

SUPPORTING INFORMATION

Table S1. List of the SNPs used for genetic profile risk score for BMI

SNP	Chr	Position	Genes	BMI-increasing allele	Other allele	BMI b per 4kg/m
rs1558902	16	52,361,075	<i>FTO</i>	A	T	0.0818
rs6567160	18	55,980,115	<i>MC4R</i>	C	T	0.0556
rs13021737	2	622,348	<i>TMEM18</i>	G	A	0.0601
rs10938397	4	44,877,284	<i>GNPDA2</i>	G	A	0.0402
rs543874	1	176,156,103	<i>SEC16B</i>	G	A	0.0482
rs2207139	6	50,953,449	<i>TFAP2B</i>	G	A	0.0447
rs11030104	11	27,641,093	<i>BDNF</i>	A	G	0.0414
rs3101336	1	72,523,773	<i>NEGR1</i>	C	T	0.0334
rs7138803	12	48,533,735	<i>BCDIN3D</i>	A	G	0.0315
rs10182181	2	25,003,800	<i>ADCY3</i>	G	A	0.0307
rs3888190	16	28,796,987	<i>ATP2A1</i>	A	C	0.0309
rs1516725	3	187,306,698	<i>ETV5</i>	C	T	0.0451
rs12446632	16	19,842,890	<i>GPRC5B</i>	G	A	0.0403
rs2287019	19	50,894,012	<i>QPCTL</i>	C	T	0.0360
rs16951275	15	65,864,222	<i>MAP2K5</i>	T	C	0.0311
rs3817334	11	47,607,569	<i>MTCH2</i>	T	C	0.0262
rs2112347	5	75,050,998	<i>POC5</i>	T	G	0.0261
rs12566985	1	74,774,781	<i>FPGT</i>	G	A	0.0242
rs3810291	19	52,260,843	<i>ZC3H4</i>	A	G	0.0283
rs7141420	14	78,969,207	<i>NRXN3</i>	T	C	0.0235
rs13078960	3	85,890,280	<i>CADM2</i>	G	T	0.0297
rs10968576	9	28,404,339	<i>LINGO2</i>	G	A	0.0249
rs17024393	1	109,956,211	<i>GNAT2</i>	C	T	0.0658
rs12429545	13	53,000,207	<i>OLFM4</i>	A	G	0.0334
rs13107325	4	103,407,732	<i>SLC39A8</i>	T	C	0.0477
rs11165643	1	96,696,685	<i>PTBP2</i>	T	C	0.0218
rs17405819	8	76,969,139	<i>HNF4G</i>	T	C	0.0224
rs1016287	2	59,159,129	<i>LINC01122</i>	T	C	0.0229
rs4256980	11	8,630,515	<i>TRIM66</i>	G	C	0.0209
rs12401738	1	78,219,349	<i>FUBP1</i>	A	G	0.0211
rs205262	6	34,671,142	<i>C6orf106</i>	G	A	0.0221
rs12016871	13	26,915,782	<i>MTIF3</i>	T	C	0.0298
rs12940622	17	76,230,166	<i>RPTOR</i>	G	A	0.0182
rs11847697	14	29,584,863	<i>PRKD1</i>	T	C	0.0492
rs2075650	19	50,087,459	<i>TOMM40</i>	A	G	0.0258
rs2121279	2	142,759,755	<i>LRP1B</i>	T	C	0.0245
rs29941	19	39,001,372	<i>KCTD15</i>	G	A	0.0182
rs6091540	20	50,521,269	<i>ZFP64</i>	C	T	0.0188
rs7715256	5	153,518,086	<i>GALNT10</i>	G	T	0.0163
rs2176040	2	226,801,046	<i>LOC646736</i>	A	G	0.0141
rs657452	1	49,362,434	<i>AGBL4</i>	A	G	0.0227
rs12286929	11	114,527,614	<i>CADM1</i>	G	A	0.0217
rs7903146	10	114,748,339	<i>TCF7L2</i>	C	T	0.0234
rs10132280	14	24,998,019	<i>STXBP6</i>	C	A	0.0230
rs17094222	10	102,385,430	<i>HIF1AN</i>	C	T	0.0249
rs7599312	2	213,121,476	<i>ERBB4</i>	G	A	0.0220
rs2365389	3	61,211,502	<i>FHIT</i>	C	T	0.0200
rs2820292	1	200,050,910	<i>NAVI</i>	C	A	0.0195
rs12885454	14	28,806,589	<i>PRKD1</i>	C	A	0.0207
rs16851483	3	142,758,126	<i>RASA2</i>	T	G	0.0483

rs1167827	7	75,001,105	<i>HIP1</i>	G	A	0.0202
rs758747	16	3,567,359	<i>NLRC3</i>	T	C	0.0225
rs1928295	9	119,418,304	<i>TLR4</i>	T	C	0.0188
rs9925964 ¹	16	31,037,396	<i>KAT8</i>	A	G	0.0192
rs11126666	2	26,782,315	<i>KCNK3</i>	A	G	0.0207
rs2650492	16	28,240,912	<i>SBK1</i>	A	G	0.0207
rs6804842	3	25,081,441	<i>RARB</i>	G	A	0.0185
rs4740619	9	15,624,326	<i>C9orf93</i>	T	C	0.0179
rs13191362	6	162,953,340	<i>PARK2</i>	A	G	0.0277
rs3736485	15	49,535,902	<i>DMXL2</i>	A	G	0.0176
rs17001654 ²	4	77,348,592	<i>SCARB2</i>	G	C	0.0306
rs11191560	10	104,859,028	<i>NT5C2</i>	C	T	0.0308
rs1528435	2	181,259,207	<i>UBE2E3</i>	T	C	0.0178
rs1000940	17	5,223,976	<i>RABEP1</i>	G	A	0.0192
rs2033529 ¹	6	40,456,631	<i>TDRG1</i>	G	A	0.0190
rs11583200	1	50,332,407	<i>ELAVL4</i>	C	T	0.0177
rs9400239	6	109,084,356	<i>FOXO3</i>	C	T	0.0188
rs10733682	9	128,500,735	<i>LMX1B</i>	A	G	0.0174
rs11688816	2	62,906,552	<i>EHBP1</i>	G	A	0.0172
rs11057405	12	121,347,850	<i>CLIP1</i>	G	A	0.0307
rs11727676	4	145,878,514	<i>HHIP</i>	T	C	0.0358
rs3849570	3	81,874,802	<i>GBE1</i>	A	C	0.0188
rs6477694	9	110,972,163	<i>EPB41LAB</i>	C	T	0.0174
rs7899106	10	87,400,884	<i>GRID1</i>	G	A	0.0395
rs2176598	11	43,820,854	<i>HSD17B12</i>	T	C	0.0198
rs2245368	7	76,446,079	<i>DTX2P1</i>	C	T	0.0317
rs17724992	19	18,315,825	<i>PGPEP1</i>	A	G	0.0194
rs7243357	18	55,034,299	<i>GRP</i>	T	G	0.0217
rs1808579	18	19,358,886	<i>C18orf8</i>	C	T	0.0167
rs2033732	8	85,242,264	<i>RALYL</i>	C	T	0.0192
rs1441264	13	78,478,920	<i>MIR548A2</i>	A	G	0.0175
rs2080454	16	47,620,091	<i>CBLN1</i>	C	A	0.0168
rs7164727	15	70,881,044	<i>LOC100287559</i>	T	C	0.0180
rs17203016	2	207,963,763	<i>CREB1</i>	G	A	0.0210
rs977747	1	47,457,264	<i>TALI</i>	T	G	0.0167
rs9914578	17	1,951,886	<i>SMG6</i>	G	C	0.0201
rs9374842	6	120,227,364	<i>LOC285762</i>	T	C	0.0187
rs16907751	8	81,538,012	<i>ZBTB10</i>	C	T	0.0350
rs9540493	13	65,103,705	<i>MIR548X2</i>	A	G	0.0172
rs7239883	18	38,401,669	<i>LOC284260</i>	G	A	0.0164
rs13201877	6	137,717,234	<i>IFNGR1</i>	G	A	0.0233
rs2836754	21	39,213,610	<i>ETS2</i>	C	T	0.0164
rs492400	2	219,057,996	<i>USP37</i>	C	T	0.0158
rs9641123	7	93,035,668	<i>CALCR</i>	C	G	0.0191
rs1460676	2	164,275,935	<i>FIGN</i>	C	T	0.0197
rs4787491	16	29,922,838	<i>INO80E</i>	G	A	0.0159
rs6465468	7	95,007,450	<i>ASB4</i>	T	G	0.0166

¹ Not genotyped in UK Biobank cohort and therefore not analysed in the current report.

² Excluded from the SNP set for GPRS calculation on the basis of Hardy-Weinberg equilibrium $p < 10^{-6}$.

Table S2. Cut off point for tertiles and categories of physical activity, fitness and sedentary behaviours.

	Lower	Middle	Higher
Total PA (MET-min.week ⁻¹), SR	<810	810-2417	>2417
Walking PA (min.day ⁻¹), SR	<20	20-45	>45
Moderate PA (min.day ⁻¹), SR	<13	13-38	>38
Vigorous PA (min.day ⁻¹), SR	<7	7-19	>19
Moderate-to-vigorous PA (MET-min.week ⁻¹), SR	<240	240-1440	>1440
Total accelerometer PA (milli-gravity.day ⁻¹)	<24	24-30	>30
Cardiorespiratory fitness (MET)	<6	6-9	>9
Total discretionary sedentary behaviours (h.day ⁻¹), SR	<4	4-6	>6
TV-viewing (h.day ⁻¹), SR	≤1	2-3	≥4
Discretionary PC-screen time (h.day ⁻¹), SR	<1	1-2	>2

SR: self-reported

Table S3. Cohort characteristic by tertiles of self-reported Physical activity

	Low	Middle	High
Socio-demographics			
Total n	96, 178	105, 232	106,355
Women, n (%)	54, 150 (56.3)	56,667 (53.9)	53,080 (49.9)
Age (years)	56.9 (7.8)	56.6 (8.0)	57.0 (8.1)
Deprivation index			
Lower (Least deprived)	34, 531 (35.9)	39, 565 (37.6)	38, 142 (35.9)
Middle	32, 769 (34.1)	36, 406 (34.6)	37, 124 (34.9)
Higher (Most deprived)	28, 878 (30.0)	29, 261 (27.8)	31, 089 (29.2)
Education			
CSEs	5, 009 (5.9)	4, 692 (5.0)	6, 907 (7.5)
O-levels	21, 807 (25.8)	22, 392 (24.0)	24, 184 (26.4)
A-levels	11, 008 (13.0)	12, 850 (13.8)	11, 375 (12.4)
College/University Degree	28, 673 (33.9)	39, 472 (42.3)	30, 310 (33.1)
None of the above	18, 055 (21.4)	13, 850 (14.9)	18, 827 (20.6)
Smoking status, n (%)			
Never	52, 324 (54.4)	59, 501 (56.5)	57, 725 (54.3)
Previous	33, 130 (34.5)	36, 990 (35.2)	38, 332 (36.0)
Current	10, 724 (11.2)	8, 741 (8.3)	10, 298 (9.7)
Obesity-related markers			
Height (cm)	168.4 (9.3)	169.2 (9.3)	169.2 (9.2)
Weight (kg)	80.3 (16.9)	77.8 (15.4)	77.0 (14.9)
BMI (kg.m ⁻²)	28.3 (5.2)	27.1 (4.9)	26.8 (4.3)
BMI Categories, n (%)			
Underweight (<18.5)	423 (0.4)	518 (0.5)	529 (0.5)
Normal weight (18.5-24.9)	26, 312 (27.4)	36, 103 (34.3)	38, 514 (36.2)
Overweight (25.0 to 29.9)	39, 947 (41.5)	45, 790 (43.5)	46, 502 (43.7)
Obese (≥30.0)	29, 496 (30.7)	22, 821 (21.7)	20, 810 (19.6)
Waist Circumference (cm)	92.5 (14.1)	89.6 (13.0)	88.8 (12.7)
Central Obesity, n (%)			
Yes	40, 240 (41.9)	32, 618 (31.0)	28, 767 (27.1)
No	55, 915 (58.2)	72, 602 (69.0)	77, 574 (73.0)
Physical activity			
Walking PA (min.day ⁻¹)*	13.0 (8.3)	31.6 (19.6)	102.3 (101.9)
Moderate PA (min.day ⁻¹)*	6.8 (5.1)	19.3 (14.0)	86.7 (87.4)
Vigorous PA (min.day ⁻¹)*	3.7 (2.9)	10.6 (7.6)	33.2 (42.8)
Total PA (MET-hour.week ⁻¹)*	5.6 (4.4)	25.3 (7.6)	100.9 (79.5)
Physically active individuals, n (%)*	3, 048 (3.2)	67, 869 (64.5)	99, 045 (93.1)
Objective total PA (milli-gravity.day ⁻¹)	25.7 (7.2)	27.9 (7.7)	30.1 (9.0)
Fitness (METs)	8.1 (3.4)	9.1 (3.4)	9.5 (3.5)
Walking pace, n (%)			
Slow	12, 850 (13.4)	5, 265 (5.0)	3, 560 (3.4)
Middle	53, 971 (56.1)	54, 721 (52.0)	52, 999 (49.8)
Brisk	29, 357 (30.5)	45, 246 (43.0)	49, 796 (46.8)
Car commuters, n (%)	2, 077 (5.2)	4, 413 (11.4)	6, 229 (15.4)
Public Transport commuters, n (%)	3, 810 (9.2)	4, 760 (12.2)	3, 475 (9.2)
Walking commuters, n (%)	1, 767 (4.5)	3, 177 (8.5)	3, 578 (9.5)
Cycling commuters, n (%)	255 (0.7)	1, 047 (3.0)	2, 361 (6.5)
Total Sedentary Behaviour (h.day ⁻¹)	5.4 (2.4)	5.0 (2.2)	4.9 (2.1)
TV viewing (h.day ⁻¹)	3.0 (1.7)	2.7 (1.5)	2.7 (1.5)
PC-screen time (h.day ⁻¹)	1.2 (1.4)	1.2 (1.3)	1.1 (1.2)
Plays Computer Games			
Never/Rarely	73, 255 (76.2)	83, 358 (79.2)	86, 435 (81.3)
Sometimes	18, 850 (19.6)	18, 525 (17.6)	17, 068 (16.1)
Often	4, 031 (4.2)	3, 318 (3.2)	2, 825 (2.7)
Dietary intake			
Total energy intake (Kcal.day ⁻¹)	2,140 (625)	2, 174 (619)	2, 226 (688)
Protein intake (% of TE)	15.5 (3.6)	15.5 (3.4)	15.4 (3.5)
Carbohydrate intake (% of TE)	46.8 (7.9)	47.2 (7.9)	47.5 (7.9)
Total Fat intake (% of TE)	32.5 (6.6)	31.9 (6.5)	31.7 (6.6)

Saturated intake (% of TE)	12.6 (3.3)	12.3 (3.2)	12.2 (3.3)
Polyunsaturated fat intake (% of TE)	5.9 (2.3)	5.9 (2.2)	5.8 (2.2)
Sugar intake (% of TE)	22.0 (6.8)	22.4 (6.6)	23.0 (6.9)
Starch intake (g.day ⁻¹)	23.0 (6.1)	22.9 (5.9)	22.6 (6.1)
Alcohol intake (% of TE)	5.1 (6.6)	5.4 (6.4)	5.3 (6.5)
Red meat (portion.day ⁻¹)	2.0 (1.4)	1.9 (1.3)	2.0 (1.4)
Processed meat (portion.day ⁻¹)	2.0 (1.0)	1.9 (1.0)	1.9 (1.1)
Fruit and vegetable (portion.day ⁻¹)	3.6 (2.1)	4.1 (2.1)	4.4 (2.4)
Health status, n (%)			
Diabetes history			
Yes	5, 861 (6.1)	4, 382 (4.2)	4, 086 (3.9)
No	90, 014 (93.9)	100, 697 (95.8)	102, 123 (96.2)
Hypertension history	24, 160 (25.1)	23, 347 (22.2)	22, 546 (21.2)
Cancer history			
Yes	7, 822 (8.2)	7, 962 (7.6)	7, 992 (7.5)
No	88, 039 (91.8)	97, 043 (92.4)	98, 155 (92.5)
CVDs			
Yes	31, 601 (32.9)	29, 863 (28.4)	29, 163 (27.4)
No	64, 577 (67.1)	75, 368 (71.6)	77, 192 (72.6)

Data presented as mean and SD for continuous variables and as n and % for categorical variables. CVD: cardiovascular diseases; TE: total energy intake; MET: metabolic equivalent task.

Table S4. Cohort Characteristics by tertiles of objective PA

	Low	Middle	High
Socio-demographics			
Total n	20, 776	20, 980	20, 731
Women, n (%)	10, 270 (49.4)	11, 930 (56.9)	12, 026 (57.9)
Age (years)	58.8 (7.2)	56.5 (7.6)	54.0 (7.6)
Deprivation index Tertile			
Lower	8, 005 (38.5)	8, 462 (40.3)	8, 293 (40.0)
Middle	7, 283 (35.1)	7, 378 (35.2)	7, 300 (35.2)
Higher	5, 488 (26.4)	5, 140 (24.5)	5, 164 (24.9)
Education			
CSEs	696 (3.8)	759 (4.0)	1, 029 (5.5)
O-levels	4, 411 (24.2)	4, 459 (23.8)	4, 394 (23.4)
A-levels	2, 658 (14.6)	2, 854 (15.2)	2, 882 (15.3)
College/University Degree	8, 314 (45.6)	9, 129 (48.6)	9, 108 (48.5)
None of the above	2, 171 (11.9)	1, 576 (8.4)	1, 378 (7.3)
Smoking status, n (%)			
Never	11, 324 (54.5)	12, 330 (58.8)	12, 468 (60.1)
Previous	7, 848 (37.8)	7, 384 (35.2)	7, 164 (34.5)
Current	1, 604 (7.7)	1, 266 (6.0)	1, 125 (5.4)
Obesity-related markers			
Height (cm)	170.1 (9.2)	169.3 (9.0)	169.1 (8.9)
Weight (kg)	81.5 (16.2)	76.4 (14.5)	72.8 (13.6)
BMI (kg.m ⁻²)	28.1 (4.9)	26.6 (4.2)	25.4 (3.8)
BMI Categories, n (%)			
Underweight (<18.5)	64 (0.3)	87 (0.4)	175 (0.8)
Normal weight (18.5-24.9)	5, 626 (27.1)	8, 126 (38.7)	10, 526 (50.7)
Overweight (25.0 to 29.9)	9, 111 (43.9)	9, 111 (43.4)	7, 772 (37.4)
Obese (≥30.0)	5, 975 (28.8)	3, 656 (17.4)	2, 284 (11.0)
Waist Circumference (cm)	93.0 (13.4)	88.0 (12.3)	84.4 (11.7)
Central Obesity, n (%)			
Yes	8, 296 (40.0)	5, 552 (26.5)	3, 553 (17.1)
No	12, 474 (60.1)	15, 426 (73.5)	17, 204 (82.9)
Physical activity			
Walking PA (min.day ⁻¹)*	40.5 (56.1)	46.8 (60.7)	58.4 (76.1)
Moderate PA (min.day ⁻¹)*	36.5 (55.7)	39.8 (57.6)	47.0 (67.5)
Vigorous PA (min.day ⁻¹)*	15.6 (23.5)	17.3 (23.3)	22.1 (28.4)
Total PA (MET-hour.week ⁻¹)*	34.0 (46.8)	40.9 (50.0)	53.4 (62.1)
Physically active individuals, n (%)*	9, 996 (48.1)	12, 063 (57.5)	14, 181 (68.3)
Objective total PA (milli-gravity.day ⁻¹)	19.9 (3.1)	27.1 (1.8)	37.0 (6.6)
Fitness (METs)	8.4 (3.2)	9.2 (3.2)	10.2 (3.4)
Walking pace, n (%)			
Slow	1, 742 (8.4)	643 (3.1)	302 (1.5)
Middle	11, 636 (56.0)	10, 337 (49.3)	8, 097 (39.0)
Brisk	7, 398 (35.6)	10, 000 (47.7)	12, 358 (59.5)
Car commuters, n (%)	584 (8.6)	892 (10.8)	1, 437 (15.5)
Public Transport commuters, n (%)	823 (11.7)	837 (10.2)	840 (9.7)
Walking commuters, n (%)	411 (6.2)	579 (7.3)	780 (9.0)
Cycling commuters, n (%)	150 (2.4)	274 (3.6)	566 (6.7)
Total Sedentary Behaviour (h.day ⁻¹)	5.4 (2.2)	4.9 (2.1)	4.5 (2.0)
TV viewing (h.day ⁻¹)	2.8 (1.6)	2.4 (1.4)	2.2 (1.3)
PC-screen time (h.day ⁻¹)	1.5 (1.4)	1.3 (1.2)	1.2 (1.2)
Plays Computer Games			
Never/Rarely	14, 723 (70.9)	16, 224 (77.3)	16, 986 (81.8)
Sometimes	4, 849 (23.3)	3, 980 (19.0)	3, 302 (15.9)
Often	1, 202 (5.8)	774 (3.7)	468 (2.3)
Dietary intake			
Total energy intake (Kcal.day ⁻¹)	2, 131 (592)	2, 184 (586)	2, 267 (642)
Protein intake (% of TE)	15.6 (3.3)	15.4 (3.2)	15.1 (3.1)
Carbohydrate intake (% of TE)	46.9 (7.6)	47.0 (7.5)	47.6 (7.4)

Total Fat intake (% of TE)	32.2 (6.3)	32.2 (6.2)	32.2 (6.2)
Saturated intake (% of TE)	12.5 (3.2)	12.4 (3.1)	12.3 (3.1)
Polyunsaturated fat intake (% of TE)	5.9 (2.1)	5.9 (2.0)	5.9 (2.1)
Sugar intake (% of TE)	22.1 (6.4)	22.4 (6.3)	22.8 (6.3)
Starch intake (g.day ⁻¹)	22.9 (5.8)	22.7 (5.6)	22.8 (5.6)
Alcohol intake (% of TE)	5.2 (6.3)	5.3 (6.0)	5.1 (5.8)
Red meat (portion.day ⁻¹)	2.0 (1.4)	1.9 (1.3)	1.8 (1.3)
Processed meat (portion.day ⁻¹)	1.9 (1.0)	1.8 (1.0)	1.8 (1.1)
Fruit and vegetable (portion.day ⁻¹)	3.9 (2.1)	4.2 (2.1)	4.3 (2.2)
Health status, n (%)			
Diabetes history			
Yes	1, 243 (6.0)	515 (2.5)	310 (1.5)
No	19, 498 (94.0)	20, 440 (97.5)	20, 427 (98.5)
Hypertension history	5, 645 (27.2)	4,071 (19.4)	2, 868 (13.8)
Cancer history			
Yes	1, 822 (8.8)	1, 510 (7.2)	1, 221 (5.9)
No	18, 900 (91.2)	19, 435 (92.8)	19, 505 (94.1)
CVDs			
Yes	7, 219 (34.8)	4, 994 (23.8)	3, 482 (16.8)
No	13, 557 (65.3)	15, 986 (76.2)	17, 275 (83.2)

Data presented as mean and SD for continuous variables and as n and % for categorical variables. CVD: cardiovascular diseases; TE: total energy intake; MET: metabolic equivalent task.

Table S5. Cohort Characteristics by categories of cardiorespiratory fitness

	Low	Middle	High
Socio-demographics			
Total n	8, 236	17, 487	18, 424
Women, n (%)	5, 777 (70.1)	11, 690 (66.9)	5, 661 (30.7)
Age (years)	60.5 (6.9)	58.4 (7.4)	54.9 (8.1)
Deprivation index Tertile			
Lower	2, 502 (30.4)	5, 898 (33.7)	6, 292 (34.2)
Middle	2, 819 (34.2)	6, 278 (35.9)	6, 488 (35.2)
Higher	2, 915 (35.4)	5, 311 (30.4)	5, 644 (30.6)
Education			
CSEs	413 (5.8)	982 (6.4)	1, 096 (6.7)
O-levels	1, 964 (27.4)	4, 331 (28.3)	3, 650 (22.4)
A-levels	854 (11.9)	2, 142 (14.0)	2, 261 (13.9)
College/University Degree	1, 910 (26.6)	5, 305 (34.7)	7, 682 (47.1)
None of the above	2, 039 (28.4)	2, 552 (16.7)	1, 630 (10.0)
Smoking status, n (%)			
Never	4, 501 (54.7)	9, 879 (56.5)	10, 124 (55.0)
Previous	2, 989 (36.3)	6, 368 (36.4)	6, 516 (35.4)
Current	746 (9.1)	1, 240 (7.1)	1, 784 (9.7)
Obesity-related markers			
Height (cm)	165.6 (8.9)	167.0 (8.5)	173.5 (8.4)
Weight (kg)	80.7 (17.9)	77.3 (15.8)	78.9 (14.6)
BMI (kg.m ⁻²)	29.4 (5.8)	27.6 (4.5)	26.1 (3.7)
BMI Categories, n (%)			
Underweight (<18.5)	38 (0.5)	61 (0.4)	96 (0.5)
Normal weight (18.5-24.9)	1, 839 (22.3)	5, 316 (30.4)	7, 444 (40.4)
Overweight (25.0 to 29.9)	3, 168 (38.5)	7, 568 (43.3)	8, 259 (44.8)
Obese (≥30.0)	3, 191 (38.7)	4, 542 (26.0)	2, 625 (14.3)
Waist Circumference (cm)	93.7 (14.7)	89.9 (13.6)	89.4 (12.3)
Central Obesity, n (%)			
Yes	4, 251 (51.6)	6, 749 (38.6)	3, 708 (20.1)
No	3, 981 (48.4)	10, 736 (61.4)	14, 714 (79.9)
Physical activity			
Walking PA (min.day ⁻¹)*	49.8 (69.5)	52.3 (69.1)	54.6 (73.3)
Moderate PA (min.day ⁻¹)*	47.1 (67.3)	46.7 (67.1)	47.1 (68.7)
Vigorous PA (min.day ⁻¹)*	18.7 (32.8)	18.2 (32.3)	23.0 (31.8)
Total PA (MET-hour.week ⁻¹)*	37.5 (56.7)	43.1 (58.5)	52.7 (64.2)
Physically active individuals, n (%)*	3, 708 (45.0)	9, 211 (52.7)	12, 144 (65.9)
Objective total PA (milli-gravity.day ⁻¹)	25.3 (7.0)	27.0 (7.1)	30.1 (8.7)
Fitness (METs)	3.6 (1.8)	8.1 (0.9)	12.0 (2.0)
Walking pace, n (%)			
Slow	1, 461 (17.7)	800 (4.6)	383 (2.1)
Middle	4, 743 (57.6)	9, 976 (57.1)	8, 428 (45.7)
Brisk	2, 032 (24.7)	6, 711 (38.4)	9, 613 (52.2)
Car commuters, n (%)	173 (9.5)	520 (9.3)	842 (11.6)
Public Transport commuters, n (%)	351 (17.5)	887 (14.8)	1, 272 (16.5)
Walking commuters, n (%)	147 (8.1)	439 (7.9)	402 (5.9)
Cycling commuters, n (%)	20 (1.2)	73 (1.4)	401 (5.9)
Total Sedentary Behaviour (h.day ⁻¹)	5.3 (2.3)	5.2 (2.2)	5.0 (2.3)
TV viewing (h.day ⁻¹)	3.3 (1.8)	2.9 (1.5)	2.4 (1.4)
PC-screen time (h.day ⁻¹)	1.1 (1.3)	1.2 (1.3)	1.4 (1.4)
Plays Computer Games			
Never/Rarely	6, 480 (78.8)	14, 032 (80.3)	14, 997 (81.5)
Sometimes	1, 459 (17.7)	2, 937 (16.8)	2, 943 (16.0)
Often	288 (3.5)	511 (2.9)	473 (2.6)
Dietary intake			
Total energy intake (Kcal.day ⁻¹)	2, 090 (659)	2, 099 (614)	2, 274 (669)
Protein intake (% of TE)	15.8 (3.7)	15.7 (3.6)	15.2 (3.4)
Carbohydrate intake (% of TE)	47.7 (8.0)	47.2 (8.0)	47.1 (8.1)
Total Fat intake (% of TE)	32.2 (6.7)	32.0 (6.7)	31.6 (6.6)

Saturated intake (% of TE)	12.5 (3.4)	12.3 (3.3)	12.1 (3.3)
Polyunsaturated fat intake (% of TE)	5.9 (2.3)	5.9 (2.2)	5.8 (2.2)
Sugar intake (% of TE)	23.0 (7.2)	22.7 (7.0)	22.3 (6.7)
Starch intake (g.day ⁻¹)	22.8 (6.2)	22.6 (6.2)	22.9 (6.1)
Alcohol intake (% of TE)	4.3 (6.1)	5.0 (6.4)	6.1 (6.9)
Red meat (portion.day ⁻¹)	2.0 (1.4)	1.9 (1.3)	1.9 (1.3)
Processed meat (portion.day ⁻¹)	1.9 (1.0)	1.9 (1.0)	2.0 (1.1)
Fruit and vegetable (portion.day ⁻¹)	4.0 (2.3)	4.1 (2.2)	4.0 (2.3)
Health status, n (%)			
Diabetes history			
Yes	648 (7.9)	807 (4.6)	621 (3.4)
No	7, 552 (92.1)	16, 650 (95.4)	17, 782 (96.6)
Hypertension history	2, 659 (32.3)	4, 110 (23.5)	3, 244 (17.6)
Cancer history			
Yes	864 (10.6)	1, 573 (9.0)	1, 196 (6.5)
No	7, 328 (89.5)	15, 865 (91.0)	17, 203 (93.5)
CVDs			
Yes	3, 534 (42.9)	4, 975 (28.5)	4, 162 (22.6)
No	4, 702 (57.1)	12, 512 (71.5)	14, 262 (77.4)

Data presented as mean and SD for continuous variables and as n and % for categorical variables. CVD: cardiovascular diseases; TE: total energy intake; MET: metabolic equivalent task.

Table S6. Cohort Characteristics by categories of walking pace

	Slow pace	Average pace	Brisk pace
Socio-demographics			
Total n	21, 675	161, 691	124, 399
Women, n (%)	11, 918 (55.0)	86, 956 (53.8)	65, 023 (52.3)
Age (years)	59.6 (7.1)	57.6 (7.9)	55.4 (8.0)
Deprivation index Tertile			
Lower	5, 539 (25.6)	58, 399 (36.1)	48,300 (38.8)
Middle	6, 651 (30.7)	56, 356 (34.9)	43, 292 (34.8)
Higher	9, 485 (43.8)	46, 936 (29.0)	32, 807 (26.4)
Education			
CSEs	1, 099 (5.9)	9, 613 (6.9)	5, 896 (5.3)
O-levels	4, 467 (23.9)	37, 567 (26.8)	26, 349 (23.9)
A-levels	1, 828 (9.8)	17, 630 (12.6)	15, 775 (14.3)
College/University Degree	3, 812 (20.5)	44, 995 (31.1)	49, 648 (45.0)
None of the above	7, 435 (39.9)	30, 523 (21.8)	12, 774 (11.6)
Smoking status, n (%)			
Never	9, 191 (42.4)	87, 103 (53.9)	73, 256 (58.9)
Previous	8, 817 (40.7)	58, 363 (36.1)	41, 272 (33.2)
Current	3, 667 (16.9)	16, 225 (10.0)	9, 871 (7.9)
Obesity-related markers			
Height (cm)	166.7 (9.3)	168.5 (9.1)	170.0 (9.3)
Weight (kg)	87.3 (19.8)	79.7 (15.7)	75.0 (14.2)
BMI (kg.m ⁻²)	31.4 (6.5)	28.0 (4.6)	25.8 (3.7)
BMI Categories, n (%)			
Underweight (<18.5)	101 (0.5)	516 (0.3)	853 (0.7)
Normal weight (18.5-24.9)	3, 108 (14.3)	42, 782 (26.5)	55, 039 (44.2)
Overweight (25.0 to 29.9)	6, 903 (31.9)	72, 478 (44.8)	52, 858 (42.5)
Obese (≥30.0)	11, 563 (53.4)	45, 915 (28.4)	15, 649 (12.6)
Waist Circumference (cm)	100.1 (15.4)	91.8 (13.1)	86.5 (12.0)
Central Obesity, n (%)			
Yes	13, 833 (63.9)	62, 659 (38.8)	25, 133 (20.2)
No	7, 829 (36.1)	99, 010 (61.2)	99, 252 (79.8)
Physical activity			
Walking PA (min.day ⁻¹)*	37.2 (57.6)	54.3 (76.3)	55.8 (75.1)
Moderate PA (min.day ⁻¹)*	38.5 (59.9)	46.4 (68.6)	46.8 (68.3)
Vigorous PA (min.day ⁻¹)*	17.9 (33.4)	20.2 (32.8)	22.0 (33.1)
Total PA (MET-hour.week ⁻¹)*	23.6 (43.8)	43.7 (61.8)	51.0 (65.3)
Physically active individuals, n (%)*	6, 340 (29.3)	85, 319 (52.8)	78, 303 (63.0)
Objective total PA (milli-gravity.day ⁻¹)	22.2 (7.0)	26.8 (7.6)	29.8 (8.4)
Fitness (METs)	5.7 (3.7)	8.6 (3.3)	9.8 (3.3)
Car commuters, n (%)	273 (6.3)	5, 729 (9.2)	6, 717 (12.9)
Public Transport commuters, n (%)	499 (10.9)	5, 725 (9.2)	5, 821 (11.4)
Walking commuters, n (%)	210 (4.9)	3, 889 (6.4)	4, 423 (8.9)
Cycling commuters, n (%)	59 (1.4)	1, 633 (2.8)	1, 971 (4.2)
Total Sedentary Behaviour (h.day ⁻¹)	5.9 (2.6)	5.2 (2.2)	4.8 (2.1)
TV viewing (h.day ⁻¹)	3.8 (2.1)	2.9 (1.6)	2.4 (1.4)
PC-screen time (h.day ⁻¹)	1.1 (1.4)	1.1 (1.2)	1.2 (1.3)
Plays Computer Games			
Never/Rarely	16, 353 (75.5)	126, 318 (78.2)	100, 377 (80.7)
Sometimes	4, 205 (19.4)	29, 839 (18.5)	20, 399 (16.4)
Often	1, 102 (5.1)	5, 472 (3.4)	3, 600 (2.9)
Dietary intake			
Total energy intake (Kcal.day ⁻¹)	2, 133 (723)	2, 170 (642)	2, 198 (640)
Protein intake (% of TE)	15.7 (4.0)	15.5 (3.5)	15.4 (3.4)
Carbohydrate intake (% of TE)	47.4 (8.3)	47.1 (7.9)	47.3 (7.9)
Total Fat intake (% of TE)	32.7 (7.0)	32.2 (6.6)	31.8 (6.5)
Saturated intake (% of TE)	13.0 (3.6)	12.5 (3.3)	12.2 (3.2)
Polyunsaturated fat intake (% of TE)	5.9 (2.3)	5.9 (2.2)	5.8 (2.1)
Sugar intake (% of TE)	22.6 (7.5)	22.3 (6.8)	22.6 (6.7)
Starch intake (g.day ⁻¹)	22.9 (6.4)	22.9 (6.0)	22.7 (6.0)

Alcohol intake (% of TE)	4.2 (6.5)	5.2 (6.5)	5.5 (6.4)
Red meat (portion.day ⁻¹)	2.1 (1.6)	2.0 (1.4)	1.9 (1.3)
Processed meat (portion.day ⁻¹)	2.1 (1.1)	2.0 (1.0)	1.8 (1.0)
Fruit and vegetable (portion.day ⁻¹)	3.8 (2.4)	3.9 (2.2)	4.3 (2.3)
Health status, n (%)			
Diabetes history			
Yes	3, 134 (14.6)	8, 219 (5.1)	2, 976 (2.4)
No	18, 403 (85.5)	153, 161 (94.9)	121, 270 (97.6)
Hypertension history	7, 469 (34.5)	40, 672 (25.2)	21, 912 (17.6)
Cancer history			
Yes	2, 511 (11.7)	12, 679 (7.9)	8, 586 (6.9)
No	19, 040 (88.4)	148, 606 (92.1)	115, 591 (93.1)
CVDs			
Yes	11, 711 (54.0)	51, 932 (31.1)	26, 984 (21.7)
No	9, 964 (46.0)	109, 758 (67.9)	97, 415 (78.3)

Data presented as mean and SD for continuous variables and as n and % for categorical variables. CVD: cardiovascular diseases; TE: total energy intake; MET: metabolic equivalent task.

Table S7. Cohort Characteristics by car versus active commuting (walking and cycling).

	Car commuters	Active commuters
Socio-demographics		
Total n	106,042	12,719
Women, n (%)	52,644 (49.6)	7,354 (57.8)
Age (years)	52.9 (7.0)	52.7 (7.0)
Deprivation index Tertile		
Lower	42,611 (40.2)	2,765 (21.7)
Middle	38,224 (36.0)	3,982 (31.3)
Higher	25,207 (23.8)	5,982 (47.0)
Education		
CSEs	10,814 (11.8)	1,786 (15.6)
O-levels	8,288 (9.0)	1,050 (9.1)
A-levels	25,021 (27.2)	2,486 (21.7)
College/University Degree	12,748 (13.9)	1,402 (12.2)
None of the above	35,051 (38.1)	4,743 (41.4)
Smoking status, n (%)		
Never	60,992 (57.5)	7,448 (58.6)
Previous	34,260 (32.3)	3,940 (31.0)
Current	10,790 (10.2)	1,331 (10.4)
Obesity-related markers		
Height (cm)	1.70 (9.1)	1.68 (9.4)
Weight (kg)	79.8 (16.1)	74.4 (14.3)
BMI (kg.m ⁻²)	27.5 (4.7)	26.0 (4.3)
BMI Categories, n (%)		
Underweight (<18.5)	373 (0.4)	105 (0.8)
Normal weight (18.5-24.9)	33,526 (1.6)	5,733 (45.1)
Overweight (25.0 to 29.9)	45,922 (43.3)	4,905 (38.6)
Obese (≥30.0)	26,221 (24.7)	1,976 (15.5)
Waist Circumference (cm)	90.4 (13.4)	80.1 (12.2)
Central Obesity, n (%)		
Yes	72,527 (68.4)	9,829 (77.3)
No	33,503 (31.6)	2,888 (22.7)
Physical activity		
Walking PA (min.day ⁻¹)*	59.2 (89.4)	74.1 (93.7)
Moderate PA (min.day ⁻¹)*	44.8 (74.7)	56.2 (76.8)
Vigorous PA (min.day ⁻¹)*	21.5 (36.5)	28.1 (42.5)
Total PA (MET-hour.week ⁻¹)*	46.6 (71.8)	63.6 (77.4)
Physically active individuals, n (%)*	55,796 (52.6)	8,481 (66.7)
Objective total PA (milli-gravity.day ⁻¹)	28.8 (8.2)	31.4 (9.2)
Fitness (METs)	9.5 (3.3)	10.0 (3.5)
Walking pace, n (%)		
Slow	4,082 (3.9)	273 (2.2)
Middle	56,545 (53.3)	5,729 (45.0)
Brisk	45,415 (42.8)	6,717 (52.8)
Public Transport commuters, n (%)	106,041 (100%)	12,045 (100%)
Walking commuters, n (%)	106,042 (100%)	8,522 (100%)
Cycling commuters, n (%)	106,042 (100%)	3,663 (100%)
Total Sedentary Behaviour (h.day ⁻¹)	5.4 (2.3)	3.9 (2.1)
TV viewing (h.day ⁻¹)	2.5 (1.3)	2.3 (1.4)
PC-screen time (h.day ⁻¹)	1.2 (1.3)	1.0 (1.2)
Plays Computer Games		
Never/Rarely	81,956 (77.3)	10,306 (81.0)
Sometimes	20,805 (19.6)	2,069 (16.3)
Often	3,265 (3.1)	340 (2.7)
Dietary intake		
Total energy intake (Kcal.day ⁻¹)	2,170 (654)	2,211 (663)
Protein intake (% of TE)	15.6 (3.6)	15.0 (3.4)
Carbohydrate intake (% of TE)	47.0 (8.0)	47.9 (8.0)
Total Fat intake (% of TE)	32.1 (6.7)	32.2 (6.6)
Saturated intake (% of TE)	12.4 (3.3)	12.3 (4.4)

Polyunsaturated fat intake (% of TE)	5.9 (2.2)	5.9 (2.2)
Sugar intake (% of TE)	22.2 (6.9)	22.5 (6.8)
Starch intake (g.day ⁻¹)	22.9 (6.2)	23.4 (6.1)
Alcohol intake (% of TE)	5.4 (6.6)	4.9 (6.2)
Red meat (portion.day ⁻¹)	1.9 (1.3)	1.7 (1.3)
Processed meat (portion.day ⁻¹)	1.9 (1.0)	1.8 (1.1)
Fruit and vegetable (portion.day ⁻¹)	3.9 (2.2)	4.2 (2.3)
Health status, n (%)		
Diabetes history		
Yes	3,587 (3.4)	285 (2.2)
No	102,299 (96.6)	12,413 (97.8)
Hypertension history	19,860 (18.7)	2,005 (15.8)
Cancer history		
Yes	5,965 (5.6)	691 (5.4)
No	99,866 (94.4)	11,988 (94.6)
CVDs		
Yes	24,262 (22.9)	2,436 (19.2)
No	81,780 (77.1)	10,283 (80.8)

Data presented as mean and SD for continuous variables and as n and % for categorical variables. CVD: cardiovascular diseases; TE: total energy intake; MET: metabolic equivalent task.

Table S8. Cohort Characteristics by car versus public transport commuting

Socio-demographics	Car commuters	Public transport commuters
Total n	106,042	12,045
Women, n (%)	52,644 (49.6)	6,970 (57.9)
Age (years)	52.9 (7.0)	53.4 (7.1)
Deprivation index Tertile		
Lower	42,611 (40.2)	2,356 (19.6)
Middle	38,224 (36.0)	3,547 (29.4)
Higher	25,207 (23.8)	6,142 (51.0)
Education		
CSEs	10,814 (11.8)	1,486 (13.6)
O-levels	8,288 (9.0)	752 (6.9)
A-levels	25,021 (27.2)	2,651 (24.4)
College/University Degree	12,748 (13.9)	1,502 (13.8)
None of the above	35,051 (38.1)	4,502 (41.3)
Smoking status, n (%)		
Never	60,992 (57.5)	6,642 (55.1)
Previous	34,260 (32.3)	3,717 (30.9)
Current	10,790 (10.2)	1,686 (14.0)
Obesity-related markers		
Height (cm)	1.70 (9.1)	1.68 (9.4)
Weight (kg)	79.8 (16.1)	77.6 (16.2)
BMI (kg.m ⁻²)	27.5 (4.7)	27.2 (5.0)
BMI Categories, n (%)		
Underweight (<18.5)	373 (0.4)	78 (0.6)
Normal weight (18.5-24.9)	33,526 (1.6)	4,295 (35.7)
Overweight (25.0 to 29.9)	45,922 (43.3)	4,831 (40.1)
Obese (≥30.0)	26,221 (24.7)	2,841 (23.6)
Waist Circumference (cm)	90.4 (13.4)	89.4 (13.5)
Central Obesity, n (%)		
Yes	72,527 (68.4)	8,084 (67.1)
No	33,503 (31.6)	3,961 (32.9)
Physical activity		
Walking PA (min.day ⁻¹)*	59.2 (89.4)	60.0 (85.1)
Moderate PA (min.day ⁻¹)*	44.8 (74.7)	36.5 (63.3)
Vigorous PA (min.day ⁻¹)*	21.5 (36.5)	19.5 (34.3)
Total PA (MET-hour.week ⁻¹)*	46.6 (71.8)	41.9(63.8)
Physically active individuals, n (%)*	55,796 (52.6)	5,587 (46.4)
Objective total PA (milli-gravity.day ⁻¹)	28.8 (8.2)	28.2 (8.2)
Fitness (METs)	9.5 (3.3)	9.5 (3.4)
Walking pace, n (%)		
Slow	4,082 (3.9)	499 (4.1)
Middle	56,545 (53.3)	5,725 (47.5)
Brisk	45,415 (42.8)	5,821 (48.4)
Car commuters, n (%)	106,041 (100%)	12,719 (100%)
Public Transport commuters, n (%)	106,042 (100%)	12,045 (100%)
Walking commuters, n (%)	106,042 (100%)	8,522 (100%)
Cycling commuters, n (%)	106,042 (100%)	3,663 (100%)
Total Sedentary Behaviour (h.day ⁻¹)	5.4 (2.3)	4.1 (2.1)
TV viewing (h.day ⁻¹)	2.5 (1.3)	2.5 (1.4)
PC-screen time (h.day ⁻¹)	1.2 (1.3)	1.2 (1.5)
Plays Computer Games		
Never/Rarely	81,956 (77.3)	9,536 (79.2)
Sometimes	20,805 (19.6)	2,131 (17.7)
Often	3,265 (3.1)	376 (3.1)
Dietary intake		
Total energy intake (Kcal.day ⁻¹)	2,170 (654)	2,162 (656)
Protein intake (% of TE)	15.6 (3.6)	15.4 (3.6)
Carbohydrate intake (% of TE)	47.0 (8.0)	46.8 (8.2)
Total Fat intake (% of TE)	32.1 (6.7)	32.1 (6.8)
Saturated intake (% of TE)	12.4 (3.3)	12.3 (3.4)

Polyunsaturated fat intake (% of TE)	5.9 (2.2)	5.9 (2.2)
Sugar intake (% of TE)	22.2 (6.9)	21.7 (6.8)
Starch intake (g.day ⁻¹)	22.9 (6.2)	23.2 (6.3)
Alcohol intake (% of TE)	5.4 (6.6)	5.7 (7.0)
Red meat (portion.day ⁻¹)	1.9 (1.3)	1.8 (1.3)
Processed meat (portion.day ⁻¹)	1.9 (1.0)	1.9 (1.1)
Fruit and vegetable (portion.day ⁻¹)	3.9 (2.2)	3.8 (2.2)
Health status, n (%)		
Diabetes history		
Yes	3,587 (3.4)	433 (3.6)
No	102,299 (96.6)	11,584 (96.4)
Hypertension history	19,860 (18.7)	2,406 (20.0)
Cancer history		
Yes	5,965 (5.6)	730 (6.1)
No	99,866 (94.4)	11,284 (93.9)
CVDs		
Yes	24,262 (22.9)	2,931 (24.3)
No	81,780 (77.1)	9,114 (75.7)

Data presented as mean and SD for continuous variables and as n and % for categorical variables. CVD: cardiovascular diseases; TE: total energy intake; MET: metabolic equivalent task.

Table S9. Cohort Characteristics by categories of overall discretionary sedentary behaviour

	<4 h/day	4-6 h/day	>6 h/day
Socio-demographics			
Total n	71,434	172,762	63,569
Women, n (%)	44,990 (63.0)	94,252 (54.6)	24,655 (38.8)
Age (years)	55.8 (8.1)	57.2 (7.9)	57.1 (7.9)
Deprivation index Tertile			
Lower	24,187 (33.9)	66,733 (38.6)	21,318 (33.5)
Middle	24,218 (33.9)	60,477 (35.0)	21,604 (34.0)
Higher	23,029 (32.2)	45,552 (26.4)	20,647 (32.5)
Education			
CSEs	9,065 (14.1)	28,057 (18.6)	13,610 (25.2)
O-levels	3,039 (4.7)	9,139 (6.0)	4,430 (8.2)
A-levels	13,488 (21.0)	40,039 (26.5)	14,856 (27.5)
College/University Degree	8,531 (13.2)	20,242 (13.4)	6,460 (12.0)
None of the above	30,255 (47.0)	53,542 (35.5)	14,658 (27.1)
Smoking status, n (%)			
Never	43,537 (61.0)	95,645 (55.4)	30,368 (47.8)
Previous	21,691 (30.4)	61,582 (35.6)	25,179 (39.6)
Current	6,205 (8.6)	15,535 (9.0)	8,022 (12.6)
Obesity-related markers			
Height (cm)	1.68 (9.1)	1.69 (9.2)	1.70 (9.2)
Weight (kg)	73.5 (14.3)	78.0 (15.2)	84.4 (16.8)
BMI (kg.m ⁻²)	26.0 (4.3)	27.3 (4.5)	29.0 (5.0)
BMI Categories, n (%)			
Underweight (<18.5)	620 (0.8)	700 (0.4)	150 (0.2)
Normal weight (18.5-24.9)	32,779 (45.9)	55,347 (32.0)	12,803 (20.1)
Overweight (25.0 to 29.9)	21,214 (38.1)	76,827 (44.5)	28,198 (44.4)
Obese (≥30.0)	10,821 (15.2)	39,888 (23.1)	22,418 (35.3)
Waist Circumference (cm)	85.8 (12.5)	90.1 (12/9)	95.8 (13.6)
Central Obesity, n (%)			
Yes	54,460 (76.2)	116,285 (67.3)	35,346 (55.6)
No	16,966 (23.8)	56,454 (32.7)	28,205 (44.4)
Physical activity			
Walking PA (min.day ⁻¹)*	56.6 (77.2)	54.3 (75.2)	49.9 (71.4)
Moderate PA (min.day ⁻¹)*	48.1 (72.2)	46.5 (68.0)	42.8 (63.9)
Vigorous PA (min.day ⁻¹)*	21.3 (32.6)	20.6 (32.0)	21.9 (36.2)
Total PA (MET-hour.week ⁻¹)*	48.6 (64.4)	45.5 (62.2)	40.7 (61.1)
Physically active individuals, n (%)*	41,939 (58.7)	96,520 (55.9)	31,503 (49.6)
Objective total PA (milli-gravity.day ⁻¹)	30.2 (8.7)	27.8 (7.9)	25.7 (7.7)
Fitness (METs)	9.3 (3.5)	8.9 (3.4)	8.6 (3.5)
Walking pace, n (%)			
Slow	3,356 (4.7)	10,931 (6.3)	7,388 (11.6)
Middle	33,033 (46.2)	92,868 (56.8)	35,790 (56.3)
Brisk	35,045 (49.1)	68,963 (39.9)	20,391 (32.1)
Car commuters, n (%)	5,996 (22.8)	5,519 (8.2)	1,204 (4.7)
Public Transport commuters, n (%)	5,244 (20.5)	5,569 (8.3)	1,232 (4.8)
Walking commuters, n (%)	3,694 (15.4)	3,997 (6.1)	831 (3.3)
Cycling commuters, n (%)	2,066 (9.0)	1,332 (2.1)	325 (1.3)
Total Sedentary Behaviour (h.day ⁻¹)	2.6 (0.7)	4.9 (0.8)	8.4 (1.9)
TV viewing (h.day ⁻¹)	1.3 (0.8)	2.9 (1.1)	4.3 (1.9)
PC-screen time (h.day ⁻¹)	0.6 (0.6)	1.0 (0.8)	2.3 (2.0)
Plays Computer Games			
Never/Rarely	62,565 (87.6)	136,721 (79.2)	43,762 (68.9)
Sometimes	7,872 (11.0)	30,984 (17.9)	15,587 (24.5)
Often	970 (1.4)	5,013 (2.9)	4,191 (6.6)
Dietary intake			
Total energy intake (Kcal.day ⁻¹)	2,181 (634)	2,170 (635)	2,214 (686)
Protein intake (% of TE)	15.3 (3.3)	15.6 (3.5)	15.5 (3.7)
Carbohydrate intake (% of TE)	47.7 (7.9)	47.1 (7.8)	46.7 (8.1)
Total Fat intake (% of TE)	31.9 (6.5)	32.0 (6.5)	32.3 (6.7)

Saturated intake (% of TE)	12.3 (3.3)	12.3 (3.2)	12.6 (3.4)
Polyunsaturated fat intake (% of TE)	5.8 (2.2)	5.9 (2.2)	5.9 (2.2)
Sugar intake (% of TE)	22.9 (6.7)	22.5 (6.7)	22.0 (7.0)
Starch intake (g.day ⁻¹)	22.8 (6.7)	22.8 (6.0)	22.8 (6.2)
Alcohol intake (% of TE)	5.0 (6.2)	5.3 (6.4)	5.5 (7.0)
Red meat (portion.day ⁻¹)	1.8 (1.3)	2.0 (1.3)	2.1 (1.5)
Processed meat (portion.day ⁻¹)	1.7 (1.3)	1.9 (1.0)	2.1 (1.0)
Fruit and vegetable (portion.day ⁻¹)	4.3 (2.3)	4.0 (2.2)	3.8 (2.3)
Health status, n (%)			
Diabetes history			
Yes	2,037 (2.9)	7,517 (4.4)	4,775 (7.5)
No	69,292 (97.1)	164,937 (95.6)	58,605 (92.5)
Hypertension history	13,260 (18.6)	39,527 (22.9)	17,266 (27.2)
Cancer history			
Yes	5,084 (7.1)	3,688 (7.9)	5,004 (7.9)
No	66,194 (92.9)	158,664 (92.1)	58,379 (92.1)
CVDs			
Yes	16,773 (23.5)	50,780 (29.4)	23,074 (36.3)
No	54,661 (76.5)	121,981 (70.6)	40,495 (63.7)

Data presented as mean and SD for continuous variables and as n and % for categorical variables. CVD: cardiovascular diseases; TE: total energy intake; MET: metabolic equivalent task.

Table S10. Cohort Characteristics by categories of how often play computer games

	Never/rarely	Sometimes	often
Socio-demographics			
Total n	243,048	54,443	10,174
Women, n (%)	131,805 (54.2)	26,941 (49.5)	5,104 (50.2)
Age (years)	57.2 (7.9)	55.5 (8.3)	56.4 (8.3)
Deprivation index Tertile			
Lower	89,668 (36.9)	19,112 (35.1)	3,439 (33.8)
Middle	84,368 (34.7)	18,649 (34.3)	3,263 (32.1)
Higher	69,012 (28.4)	16,682 (30.6)	3,472 (34.1)
Education			
CSEs	41,614 (19.5)	7,578 (16.0)	1,486 (16.7)
O-levels	12,416 (5.8)	3,605 (7.6)	585 (6.5)
A-levels	52,687 (24.7)	13,284 (28.1)	2,400 (26.9)
College/University Degree	27,138 (12.8)	6,720 (14.2)	1,369 (15.4)
None of the above	79,233 (37.2)	16,148 (34.1)	3,070 (34.5)
Smoking status, n (%)			
Never	136,884 (56.3)	27,992 (51.4)	4,626 (45.5)
Previous	84,233 (34.7)	20,223 (37.2)	3,963 (39.0)
Current	21,931 (9.0)	6,228 (11.4)	1,585 (15.5)
Obesity-related markers			
Height (cm)	1.69 (9.2)	1.70 (9.4)	1.70 (9.6)
Weight (kg)	77.3 (15.4)	82.0 (16.3)	83.9 (17.0)
BMI (kg.m ⁻²)	27.0 (4.60)	28.4 (5.0)	29.1 (5.3)
BMI Categories, n (%)			
Underweight (<18.5)	1,300 (0.5)	141 (0.2)	26 (0.3)
Normal weight (18.5-24.9)	85,272 (35.1)	13,464 (24.7)	2,165 (21.3)
Overweight (25.0 to 29.9)	104,030 (42.8)	23,880 (43.9)	4,287 (42.1)
Obese (≥30.0)	52,446 (21.6)	16,958 (31.2)	3,96 (36.3)
Waist Circumference (cm)	89.4 (13.2)	93.1 (13.4)	95.2 (13.5)
Central Obesity, n (%)			
Yes	168,281 (69.2)	32,365 (59.5)	5,381 (52.9)
No	74,727 (30.8)	22,071 (40.5)	4,791 (47.1)
Physical activity			
Walking PA (min.day ⁻¹)*	54.5 (75.3)	52.5 (74.0)	48.5 (70.5)
Moderate PA (min.day ⁻¹)*	47.5 (69.6)	41.1 (62.5)	40.4 (63.7)
Vigorous PA (min.day ⁻¹)*	21.2 (33.3)	20.0 (30.8)	20.5 (36.9)
Total PA (MET-hour.week ⁻¹)*	46.4 (63.4)	41.6 (59.0)	38.1 (60.0)
Physically active individuals, n (%)*	136,891 (56.3)	28,295 (52.0)	4,729 (46.5)
Objective total PA (milli-gravity.day ⁻¹)	28.5 (8.2)	26.7 (8.0)	25.0 (7.6)
Fitness (METs)	9.0 (3.5)	8.8 (3.4)	8.4 (3.4)
Walking pace, n (%)			
Slow	16,353 (6.7)	4,205 (7.7)	1,102 (10.8)
Middle	126,318 (52.0)	29,839 (54.8)	5,472 (53.8)
Brisk	100,377 (41.3)	20,399 (37.5)	3,600 (35.4)
Car commuters, n (%)	10,306 (11.2)	2,069 (9.0)	340 (9.4)
Public Transport commuters, n (%)	9,536 (10.4)	2,131 (9.3)	376 (10.3)
Walking commuters, n (%)	6,880 (7.7)	1,404 (6.3)	237 (6.8)
Cycling commuters, n (%)	3,019 (3.6)	565 (2.6)	76 (2.3)
Total Sedentary Behaviour (h.day ⁻¹)	4.9 (2.2)	5.7 (2.3)	6.4 (2.6)
TV viewing (h.day ⁻¹)	2.7 (1.6)	2.9 (1.6)	3.1 (1.8)
PC-screen time (h.day ⁻¹)	1.0 (1.2)	1.5 (1.3)	2.2 (1.6)
Dietary intake			
Total energy intake (Kcal.day ⁻¹)	1,180 (641)	2,186 (662)	2,196 (654)
Protein intake (% of TE)	15.5 (3.5)	15.5 (3.5)	15.4 (3.6)
Carbohydrate intake (% of TE)	47.2 (7.9)	47.2 (7.8)	46.6 (7.9)
Total Fat intake (% of TE)	32.0 (6.6)	32.3 (6.5)	32.7 (6.6)
Saturated intake (% of TE)	12.3 (3.3)	12.5 (3.2)	12.8 (3.3)
Polyunsaturated fat intake (% of TE)	5.9 (2.2)	5.9 (2.2)	5.9 (2.2)
Sugar intake (% of TE)	22.6 (6.8)	22.3 (6.8)	22.0 (6.9)
Starch intake (g.day ⁻¹)	22.8 (6.0)	23.0 (6.0)	22.7 (6.0)

Alcohol intake (% of TE)	5.3 (6.5)	5.1 (6.4)	5.3 (6.8)
Red meat (portion.day ⁻¹)	1.9 (1.4)	2.0 (1.4)	2.1 (1.5)
Processed meat (portion.day ⁻¹)	1.9 (1.0)	2.0 (1.0)	2.1 (1.1)
Fruit and vegetable (portion.day ⁻¹)	4.1 (2.3)	3.8 (2.2)	3.6 (2.3)
Health status, n (%)			
Diabetes history			
Yes	10,574 (4.4)	3,062 (5.6)	691 (6.8)
No	232,029 (95.6)	51,264 (94.4)	9,460 (93.2)
Hypertension history	54,452 (22.4)	12,951 (23.8)	2,630 (25.9)
Cancer history			
Yes	18,975 (7.8)	3,981 (7.3)	814 (8.0)
No	223,515 (92.2)	50,314 (92.7)	9,330 (92.0)
CVDs			
Yes	70,510 (29.0)	16,679 (30.6)	3,394 (33.4)
No	172,538 (71.0)	37,764 (69.4)	6,780 (66.6)

Data presented as mean and SD for continuous variables and as n and % for categorical variables. CVD: cardiovascular diseases; TE: total energy intake; MET: metabolic equivalent task.

Table S11. Cohort Characteristics by tertiles of TV-viewing

	Lower	Middle	Higher
Socio-demographics			
Total n	60,868	157,028	89,869
Women, n (%)	32,915 (54.1)	82,986 (52.8)	47,996 (53.4)
Age (years)	54.6 (8.0)	56.4 (8.0)	59.1 (7.4)
Deprivation index Tertile			
Lower	22,523 (37.0)	60,593 (38.6)	29,122 (32.4)
Middle	20,955 (34.4)	55,138 (35.1)	30,206 (33.6)
Higher	17,390 (28.6)	41,297 (26.3)	30,541 (34.0)
Education			
CSEs	3,542 (6.3)	20,242 (14.8)	26,948 (35.1)
O-levels	1,940 (3.5)	8,781 (6.3)	5,887 (7.6)
A-levels	9,653 (17.4)	36,713 (26.8)	22,017 (28.7)
College/University Degree	7,698 (13.9)	19,553 (14.3)	7,982 (10.4)
None of the above	32,669 (58.9)	51,849 (37.8)	13,937 (18.2)
Smoking status, n (%)			
Never	37,271 (61.2)	88,760 (56.5)	43,519 (48.4)
Previous	18,878 (31.0)	54,507 (34.7)	35,067 (39.0)
Current	4,719 (7.8)	13,761 (8.8)	11,283 (12.6)
Obesity-related markers			
Height (cm)	1.70 (9.1)	1.69 (9.2)	1.68 (9.2)
Weight (kg)	75.0 (14.7)	78.2 (15.4)	80.8 (16.6)
BMI (kg.m ⁻²)	25.8 (4.2)	27.2 (4.5)	28.6 (5.0)
BMI Categories, n (%)			
Underweight (<18.5)	482 (0.8)	675 (0.4)	313 (0.4)
Normal weight (18.5-24.9)	28,191 (46.3)	51,944 (33.1)	20,794 (23.1)
Overweight (25.0 to 29.9)	23,573 (38.7)	69,238 (44.1)	39,428 (43.9)
Obese (≥30.0)	8,622 (14.2)	35,171 (22.4)	29,334 (32.6)
Waist Circumference (cm)	86.4 (12.6)	56.6 (13.0)	93.4 (13.7)
Central Obesity, n (%)			
Yes	47,809 (78.6)	107,692 (68.6)	50,590 (56.3)
No	13,052 (21.4)	49,319 (31.4)	32,254 (43.7)
Physical activity			
Walking PA (min.day ⁻¹)*	49.8 (70.2)	55.0 (76.0)	55.1 (76.2)
Moderate PA (min.day ⁻¹)*	42.6 (66.2)	46.6 (69.1)	48.2 (68.1)
Vigorous PA (min.day ⁻¹)*	20.0 (29.7)	20.9 (32.7)	22.2 (36.4)
Total PA (MET-hour.week ⁻¹)*	45.4 (59.9)	46.6 (63.5)	42.7 (62.5)
Physically active individuals, n (%)*	36,348 (59.7)	88,808 (56.6)	44,806 (49.9)
Objective total PA (milli-gravity.day ⁻¹)	30.0 (8.7)	28.0 (8.0)	25.6 (7.5)
Fitness (METs)	9.9 (3.5)	9.1 (9.4)	7.9 (3.4)
Walking pace, n (%)			
Slow	2,178 (3.6)	8,167 (5.2)	11,330 (12.6)
Middle	26,254 (43.1)	82,734 (52.7)	52,703 (58.6)
Brisk	32,436 (53.3)	66,127 (42.1)	25,836 (28.8)
Car commuters, n (%)	3,805 (14.0)	6,331 (9.4)	2,583 (10.5)
Public Transport commuters, n (%)	2,918 (11.1)	6,492 (9.7)	2,635 (10.7)
Walking commuters, n (%)	1,998 (7.9)	4,435 (6.8)	2,089 (8.7)
Cycling commuters, n (%)	1,574 (6.3)	1,668 (2.7)	421 (1.9)
Total Sedentary Behaviour (h.day ⁻¹)	3.2 (1.8)	4.8 (1.8)	6.8 (2.0)
TV viewing (h.day ⁻¹)	0.7 (0.4)	2.5 (0.5)	4.7 (1.2)
PC-screen time (h.day ⁻¹)	1.3 (1.4)	1.2 (1.2)	1.0 (1.2)
Plays Computer Games			
Never/Rarely	50,626 (83.2)	123,590 (78.7)	68,832 (76.7)
Sometimes	8,470 (13.9)	28,707 (18.3)	17,266 (19.2)
Often	1,764 (2.9)	4,696 (3.0)	3,714 (4.1)
Dietary intake			
Total energy intake (Kcal.day ⁻¹)	2,215 (644)	2,173 (635)	2,168 (671)
Protein intake (% of TE)	15.2 (3.3)	15.5 (3.4)	15.6 (3.7)
Carbohydrate intake (% of TE)	47.4 (7.8)	47.1 (7.9)	47.0 (8.0)
Total Fat intake (% of TE)	32.0 (6.5)	32.0 (6.6)	32.2 (6.7)

Saturated intake (% of TE)	12.3(3.3)	12.3 (3.2)	12.5 (3.3)
Polyunsaturated fat intake (% of TE)	5.7 (2.1)	5.9 (2.2)	6.0 (2.3)
Sugar intake (% of TE)	22.6 (6.6)	22.5 (6.7)	22.3 (7.1)
Starch intake (g.day ⁻¹)	22.7 (5.9)	22.8 (6.0)	22.9 (6.2)
Alcohol intake (% of TE)	5.4 (6.3)	5.3 (6.4)	5.1 (6.8)
Red meat (portion.day ⁻¹)	1.8 (1.3)	1.9 (1.3)	2.1 (1.4)
Processed meat (portion.day ⁻¹)	1.7 (1.1)	1.9 (1.0)	2.0 (1.0)
Fruit and vegetable (portion.day ⁻¹)	4.3 (2.3)	4.1 (2.2)	3.8 (2.3)
Health status, n (%)			
Diabetes history			
Yes	1,616 (2.7)	6,198 (4.0)	6,515 (7.3)
No	59,193 (97.3)	150,567 (96.0)	83,074 (92.7)
Hypertension history	10,022 (16.5)	34,596 (22.0)	25,435 (28.3)
Cancer history			
Yes	4,014 (6.6)	11,692 (7.5)	8,070 (9.0)
No	56,752 (93.4)	144,999 (92.5)	81,486 (91.0)
CVDs			
Yes	12,516 (20.6)	43,743 (27.9)	34,368 (38.2)
No	48,352 (79.4)	113,285 (72.1)	55,500 (61.8)

Data presented as mean and SD for continuous variables and as n and % for categorical variables. CVD: cardiovascular diseases; TE: total energy intake; MET: metabolic equivalent task.

Table S12. Correlation matrix between exposures and genetic profile risk score for BMI.

Exposures	Self-reported PA	Walking PA	Moderate PA	Vigorous PA	Objective PA	Fitness	MVPA	Overall Sedentary behaviours	TV-viewing	PC-screen	BMI
Self-reported total PA (SR)	1										
Walking PA (SR)	0.8207**	1									
Moderate PA (SR)	0.7364**	0.4329**	1								
Vigorous PA (SR)	0.762**	0.4659**	0.3182**	1							
Objective total PA	0.177*	0.0881**	0.1377*	0.1283*	1						
Fitness	0.1099*	0.0068	0.0729	0.0261	0.2585	1					
MVPA (SR)	0.9165**	0.4362**	0.8602**	0.8302**	0.1632*	0.1166*	1				
Overall Sedentary behaviours	-0.0371	-0.0333	0.008	-0.04	-0.1829*	-0.0464	-0.0273	1			
TV-viewing	-0.0384	0.0148	0.0231	0.0072	-0.1985*	-0.2086**	-0.0412	0.6408**	1		
PC-screen	-0.0663	-0.0868*	-0.0462	-0.0843*	-0.103*	0.0628	-0.0500	0.5349**	-0.0609	1	
BMI	-0.1686*	-0.1304*	-0.1104*	-0.1279*	-0.2689**	-0.2783**	0.2022**	0.2082**	0.2134**	0.0529	1
GPRS-BMI	0.0002	0.0004	0.0053	0.0022	-0.0097	-0.0249	0.0003	0.0178	0.0168	0.0039	0.1233*

Pearson correlation coefficient. P-values at *<0.01, **<0.0001

Table S13. Association of the genetic profile risk score with body mass index, overweight and obesity.

Models	N	BMI (kg.m ⁻²)*		BMI ≥25 [‡]		BMI ≥30 [‡]	
		Beta (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value
Model 1	310,652	0.54 (0.53; 0.56)	2.1x10 ⁻²⁴¹	1.18 (1.16; 1.19)	1.9x10 ⁻²⁸¹	1.30 (1.28; 1.31)	1.7x10 ⁻²⁵³
Model 2	229,871	0.51 (0.49; 0.53)	4.3x10 ⁻²⁰⁷	1.17 (1.16; 1.18)	2.0x10 ⁻¹⁹³	1.29 (1.28; 1.31)	1.5x10 ⁻¹⁹¹

Data presented as beta coefficients (*) or odds ratio (OR) (‡) and the corresponding 95%CI. *The beta coefficient indicates the change in BMI per SD increase in GPRS. ‡ The OR indicates the odds ratio for extra risk of being overweight (BMI ≥25.0) or obese (BMI ≥30.0) per SD increase in GPRS. Analyses for model 1 were adjusted for age, sex, deprivation, education qualifications, recruitment center, month of recruitment, the first 10 principal components of ancestry and genotyping batch, smoking status, dietary intake (alcohol, fruit & vegetable, red meat, processed meat, cereals, bread and cheese), sleep duration, physical activity, sedentary behaviours and comorbidities (diabetes, hypertension, cardiovascular diseases and cancer). Analyses for model 2 was adjusted for model 1 but participants with CVD, cancer, diabetes hypertension and major illness were excluded from the analyses.

Table S14. Association between genetic profile risk score and BMI by self-reported and objectively measured physical activity and fitness.

Physical activity-related exposures	n	Tertile / categories						β-interaction between GRPS and -PA-related exposures (95% CI)	P _(interaction)
		Lower		Middle		Higher			
		β (95% CI)	p-value	β (95% CI)	p-value	β (95% CI)	p-value		
Total PA (SR)	310,652	0.66 (0.63; 0.70)	6.6x10 ⁻²⁰⁷	0.50 (0.47; 0.52)	4.9x10 ⁻²⁶¹	0.45 (0.43; 0.48)	1.0x10 ⁻²⁹⁶	-0.11 (-0.13; -0.09)	6.6x10 ⁻³¹
Walking PA (SR)	267,867	0.57 (0.54; 0.60)	5.7x10 ⁻²³⁹	0.47 (0.45; 0.50)	7.4x10 ⁻²⁴⁶	0.48 (0.45; 0.51)	4.7x10 ⁻²⁵⁷	-0.05 (-0.07; -0.03)	1.0x10 ⁻⁰⁶
Moderate PA (SR)	233,611	0.53 (0.50; 0.56)	1.2x10 ⁻²⁶⁵	0.48 (0.45; 0.51)	2.3x10 ⁻²⁰⁴	0.47 (0.44; 0.50)	8.5x10 ⁻²³¹	-0.03 (-0.05; -0.10)	0.004
Vigorous PA (SR)	171,504	0.52 (0.49; 0.56)	3.1x10 ⁻¹⁹⁵	0.44 (0.40; 0.47)	2.1x10 ⁻¹⁵³	0.42 (0.39; 0.45)	2.9x10 ⁻¹⁴²	-0.06 (-0.08; -0.03)	3.6x10 ⁻⁰⁶
MVPA (SR)	310,652	0.65 (0.62; 0.68)	2.4x10 ⁻³⁰⁸	0.51 (0.48; 0.54)	2.9x10 ⁻²³⁷	0.44 (0.41; 0.46)	1.9x10 ⁻²⁶⁹	-0.12 (-0.13; -0.9)	4.4x10 ⁻³²
Objective Total PA*	62,756	0.58 (0.52; 0.65)	1.3x10 ⁻⁷⁰	0.50 (0.44; 0.55)	7.4x10 ⁻⁷⁴	0.33 (0.28; 0.38)	6.4x10 ⁻⁴¹	-0.13 (-0.17; -0.09)	3.3x10 ⁻¹¹
Fitness	44,469	0.72 (0.60; 0.84)	3.7x10 ⁻³²	0.48 (0.41; 0.54)	4.8 x10 ⁻⁴⁹	0.36 (0.32; 0.41)	4.5x10 ⁻⁴⁹	-0.18 (-0.23; -0.13)	1.4x10 ⁻¹¹
Walking pace [‡]	309,406	0.91 (0.83; 0.99)	1.5x10 ⁻¹⁰³	0.54 (0.52; 0.56)	5.3x10 ⁻²⁵⁰	0.38 (0.36; 0.40)	3.7x10 ⁻²⁶⁹	-0.23 (-0.26; -0.21)	5.7x10 ⁻⁷⁶

Data presented as beta coefficients (95%CI). The beta coefficient indicates the change in BMI per SD increase in the genetic profile risk score by levels of physical activity (self-reported or objectively-measured PA), cardiorespiratory fitness and walking pace. The p-value for the interaction between GPRS-obesity and the exposure of interest is presented as P-interaction. Analyses were adjusted for age, sex, deprivation, education qualifications, recruitment center, month of recruitment, the first 10 principal components of ancestry and genotyping batch, smoking status, dietary intake (alcohol, fruit & vegetable, red meat, processed meat, cereals, bread and cheese), sleep duration, overall sedentary behaviour and comorbidities (diabetes, hypertension, cardiovascular diseases and cancer). *Analyses performed for objectively measured PA were additionally adjusted for season and wearing time. ‡Walking pace was categorised as slow, average and brisk walking pace, respectively.

*Objectively measured physical activity; SR: self-reported; PA: physical activity; BMI: body mass index; MVPA: moderate-to-vigorous physical activity.

Table S15. Association between genetic profile risk score and BMI by discretionary sedentary-related behaviours.

Sedentary-related behaviours	n	Categories of sedentary-related behaviours						β -interaction between GRPS and sedentary behaviours (95% CI)	P _(interaction)
		Lower		Middle		Higher			
		β (95% CI)	p-value	β (95% CI)	p-value	β (95% CI)	p-value		
Sedentary behaviour	310,652	0.48 (0.44; 0.50)	1.1x10 ⁻²⁰⁵	0.52 (0.50; 0.54)	5.2x10 ⁻²¹⁷	0.64 (0.60; 0.68)	3.4x10 ⁻²⁴⁵	0.08 (0.06; 0.10)	9.1x10 ⁻¹²
TV-viewing	309,323	0.47 (0.44; 0.50)	2.2x10 ⁻¹⁸⁶	0.52 (0.50; 0.54)	5.2x10 ⁻²⁰¹	0.62 (0.59; 0.65)	6.1x10 ⁻²³⁴	0.08 (0.05; 0.10)	1.7x10 ⁻¹¹
PC-screen	309,319	0.54 (0.53; 0.56)	5.4x10 ⁻¹⁴²	0.54 (0.46; 0.63)	2.6x10 ⁻³⁹	0.82 (0.63; 1.02)	6.0x10 ⁻¹⁷	0.08 (0.03; 0.14)	0.0004
Playing computer games*	310,897	0.52 (0.51; 0.54)	5.2x10 ⁻¹⁶³	0.61 (0.57; 0.65)	5.7x10 ⁻¹⁹⁹	0.69 (0.59; 0.79)	7.1x10 ⁻⁴²	0.10 (0.07; 0.13)	8.9x10 ⁻¹⁰

Data presented as beta coefficients (95%CI). The beta coefficient indicates the change in BMI per SD increase in the genetic profile risk score by levels of self-reported discretionary sedentary-related behaviours. The p-value for the interaction between GPRS and the exposure of interest is presented as P-interaction. Analyses were adjusted for age, sex, deprivation, education qualifications, recruitment center, month of recruitment, the first 10 principal components of ancestry and genotyping batch, smoking status, dietary intake (alcohol, fruit & vegetable, red meat, processed meat, cereals, bread and cheese), sleep duration, self-reported physical activity and comorbidities (diabetes, hypertension, cardiovascular diseases and cancer). Analyses performed for objectively measured PA were additionally adjusted for season and wearing time. *Playing computer games was categorised as never/rarely, sometimes and often.

Table S16. Association between genetic profile risk score and BMI by commuting mode.

Commuting mode	n	Car commuters only		Other types of commuters		β -interaction between GRPS and commuting mode (95% CI)	P _(interaction)
		β (95% CI)	p-value	β (95% CI)	p-value		
Car vs Public transport	118,584	0.56 (0.54; 0.59)	7.0x10 ⁻⁴⁷	0.54 (0.46; 0.63)	4.5x10 ⁻³⁷	-0.021 (-0.10; 0.06)	0.611
Car vs Walking only	115,060	0.57 (0.54; 0.59)	7.0x10 ⁻⁴⁷	0.52 (0.43; 0.61)	7.9x10 ⁻²⁸	-0.044 (-0.14; 0.05)	0.369
Car vs Cycling only	110,148	0.52 (0.51; 0.54)	7.0x10 ⁻⁴⁷	0.48 (0.37; 0.59)	2.4x10 ⁻¹⁸	-0.079 (-0.22; 0.06)	0.273
Car vs Active commuters (walking or cycling)	119,273	0.56 (0.54; 0.59)	7.0x10 ⁻⁴⁷	0.49 (0.42; 0.56)	1.6x10 ⁻⁴²	-0.068 (-0.14; 0.12)	0.096

Data presented as beta coefficients (95%CI). The beta coefficient indicates the change in BMI per SD increase in the genetic profile risk score by levels of commuting mode. The p-value for the interaction between GPRS and the exposure of interest is presented as P-interaction. Analyses were adjusted for age, sex, deprivation, education qualifications, recruitment center, month of recruitment, the first 10 principal components of ancestry and genotyping batch, smoking status, dietary intake (alcohol, fruit & vegetable, red meat, processed meat, cereals, bread and cheese), sleep duration, overall sedentary behaviour and comorbidities (diabetes, hypertension, cardiovascular diseases and cancer). Car commuters were used as our reference groups for all analyses.