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Supplementary Material

Chronic health conditions at year 1 and year 10

Prevalence of cancer and cardiovascular disease (any cerebrovascular or coronary heart disease) at year 1 was estimated from defined algorithms based on self-report, medication use and medical records (1). At year 10 the prevalence was updated to include baseline reports and any incidence up to the date of the year 10 visit. Pulmonary disease was defined as reporting history of chronic obstructive pulmonary disease (COPD) or emphysema, current asthma or bronchitis, or use of pulmonary drugs at the current year (1 or 10). Depression was defined as a score of 10 or more on the 10-item Center for Epidemiological Studies Depression scale (CESD-10, (2)) at the current year. Hip or knee osteoarthritis was defined from self-report at year 1, at year 10 the prevalence was updated to include reports from any year up to year 10 with the relevant information (years 2-6 & 10). Osteoporosis was inferred from medication use at the current year. Diagnosed hypertension and diabetes were defined from self-report and medication use at year 1. At year 10 the prevalence was updated to include any self-report or medication use at any year up to year 10.

References

1. Health ABC study documentation - outcomes datasets. <https://healthabc.nia.nih.gov/dataset-documentation/outcomes-datasets>.
2. Irwin M, Artin K, Oxman MN. Screening for depression in the older adult: Criterion validity of the 10-item center for epidemiological studies depression scale (ces-d). *Archives of Internal Medicine*. 1999;159:1701-1704.

Table S1: Healthy Aging Index item changes (n=1122)

	Change score (n(%))					
	Mean (SD)	-2	-1	0	1	2
SBP*	0.28 (0.74)	17 (1.5)	44 (3.9)	772 (68.8)	191 (17.0)	98 (8.7)
FVC	0.45 (0.68)	4 (0.4)	41 (3.7)	591 (52.7)	421 (37.5)	65 (5.8)
DSST	0.29 (0.65)	4 (0.4)	78 (7.0)	669 (59.6)	336 (30.0)	35 (3.1)
Cystatin C	0.29 (0.72)	4 (0.4)	95 (8.5)	665 (59.3)	287 (25.6)	71 (6.3)
Glucose*	0.16 (0.62)	8 (0.7)	81 (7.2)	793 (70.7)	206 (18.4)	34 (3.0)

*Including self-reported diagnoses & medication use

Table S2: Correlations between changes in Healthy Aging

Index items (n=1122)

	SBP*	FVC	DSST	Cystatin C	Glucose*
SBP*	1	0	0	0	0
FVC	-0.0073	1	0	0	0
DSST	-0.0323	0.0586	1	0	0
Cystatin C	0.0226	0.0489	0.0122	1	0
Glucose*	-0.0461	-0.0112	0.0059	0.1071	1

*Including self-reported diagnoses & medication use

Table S3: Full models for HAI and mortality from year 1

	Model 1	Model 2	Model 3
HA Index (1 unit)	1.18 [1.14,1.21]	1.19 [1.15,1.23]	1.17 [1.13,1.21]
Age (1 year)	1.08 [1.06,1.10]	1.07 [1.04,1.09]	1.06 [1.03,1.08]
Female	0.74 [0.66,0.82]	0.80 [0.71,0.90]	0.72 [0.63,0.82]
Black race	0.99 [0.87,1.11]	1.00 [0.88,1.14]	0.93 [0.81,1.06]
Pittsburgh site	0.81 [0.73,0.90]	0.81 [0.73,0.90]	0.83 [0.74,0.93]
Secondary education	1.05 [0.91,1.21]	1.09 [0.94,1.26]	1.12 [0.95,1.31]
Tertiary education	0.92 [0.80,1.07]	0.95 [0.82,1.10]	1.00 [0.85,1.18]
BMI (1 kg/m ²)		0.96 [0.95,0.98]	0.96 [0.95,0.98]
Current smoker		1.48 [1.23,1.79]	1.46 [1.19,1.78]
Former smoker		1.15 [1.02,1.29]	1.14 [1.01,1.30]
Physical activity (1 kcal/kg/week)		1.00 [1.00,1.00]	1.00 [1.00,1.00]
Cancer		1.36 [1.19,1.55]	1.42 [1.24,1.64]
Cardiovascular disease		1.28 [1.14,1.44]	1.22 [1.07,1.38]
Pulmonary disease		1.22 [1.04,1.44]	1.16 [0.97,1.40]
Osteoporotic drug		0.78 [0.58,1.05]	0.84 [0.62,1.14]
Hip or knee arthritis		1.15 [0.98,1.37]	1.08 [0.90,1.29]
Depression		1.09 [0.87,1.37]	1.16 [0.89,1.51]
Gait speed (10 cm/s faster)			0.93 [0.90,0.95]
N	2257	2156	1931

Table S4: Full models for HAI and mortality from year 10

	Model 1	Model 2	Model 3
HA Index (1 unit)	1.23 [1.17,1.29]	1.24 [1.18,1.31]	1.20 [1.14,1.27]
Age (1 year)	1.09 [1.06,1.12]	1.05 [1.02,1.09]	1.02 [0.99,1.06]
Female	0.76 [0.63,0.91]	0.76 [0.62,0.94]	0.64 [0.51,0.79]
Black race	0.82 [0.67,1.01]	0.84 [0.67,1.04]	0.73 [0.58,0.91]
Pittsburgh site	0.78 [0.65,0.93]	0.79 [0.65,0.96]	0.92 [0.76,1.12]
Secondary education	1.06 [0.81,1.39]	1.05 [0.79,1.39]	1.09 [0.82,1.45]
Tertiary education	1.07 [0.83,1.39]	1.10 [0.84,1.44]	1.12 [0.85,1.47]
BMI (1 kg/m ²)		0.95 [0.92,0.97]	0.93 [0.91,0.95]
Current smoker		1.61 [1.04,2.49]	1.53 [0.99,2.36]
Former smoker		0.93 [0.76,1.14]	0.90 [0.73,1.10]
Physical activity (1 kcal/kg/week)		0.99 [0.99,1.00]	1.00 [0.99,1.00]
Cancer		1.39 [1.13,1.70]	1.44 [1.17,1.77]
Cardiovascular disease		1.26 [1.03,1.53]	1.17 [0.96,1.43]
Pulmonary disease		1.07 [0.82,1.40]	1.06 [0.81,1.38]
Osteoporotic drug		0.94 [0.70,1.25]	0.92 [0.69,1.22]
Hip or knee arthritis		1.27 [1.04,1.56]	1.12 [0.91,1.38]
Depression		0.89 [0.67,1.17]	0.81 [0.62,1.07]
Gait speed (10 cm/s faster)			0.83 [0.80,0.88]
N	1122	1065	1051

Table S5: Full models for HAI change and mortality from year 10

	Model 1	Model 2	Model 3
HA Index change (1 unit)	1.09 [1.03,1.16]	1.08 [1.02,1.14]	1.08 [1.02,1.15]
Age (1 year)	1.12 [1.09,1.16]	1.09 [1.06,1.13]	1.05 [1.02,1.09]
Female	0.67 [0.56,0.80]	0.69 [0.56,0.85]	0.57 [0.46,0.71]
Black race	1.01 [0.83,1.24]	1.01 [0.81,1.25]	0.84 [0.67,1.05]
Pittsburgh site	0.79 [0.66,0.95]	0.77 [0.64,0.93]	0.93 [0.76,1.14]
Secondary education	1.01 [0.77,1.32]	0.97 [0.73,1.29]	1.03 [0.77,1.37]
Tertiary education	0.93 [0.72,1.20]	0.96 [0.73,1.25]	1.01 [0.77,1.33]
BMI (1 kg/m ²)		0.97 [0.95,0.99]	0.95 [0.93,0.97]
Current smoker		1.76 [1.14,2.74]	1.58 [1.02,2.46]
Former smoker		0.97 [0.79,1.18]	0.92 [0.75,1.13]
Physical activity (1 kcal/kg/week)		0.99 [0.99,1.00]	1.00 [0.99,1.00]
Cancer		1.39 [1.13,1.71]	1.44 [1.17,1.77]
Cardiovascular disease		1.42 [1.17,1.73]	1.28 [1.05,1.56]
Pulmonary disease		1.16 [0.89,1.51]	1.13 [0.86,1.48]
Osteoporotic drug		0.93 [0.70,1.24]	0.91 [0.68,1.21]
Hip or knee arthritis		1.29 [1.05,1.58]	1.11 [0.90,1.36]
Depression		0.92 [0.70,1.21]	0.82 [0.62,1.08]
Gait speed (10 cm/s faster)			0.81 [0.77,0.85]
N	1122	1065	1051

Table S6: Harrell's C-statistics for mortality models at year 10

	C-statistic
HAI score	0.62
HAI change	0.53
HAI score + HAI change	0.62
HAI score full model	0.7
Full model excluding HAI score	0.69

C-statistics calculated as ratio of correctly ranked pairs to total analytical pairs

Table S7: Relationships between HAI components and mortality from year 1 and 10

	Model 1	Model 2	Model 3
Year 1			
HR [95%CI] per unit higher for mortality year 3-17			
Systolic BP*	1.14 [1.06,1.21]	1.15 [1.07,1.23]	1.14 [1.06,1.22]
FVC	1.23 [1.15,1.32]	1.21 [1.13,1.30]	1.16 [1.07,1.25]
DSST	1.24 [1.14,1.34]	1.24 [1.14,1.34]	1.16 [1.06,1.26]
Cystatin C**	1.30 [1.22,1.39]	1.29 [1.21,1.39]	1.25 [1.16,1.35]
Glucose*	1.22 [1.14,1.30]	1.23 [1.15,1.32]	1.24 [1.15,1.34]
Year 10			
HR [95%CI] per unit higher for mortality year 10-17			
Systolic BP*	1.15 [1.00,1.31]	1.14 [0.99,1.31]	1.10 [0.95,1.26]
FVC	1.30 [1.15,1.47]	1.32 [1.15,1.51]	1.26 [1.10,1.45]
DSST	1.64 [1.43,1.87]	1.60 [1.38,1.84]	1.42 [1.23,1.64]
Cystatin C	1.29 [1.15,1.45]	1.29 [1.14,1.46]	1.22 [1.08,1.38]
Glucose*	1.22 [1.09,1.36]	1.22 [1.08,1.36]	1.21 [1.07,1.36]

Model 1: age, sex, site, race, education

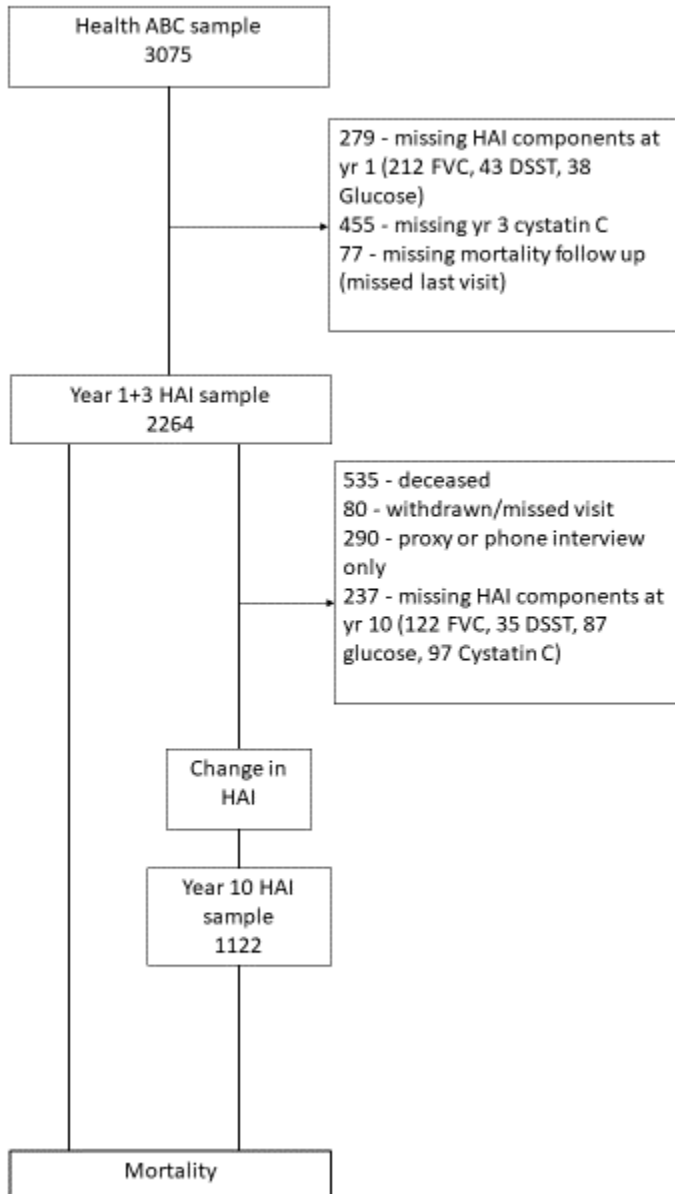
Model 2: age, sex, site, race, education, BMI, smoking, physical activity, cancer, cardiovascular disease, pulmonary disease, depression, osteoporotic drugs, and hip or knee osteoarthritis

Model 2: age, sex, site, race, education, BMI, smoking, physical activity, cancer, cardiovascular disease, pulmonary disease, depression, osteoporotic drugs, hip or knee osteoarthritis and gait speed

*Including self-reported diagnoses and medication use

**from year 3

Figure S1: Study design and participant flow



Note – Systolic BP & Glucose components include baseline diagnoses and treatments at year 1 and cumulative reports at year 10. Non-fasting glucose measurements were included if known diabetics or scoring in the lowest tertile (n=36 at year 1 & n=16 at year 10)