

ELECTRONIC SUPPLEMENTARY MATERIAL (3 Figures, 6 Tables)

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Figure A1 Density of the population in Switzerland

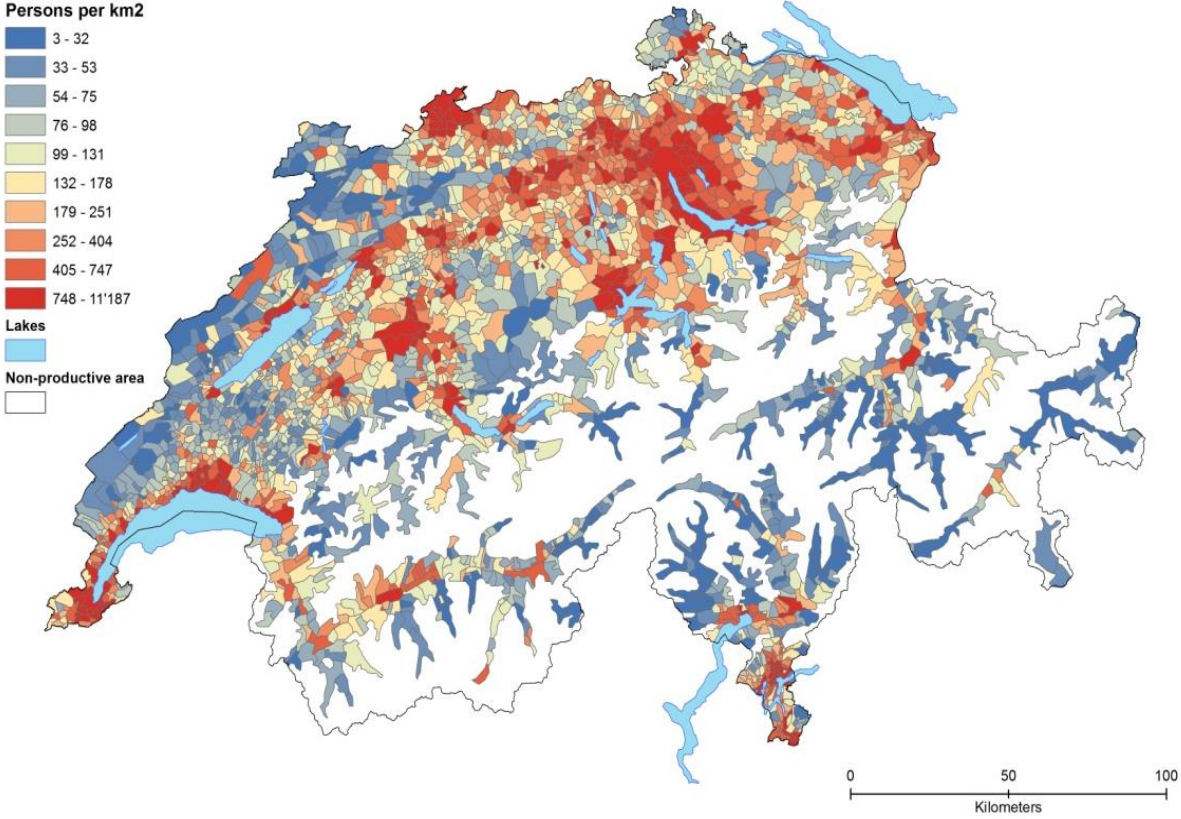


Figure A2 Main road network in Switzerland

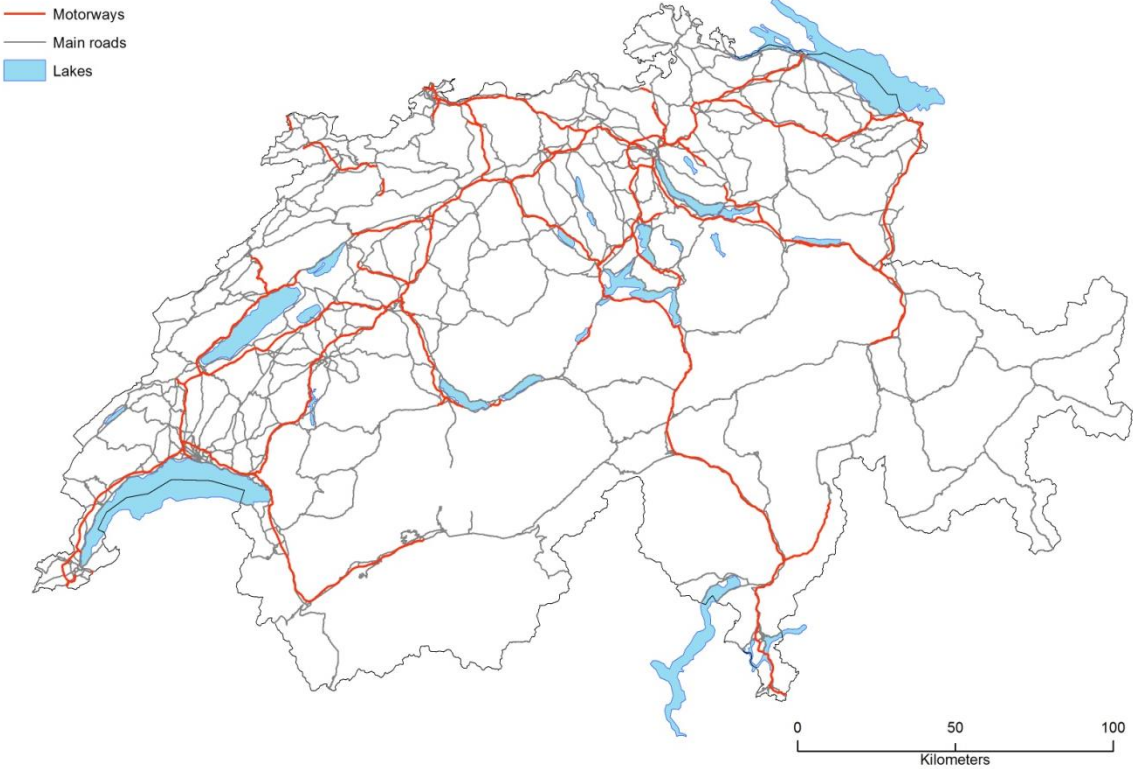
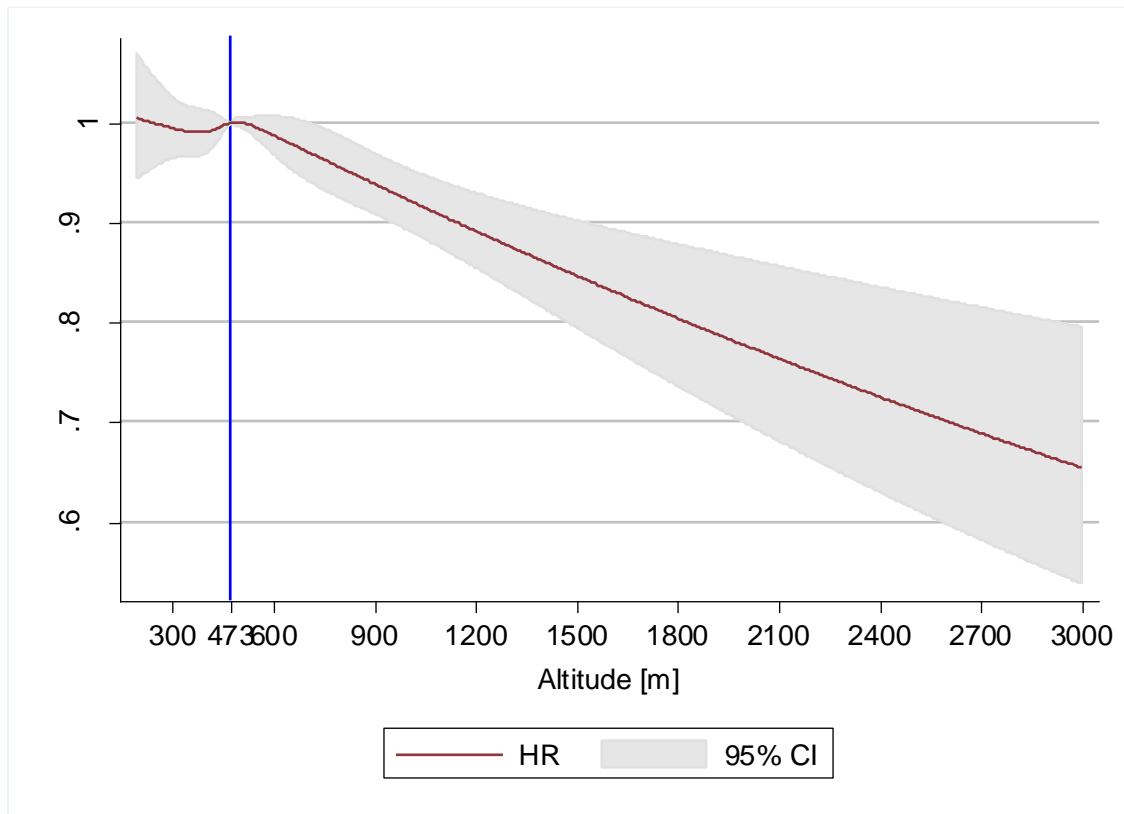


Figure A3 Hazard ratios (HR) with 95% confidence interval (CI) for ischemic heart mortality by altitude (full range of altitude, 195-2971m)



*cubic splines with median altitude (473m) as reference to report HRs, adjusted for age, sex, marital status, education, profession, type of household, language region, urbanization, Swiss SEP, sunshine duration, precipitation, temperature, slope and distance to main roads

Tables

Table A1 Correlation between environmental variables, Swiss National Cohort 2000-2008

	Altitude	Sunshine	Precipitation	Temperature	Slope	Road distance
Altitude	1					
Sunshine	0,30	1				
Precipitation	0,19	0,28	1			
Temperature	-0,83	-0,09	-0,11	1		
Slope	0,23	0,16	0,16	-0,15	1	
Road distance ^a	0,38	0,18	0,08	-0,35	0,13	1

^a Distance to main roads in meter as a proxy for noise and air pollution

Table A2 Continuation of Table 1: Number and percentage of Swiss residents by socio-economic/demographic factors, distributed over five altitudinal ranges, Swiss National Cohort 2000-2008

Altitude at 2000 census in [m] above sea level	<600		600 - <900		900 - <1200		1200 - <1500		≥1500		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Marital status												
Single	439 206	13	71 720	12	16 115	12	5 635	13	4 299	15	536 975	13
Married	2 327 096	70	461 244	74	102 042	73	31 982	73	21 304	72	2 943 668	71
Widowed	242 965	7	46 840	8	11 992	9	3 581	8	1 916	7	307 294	7
Divorced	312 054	9	44 715	7	9 653	7	2 363	5	1 998	7	370 783	9
Education												
Primary	1 140 472	34	232 618	37	63 708	46	20 042	46	10 743	36	1 467 583	35
Secondary	1 521 150	46	282 049	45	58 870	42	18 333	42	14 162	48	1 894 564	46
Tertiary	659 699	20	109 852	18	17 224	12	5 186	12	4 612	16	796 573	19
Professional attainment												
Management	85 820	3	13 854	2	1 951	1	565	1	620	2	102 810	3
Self-employed	213 419	6	53 734	9	14 204	10	4 728	11	3 241	11	289 326	7
Professionals	205 311	6	32 550	5	4 360	3	1 258	3	1 361	5	244 840	6
Skilled labour	862 677	26	157 475	25	30 052	22	8 770	20	7 274	25	1 066 248	26
Unskilled labour	218 835	7	39 472	6	9 711	7	2 898	7	2 447	8	273 363	7
Not classified	469 410	14	92 140	15	21 579	15	7 370	17	5 019	17	595 518	14
Unemployed	79 252	2	10 353	2	1 849	1	484	1	308	1	92 246	2
Not in paid empl.	1 186 597	36	224 941	36	56 096	40	17 488	40	9 247	31	1 494 369	36
Type of household												
Single	670 698	20	98 064	16	24 755	18	7 688	18	6 037	21	807 242	19
Multi person	2 618 236	79	520 066	83	113 652	81	35 377	81	22 328	76	3 309 659	80
Institution	32 387	1	6 389	1	1 395	1	496	1	1 152	4	41 819	1
Language region												
German	2 468 973	74	416 832	67	64 782	46	28 654	66	26 306	89	3 005 547	72
French	673 852	20	196 000	31	68 706	49	14 164	33	2 840	10	955 562	23
Italian	178 496	5	11 687	2	6 314	5	743	2	371	1	197 611	5
Swiss-SEP index deciles												
Dec1 - low	325 223	10	106 234	17	44 691	32	15 289	35	6 566	22	498 003	12
Dec2	312 830	9	92 877	15	30 200	22	9 335	21	3 987	14	449 229	11
Dec3	315 163	10	77 205	12	21 056	15	6 093	14	2 968	10	422 485	10
Dec4	322 512	10	67 907	11	15 469	11	4 431	10	3 188	11	413 507	10
Dec5	330 018	10	59 925	10	11 217	8	3 871	9	3 356	11	408 387	10
Dec6	341 319	10	51 593	8	7 672	6	1 998	5	3 215	11	405 797	10
Dec7	347 636	11	46 182	7	5 036	4	1 482	3	2 777	9	403 113	10
Dec8	349 371	11	44 612	7	3 064	2	655	2	2 426	8	400 128	10
Dec9	345 005	10	42 680	7	1 222	1	328	1	933	3	390 168	9
Dec10 - high	332 244	10	35 304	6	175	0	79	0	101	0	367 903	9

Table A3 Continuation of Table 2: Hazard ratios of Swiss residents living at five altitudinal ranges from models with increasing adjustment, socio-economic/demographic factors, Swiss National Cohort 2000-2008

	Crude Model ^a	Model 1 ^b	Model 2 ^c	Model 3 ^c	Model 4 ^c	Model 5 ^c	Model 6 ^c	Model 7 ^c
	HR (95% CI)	HR (95% CI)	HR (95% CI)	HR (95% CI)	HR (95% CI)	HR (95% CI)	HR (95% CI)	HR (95% CI)
Altitude at census 2000 [m above sea level]								
<600m	1	1	1	1	1	1	1	1
600-<900m	1.01 (0.99-1.03)	0.98 (0.95-1.00)	0.97 (0.94-0.99)	0.98 (0.96-1.00)	0.98 (0.96-1.00)	0.98 (0.96-1.00)	0.97 (0.95-1.00)	0.97 (0.94-1.00)
900-<1200m	0.96 (0.93-1.00)	0.96 (0.92-1.00)	0.96 (0.92-1.01)	0.97 (0.93-1.01)	0.96 (0.92-1.00)	0.96 (0.93-1.00)	0.97 (0.93-1.02)	0.96 (0.92-1.01)
1200-<1500m	0.85 (0.80-0.92)	0.78 (0.72-0.83)	0.82 (0.76-0.88)	0.79 (0.73-0.85)	0.78 (0.72-0.84)	0.78 (0.72-0.84)	0.83 (0.77-0.90)	0.82 (0.76-0.89)
>=1500m	0.75 (0.68-0.83)	0.67 (0.60-0.74)	0.73 (0.65-0.81)	0.68 (0.61-0.75)	0.67 (0.60-0.74)	0.67 (0.60-0.74)	0.74 (0.66-0.82)	0.73 (0.65-0.81)
Gender								
Men	1	1	1	1	1	1	1	1
Women	0.45 (0.44-0.46)	0.37 (0.36-0.38)	0.37 (0.36-0.38)	0.37 (0.36-0.38)	0.37 (0.36-0.38)	0.37 (0.36-0.38)	0.37 (0.36-0.38)	0.37 (0.36-0.38)
Marital status								
Single	1.11 (1.08-1.14)	1.27 (1.23-1.31)	1.27 (1.23-1.31)	1.27 (1.23-1.31)	1.27 (1.23-1.31)	1.27 (1.23-1.31)	1.27 (1.23-1.31)	1.27 (1.23-1.31)
Married	1	1	1	1	1	1	1	1
Widowed	0.98 (0.96-0.99)	1.38 (1.34-1.41)	1.37 (1.34-1.41)	1.38 (1.34-1.41)	1.38 (1.34-1.41)	1.38 (1.34-1.41)	1.37 (1.34-1.41)	1.37 (1.34-1.41)
Divorced	1.17 (1.14-1.20)	1.39 (1.35-1.44)	1.39 (1.35-1.44)	1.39 (1.35-1.44)	1.39 (1.35-1.44)	1.39 (1.35-1.44)	1.39 (1.35-1.44)	1.39 (1.35-1.44)
Education								
Primary	1.08 (1.06-1.11)	1.36 (1.32-1.39)	1.35 (1.32-1.39)	1.35 (1.32-1.39)	1.36 (1.32-1.39)	1.36 (1.32-1.39)	1.35 (1.32-1.39)	1.35 (1.32-1.39)
Secondary	1.06 (1.03-1.09)	1.18 (1.15-1.21)	1.18 (1.15-1.21)	1.18 (1.15-1.21)	1.18 (1.15-1.21)	1.18 (1.15-1.21)	1.18 (1.15-1.21)	1.18 (1.15-1.21)
Tertiary	1	1	1	1	1	1	1	1
Professional attainment								
Management	0.92 (0.83-1.02)	0.94 (0.84-1.04)	0.94 (0.84-1.04)	0.94 (0.85-1.04)	0.94 (0.84-1.04)	0.94 (0.84-1.04)	0.94 (0.85-1.04)	0.94 (0.84-1.04)
Self-employed	1.28 (1.20-1.36)	1.17 (1.10-1.24)	1.17 (1.10-1.24)	1.17 (1.10-1.24)	1.17 (1.10-1.24)	1.17 (1.10-1.24)	1.17 (1.10-1.24)	1.17 (1.10-1.24)
Professionals	0.88 (0.81-0.95)	0.88 (0.81-0.96)	0.88 (0.81-0.96)	0.88 (0.81-0.96)	0.88 (0.81-0.96)	0.88 (0.81-0.96)	0.88 (0.81-0.96)	0.88 (0.81-0.96)
Skilled labour	1	1	1	1	1	1	1	1
Unskilled labour	1.02 (0.95-1.10)	0.98 (0.91-1.06)	0.98 (0.91-1.06)	0.98 (0.91-1.06)	0.98 (0.91-1.06)	0.98 (0.91-1.06)	0.98 (0.91-1.06)	0.98 (0.91-1.06)
Not classified	1.28 (1.22-1.34)	1.32 (1.26-1.39)	1.32 (1.26-1.39)	1.32 (1.26-1.39)	1.32 (1.26-1.39)	1.32 (1.25-1.38)	1.32 (1.26-1.39)	1.32 (1.26-1.39)
Unemployed	1.78 (1.63-1.95)	1.81 (1.66-1.98)	1.82 (1.66-1.99)	1.81 (1.66-1.98)	1.81 (1.66-1.98)	1.80 (1.65-1.97)	1.81 (1.65-1.98)	1.81 (1.65-1.98)
Not in paid empl.	1.26 (1.20-1.31)	1.56 (1.49-1.63)	1.56 (1.49-1.64)	1.56 (1.49-1.63)	1.56 (1.49-1.63)	1.56 (1.49-1.63)	1.56 (1.49-1.64)	1.56 (1.49-1.64)
Type of household								
Single	0.98 (0.96-0.99)	1.03 (1.00-1.05)	1.03 (1.00-1.05)	1.03 (1.00-1.05)	1.03 (1.00-1.05)	1.03 (1.00-1.05)	1.03 (1.00-1.05)	1.03 (1.00-1.05)
Multi person	1	1	1	1	1	1	1	1
Institution	1.64 (1.57-1.70)	1.58 (1.52-1.65)	1.58 (1.52-1.65)	1.58 (1.52-1.65)	1.58 (1.52-1.65)	1.58 (1.52-1.65)	1.58 (1.52-1.65)	1.58 (1.52-1.65)
Language region								
German	1	1	1	1	1	1	1	1
French	0.67 (0.66-0.69)	0.65 (0.64-0.67)	0.70 (0.68-0.71)	0.65 (0.64-0.67)	0.65 (0.64-0.66)	0.65 (0.64-0.66)	0.70 (0.68-0.71)	0.69 (0.68-0.71)

Italian	0.85 (0.83-0.88)	0.81 (0.78-0.84)	0.85 (0.81-0.90)	0.82 (0.79-0.84)	0.81 (0.78-0.84)	0.81 (0.78-0.84)	0.86 (0.82-0.90)	0.86 (0.82-0.90)
Urbanization								
Urban	1	1	1	1	1	1	1	1
Peri-urban	1.01 (1.00-1.03)	0.99 (0.98-1.01)	0.99 (0.97-1.00)	1.00 (0.98-1.01)	0.99 (0.98-1.01)	1.00 (0.98-1.02)	0.99 (0.98-1.01)	0.99 (0.97-1.01)
Rural	1.11 (1.09-1.13)	1.00 (0.98-1.02)	0.99 (0.96-1.01)	1.01 (0.99-1.03)	1.00 (0.98-1.02)	1.01 (0.99-1.03)	1.00 (0.97-1.02)	0.99 (0.97-1.02)
Swiss-SEP index deciles								
Dec1 - low	1	1	1	1	1	1	1	1
Dec2	0.97 (0.94-1.00)	0.96 (0.93-0.99)	0.96 (0.93-0.99)	0.96 (0.93-0.99)	0.96 (0.93-0.99)	0.96 (0.93-0.99)	0.96 (0.93-0.99)	0.96 (0.93-0.99)
Dec3	0.98 (0.95-1.01)	0.96 (0.93-0.98)	0.96 (0.93-0.98)	0.96 (0.93-0.99)	0.96 (0.93-0.98)	0.96 (0.93-0.99)	0.96 (0.93-0.99)	0.96 (0.93-0.99)
Dec4	0.97 (0.95-1.00)	0.95 (0.92-0.98)	0.95 (0.92-0.98)	0.95 (0.92-0.98)	0.95 (0.92-0.98)	0.95 (0.92-0.98)	0.95 (0.92-0.98)	0.95 (0.92-0.98)
Dec5	0.94 (0.92-0.97)	0.92 (0.89-0.94)	0.91 (0.89-0.94)	0.92 (0.89-0.94)	0.92 (0.89-0.94)	0.92 (0.89-0.95)	0.92 (0.89-0.95)	0.92 (0.89-0.95)
Dec6	0.93 (0.91-0.96)	0.91 (0.88-0.94)	0.91 (0.88-0.94)	0.91 (0.89-0.94)	0.91 (0.88-0.94)	0.92 (0.89-0.95)	0.92 (0.89-0.95)	0.92 (0.89-0.95)
Dec7	0.91 (0.88-0.93)	0.89 (0.86-0.92)	0.89 (0.86-0.92)	0.89 (0.86-0.92)	0.89 (0.86-0.92)	0.90 (0.87-0.92)	0.90 (0.87-0.93)	0.89 (0.87-0.92)
Dec8	0.85 (0.83-0.88)	0.85 (0.82-0.88)	0.84 (0.82-0.87)	0.85 (0.82-0.88)	0.85 (0.82-0.88)	0.85 (0.83-0.88)	0.86 (0.83-0.88)	0.85 (0.83-0.88)
Dec9	0.81 (0.78-0.84)	0.81 (0.79-0.84)	0.81 (0.78-0.84)	0.82 (0.79-0.85)	0.82 (0.79-0.84)	0.82 (0.80-0.85)	0.83 (0.80-0.85)	0.82 (0.79-0.85)
Dec10 - high	0.72 (0.70-0.75)	0.74 (0.71-0.77)	0.73 (0.71-0.76)	0.74 (0.72-0.77)	0.74 (0.71-0.77)	0.75 (0.72-0.78)	0.75 (0.72-0.78)	0.75 (0.72-0.78)

^aeach variable adjusted for age

^badjusted for age, sex, marital status, education, profession, type of household, language region, urbanization and Swiss SEP

^cadjusted for age, sex, marital status, education, profession, type of household, language region, urbanization, Swiss SEP and variables listed in respective column of Table 2

Table A4 Hazard ratios for ischemic heart disease mortality of Swiss residents living below 600m (N=3,321,321), Swiss National Cohort 2000-2008

	Crude Model ^a HR (95% CI)	Full Model ^b HR (95% CI)
Sunshine duration, % of max		
32.6 - <35.0%	1	1
35.0 - <35.8%	1.02 (1.00-1.04)	1.05 (1.02-1.07)
35.8 - <37.6%	0.95 (0.93-0.98)	1.02 (1.00-1.05)
37.6 - <41.4%	0.72 (0.70-0.74)	0.96 (0.93-0.99)
41.4 - 58.5%	0.84 (0.82-0.87)	0.98 (0.95-1.02)
Precipitation [mm]		
540 - 993	1	1
994 - 1080	1.09 (1.07-1.12)	1.04 (1.01-1.06)
1081 - 1165	1.13 (1.11-1.16)	1.07 (1.04-1.09)
1166 - 1316	1.12 (1.09-1.15)	1.05 (1.02-1.08)
1317 - 2735	1.10 (1.07-1.13)	1.07 (1.04-1.11)
Temperature [degree C]		
-3.3-<8.6	1	1
8.6-<9.2	1.00 (0.96-1.03)	1.02 (0.98-1.06)
9.2-<9.6	1.02 (0.98-1.05)	1.05 (1.01-1.09)
9.6-<10.0	0.96 (0.93-1.00)	1.00 (0.97-1.04)
10.0-<13.4	0.75 (0.72-0.78)	1.00 (0.96-1.04)
Slope at place of residence		
0 - <3%	1	1
3 - <5%	1.00 (0.98-1.02)	1.01 (0.98-1.03)
5 - <10%	0.98 (0.96-1.00)	0.99 (0.97-1.01)
10 - <15%	0.91 (0.88-0.94)	0.94 (0.92-0.97)
15 - <25%	0.93 (0.89-0.97)	0.98 (0.94-1.03)
>=25%	0.84 (0.77-0.92)	0.93 (0.84-1.01)
Distance to main road		
0 - <50m	1	1
50 - <100m	0.96 (0.93-0.99)	0.97 (0.94-1.00)
100 - <150m	0.93 (0.90-0.96)	0.94 (0.91-0.98)
150 - <200m	0.92 (0.88-0.95)	0.94 (0.91-0.97)
>=200m	0.93 (0.91-0.95)	0.92 (0.90-0.95)

^a adjusted for age

^b adjusted for age, gender, marital status, education, profession, type of household, language region, urbanization, Swiss SEP and variables listed in table

Table A5 Hazard ratios for ischemic heart disease mortality of Swiss residents living in the mountain area (N= 1,159,173), Swiss National Cohort 2000-2008

	Crude Model ^a HR (95% CI)	Full Model ^b HR (95% CI)
Altitude at census 2000		
<600m	1	1
600-<900m	1.05 (1.01-1.08)	0.94 (0.90-0.98)
900-<1200m	1.01 (0.97-1.06)	0.94 (0.88-1.00)
1200-<1500m	0.84 (0.78-0.90)	0.81 (0.75-0.88)
>=1500m	0.73 (0.66-0.81)	0.72 (0.64-0.81)
Sunshine duration, % of max		
32.6 - <35.0%	1	1
35.0 - <35.8%	1.12 (1.05-1.20)	1.01 (0.94-1.08)
35.8 - <37.6%	1.06 (1.00-1.12)	0.96 (0.90-1.02)
37.6 - <41.4%	1.10 (1.05-1.16)	1.02 (0.96-1.08)
41.4 - 58.5%	0.89 (0.86-0.93)	0.93 (0.88-0.98)
Precipitation [mm]		
540 - 993	1	1
994 - 1080	1.11 (1.05-1.17)	0.99 (0.94-1.05)
1081 - 1165	1.26 (1.19-1.34)	1.06 (1.00-1.13)
1166 - 1316	1.21 (1.15-1.27)	1.03 (0.98-1.09)
1317 - 2735	1.18 (1.13-1.23)	1.06 (1.01-1.11)
Temperature [degree C]		
-3.3-<8.6	1	1
8.6-<9.2	0.98 (0.94-1.02)	0.99 (0.94-1.04)
9.2-<9.6	0.98 (0.94-1.02)	1.00 (0.95-1.05)
9.6-<10.0	0.98 (0.95-1.02)	1.00 (0.95-1.05)
10.0-<13.4	0.91 (0.87-0.94)	1.03 (0.96-1.11)
Slope at place of residence		
0 - <3%	1	1
3 - <5%	0.98 (0.94-1.02)	0.98 (0.94-1.02)
5 - <10%	0.98 (0.95-1.01)	0.99 (0.96-1.03)
10 - <15%	0.95 (0.91-0.99)	0.99 (0.95-1.03)
15 - <25%	0.89 (0.85-0.94)	0.96 (0.91-1.01)
>=25%	0.83 (0.76-0.91)	0.92 (0.84-1.01)
Distance to main road		
0 - <50m	1	1
50 - <100m	0.93 (0.88-0.98)	0.93 (0.88-0.99)
100 - <150m	0.92 (0.87-0.97)	0.92 (0.87-0.98)
150 - <200m	0.86 (0.81-0.91)	0.88 (0.82-0.93)
>=200m	0.91 (0.88-0.95)	0.91 (0.87-0.95)

^a adjusted for age

^b adjusted for age, gender, marital status, education, profession, type of household, language region, urbanization, Swiss SEP and variables listed in table

Table A6 Hazard ratios for ischemic heart disease mortality of Swiss residents including changes in altitude between place of birth and residence at census (N= 2,953,959*), Swiss National Cohort 2000-2008

	Crude Model ^a HR (95% CI)	Full Model ^b HR (95% CI)
Altitude range in m above sea level (census 2000)		
<600		1
600-<900		0.96 (0.93-0.99)
900-<1200		0.96 (0.91-1.01)
1200-<1500		0.85 (0.78-0.92)
≥1500		0.75 (0.66-0.85)
Change in altitude (place of birth vs census)		
Moved down >400m	0.89 (0.86-0.93)	0.94 (0.91-0.98)
Stayed within +/-400m	1	1
Moved up >400m	0.85 (0.80-0.90)	1.01 (0.94-1.08)
Mean annual sunshine duration in % of maximum		
32.6 - <35.0		1
35.0 - <35.8		1.05 (1.02-1.08)
35.8 - <37.6		1.01 (0.98-1.04)
37.6 - <41.4		0.95 (0.92-0.98)
41.4 - 58.5		0.94 (0.91-0.97)
Mean annual precipitation in mm		
540 - 993		1
994 - 1080		1.02 (1.00-1.05)
1081 - 1165		1.06 (1.03-1.09)
1166 - 1316		1.04 (1.01-1.07)
1317 - 2735		1.09 (1.06-1.13)
Mean annual temperature in degree C		
-3.3-<8.6		1
8.6-<9.2		1.01 (0.97-1.04)
9.2-<9.6		1.03 (0.99-1.06)
9.6-<10.0		0.99 (0.95-1.02)
10.0-<13.4		0.98 (0.94-1.02)
Slope at place of residence in %		
0 - <3 (flat)		1
3 - <5		0.98 (0.96-1.01)
5 - <10		0.98 (0.96-1.00)
10 - <15		0.95 (0.93-0.98)
15 - <25		0.95 (0.92-0.99)
≥25		0.93 (0.85-1.01)
Distance to main road in m		
0 - <50		1
50 - <100		0.96 (0.93-1.00)
100 - <150		0.93 (0.90-0.96)
150 - <200		0.91 (0.88-0.95)
≥200		0.91 (0.89-0.93)

^a adjusted for age

^b adjusted for age, gender, marital status, education, profession, type of household, language region, urbanization, Swiss SEP and variables listed in table

* 1,204,764 persons did not have the information on the place of birth and were excluded