Supplementary file for manuscript "Estimating expected life-years and risk factor associations with mortality in Finland: cohort study"

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Contents

Data

The individual-level data cannot be distributed as they are sensitive data. However, there is a procedure for requesting access to individual data for research collaboration at https://thl.fi/en/web/thlfi-en/research-and-expertwork/population-studies/the-national-finrisk-study.

Risk factor details

Sociodemographic background and medical history

In addition to age and sex, education was included in the model. Education was categorized using tertiles of self-reported years of education in 5-calendar-year birth cohorts. This takes into account the relative increase in educational level across the generations.

Myocardial infarction of mother under age 65 years in the FINRISK 2007 survey and in other surveys of father and mother under age 60 was asked with options yes and no, and these variables reflect the genetic predisposition.

Diagnosis for diabetes was based on the question "Has a doctor ever diagnosed you with diabetes" with options 'no', 'yes, dietary counselling' and 'yes, prescription medicine'.

Lifestyle risk factors

Dietary variables

Information on dietary variables was collected via self-administered questionnaires. Slight variations in the response options between study years were harmonized for the present analysis.

Frequency of usual use of fresh vegetables (fresh vegetables, root crops, fresh salads) was categorized as 'at most twice a week', 'almost daily' or 'daily', while frequency of usual use of fruit and berries was categorized as 'at most twice a month', 'once or twice a week', 'almost daily or daily'.

Type of milk used was asked as "If you drink milk, what kind is it usually?" and the alternatives were 'whole or full milk' (including raw milk), 'low-fat milk', 'skimmed milk' or 'I do not drink milk'. Of these alternatives, 'low-fat milk' and 'I do not drink milk' were coded together. Question concerning usual type of bread spread had options of 'low-fat spread or nothing', 'household margarine or spreads with plant stanols' and 'butter, butter-vegetable oil mixture or cooking margarine'. For this variable, the categories of 'low-fat spread or nothing' and 'household margarine or spreads with plant stanols' were merged.

Smoking, alcohol intake and physical exercise

Self-reported smoking variable had response options 1) No, I have never smoked, 2) No, I quitted smoking more than 6 months ago and 3) Yes, I smoke currently. We also used the number of cigarettes per day.

As many other observational cohort studies, also the FINRISK study shows a J-shaped association with alcohol consumption and mortality, with moderate drinking associating to lower hazard than non-drinking. This has been the case in particular for cardiovascular diseases. However, there is ongoing debate as how

much of this is causal and how much is explained by possible reversed causality. A recent study based on Mendelian randomization found no J shape in vascular disease incidence.[1] Therefore, we assumed that 1 unit of alcohol per day (84 grams of absolute alcohol per week) or less has a constant mortality risk, and an additional consumption can increase the risk linearly. We also included the question 'How often, during the past 12 months, have you felt intoxicated by alcohol?' with response options 1) once a week or more often, 2) at least once a month and 3) less than once a month, which indicated drinking habits.

Leisure time physical activity was assessed using the question: "How much do you exercise and stress yourself physically in your leisure time? If it varies much according to the different seasons, mark the alternative which best describes the average situation." The response options were: 1) In my leisure time I read, watch TV, and work in the household with tasks that do not make me move much and that do not physically tax me, 2) In my spare time I walk, cycle or exercise otherwise at least 4 hours per week. This includes walking, fishing and hunting, light gardening etc. but excludes travel to work, 3) In my spare time I exercise to maintain my physical condition, e.g. running, jogging, skiing, gymnastics, swimming, playing ball games or I do heavy gardening or the like for at least 3 hours per week, and 4) In my spare time I regularly exercise several times a week by participating in competitive sports such as running, orienteering, skiing, swimming, ball games or other heavy sports. The question has shown good criterion validity against morbidity and mortality, and moderate correlation against accelerometer counts among the working age population (Fagt et al., 2011).

Life satisfaction

Stress during the past month was measured using a 4-category question with options 1) 'yes, my life is almost unbearable', 2) 'yes, quite more so than people usually are', 3) 'yes, somewhat, but no more than what is usual' and 4) 'not at all'.

'How satisfied are you with your accomplishments in life?' with options 'very satisfied', 'satisfied', 'somewhat satisfied' and 'unsatisfied or very unsatisfied'.

'How often are you troubled by having to stretch your strength to the extreme to be able to cope with your present work or work load?' with options 'almost all the time', 'quite often', 'sometimes', 'seldom or never' and 'I do not work'.

'Do you have trouble getting along with your spouse?' with options 'almost all the time', 'quite often or seldom', 'never' and 'I do not have a spouse'.

'Have your children caused you special trouble?' with options 'no children or often', 'sometimes', 'seldom' and 'never'.

'Is you financial status now better or worse than before?' with options 'much better', 'somewhat better', 'about the same', 'a bit worse' and 'a lot worse'.

'I feel it impossible to attain the goals that I'd like to attain.' with options 'absolutely agree', 'somewhat agree', 'hard to say', 'somewhat disagree' and 'absolutely disagree'.

'I feel that I do not have even one good friend.' with options 'disagree' and 'agree or hard to say'.

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[1] Millwood IY, Walters RG, Mei XW, et al. Conventional and genetic evidence on alcohol and vascular disease aetiology: a prospective study of 500 000 men and women in China. *Lancet* 2019;393:1831-42 doi:S0140-6736(18)31772-0 [pii].

Measured biologic risk factors

Body mass index was based on measured weight and height. Height was measured to the nearest 0.5 cm (1972-1997) and 0.1 cm (2002 onwards). Weight was measured in light clothing to the nearest 100 grams using a beam balance scale. BMI was calculated as weight in kilograms divided by squared height in meters (kg/m2).

Blood sampling with at least 4-hour fast was included in the FINRISK protocol. Blood lipids were analysed from sera at the laboratory of THL, including serum total cholesterol and HDL cholesterol. The non-HDL cholesterol was defined as the difference of total cholesterol and HDL cholesterol.

In the FINRISK Study, blood pressure was measured using the mercury sphygmomanometer by trained study nurses. Measurements were made from the right arm in a sitting position with at least a 5-minute rest before the measurement. The first phase of Korotkoff sounds was recorded as systolic blood pressure and the fifth phase as diastolic blood pressure. Blood pressure was measured either twice (1977-1997) or three times (2002-2012). In the analyses the mean of the two first measurements was used.

Results

Descriptive statistics

Supplementary Table S1 presents the descriptive statistics of the risk factors. 29% of men and 46% of women reported consumption of zero grams of alcohol per week, and the averages were 88 and 32 grams per week, respectively. The fully adjusted Poisson regression model contains all these risk factors. Continuous risk factors (age, BMI, blood pressure and cholesterol) were modelled using natural cubic splines with four degrees of freedom, in which the interior knots were the 25%, 50% and 75% quantile points of the risk factor, and the boundary knots the corresponding minimum and maximum values. Categorical risk factors consumed one degree of freedom per category (excluding the reference category), and the remaining two continuous risk factors, the number of cigarettes and alcohol use, which were entered as linear terms in the linear predictor, consumed one degree of freedom each.

Supplementary Table S1: Descriptive statistics. Means and standard deviations (SD) for continuous variables and prevalences (%) for categorical variables.

	Men	Women		Men	Women
Age in years at baseline			Have you felt tensioned, stressed or under a lot of strain during the past month?		
mean	47.2	46.3	yes, my life is almost unbearable	1.9	2.1
sd	12.9	12.9	yes, quite more so than people usually are	13.7	13.9
Education			yes, somewhat, but no more than what is usual	58.2	61.8
Low	31.2	31.4	not at all	26.2	22.2
Middle	32.1	32.1	How satisfied are you with your accomplishments in life?		
High	36.7	36.5	very satisfied	7.9	10.3
Has your father been diagnosed as having had myocardial infarction when he was under 60 years?			satisfied	35.7	40.3
no	82.0	81.4	somewhat satisfied	46.9	43.5

yes	18.0	18.6	unsatisfied	9.5	6.0
Has your mother been diagnosed as having had myocardial infarction when he was under 60 years?			How often do you have to stretch your strength to the extreme in order to cope with your present work?		
no	93.9	91.9	almost all the time	2.4	2.8
yes	6.1	8.1	quite often	9.5	11.3
Have you ever been diagnosed as having diabetes, and how is it treated?			sometimes	22.9	26.2
no	94.7	95.1	seldom or never	42.1	38.6
yes, dietary counseling	2.5	3.0	I do not work	23.1	21.2
yes, medicine prescribed	2.8	1.8	Do you have trouble getting along with your spouse?		
Smoking?			quite often or more often	3.3	4.6
Never	40.6	64.6	sometimes or seldom	58.0	55.1
Quitted more than 6 months ago	25.5	14.0	never	17.3	15.3
Current	33.9	21.4	I do not have a spouse	21.4	24.9
Number of cigarettes per day			How often have your children caused you special trouble?		
mean	5.85	2.63	often or I have no children	27.5	23.9
sd	9.77	6.05	sometimes	9.1	12.8
Alcohol per week (100 g above 84 g)			seldom	25.2	27.9
mean	0.43	0.07	never	38.2	35.4
sd	1.07	0.37	Is you financial status now better or worse than before?		
How often, during the past 12 months, have you felt intoxicated by alcohol?			much better	10.3	12.5
once a week or more often	12.7	2.4	somewhat better	28.8	27.5
at least once a month	27.2	9.5	about the same	40.2	40.3
less than once a month	60.1	88.1	a bit worse	13.9	13.9
Bread spread			a lot worse	6.8	5.7
low-fat spread, nothing, household margarine or spreads with plant stanols	68.4	71.9	I feel it impossible to attain the goals that I'd like to attain.		
butter, butter-vegetable oil mixture or cooking margarine	31.6	28.1	absolutely agree	3.7	3.4
If you drink milk, what kind is it usually?			somewhat agree	14.3	14.0
skimmed milk	20.2	24.8	hard to say	34.8	34.9
low-fat milk or I do not drink milk	65.8	67.6	somewhat disagree	25.4	25.2
whole or full milk	14.0	7.6	absolutely disagree	21.8	22.5
How often do you usually eat fresh vegetables, root crops (excluding potatoes), fresh salads?			I feel that I do not have any good friends.		
At most twice a week	50.9	32.7	disagree	84.8	87.1
Almost daily	28.7	33.5	agree or hard to say	15.2	12.9
Daily	20.4	33.8	Body Mass Index BMI (kg/m2)		
How often do you usually eat fruit or berries?			mean	26.8	26
At most twice a month	11.0	4.2	sd	3.76	4.5
Once or twice a week	36.2	21.0	Non-HDL cholesterol (mmol/l)		

Almost daily or daily	52.8	74.8	mean		4.34	3.94
How much do you exercise and stress yourself physically in your leisure time?			sd		1.11	1.08
inactive	22.3	23.6	Diastolic Blood Pressure mean (mmHg)			
low	52.7	56.6	mean		83.4	78.7
high	25.0	19.8	sd		11.6	11.2
			Systolic Blood Pressure mean (mmHg)			
			mean		139	133
			sd		18.5	20.4

Parameter estimates of the simple and multiple Poisson regression models
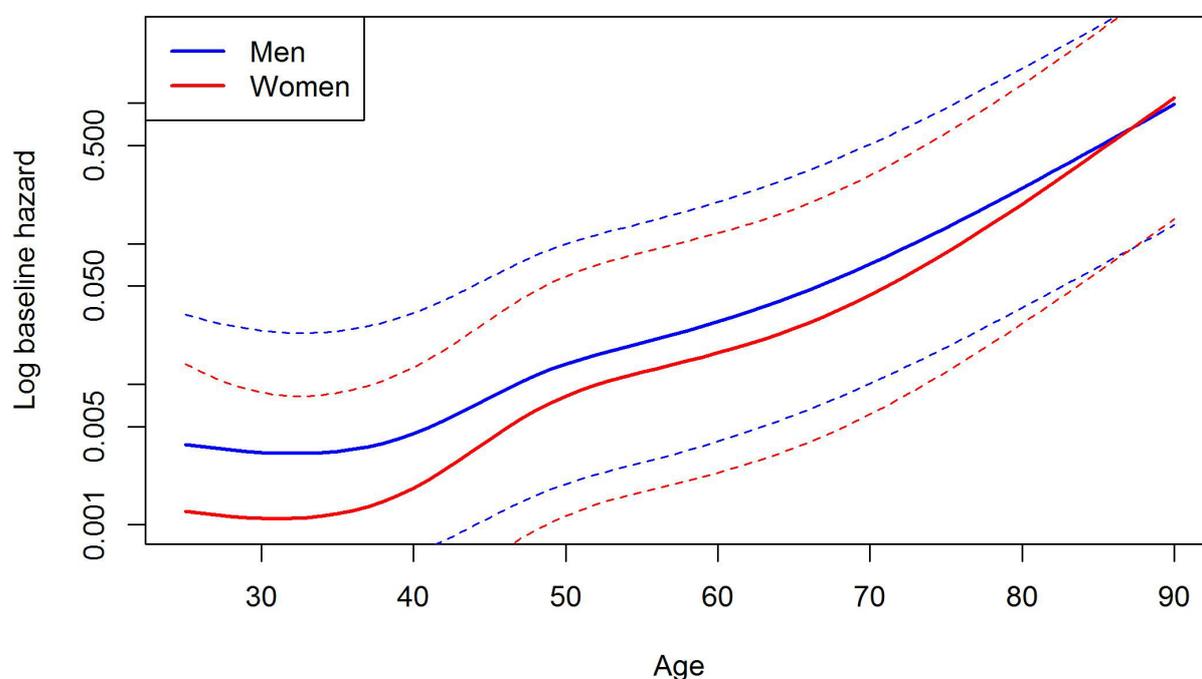
Supplementary Figure S1: Baseline hazard estimates for men and women with 95% confidence intervals (dashed lines).

Supplementary Table S2: Hazard ratio estimates (with 95% confidence intervals) of categorical risk factors based on age and sex adjusted simple, and fully adjusted regression models both without and with biological risk factors, and the Wald test p-values.

	Simple regression model		Fully adjusted without biological		Fully adjusted with biological	
	HR	95% CI	HR	95% CI	HR	95% CI
Education					p=0.032	
Low	1.00		1.00		1.00	
Middle	0.86	(0.78, 0.95)	0.94	(0.86, 1.04)	0.94	(0.86, 1.03)

High	0.70	(0.64, 0.77)	0.90	(0.81, 1.00)	0.90	(0.81, 0.99)
Has your father been diagnosed as having had myocardial infarction when he was under 60 years?					p=0.082	
no	1.00		1.00		1.00	
yes	1.13	(1.02, 1.25)	1.10	(0.99, 1.23)	1.10	(0.99, 1.22)
Has your mother been diagnosed as having had myocardial infarction when he was under 60 years?					p=0.013	
no	1.00		1.00		1.00	
yes	1.28	(1.11, 1.48)	1.21	(1.05, 1.40)	1.20	(1.04, 1.39)
Smoking?					p=0.000	
Never	1.00		1.00		1.00	
Quitted more than 6 months ago	1.22	(1.09, 1.35)	1.18	(1.05, 1.31)	1.17	(1.05, 1.31)
Current	2.75	(2.50, 3.01)	1.65	(1.42, 1.91)	1.67	(1.44, 1.93)
Number of cigarettes per day					p=0.000	
	1.04	(1.04, 1.05)	1.02	(1.01, 1.02)	1.02	(1.01, 1.02)
Alcohol per week (100 g)					p=0.000	
	1.19	(1.16, 1.22)	1.08	(1.05, 1.12)	1.08	(1.04, 1.12)
How often, during the past 12 months, have you felt intoxicated by alcohol?					p=0.001	
once a week or more often	1.00		1.00		1.00	
at least once a month	0.78	(0.67, 0.91)	0.95	(0.81, 1.12)	0.95	(0.81, 1.12)
less than once a month	0.51	(0.44, 0.58)	0.79	(0.68, 0.93)	0.81	(0.69, 0.94)
Bread Spread					p=0.004	
low-fat spread, nothing, household margarine or spreads with plant stanols	1.00		1.00		1.00	
butter, butter-vegetable oil mixture or cooking margarine	1.32	(1.22, 1.43)	1.14	(1.05, 1.25)	1.14	(1.04, 1.24)
If you drink milk, what kind is it usually?					p=0.000	
skimmed milk	1.00		1.00		1.00	
low-fat milk or I do not drink milk	1.25	(1.12, 1.41)	1.17	(1.04, 1.32)	1.17	(1.04, 1.31)
whole or full milk	2.10	(1.84, 2.39)	1.56	(1.35, 1.80)	1.53	(1.33, 1.77)
How often do you usually eat fresh vegetables, root crops (excluding potatoes), fresh salads?					p=0.031	
At most twice a week	1.00		1.00		1.00	
Almost daily	0.72	(0.65, 0.78)	0.94	(0.85, 1.04)	0.94	(0.86, 1.04)
Daily	0.61	(0.55, 0.68)	0.88	(0.78, 0.98)	0.88	(0.79, 0.99)
How often do you usually eat fruit or berries?					p=0.007	

At most twice a month	1.00		1.00		1.00	
Once or twice a week	0.67	(0.59, 0.76)	0.95	(0.83, 1.09)	0.94	(0.82, 1.08)
Almost daily or daily	0.48	(0.42, 0.54)	0.85	(0.74, 0.98)	0.85	(0.74, 0.98)
How much do you exercise and stress yourself physically in your leisure time?					p=0.000	
inactive	1.00		1.00		1.00	
low	0.66	(0.60, 0.72)	0.82	(0.74, 0.90)	0.81	(0.74, 0.89)
high	0.47	(0.41, 0.54)	0.75	(0.65, 0.86)	0.75	(0.65, 0.86)
Have you felt tensioned, stressed or under a lot of strain during the past month?					p=0.002	
yes, my life is almost unbearable	1.00		1.00		1.00	
yes, quite more so than people usually are	0.60	(0.47, 0.76)	0.82	(0.63, 1.05)	0.82	(0.64, 1.06)
yes, somewhat, but no more than what is usual	0.47	(0.37, 0.59)	0.73	(0.57, 0.93)	0.73	(0.57, 0.93)
not at all	0.50	(0.39, 0.63)	0.79	(0.61, 1.02)	0.79	(0.61, 1.02)
How satisfied are you with your accomplishments in life?					p=0.004	
very satisfied	1.00		1.00		1.00	
satisfied	1.16	(0.98, 1.37)	1.12	(0.94, 1.33)	1.12	(0.94, 1.33)
somewhat satisfied	1.49	(1.27, 1.75)	1.21	(1.02, 1.43)	1.21	(1.02, 1.43)
unsatisfied	2.41	(1.98, 2.93)	1.33	(1.07, 1.65)	1.32	(1.06, 1.64)
How often do you have to stretch your strength to the extreme in order to cope with your present work?					p=0.001	
I do not work	0.96	(0.74, 1.24)	1.13	(0.86, 1.48)	1.13	(0.86, 1.48)
almost all the time	1.00		1.00		1.00	
quite often	0.75	(0.56, 1.00)	0.91	(0.68, 1.23)	0.92	(0.68, 1.24)
sometimes	0.74	(0.57, 0.97)	1.00	(0.76, 1.31)	0.99	(0.75, 1.31)
seldom or never	0.70	(0.54, 0.91)	0.96	(0.73, 1.26)	0.96	(0.73, 1.26)
Do you have trouble getting along with your spouse?					p=0.000	
I do not have a spouse	1.60	(1.26, 2.03)	1.38	(1.08, 1.76)	1.35	(1.06, 1.73)
quite often or more often	1.00		1.00		1.00	
sometimes or seldom	0.98	(0.78, 1.25)	1.16	(0.91, 1.47)	1.14	(0.90, 1.45)
never	1.02	(0.79, 1.31)	1.24	(0.96, 1.59)	1.21	(0.94, 1.56)
How often have your children caused you					p=0.040	

special trouble?						
often or I have no children	1.00		1.00		1.00	
sometimes	0.78	(0.67, 0.90)	0.96	(0.82, 1.12)	0.96	(0.83, 1.12)
seldom	0.72	(0.64, 0.81)	0.93	(0.82, 1.06)	0.93	(0.82, 1.06)
never	0.71	(0.64, 0.79)	0.90	(0.81, 1.01)	0.89	(0.80, 1.00)
Is you financial status now better or worse than before?					p=0.001	
much better	1.00		1.00		1.00	
somewhat better	0.98	(0.83, 1.15)	0.93	(0.79, 1.10)	0.93	(0.79, 1.09)
about the same	1.20	(1.04, 1.39)	1.09	(0.94, 1.27)	1.09	(0.94, 1.26)
a bit worse	1.37	(1.16, 1.62)	1.13	(0.95, 1.34)	1.12	(0.94, 1.33)
a lot worse	1.87	(1.55, 2.25)	1.14	(0.93, 1.40)	1.14	(0.93, 1.39)
I feel it impossible to attain the goals that I'd like to attain.					p=0.000	
absolutely agree	1.00		1.00		1.00	
somewhat agree	0.71	(0.58, 0.86)	0.86	(0.71, 1.06)	0.87	(0.71, 1.07)
hard to say	0.69	(0.58, 0.83)	0.85	(0.70, 1.03)	0.85	(0.70, 1.03)
somewhat disagree	0.49	(0.41, 0.60)	0.72	(0.58, 0.88)	0.72	(0.59, 0.89)
absolutely disagree	0.46	(0.37, 0.57)	0.74	(0.59, 0.93)	0.74	(0.59, 0.94)
I feel that I do not have any good friends.					p=0.105	
disagree	p=0.000		p=0.000		p=0.000	
agree or hard to say	1.38	(1.24, 1.53)	1.11	(0.99, 1.23)	1.09	(0.98, 1.22)
Have you ever been diagnosed as having diabetes, and how is it treated?					p=0.000	
no	1.00		1.00		1.00	
yes, dietary counseling	1.19	(0.98, 1.44)	1.15	(0.95, 1.40)	1.16	(0.96, 1.41)
yes, medicine prescribed	2.24	(1.92, 2.63)	2.19	(1.86, 2.57)	2.21	(1.87, 2.60)

Example calculation of the EAD

The EAD can be calculated using the parameter estimates of the Poisson regression model and the risk factor values of an individual. The R code (in boxes) and the output are listed below:

```
> ## Example data containing one individual:
> str(pred1.df)
```

```
'data.frame':          1 obs. of  35 variables:
 $ koulgr7202 : Factor w/ 3 levels "Low","Middle",..: 3
 $ q32a       : Factor w/ 2 levels "no","yes": 1
 $ q33a       : Factor w/ 2 levels "no","yes": 1
 $ tupak2     : Factor w/ 3 levels "Never","Quitted more than 6 months ago",..: 1
```

```
 $ savukkeita : num 0
 $ alki12     : num 0
 $ q137_4     : Factor w/ 3 levels "once a week or more often",..: 3
 $ oma_lrasva4: Factor w/ 2 levels "low-fat spread, nothing, household margarine or
spreads with plant stanols",..: 1
 $ q87        : Factor w/ 3 levels "skimmed milk",..: 2
 $ diab3      : Factor w/ 3 levels "no","yes, dietary counseling",..: 1
 $ q91        : Factor w/ 3 levels "At most twice a week",..: 1
 $ q92        : Factor w/ 3 levels "At most twice a month",..: 3
 $ q57        : Factor w/ 3 levels "inactive","low",..: 2
 $ q47        : Factor w/ 4 levels "yes, my life is almost unbearable",..: 3
 $ q113       : Factor w/ 4 levels "very satisfied",..: 3
 $ q107       : Factor w/ 5 levels "almost all the time",..: 4
 $ q108       : Factor w/ 4 levels "quite often or more often",..: 2
 $ q110       : Factor w/ 4 levels "often or I have no children",..: 4
 $ q115       : Factor w/ 5 levels "much better",..: 3
 $ q117       : Factor w/ 5 levels "absolutely agree",..: 3
 $ q121       : Factor w/ 2 levels "disagree","agree or hard to say": 1
 $ bmi        : num 25.9
 $ hdl        : num 1.25
 $ kol        : num 5.49
 $ dias1      : num 79
 $ sys1       : num 130
 $ sukup      : Factor w/ 2 levels "male","female": 2
 $ cal.t.f    : Factor w/ 3 levels "[2.01e+03,2.02e+03)",..: 1
 $ cal.age.75 : Factor w/ 2 levels "present","historical": 1
 $ non.hdl    : num 4.24
 $ alki100    : num 0
 $ dead       : num 0
 $ exit_time  : num 2081
 $ birth_time : num 1972
 $ bl_time    : num 2019
```

```
> pred1.df
```

```
      koulgr7202 q32a q33a tupak2 savukkeita alki12                 q137_4
35805       High   no   no  Never          0      0 less than once a month
                                                                        oma_lrasva4
35805 low-fat spread, nothing, household margarine or spreads with plant stanols
                                    q87 diab3                 q91
35805 low-fat milk or I do not drink milk    no At most twice a week
                  q92 q57                                         q47
35805 Almost daily or daily low yes, somewhat, but no more than what is usual
                  q113           q107         q108 q110           q115
35805 somewhat satisfied seldom or never sometimes or seldom never about the same
            q117     q121      bmi  hdl  kol dias1 sys1  sukup        cal.t.f
35805 hard to say disagree 25.90912 1.25 5.49    79  130 female [2.01e+03,2.02e+03)
    cal.age.75 non.hdl alki100 dead exit_time birth_time bl_time
35805    present    4.24       0    0      2081       1972    2019
```

```
> ## Create the Lexis object:
> d.lx <- Lexis(entry=list(age=bl_time - birth_time, cal.t=bl_time),
+               exit=list(age=exit_time - birth_time),
+               exit.status=dead,
+               data=pred1.df)
```
NOTE: entry.status has been set to 0 for all.

```
> summary(d.lx)
```

```
Transitions:
    To
From 0  Records:  Events: Risk time:  Persons:
  0 1          1        0        62         1
```

```
 > ## Split the follow-up time into 1-year intervals:
 > d.lx0 <- within(splitLexis(d.lx, "age", breaks=25:110), {
```
```
+     cal.t.f <- cut(cal.t, c(floor(min(cal.t)), seq(2000, 2050, 10)), right=FALSE,
include.lowest=TRUE)
+     cal.t.f <- droplevels(cal.t.f)
+     cal.t.f <- relevel(cal.t.f, rev(levels(cal.t.f))[1])
+ })
```

```
 > str(d.lx0)
```

```
Classes 'Lexis' and 'data.frame':   62 obs. of  41 variables:
 $ lex.id    : int  1 1 1 1 1 1 1 1 1 1 ...
 $ age       : num  47 48 49 50 51 52 53 54 55 56 ...
 $ cal.t     : num  2019 2020 2021 2022 2023 ...
 $ lex.dur   : num  1 1 1 1 1 1 1 1 1 1 ...
 $ lex.Cst   : num  0 0 0 0 0 0 0 0 0 0 ...
 $ lex.Xst   : num  0 0 0 0 0 0 0 0 0 0 ...
 $ koulgr7202 : Factor w/ 3 levels "Low","Middle",..: 3 3 3 3 3 3 3 3 3 3 ...
 $ q32a      : Factor w/ 2 levels "no","yes": 1 1 1 1 1 1 1 1 1 1 ...
 $ q33a      : Factor w/ 2 levels "no","yes": 1 1 1 1 1 1 1 1 1 1 ...
 $ tupak2    : Factor w/ 3 levels "Never","Quitted more than 6 months ago",..: 1 1 1 1 1
1 1 1 1 1 ...
 $ savukkeita : num  0 0 0 0 0 0 0 0 0 0 ...
 $ alki12    : num  0 0 0 0 0 0 0 0 0 0 ...
 $ q137_4    : Factor w/ 3 levels "once a week or more often",..: 3 3 3 3 3 3 3 3 3 3
...
 $ oma_lrasva4: Factor w/ 2 levels "low-fat spread, nothing, household margarine or
spreads with plant stanols",..: 1 1 1 1 1 1 1 1 1 1 ...
 $ q87       : Factor w/ 3 levels "skimmed milk",..: 2 2 2 2 2 2 2 2 2 2 ...
 $ diab3     : Factor w/ 3 levels "no","yes, dietary counseling",..: 1 1 1 1 1 1 1 1 1 1
...
 $ q91       : Factor w/ 3 levels "At most twice a week",..: 1 1 1 1 1 1 1 1 1 1 1 ...
 $ q92       : Factor w/ 3 levels "At most twice a month",..: 3 3 3 3 3 3 3 3 3 3 3 ...
 $ q57       : Factor w/ 3 levels "inactive","low",..: 2 2 2 2 2 2 2 2 2 2 ...
 $ q47       : Factor w/ 4 levels "yes, my life is almost unbearable",..: 3 3 3 3 3 3 3
3 3 3 ...
 $ q113      : Factor w/ 4 levels "very satisfied",..: 3 3 3 3 3 3 3 3 3 3 ...
 $ q107      : Factor w/ 5 levels "almost all the time",..: 4 4 4 4 4 4 4 4 4 4 ...
 $ q108      : Factor w/ 4 levels "quite often or more often",..: 2 2 2 2 2 2 2 2 2 2
...
 $ q110      : Factor w/ 4 levels "often or I have no children",..: 4 4 4 4 4 4 4 4 4 4
...
 $ q115      : Factor w/ 5 levels "much better",..: 3 3 3 3 3 3 3 3 3 3 ...
 $ q117      : Factor w/ 5 levels "absolutely agree",..: 3 3 3 3 3 3 3 3 3 3 ...
 $ q121      : Factor w/ 2 levels "disagree","agree or hard to say": 1 1 1 1 1 1 1 1 1 1
...
 $ bmi       : num  25.9 25.9 25.9 25.9 25.9 ...
 $ hdl       : num  1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.25 ...
 $ kol       : num  5.49 5.49 5.49 5.49 5.49 ...
 $ dias1     : num  79 79 79 79 79 79 79 79 79 79 ...
 $ sys1      : num  130 130 130 130 130 130 130 130 130 ...
 $ sukup     : Factor w/ 2 levels "male","female": 2 2 2 2 2 2 2 2 2 2 ...
 $ cal.t.f   : Factor w/ 4 levels "[2040,2050]",..: 2 3 3 3 3 3 3 3 3 3 ...
 $ cal.age.75 : Factor w/ 2 levels "present","historical": 1 1 1 1 1 1 1 1 1 1 ...
 $ non.hdl   : num  4.24 4.24 4.24 4.24 4.24 ...
 $ alki100   : num  0 0 0 0 0 0 0 0 0 0 ...
 $ dead      : num  0 0 0 0 0 0 0 0 0 0 ...
 $ exit_time : num  2081 2081 2081 2081 2081 ...
 $ birth_time : num  1972 1972 1972 1972 1972 ...
 $ bl_time   : num  2019 2019 2019 2019 2019 ...
 - attr(*, "breaks")=List of 2
  ..$ age  : int  25 26 27 28 29 30 31 32 33 34 ...
  ..$ cal.t: NULL
 - attr(*, "time.scales")= chr  "age" "cal.t"
 - attr(*, "time.since")= chr  "" ""
```

```
> ## The first and last columns, and the first 5 rows:
> d.lx0[1:5, c(1:10, 30:35)]
```

```
  lex.id age cal.t lex.dur lex.Cst lex.Xst koulgr7202 q32a q33a tupak2  kol dias1
1      1  47  2019       1       0       0       High   no   no  Never 5.49    79
2      1  48  2020       1       0       0       High   no   no  Never 5.49    79
3      1  49  2021       1       0       0       High   no   no  Never 5.49    79
4      1  50  2022       1       0       0       High   no   no  Never 5.49    79
5      1  51  2023       1       0       0       High   no   no  Never 5.49    79
  sys1  sukup      cal.t.f cal.age.75
1  130 female [2019,2020)    present
2  130 female [2020,2030)    present
3  130 female [2020,2030)    present
4  130 female [2020,2030)    present
5  130 female [2020,2030)    present
```

```
> ## Poisson regression coefficient estimates:
> class(surv4)
```

```
[1] "survreg"
```

```
> str(surv4$coefficients)
```

```
 Named num [1:75] 5.26 -1.25 -1.7 -2.92 -3.85 ...
 - attr(*, "names")= chr [1:75] "(Intercept)" "ns(age, df = 5)1" "ns(age, df = 5)2"
"ns(age, df = 5)3" ...
```

```
> ## Linear predictor values for each follow-up year:
> lp <- predict(surv4, d.lx0, type="lp") # ... returns negative LP
>
> ## Predictive probabilities P(T = t|T > t − 1):
> pv <- 1-exp(-exp(-lp)) # survreg
>
> ## Print age, linear predictor and predictive probability values:
> round(rbind(age=d.lx0$age, lp, pv), 3)
```

```
        1       2       3       4       5       6       7       8       9      10      11
age 47.000  48.000  49.000  50.000  51.000  52.000  53.000  54.000  55.000  56.000  57.000
lp   7.687   7.542   7.414   7.302   7.204   7.118   7.041   6.971   6.905   6.842   6.779
pv   0.000   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001   0.001
       12      13      14      15      16      17      18      19      20      21      22
age 58.000  59.000  60.000  61.000  62.000  63.000  64.000  65.000  66.000  67.000  68.000
lp   6.715   6.650   6.582   6.511   6.437   6.357   6.272   6.181   6.083   5.978   5.867
pv   0.001   0.001   0.001   0.001   0.002   0.002   0.002   0.002   0.002   0.003   0.003
       23      24      25      26      27      28      29      30      31      32      33
age 69.000  70.000  71.000  72.000  73.000  74.000  75.000  76.000  77.000  78.000  79.000
lp   5.749   5.626   5.497   5.363   5.224   5.081   4.933   4.781   4.626   4.467   4.305
pv   0.003   0.004   0.004   0.005   0.005   0.006   0.007   0.008   0.010   0.011   0.013
       34      35      36      37      38      39      40      41      42      43      44
age 80.000  81.000  82.000  83.000  84.000  85.000  86.000  87.000  88.000  89.000  90.000
lp   4.141   3.974   3.804   3.633   3.461   3.287   3.112   2.937   2.761   2.585   2.410
pv   0.016   0.019   0.022   0.026   0.031   0.037   0.044   0.052   0.061   0.073   0.086
       45      46      47      48      49      50      51      52      53       54       55
age 91.000  92.000  93.000  94.000  95.000  96.000  97.000  98.000  99.000  100.000  101.000
lp   2.234   2.058   1.882   1.707   1.531   1.355   1.180   1.004   0.828    0.652    0.477
pv   0.102   0.120   0.141   0.166   0.195   0.227   0.265   0.307   0.354    0.406    0.463
         56       57       58       59       60       61       62
age 102.000  103.000  104.000  105.000  106.000  107.000  108.000
lp    0.301    0.125   -0.051   -0.226   -0.402   -0.578   -0.753
pv    0.523    0.586    0.651    0.715    0.776    0.832    0.880
```

```
> ## EAD:
> life.exp <- function(x, p) {
+   s.cum <- c(1, cumprod(1-p)[-length(p)])
+   sum(x * p * s.cum)
+ }
>
> ## Print the EAD:
> cat("\nExpected age at death (EAD): ", round(life.exp(d.lx0$age, pv), 2), "\n")
```
Expected age at death (EAD): 89.84

Expected age of death for all risk factors and excluding the biologic risk factors

Supplementary Table S3: Expected age of death for individuals in different ages and sex. Risk factors are at their reference values, and the value of one risk factor was changed at a time.

Modified risk factor [1,3,4]	Males			Females		
Age:	30	50	70	30	50	70
All risk factors were fixed to their reference levels [2]	88.1	88.6	90.1	89.3	89.5	90.4
Causal effect fixing risk factors except the biological risk factors to their reference levels						
	86.8	87.3	89.0	88.4	88.6	89.6
Education						
Low	85.7	86.3	88.2	87.4	87.6	88.8
Middle	86.2	86.8	88.6	87.8	88.1	89.2
High [1]	86.8	87.3	89.0	88.4	88.6	89.6
Has your father been diagnosed as having had myocardial infarction when he was under 60 years?						
no [1]	86.8	87.3	89.0	88.4	88.6	89.6
yes	86.0	86.6	88.4	87.8	88.1	89.2
Has your mother been diagnosed as having had myocardial infarction when he was under 60 years?						
no [1]	86.8	87.3	89.0	88.4	88.6	89.6
yes	85.1	85.7	87.7	87.0	87.3	88.5
Have you ever been diagnosed as having diabetes, and how is it treated?						
no [1]	86.8	87.3	89.0	88.4	88.6	89.6
yes, dietary counseling	85.4	86.0	88.0	87.3	87.6	88.8
yes, medicine prescribed	80.2	81.2	84.2	83.1	83.6	85.5
Smoking?						
Never [1]	86.8	87.3	89.0	88.4	88.6	89.6
Quitted more than 6 months ago	85.6	86.2	88.1	87.4	87.7	88.9
Current	82.6	83.4	85.8	85.0	85.4	86.9
Number of cigarettes per day						
0 (also Never smoker) [1]	86.8	87.3	89.0	88.4	88.6	89.6
20 (also Current smoker)	80.2	81.2	84.1	82.9	83.4	85.3
Alcohol per week (in 100 g above 84 g)						
0 [1]	86.8	87.3	89.0	88.4	88.6	89.6
1	86.1	86.6	88.5	87.6	87.9	89.0
How often, during the past 12 months, have you felt intoxicated by alcohol?						
once a week or more often	85.0	85.6	87.6	87.0	87.3	88.5
at least once a month	85.2	85.8	87.8	87.1	87.4	88.6
less than once a month [1]	86.8	87.3	89.0	88.4	88.6	89.6

Bread spread						
low-fat spread, nothing, household margarine or spreads with plant stanols [1]	86.8	87.3	89.0	88.4	88.6	89.6
butter, butter-vegetable oil mixture or cooking margarine	85.7	86.3	88.2	87.6	87.8	89.0
If you drink milk, what kind is it usually?						
skimmed milk	87.9	88.4	89.9	89.4	89.6	90.5
low-fat milk or I do not drink milk [1]	86.8	87.3	89.0	88.4	88.6	89.6
whole or full milk	84.5	85.2	87.3	86.5	86.8	88.1
How often do you usually eat fresh vegetables, root crops (excluding potatoes), fresh salads?						
At most twice a week [1]	86.8	87.3	89.0	88.4	88.6	89.6
Almost daily	87.2	87.7	89.3	88.7	88.9	89.9
Daily	87.7	88.2	89.7	88.8	89.1	90.1
How often do you usually eat fruit or berries?						
At most twice a month	85.4	86.0	87.9	87.1	87.4	88.6
Once or twice a week	85.9	86.5	88.3	87.5	87.8	88.9
Almost daily or daily [1]	86.8	87.3	89.0	88.4	88.6	89.6
How much do you exercise and stress yourself physically in your leisure time?						
inactive	85.0	85.6	87.6	87.0	87.3	88.5
low [1]	86.8	87.3	89.0	88.4	88.6	89.6
high	87.4	87.9	89.5	88.8	89.0	90.0
Have you felt tensioned, stressed or under a lot of strain during the past month?						
yes, my life is almost unbearable	84.0	84.7	86.9	86.1	86.5	87.8
yes, quite more so than people usually are	85.6	86.2	88.1	87.4	87.7	88.9
yes, somewhat, but no more than what is usual [1]	86.8	87.3	89.0	88.4	88.6	89.6
not at all	86.2	86.8	88.6	87.9	88.1	89.2
How satisfied are you with your accomplishments in life?						
very satisfied	88.4	88.8	90.3	89.6	89.8	90.7
satisfied	87.5	88.0	89.6	88.9	89.1	90.1
somewhat satisfied [1]	86.8	87.3	89.0	88.4	88.6	89.6
unsatisfied	85.8	86.4	88.3	87.6	87.9	89.0
How often do you have to stretch your strength to the extreme in order to cope with your present work?						
almost all the time	86.6	87.2	88.9	88.2	88.4	89.5
quite often	87.3	87.8	89.4	88.8	89.0	90.0
sometimes	86.5	87.1	88.8	88.1	88.3	89.4
seldom or never [1]	86.8	87.3	89.0	88.4	88.6	89.6
I do not work	85.5	86.1	88.0	87.3	87.6	88.8
Do you have trouble getting along with your spouse?						
quite often or more often	87.5	88.0	89.6	89.0	89.2	90.2
sometimes or seldom [1]	86.8	87.3	89.0	88.4	88.6	89.6
never	86.4	86.9	88.7	88.0	88.3	89.4
I do not have a spouse	85.5	86.1	88.0	87.4	87.6	88.8
How often have your children caused you special trouble?						
often or I have no children	85.7	86.3	88.2	87.4	87.7	88.8
sometimes	86.3	86.9	88.7	88.0	88.3	89.3
seldom	86.5	87.0	88.8	88.0	88.2	89.3

never [1]	86.8	87.3	89.0	88.4	88.6	89.6
Is you financial status now better or worse than before?						
much better	87.3	87.8	89.5	88.9	89.1	90.1
somewhat better	87.9	88.4	89.9	89.4	89.6	90.5
about the same [1]	86.8	87.3	89.0	88.4	88.6	89.6
a bit worse	86.6	87.2	88.9	88.2	88.5	89.5
a lot worse	86.2	86.8	88.6	88.0	88.3	89.4
I feel it impossible to attain the goals that I'd like to attain.						
absolutely agree	85.9	86.4	88.3	87.6	87.9	89.0
somewhat agree	86.7	87.3	89.0	88.3	88.6	89.6
hard to say [1]	86.8	87.3	89.0	88.4	88.6	89.6
somewhat disagree	88.2	88.7	90.2	89.7	89.9	90.8
absolutely disagree	87.5	88.0	89.6	89.0	89.2	90.2
I feel that I do not have any good friends.						
disagree [1]	86.8	87.3	89.0	88.4	88.6	89.6
agree or hard to say	86.3	86.9	88.7	88.0	88.3	89.3

[1] *Mode values of risk factors were used as the risk factor values for the reference individual.*

[2] *For full conditional projections also BMI=24.4, non-hdl cholesterol=3.8, diastolic blood pressure=79, systolic blood pressure =130.*

[3] *Intermediating biological risk factors were handled using the causal calculus.*

Contrasts of risk factor categories

Supplementary Table S4: Expected age at death estimates for 30 year old males and females in the most optimal category of the risk factors, the contrasts with the other categories, and their 95% prediction intervals.

Sex and age	Variable	Full conditional	95% CI	Causal effect	95% CI
male 30	Education				
	Low	-0.94	(-1.76, -0.14)	-1.22	(-6.42, 3.78)
	Middle	-0.52	(-1.33, 0.21)	-0.78	(-5.89, 4.07)
	High	88.02	(86.22, 89.73)	86.85	(82.65, 89.74)
female 30	Education				
	Low	-0.8	(-1.46, -0.12)	-0.68	(-5.42, 3.59)
	Middle	-0.45	(-1.11, 0.18)	-0.26	(-4.72, 4.31)
	High	89.34	(87.64, 91.12)	88.09	(84.26, 91.1)
male 30	Has your father been diagnosed as having had myocardial infarction when he was under 60 years?				
	no	88.02	(86.22, 89.73)	86.85	(82.65, 89.74)
	yes	-0.68	(-1.49, 0.08)	-0.67	(-2.14, 0.75)
female 30	Has your father been diagnosed as having had myocardial infarction when he was under 60 years?				
	no	89.34	(87.64, 91.12)	88.09	(84.26, 91.1)
	yes	-0.59	(-1.21, 0.07)	-0.55	(-4.23, 3.16)

male 30	Has your mother been diagnosed as having had myocardial infarction when he was under 60 years?				
	no	88.02	(86.22, 89.73)	86.85	(82.65, 89.74)
	yes	-1.59	(-2.74, -0.41)	-1.64	(-2.83, -0.45)
female 30	Has your mother been diagnosed as having had myocardial infarction when he was under 60 years?				
	no	89.34	(87.64, 91.12)	88.09	(84.26, 91.1)
	yes	-1.35	(-2.26, -0.38)	-1.33	(-3.73, 0.76)
male 30	Have you ever been diagnosed as having diabetes, and how is it treated?				
	no	88.02	(86.22, 89.73)	86.85	(82.65, 89.74)
	yes, dietary counseling	-1.17	(-2.77, 0.24)	-1.98	(-7.83, 3.25)
	yes, medicine prescribed	-6.31	(-7.65, -4.87)	-7.27	(-12.86, -1.91)
female 30	Have you ever been diagnosed as having diabetes, and how is it treated?				
	no	89.34	(87.64, 91.12)	88.09	(84.26, 91.1)
	yes, dietary counseling	-0.99	(-2.32, 0.23)	-0.94	(-5.47, 3.37)
	yes, medicine prescribed	-5.19	(-6.42, -3.96)	-5.22	(-9.95, -0.65)
male 30	Smoking?				
	Never	88.02	(86.22, 89.73)	86.85	(82.65, 89.74)
	Quitted more than 6 months ago	-1.11	(-1.96, -0.3)	-1.15	(-2.01, -0.33)
	Current (1 cigarette per day)	-4.05	(-5.2, -2.77)	-4.13	(-9.26, 0.59)
	Current (20 cigarettes per day)	-6.49	(-7.43, -5.51)	-6.49	(-11.29, -1.29)
female 30	Smoking?				
	Never	89.34	(87.64, 91.12)	88.09	(84.26, 91.1)
	Quitted more than 6 months ago	-0.95	(-1.64, -0.27)	-0.84	(-4.03, 3.17)
	Current (1 cigarette per day)	-3.35	(-4.36, -2.41)	-3.15	(-7.99, 1.31)
	Current (20 cigarettes per day)	-5.33	(-6.22, -4.44)	-5.11	(-9.83, -0.6)
male 30	Alcohol per week (in 100 g above 84 g)				
	0	88.02	(86.22, 89.73)	86.85	(82.65, 89.74)
	1	-0.57	(-0.84, -0.26)	-0.68	(-5.19, 3.55)
female 30	Alcohol per week (in 100 g above 84 g)				
	0	89.34	(87.64, 91.12)	88.09	(84.26, 91.1)
	1	-0.49	(-0.72, -0.27)	-0.47	(-3.66, 3.2)
male 30	How often, during the past 12 months, have you felt intoxicated by alcohol?				
	once a week or more often	-1.58	(-2.88, -0.27)	-1.62	(-4.08, 0.88)
	at least once a month	-1.49	(-2.38, -0.6)	-1.53	(-3.77, 0.72)
	less than once a month	88.02	(86.22, 89.73)	86.85	(82.65, 89.74)
female 30	How often, during the past 12 months, have you felt intoxicated by alcohol?				
	once a week or more often	-1.34	(-2.43, -0.25)	-1.37	(-5.52, 2.47)
	at least once a month	-1.27	(-1.98, -0.56)	-1.3	(-5.28, 2.68)

	less than once a month	89.34	(87.64, 91.12)	88.09	(84.26, 91.1)
male 30	Fat on bread				
	low-fat spread, nothing, household margarine or spreads with plant stanols	88.02	(86.22, 89.73)	86.85	(82.65, 89.74)
	butter, butter-vegetable oil mixture or cooking margarine	-0.96	(-1.66, -0.24)	-1.07	(-5.96, 3.18)
female 30	Fat on bread				
	low-fat spread, nothing, household margarine or spreads with plant stanols	89.34	(87.64, 91.12)	88.09	(84.26, 91.1)
	butter, butter-vegetable oil mixture or cooking margarine	-0.82	(-1.4, -0.26)	-0.77	(-5.02, 3.12)
male 30	If you drink milk, what kind is it usually?				
	skimmed milk	89.02	(87.23, 90.58)	88.01	(84.12, 90.73)
	low-fat milk or I do not drink milk	-1	(-1.84, -0.09)	-1.16	(-5.36, 2.87)
	whole or full milk	-3.06	(-4.19, -1.75)	-3.37	(-8.36, 0.98)
female 30	If you drink milk, what kind is it usually?				
	skimmed milk	90.26	(88.42, 92.1)	89.05	(85.11, 92.03)
	low-fat milk or I do not drink milk	-0.92	(-1.63, -0.21)	-0.96	(-2.07, 0.09)
	whole or full milk	-2.65	(-3.61, -1.71)	-2.71	(-6.75, 0.87)
male 30	How often do you usually eat fresh vegetables, root crops (excluding potatoes), fresh salads?				
	At most twice a week	-0.82	(-1.69, 0.02)	-0.67	(-5.39, 4.79)
	Almost daily	-0.44	(-1.28, 0.38)	-0.48	(-1.9, 0.66)
	Daily	88.84	(87.16, 90.37)	87.52	(82.87, 90.54)
female 30	How often do you usually eat fresh vegetables, root crops (excluding potatoes), fresh salads?				
	At most twice a week	-0.74	(-1.47, 0.01)	-0.75	(-2.09, 0.42)
	Almost daily	-0.4	(-1.14, 0.34)	-0.41	(-1.69, 0.69)
	Daily	90.08	(88.32, 91.89)	88.84	(84.57, 91.96)
male 30	How often do you usually eat fruit or berries?				
	At most twice a month	-1.27	(-2.35, -0.21)	-1.32	(-2.42, -0.25)
	Once or twice a week	-0.84	(-1.57, -0.2)	-0.87	(-1.64, -0.22)
	Almost daily or daily	88.02	(86.22, 89.73)	86.85	(82.65, 89.74)
female 30	How often do you usually eat fruit or berries?				
	At most twice a month	-1.08	(-1.95, -0.21)	-0.94	(-5.07, 3.24)
	Once or twice a week	-0.72	(-1.35, -0.18)	-0.68	(-5.09, 3.23)
	Almost daily or daily	89.34	(87.64, 91.12)	88.09	(84.26, 91.1)
male 30	How much do you exercise and stress yourself physically in your leisure time?				
	inactive	-2.06	(-3.14, -0.93)	-2.18	(-7.22, 2.91)

	low	-0.54	(-1.52, 0.35)	-0.5	(-5.3, 4.05)
	high	88.55	(86.73, 90.21)	87.35	(83.06, 90.29)
female 30	How much do you exercise and stress yourself physically in your leisure time?				
	inactive	-1.77	(-2.67, -0.89)	-1.47	(-5.81, 2.9)
	low	-0.48	(-1.31, 0.3)	-0.33	(-4.11, 3.64)
	high	89.82	(88.04, 91.72)	88.42	(84.46, 91.67)
male 30	Have you felt tensioned, stressed or under a lot of strain during the past month?				
	yes, my life is almost unbearable	-2.65	(-4.66, -0.81)	-2.78	(-8.15, 2.13)
	yes, quite more so than people usually are	-1.05	(-2.09, -0.02)	-1.1	(-2.53, 0.38)
	yes, somewhat, but no more than what is usual	88.02	(86.22, 89.73)	86.85	(82.65, 89.74)
	not at all	-0.55	(-1.27, 0.13)	-0.54	(-5.29, 4.2)
female 30	Have you felt tensioned, stressed or under a lot of strain during the past month?				
	yes, my life is almost unbearable	-2.21	(-3.79, -0.7)	-2.25	(-4.81, 0.36)
	yes, quite more so than people usually are	-0.9	(-1.73, -0.04)	-0.86	(-4.43, 2.77)
	yes, somewhat, but no more than what is usual	89.34	(87.64, 91.12)	88.09	(84.26, 91.1)
	not at all	-0.48	(-1.07, 0.11)	-0.39	(-3.64, 3.08)
male 30	How satisfied are you with your accomplishments in life?				
	very satisfied	89.41	(87.46, 91.02)	88.33	(83.72, 91.15)
	satisfied	-0.75	(-2, 0.33)	-0.8	(-5.19, 3.62)
	somewhat satisfied	-1.39	(-2.7, -0.04)	-1.48	(-5.93, 3)
	unsatisfied	-2.23	(-3.95, -0.39)	-2.34	(-6.98, 2.05)
female 30	How satisfied are you with your accomplishments in life?				
	very satisfied	90.65	(88.54, 92.52)	89.47	(85.66, 92.35)
	satisfied	-0.73	(-1.86, 0.23)	-0.75	(-4.46, 3.28)
	somewhat satisfied	-1.31	(-2.37, -0.29)	-1.38	(-5.66, 3.16)
	unsatisfied	-2.02	(-3.46, -0.66)	-2.11	(-6.09, 1.96)
male 30	How often do you have to stretch your strength to the extreme in order to cope with your present work?				
	almost all the time	-0.72	(-3.05, 1.38)	-1.35	(-6.72, 3.93)
	quite often	88.46	(86.41, 90.28)	87.36	(83.16, 90.26)
	sometimes	-0.77	(-2.11, 0.58)	-0.89	(-4.9, 3.37)
	seldom or never	-0.44	(-1.74, 0.84)	-0.51	(-4.72, 3.44)
	I do not work	-1.7	(-3, -0.42)	-2.18	(-7.19, 2.88)
female 30	How often do you have to stretch your strength to the extreme in order to cope with your present work?				
	almost all the time	-0.62	(-2.67, 1.26)	-0.96	(-5.53, 3.32)
	quite often	89.74	(87.79, 91.66)	88.55	(84.86, 91.63)
	sometimes	-0.68	(-1.83, 0.5)	-0.65	(-4.02, 3.1)

	seldom or never	-0.4	(-1.55, 0.7)	-0.47	(-4.13, 3.19)
	I do not work	-1.47	(-2.52, -0.41)	-1.8	(-6.14, 2.42)
male 30	Do you have trouble getting along with your spouse?				
	quite often or more often	88.66	(86.22, 90.69)	87.68	(83.4, 90.67)
	sometimes or seldom	-0.65	(-2.17, 0.95)	-0.83	(-5.45, 3.79)
	never	-1.02	(-2.68, 0.75)	-1.06	(-5.13, 3.33)
	I do not have a spouse	-1.83	(-3.47, -0.05)	-2.41	(-7.54, 2.77)
female 30	Do you have trouble getting along with your spouse?				
	quite often or more often	89.94	(87.72, 92.23)	88.67	(84.57, 92.1)
	sometimes or seldom	-0.6	(-1.98, 0.8)	-0.58	(-2.94, 2.14)
	never	-0.92	(-2.48, 0.6)	-0.87	(-3.33, 1.78)
	I do not have a spouse	-1.61	(-3.06, -0.07)	-1.57	(-6.26, 3.1)
male 30	How often have your children caused you special trouble?				
	often or I have no children	-0.98	(-1.82, -0.18)	-0.85	(-5.37, 3.79)
	sometimes	-0.42	(-1.4, 0.58)	-0.38	(-3.85, 3.72)
	seldom	-0.21	(-0.94, 0.47)	-0.12	(-3.26, 3.64)
	never	88.02	(86.22, 89.73)	86.85	(82.65, 89.74)
female 30	How often have your children caused you special trouble?				
	often or I have no children	-0.83	(-1.53, -0.17)	-0.86	(-4.59, 2.91)
	sometimes	-0.36	(-1.17, 0.48)	-0.37	(-1.43, 0.75)
	seldom	-0.18	(-0.79, 0.39)	-0.19	(-1.04, 0.87)
	never	89.34	(87.64, 91.12)	88.09	(84.26, 91.1)
male 30	Is you financial status now better or worse than before?				
	much better	-0.53	(-1.74, 0.51)	-0.68	(-3.55, 2.12)
	somewhat better	89.15	(87.36, 90.68)	88.05	(84.23, 90.77)
	about the same	-1.13	(-1.92, -0.26)	-1.2	(-4.48, 1.98)
	a bit worse	-1.31	(-2.29, -0.23)	-1.39	(-2.52, -0.24)
	a lot worse	-1.48	(-2.78, -0.27)	-1.55	(-5.02, 1.41)
female 30	Is you financial status now better or worse than before?				
	much better	-0.49	(-1.48, 0.46)	-0.5	(-2.06, 1.07)
	somewhat better	90.38	(88.52, 92.19)	89.16	(85.36, 92.23)
	about the same	-1.04	(-1.66, -0.43)	-1.07	(-1.74, -0.43)
	a bit worse	-1.19	(-1.98, -0.43)	-1.24	(-3.46, 0.82)
	a lot worse	-1.34	(-2.33, -0.38)	-1.37	(-3.09, 0.39)
male 30	I feel it impossible to attain the goals that I'd like to attain.				
	absolutely agree	-2.19	(-3.7, -0.56)	-2.53	(-7.98, 2.07)
	somewhat agree	-1.41	(-2.48, -0.19)	-1.62	(-6.37, 3.22)
	hard to say	-1.33	(-2.22, -0.25)	-1.44	(-3.67, 0.38)
	somewhat disagree	89.35	(87.59, 90.76)	88.28	(84.28, 90.86)
	absolutely disagree	-0.71	(-1.87, 0.25)	-0.77	(-2.94, 1.21)
female 30	I feel it impossible to attain the goals that I'd like to attain.				

	absolutely agree	-1.97	(-3.21, -0.78)	-2.1	(-6.43, 1.87)
	somewhat agree	-1.3	(-2.17, -0.53)	-1.35	(-5.09, 2.55)
	hard to say	-1.24	(-1.92, -0.57)	-1.29	(-4.4, 2.05)
	somewhat disagree	90.58	(88.75, 92.37)	89.38	(85.26, 92.25)
	absolutely disagree	-0.67	(-1.63, 0.2)	-0.67	(-3.79, 2.78)
male 30	I feel that I do not have any good friends.				
	disagree	88.02	(86.22, 89.73)	86.85	(82.65, 89.74)
	agree or hard to say	-0.41	(-1.16, 0.36)	-0.37	(-4.36, 3.76)
female 30	I feel that I do not have any good friends.				
	disagree	89.34	(87.64, 91.12)	88.09	(84.26, 91.1)
	agree or hard to say	-0.35	(-1.01, 0.31)	-0.28	(-3.96, 3.47)

Fully adjusted expected age at death estimates and their contrasts for the biologic risk factors

Supplementary Figure S2: Contrasts of expected age at death estimates compared to the lowest risk values and their 95% confidence intervals.