**Table S1: Differences in observed socio-demographic characteristics between children with complete and incomplete observations on outcome and exposure whose family had a productive interview at MCS3, MCS4, and MCS5.**

| Variable | MCS3 | | | MCS4 | | | MCS5 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Partial missing N(%) | Complete case N(%) | p-value | Partial missing N(%) | Complete case N(%) | p-value | Partial missing N(%) | Complete cases N(%) | p-value |
| **Gender** | | | | | | | | | |
| Male | 994(52.3%) | 6,712(50.7%) | 0.2 | 933(51.2%) | 6,011(50.4%) | 0.6 | 805(51.4%) | 5,735(50.4%) | 0.4 |
| Female | 908(47.7%) | 6,516(49.3%) | | 891(48.8%) | 5,906(49.6%) | | 761(48.6%) | 5,649(49.6%) | |
| **Ethnicity** | | | | | | | | | |
| *White* | 876(67.8%) | 11,389(86.1%) | | 895(68.4%) | 10,291(86.4%) | | 683 (63.3%) | 9,739(85.6%) | |
| *Mixed* | 28(2.1%) | 373(2.8%) | | 30(2.3%) | 323(2.7%) | | 21(1.9%) | 318(2.8%) | |
| *Black African/Caribbean* | 118(9.0%) | 316(2.4%) | <0.0001 | 110(8.4%) | 275(2.3%) | <0.0001 | 99(9.2%) | 268(2.4%) | <0.0001 |
| *Asian* | 257(19.6%) | 978(7.4%) | | 248(19.0%) | 873(7.3%) | | 248(22.9%) | 898(7.9%) | |
| *Other* | 33(2.5%) | 172(1.3%) | | 26(2.0%) | 155(1.3%) | | 28(2.6%) | 161(1.4%) | |
| **Main respondent's highest education (MCS1)** | | | | | | | | | |
| *None* | 384(29.3%) | 2,106(15.9%) | | 335(25.6%) | 1,829(15.3%) | | 309(8.7%) | 1,734(15.2%) | |
| *GCSE/A levels* | 617(47.1%) | 7,201(54.5%) | | 588(44.9%) | 6,532(54.8%) | | 511(47.5%) | 6,147(54.0%) | |
| *Diploma higher education* | 71(5.1%) | 1,266(9.6%) | <0.0001 | 74(5.7%) | 1,139(9.6%) | <0.0001 | 56(5.2%) | 1,068(9.4%) | <0.0001 |
| *Degree or higher* | 169(12.8%) | 2,350(17.8%) | | 244(18.6%) | 2,159(18.1%) | | 141(13.1%) | 2,168(19.0%) | |
| *Foreign qualification* | 68(5.3%) | 305(2.3%) | | 69(5.3%) | 258(2.2%) | | 59(5.5%) | 276(2.4%) | |
| **Natural mum's BMI (MCS1)** | | | | | | | | | |
| *Pregnant* | 4(3.9%) | 597(4.5%) | | 5(2.4%) | 545(4.6%) | | 2(5.3%) | 531(4.7%) | |
| *Underweight* | 1(0.9%) | 517(3.9%) | | 4(1.4%) | 451(3.8%) | | 2(5.3%) | 433(3.8%) | |
| *Normal weight* | 61(58.6%) | 7,175(54.2%) | 0.5 | 133(64.2%) | 6,455(54.1%) | 0.004 | 14(36.8%) | 6,191(54.4%) | 0.3 |
| *Overweight* | 27(26.9%) | 3,287(24.9%) | | 53(25.6%) | 2,970(24.9%) | | 14(36.8%) | 2,816(24.8%) | |
| *Obese* | 11(10.6%) | 1,652(12.5%) | | 12(5.8%) | 1,507(12.7%) | | 6(15.8%) | 1,413(12.4%) | |
| | Mean (SD) | Mean (SD) | P(F) | Mean (SD) | Mean (SD) | P(F) | Mean (SD) | Mean (SD) | P(F) |
| **Child's age** | 4.8(0.8) | 4.8(0.4) | 0.5 | 6.8(0.8) | 6.8(0.4) | 0.5 | 10.7(0.5) | 10.7(0.5) | 0.05 |
| **OECD Equivalised weekly family income** | 268.5(185.3) | 357.8(219.2) | <0.0001 | 304.2(197.4) | 394.1(229.4) | <0.0001 | 221.79(110.9) | 275.80(112.47) | <0.0001 |

MCS = Millenium Cohort Study. BMI = body mass index. SD = standard deviation. OECD = Organisation for Econonic Co-operation and Development. GCSE = General Certificate of Secondary Education.

**Table S2: Association between overweight and obese BMI (vs. normal BMI) and use of medications. (Children with complete data at least at one sweep)**

| BMI | Crude ME (95%CI) | Adjusted[1] ME (95%CI) |
|---|---|---|
| **Taking ≥1 regular prescriptions** | | |
| *Normal weight* | Ref. | Ref. |
| *Overweight* | 0.005(0.001;0.009)** | 0.002(-0.002;0.006) |
| *Obese* | 0.019(0.009;0.029)** | 0.014(0.005;0.023)** |
| | | |
| **Number of regular prescriptions** | | |
| *Normal weight* | Ref. | Ref. |
| *Overweight* | 0.029(0.011-0.047)** | 0.017(-0.001;0.035)* |
| *Obese* | 0.083(0.047-0.119)** | 0.063(0.029;0.096)** |

*Adjusted[1]: age, gender, ethnicity, main respondent education, OECD equivalised income, natural mother's BMI*

*** p<0.05*

** 0.1>p>0.05*

BMI = body mass index. ME = Marginal effect. CI = confidence interval.

**Table S3: Distribution of long-term illnesses by ICD-10 broad categories across BMI status in MCS3 and MCS4 for children with complete data.**

| ICD-10 condition | MCS3 | | | MCS4 | | |
|---|---|---|---|---|---|---|
| | No, N(%) | Yes, N(%) | P(χ²) | No, N(%) | Yes, N(%) | P(χ²) |
| **Infectious** | | | | | | |
| *Normal weight* | 7,709(99.88%) | 9(0.12%) | | 7,812(99.91%) | 7(0.09%) | |
| *Overweight* | 1,471(99.86%) | 2(0.14%) | 0.7 | 1,337(100.00%) | 0(0.00%) | 0.4 |
| *Obese* | 476(100.0%) | 0(0.0%) | | 511(100.00%) | 0(0.00%) | |
| **Neoplasm** | | | | | | |
| *Normal weight* | 7,712(99.92%) | 6(0.08%) | | 7,815 (99.95%) | 4(0.05%) | |
| *Overweight* | 1,471(99.86%) | 2(0.14%) | 0.6 | 1,337(100.00%) | 0(0.00%) | 0.007 |
| *Obese* | 476(100.00%) | 0(0.00%) | | 509(99.61%) | 2(0.39%) | |
| **Blood** | | | | | | |
| *Normal weight* | 7,699(99.75%) | 19(0.24%) | | 7,803(99.80%) | 16(0.20%) | |
| *Overweight* | 1,469(99.73%) | 4(0.27%) | 0.9 | 1,334(99.78%) | 3(0.22%) | 0.5 |
| *Obese* | 475(99.79%) | 1(0.21%) | | 511(100.00%) | 0(0.00%) | |
| **Endocrine** | | | | | | |
| *Normal weight* | 7,700(99.77%) | 18(0.23%) | | 7,797(99.72%) | 22(0.28%) | |
| *Overweight* | 1,465(99.46%) | 8(0.54%) | 0.002 | 1,333(99.70%) | 4(0.30%) | 0.1 |
| *Obese* | 471(98.95%) | 5(1.05%) | | 507(99.22%) | 4(0.78%) | |
| **Mental** | | | | | | |
| *Normal weight* | 7,664(99.30%) | 54(0.70%) | | 7,755(99.18%) | 64(0.82%) | |
| *Overweight* | 1,471(99.86%) | 2(0.14%) | 0.02 | 1,326(99.18%) | 11(0.82%) | 0.4 |
| *Obese* | 472(98.95%) | 5(1.05%) | | 504(98.64%) | 7(1.36%) | |
| **Nervous** | | | | | | |
| *Normal weight* | 7,694(99.69%) | 24(0.31%) | | 7,786(99.58%) | 33(0.42%) | |
| *Overweight* | 1,465(99.46%) | 8(0.54%) | 0.5 | 1,331(99.55%) | 6(0.45%) | 0.8 |
| *Obese* | 472(0.84%) | 4(0.84%) | | 508(99.42%) | 3(0.58%) | |

Table S4: continued

| ICD-10 condition | MCS3 | | | MCS4 | | |
|---|---|---|---|---|---|---|
| | No, N(%) | Yes, N(%) | P(χ²) | No, N(%) | Yes, N(%) | P(χ²) |
| **Eye** | | | | | | |
| *Normal weight* | 7,650(99.12%) | 68(0.88%) | | 7.772(99.40%) | 47(0.60%) | |
| *Overweight* | 1,464(99.39%) | 9(0.61%) | 0.5 | 1,329(99.40%) | 8(0.60%) | 0.8 |
| *Obese* | 473(99.37%) | 3(0.63%) | | 507(99.22%) | 4(0.78%) | |
| **Ear** | | | | | | |
| *Normal weight* | 7,570(98.09%) | 148(1.91%) | | 7,709(98.60%) | 110(1.40%) | |
| *Overweight* | 1,451(98.51%) | 22(1.49%) | 0.5 | 1,320(98.73%) | 17(1.27%) | 0.9 |
| *Obese* | 468(98.33%) | 8(1.67%) | | 504(98.64%) | 7(1.36%) | |
| **Circulatory system** | | | | | | |
| *Normal weight* | 7,705(99.83%) | 13(0.17%) | | 7,807(99.85%) | 12(0.15%) | |
| *Overweight* | 1,471(99.86%) | 2(0.14%) | 0.6 | 1,333(99.70%) | 4(0.30%) | 0.3 |
| *Obese* | 476(100.00%) | 0(0.00%) | | 511(100.00%) | 0(0.00%) | |
| **Respiratory** | | | | | | |
| *Normal weight* | 7,144(92.56%) | 575(7.44%) | | 7,290(93.23%) | 530(6.77%) | |
| *Overweight* | 1,347(91.46%) | 126(8.54%) | 0.001 | 1,234(92.30%) | 103(7.70%) | <0.0001 |
| *Obese* | 418(87.87%) | 58(12.13%) | | 452(88.50%) | 50(11.50%) | |
| **Digestive** | | | | | | |
| *Normal weight* | 7,658(99.22%) | 60(0.78%) | | 7,756(99.18%) | 64(0.82%) | |
| *Overweight* | 1,463(99.32%) | 10(0.68%) | 0.08 | 1,323(98.95%) | 14(1.05%) | 0.1 |
| *Obese* | 468(98.33%) | 8(1.67%) | | 503(98.44%) | 8(1.56%) | |
| **Skin** | | | | | | |
| *Normal weight* | 7,436(96.35%) | 282(3.65%) | | 7,619(97.43%) | 201(2.57%) | |
| *Overweight* | 1,429(97.02%) | 44(2.98%) | 0.4 | 1,308(97.83%) | 29(2.17%) | 0.7 |
| *Obese* | 459(96.44%) | 17(3.56%) | | 498(97.46%) | 13(2.54%) | |

Table S4: continued

| ICD-10 condition | MCS3 | | | MCS4 | | |
|---|---|---|---|---|---|---|
| | No, N(%) | Yes, N(%) | P(χ²) | No, N(%) | Yes, N(%) | P(χ²) |
| **Musco-skeletal** | | | | | | |
| *Normal weight* | 7,685(99.57%) | 33(0.43%) | | 7,776(99.45%) | 43(0.55%) | |
| *Overweight* | 1,465(99.46%) | 8(0.54%) | 0.8 | 1,328(99.33%) | 9(0.67%) | 0.7 |
| *Obese* | 474(99.58%) | 2(0.42%) | | 509(99.61%) | 2(0.39%) | |
| **Genito-urinary** | | | | | | |
| *Normal weight* | 7,681(99.52%) | 37(0.48%) | | 7,784(99.55%) | 35(0.45%) | |
| *Overweight* | 1,464(99.39%) | 9(0.54%) | 0.2 | 1,334(99.78%) | 3(0.22%) | 0.4 |
| *Obese* | 471(98.95%) | 5(1.05%) | | 508(99.42%) | 3(0.58%) | |
| **Malformation** | | | | | | |
| *Normal weight* | 7,653(99.16%) | 65(0.84%) | | 7,757(99.21%) | 62(0.79%) | |
| *Overweight* | 1,457(98.92%) | 16(1.08%) | 0.2 | 1,327(99.25%) | 10(0.75%) | 0.8 |
| *Obese* | 469(98.54%) | 7(1.46%) | | 506(99.03%) | 5(0.97%) | |
| **Clinical Abnormality** | | | | | | |
| *Normal weight* | 7,616(98.68%) | 102(1.32%) | | 7,733(98.90%) | 86(1.10%) | |
| *Overweight* | 1,455(98.78%) | 18(1.22%) | 0.004 | 1,326(99.18%) | 11(0.82%) | 0.6 |
| *Obese* | 461(96.86%) | 15(3.14%) | | 506(99.03%) | 5(0.97%) | |
| **Injury/poisoning** | | | | | | |
| *Normal weight* | 7,648(99.09%) | 70(0.91%) | | 7,760(99.25%) | 59(0.75%) | |
| *Overweight* | 1,464(99.39%) | 9(0.61%) | 0.3 | 1,327(99.25%) | 10(0.75%) | 0.9 |
| *Obese* | 474(99.58%) | 2(0.42%) | | 508(99.42%) | 3(0.58%) | |
| **Other factors** | | | | | | |
| *Normal weight* | 7,706(99.84%) | 12(0.16%) | | 7,808(99.86%) | 11(0.14%) | |
| *Overweight* | 1,472(99.93%) | 1(0.07%) | 0.5 | 1,336(99.93%) | 1(0.07%) | 0.2 |
| *Obese* | 476(100.00%) | 0(0.00%) | | 509(99.61%) | 2(0.39%) | |