

Table of contents

Supplementary Table 1: Participants enrollment, population interview and clinical evaluations for the diagnosis of Alzheimer's dementia in CHAP study

Supplementary Figure 1: Flowchart the stratified random sampling for diagnosis of Alzheimer's dementia in Chicago Health and Aging Project (1993-2012).

Supplementary Table 2: Total life expectancy and life expectancy with and without Alzheimer's dementia in women with 0-1 and 4-5 healthy behaviours.

Supplementary Table 3: Total life expectancy and life expectancy with and without Alzheimer's dementia in men with 0-1 and 4-5 healthy behaviours.

Supplementary Table 4: Associations of a healthy lifestyle score with risk of Alzheimer's dementia and mortality in women and men in model additionally adjusted by body mass index, and depressive symptoms.

Supplementary Table 5: Associations of a healthy lifestyle score (without alcohol score) and the risk of Alzheimer's dementia and mortality in women and men

Supplementary Figure 2: Overall life expectancy and life expectancy with and without Alzheimer's dementia according to adherence to a healthy lifestyle (without alcohol score) in women and men

Supplementary Figure 3: Changes of lifestyle score across calendar time (1993-2009).

Supplementary Table 6: Associations of a healthy lifestyle score (1993-1999) with risk of Alzheimer's dementia and mortality in women and men.

Supplementary Table 7: Associations of a healthy lifestyle score with risk of Alzheimer's dementia (excluding dementia from other causes) in women and men

Supplementary Table 8: Associations of a healthy lifestyle score with risk of Alzheimer's dementia and death in black or African Americans and whites.

Supplementary Table 9: Associations of a healthy lifestyle score as a continuous variable with risk of Alzheimer's dementia and mortality in women and men.

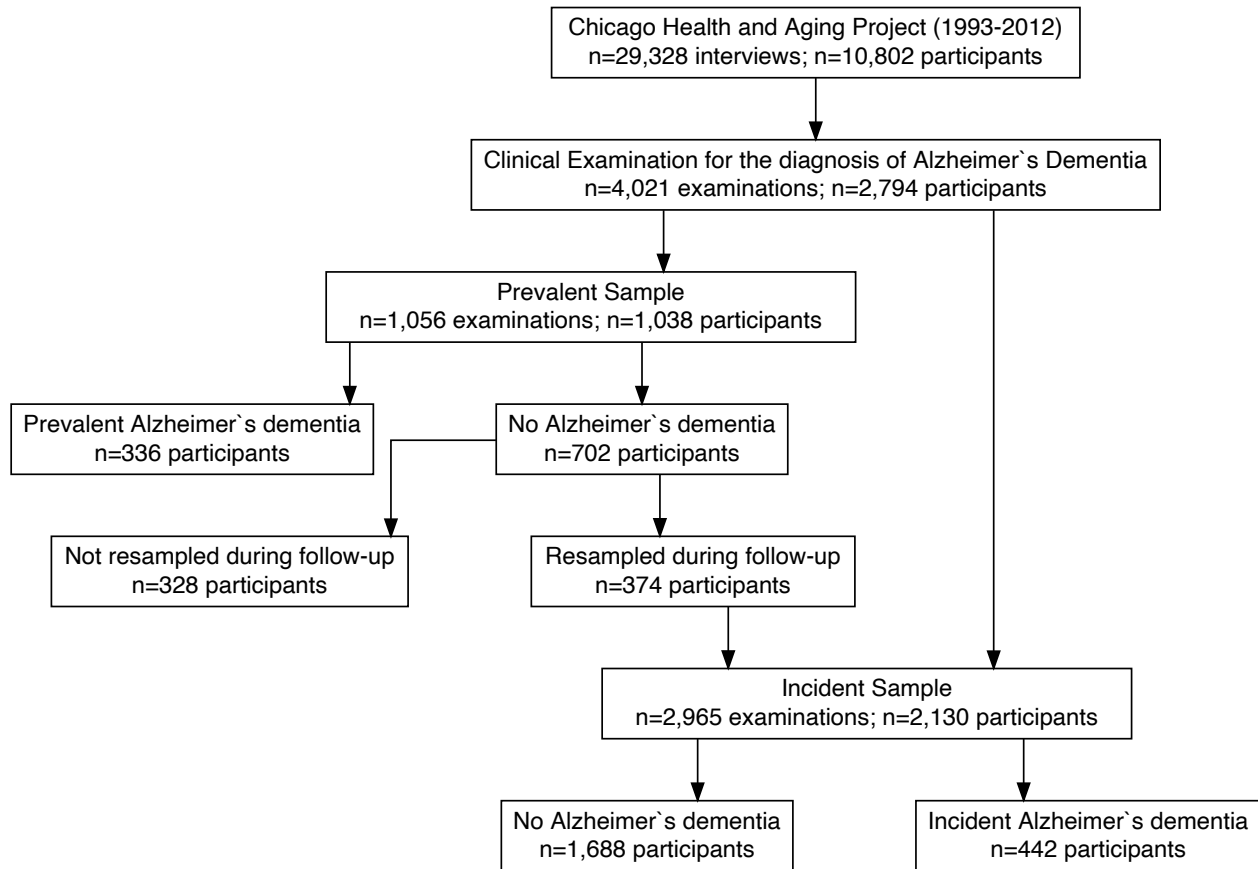
Supplementary Table 10: Associations of a healthy lifestyle score with risk of Alzheimer's dementia and mortality in women and men without missing/imputed data.

Supplementary Figure 4: Overall life expectancy and life expectancy with and without Alzheimer's dementia according to adherence to a healthy lifestyle in women and men without missing/imputed data.

Supplementary Table 1. Participants enrollment, population interview and clinical evaluations for the diagnosis of Alzheimer's dementia in CHAP study (n=10,802; 1993-2012)

	Calendar of participants enrollment, interviews, and clinical examinations					
	1993-1997	1998-2000	2001-2003	2004-2006	2007-2009	2010-2012
Cohorts						
Original Cohort	6157	4318	2942	2350	1570	1133
Successive Cohort 1			1890	1512	1181	956
Successive Cohort 2				1497	1068	853
Successive Cohort 3					974	643
Successive Cohort 4						284
Population						
Population Interview	6157	4318	4832	5359	4793	3869
Clinical Evaluations						
Clinical Evaluations for AD	731	842	643	734	656	415
Prevalent Sample	731	0	127	82	62	54
Incident Sample	0	842	516	652	594	361

Abbreviations: CHAP = Chicago Health and Aging Project; AD = Alzheimer's dementia



Supplementary Figure 1: Flowchart the stratified random sampling for diagnosis of Alzheimer's dementia in Chicago Health and Aging Project (1993-2012). Incident sample included participants without Alzheimer's dementia at baseline based on the cognitive assessment in-home interview and the clinical evaluation information (doi: 10.3233/jad-2003-5501). For example, an individual free of Alzheimer's dementia at the baseline had either good cognitive function in the population interview or, if the cognitive function was intermediate or poor, was free from Alzheimer's dementia based on the baseline clinical evaluation for prevalent dementia. Participants without Alzheimer's dementia at the baseline were eligible for incident sampling, but it was not required that incident sampling include participants with prior clinical evaluation since random sampling for clinical evaluation was based on strata defined by age, sex, race, and categories of cognitive function.

Supplementary Table 2: Total life expectancy and life expectancy with and without Alzheimer's dementia in women with 0-1 and 4-5 healthy lifestyle factors

age	Participants with 0-1 healthy behaviors				Participants with 4-5 healthy behaviors			
	LE without AD, years	LE with AD, years	Total LE	Proportion of LE lived with AD, %	LE without AD, years	LE with AD, years	Total LE	Proportion of LE lived with AD, %
65	17.0	4.1	21.1	19.3	21.5	2.6	24.2	10.8
66	16.1	4.1	20.2	20.2	20.6	2.6	23.3	11.3
67	15.2	4.1	19.4	21.3	19.7	2.6	22.4	11.8
68	14.4	4.1	18.5	22.4	18.8	2.6	21.5	12.3
69	13.6	4.2	17.7	23.5	17.9	2.6	20.6	12.9
70	12.7	4.2	16.9	24.8	17.1	2.7	19.7	13.5
71	11.9	4.2	16.1	26.2	16.2	2.7	18.9	14.1
72	11.1	4.3	15.4	27.6	15.4	2.7	18.0	14.8
73	10.4	4.3	14.6	29.2	14.5	2.7	17.2	15.6
74	9.6	4.3	13.9	30.9	13.7	2.7	16.4	16.4
75	8.9	4.3	13.2	32.8	12.9	2.7	15.6	17.2
76	8.2	4.3	12.5	34.7	12.1	2.7	14.8	18.2
77	7.5	4.4	11.8	36.9	11.3	2.7	14.0	19.2
78	6.8	4.4	11.2	39.2	10.6	2.7	13.3	20.3
79	6.1	4.4	10.5	41.6	9.8	2.7	12.5	21.5
80	5.5	4.4	9.9	44.3	9.1	2.7	11.8	22.8
81	4.9	4.4	9.3	47.1	8.4	2.7	11.1	24.1
82	4.4	4.4	8.8	50.2	7.7	2.7	10.4	25.7
83	3.8	4.4	8.2	53.4	7.1	2.7	9.8	27.3
84	3.3	4.4	7.7	56.8	6.5	2.6	9.1	29.0
85	2.9	4.4	7.2	60.3	5.9	2.6	8.5	30.9
86	2.4	4.3	6.7	64.0	5.3	2.6	7.9	33.0
87	2.0	4.3	6.3	67.8	4.7	2.6	7.3	35.2
88	1.7	4.2	5.9	71.7	4.2	2.5	6.8	37.6
89	1.3	4.1	5.5	75.5	3.7	2.5	6.2	40.2
90	1.0	4.0	5.1	79.4	3.3	2.5	5.7	43.0
91	0.8	3.9	4.7	83.0	2.8	2.4	5.2	45.9
92	0.6	3.8	4.3	86.4	2.4	2.3	4.8	49.0
93	0.4	3.6	4.0	89.5	2.1	2.3	4.3	52.2
94	0.3	3.4	3.7	92.1	1.7	2.2	3.9	55.6
95	0.2	3.1	3.3	94.3	1.4	2.0	3.4	58.8
96	0.1	2.8	2.9	96.0	1.1	1.9	3.0	62.1
97	0.1	2.5	2.5	97.3	0.9	1.7	2.6	65.5
98	0.0	2.0	2.1	98.3	0.6	1.4	2.1	68.9
99	0.0	1.5	1.5	98.9	0.4	1.1	1.5	72.2
100	0.0	0.9	0.9	99.4	0.2	0.6	0.9	75.3

Abbreviations: LE, life expectancy; AD, Alzheimer's dementia. Life expectancy estimates are rounded to one decimal place. A behavior was classified as low-risk (or 'healthy') if it met the following criterion: MIND score (without alcohol) greater than 7.5, corresponding to the upper 40% of the cohort distribution; cognitive activity score greater than 3.43, corresponding to the upper 40% of the cohort distribution; not being a current smoker; moderate or vigorous exercise for equal or more than 150 minutes/week; and light-to-moderate alcohol consumption (1–15 g/day for women and 1–30 g/day for men).

Supplementary Table 3: Total life expectancy and life expectancy with and without Alzheimer's dementia in men with 0-1 and 4-5 healthy lifestyle factors

age	Participants with 0-1 healthy behaviors				Participants with 4-5 healthy behaviors			
	LE without AD, years	LE with AD, years	Total LE	Proportion of LE lived with AD, %	LE without AD, years	LE with AD, years	Total LE	Proportion of LE lived with AD, %
65	15.3	2.1	17.4	12.0	21.7	1.4	23.1	6.1
66	14.5	2.1	16.6	12.7	20.8	1.4	22.2	6.4
67	13.6	2.1	15.8	13.5	19.9	1.4	21.3	6.7
68	12.8	2.1	15.0	14.3	19.1	1.4	20.5	7.0
69	12.1	2.2	14.2	15.2	18.2	1.4	19.6	7.3
70	11.3	2.2	13.5	16.2	17.4	1.4	18.8	7.6
71	10.6	2.2	12.8	17.2	16.5	1.4	18.0	8.0
72	9.8	2.2	12.1	18.3	15.7	1.4	17.2	8.4
73	9.2	2.2	11.4	19.6	14.9	1.4	16.4	8.9
74	8.5	2.2	10.7	20.9	14.1	1.5	15.6	9.3
75	7.8	2.3	10.1	22.4	13.4	1.5	14.8	9.8
76	7.2	2.3	9.5	24.0	12.6	1.5	14.1	10.4
77	6.6	2.3	8.9	25.7	11.9	1.5	13.3	11.0
78	6.0	2.3	8.3	27.6	11.2	1.5	12.6	11.6
79	5.5	2.3	7.8	29.7	10.5	1.5	11.9	12.3
80	5.0	2.3	7.3	31.9	9.8	1.5	11.3	13.0
81	4.5	2.3	6.8	34.4	9.2	1.5	10.6	13.8
82	4.0	2.4	6.4	37.0	8.5	1.5	10.0	14.7
83	3.6	2.4	5.9	39.9	7.9	1.5	9.4	15.6
84	3.2	2.4	5.5	42.9	7.4	1.5	8.8	16.6
85	2.8	2.4	5.2	46.0	6.8	1.5	8.3	17.7
86	2.4	2.4	4.8	49.4	6.3	1.5	7.7	18.8
87	2.1	2.4	4.5	53.1	5.8	1.4	7.2	20.1
88	1.8	2.4	4.2	57.1	5.3	1.4	6.7	21.4
89	1.5	2.4	3.9	61.3	4.8	1.4	6.2	22.9
90	1.2	2.4	3.6	65.7	4.4	1.4	5.8	24.5
91	1.0	2.4	3.4	70.2	3.9	1.4	5.3	26.2
92	0.8	2.3	3.1	74.5	3.5	1.4	4.9	27.9
93	0.6	2.3	2.9	78.5	3.2	1.3	4.5	29.6
94	0.5	2.2	2.7	82.0	2.8	1.3	4.1	31.1
95	0.4	2.1	2.5	84.6	2.5	1.2	3.8	32.4
96	0.3	2.0	2.3	86.6	2.2	1.1	3.3	33.5
97	0.2	1.8	2.0	88.8	1.8	1.0	2.8	34.9
98	0.2	1.6	1.7	90.8	1.4	0.8	2.2	36.6
99	0.1	1.3	1.4	92.7	1.0	0.6	1.6	38.5
100	0.0	0.8	0.8	94.3	0.5	0.4	0.9	40.6

Abbreviations: LE, life expectancy; AD, Alzheimer's dementia. Life expectancy estimates are rounded to one decimal place. A behavior was classified as low-risk (or 'healthy') if it met the following criterion: MIND score (without alcohol) greater than 7.5, corresponding to the upper 40% of the cohort distribution; cognitive activity score greater than 3.43, corresponding to the upper 40% of the cohort distribution; not being a current smoker; moderate or vigorous exercise for equal or more than 150 minutes/week; and light-to-moderate alcohol consumption (1–15 g/day for women and 1–30 g/day for men).

Supplementary Table 4. Associations of a healthy lifestyle score with the risk of Alzheimer's dementia and mortality in men and women in model additionally adjusted by body mass index, and depressive symptoms

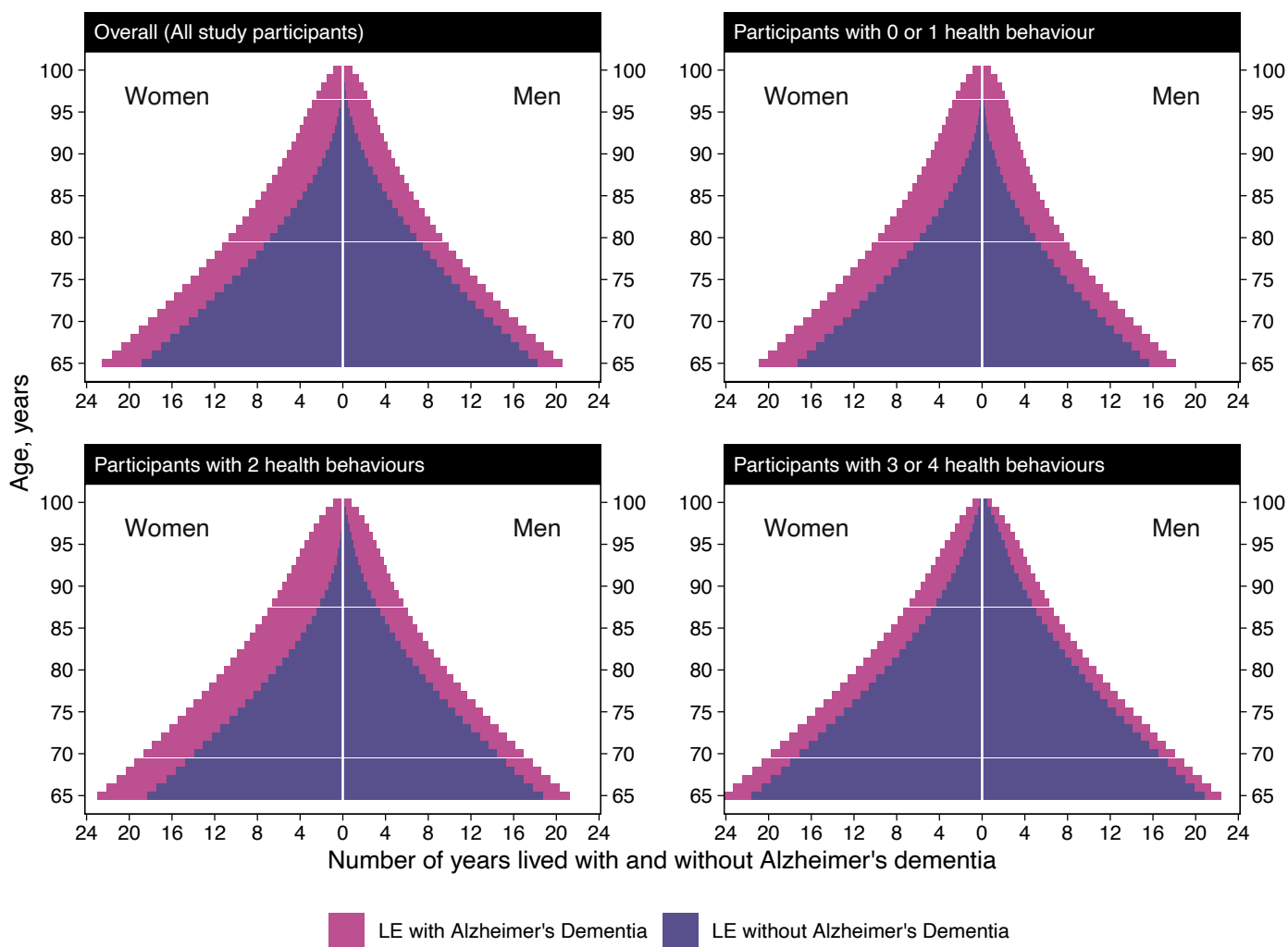
Lifestyle Score	Women			Men		
	Cases, No./Person-Years	HR	95% CI	Cases, No./Person-Years	HR	95% CI
Transition 1						
Risk of incident Alzheimer's dementia						
0-1 healthy factors	275/8,332	1	reference	164/4,715	1	reference
2-3		0.75	0.62-0.92		0.69	0.52-0.91
4-5		0.46	0.34-0.62		0.31	0.2-0.48
Transition 2						
Risk of mortality in participants without Alzheimer's dementia						
0-1 healthy factors	787/17,753	1	reference	527/9,626	1	reference
2-3		0.72	0.65-0.8		0.58	0.5-0.67
4-5		0.62	0.54-0.72		0.48	0.4-0.59
Transition 3						
Risk of mortality in participants with Alzheimer's dementia						
0-1 healthy factors	424/2,521	1	reference	260/1,321	1	reference
2-3		1.16	1.03-1.3		0.82	0.68-0.98
4-5		1.36	1.07-1.74		1.06	0.77-1.47

Abbreviations: HR, hazard ratio; CI, confidence interval; No, absolute number. Models adjusted by age, race, marital status, education, APOE e4, and comorbidities, and body mass index, and depressive symptoms. Depressive symptoms were classified by Center for Epidemiologic Studies Depression (CESD score). A lifestyle factor was classified as low-risk (or 'healthy') if it met the following criterion: MIND score (without alcohol) greater than 7.5, corresponding to the upper 40% of the cohort distribution; cognitive activity score greater than 3.43, corresponding to the upper 40% of the cohort distribution; not being a current smoker; moderate or vigorous exercise for equal or more than 150 minutes/week; and light-to-moderate alcohol consumption (1–15 g/day for women and 1–30 g/day for men). Participants with Alzheimer's dementia (Transition 3) include prevalent dementia at the baseline (n=339) and incident cases (n=439) during follow-up.

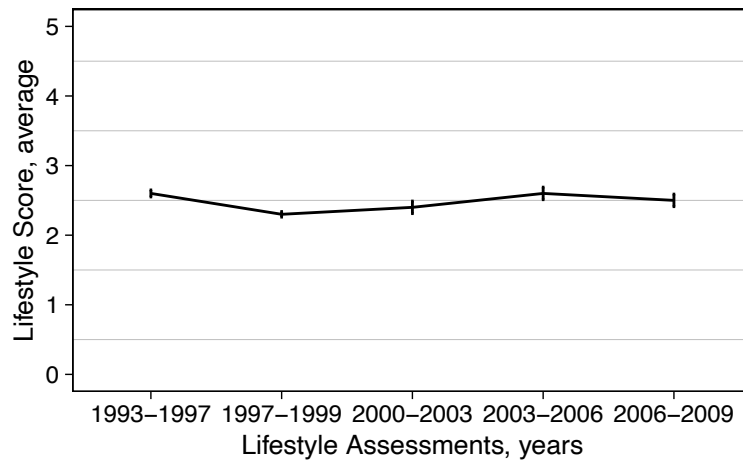
Supplementary Table 5. Associations of a healthy lifestyle score (without alcohol score) and the risk of Alzheimer's dementia and mortality in women and men

Lifestyle Score	Women			Men		
	Cases, No./Person-Years	HR	95% CI	Cases, No./Person-Years	HR	95% CI
Transition 1						
Risk of incident Alzheimer's dementia						
0-1 healthy factors	275/8,332	1	reference	164/4,715	1	reference
2		0.98	0.8-1.2		0.61	0.47-0.8
3-4		0.49	0.39-0.63		0.34	0.24-0.49
Transition 2						
Risk of mortality in participants without Alzheimer's dementia						
0-1 healthy factors	787/17,753	1	reference	527/9,626	1	reference
2		0.74	0.66-0.82		0.64	0.56-0.74
3-4		0.56	0.5-0.63		0.59	0.51-0.69
Transition 3						
Risk of mortality in participants with Alzheimer's dementia						
0-1 healthy factors	424/2,521	1	reference	260/1,321	1	reference
2		0.8	0.71-0.91		0.91	0.75-1.09
3-4		1.21	1.03-1.42		1.03	0.78-1.35

Abbreviations: HR, hazard ratio; CI, confidence interval; No, absolute number. Models adjusted by age, race, education, APOE e4, and comorbidities. A behavior was classified as low-risk (or 'healthy') if it met the following criterion: MIND score (without alcohol) greater than 7.5, corresponding to the upper 40% of the cohort distribution; cognitive activity score greater than 3.43, corresponding to the upper 40% of the cohort distribution; not being a current smoker; and moderate or vigorous exercise for equal or more than 150 minutes/week. Participants with Alzheimer's dementia (Transition 3) include prevalent dementia at the baseline (n=339) and incident cases (n=439) during follow-up.



Supplementary Figure 2: Overall life expectancy and life expectancy with and without Alzheimer's dementia according to categories of lifestyle score (without alcohol score) in women and men. A behavior was classified as low-risk or 'healthy' if it met the following criterion: MIND score (without alcohol) greater than 7.5, corresponding to the upper 40% of the cohort distribution; cognitive activity score greater than 3.43, corresponding to the upper 40% of the cohort distribution; not being a current smoker; moderate or vigorous exercise for equal or more than 150 minutes/week.



Supplementary Figure 3: Changes of lifestyle score across calendar time 1993 to 2009

Supplementary Table 6. Associations of a healthy lifestyle score (1993-1999) with the risk of Alzheimer's dementia and mortality in women and men

Lifestyle Score	Women			Men		
	Cases, No./Person-Years	HR	95% CI	Cases, No./Person-Years	HR	95% CI
Transition 1						
Risk of incident Alzheimer's dementia						
0-1 healthy factors	240/6,842	1	reference	137/3,925	1	reference
2-3		0.63	0.51-0.79		0.76	0.55-1.04
4-5		0.32	0.22-0.46		0.41	0.25-0.66
Transition 2						
Risk of mortality in participants without Alzheimer's dementia						
0-1 healthy factors	702/13,830	1	reference	467/7,522	1	reference
2-3		0.64	0.57-0.72		0.61	0.52-0.72
4-5		0.6	0.51-0.7		0.65	0.53-0.79
Transition 3						
Risk of mortality in participants with Alzheimer's dementia						
0-1 healthy factors	381/2,080	1	reference	227/1,082	1	reference
2-3		1.22	1.07-1.38		0.81	0.66-1
4-5		1.07	0.81-1.41		0.75	0.53-1.06

Abbreviations: HR, hazard ratio; CI, confidence interval; No, absolute number. Models adjusted by age, race, marital status, education, APOE e4, and comorbidities. Lifestyle factors are assessed from 1993-1999 calendar year. A behavior was classified as low-risk (or 'healthy') if it met the following criterion: MIND score (without alcohol) greater than 7.5, corresponding to the upper 40% of the cohort distribution; cognitive activity score greater than 3.43, corresponding to the upper 40% of the cohort distribution; not being a current smoker; moderate or vigorous exercise for equal or more than 150 minutes/week; and light-to-moderate alcohol consumption (1–15 g/day for women and 1–30 g/day for men). Participants with Alzheimer's dementia (Transition 3) include prevalent dementia at the baseline (n=279) and incident cases (n=377) during follow-up.

Supplementary Table 7. Associations of a healthy lifestyle score with the risk of Alzheimer's dementia (excluding dementia from other causes) in women and men

Lifestyle Score	Women			Men		
	Cases, No./Person-Years	HR	95% CI	Cases, No./Person-Years	HR	95% CI
Transition 1						
Risk of incident Alzheimer's dementia						
0-1 healthy factors	275/8,294	1	reference	164/4,682	1	reference
2-3		0.72	0.59-0.87		0.7	0.53-0.92
4-5		0.44	0.32-0.59		0.29	0.19-0.46

Abbreviations: HR, hazard ration; CI, confidence interval; No, absolute number. Models adjusted by age, race, marital status, education, APOE e4, and comorbidities. A behavior was classified as low-risk (or 'healthy') if it met the following criterion: MIND score (without alcohol) greater than 7.5, corresponding to the upper 40% of the cohort distribution; cognitive activity score greater than 3.43, corresponding to the upper 40% of the cohort distribution; not being a current smoker; moderate or vigorous exercise for equal or more than 150 minutes/week; and light-to-moderate alcohol consumption (1–15 g/day for women and 1–30 g/day for men). Alzheimer's dementia from other causes (e.g., atypical dementia) are excluded (n=12)

Supplementary Table 8. Associations of a healthy lifestyle score with risk of Alzheimer's dementia and death in black or African Americans and whites.

Lifestyle Score	Black or African Americans			Whites		
	Cases, No./Person-Years	HR	95% CI	Cases, No./Person-Years	HR	95% CI
Transition 1						
Risk of incident Alzheimer's dementia						
0-1 healthy factors	274/7,104	1	reference	165/5,944	1	reference
2-3		0.93	0.77-1.11		0.35	0.26-0.48
4-5		0.37	0.26-0.52		0.26	0.17-0.39
Transition 2						
Risk of mortality in participants without Alzheimer's dementia						
0-1 healthy factors	630/15,218	1	reference	684/12,161	1	reference
2-3		0.67	0.6-0.74		0.56	0.48-0.64
4-5		0.51	0.43-0.61		0.49	0.42-0.59
Transition 3						
Risk of mortality in participants with Alzheimer's dementia						
0-1 healthy factors	426/2,788	1	reference	258/1,055	1	reference
2-3		0.95	0.85-1.06		1.15	0.94-1.4
4-5		1.22	0.91-1.63		1.13	0.86-1.49

Abbreviations: HR, hazard ratio; CI, confidence interval; No, absolute number. Models adjusted by age, sex, marital status, education, APOE e4, and comorbidities. A behavior was classified as low-risk (or 'healthy') if it met the following criterion: MIND score (without alcohol) greater than 7.5, corresponding to the upper 40% of the cohort distribution; cognitive activity score greater than 3.43, corresponding to the upper 40% of the cohort distribution; not being a current smoker; moderate or vigorous exercise for equal or more than 150 minutes/week; and light-to-moderate alcohol consumption (1–15 g/day for women and 1–30 g/day for men).

Supplementary Table 9. Associations of a healthy lifestyle score as a continuous variable with the risk of Alzheimer's dementia and mortality in men and women

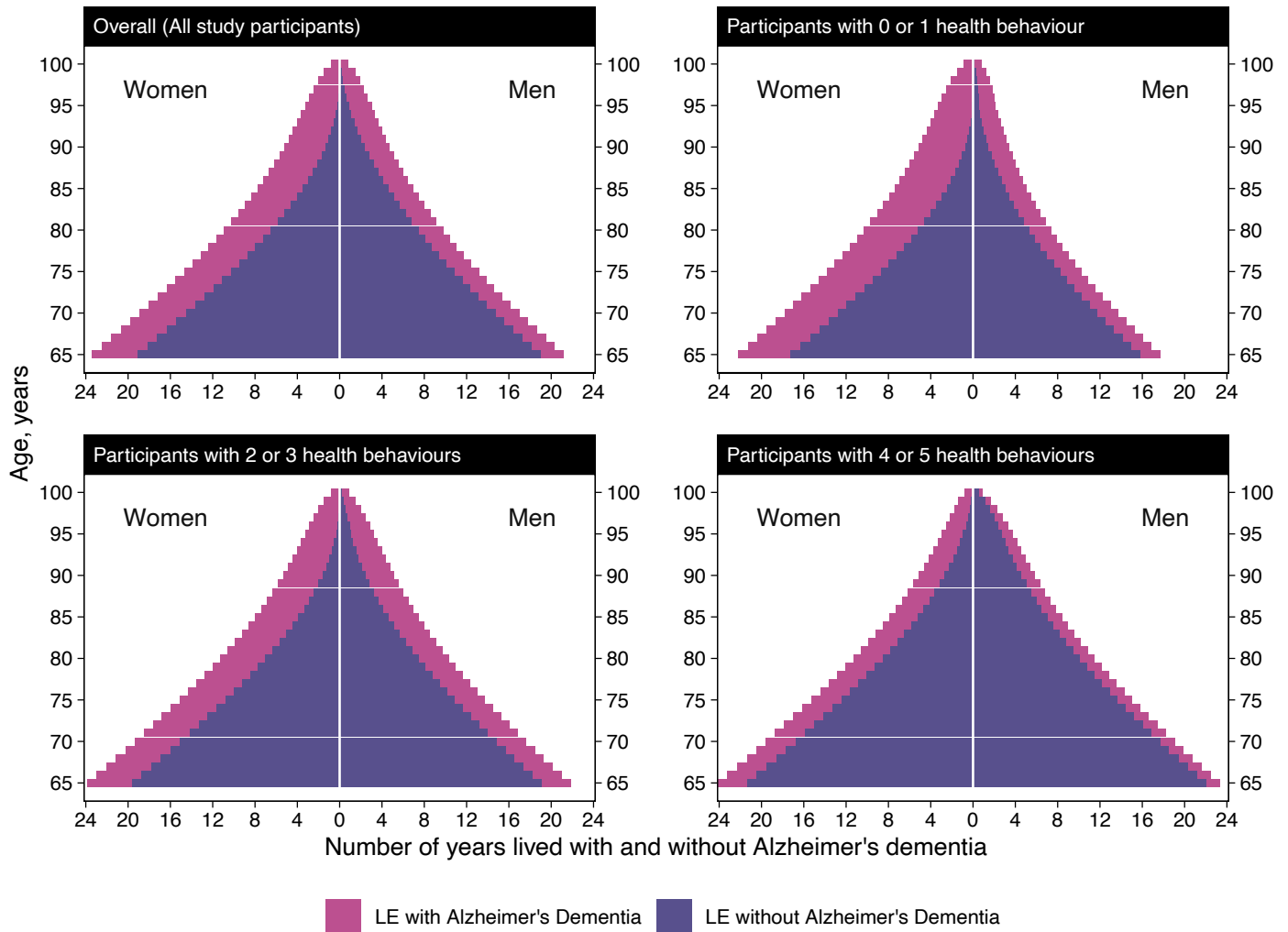
Lifestyle Score	Women			Men		
	Cases, No./Person-Years	HR	95% CI	Cases, No./Person-Years	HR	95% CI
Transition 1						
Risk of incident Alzheimer's dementia						
Continuous	275/8,332	0.75	0.69-0.82	164/4,715	0.72	0.64-0.81
Transition 2						
Risk of mortality in participants without Alzheimer's dementia						
Continuous	787/17,753	0.84	0.8-0.87	527/9,626	0.77	0.73-0.81
Transition 3						
Risk of mortality in participants with Alzheimer's dementia						
Continuous	424/2,521	1.07	1.01-1.13	260/1,321	0.92	0.84-1

Abbreviations: HR, hazard ratio; CI, confidence interval; No, absolute number. Models adjusted by age, race, marital status, education, APOE e4, and comorbidities. A lifestyle factor was classified as low-risk (or 'healthy') if it met the following criterion: MIND score (without alcohol) greater than 7.5, corresponding to the upper 40% of the cohort distribution; cognitive activity score greater than 3.43, corresponding to the upper 40% of the cohort distribution; not being a current smoker; moderate or vigorous exercise for equal or more than 150 minutes/week; and light-to-moderate alcohol consumption (1–15 g/day for women and 1–30 g/day for men). Participants with Alzheimer's dementia (Transition 3) include prevalent dementia at the baseline (n=339) and incident cases (n=439) during follow-up.

Supplementary Table 10. Associations of a healthy lifestyle score with the risk of Alzheimer's dementia and mortality in women and men without missing/imputed data

Lifestyle Score	Women			Men		
	Cases, No./Person-Years	HR	95% CI	Cases, No./Person-Years	HR	95% CI
Transition 1						
Risk of incident Alzheimer's dementia						
0-1 healthy factors	246/7,322	1	reference	146/4,214	1	reference
2-3		0.66	0.54-0.81		0.65	0.48-0.87
4-5		0.44	0.32-0.6		0.27	0.17-0.44
Transition 2						
Risk of mortality in participants without Alzheimer's dementia						
0-1 healthy factors	706/15,670	1	reference	475/8,594	1	reference
2-3		0.69	0.61-0.77		0.58	0.5-0.68
4-5		0.6	0.51-0.7		0.52	0.42-0.63
Transition 3						
Risk of mortality in participants with Alzheimer's dementia						
0-1 healthy factors	305/1,949	1	reference	191/1,073	1	reference
2-3		1.08	0.93-1.24		0.6	0.48-0.75
4-5		1.6	1.23-2.09		0.66	0.45-0.96

Abbreviations: HR, hazard ratio; CI, confidence interval; No, absolute number. Models adjusted by age, race, marital status, education, APOE e4, and comorbidities. A behavior was classified as low-risk (or 'healthy') if it met the following criterion: MIND score (without alcohol) greater than 7.5, corresponding to the upper 40% of the cohort distribution; cognitive activity score greater than 3.43, corresponding to the upper 40% of the cohort distribution; not being a current smoker; moderate or vigorous exercise for equal or more than 150 minutes/week; and light-to-moderate alcohol consumption (1–15 g/day for women and 1–30 g/day for men). Participants with Alzheimer's dementia (Transition 3) include prevalent dementia at the baseline (n=172) and incident cases (n=392) during follow-up.



Supplementary Figure 4: Overall life expectancy and life expectancy with and without Alzheimer's dementia according to categories of lifestyle score in women and men without missing/imputed data. A behavior was classified as low-risk or 'healthy' if it met the following criterion: MIND score (without alcohol) greater than 7.5, corresponding to the upper 40% of the cohort distribution; cognitive activity score greater than 3.43, corresponding to the upper 40% of the cohort distribution; not being a current smoker; moderate or vigorous exercise for equal or more than 150 minutes/week; and light-to-moderate alcohol consumption (1–15 g/day for women and 1–30 g/day for men).