**Appendix A Sample information**

**Table A.1** Correlation matrix of the mediators and the outcomes in the main model (*n* = 21,097). Upper diagonal: Pearson correlation coefficients, lower diagonal: p-values.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Generalhealth | Mentalhealth | Watersports | On-landoutdoor PA | Indoor/otherPA |
| General health (mean = 3.99, SD = .93) |  | .380 | .029 | .193 | .181 |
| Mental health (mean = 10.61, SD = 2.64) | <.001 |  | .017 | .082 | .068 |
| Watersports (mean = .11, SD=1.84) | <.001 | .016 |  | .031 | .019 |
| On-land outdoor PA (mean = 14.88, SD = 25.81) | <.001 | <.001 | <.001 |  | .174 |
| Indoor/other PA (mean = 7.41, SD = 17.46) | <.001 | <.001 | .007 | <.001 |  |

**Figure A.1** Histograms of the outcomes (*n* = 21,097)



**Figure A.2** Histograms of the PA mediators (*n* = 21,097)



**Appendix B Table B.1:** Estimates and standard errors (s.e.) of Model 1 (*n =* 21,097). χ² (robust) = .059, df = 6, *p =* 1.000; CFI = 1.00; TLI = 1.06; RMSEA < .001; SRMR = .001. Error covariances: general and mental health .454, watersports and on-land outdoor PA 1.453, watersports and indoor/other PA .391, and on-land outdoor PA and indoor/other PA 59.916.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | General health (36.2%) | Mental health (12.2%) | Watersports (.3%) | On-land outdoor PA (5.2%) | Indoor/other PA (6.8%) |
| Explanatory variable | est. | s.e. | p | est. | s.e. | p | est. | s.e. | p | est. | s.e. | p | est. | s.e. | p |
| Coastal proximity >50km vs 20-50km | **.044** | .015 | .002 | .005 | .046 | .918 | -.008 | .034 | .808 | **1.744** | .516 | .001 |  |  |  |
| 5-20km | .014 | .017 | .415 | **.124** | .052 | .017 | .027 | .049 | .589 | **1.466** | .663 | .027 |  |  |  |
| <5km | .028 | .017 | .105 | **.145** | .056 | .010 | **.121** | .048 | .012 | **2.625** | .650 | .000 |  |  |  |
| Freshwater presence\* | .006 | .015 | .674 | **.133** | .051 | .009 | -.007 | .045 | .884 | -.096 | .569 | .866 |  |  |  |
| Green space % (1-5) | .003 | .005 | .626 | -.012 | .016 | .467 | na | na | na | .134 | .195 | .492 |  |  |  |
| Rural (vs. urban) | **.039** | .018 | .031 | .099 | .056 | .076 | .047 | .052 | .368 | .370 | .683 | .588 | .251 | .372 | .500 |
| QIMD, 1st quintile vs 2nd | **-.036** | .017 | .036 | -.023 | .051 | .652 | -.046 | .058 | .424 | -.424 | .647 | .512 | -.552 | .465 | .235 |
| 3rd | **-.084** | .018 | .000 | **-.118** | .055 | .033 | -.037 | .058 | .523 | -.935 | .677 | .167 | **-1.345** | .490 | .006 |
| 4th | **-.110** | .019 | .000 | -.030 | .059 | .610 | -.070 | .053 | .187 | **-2.352** | .675 | .000 | **-2.171** | .487 | .000 |
| 5th | **-.190** | .021 | .000 | **-.244** | .068 | .000 | -.030 | .064 | .636 | **-3.109** | .776 | .000 | **-1.624** | .545 | .003 |
| Age | **-.026** | .004 | .000 | **.156** | .014 | .000 | -.006 | .010 | .546 | **-1.766** | .161 | .000 | **-1.734** | .113 | .000 |
| Sex\*\* | **-.041** | .010 | .000 | **.249** | .035 | .000 | **.105** | .028 | .000 | **5.570** | .394 | .000 | **1.953** | .263 | .000 |
| Equiv. income (in thousands) | **.002** | .000 | .000 | **.002** | .001 | .001 | .001 | .001 | .079 | **.019** | .009 | .035 | **.047** | .007 | .000 |
| Income missing\* | **.036** | .017 | .038 | **.187** | .054 | .001 | .090 | .047 | .057 | .411 | .645 | .524 | **1.883** | .439 | .000 |
| Education: NVQ1 etc. | -.016 | .029 | .567 | -.079 | .096 | .408 | -.010 | .045 | .825 | .991 | 1.246 | .426 | 1.359 | .802 | .090 |
| NVQ2 etc. | **.128** | .018 | .000 | -.067 | .059 | .250 | -.007 | .031 | .824 | **1.767** | .611 | .004 | **1.002** | .367 | .006 |
| NVQ3 etc.  | **.160** | .020 | .000 | -.013 | .064 | .836 | .057 | .048 | .230 | **3.308** | .740 | .000 | **2.228** | .475 | .000 |
| Higher ed. below degree | **.137** | .021 | .000 | -.134 | .069 | .052 | .083 | .065 | .207 | **2.435** | .771 | .002 | **2.728** | .504 | .000 |
| NVQ4/NVQ5 etc. | **.227** | .019 | .000 | **-.231** | .061 | .000 | **.094** | .039 | .017 | **4.720** | .718 | .000 | **3.579** | .444 | .000 |
| Unemployed\* | **-.107** | .037 | .004 | **-.944** | .150 | .000 | -.056 | .032 | .080 | **5.370** | 1.613 | .001 | 1.349 | .999 | .177 |
| Other economically inactive\* | **-.137** | .014 | .000 | **-.380** | .045 | .000 | -.003 | .037 | .929 | **2.360** | .581 | .000 | **1.381** | .359 | .000 |
| Limiting illness\* | **-.991** | .016 | .000 | **-1.843** | .058 | .000 | -.026 | .025 | .296 | **-5.873** | .488 | .000 | **-2.888** | .267 | .000 |
| Marital status\*\*\* | -.006 | .013 | .616 | **.155** | .042 | .000 | -.045 | .036 | .203 | -.735 | .489 | .133 | **-1.988** | .334 | .000 |
| Children | **.018** | .007 | .016 | .018 | .024 | .450 | -.007 | .016 | .674 | .492 | .304 | .106 | -.253 | .191 | .186 |
| Infants | **.051** | .019 | .008 | .101 | .059 | .091 | **-.081** | .020 | .000 | **-3.887** | .564 | .000 | **-3.608** | .430 | .000 |
| Car availability\* | **.097** | .018 | .000 | **.214** | .061 | .000 | **.059** | .030 | .048 | **-2.130** | .673 | .002 | **1.286** | .404 | .001 |
| Survey year\*\*\*\* | **-.025** | .012 | .043 | **-.175** | .040 | .000 | -.030 | .032 | .350 | **1.063** | .490 | .030 | .025 | .323 | .939 |
| Watersports | **.006** | .002 | .017 | .011 | .006 | .069 |  |  |  |  |  |  |  |  |  |
| On-land outdoor PA | **.003** | .000 | .000 | **.004** | .001 | .000 |  |  |  |  |  |  |  |  |  |
| Indoor/other PA | **.004** | .000 | .000 | **.005** | .001 | .000 |  |  |  |  |  |  |  |  |  |

\*0=no/none, 1=yes

\*\*0=female, 1=male

\*\*\*0=other, 1=married, cohabitee or civil partnership

\*\*\*\*0=2008, 1=2012

**Appendix C** Results from Sensitivity model 1

**Table C.1:** Estimates and standard errors (s.e.) of Sensitivity Model 1, with on-land outdoor PA disaggregated into ‘walking’ and ‘other on-land outdoor PA’. (*n =* 21,097). χ² (robust) = .081, df = 6, *p =* 1.000; CFI = 1.00; TLI = 1.06; RMSEA < .001; SRMR = .001. Error covariances: general and mental health .454, watersports and walking .429, watersports and other on-land outdoor PA 1.029, watersports and indoor/other PA .397, walking and other on-land outdoor PA 14.044, walking and indoor/other PA 30.857, and other on-land outdoor PA and indoor/other PA 29.023.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Explanatory variable | General health (36.2%) | Mental health (12.2%) | Watersports (.3%) | Walking (1.9%) | Other on-land outdoor PA (7.6%) | Indoor/other PA (6.8%) |
| est. | s.e. | p | est. | s.e. | p | est. | s.e. | p | est. | s.e. | p | est. | s.e. | p | est. | s.e. | p |
| Coastal proximity >50km vs 20-50km | **.046** | .015 | .002 | .011 | .046 | .815 | -.007 | .034 | .832 | **1.582** | .433 | .000 | .181 | .284 | .526 |  |  |  |
| 5-20km | .017 | .017 | .336 | **.130** | .052 | .012 | .029 | .051 | .568 | **1.040** | .479 | .030 | .449 | .415 | .279 |  |  |  |
| <5km | .029 | .017 | .088 | **.150** | .056 | .007 | **.120** | .048 | .013 | **2.233** | .541 | .000 | .408 | .334 | .221 |  |  |  |
| Freshwater presence\* | .011 | .015 | .458 | **.145** | .050 | .004 | .003 | .039 | .937 | -.134 | .440 | .761 | .080 | .329 | .808 |  |  |  |
| Green space % (1-5) | .009 | .005 | .059 | .006 | .014 | .695 | na | na | na | .197 | .148 | .183 | -.001 | .092 | .989 |  |  |  |
| Rural (vs. urban) | .013 | .020 | .517 | .067 | .062 | .279 | -.071 | .061 | .249 | .845 | .552 | .125 | -.375 | .464 | .419 | .763 | .476 | .109 |
| QIMD, 1st quintile vs 2nd | **-.037** | .017 | .032 | -.027 | .052 | .607 | -.042 | .057 | .464 | .130 | .528 | .806 | -.582 | .353 | .099 | -.590 | .466 | .206 |
| 3rd | **-.086** | .018 | .000 | **-.123** | .055 | .026 | -.034 | .058 | .556 | .058 | .545 | .915 | **-1.041** | .384 | .007 | **-1.431** | .497 | .004 |
| 4th | **-.114** | .019 | .000 | -.040 | .059 | .498 | -.069 | .053 | .190 | **-1.155** | .535 | .031 | **-1.268** | .391 | .001 | **-2.306** | .488 | .000 |
| 5th | **-.195** | .021 | .000 | **-.256** | .068 | .000 | -.029 | .063 | .640 | **-1.383** | .622 | .026 | **-1.815** | .446 | .000 | **-1.797** | .546 | .001 |
| Age | **-.026** | .004 | .000 | **.158** | .014 | .000 | -.006 | .011 | .586 | **-.259** | .119 | .030 | **-1.505** | .104 | .000 | **-1.730** | .113 | .000 |
| Sex\*\* | **-.042** | .010 | .000 | **.240** | .035 | .000 | **.105** | .028 | .000 | .439 | .300 | .144 | **5.129** | .238 | .000 | **1.949** | .263 | .000 |
| Equiv. income (in thousands) | **.002** | .000 | .000 | **.002** | .001 | .001 | .001 | .001 | .071 | .007 | .007 | .327 | **.012** | .005 | .016 | **.047** | .007 | .000 |
| Income missing\* | **.036** | .017 | .038 | **.187** | .054 | .001 | .090 | .047 | .055 | .365 | .551 | .507 | .038 | .326 | .907 | **1.864** | .438 | .000 |
| Education: NVQ1 etc. | -.016 | .029 | .580 | -.076 | .096 | .428 | -.010 | .045 | .831 | 1.386 | .962 | .150 | -.385 | .733 | .599 | 1.379 | .801 | .085 |
| NVQ2 etc. | **.128** | .018 | .000 | -.066 | .059 | .263 | -.006 | .031 | .849 | **2.152** | .489 | .000 | -.389 | .343 | .257 | **.999** | .367 | .006 |
| NVQ3 etc.  | **.160** | .020 | .000 | -.011 | .064 | .860 | .058 | .048 | .223 | **3.060** | .556 | .000 | .244 | .471 | .604 | **2.220** | .475 | .000 |
| Higher ed. below degree | **.138** | .021 | .000 | -.128 | .069 | .063 | .084 | .066 | .204 | **3.002** | .602 | .000 | -.558 | .450 | .215 | **2.741** | .503 | .000 |
| NVQ4/NVQ5 etc. | **.228** | .019 | .000 | **-.228** | .061 | .000 | **.095** | .040 | .016 | **4.140** | .601 | .000 | .576 | .370 | .119 | **3.559** | .444 | .000 |
| Unemployed\* | **-.107** | .037 | .004 | **-.946** | .150 | .000 | -.055 | .032 | .083 | **3.948** | 1.101 | .000 | 1.410 | 1.086 | .194 | 1.332 | .998 | .182 |
| Other economically inactive\* | **-.137** | .014 | .000 | **-.380** | .045 | .000 | -.003 | .037 | .943 | **1.192** | .432 | .006 | **1.170** | .370 | .002 | **1.380** | .358 | .000 |
| Limiting illness\* | **-.991** | .016 | .000 | **-1.844** | .058 | .000 | -.027 | .025 | .287 | **-4.430** | .413 | .000 | **-1.439** | .234 | .000 | **-2.877** | .267 | .000 |
| Marital status\*\*\* | -.006 | .013 | .638 | **.158** | .043 | .000 | -.045 | .036 | .210 | .620 | .408 | .128 | **-1.352** | .251 | .000 | **-1.982** | .333 | .000 |
| Children | **.017** | .007 | .018 | .017 | .024 | .473 | -.006 | .016 | .694 | .251 | .254 | .324 | .238 | .155 | .124 | -.257 | .191 | .177 |
| Infants | **.051** | .019 | .009 | .102 | .059 | .086 | **-.081** | .020 | .000 | **-1.520** | .478 | .001 | **-2.371** | .274 | .000 | **-3.612** | .430 | .000 |
| Car availability\* | **.098** | .018 | .000 | **.215** | .061 | .000 | **.061** | .029 | .038 | **-1.941** | .557 | .000 | -.172 | .375 | .646 | **1.322** | .403 | .001 |
| Survey year\*\*\*\* | **-.025** | .012 | .044 | **-.175** | .040 | .000 | -.030 | .032 | .344 | .357 | .388 | .357 | **.713** | .281 | .011 | .039 | .323 | .903 |
| Watersports | **.006** | .002 | .016 | .011 | .006 | .070 |  |  |  |  |  |  |  |  |  |  |  |  |
| Walking | **.003** | .000 | .000 | **.004** | .001 | .000 |  |  |  |  |  |  |  |  |  |  |  |  |
| Other on-land outdoor PA | **.003** | .000 | .000 | **.006** | .001 | .000 |  |  |  |  |  |  |  |  |  |  |  |  |
| Indoor/other PA | **.004** | .000 | .000 | **.005** | .001 | .000 |  |  |  |  |  |  |  |  |  |  |  |  |

 |  |  |  |  |  |  |

\*0=no/none, 1=yes

\*\*0=female, 1=male

\*\*\*0=other, 1=married, cohabitee or civil partnership

\*\*\*\*0=2008, 1=2012

**Table C.2:** Total, direct, and indirect effects (estimates and 95% CIs) from blue/green space indicators to general and mental health via watersports, walking, and other on-land outdoor PA (ie running, cycling, football/rugby) in Sensitivity model 1. In bold: *p <* .05. If the estimate is |<.001|, no CI shown for clarity.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Env. Indicator | Health outcome | Total effect | Direct effect | Indirect effects via |
| Watersports | Walking | Other on-land outdoor PA |
| Coastal proximity (20-50km vs >50km) | General | **.051 [.023;.080]** | **.046 [.018;.075]** | |<.001| | **.005 [.002;.007]** | .001 [-.001;.002] |
| Mental | .017 [-.073;.108] | .011 [-.079;.101] | |<.001| | **.006 [.002;.009]** | .001 [-.002;.004] |
|  |  |  |  |  |  |  |
| Coastal proximity(5-20km vs >50km) | General | .021 [-.013;.055] | .017 [-.017;.050] | |<.001| | **.003 [|<.001|;.006]** | .001 [-.001;.004] |
| Mental | **.137 [.035;.239]** | **.130 [.029;.232]** | |<.001| | .004 [|<.001|;.008] | .003 [-.002;.008] |
|  |  |  |  |  |  |  |
| Coastal proximity(0-5km vs >50km) | General | **.038 [.004;.071]** | .029 [-.004;.062] | .001 [|<.001|;.001] | **.007 [.003;.010]** | .001 [-.001;.003] |
| Mental | **.162 [.052;.272]** | **.150 [.040;.260]** | .001 [|<.001|;.003] | **.008 [.003;.013]** | .002 [-.002;.007] |
|  |  |  |  |  |  |  |
| Freshwater presence | General | .011 [-.019;.041] | .011 [-.019;.041] | |<.001| | |<.001| | |<.001| |
| Mental | **.145 [.047;.243]** | **.145 [.047;.243]** | |<.001| | |<.001| | |<.001| |
|  |  |  |  |  |  |  |
| Greenspace density | General | **.009 [|<.001|;.018]** | .009 [|<.001|;.018] | na | .001 [|<.001|;.001] | |<.001| |
| Mental | .006 [-.022;.035] | .006 [-.023;.034] | na | .001 [|<.001|;.002] | |<.001| |



**Figure C.1.** Unstandardised estimates and the 95% CIs (*n* = 21,097) in Sensitivity model 1, adjusted for all covariates (Table C.1). All PA variables are measured in MET hours/week. Error covariances between the mediators and the outcomes not shown for readability. Bold typeface indicates statistical significance.

**Appendix D Table D.1:**  Estimates and standard errors (s.e.) of Sensitivity model 2a (excluding all respondents with missing income). *n =* 17,195. χ² (robust) = .064, df = 6, *p =* 1.000; CFI = 1.00; TLI = 1.06; RMSEA < .001; SRMR = .001.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Explanatory variable | General health (36.0%) | Mental health (12.5%) | Watersports (.4%) | On-land outdoor PA (5.1%) | Indoot/other PA (6.6%) |
| est. | s.e. | p | est. | s.e. | p | est. | s.e. | p | est. | s.e. | p | est. | s.e. | p |
| Coastal proximity >50km vs 20-50km | **.047** | .016 | .003 | -.004 | .051 | .945 | -.021 | .035 | .540 | **1.753** | .581 | .003 |  |  |  |
| 5-20km | .028 | .019 | .139 | .092 | .057 | .107 | .047 | .060 | .428 | **1.544** | .737 | .036 |  |  |  |
| <5km | .033 | .018 | .076 | **.133** | .062 | .032 | .090 | .046 | .053 | **2.660** | .692 | .000 |  |  |  |
| Freshwater presence\* | .004 | .017 | .817 | **.143** | .055 | .009 | .010 | .038 | .784 | -.180 | .613 | .769 |  |  |  |
| Green space % (1-5) | **.014** | .005 | .006 | .011 | .016 | .482 | na | na | na | .155 | .187 | .407 |  |  |  |
| Rural (vs. urban) | **.045** | .022 | .043 | .076 | .068 | .265 | -.036 | .047 | .438 | -.068 | .838 | .935 | .478 | .533 | .369 |
| QIMD, 1st quintile vs 2nd | -.041 | .019 | .027 | -.038 | .057 | .503 | -.015 | .059 | .807 | -.464 | .725 | .523 | -.686 | .504 | .174 |
| 3rd | **-.080** | .019 | .000 | -.090 | .061 | .138 | -.013 | .060 | .824 | **-1.632** | .730 | .026 | **-1.286** | .544 | .018 |
| 4th | **-.102** | .021 | .000 | .006 | .065 | .925 | -.048 | .055 | .381 | **-2.532** | .754 | .001 | **-2.127** | .529 | .000 |
| 5th | **-.182** | .023 | .000 | **-.325** | .076 | .000 | -.030 | .060 | .613 | **-3.063** | .879 | .000 | **-1.635** | .601 | .007 |
| Age | **-.020** | .005 | .000 | **.159** | .016 | .000 | -.008 | .009 | .383 | **-1.678** | .184 | .000 | **-1.713** | .127 | .000 |
| Sex\*\* | **-.038** | .011 | .001 | **.279** | .039 | .000 | **.108** | .030 | .000 | **5.715** | .434 | .000 | **1.791** | .284 | .000 |
| Equiv. income (in thousands) | **.002** | .000 | .000 | **.002** | .001 | .001 | .001 | .001 | .073 | **.021** | .009 | .024 | **.048** | .008 | .000 |
| Education: NVQ1 etc. | -.011 | .032 | .733 | -.043 | .107 | .689 | -.024 | .051 | .639 | 1.474 | 1.300 | .257 | **1.946** | .953 | .041 |
| NVQ2 etc. | **.121** | .020 | .000 | -.058 | .066 | .383 | -.041 | .029 | .164 | **2.244** | .675 | .001 | **.940** | .402 | .019 |
| NVQ3 etc.  | **.148** | .022 | .000 | .004 | .072 | .961 | .007 | .047 | .879 | **3.839** | .827 | .000 | **2.217** | .516 | .000 |
| Higher ed. below degree | **.133** | .023 | .000 | -.100 | .076 | .190 | .015 | .054 | .779 | **2.516** | .851 | .003 | **2.388** | .503 | .000 |
| NVQ4/NVQ5 etc. | **.206** | .021 | .000 | **-.232** | .069 | .001 | **.094** | .045 | .036 | **5.436** | .801 | .000 | **3.607** | .495 | .000 |
| Unemployed\* | **-.110** | .039 | .005 | **-1.031** | .171 | .000 | -.056 | .037 | .131 | **6.027** | 1.826 | .001 | .361 | 1.025 | .724 |
| Other economically inactive\* | **-.148** | .015 | .000 | **-.375** | .051 | .000 | -.037 | .030 | .224 | **2.999** | .679 | .000 | **1.562** | .395 | .000 |
| Limiting illness\* | **-.984** | .018 | .000 | **-1.864** | .065 | .000 | -.020 | .021 | .330 | **-6.182** | .518 | .000 | **-2.985** | .293 | .000 |
| Marital status\*\*\* | -.011 | .014 | .448 | **.102** | .047 | .032 | **-.083** | .042 | .047 | -.694 | .536 | .196 | **-1.969** | .371 | .000 |
| Children | **.025** | .008 | .002 | .010 | .027 | .720 | .006 | .018 | .733 | .502 | .332 | .131 | -.221 | .208 | .288 |
| Infants | **.057** | .021 | .008 | .121 | .066 | .067 | **-.073** | .022 | .001 | **-3.769** | .601 | .000 | **-3.657** | .456 | .000 |
| Car availability\* | **.102** | .020 | .000 | **.240** | .069 | .001 | .045 | .033 | .169 | **-2.726** | .719 | .000 | **1.238** | .455 | .006 |
| Survey year\*\*\*\* | **-.038** | .014 | .005 | **-.205** | .045 | .000 | -.057 | .030 | .059 | .905 | .535 | .091 | .108 | .357 | .762 |
| Watersports | .003 | .003 | .296 | .008 | .008 | .314 |  |  |  |  |  |  |  |  |  |
| On-land outdoor PA | **.003** | .000 | .000 | **.005** | .001 | .000 |  |  |  |  |  |  |  |  |  |
| Indoor/other PA | **.004** | .000 | .000 | **.005** | .001 | .000 |  |  |  |  |  |  |  |  |  |

\*0=no/none, 1=yes

\*\*0=female, 1=male

\*\*\*0=other, 1=married, cohabitee or civil partnership

\*\*\*\*0=2008, 1=2012

**Table D.2** Estimates and standard errors (s.e.) of Sensitivity model 2b (excluding income as a covariate). *n =* 21,097. χ² (robust) = .123, df = 6, *p =* 1.000; CFI = 1.00; TLI = 1.05; RMSEA < .001; SRMR = .001.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Explanatory variable | General health (36.0%) | Mental health (12.1%) | Watersports (.3%) | On-land outdoor PA (5.1%) | Indoot/other PA (6.5%) |
| est. | s.e. | p | est. | s.e. | p | est. | s.e. | p | est. | s.e. | p | est. | s.e. | p |
| Coastal proximity >50km vs 20-50km | **.050** | .015 | .001 | .021 | .046 | .643 | -.002 | .034 | .954 | **1.785** | .517 | .001 |  |  |  |
| 5-20km | .014 | .017 | .423 | **.125** | .052 | .016 | .027 | .051 | .602 | **1.473** | .664 | .027 |  |  |  |
| <5km | .027 | .017 | .113 | **.143** | .056 | .011 | **.118** | .048 | .014 | **2.634** | .649 | .000 |  |  |  |
| Freshwater presence\* | .014 | .015 | .347 | **.152** | .050 | .003 | .005 | .039 | .894 | -.036 | .557 | .949 |  |  |  |
| Green space % (1-5) | .009 | .005 | .060 | .005 | .014 | .756 | na | na | na | .197 | .174 | .259 |  |  |  |
| Rural (vs. urban) | .016 | .020 | .424 | .072 | .062 | .243 | -.067 | .061 | .273 | .510 | .748 | .495 | .869 | .478 | .069 |
| QIMD, 1st quintile vs 2nd | **-.042** | .017 | .014 | -.037 | .052 | .476 | -.046 | .057 | .415 | -.520 | .647 | .421 | -.766 | .466 | .100 |
| 3rd | **-.094** | .018 | .000 | **-.137** | .055 | .013 | -.040 | .057 | .483 | -1.092 | .680 | .108 | **-1.708** | .496 | .001 |
| 4th | **-.126** | .019 | .000 | -.060 | .059 | .309 | -.078 | .052 | .134 | **-2.586** | .678 | .000 | **-2.714** | .485 | .000 |
| 5th | **-.210** | .021 | .000 | **-.278** | .068 | .000 | -.039 | .062 | .531 | **-3.396** | .770 | .000 | **-2.268** | .541 | .000 |
| Age | **-.025** | .004 | .000 | **.158** | .014 | .000 | -.005 | .010 | .615 | **-1.755** | .161 | .000 | **-1.709** | .113 | .000 |
| Sex\*\* | **-.041** | .010 | .000 | **.248** | .035 | .000 | **.105** | .028 | .000 | **5.572** | .394 | .000 | **1.958** | .264 | .000 |
| Education: NVQ1 etc. | -.017 | .029 | .554 | -.083 | .095 | .382 | -.012 | .045 | .780 | .991 | 1.243 | .425 | 1.321 | .803 | .100 |
| NVQ2 etc. | **.131** | .018 | .000 | -.069 | .059 | .239 | -.007 | .030 | .830 | **1.807** | .612 | .003 | **1.064** | .366 | .004 |
| NVQ3 etc.  | **.166** | .020 | .000 | -.008 | .064 | .899 | .061 | .047 | .198 | **3.387** | .742 | .000 | **2.390** | .472 | .000 |
| Higher ed. below degree | **.146** | .021 | .000 | -.124 | .069 | .070 | .087 | .065 | .182 | **2.566** | .777 | .001 | **2.991** | .504 | .000 |
| NVQ4/NVQ5 etc. | **.252** | .018 | .000 | **-.200** | .060 | .001 | **.110** | .042 | .008 | **5.041** | .705 | .000 | **4.315** | .429 | .000 |
| Unemployed\* | **-.126** | .037 | .001 | **-.975** | .150 | .000 | **-.069** | .032 | .033 | **5.114** | 1.604 | .001 | .743 | .997 | .456 |
| Other economically inactive\* | **-.149** | .014 | .000 | **-.392** | .045 | .000 | -.008 | .038 | .831 | **2.203** | .568 | .000 | **1.034** | .356 | .004 |
| Limiting illness\* | **-.994** | .016 | .000 | **-1.851** | .058 | .000 | -.031 | .026 | .218 | **-5.916** | .487 | .000 | **-3.018** | .268 | .000 |
| Marital status\*\*\* | -.003 | .013 | .824 | **.155** | .043 | .000 | -.045 | .035 | .198 | -.690 | .488 | .157 | **-1.915** | .335 | .000 |
| Children | .013 | .007 | .079 | .008 | .024 | .754 | -.011 | .016 | .490 | .430 | .303 | .155 | **-.418** | .191 | .028 |
| Infants | **.048** | .019 | .013 | .093 | .059 | .118 | **-.085** | .020 | .000 | **-3.930** | .564 | .000 | **-3.724** | .431 | .000 |
| Car availability\* | **.104** | .018 | .000 | **.226** | .061 | .000 | **.065** | .028 | .022 | **-2.031** | .668 | .002 | **1.516** | .403 | .000 |
| Survey year\*\*\*\* | -.022 | .012 | .075 | **-.170** | .040 | .000 | -.028 | .032 | .373 | **1.107** | .491 | .024 | .127 | .325 | .695 |
| Watersports | **.006** | .002 | .011 | **.012** | .006 | .047 |  |  |  |  |  |  |  |  |  |
| On-land outdoor PA | **.003** | .000 | .000 | **.004** | .001 | .000 |  |  |  |  |  |  |  |  |  |
| Indoor/other PA | **.004** | .000 | .000 | **.005** | .001 | .000 |  |  |  |  |  |  |  |  |  |

**Appendix E Table E.1:** Estimates and standard errors (s.e.) of Sensitivity model 4 (PA variables measured as hours/week). *n =* 21,097. χ² (robust) = .156, df = 6, *p =* 1.000; CFI = 1.00; TLI = 1.06; RMSEA < .001; SRMR = .001.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Explanatory variable | General health (36.0%) | Mental health (12.3%) | Watersports (.4%) | On-land outdoor PA (2.5%) | Indoor/other PA (5.6%) |
| est. | s.e. | p | est. | s.e. | p | est. | s.e. | p | est. | s.e. | p | est. | s.e. | p |
| Coastal proximity >50km vs 20-50km | **.046** | .015 | .001 | .009 | .046 | .847 | -.002 | .010 | .867 | **.389** | .116 | .001 |  |  |  |
| 5-20km | .018 | .017 | .287 | **.132** | .052 | .011 | .030 | .024 | .201 | .199 | .134 | .138 |  |  |  |
| <5km | .028 | .017 | .101 | **.145** | .056 | .009 | **.052** | .019 | .006 | **.532** | .142 | .000 |  |  |  |
| Freshwater presence\* | .012 | .015 | .421 | **.147** | .050 | .003 | -.001 | .015 | .964 | -.054 | .117 | .642 |  |  |  |
| Green space % (1-5) | .008 | .005 | .078 | .004 | .014 | .764 | na | na | na | .053 | .039 | .172 |  |  |  |
| Rural (vs. urban) | .013 | .020 | .525 | .064 | .061 | .295 | -.018 | .020 | .355 | .153 | .150 | .310 | .079 | .076 | .295 |
| QIMD, 1st quintile vs 2nd | **-.038** | .017 | .026 | -.029 | .052 | .573 | -.011 | .022 | .626 | -.005 | .138 | .969 | -.090 | .074 | .224 |
| 3rd | **-.089** | .018 | .000 | **-.129** | .055 | .020 | -.018 | .018 | .317 | -.040 | .143 | .779 | **-.180** | .081 | .027 |
| 4th | **-.117** | .019 | .000 | -.044 | .059 | .455 | -.031 | .017 | .063 | -.265 | .146 | .070 | **-.382** | .076 | .000 |
| 5th | **-.198** | .021 | .000 | **-.262** | .068 | .000 | -.005 | .024 | .827 | **-.387** | .167 | .021 | **-.336** | .082 | .000 |
| Age | **-.030** | .004 | .000 | **.151** | .014 | .000 | .001 | .004 | .820 | **-.167** | .033 | .000 | **-.216** | .018 | .000 |
| Sex\*\* | **-.032** | .010 | .002 | **.259** | .035 | .000 | **.043** | .009 | .000 | **.541** | .079 | .000 | **.307** | .041 | .000 |
| Equiv. income (in thousands) | **.002** | .000 | .000 | **.002** | .001 | .000 | .000 | .000 | .083 | .002 | .002 | .300 | **.007** | .001 | .000 |
| Income missing\* | **.037** | .017 | .033 | **.187** | .054 | .001 | **.034** | .017 | .049 | .033 | .144 | .820 | **.280** | .070 | .000 |
| Education: NVQ1 etc. | -.018 | .029 | .521 | -.083 | .095 | .386 | .006 | .022 | .784 | .352 | .256 | .170 | **.263** | .112 | .019 |
| NVQ2 etc. | **.126** | .018 | .000 | -.072 | .059 | .217 | .001 | .013 | .921 | **.416** | .133 | .002 | **.238** | .060 | .000 |
| NVQ3 etc.  | **.160** | .020 | .000 | -.017 | .064 | .794 | .023 | .017 | .183 | **.713** | .158 | .000 | **.388** | .075 | .000 |
| Higher ed. below degree | **.137** | .021 | .000 | **-.135** | .069 | .049 | .038 | .026 | .139 | **.568** | .162 | .000 | **.458** | .079 | .000 |
| NVQ4/NVQ5 etc. | **.231** | .019 | .000 | **-.230** | .061 | .000 | .025 | .015 | .083 | **.898** | .157 | .000 | **.558** | .070 | .000 |
| Unemployed\* | **-.109** | .037 | .003 | **-.953** | .150 | .000 | -.021 | .012 | .085 | **1.334** | .305 | .000 | .261 | .150 | .083 |
| Other economically inactive\* | **-.138** | .014 | .000 | **-.384** | .045 | .000 | -.008 | .014 | .565 | **.614** | .120 | .000 | **.277** | .059 | .000 |
| Limiting illness\* | **-.990** | .016 | .000 | **-1.837** | .058 | .000 | -.005 | .010 | .622 | **-1.338** | .111 | .000 | **-.505** | .044 | .000 |
| Marital status\*\*\* | -.010 | .013 | .453 | **.151** | .042 | .000 | -.014 | .012 | .274 | .077 | .108 | .476 | **-.303** | .053 | .000 |
| Children | **.018** | .007 | .012 | .019 | .024 | .431 | -.002 | .006 | .727 | .080 | .068 | .239 | **-.065** | .029 | .026 |
| Infants | **.047** | .019 | .017 | .097 | .059 | .104 | **-.022** | .007 | .003 | **-.583** | .131 | .000 | **-.572** | .061 | .000 |
| Car availability\* | **.099** | .018 | .000 | **.219** | .061 | .000 | .014 | .012 | .249 | **-.563** | .152 | .000 | **.201** | .069 | .004 |
| Survey year\*\*\*\* | -.023 | .012 | .063 | **-.171** | .040 | .000 | -.012 | .011 | .316 | .156 | .104 | .134 | -.018 | .050 | .723 |
| Watersports | **.019** | .007 | .004 | **.046** | .014 | .001 |  |  |  |  |  |  |  |  |  |
| On-land outdoor PA | **.013** | .001 | .000 | **.021** | .003 | .000 |  |  |  |  |  |  |  |  |  |
| Indoor/other PA | **.023** | .002 | .000 | **.035** | .005 | .000 |  |  |  |  |  |  |  |  |  |

\*0=no/none, 1=yes

\*\*0=female, 1=male

\*\*\*0=other, 1=married, cohabitee or civil partnership

\*\*\*\*0=2008, 1=2012

**Appendix F Table F.1:** Estimates and standard errors (s.e.) of Sensitivity model 5 (with all possible paths estimated, i.e. a saturated model). *n =* 21,097.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Explanatory variable | General health (36.2%) | Mental health (12.2%) | Watersports (.3%) | On-land outdoor PA (5.2%) | Indoor/other PA (6.9%) |
| est. | s.e. | p | est. | s.e. | p | est. | s.e. | p | est. | s.e. | p | est. | s.e. | p |
| Coastal proximity >50km vs 20-50km | **.046** | .015 | .002 | .010 | .046 | .829 | -.007 | .035 | .844 | **1.876** | .526 | .000 | .590 | .381 | .121 |
| 5-20km | .017 | .017 | .336 | **.130** | .052 | .012 | .030 | .050 | .547 | **1.536** | .672 | .022 | .242 | .399 | .544 |
| <5km | .029 | .017 | .089 | **.149** | .056 | .008 | **.120** | .049 | .014 | **2.694** | .656 | .000 | .269 | .405 | .507 |
| Freshwater presence\* | .011 | .015 | .457 | **.145** | .050 | .004 | .007 | .045 | .872 | -.092 | .565 | .871 | -.207 | .375 | .580 |
| Green space % (1-5) | .009 | .005 | .059 | .006 | .014 | .702 | -.003 | .015 | .851 | .239 | .176 | .175 | .232 | .122 | .056 |
| Rural (vs. urban) | .013 | .020 | .519 | .065 | .062 | .288 | -.073 | .062 | .240 | .520 | .749 | .487 | **1.028** | .503 | .041 |
| QIMD, 1st quintile vs 2nd | **-.037** | .017 | .031 | -.028 | .052 | .593 | -.042 | .057 | .463 | -.460 | .648 | .478 | -.628 | .469 | .181 |
| 3rd | **-.086** | .018 | .000 | **-.125** | .055 | .024 | -.035 | .059 | .554 | -.974 | .679 | .151 | **-1.388** | .494 | .005 |
| 4th | **-.114** | .019 | .000 | -.041 | .059 | .487 | -.071 | .055 | .202 | **-2.403** | .677 | .000 | **-2.199** | .487 | .000 |
| 5th | **-.195** | .021 | .000 | **-.258** | .068 | .000 | -.031 | .066 | .634 | **-3.167** | .777 | .000 | **-1.635** | .545 | .003 |
| Age | **-.026** | .004 | .000 | **.156** | .014 | .000 | -.006 | .010 | .587 | **-1.767** | .161 | .000 | **-1.744** | .114 | .000 |
| Sex\*\* | **-.041** | .010 | .000 | **.248** | .035 | .000 | **.105** | .028 | .000 | **5.567** | .394 | .000 | **1.949** | .263 | .000 |
| Equiv. income (in thousands) | **.002** | .000 | .000 | **.002** | .001 | .001 | .001 | .001 | .071 | **.019** | .009 | .037 | **.047** | .007 | .000 |
| Income missing\* | **.036** | .017 | .039 | **.186** | .054 | .001 | .090 | .047 | .055 | .399 | .644 | .536 | **1.843** | .438 | .000 |
| Education: NVQ1 etc. | -.016 | .029 | .578 | -.077 | .095 | .417 | -.009 | .045 | .839 | .991 | 1.245 | .426 | 1.326 | .795 | .095 |
| NVQ2 etc. | **.128** | .018 | .000 | -.068 | .059 | .246 | -.006 | .031 | .853 | **1.759** | .611 | .004 | **.975** | .367 | .008 |
| NVQ3 etc.  | **.160** | .020 | .000 | -.013 | .064 | .834 | .058 | .048 | .223 | **3.304** | .741 | .000 | **2.215** | .475 | .000 |
| Higher ed. below degree | **.138** | .021 | .000 | -.131 | .069 | .056 | .084 | .066 | .203 | **2.440** | .771 | .002 | **2.713** | .503 | .000 |
| NVQ4/NVQ5 etc. | **.228** | .019 | .000 | **-.230** | .061 | .000 | **.095** | .039 | .016 | **4.718** | .716 | .000 | **3.566** | .442 | .000 |
| Unemployed\* | **-.107** | .037 | .003 | **-.947** | .150 | .000 | -.055 | .032 | .083 | **5.356** | 1.613 | .001 | 1.325 | .999 | .184 |
| Other economically inactive\* | **-.136** | .014 | .000 | **-.379** | .045 | .000 | -.003 | .037 | .941 | **2.362** | .582 | .000 | **1.383** | .358 | .000 |
| Limiting illness\* | **-.991** | .016 | .000 | **-1.842** | .058 | .000 | -.027 | .025 | .289 | **-5.870** | .489 | .000 | **-2.884** | .267 | .000 |
| Marital status\*\*\* | -.006 | .013 | .631 | **.155** | .042 | .000 | -.045 | .036 | .209 | -.734 | .489 | .133 | **-1.996** | .334 | .000 |
| Children | **.017** | .007 | .018 | .018 | .024 | .467 | -.006 | .016 | .693 | .486 | .304 | .110 | -.268 | .192 | .163 |
| Infants | **.051** | .019 | .009 | .100 | .059 | .094 | **-.081** | .020 | .000 | **-3.894** | .564 | .000 | **-3.625** | .432 | .000 |
| Car availability\* | **.098** | .018 | .000 | **.216** | .061 | .000 | **.061** | .030 | .042 | **-2.121** | .673 | .002 | **1.285** | .404 | .001 |
| Survey year\*\*\*\* | **-.025** | .012 | .044 | **-.174** | .040 | .000 | -.030 | .032 | .349 | **1.067** | .489 | .029 | .020 | .323 | .950 |
| Watersports | **.006** | .002 | .016 | .011 | .006 | .061 |  |  |  |  |  |  |  |  |  |
| On-land outdoor PA | **.003** | .000 | .000 | **.004** | .001 | .000 |  |  |  |  |  |  |  |  |  |
| Indoor/other PA | **.004** | .000 | .000 | **.005** | .001 | .000 |  |  |  |  |  |  |  |  |  |

\*0=no/none, 1=yes

\*\*0=female, 1=male

\*\*\*0=other, 1=married, cohabitee or civil partnership

\*\*\*\*0=2008, 1=2012