**Table 1.** ENT derived data (*n =* 6560)

|  |  |  |
| --- | --- | --- |
| Parameter | Original data (*n* (% or SD)) | Original plus imputed data (*n* (% or SE))  |
| Pus or mucus leaking from the child’s ear |  |  |
| – Never | 4690 (74) | 4842 (74) |
| – Once | 998 (16) | 1018 (16)  |
| – >1 | 673 (11) | 700 (11) |
| – Missing | 199 |  |
| Child holds breathe for several seconds while sleeping\* |  |  |
| – No | 4140 (70) | 4583 (70)  |
| – Yes | 1805 (30) | 1977 (30) |
| – Missing | 615 |  |
| Child ever snores\* |  |  |
| – No | 5274 (83) | 5449 (83) |
| – Yes | 1051 (17) | 1111 (17) |
| – Missing | 235 |  |
| Child snores on at least two time points (prolonged snoring)† |  |  |
| – No | 5807 (92) | 5903 (90) |
| – Yes | 518 (8) | 657 (10) |
| – Missing | 235 |  |
| Child snores at 6 and 18 months (early snoring (positive if snoring reported ‘most nights’ at either 6 or 18 months)) |  |  |
| – No | 5642 (96) | 6023 (92) |
| – Yes | 261 (4) | 537 (6) |
| – Missing | 657  |  |
| Mother reported a history of having grommets inserted |  |  |
| – No | 5133 (98) | 6424 (98) |
| – Yes | 85 (2) | 136 (2) |
| – Missing | 1342 |  |
| Child had grommets inserted (by age 9) |  |  |
| – Did not have grommets | 6166 (95) | 6197 (94) |
| – Grommets inserted once | 291 (5) | 293 (4) |
| – Grommets inserted >1 | 66 (1) | 70 (1) |
| – Missing | 37 |  |
| Child had tonsils removed (by age 9) |  |  |
| – No | 6414 (98) | 6445 (98) |
| – Yes | 112 (2) | 115 (2) |
| – Missing | 34 |  |
| Child had adenoids removed (by age 9) |  |  |
| – No | 6322 (97) | 6352 (97) |
| – Yes | 204 (3) | 208 (3) |
| – Missing | 34 |  |
| Cough count‡ |  |  |
| – Mean | 61 (SD 28) | 60 (SE 0.4) |
| Fever reported alongside a cough\*\* |  |  |
| – No cough reported/never | 1515 (25) | 1664 (25) |
| – Fever with some attacks | 3462 (57) | 3681 (56) |
| – Fever with every attack | 1155 (19) | 1215 (19) |
| – Missing | 428 |  |
| Tympanometry at age seven in better functioning ear§ |  |  |
| – Type A | 4059 (75) | 4808 (73) |
| – Type C1 | 646 (12) | 790 (12) |
| – Type C2 | 360 (7) | 466 (7) |
| – Type B | 369 (7) | 496 (8) |
| – Missing | 1126 |  |
| Audiometry age 7 better hearing ear (dB)# |  |  |
| – <20 | 5100 (98) | 6390 (97) |
| – ≥20 | 126 (2) | 170 (3) |
| – Missing | 1334 |  |

All variables are derived from longitudinal questionnaire data reported by the parent(s) when the child was 6, 18, 30, 42, 57, 69, 81, 91 and 103 months. \*Yes = a report of yes for at least one minute, with at least one ‘yes often’ or ‘most nights’ across all time points; †yes = a report of snoring for at least one minute, with at least two reports of ‘most nights’ across time points; ‡cough count = per cent of times a cough was reported across all time points (cough count was considered missing if more than 50 per cent of time points were missing); \*\*categorised as ‘no cough reported or no fever recorded with any cough attack’, ‘fever with some cough attacks’ or ‘fever with every cough attack’; §tympanograms were coded according to Fieullau-Nikolajsen’s modification of Jerger’s classification, categorised as type A, C1/C2 or B in the better functioning ear28; # hearing thresholds were measured using pure tone audiometry across 0.5, 1, 2 and 4 kHz in the left and right ears. The air conduction average hearing threshold in the better hearing ear was calculated. SD = standard deviation; SE = standard error

**Table 2.** Additional variables (*n =* 6560)

|  |  |  |  |
| --- | --- | --- | --- |
| Data category | Parameter | Original data (*n* (%)) | Original plus imputed data (*n* (%)) |
| Medical factors |  |  |  |
|  |  Allergy (7 years)\* |  |  |
|  | – No | 3875 (79) | 5176 (79) |
|  | – Yes | 1032 (21) | 1384 (21) |
|  | – Excluded | 111 |  |
|  | – Missing | 1542 |  |
|  |  Atopic dermatitis(7 years)† |  |  |
| – No | 5268 (92) | 6032 (92) |
| – Yes | 464 (8) | 528 (8) |
| – Missing | 828 |  |
|  |  Doctor diagnosis of asthma(91 months) |  |  |
| – No | 4153 (80) | 5205 (79) |
| – Yes | 1050 (20) | 1355 (21) |
| – Missing | 1357 |  |
| Day care |  |  |  |
|  | Day care at any time (up to 38 months)‡ |  |  |
| – None | 3021 (57) | 3936 (60) |
| – Yes | 2303 (43) | 2624 (40) |
| – Missing | 1236 |  |
|  | Day care regularly (i.e. not a one off) (38 months) |  |  |
| – No | 3490 (62) | 4100 (63) |
| – Yes | 2112 (38) | 2460 (38) |
| – Missing | 958 |  |
|  | Day care 10+ hours per week (38 months) |  |  |
| – No | 4665 (83) | 5378 (82) |
| – Yes | 937 (17 | 1182 (18) |
| – Missing | 958 |  |
| Crowding |  |  |  |
|  | Number of children in house (6 months) |  |  |
| – 0 | 2595 (45) | 2926 (44) |
| – 1 | 2177 (38) | 2454 (37) |
| – >2 | 1035 (18) | 1180 (18) |
| – Missing | 753 |  |
|  | Number of children in house (81 months) |  |  |
| – 0 | 546 (10) | 673 (10) |
| – 1 | 2888 (55) | 3547 (54) |
| – >2 | 1865 (35) | 2340 (36) |
| – Missing | 1261 |  |
|  | Crowding index (8 months)\*\* |  |  |
| – ≤0.5 | 837 (16) | 1022 (16) |
| – 0.5–0.75 | 2192 (41) | 2479 (38) |
| – 0.75–1 | 1811 (34) | 2161 (33) |
| – >1 | 558 (10) | 898 (13) |
| – Missing | 1162 |  |
|  | Crowding index (33 months)\*\* |  |  |
| – ≤0.5 | 1042 (20) | 1269 (20) |
| – 0.5–0.75 | 2042 (40) | 2474 (38)  |
| – 0.75–1 | 1777 (34) | 2370 (36) |
| – >1 | 315 (6) | 447 (7) |
| – Missing | 1384 |  |
|  | Crowding index (81 months)\*\* |  |  |
| – ≤0.5 | 712 (14) | 887 (14) |
| – 0.5–0.75 | 1838 (36) | 2206 (34) |
| – 0.75–1 | 2123 (41) | 2578 (39) |
| – >1 | 501 (10) | 889 (13) |
| – Missing | 1386 |  |
|  | Presence of mould in the home (8 months) |  |  |
| – None | 4097 (75) | 4912 (75) |
| – Not serious | 1236 (23) | 1465 (22) |
| – Fairly/very serious | 143 (3) | 183 (3) |
| – Missing | 1084 |  |
|  | Presence of damp in the home (8 months) |  |  |
| – None | 2850 (52) | 3196 (49) |
| – Not serious | 2356 (43) | 2917 (45) |
| – Fairly/very serious | 289 (5) | 447 (6) |
| – Missing | 1065 |  |
|  |  |  |
| Smoking |  |  |  |
|  | Child any exposure to smoke (up to 54 months)§ |  |  |
| – None | 2654 (51) | 3260 (50) |
| – Yes | 2552 (49) | 3300 (50) |
| – Missing | 1354 |  |
|  |  Child exposure to smoke (6 months) |  |  |
| – None | 3845 (67) | 4331 (66) |
| – Yes | 1876 (33) | 2229 (34) |
| – Missing | 839 |  |
|  |  Child exposure to smoke (38 months) |  |  |
| – None | 3505 (63) | 4209 (62) |
| – Yes | 2033 (37) | 2351 (38) |
| – Missing | 1022 |  |
|  |  Child exposure to smoke (54 months) |  |  |
| – None | 3575 (65) | 4306 (66) |
| – Yes | 1912 (35) | 2254 (34) |
| – Missing | 1073 |  |
|  | Maternal smoking during pregnancy (at any time)# |  |  |
| – None | 4730 (82) | 5310 (81) |
| – Yes | 1076 (19) | 1250 (19) |
| – Missing | 754 |  |
|  | Maternal smoking during pregnancy (18 weeks) |  |  |
| – None | 4747 (83) | 5374 (82) |
| – Yes | 989 (17) | 1186 (18) |
| – Missing | 824 |  |
|  | Maternal smoking during pregnancy (32 weeks) |  |  |
| – None | 4829 (87) | 5631 (85) |
| – Yes | 744 (13) | 929 (14) |
| – Missing | 987 |  |
| At birth |  |  |  |
|  | Breast feeding at any time point^ |  |  |
| – No | 977 (16) | 1129 (17) |
| – Yes | 5019 (84) | 5431 (83) |
| – Missing | 564 |  |
|  | Breast feeding duration across time points^ |  |  |
| – Never | 1164 (20) | 1419 (22) |
| – <3 months | 1327 (23) | 1542 (24) |
| – 3–5 months | 977 (17) | 1123 (17) |
| – 6 months + | 864 | 2476 (38) |
| – Missing |  |  |
|  | Birthweight of child |  |  |
| – > 2500g | 5832 (95) | 6215 (95) |
| – ≤ 2500g | 311 (5) |  |
| – Missing | 417 |  |
|  | Gestational age of child  |  |  |
| – < 37 weeks | 339 (6) | 359 (5) |
| – ≥ 37 weeks | 5872 (95) | 6201 (95) |
| – Missing | 349 |  |
|  | Child ever use a dummy/ pacifier |  |  |
| – No | 3160 (54) | 3474 (53) |
| – Yes | 2683 (46) | 3086 (47) |
| – Missing | 717 |  |

All variables are derived from questionnaire data reported by the parent(s) when the child was 6, 18, 30, 42, 57, 69, 81, 91 and 103 months. \*A child was deemed to react to an allergen if the weal and/or flare was ≥2 mm at the age seven focus clinic. Children were excluded if they didn’t react to the positive allergen or did react to the negative control. For this study children were categorised with an allergy if they were positive for house dust mite, mixed grasses or cat. These excluded children were imputed along with the missing data; †categorised as present if >1 cm in diameter in any of the following areas: around the eyes, the sides or front of the neck, in front of the elbows, behind the knees or in front of the ankles; ‡the child attended day care, as reported by the parent, at 15, 24 and 38 months; \*\*a measure of the number of persons in the household divided by the number of rooms available (including the kitchen if large enough to eat in). The crowding index was derived from the number of persons in the household divided by the number of rooms available in the house (<0.5, 0.5–<0.75, 0.75–<1 or ≥1), where the higher the number the greater the crowding; §child had some exposure to smoking (passive smoking) at any point up to 54 months; #mother reported smoking during pregnancy (at any time).

**Table 3.** Fully adjusted model (original plus imputed data *n =* 6560)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Model 1 | No COM (*n* (%)) (*n =* 5814) | Mild or significant COM (*n* (%)) (*n =* 746) | No COM *vs* mild or significant COM (Adjusted *p*-value) | No COM *vs* mild or significant COM (adjusted OR (95% CI)) |
| Pus or mucus leaking from the child’s ear |  |  |  |  |
| – Never | 4439 (76) | 404 (54) |
| – At least once | 1375 (24) | 342 (46) | <0.001\* | 1.4 (1.3–1.6)\* |
| Child snores on at least two time points (prolonged snoring)† |  |  |  |  |
| – No | 5277 (91) | 625 (84) |
| – Yes | 537 (9) | 121 (16) | 0.242 | 1.2 (0.9–1.5) |
| Child had grommets inserted (by age 9) |  |  |  |  |
| – No | 5634 (97) | 563 (75) |
| – Yes | 180 (3) | 183 (25) | <0.001\* | 4.9 (3.6–6.7)\* |
| Child reported having tonsils removed (age 9) |  |  |  |  |
| – No | 5738 (99) | 707 (95) |
| – Yes | 76 (1) | 39 (5) | 0.286 | 0.7 (0.4–1.3) |
| Child reported having adenoids removed (age 9) |  |  |  |  |
| – No | 5692 (98) | 660 (88) |  |  |
| – Yes | 122 (2) | 86 (12) | 0.418 | 1.2 (0.8–1.9) |
| Tympanometry at age 7 in better functioning ear |  |  |  |  |
| – Type A | 4464 (77) | 344 (46) |
| – Type C1/C2 | 1037 (18) | 220 (29) | <0.001\* | 2.3 (1.9–2.9)\* |
| – Type B | 313 (5) | 183 (25) | <0.001\* | 4.5 (3.3–6.1)\* |
| Audiometry age 7 in better hearing ear (dB) |  |  |  |  |
| – < 20 | 5694 (98) | 696 (93) |
| – ≥ 20 | 120 (2) | 50 (7) | 0.996 | 1.0 (0.6–1.8) |
| Birthweight |  |  |  |  |
| – > 2500g | 5524 (95) | 691 (93) |
| – ≤ 2500g | 290 (5) | 55 (7) | 0.463 | 1.2 (0.8–1.4) |
| Gestational age |  |  |  |  |
| – ≥ 37 weeks | 5514 (95) | 687 (92)  |
| – < 37 weeks | 300 (5) | 59 (8) | 0.010\* | 1.5 (1.1–2.1)\* |

\*Significant value; †because of coloration, ‘prolonged snoring’ was chosen to be entered into the model over ‘snoring’ and ‘early snoring’ due to a higher univariate odds ratio. COM = chronic otitis media; CI = confidence interval