

1 **Table S1:** Search strategy for the systematic review

| Domain | | Determinant (s) | | Outcome (s) | |
|-------------|-----|-----------------|-----|----------------|-------------------------|
| Children | OR | BMI | OR | Asthma control | Asthma exacerbation |
| Childhood | AND | Body mass index | AND | | OR |
| Adolescents | OR | Obesity | OR | | Asthma severity AND |
| Pediatrics | | Overweight | | | Hospitalization OR |
| | | | | | Oral corticosteroid use |

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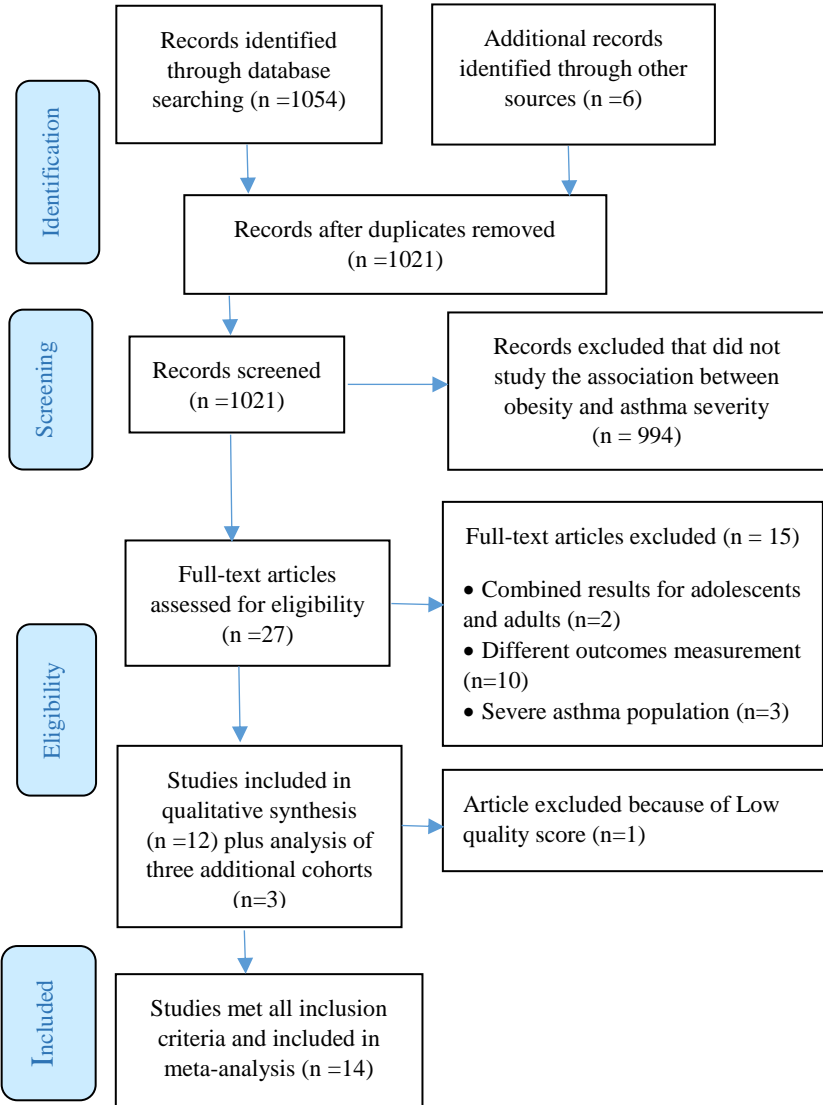


Fig S1: Flow diagram of study selection

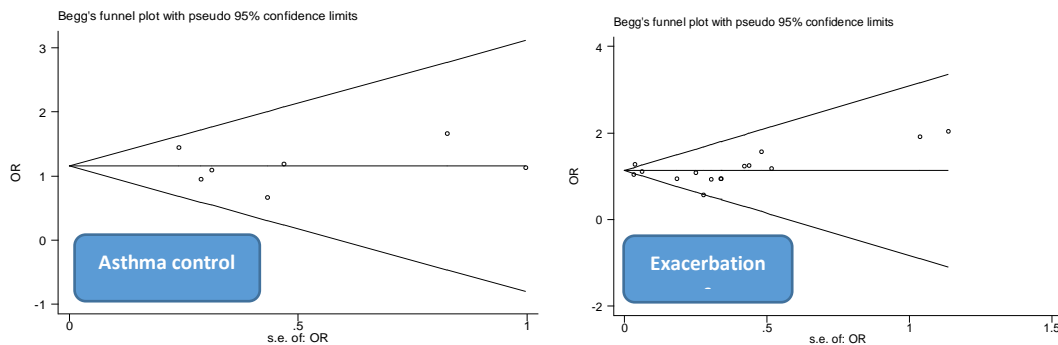


Fig S2: Funnel plots for publication bias in the association overweight/obesity and poor asthma control (p-value=0.81) and asthma exacerbations (p-value=0.80)

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33 **Association body mass index (BMI) and poor asthma control/exacerbations in BREATHE,**
 34 **PACMAN and PAGES:**

35 **Methods and data analysis:**

36 Association BMI and poor asthma control/exacerbations was tested in BREATHE, PACMAN and

37 PAGES databases. For this cross-sectional analysis, the study sample consisted of asthmatic

38 children and adolescents who participated in three North-European pediatric cohorts including the

39 BREATHE cohort (Scotland, UK, age: 4–18 years) [1,2], the Pharmacogenetics of Asthma

40 Medication in Children study (PACMAN) cohort (The Netherlands, age: 4–12 years) [3] and the

41 Pediatric Asthma Gene Environment Study (PAGES) cohort (Scotland, UK, age: 4–17 years) [4].

42 All three studies are retrospective cohort studies. In BREATHE, children and adolescents with

43 physician-diagnosed asthma were recruited either through primary or secondary clinics. In

44 PACMAN paediatric users of asthma medication were selected through Dutch community

45 pharmacies. In this cohort, children aged 4-12 years with at least 2 years of medication history

46 available and at least 3 prescriptions for any asthma drug within the last 2 years and at least 1

47 prescription in the last 6 months were selected from pharmacies in different regions in the

48 Netherlands. In PAGES physician-diagnosed asthmatic children were recruited through primary and

49 secondary care. A detailed clinical history including e.g. information on asthma symptoms,
50 treatment, asthma control and exacerbations was obtained from the parents and children. In
51 PACMAN, BMI at the time of recruitment was calculated using weight and height measures for
52 each child at the time of recruitment in pharmacy or the values were obtained from parental
53 questionnaire. In BREATHE and PAGES weight and height were measured using the calibrated
54 equipment in each hospital's clinic and BMI calculated. Data on asthma control were available in
55 PACMAN and PAGES. In PACMAN the Asthma Control Questionnaire score (ACQ) was used to
56 measure asthma control. An $ACQ \geq 0.75$ was considered as poor asthma control [5]. For children and
57 adolescents in PAGES, asthma control was assessed using the 7-item childhood Asthma Control
58 Test scores (ACT). An ACT score of ≤ 19 was considered poor asthma control [6]. Two measures of
59 asthma exacerbations were applied [7]; 1) asthma-related visits to an emergency department (ED) in
60 the past 12 months from the date of completion of the questionnaire (PACMAN) and asthma-related
61 hospitalization in the past 6 months (BREATHE and PAGES) 2) prescribed courses of oral
62 corticosteroids (OCSs) in the past 12 months (PACMAN) and in the past 6 months (BREATHE and
63 PAGES). We used SAS version 9.1 for Windows to calculate age- and gender-adjusted BMI
64 percentiles for children using height and weight measures as defined by the CDC standardized sex-
65 and age-specific growth charts (<http://www.cdc.gov/nccdphp/dnpao/growthcharts/resources/sas.htm>).
66 Children were classified as follows: a) non-obese: either normal weight ($BMI \geq 5^{th}$ to $< 85^{th}$
67 percentile) or overweight ($BMI \geq 85^{th}$ to $< 95^{th}$ percentile) and b) obese ($BMI \geq 95^{th}$ percentile) [8].
68 Underweight children were not included in the logistic regression analyses. The differences in
69 baseline characteristics of children with and without missing values in the three cohorts were
70 compared. The frequency of baseline characteristics in the different BMI percentile categories were
71 stratified by gender. The associations of obesity with poor asthma control and/or risk of

72 exacerbations among obese girls and boys versus non- obese peers was estimated using binary
73 logistic regression in univariate and multivariate ways to calculate crude and adjusted odd ratios
74 (ORs) with 95% confidence intervals (CIs). In subgroup analysis, the effect of age on this
75 association was tested in stratified analyses in three different age categories 4-6, 6.01-12.99 and 13-
76 18 years. In a sensitivity analysis, the associations between obesity versus normal weight and poor
77 asthma control and/or risk of exacerbations among obese girls and boys were also evaluated. Age,
78 eczema, hay fever, pet's exposure, breast feeding, family history of asthma and family history of
79 allergy, asthma in sibling and race/ethnicity were considered as potential confounders in these
80 associations.
81 P-values of 0.05 were used to assess the statistical significance of main effect associations. We used
82 SPSS 23.0 to analysis the data.

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84 **Results:**

85 Data were available for 1,318 children and adolescents ages 4-18 years of the BREATHE cohort,
86 648 children ages 4-12 year of the PACMAN cohort and 422 children and adolescents ages 4-17
87 years of the PAGES cohort. The baseline characteristics of the three study populations are presented
88 in **Table S2**. The incidence of obesity was 13% in BREATHE, 11% in PACMAN and 15% in
89 PAGES. Poor asthma control was higher in PAGES (64%) compared with PACMAN (40%).
90 Asthma exacerbations (either ED visits/asthma related hospitalization or OCSs dispensing) rates
91 were higher in BREATHE (27%) and PAGES (40%) compared with PACMAN (10%).
92 We found statistically significant differences in baseline characteristics of the patients with and
93 without data on BMI which was more pronounced in BREATHE and PAGES. Children in
94 BREATHE and PAGES cohorts with missing data on BMI have remarkably less asthma

95 exacerbations (both hospitalization due to asthma and OCSs use) compared with those that have
96 data on BMI (**Table S3**).

97 The frequency of the baseline characteristics in the different BMI percentile categories was shown
98 in **Table S4**. As shown, no significant differences between obese vs. non-obese children in different
99 baseline characteristics were observed neither in girls nor in boys in the BREATHE cohort. In the
100 PACMAN cohort, there were statistically significant differences between obese and non-obese peers
101 in different baseline characteristics e.g. age ($p=0.003$), race ($p=0.03$) and exacerbations ($p<0.001$) in
102 girls and family history of asthma in boys ($p=0.01$). In the PAGES cohort, significant difference
103 between obese and non-obese children was shown only in girls with eczema ($p=0.05$) and in boys
104 with poor asthma control ($p=0.04$).

105 As shown in **Table S5**, when boys and girls were combined, there was no association between
106 obesity and poor asthma control in either population with an opposite direction in PACMAN and
107 PAGES cohorts (OR: 0.95, 95% CI: 0.54-1.67 and OR: 1.66, 95% CI: 0.70-3.94, respectively).

108 Obese girls in the PACMAN cohort were more likely to have poor asthma control compared to non-
109 obese girls while in the PAGES cohort obese boys were at increased risk of poor asthma control
110 than non-obese boys. No asthma control data was available for the BREATHE cohort.

111 There was an increased risk for exacerbations (both ED visits and OCSs use) among obese girls
112 compared to non-obese girls in the PACMAN population (OR: 4.03, 95% CI: 1.06-15.38 and OR:
113 5.66, 95% CI: 1.37-23.31, respectively) but not in the other populations. When boys only and when
114 boys and girls were combined, there was no significant association between obesity and risk for
115 exacerbations (**Table S5**).

116 When stratifying logistic regression analysis by age, the results showed no difference between
117 different age categories (**Table S6**).

118 A sensitivity analysis was conducted to evaluate the association between obesity and outcomes in
119 obese versus normal-weight children and the results showed no significant differences compared
120 with the results for these associations in obese versus non-obese peers (data not shown).

121 Actual confounders in the association between obesity and asthma severity were the following:
122 in BREATHE, age, rhinitis, and family history of asthma, in PACMAN, age, eczema, breast
123 feeding, ethnicity/race, family history of asthma and allergy, and in PAGES, age, eczema, rhinitis
124 and family history of allergy.

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126 **Reference:**

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140 shortened versions of the asthma control questionnaire. *Respir Med* 2005 May;99(5):553-558.
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151 **Table S2:** Baseline characteristics of children with asthma (with available BMI)

| | BREATHE (n=1,318) | PACMAN (n=648) | PAGES (n=422) |
|---|--|----------------|---------------|
| Gender (girls), n (%) | 534 (40.5) | 242 (37.3) | 179 (42.4) |
| Age, mean (SD), years | 10.1 (3.7) | 8.4 (2.4) | 9.8 (3.3) |
| Age groups, years | 4-6 | 230 (17.5) | 71 (16.8) |
| | 6.01-12.99 | 777 (59.0) | 271 (64.2) |
| | 13-18 | 311 (23.6) | 80 (19.0) |
| Race/ethnicity | White in UK Caucasian* in Netherlands | - | 564 (87.0) |
| | Others | - | 68 (10.5) |
| | | | 15 (3.6) |
| BMI (kg/m ²), mean (SD) | 19.0 (4.1) | 16.9 (2.7) | 19.1 (4.8) |
| BMI percentile category, n (%) | Underweight (<5th percentile) | 43 (3.3) | 14 (3.3) |
| | Normal weight (≥5th to 85th percentile) | 877 (66.5) | 438 (67.6) |
| | Overweight (≥85th to 95th percentile) | 221 (16.8) | 80 (12.3) |
| | Obese (≥95th percentile) | 177 (13.4) | 67 (10.3) |
| Asthma control, n (%) | Well-controlled | - | 368 (56.8) |
| | Poor-controlled | - | 258 (39.8) |
| ED visits/hospitalization due to asthma, n (%) | 200 (15.2) | 40 (6.2) | 57 (14.3) |
| OCSs use, n (%) | 342 (25.9) | 33 (5.1) | 157 (39.4) |
| Asthma exacerbations ^φ , n (%) | 357 (27.1) | 62 (9.8) | 170 (40.3) |
| Medication used based on BTS ^a treatment step, n (%) | Step 1 | 249 (18.9) | 33 (7.9) |
| | Step 2 | 706 (53.6) | 93 (22.2) |
| | Step 3 | 198 (15.0) | 237 (56.6) |
| | Step 4 | 165 (12.5) | 56 (13.4) |
| Atopy, n (%) | Eczema | 706 (53.6) | 167 (39.6) |
| | Hay fever | 348 (26.7) | 165 (39.1) |
| | Food allergy | - | 148 (35.1) |
| | Breast feeding | - | 462 (71.3) |
| Environmental factors, n (%) | Pets exposure | 829 (64.5) | 230 (54.5) |
| | | | |
| Family history of asthma ^b , n (%) | 541 (41.0) | 287 (44.3) | 315 (74.6) |
| Family history of allergy ^c , n (%) | 643 (48.8) | 497 (76.7) | 148 (35.1) |
| Asthma in sibling ^d , n (%) | 398 (30.2) | 184 (28.4) | - |

152 **Abbreviations:** BMI, body mass index; SD, standard deviation; ED, emergency department visit for asthma; OCSs, oral

153 corticosteroids; BTS, British Thoracic Society.

154 *Caucasian including Dutch, Turkish and Moroccan.

155 ^a The treatment step was modified from BTS guidelines as follows: step 1 is use of short-acting beta agonists (SABAs) as needed; step
156 2 is the step 1 plus regular inhaled corticosteroids (ICSs); step 3 is the step 2 plus regular long-acting beta agonists (LABAs); and step 4
157 is the step 3 plus oral leukotriene receptor antagonists (LTRAs).

158 ^b At least one asthmatic parent.

159 ^c At least one allergic parent.

160 ^d At least on asthmatic sibling.

161 ^φ Asthma exacerbations defined as either ED visits/hospitalization due to asthma or OCSs use

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Table S3: Differences in baseline characteristics of children with and without data on BMI

| | | Missing BMI | Non-missing BMI | | Missing BMI | Non-missing BMI | | Missing BMI | Non-missing BMI | |
|--|---|-----------------|-------------------|-------------|----------------|-----------------|--------------|---------------|-----------------|--------------|
| | | BREATHE (n=162) | BREATHE (n=1,318) | P-value | PACMAN (n=347) | PACMAN (n=648) | P-value | PAGES (n=340) | PAGES (n=422) | P-value |
| Gender, n (%) | Girls | 69 (11.4) | 534 (86.6) | 0.61 | 137(36.1) | 242 (63.9) | 0.51 | 145 (44.8) | 179 (55.2) | 0.95 |
| | Boys | 93 (10.6) | 784 (89.4) | | 210 (34.1) | 406 (65.9) | | 195 (44.5) | 243 (55.5) | |
| Age groups, years | 4-6 | 56 (19.6) | 230 (80.4) | <0.001 | 68 (31.9) | 145 (68.1) | 0.31 | 19 (21.1) | 71 (78.9) | <0.001 |
| | 6.01-12.99 | 25 (7.5) | 310 (92.4) | | 279 (35.7) | 503 (64.3) | | 222 (45.0) | 271 (55.0) | |
| | 13-18 | 25 (7.4) | 311 (92.6) | | - | - | | 99 (55.3) | 80 (44.7) | |
| Race/ethnicity | White in UK Caucasian* in Netherlands | - | - | - | 317 (36.0) | 564 (64.0) | 0.01 | 63 (16.8) | 313 (83.2) | 0.07 |
| Asthma control, n (%) | Poor controlled | - | - | - | 148 (44.6) | 258 (41.2) | 0.32 | 88 (62.4) | 164 (63.8) | 0.78 |
| ED visits/hospitalization due to asthma, n (%) | | 67 (41.4) | 200 (15.2) | <0.001 | 21 (6.2) | 40 (6.5) | 0.87 | 14 (4.6) | 57 (14.3) | <0.001 |
| OCSs use, n (%) | | 78 (48.1) | 342 (25.9) | <0.001 | 27 (7.9) | 33 (5.2) | 0.09 | 45 (14.8) | 157 (39.4) | <0.001 |
| Asthma exacerbations, n (%) | | 87 (53.7) | 357 (27.1) | <0.001 | 39 (11.4) | 62 (9.7) | 0.39 | 46 (15.1) | 170 (42.6) | <0.001 |
| Atopy, n (%) | Eczema | 96 (59.3) | 706 (53.6) | 0.17 | 232 (69.3) | 387 (60.9) | 0.01 | 116 (37.7) | 167 (39.6) | 0.60 |
| | Hay fever | 67 (41.4) | 348 (26.7) | <0.001 | 155 (47.1) | 256 (40.8) | 0.06 | 111 (36.0) | 165 (39.1) | 0.40 |
| | Food allergy | - | - | - | 177 (53.0) | 309 (48.8) | 0.22 | 74 (24.0) | 148 (35.1) | 0.001 |
| Environmental factors, n (%) | Pets exposure | 92 (57.1) | 829 (64.5) | 0.07 | 112 (33.1) | 273 (42.9) | 0.003 | 196 (57.6) | 230 (54.5) | 0.39 |
| Family history of asthma **, n (%) | | 82 (50.6) | 541 (41.0) | 0.02 | 161 (50.5) | 287 (45.9) | 0.19 | 247 (80.2) | 315 (74.6) | 0.08 |
| Family history of allergy ***, n (%) | | 112 (69.1) | 643 (48.8) | <0.001 | 271 (83.9) | 497 (79.1) | 0.08 | 153 (45.0) | 148 (35.1) | 0.005 |

Abbreviations: BMI, body mass index; ED, emergency department visit for asthma; OCSs, oral corticosteroids;

*Caucasian including Dutch, Turkish and Moroccan.

** At least one asthmatic parent.

*** At least one allergic parent.

Table S4: Frequency of baseline characteristics in different BMI percentile categories, stratified by gender

| BMI percentile categories | BREATHE | | | | | | PACMAN | | | | | | PAGES | | | | | | |
|--|---|------------|------------|--------------|------------|------------|---------------|------------|--------------|------------------|------------|------------|---------------|------------|------------|--------------|------------|-------------|------|
| | Girls (n=534) | | | Boys (n=784) | | | Girls (n=242) | | | Boys (n=406) | | | Girls (n=179) | | | Boys (n=243) | | | |
| | Obese | Non obese | P-value | Obese | Non obese | P-value | Obese | Non obese | P-value | Obese | Non obese | P-value | Obese | Non obese | P-value | Obese | Non obese | P-value | |
| N (%) | 68 (12.7) | 443 (83.0) | | 109 (13.9) | 655 (83.5) | | 31 (12.98) | 191 (78.9) | | 36 (8.9) | 327 (80.5) | | 30 (16.8) | 143 (79.9) | | 35 (14.4) | 200 (82.3) | | |
| Age groups, years | 4-6 | 16 (18.0) | 73 (82.0) | 25 (17.9) | 115 (82.1) | | 14 (26.4) | 39 (73.6) | 0.003 | 11 (14.9) | 63 (85.1) | 0.11 | 5 (17.2) | 24 (82.8) | 0.89 | 6 (14.3) | 36 (85.7) | 0.26 | |
| | 6.01-12.99 | 35 (12.5) | 245 (87.5) | 61 (13.0) | 408 (87.0) | 0.36 | 17 (10.1) | 152 (89.9) | | 25 (8.7) | 264 (91.3) | | 18 (16.5) | 91 (83.5) | | 19 (12.8) | 130 (87.2) | | |
| | 13-18 | 17 (12.0) | 125 (88.0) | 23 (14.8) | 132 (85.2) | | - | - | | - | - | | 7 (20.0) | 28 (80.0) | | 10 (22.7) | 34 (77.3) | | |
| Race /ethnicity | White in UK Caucasian* in Netherlands | - | - | - | - | | 22 (11.4) | 171 (88.6) | 0.03 | 28 (8.8) | 290 (91.2) | 0.21 | 23 (17.3) | 110 (82.7) | 0.32 | 27 (15.5) | 147 (84.5) | 0.72 | |
| Asthma control, n (%) | Not-well controlled | - | - | - | - | | 13 (44.8) | 79 (42.7) | 0.83 | 14 (9.9) | 127 (90.1) | 0.89 | 12 (63.2) | 66 (70.2) | 0.54 | 17 (81.0) | 68 (56.7) | 0.04 | |
| ED visits/hospitalization due to asthma, n (%) | | 9 (13.2) | 67 (15.1) | 0.68 | 19 (17.4) | 97 (14.8) | 0.48 | 5 (17.2) | 8 (4.4) | 0.008 | 2 (5.9) | 20 (6.9) | 0.91 | 4 (14.3) | 19 (13.8) | 0.94 | 5 (15.2) | 28 (14.8) | 0.96 |
| OCSs use, n (%) | | 12 (17.6) | 113 (25.5) | 0.16 | 33 (30.3) | 175 (26.7) | 0.44 | 5 (16.1) | 7 (3.7) | 0.005 | 3 (8.3) | 18 (5.6) | 0.50 | 9 (32.1) | 45 (32.6) | 0.96 | 15 (45.5) | 87 (46.3) | 0.93 |
| Exacerbations, n (%) | | 12 (17.6) | 116 (26.2) | 0.13 | 35 (32.1) | 183 (27.9) | 0.37 | 9 (29.0) | 12 (6.4) | <0.001 | 4 (11.1) | 32 (9.8) | 0.81 | 11 (18.3) | 49 (81.7) | 0.70 | 16 (14.7) | 93 (85.3) | 0.94 |
| Atopy, n (%) | Eczema | 34 (50.0) | 233 (52.6) | 0.69 | 52 (47.7) | 365 (55.5) | 0.12 | 17 (56.7) | 124 (66.7) | 0.29 | 16 (44.4) | 189 (58.5) | 0.11 | 7 (23.3) | 61 (42.7) | 0.05 | 12 (34.3) | 84 (42.0) | 0.39 |
| | Hay fever | 19 (28.4) | 107 (24.3) | 0.48 | 37 (34.3) | 171 (26.4) | 0.09 | 7 (24.1) | 81 (43.8) | 0.046 | 10 (28.6) | 138 (43.1) | 0.10 | 7 (23.3) | 57 (39.9) | 0.09 | 15 (42.9) | 78 (39.0) | 0.67 |
| | Food allergy | - | - | - | - | - | - | 15 (51.7) | 85 (46.4) | 0.60 | 14 (38.9) | 160 (49.2) | 0.24 | 6 (20.0) | 51 (35.7) | 0.10 | 10 (28.6) | 78 (39.0) | 0.24 |
| Environmental factors, n (%) | Breast feeding | - | - | - | - | | 18 (62.1) | 135 (72.6) | 0.25 | 26 (72.2) | 231 (72.0) | 0.97 | - | - | - | - | - | - | - |
| | Pets exposure | 45 (66.2) | 295 (68.9) | 0.65 | 65 (60.2) | 394 (61.7) | 0.77 | 9 (30.0) | 93 (49.7) | 0.04 | 12 (33.3) | 136 (42.1) | 0.31 | 16 (53.3) | 81 (56.6) | 0.74 | 21 (60.0) | 106 (53.0) | 0.44 |
| Family history of asthma**, n (%) | | 29 (43.3) | 189 (43.1) | 0.90 | 40 (37.0) | 270 (41.8) | 0.37 | 17 (56.7) | 101 (54.9) | 0.86 | 7 (20.0) | 133 (42.1) | 0.01 | 23 (76.7) | 116 (81.1) | 0.58 | 27 (77.1) | 142 (71.0) | 0.46 |
| Family history of atopy***, n (%) | | 35 (52.2) | 219 (50.0) | 0.76 | 48 (44.4) | 311 (48.1) | 0.51 | 23 (76.7) | 149 (81.0) | 0.58 | 20 (57.1) | 255 (80.2) | 0.002 | 9 (30.0) | 58 (40.6) | 0.28 | 12 (34.3) | 65 (32.5) | 0.84 |
| Asthma in sibling****, n (%) | | 24 (35.8) | 142 (32.3) | 0.57 | 34 (31.5) | 189 (29.3) | 0.65 | 8 (40.0) | 57 (36.3) | 0.75 | 11 (34.4) | 91 (34.2) | 0.99 | - | - | - | - | - | - |

Abbreviations: BMI, body mass index; ED, emergency department visit for asthma; OCSs, oral corticosteroids;* Caucasian including Dutch, Turkish and Moroccan, **At least one asthmatic parent ***At least one atopic parent, **** At least one asthmatic sibling.

Table S5: Association obesity and poor asthma control/exacerbations by gender (obese vs. non-obese children)

| | BREATHE | | | PACMAN | | | PAGES | | |
|---|----------------------|------------------|------------------|----------------------|-------------------|--------------------------|----------------------|-------------------|------------------|
| | Subjects included, n | OR (95%CI) | | Subjects included, n | OR (95%CI) | | Subjects included, n | OR (95%CI) | |
| | | Crude | Adjusted* | | Crude | Adjusted* | | Crude | Adjusted* |
| Poor asthma control | | | | | | | | | |
| Girls | - | - | - | 213 | 1.08 (0.49-2.37) | 1.28 (0.53-3.08) | 113 | 0.73 (0.26-2.04) | 0.88 (0.23-3.39) |
| Boys | - | - | - | 351 | 0.96 (0.47-1.94) | 0.89 (0.41-1.92) | 141 | 3.25 (1.03-10.24) | 2.78 (0.84-9.20) |
| Total | - | - | - | 564 | 1.02 (0.60-1.72) | 0.95 (0.54-1.67) | 254 | 1.57 (0.75-3.32) | 1.66 (0.70-3.94) |
| ED visits/asthma-related hospitalization | | | | | | | | | |
| Girls | 511 | 0.86 (0.41-1.81) | 0.80 (0.38-1.71) | 210 | 4.51 (1.36-14.90) | 4.03 (1.06-15.38) | 166 | 1.04 (0.33-3.34) | 1.26 (0.38-4.17) |
| Boys | 764 | 1.21 (0.71-2.08) | 1.27 (0.73-2.21) | 344 | 0.91 (0.20-4.06) | 0.70 (0.15-3.24) | 222 | 1.03 (0.37-2.88) | 1.29 (0.44-3.81) |
| Total | 1275 | 1.07 (0.69-1.66) | 1.08 (0.69-1.68) | 554 | 2.07 (0.86-4.95) | 1.91 (0.76-4.83) | 388 | 1.03 (0.48-2.23) | 1.17 (0.53-2.56) |
| OCSs use | | | | | | | | | |
| Girls | 511 | 0.63 (0.32-1.21) | 0.57 (0.29-1.12) | 221 | 5.03 (1.49-17.01) | 5.66 (1.37-23.31) | 166 | 0.98 (0.41-2.34) | 1.06 (0.42-2.69) |
| Boys | 764 | 1.19 (0.76-1.86) | 1.27 (0.80-2.00) | 361 | 1.55 (0.43-5.54) | 1.47 (0.39-5.56) | 221 | 0.97 (0.46-2.03) | 0.90 (0.40-2.02) |
| Total | 1275 | 0.96 (0.67-1.38) | 0.94 (0.65-1.38) | 582 | 2.66 (1.15-6.16) | 2.04 (0.79-5.25) | 387 | 0.95 (0.55-1.67) | 0.93 (0.51-1.71) |

*Adjusted for age, hay fever, eczema, family history of asthma and allergy, breast feeding, pet's exposure and race/ethnicity by stepwise logistic regression model.

Data on breast feeding was not available in BREATHE and PAGES cohorts.

Data on race/ethnicity was not available in BREATHE cohort.

Table S6: Association obesity and poor asthma control/exacerbations stratified by age, obese versus non-obese children

| | BREATHE | | PACMAN | | PAGES | |
|---|----------------------|------------------|----------------------|-------------------|----------------------|-------------------|
| | Subjects included, n | OR (95%CI) | Subjects included, n | OR (95%CI) | Subjects included, n | OR (95%CI) |
| Poor asthma control | | | | | | |
| 4-6 year | - | - | 124 | 0.83 (0.30-2.31) | 21 | - |
| 6.01-12.99 year | - | - | 440 | 0.98 (0.49-1.95) | 158 | 1.32 (0.45-3.88) |
| 13-18 year | - | - | - | - | 75 | 1.35 (0.34-5.42) |
| ED visits/asthma-related hospitalization | | | | | | |
| 4-6 year | 229 | 0.84 (0.35-1.97) | 124 | 3.13 (0.90-10.92) | 69 | 1.69 (0.26-11.16) |
| 6.01-12.99 year | 749 | 1.05 (0.59-1.88) | 430 | 1.40 (0.31-6.35) | 243 | 1.42 (0.53-3.81) |
| 13-18 year | 297 | 1.46 (0.45-4.70) | - | - | 76 | 0.40 (0.05-3.43) |
| OCSs use | | | | | | |
| 4-6 year | 229 | 0.89 (0.43-1.87) | 127 | 2.72 (0.61-12.12) | 69 | 1.45 (0.29-7.11) |
| 6.01-12.99 year | 749 | 0.90 (0.54-1.49) | 455 | 2.04 (0.55-7.56) | 242 | 0.91 (0.40-2.07) |
| 13-18 year | 297 | 1.17 (0.49-2.80) | - | - | 76 | 0.86 (0.27-2.72) |

*Adjusted for gender, hay fever, eczema, family history of asthma and allergy, breast feeding, pet's exposure and race/ethnicity by stepwise logistic regression model.

Data on breast feeding was not available in BREATHE and PAGES cohorts.

Data on race/ethnicity was not available in BREATHE cohort.