THE LANCET
Public Health

Supplementary appendix

SUPPLEMENTARY TABLES S1-S4 AND SUPPLEMENTARY FIGURES S1-S6

Table S1. The Saltin-Grimby Physical Activity Level Scale, the CONOR instrument* and harmonization of leisure time PA measured by the two instruments

Introductory texts of the the Saltin-Grimby Physical Activity Level Scale:

*The following two sections have been designed to allow an estimate of your lifetime physical activity, both occupational and recreational. The first section deals with physical activity within your **occupation**. We have classified all occupations in four groups, from sedentary to hard manual work. Please study the following table and then match your own occupation during various periods of your life with the table by checking appropriate boxes below:*

*The following section deals with your **spare-time physical activity**. The table outlines four different levels. Please read the table carefully and then check appropriate boxes below:*

Categories of occupational physical activity - *The Saltin-Grimby Physical Activity Level Scale*
1 ("Sedentary"): *You are mainly sedentary and do not walk much around at your workplace—for example, desk work, work including assembling of minor parts.*
2 ("Walking"): *You walk around quite a bit at your workplace but do not have to carry heavy items—for example, light industrial work, non-sedentary office work, inspection and the like.*
3 ("Walk+lift"): *Most of the time you walk, and you often have to walk up stairs and lift various items. Examples include mail delivery and construction work.*
4 ("Heavy labour"): *You have heavy physical work. You carry heavy burdens and carry out physically strenuous work—for example, work including digging and shovelling*
Categories of leisure time physical activity - *The Saltin-Grimby Physical Activity Level Scale*
1 "Sedentary": *Almost completely inactive: reading, TV watching, movies, etc.*
2 "Low": *Some physical activity during at least 4 hours per week: riding a bicycle or walking to work, walking or skiing with the family, gardening.*
3 "Moderate": *Regular activity: such as heavy gardening, running, calisthenics, tennis, etc.*
4 "High": *Regular hard physical training for competition in running events, soccer, racing, European handball, etc. several times per week.*

Introductory text of the CONOR instrument
During the last year, how has your physical activity level been during leisure time? Think of a weekly average. Commuting to/from work is included in leisure time.
Categories of light and hard leisure time physical activity - *the CONOR instrument*

	Average weekly hours:
Light physical activity (not sweating/not out of breath)	1. None
	2. Less than 1 hour
Hard physical activity (sweating/out of breath)	3. 1-2 hours
	4. 3 or more hours

Harmonization of *the Saltin-Grimby Physical Activity Level Scale* and *the CONOR scale*

Saltin-Grimby Physical Activity Level Scale levels		Categories of light and hard PA in the CONOR scale
1	←→	Light PA = 1, 2 or 3 & Hard PA = not answered
1	←→	Hard PA = 1 or 2 & Light PA = not answered
1	←→	Light PA = 1 or 2 & Hard PA = 1 or 2
1	←→	Light PA = 3 & Hard PA = 1
2	←→	Light PA = 4 & Hard FA = not answered
2	←→	Hard PA = 3 & Light PA = not answered
2	←→	Light PA = 1 or 2 & Hard PA = 3
2	←→	Light PA = 3 or 4 & Hard PA = 1 or 2
3	←→	Light PA = 4 & Hard PA = 2 or 3
3	←→	Light PA = 3 & Hard PA = 3
4	←→	Hard PA = 4 & Light PA = not answered
4	←→	Light PA = 1, 2, 3 or 4 & Hard PA = 4

*Graff-Iversen S et. al. Two short questionnaires on leisure-time physical activity compared with serum lipids, anthropometric measurements and aerobic power in a suburban population from Oslo, Norway. European journal of epidemiology 2008; 23(3): 167-74.

Table S2 Background characteristics by sex and occupational physical activity category

	Men (n=213,079) [a]				Women (n=224,299) [a]			
	"Sedentary"	"Walking"	"Walk+lift"	"Heavy labour"	"Sedentary"	"Walking"	"Walk+lift"	"Heavy labour"
n	81,536	57,374	45,629	28,540	64,420	113,130	42,133	4,616
Age (years)	41·8±6·2	41·8±6·3	40·8±6·5*#	41·4±7·1*#¤	41·4±6·6	41·4±6·1	41·0±6·5*#	42·3±6·7*#¤
BMI (kg·m^{-2}))	25·6±3·2	25·4±3·2*	25·5±3·2*#	25·6±3·2*#¤	24·2±3·9	24·3±4·0*	24·7±4·1*#	25·5±4·3*#¤
Systolic BP (mmHg)	134·4±14·3	134·9±14·5*	135·1±14·1*#	136·3±14·9*#¤	124·9±15·0	126·9±15·9*	126·1±15·4*#	130·2±16·7*#¤
Diastolic BP (mmHg)	81·5±10·4	81·4±10·4	80·8±10·4*#	81·1±10·8*#¤	75·8±10·3	77·2±10·5*	76·3±10·5*#	78·5±10·8*#¤
Resting heart rate (bpm)	68·9±12·9	69·8±12·8*	70·5±12·6*#	69·5±12·6*#¤	73·2±12·3	74·6±12·7*	73·9±12·1*#	72·8±12·1¤
Cholesterol (mmol/l)	5·87±1·14	5·88±1·15	5·92±1·19*#	6·02±1·23*#¤	5·51±1·08	5·65±1·13*	5·64±1·12*	5·90±1·19*#¤
Triglycerides (mmol/l)	2·12±1·38	2·11±1·39	2·12±1·40	2·12±1·44	1·31±0·80	1·38±0·84*	1·39±0·85*	1·48±0·85*#¤
Current smokers	29,426 (36·1%)	23,888 (41·6%)*	22,760 (49·9%)*#	13,042 (45·7%)/#¤	23,616 (36·7%)	43,846 (38·8%)*	18,502 (43·9%)*#	1,602 (34·7%)*#¤
Prevalent CVD	4,534 (5·6%)	3,156 (5·5%)	2,000 (4·4%)*#	1,203 (4·2%)*#	2,442 (3·8%)	4,372 (3·9%)	1,516 (3·6%)#	237 (5·1%)*#¤
Non-Nordic ethnicity	1,675 (2·1%)	1,440 (2·5%)*	932 (2·0%)#	263 (0·9%)*#¤	1,204 (1·9%)	2,002 (1·8%)	754 (1·8%)	98 (2·1%)#
Education [b]								
1st - ≤10th class	9,339 (11·5%)	10,906 (19·0%)*	13,680 (30·0%)*#	10,381 (36·4%)*#¤	7,073 (11·0%)	31,376 (27·7%)*	10,470 (24·9%)*#	1,669 (36·2%)*#¤
11th-12th class	20,035 (24·6%)	17,727 (30·9%)*	16,059 (35·2%)*#	11,263 (39·5%)*#¤	28,384 (44·1%)	43,353 (38·3%)*	19,175 (45·5%)*#	2,227 (48·3%)*#¤
13^{th+}-14^{th+} class	19,541 (24·0%)	14,325 (25·0%)*	13,636 (29·9%)*#	5,857 (20·5%)*#¤	11,757 (18·3%)	12,375 (10·9%)*	5,490 (13·0%)*#	421 (9·1%)*#¤
14th-17th class	20,648 (25·3%)	11,260 (19·6%)*	¹,933 (4·2%)*#	811 (2·8%)*#¤	13,552 (21·0%)	24,075 (21·3%)	6,847 (16·3%)*#	277 (6·0%)*#¤
18th-20^{th+} class	11,973 (14·7%)	3,156 (5·5%)*	321 (0·7%)*#	228 (0·8%)*#	3,654 (5·7%)	1,951 (1·7%)*	151 (0·4%)*#	22 (0·5%)*#
Income [c]								
Level 1	2,610 (3·2%)	2,261 (3·9%)*	2,088 (4·6%)*#	2,781 (9·7%)*#¤	1,851 (2·9%)	7,840 (6·9%)*	1,047 (2·5%)*#	269 (5·8%)*#¤
Level 5	42,596 (52·2%)	18·169 (31·7%)*	9,534 (20·9%)*#	5,488 (19·2%)*#¤	34,722 (53·9%)	35,382 (31·3%)*	13,028 (30·9%)*	869 (18·8%)*#¤
Leisure time PA								
"Sedentary"	20,829 (25·6%)	10,238 (17·8%)*	8,924 (19·6%)*#	6,277 (22·0%)*#¤	16,647 (25·8%)	22,932 (20·3%)*	9,126 (21·7%)*#	1,054 (22·8%)*#
"Low"	37,368 (45·8%)	29,860 (52·0%)*	22,143 (48·5%)*#	11,624 (40·7%)*#¤	37,858 (58·8%)	75,973 (67·2%)*	25,122 (59·6%)*#	2,225 (48·2%)*#¤
"Moderate"	19,304 (23·7%)	14,535 (25·3%)*	12,407 (27·2%)*#	8,798 (30·8%)*#¤	8,566 (13·3%)	12,766 (11·3%)*	6,904 (16·4%)*#	1,207 (26·2%)*#¤
"High"	4,035 (5·0%)	2,741 (4·8%)	2,155 (4·7%)	1,841 (6·5%)*#¤	1,349 (2·1%)	1,459 (1·3%)*	981 (2·3%)*#	130 (2·8%)*#¤
Mortality (n (%))	13,676 (16·8%)	11,536 (20·1%)	10,144 (22·2%)	7,799 (27·3%)	6,809 (10·6%)	17,882 (15·8%)	5,423 (12·9%)	934 (20·2%)
Cause-specific mortality								
CVD (n (%))	4,037 (29·5%)	3,552 (30·8%)	3,054 (30·1%)	2,617 (33·6%)	1,228 (18·0%)	4,167 (23·3%)	1,205 (22·2%)	251 (26·9%)
Cancer (n (%))	5,148 (37·6%)	4,253 (36·9%)	3,711 (36·6%)	2,625 (33·7%)	3,433 (50·4%)	7,830 (43·8%)	2,541 (46·9%)	345 (36·9%)
Other causes (n (%))	4,491 (32·8%)	3,731 (32·3%)	3,379 (33·3%)	2·557 (32·8%)	2,148 (31·5%)	5·885 (32·9%)	1,677 (30·9%)	338 (36·2%)

Values are mean (SD) unless otherwise specified. * Significantly different from "Sedentary" (p<0·05). # Significantly different from "Walking" (p<0·05). ¤ Significantly different from "Walk+lift" (p<0·05)

Abbreviations: BMI, body mass index; BP, blood pressure; RHR, resting heart rate; bpm, beats per minute; PA, physical activity.

[a] Due to missing values, n varied from 212,866-212,889 and from 224,086-224,245 for diastolic BP, systolic BP, cholesterol and triglycerides and was 199,754 and 212,300 for resting heart rate in men and women, respectively. [b] Highest level attained from study entry to 31.12.2001. [c] Percentage of participants that were consistently among the quintile with the lowest income during follow-up (Level 1) and that were among the quintile with the highest income at some point during follow-up (Level 5).

Current smokers = daily smokers with <20 pack years & daily smoker with ≥20 pack years combined. Prevalent CVD = Angina pectoris, antihypertensive medication use, diabetes mellitus, myocardial infarction or stroke. Non-Nordic ethnicity = 1. generation immigrant without Nordic background and those born in Nordic country by non-Nordic parents (Nordic = Norway, Sweden, Denmark, Finland, Iceland or Faroe Islands)

Table S3. Additional background characteristics in <u>men</u> by occupational physical activity category

	n=213,079			
	"Sedentary"	**"Walking"**	**"Walk+lift"**	**"Heavy labour"**
n	81,536	57,374	45,629	28,540
Smoking status				
Never	30,224 (37.1%)	18,284 (31.9%)*	11,815 (25.9%)*#	8,968 (31.4%)*¤
Former with <20 pack years	18,203 (22.3%)	12,845 (22.4%)	9,277 (20.3%)*#	5,510 (19.3%)*#¤
Former with ≥20 pack years	3,683 (4.5%)	2,357 (4.1%)*	1,777 (3.9%)*	1,020 (3.6%)*#¤
Current daily smoker with < 20 pack years	18,489 (22.7%)	16,116 (28.1%)*	15,638 (34.3%)*#	9,108 (31.9%)*#¤
Current daily smoker with ≥ 20 pack years	10,937 (13.4%)	7,772 (13.6%)	7,122 (15.6%)*#	3,934 (13.8%)¤
Prevalent CVD				
No prevalent CVD	77,002 (94.4%)	54,218 (94.5%)	43,629 (95.6%)*#	27,337 (95.8%)*#
Angina pectoris	874 (1.1%)	646 (1.1%)	397 (0.9%)*#	250 (0.9%)*#
Taking antihypertensive medications	2,907 (3.5%)	1,955 (3.3%)	1,221 (2.6%)*#	756 (2.6%)*#
Diabetes mellitus	830 (1.0%)	600 (1.1%)	354 (0.8%)*#	211 (0.7%)*#
Myocardial infarction	713 (0.9%)	539 (0.9%)	313 (0.7%)	177 (0.6%)
Stroke	298 (0.4)	179 (0.3%)	90 (0.2%)*#	69 (0.2%)*
Ethnicity [a]				
Nordic	79,861 (98.0%)	55,934 (97.5%)*	44,697 (98.0%)#	28,277 (99.1%)*#¤
First gen. immigrant without Nordic background	1,650 (2.0%)	1,426 (2.5%)*	925 (2.0%)#	260 (0.9%)*#¤
Born in Nordic country by non-Nordic parents	25 (<0.1%)	14 (<0.1%)	7 (<0.1%)	3 (<0.1%)
Income [b]				
Level 1	2,610 (3.2%)	2,261 (3.9%)*	2,088 (4.6%)*#	2,781 (9.7%)*#¤
Level 2	5,291 (6.5%)	7,050 (12.3%)*	8,518 (18.7%)*#	7,526 (26.4%)*#¤
Level 3	10,937 (13.4%)	12,520 (21.8%)*	12,991 (28.5%)*#	6,462 (22.6%)*#¤
Level 4	20,102 (24.7%)	17,374 (30.3%)*	12,498 (27.4%)*#	6,283 (22.0%)*#¤
Level 5	42,596 (52.2%)	18.169 (31.7%)*	9,534 (20.9%)*#	5,488 (19.2%)*#¤

Values are mean (SD) unless otherwise specified. * Significantly different from "Sedentary" (p<0.05). #
Significantly different from "Walking" (p<0.05). ¤ Significantly different from "Walk+lift" (p<0.05)
Abbreviations: BMI, body mass index; BP, blood pressure; RHR, resting heart rate; bpm, beats per minute; PA,
physical activity; gen., generation
[a] Nordic = Norway, Sweden, Denmark, Finland, Iceland or Faroe Islands. [b] Highest attained income quintile
within study sample from study entry to 31.12.2001.

Table S4. Additional background characteristics in <u>women</u> by occupational physical activity category

	n=224,299			
	"Sedentary"	**"Walking"**	**"Walk+lift"**	**"Heavy labour"**
n	64,420	113,130	42,133	4,616
Smoking status				
Never	26,216 (40.7%)	47,553 (42.0%)*	15,380 (36.5%)*#	2,277 (49.3%)*#¤
Former with <20 pack years	13,466 (20.9%)	20,474 (18.1%)*	7,622 (18.1%)*	684 (14.8%)*#¤
Former with ≥20 pack years	1,122 (1.7%)	1,257 (1.1%)*	629 (1.5%)*	53 (1.2%)*
Current daily smoker with < 20 pack years	18,895 (29.3%)	37,248 (32.9%)*	15,627 (37.1%)*#	1,381 (29.9%)#¤
Current daily smoker with ≥ 20 pack years	4,721 (7.3%)	6,598 (5.8%)*	2,875 (6.8%)*#	221 (4.8%)*#¤
Prevalent CVD				
No prevalent CVD	61,978 (3.8%)	4,372 (3.9%)	1,516 (3.6%)#	237 (5.1%)*#¤
Angina pectoris	266 (0.4%)	449 (0.4%)	136 (0.3%)*#	14 (0.3%)
Taking antihypertensive medications	1,755 (2.7%)	3,300 (2.9%)	1,174 (2.7%)*	205 (4.3%)
Diabetes mellitus	472 (0.7%)	739 (0.7%)	259 (0.6%)*	30 (0.7%)
Myocardial infarction	117 (0.2%)	161 (0.1%)*	50 (0.1%)*	5 (0.1%)
Stroke	193 (0.3%)	273 (0.2%)*	74 (0.2%)*#	15 (0.3%)¤
Ethnicity [a]				
Nordic	63,216 (98.1%)	111,128 (98.2%)	41,379 (98.2%)	4,518 (97.9%)
First gen. immigrant without Nordic background	1,187 (1.8%)	1,987 (1.8%)	751 (1.8%)	97 (2.1%)
Born in Nordic country by non-Nordic parents	17 (<0.1%)	15 (<0.1%)	3 (<0.1%)*	3 (<0.1%)
Income [b]				
Level 1	1,851 (2.9%)	7,840 (6.9%)*	1,047 (2.5%)*#	269 (5.8%)*#¤
Level 2	3,322 (5.2%)	14,889 (13.2%)*	3,824 (9.1%)*#	841 (18.2%)*#¤
Level 3	7,183 (11.2%)	25,675 (22.7%)*	9,733 (23.1%)*	1,447 (31.4%)*#¤
Level 4	17,342 (26.9%)	29,344 (25.9%)*	14,501 (34.4%)*#	1,190 (25.8%)¤
Level 5	34,722 (53.9%)	35,382 (31.3%)*	13,028 (30.9%)*	869 (18.8%)*#¤

Values are mean (SD) unless otherwise specified. * Significantly different from "Sedentary" (p<0.05). #
Significantly different from "Walking" (p<0.05). ¤ Significantly different from "Walk+lift" (p<0.05)
Abbreviations: BMI, body mass index; BP, blood pressure; RHR, resting heart rate; bpm, beats per minute; PA,
physical activity; gen., generation
[a] Nordic = Norway, Sweden, Denmark, Finland, Iceland or Faroe Islands. [b] Highest attained income quintile
within study sample from study entry to 31.12.2001.

Table S5. Stability of occupational PA in a sub-sample from the Norwegian Counties Study that self-reported their level of occupational PA at three time points during follow-up (n=36,478)

Survey 1 (ca. 1975) vs. survey 2 (ca. 1980)				
	Survey 2			
Survey 1	Sedentary	Walking	Walk+lift	Heavy labour	
Sedentary	**4,475 (71%)**	1,180 (19%)	473 (8%)	166 (3%)	6,294
Walking	1,852 (11%)	**11,764 (68%)**	3,143 (18%)	593 (3%)	17,352
Walk+lift	502 (7%)	2,263 (30%)	**3,451 (45%)**	1,402 (18%)	7,618
Heavy labour	210 (4%)	479 (9%)	1,275 (24%)	**3,250 (62%)**	5,214
	7,039	15,686	8,342	5,411	36,478
Survey 1 (ca. 1975) vs. survey 3 (ca. 1986)				
	Survey 3			
Survey 1	Sedentary	Walking	Walk+lift	Heavy labour	
Sedentary	**4,392 (70%)**	1,252 (20%)	449 (7%)	201 (3%)	6,294
Walking	3,103 (18%)	**10,510 (61%)**	3,179 (18%)	560 (3%)	17,352
Walk+lift	972 (13%)	2,619 (34%)	**2,785 (37%)**	1,242 (16%)	7,618
Heavy labour	479 (9%)	769 (15%)	1,115 (21%)	**2,851 (55%)**	5,214
	8,946	15,150	7,528	4,854	36,478
Survey 2 (ca. 1980) vs. survey 3 (ca. 1986)				
	Survey 3			
Survey 2	Sedentary	Walking	Walk+lift	Heavy labour	
Sedentary	**5,190 (74%)**	1,316 (19%)	384 (5%)	149 (2%)	7,039
Walking	2,460 (16%)	**10,283 (66%)**	2,570 (16%)	373 (2%)	15,686
Walk+lift	891 (11%)	2,839 (34%)	**3,426 (41%)**	1,186 (14%)	8,342
Heavy labour	405 (7%)	712 (13%)	1,148 (21%)	**3,146 (58%)**	5,411
	8,946	15,150	7,528	4,854	36,478

Model A

Model B

Model C
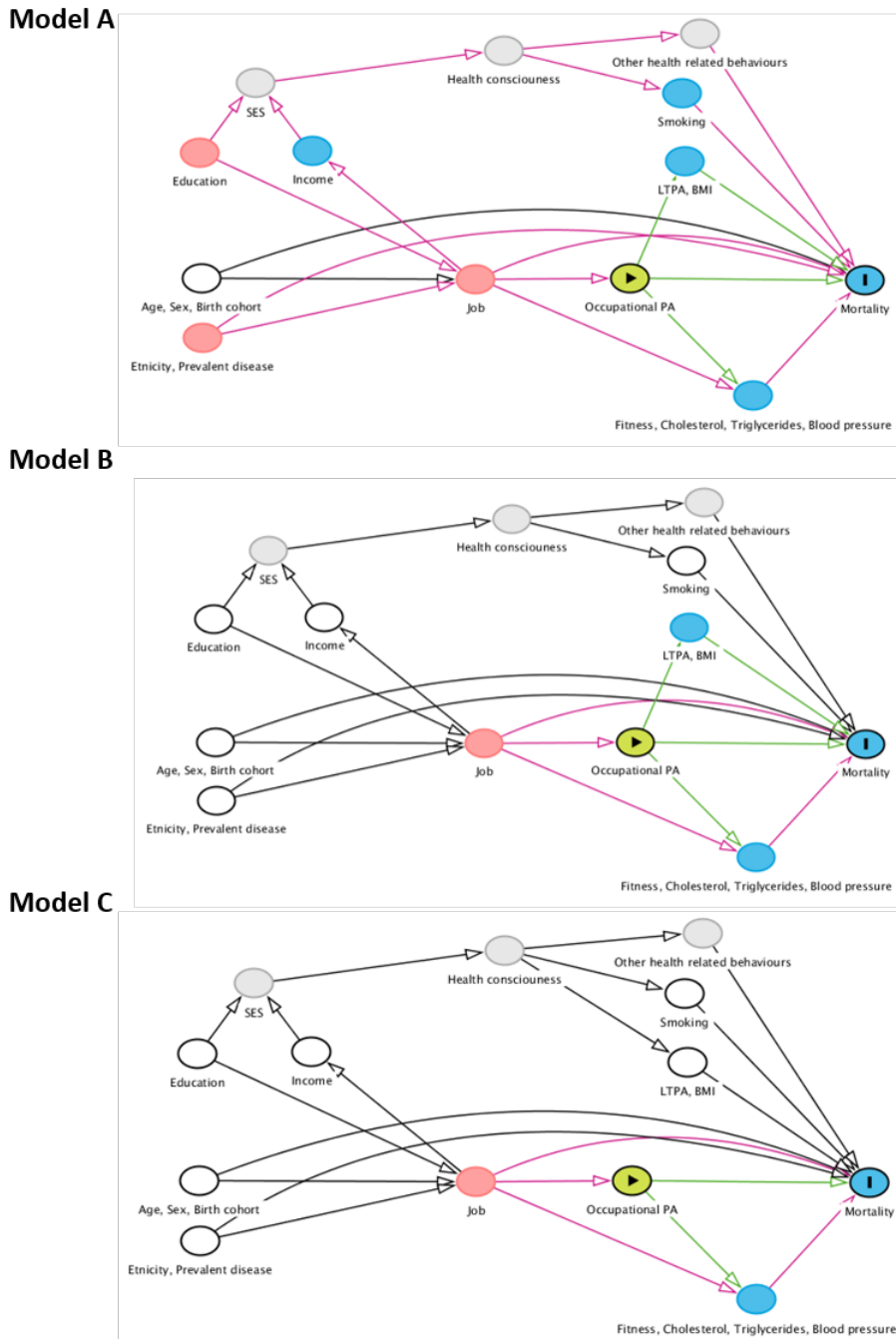
Figure S1. Simplified DAGs of the total effect of occupational physical activity on mortality
Nodes: Green (with ►) = exposure, Blue (with **I**) = outcome, Blue = ancestor of outcome, Red = ancestor of exposure *and* outcome (confounder), White = adjusted variable, Grey = unobserved (latent) variable.
Arrows: Green = causal path, red = biasing path, black = blocked path
Abbreviations: PA= physical activity. LTPA=leisure time physical activity. SES=socioeconomic status. BMI=body mass index.

Note: "Under-adjustment" is always a challenge in observational studies, i.e. residual confounding. However, "over-adjustment" may also be a problem when: A) Adjusting for intermediates, which may attenuate the true causal effect of the exposure or even reverse it, leading to counterintuitive results; B) Adjusting for a variable that has an effect on the exposure, but not the outcome. I.e. variables that are not confounders, but rather ancestors of the exposure alone. This may lead to worsened precision and bias-amplification from unmeasured confounding; C) Adjusting for a confounder that has a strong effect on the exposure, but only weak effect on the outcome, may give similar problems (as in B)). This was assessed and ruled out by correlating confounders with the exposure (i.e. by estimating to what extent both variance and bias may be inflated (calculated as $1/(1-rho^2)$). See https://ftp.cs.ucla.edu/pub/stat_ser/r493.pdf for reference.

Outcome	Model	OPA Category	No. of Participants	Events No. of (%)	RMST difference Years (95% CI)
All-cause	C	Sedentary	81,536	13,676 (16.8%)	0.0 (reference)
		Walking	57,374	11,536 (20.1%)	0.4 (-0.1, 1.0)
		Walk+lift	45,629	10,144 (22.2%)	0.8 (0.3, 1.3)
		Heavy labour	28,540	7,799 (27.3%)	1.7 (1.2, 2.3)
CVD	C	Sedentary	81,536	4,037 (5.0%)	0.0 (reference)
		Walking	57,374	3,552 (6.2%)	0.2 (-0.0, 0.4)
		Walk+lift	45,629	3,054 (6.7%)	0.2 (-0.1, 0.4)
		Heavy labour	28,540	2,617 (9.2%)	0.5 (0.2, 0.7)
Cancer	C	Sedentary	81,536	5,148 (6.3%)	0.0 (reference)
		Walking	57,374	4,253 (7.4%)	0.1 (-0.2, 0.4)
		Walk+lift	45,629	3,711 (8.1%)	0.3 (-0.1, 0.6)
		Heavy labour	28,540	2,625 (9.2%)	0.7 (0.3, 1.1)
All-cause	S1	Sedentary	77,693	11,610 (14.9%)	0.0 (reference)
		Walking	53,953	9,487 (17.6%)	0.3 (-0.4, 1.0)
		Walk+lift	42,471	8,163 (19.2%)	0.8 (0.2, 1.4)
		Heavy labour	25,637	5,772 (22.5%)	1.6 (1.0, 2.2)
CVD	S1	Sedentary	77,693	3,282 (4.2%)	0.0 (reference)
		Walking	53,953	2,792 (5.2%)	0.2 (-0.1, 0.5)
		Walk+lift	42,471	2,323 (5.5%)	0.1 (-0.2, 0.4)
		Heavy labour	25,637	1,850 (7.2%)	0.2 (-0.1, 0.6)
Cancer	S1	Sedentary	77,693	4,514 (5.8%)	0.0 (reference)
		Walking	53,953	3,620 (6.7%)	0.2 (-0.2, 0.6)
		Walk+lift	42,471	3,130 (7.4%)	0.2 (-0.2, 0.6)
		Heavy labour	25,637	2,044 (8.0%)	0.7 (0.2, 1.2)
All-cause	S2	Sedentary	76,464	11,320 (14.8%)	0.0 (reference)
		Walking	53,835	9,834 (18.3%)	0.1 (-0.5, 0.7)
		Walk+lift	43,330	9,031 (20.8%)	0.5 (-0.2, 1.2)
		Heavy labour	27,133	7,055 (26.0%)	1.6 (0.9, 2.2)
CVD	S2	Sedentary	76,464	3,061 (4.0%)	0.0 (reference)
		Walking	53,835	2,870 (5.3%)	0.1 (-0.3, 0.5)
		Walk+lift	43,330	2,625 (6.1%)	0.4 (0.0, 0.7)
		Heavy labour	27,133	2,306 (8.5%)	0.8 (0.4, 1.1)
Cancer	S2	Sedentary	76,464	4,550 (6.0%)	0.0 (reference)
		Walking	53,835	3,803 (7.1%)	0.1 (-0.3, 0.5)
		Walk+lift	43,330	3,416 (7.9%)	0.3 (-0.1, 0.7)
		Heavy labour	27,133	2,428 (8.9%)	0.8 (0.3, 1.2)
All-cause	S3	Sedentary	69,401	9,795 (14.1%)	0.0 (reference)
		Walking	48,720	8,508 (17.5%)	0.1 (-0.7, 0.9)
		Walk+lift	38,237	8,058 (21.1%)	1.1 (0.4, 1.7)
		Heavy labour	23,523	6,289 (26.7%)	1.7 (0.9, 2.5)
CVD	S3	Sedentary	69,401	2,680 (3.9%)	0.0 (reference)
		Walking	48,720	2,507 (5.1%)	0.2 (-0.2, 0.6)
		Walk+lift	38,237	2,352 (6.2%)	0.6 (0.2, 0.9)
		Heavy labour	23,523	2,077 (8.8%)	1.0 (0.6, 1.3)
Cancer	S3	Sedentary	69,401	3,955 (5.7%)	0.0 (reference)
		Walking	48,720	3,306 (6.8%)	-0.1 (-0.7, 0.6)
		Walk+lift	38,237	3,061 (8.0%)	0.2 (-0.3, 0.6)
		Heavy labour	23,523	2,155 (9.2%)	0.7 (0.2, 1.2)

Years (95% CI): -3 -2 -1 0 1 2 3

Figure S2. Comparison of associations from model C and sensitivity analyses S1-S3 between occupational physical activity, all-cause mortality, cardiovascular disease mortality and cancer mortality in men.
RMST = restricted mean survival time. Model S1 = Model C + adjustment for resting heart rate (continuous). Model S2 = Model C + exclusion of participants with "prevalent CVD" (angina pectoris, hypertension, myocardial infarction, stroke or diabetes mellitus) at study entry and/or that died within the first 5 yrs. of follow-up. Model S3 = Model S2 + restricted to those aged 30-50 years at study entry.

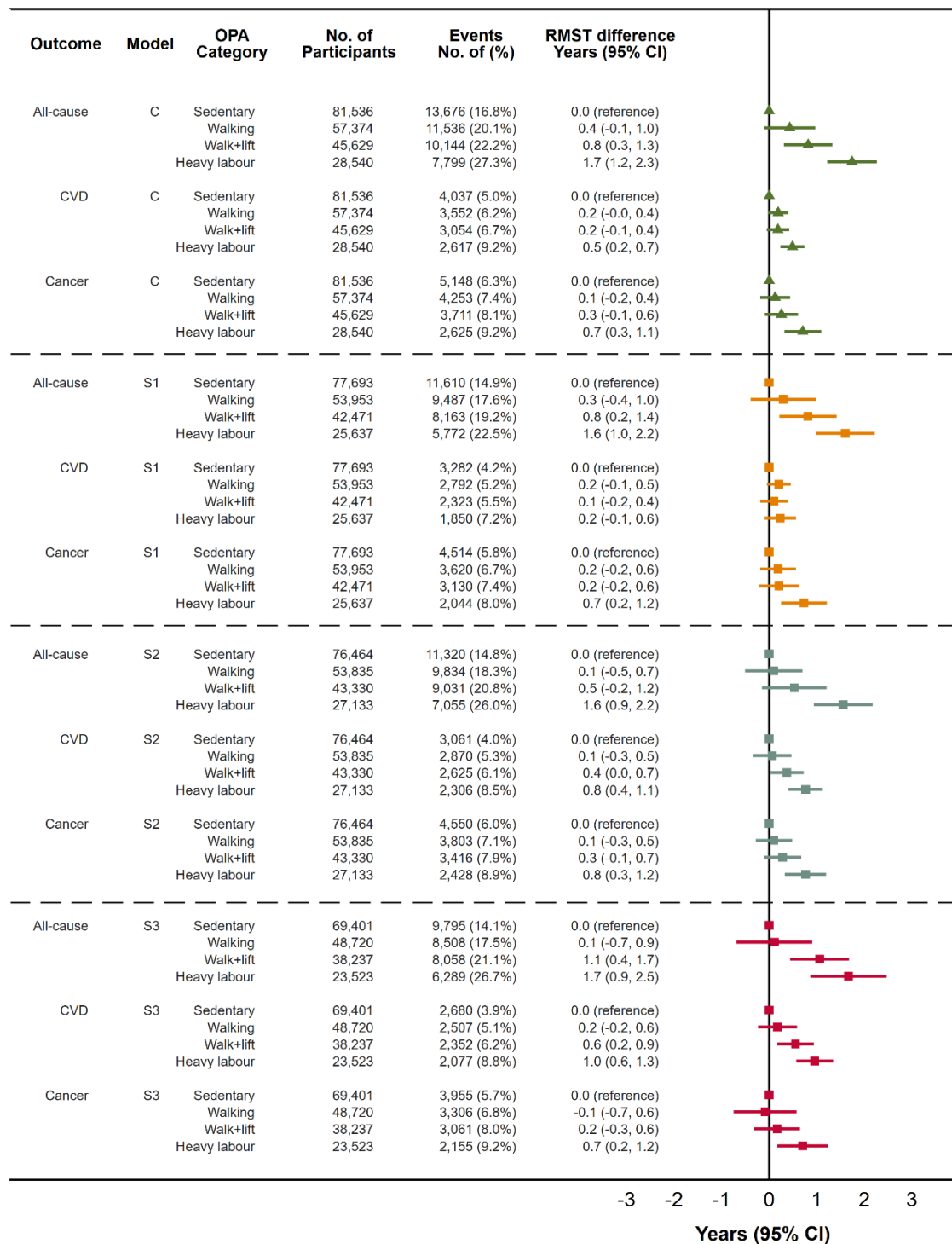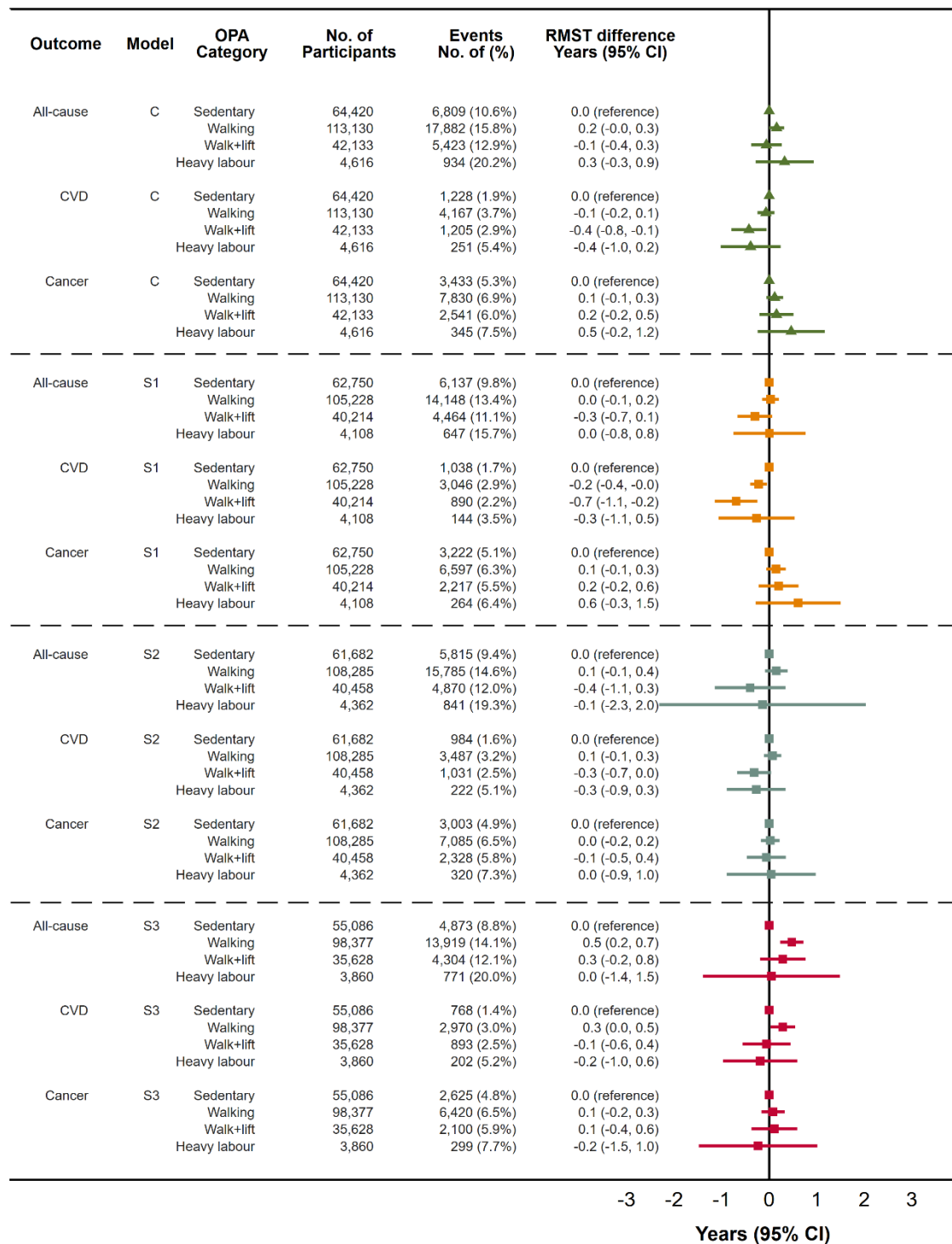| Outcome	Model	OPA Category	No. of Participants	Events No. of (%)	RMST difference Years (95% CI)
All-cause	C	Sedentary	64,420	6,809 (10.6%)	0.0 (reference)
		Walking	113,130	17,882 (15.8%)	0.2 (-0.0, 0.3)
		Walk+lift	42,133	5,423 (12.9%)	-0.1 (-0.4, 0.3)
		Heavy labour	4,616	934 (20.2%)	0.3 (-0.3, 0.9)
CVD	C	Sedentary	64,420	1,228 (1.9%)	0.0 (reference)
		Walking	113,130	4,167 (3.7%)	-0.1 (-0.2, 0.1)
		Walk+lift	42,133	1,205 (2.9%)	-0.4 (-0.8, -0.1)
		Heavy labour	4,616	251 (5.4%)	-0.4 (-1.0, 0.2)
Cancer	C	Sedentary	64,420	3,433 (5.3%)	0.0 (reference)
		Walking	113,130	7,830 (6.9%)	0.1 (-0.1, 0.3)
		Walk+lift	42,133	2,541 (6.0%)	0.2 (-0.2, 0.5)
		Heavy labour	4,616	345 (7.5%)	0.5 (-0.2, 1.2)
All-cause	S1	Sedentary	62,750	6,137 (9.8%)	0.0 (reference)
		Walking	105,228	14,148 (13.4%)	0.0 (-0.1, 0.2)
		Walk+lift	40,214	4,464 (11.1%)	-0.3 (-0.7, 0.1)
		Heavy labour	4,108	647 (15.7%)	0.0 (-0.8, 0.8)
CVD	S1	Sedentary	62,750	1,038 (1.7%)	0.0 (reference)
		Walking	105,228	3,046 (2.9%)	-0.2 (-0.4, -0.0)
		Walk+lift	40,214	890 (2.2%)	-0.7 (-1.1, -0.2)
		Heavy labour	4,108	144 (3.5%)	-0.3 (-1.1, 0.5)
Cancer	S1	Sedentary	62,750	3,222 (5.1%)	0.0 (reference)
		Walking	105,228	6,597 (6.3%)	0.1 (-0.1, 0.3)
		Walk+lift	40,214	2,217 (5.5%)	0.2 (-0.2, 0.6)
		Heavy labour	4,108	264 (6.4%)	0.6 (-0.3, 1.5)
All-cause	S2	Sedentary	61,682	5,815 (9.4%)	0.0 (reference)
		Walking	108,285	15,785 (14.6%)	0.1 (-0.1, 0.4)
		Walk+lift	40,458	4,870 (12.0%)	-0.4 (-1.1, 0.3)
		Heavy labour	4,362	841 (19.3%)	-0.1 (-2.3, 2.0)
CVD	S2	Sedentary	61,682	984 (1.6%)	0.0 (reference)
		Walking	108,285	3,487 (3.2%)	0.1 (-0.1, 0.3)
		Walk+lift	40,458	1,031 (2.5%)	-0.3 (-0.7, 0.0)
		Heavy labour	4,362	222 (5.1%)	-0.3 (-0.9, 0.3)
Cancer	S2	Sedentary	61,682	3,003 (4.9%)	0.0 (reference)
		Walking	108,285	7,085 (6.5%)	0.0 (-0.2, 0.2)
		Walk+lift	40,458	2,328 (5.8%)	-0.1 (-0.5, 0.4)
		Heavy labour	4,362	320 (7.3%)	0.0 (-0.9, 1.0)
All-cause	S3	Sedentary	55,086	4,873 (8.8%)	0.0 (reference)
		Walking	98,377	13,919 (14.1%)	0.5 (0.2, 0.7)
		Walk+lift	35,628	4,304 (12.1%)	0.3 (-0.2, 0.8)
		Heavy labour	3,860	771 (20.0%)	0.0 (-1.4, 1.5)
CVD	S3	Sedentary	55,086	768 (1.4%)	0.0 (reference)
		Walking	98,377	2,970 (3.0%)	0.3 (0.0, 0.5)
		Walk+lift	35,628	893 (2.5%)	-0.1 (-0.6, 0.4)
		Heavy labour	3,860	202 (5.2%)	-0.2 (-1.0, 0.6)
Cancer	S3	Sedentary	55,086	2,625 (4.8%)	0.0 (reference)
		Walking	98,377	6,420 (6.5%)	0.1 (-0.2, 0.3)
		Walk+lift	35,628	2,100 (5.9%)	0.1 (-0.4, 0.6)
		Heavy labour	3,860	299 (7.7%)	-0.2 (-1.5, 1.0)

Figure S3. Comparison of associations from model C and sensitivity analyses S1-S3 between occupational physical activity, all-cause mortality, cardiovascular disease mortality and cancer mortality in women. RMST=restricted mean survival time. Model S1 = Model C + adjustment for resting heart rate (continuous). Model S2 = Model C + exclusion of participants with "prevalent CVD" (angina pectoris, hypertension, myocardial infarction, stroke or diabetes mellitus) at study entry and/or that died within the first 5 yrs. of follow-up. Model S3 = Model S2 + restricted to those aged 30-50 years at study entry. Note: due to low cell counts, the birth cohort variable had to be dichotomized for women (born before/after 1950) when modelling the association between occupational PA and CVD mortality in model S3 to achieve model convergence.
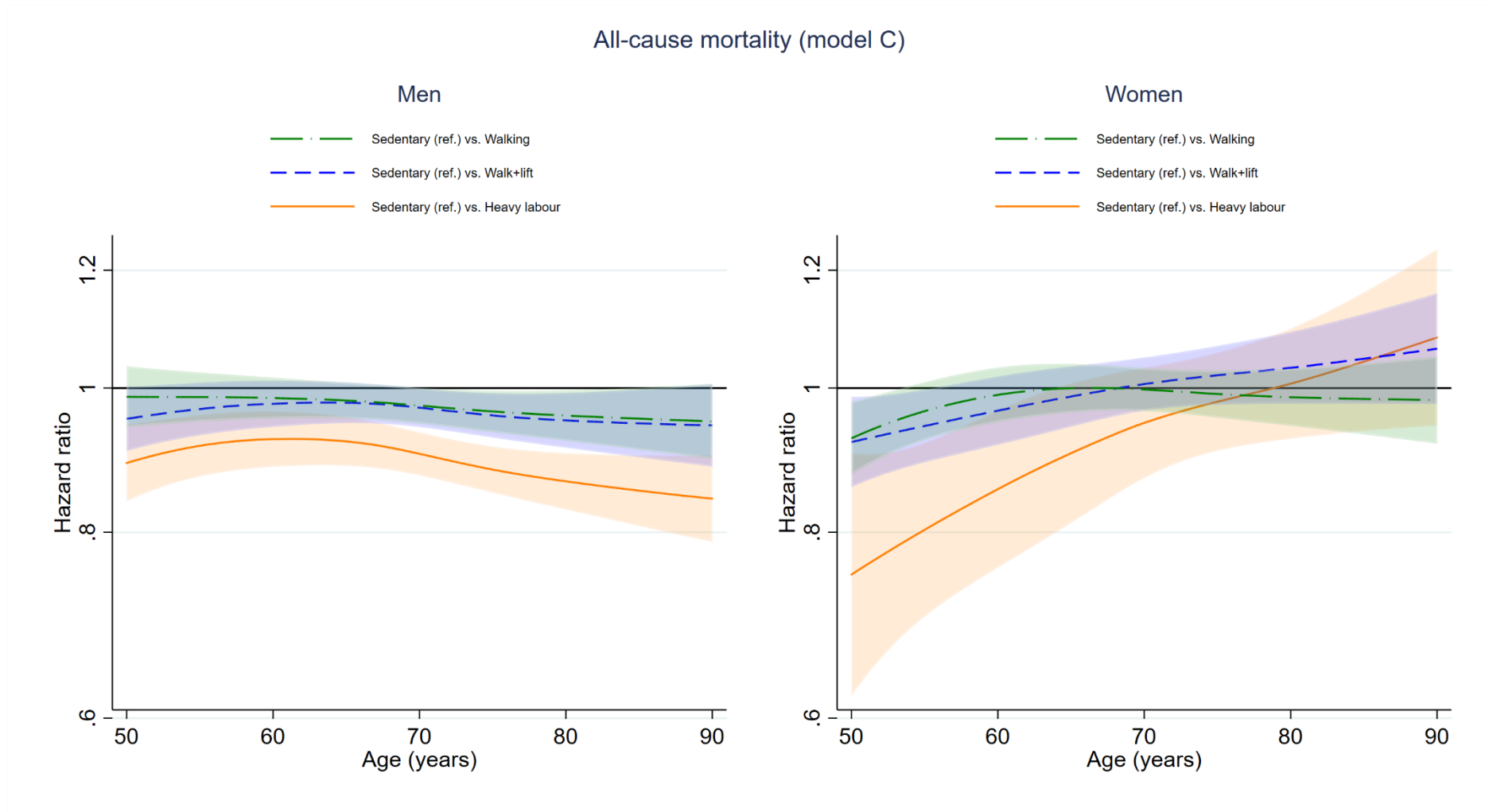
Figure S4. Time varying hazard ratios (and 95% CIs (shaded areas)) between the sedentary occupations reference group and the three other occupational physical activity groups between age 50 and 90 from model C with all-cause mortality as the outcome (adjustment for age, sex, "calendar effects" (10-yr birth cohorts), highest attained education level, ethnicity, prevalent CVD, smoking, income, BMI and leisure time physical activity) modelled as interactions between the exposure and a spline of time with two degrees of freedom for each time-dependent effect.
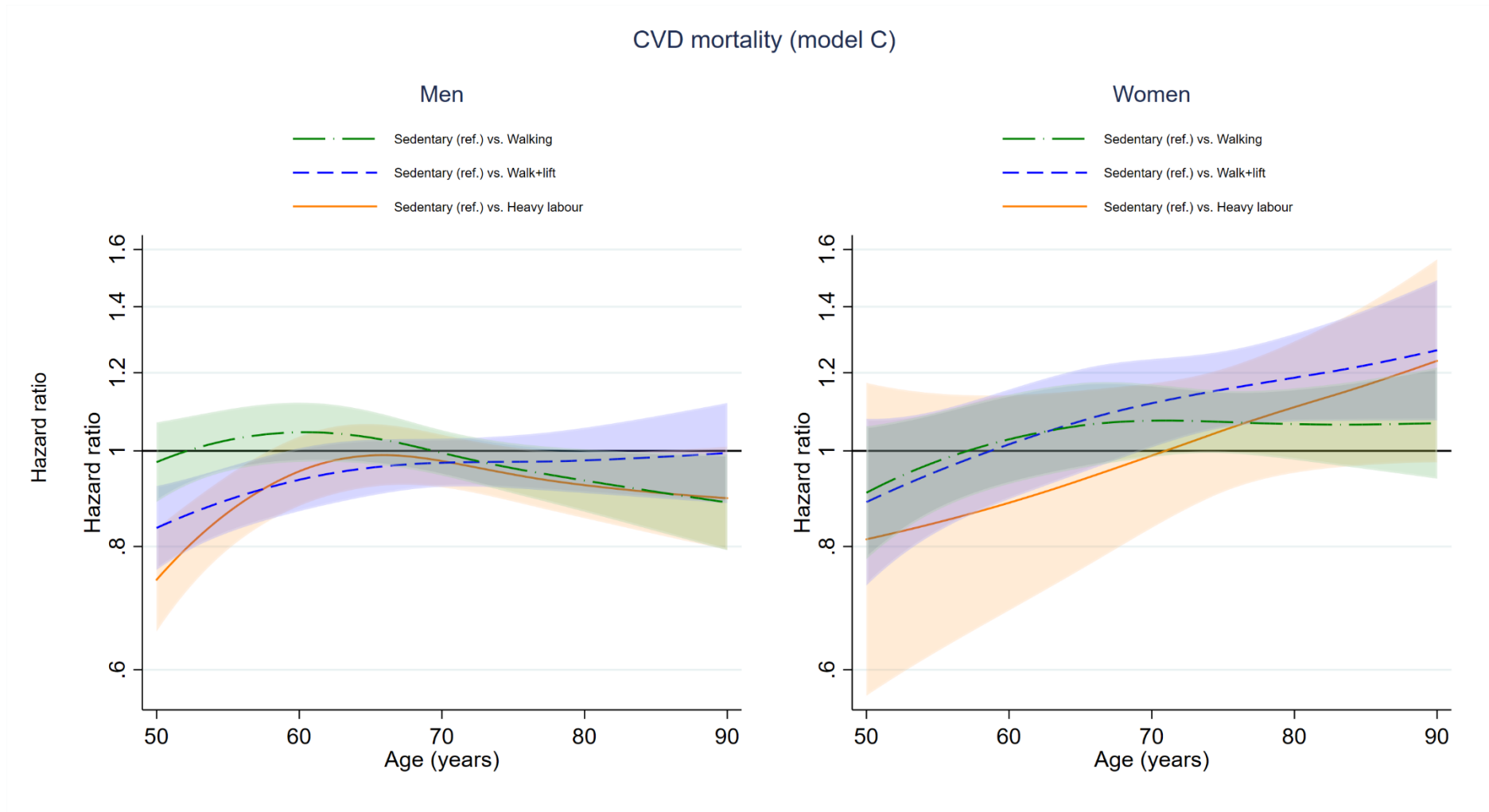
CVD mortality (model C)

Figure S5. Time varying hazard ratios (and 95% CIs (shaded areas)) between the sedentary occupations reference group and the three other occupational physical activity groups between age 50 and 90 from model C with CVD mortality as the outcome (adjustment for age, sex, "calendar effects" (10-yr birth cohorts), highest attained education level, ethnicity, prevalent CVD, smoking, income, BMI and leisure time physical activity) modelled as interactions between the exposure and a spline of time with two degrees of freedom for each time-dependent effect.

Cancer mortality (model C)

Men

- — · — Sedentary (ref.) vs. Walking
- – – – Sedentary (ref.) vs. Walk+lift
- —— Sedentary (ref.) vs. Heavy labour

Women

- — · — Sedentary (ref.) vs. Walking
- – – – Sedentary (ref.) vs. Walk+lift
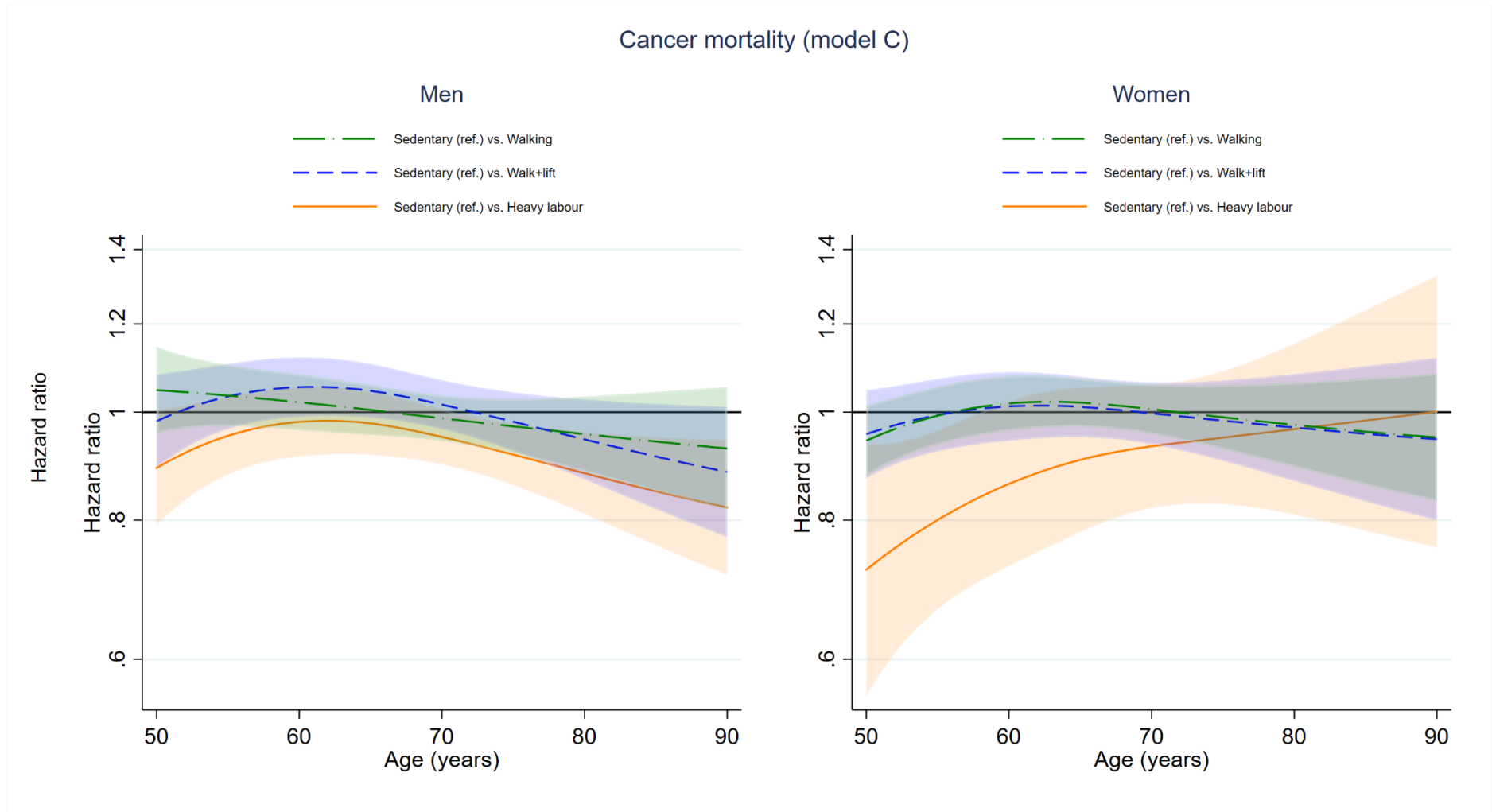- —— Sedentary (ref.) vs. Heavy labour

Figure S6. Time varying hazard ratios (and 95% CIs (shaded areas)) between the sedentary occupations reference group and the three other occupational physical activity groups between age 50 and 90 from model C with cancer mortality as the outcome (adjustment for age, sex, "calendar effects" (10-yr birth cohorts), highest attained education level, ethnicity, prevalent CVD, smoking, income, BMI and leisure time physical activity) modelled as interactions between the exposure and a spline of time with two degrees of freedom for each time-dependent effect.