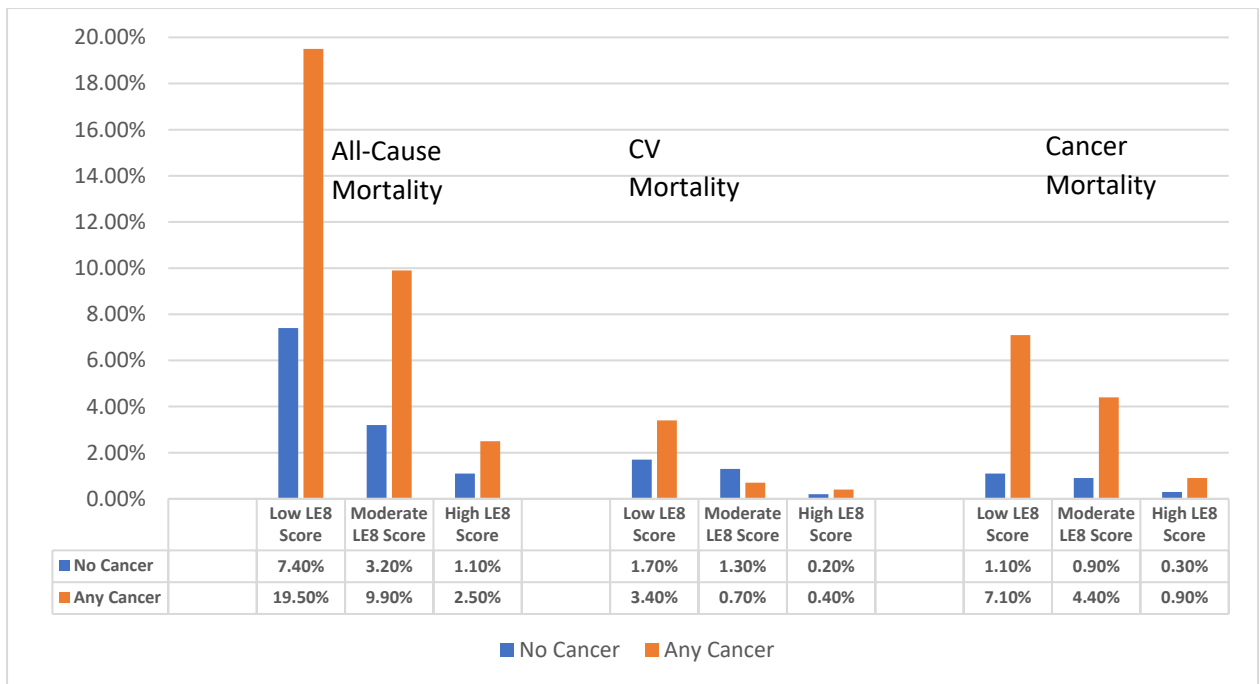


Figure S2. Crude mortality rates by LE8 score in individuals with and without cancer.



All p values for comparison any cancer vs no cancer <0.001