

Supplementary Information

Supplementary Table 1.

Life's Simple 7 metric definitions of poor, intermediate, and ideal for men participating in the British Regional Heart Study.

LS7 Metric	Poor	Intermediate	Ideal
BMI, kg/m ²	≥ 30	25-30	< 25
Blood pressure, mmHg	SBP≥140 or DBP≥90	SBP 120-140 or DBP 80-90 or treated to goal	SBP < 120, DBP < 80 and untreated
Blood glucose ^a , mmol/L	N/A	5.6-7.0 or treated to goal	< 5.6 and untreated
Total cholesterol, mmol/L	≥ 6.2	5.2-6.2	< 5.2
Smoking	Current smoking	Gave up ≤ 5 years	Never or gave up > 5 years
Physical activity ^b	Inactive	Occasional to light activity	Moderate to vigorous activity
Diet ^c	EDI score 12-23	EDI score 24-26	EDI score 27-35

^a Blood glucose ≥ 7.0 mmol/L was defined as screen-detected type 2 diabetes.

^b Physical activity level was derived based on the frequency and type (intensity) of self-reported usual pattern of physical activity, including regular walking or cycling, recreational, and sporting (vigorous) activity. In specific, based on the frequency and type (intensity), the self-reported physical activity information was firstly summarized into a score based on the recommendations of a National Heart, lung, and Blood Institute workshop and the Minnesota intensity codes^{30,31}, and then the scores were grouped into six broad categories: 0-2 inactive; 3-5 occasional activity; 6-8 light activity; 9-12 moderate activity; 13-20 moderately vigorous activity; and ≥ 21 vigorous activity. The LS7 physical activity metric was created by further categorizing inactive as poor; occasional to light as intermediate; and moderate to vigorous activity as ideal.

^c Diet was assessed by the Elderly Dietary Index (EDI) score, which is a dietary score that developed specifically to address older adults' adherence to the nutritional recommendations²⁷. The EDI consists of 9 components (fruit, vegetables, meat, fish/seafood, cereals, legumes, bread, olive oil, and dairy). Each component was assigned a 4-point scoring system based on the consumption frequency (1, 2, 3, 4, 5, 6, or 7 days/wk; monthly; or rarely/never). This resulted in a total EDI score range from 9 to 36, with higher scores indicating a presumably healthier diet. The LS7 diet metric was derived by categorizing participants into tertiles of EDI scores: 12-23 (poor); 24-26 (intermediate); and 27-35 (ideal).

BMI = body mass index; DBP = diastolic blood pressure; EDI = elderly diet index; SBP = systolic blood pressure.

Supplementary Table 2.

Comparison of complete cases and missing sample, among BRHS participants free of prevalence cardiometabolic diseases at Q20 (n=3167).

Variable	Complete cases (n=2662)	Missing sample (n=505)	p-value
CMD/Death events (%)	1764 (66.3)	390 (77.2)	
Incidence / 1000PY	33.1	38.6	
Age at baseline, years	68.2 (5.5)	69.7 (5.8), N = 505	< 0.01
Social Class		N = 505	< 0.01
Manual	45.7	51.3	
Non-manual	50.6	41.2	
Unspecified	3.8	7.5	

Alcohol Intake		N = 505	< 0.01
None	8.7	13.9	
Occasional	25.9	24.4	
Light	44.9	40.8	
Moderate	16.2	12.3	
Heavy	2.8	4.2	
Unspecified	1.5	4.6	
Energy Intake	2152.8 (519.0)	2059.9 (575.5), N = 414	< 0.01
BMI		N = 496	< 0.01
Poor	13.7	20.6	
Intermediate	53.2	51.2	
Ideal	33.1	28.2	
Blood Pressure		N = 473	0.63
Poor	40.8	40.4	
Intermediate	51.6	50.7	
Ideal	7.6	8.9	
Blood Glucose		N = 354	0.84
Intermediate	46.6	47.2	
Ideal	53.4	52.8	
Total Cholesterol		N = 356	0.07
Poor	45.8	39.9	
Intermediate	36.3	38.5	
Ideal	17.8	21.6	
Smoking		N = 499	0.61
Poor	13.0	14.6	
Intermediate	2.6	2.6	
Ideal	84.4	82.8	
Physical Activity		N = 401	< 0.01
Poor	8.7	12.2	
Intermediate	41.0	47.4	
Ideal	50.3	40.4	
Diet		N = 273	0.06
Poor	38.7	45.8	
Intermediate	37.2	34.8	
Ideal	24.0	19.4	

Values are presented as Mean (SD) or percentage unless stated otherwise.

Pearson Chi-squared test was used for all categorical variables.

Wilcoxon rank sum test was used for all continuous variables.

BMI = body mass index; CMD = cardiometabolic disease; LS7 = Life's Simple 7.

Supplementary Table 3.

The Hazard Ratios (HRs) of the associations between Life's Simple 7 adherence and risk of cardiometabolic diseases/death in BRHS participants aged 60-79 in 1998-2000, after imputing missing covariates (n=3167).

LS7 Adherence	HR	95% CI	p-value
Poor (Achieved 0-1 LS7 ideal levels)	Ref	-	< 0.01
Intermediate (Achieved 2-3 LS7 ideal levels)	0.72	(0.64, 0.81)	
Ideal (Achieved 4+ LS7 ideal levels)	0.57	(0.49, 0.66)	

Models used age as time scale, and adjusted for social class, alcohol intake, and energy intake.

LS7 = Life's Simple 7.

Supplementary Table 4.

The Hazard Ratios (HRs) of the associations between Life's Simple 7 adherence and risk of cardiometabolic diseases/death in BRHS participants aged 60-79 in 1998-2000, further adjusted for IMD (n=2662).

LS7 Adherence	HR	95% CI	p-value
Poor (Achieved 0-1 LS7 ideal levels)	Ref	-	< 0.01
Intermediate (Achieved 2-3 LS7 ideal levels)	0.74	(0.65, 0.84)	
Ideal (Achieved 4+ LS7 ideal levels)	0.59	(0.51, 0.70)	

IMD: National index of Multiple Deprivation (IMD).

Models used age as time scale, and adjusted for social class, alcohol intake, energy intake, and IMD. LS7 = Life's Simple 7.

Supplementary Table 5.

The Hazard Ratios (HRs) of the associations between Life's Simple 7 adherence and risk of cardiometabolic diseases/death in BRHS participants aged 60-79 in 1998-2000, further adjusted for baseline prevalent cancer status (n=2662).

LS7 Adherence	HR	95% CI	p-value
Poor (Achieved 0-1 LS7 ideal levels)	Ref	-	< 0.01
Intermediate (Achieved 2-3 LS7 ideal levels)	0.73	(0.64, 0.83)	
Ideal (Achieved 4+ LS7 ideal levels)	0.58	(0.50, 0.68)	

Models used age as time scale, and adjusted for social class, alcohol intake, energy intake, and baseline prevalent cancer status. LS7 = Life's Simple 7.

Supplementary Table 6.

Cardiometabolic disease-free life expectancy and years of cardiometabolic disease-free life gained at age 60 for BRHS participants by Life's Simple 7 adherence (n=2662)

LS7 Adherence	Cardiometabolic disease-free life expectancy at 60 y		Years of cardiometabolic disease-free life gained at 60 y	
	Years	95% CI	Years	95% CI
Poor (Achieved 0-1 LS7 ideal levels, n = 403)	18.42	16.93, 19.90	Ref	-
Intermediate (Achieved 2-3 LS7 ideal levels, n = 1630)	20.95	19.64, 22.25	2.53	1.44, 3.62
Ideal (Achieved 4+ LS7 ideal levels, n = 629)	22.79	21.27, 24.31	4.37	2.95, 5.79

Models used age as time scale, and adjusted for social class, alcohol intake, and energy intake. LS7, Life's Simple 7.

Supplementary Table 7.

Cardiometabolic disease-free life expectancy and years of cardiometabolic disease-free life gained at age 60 for BRHS participants by Life's Simple 7 adherence, stratified by social class.

Manual workers (N = 1216)	Cardiometabolic disease-free life expectancy at 60 y		Years of cardiometabolic disease-free life gained at 60 y	
	Years	95% CI	Years	95% CI
LS7 Adherence				
Poor (Achieved 0-1 LS7 ideal levels, n = 238)	17.19	15.19, 19.20	Ref	-
Intermediate (Achieved 2-3 LS7 ideal levels, n = 729)	19.88	18.04, 21.71	2.68	1.18, 4.19
Ideal (Achieved 4+ LS7 ideal levels, n = 229)	21.65	19.39, 23.91	4.46	2.38, 6.53

Non-manual workers (N = 1346)	Cardiometabolic disease-free life expectancy at 60 y		Years of cardiometabolic disease-free life gained at 60 y	
	Years	95% CI	Years	95% CI
LS7 Adherence				
Poor (Achieved 0-1 LS7 ideal levels, n = 151)	20.14	17.06, 23.23	Ref	-
Intermediate (Achieved 2-3 LS7 ideal levels, n = 818)	22.21	19.25, 25.18	2.06	0.30, 3.82
Ideal (Achieved 4+ LS7 ideal levels, n = 377)	24.26	21.17, 27.36	4.12	1.88, 6.35

Models used age as time scale and adjusted for alcohol intake and energy intake.
LS7, Life's Simple 7.

Supplementary Table 8.

Cardiometabolic disease-free life expectancy and years of cardiometabolic disease-free life gained at age 60 for BRHS participants by each Life's Simple 7 lifestyle metric (n=2662)

LS7 lifestyle metric	Cardiometabolic disease-free life expectancy at 60 y		Years of cardiometabolic disease-free life gained at 60 y	
	Years	95% CI	Years	95% CI
BMI				
Poor (n = 365)	18.82	17.29, 20.35	Ref	-
Intermediate (n = 1417)	21.28	19.95, 22.60	2.46	1.29, 3.63
Ideal (n = 880)	21.34	19.94, 22.74	2.53	1.28, 3.77
Blood Pressure				
Poor (n = 1087)	19.89	18.54, 21.23	Ref	-
Intermediate (n = 1373)	21.40	20.06, 22.74	1.52	0.69, 2.35
Ideal (n = 202)	22.98	20.97, 24.99	3.10	1.37, 4.82
Blood Glucose ^a				
Intermediate (n = 1241)	20.56	19.23, 21.89	Ref	-
Ideal (n = 1421)	21.23	19.90, 22.57	0.67	-0.11, 1.45
Total Cholesterol				
Poor (n = 1220)	20.96	19.62, 22.30	Ref	-
Intermediate (n = 967)	21.00	19.61, 22.38	0.04	-0.82, 0.89

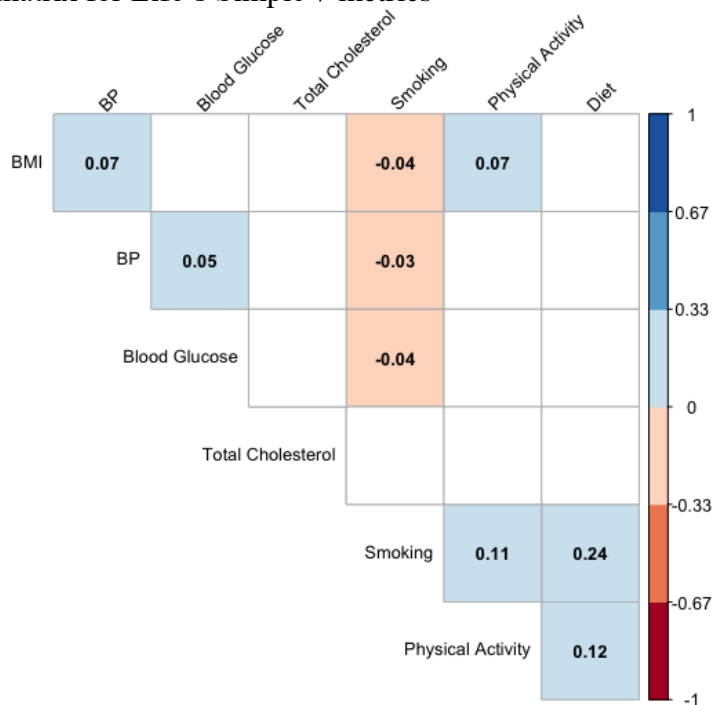
Ideal (n = 475)	20.65	19.12, 22.18	-0.31	-1.37, 0.76
Smoking				
Poor (n = 346)	17.73	16.25, 19.22	Ref	-
Intermediate (n = 70)	16.95	14.63, 19.27	-0.78	-2.98, 1.42
Ideal (n = 2246)	21.65	20.38, 22.92	3.92	2.74, 5.10
Physical Activity				
Poor (n = 232)	17.25	15.61, 18.88	Ref	-
Intermediate (n = 1092)	20.36	19.00, 21.71	3.11	1.75, 4.46
Ideal (n = 1338)	22.10	20.74, 23.45	4.84	3.37, 6.32
Elderly Diet Index				
Poor (n = 1031)	19.81	18.46, 21.16	Ref	-
Intermediate (n = 991)	21.30	19.90, 22.69	1.48	0.58, 2.39
Ideal (n = 640)	22.42	20.90, 23.93	2.61	1.48, 3.73

^a Participants with poor glucose status were diabetic and excluded from the analysis.

Models used age as time scale, and adjusted for social class, alcohol intake, and energy intake. BMI = body mass index; LS7 = Life's Simple 7.

Supplementary Figure 1.

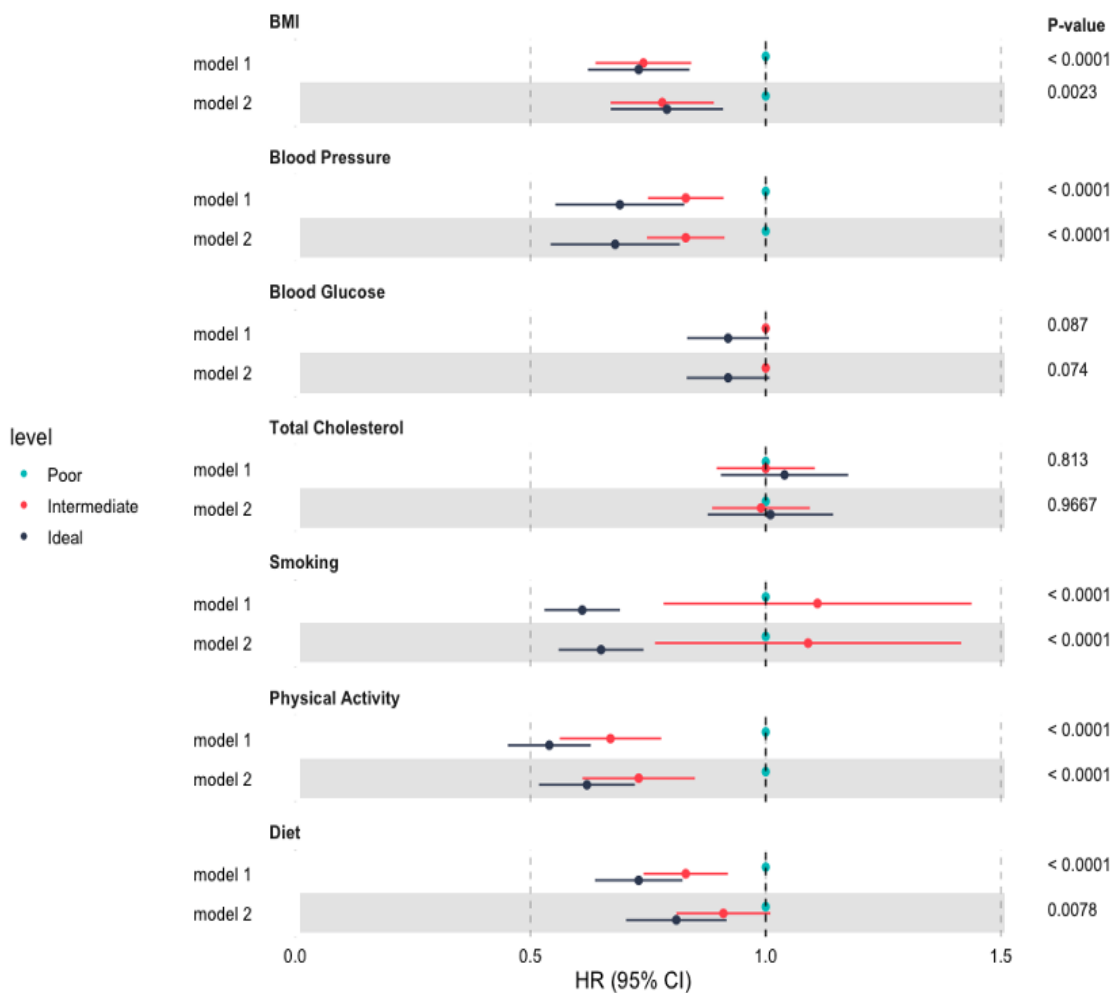
Correlation matrix for Life's Simple 7 metrics



Spearman's rank correlation was used to measure the associations between each pair of LS7 metrics. Only significant correlation coefficients (p-value < 0.05) were kept in the figure. BMI = body mass index; BP = blood pressure.

Supplementary Figure 2.

The Hazard Ratios and 95% Confidence Intervals of the associations between individual Life's Simple 7 metrics and risk of cardiometabolic diseases/death in BRHS participants aged 60-79 in 1998-2000 (n=2662).



Model 1 used age as time scale and adjusted for social class, alcohol intake, and total energy intake. Model 2 used age as time scale and adjusted for social class, alcohol intake, total energy intake, and other LS7 factors.
 BMI = body mass index.