

## **Supplementary Material for**

**Combined impact of healthy lifestyle factors on risk of asthma,  
rhinoconjunctivitis, and eczema in school children: ISAAC Phase  
Three**

**Table S1.** Number of centres and children per country, and prevalence of wheeze, asthma, rhinoconjunctivitis and eczema, the ISAAC Phase Three.

| Region of the world, country, centre | N            | Healthy lifestyle index |            |      |      |        | Current wheeze (%) | Asthma ever (%) | Eczema ever (%) | Hay fever ever (%) | Current symptoms of rhinoconjunctivitis (%) | Current symptoms of eczema (%) |
|--------------------------------------|--------------|-------------------------|------------|------|------|--------|--------------------|-----------------|-----------------|--------------------|---|--------------------------------|
|                                      |              | mean                    | points (%) |      |      |        |                    |                 |                 |                    |   |                                |
|                                      |              |                         | 0 or 1     | 2    | 3    | 4 or 5 |                    |                 |                 |                    |   |                                |
| <b>Oceania</b>                       | <b>3401</b>  |                         |            |      |      |        |                    |                 |                 |                    |   |                                |
| <b>New Zealand</b>                   |              |                         |            |      |      |        |                    |                 |                 |                    |   |                                |
| Auckland                             | 1433         | 2.64                    | 12.6       | 30.4 | 39.1 | 18.0   | 20.0               | 6.3             | 28.1            | 16.4               | 11.9  | 12.3                           |
| Christchurch                         | 1968         | 2.95                    | 7.2        | 24.1 | 40.0 | 28.7   | 21.6               | 31.2            | 41.5            | 21.8               | 15.1  | 20.0                           |
| <b>Western Europe</b>                | <b>21002</b> |                         |            |      |      |        |                    |                 |                 |                    |   |                                |
| <b>Spain</b>                         |              |                         |            |      |      |        |                    |                 |                 |                    |   |                                |
| Cartagena                            | 1850         | 2.32                    | 22.9       | 34.8 | 28.8 | 13.5   | 11.3               | 11.0            | 31.7            | 7.9                | 9.7   | 4.8                            |
| Barcelona                            | 2586         | 2.84                    | 6.9        | 29.6 | 40.7 | 22.8   | 8.4                | 12.0            | 25.1            | 8.6                | 4.0   | 4.0                            |
| Bilbao                               | 2502         | 2.75                    | 12.9       | 28.7 | 33.2 | 25.2   | 11.8               | 20.7            | 33.1            | 9.1                | 9.7   | 6.9                            |
| Valencia                             | 2290         | 2.60                    | 15.1       | 32.5 | 32.0 | 20.4   | 9.2                | 8.4             | 32.3            | 6.9                | 8.3   | 5.6                            |
| Madrid                               | 1703         | 2.59                    | 14.5       | 33.6 | 31.7 | 20.2   | 9.2                | 10.2            | 34.8            | 10.8               | 12.2  | 6.0                            |
| Asturias                             | 2465         | 2.74                    | 12.6       | 28.6 | 34.4 | 24.4   | 11.2               | 15.0            | 32.5            | 13.5               | 12.1  | 6.6                            |
| A Coruña                             | 2103         | 2.60                    | 15.3       | 31.0 | 33.8 | 19.9   | 11.4               | 13.9            | 37.7            | 13.6               | 12.5  | 7.0                            |
| <b>Portugal</b>                      |              |                         |            |      |      |        |                    |                 |                 |                    |   |                                |
| Lisbon                               | 1419         | 2.59                    | 14.5       | 32.0 | 33.9 | 19.6   | 15.4               | 7.4             | 17.8            | 2.6                | 12.5  | 12.1                           |
| Porto                                | 1180         | 2.69                    | 13.8       | 29.2 | 32.8 | 24.2   | 8.8                | 9.1             | 11.8            | 2.8                | 7.6   | 9.1                            |
| <b>Belgium</b>                       |              |                         |            |      |      |        |                    |                 |                 |                    |   |                                |
| Antwerp                              | 2904         | 2.57                    | 13.7       | 34.2 | 34.1 | 18.0   | 7.1                | 5.8             | 25.6            | 5.5                | 7.0   | 13.1                           |
| <b>Northern and Eastern Europe</b>   | <b>8478</b>  |                         |            |      |      |        |                    |                 |                 |                    |   |                                |
| <b>Estonia</b>                       |              |                         |            |      |      |        |                    |                 |                 |                    |   |                                |
| Tallin                               | 1679         | 2.47                    | 17.0       | 33.0 | 35.1 | 14.9   | 10.3               | 5.4             | 10.1            | 3.8                | 4.9   | 11.9                           |
| <b>Poland</b>                        |              |                         |            |      |      |        |                    |                 |                 |                    |   |                                |
| Poznan                               | 1169         | 2.48                    | 17.6       | 34.1 | 31.5 | 16.8   | 13.2               | 5.7             | 35.7            | 19.9               | NA  | 14.4                           |

|                              |                      |              |      |      |      |      |      |      |      |      |      |      |      |
|------------------------------|----------------------|--------------|------|------|------|------|------|------|------|------|------|------|------|
|                              | Krakow               | 1813         | 2.67 | 12.9 | 30.3 | 35.4 | 21.4 | 14.7 | 5.6  | 30.3 | 22.3 | 17.4 | 10.9 |
|                              | <b>Hungary</b>       |              |      |      |      |      |      |      |      |      |      |      |      |
|                              | Svabhegy             | 2402         | 2.08 | 30.9 | 35.9 | 23.0 | 10.1 | 6.4  | 4.8  | 9.9  | 5.2  | 5.8  | 4.6  |
|                              | <b>Lithuania</b>     |              |      |      |      |      |      |      |      |      |      |      |      |
|                              | Kaunas               | 1415         | 1.92 | 33.3 | 41.8 | 20.1 | 4.8  | 6.7  | 2.8  | 4.2  | 3.1  | 4.7  | 3.6  |
| <b>Eastern Mediterranean</b> |                      | <b>9474</b>  |      |      |      |      |      |      |      |      |      |      |      |
|                              | <b>Iran</b>          |              |      |      |      |      |      |      |      |      |      |      |      |
|                              | Tehran               | 1083         | 2.22 | 20.4 | 41.6 | 30.7 | 7.3  | 7.6  | 1.7  | 13.5 | 1.9  | 2.4  | 1.1  |
|                              | Rasht                | 1481         | 2.36 | 16.3 | 38.3 | 37.5 | 7.8  | 15.0 | 7.5  | 13.8 | 1.8  | 2.8  | 1.8  |
|                              | <b>Oman</b>          |              |      |      |      |      |      |      |      |      |      |      |      |
|                              | Al-Khod              | 2789         | 2.98 | 4.8  | 25.1 | 41.1 | 28.9 | 7.6  | 9.9  | 7.1  | 4.7  | 7.1  | 4.5  |
|                              | <b>Syria</b>         |              |      |      |      |      |      |      |      |      |      |      |      |
|                              | Lattakia             | 1999         | 2.27 | 21.7 | 38   | 29.2 | 11.2 | 4.8  | 4.0  | 2.3  | 4.1  | 4.3  | 2.2  |
|                              | Tartous              | 2122         | 2.02 | 27.9 | 43.9 | 23.2 | 4.9  | 5.4  | 4.3  | 4.9  | 8.6  | 5.4  | 1.6  |
| <b>Latin America</b>         |                      | <b>19825</b> |      |      |      |      |      |      |      |      |      |      |      |
|                              | <b>Chile</b>         |              |      |      |      |      |      |      |      |      |      |      |      |
|                              | South Santiago       | 1494         | 2.19 | 25.1 | 38.1 | 26.8 | 10.0 | 14.7 | 8.5  | 19.4 | 14.9 | 15.8 | 15.6 |
|                              | Punta Arenas         | 1801         | 2.20 | 23.9 | 38.7 | 27.5 | 9.9  | 17.8 | 7.3  | 35.3 | 16.9 | 14.6 | 12.9 |
|                              | <b>Colombia</b>      |              |      |      |      |      |      |      |      |      |      |      |      |
|                              | Bogota               | 1197         | 2.78 | 8.9  | 29.1 | 38.3 | 23.8 | 10.5 | 6.0  | 9.3  | 19.5 | 19.4 | 15.3 |
|                              | Barranquilla         | 1512         | 2.71 | 9.5  | 27.0 | 46.5 | 16.9 | 14.1 | 11.5 | 16.2 | 22.2 | 16.6 | 20.1 |
|                              | <b>Mexico</b>        |              |      |      |      |      |      |      |      |      |      |      |      |
|                              | Monterrey            | 1486         | 2.38 | 19.4 | 34.1 | 33.3 | 13.2 | 9.4  | 6.4  | 2.7  | 8.2  | 8.6  | 3.8  |
|                              | Mérida               | 1940         | 2.31 | 20   | 38.9 | 29.8 | 11.3 | 13.3 | 13.0 | 7.3  | 13.7 | 18.1 | 8.2  |
|                              | Ciudad Victoria      | 1031         | 2.55 | 13.8 | 33.3 | 35.5 | 17.4 | 8.8  | 5.2  | 2.3  | 5.1  | NA   | 2.2  |
|                              | Ciudad de Mexico (1) | 1943         | 2.42 | 18.3 | 33.2 | 35.7 | 12.8 | 7.4  | 4.8  | 5.0  | 4.9  | 22.5 | 9.8  |
|                              | Ciudad de Mexico (3) | 3411         | 2.57 | 13.1 | 32.8 | 38.2 | 15.9 | 3.5  | 2.2  | 2.3  | 3.9  | 24.7 | 8.3  |
|                              | Toluca               | 2665         | 2.62 | 14.6 | 29.0 | 35.4 | 21.0 | 5.7  | 2.1  | 3.8  | 4.7  | 8.4  | 6    |

|                     |                  |             |      |      |      |      |      |      |      |      |      |      |      |
|---------------------|------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|
|                     | <b>Venezuela</b> |             |      |      |      |      |      |      |      |      |      |      |      |
|                     | Caracas          | 1345        | 2.37 | 18.9 | 34.7 | 34   | 12.3 | 21.0 | 27.7 | 33.7 | 26.5 | 26.4 | 13.3 |
| <b>Asia-Pacific</b> |                  | <b>8615</b> |      |      |      |      |      |      |      |      |      |      |      |
|                     | <b>Japan</b>     |             |      |      |      |      |      |      |      |      |      |      |      |
|                     | Fukuoka          | 2314        | 2.38 | 20.4 | 35.1 | 30.3 | 14.3 | 17.9 | 22.6 | NA   | 15.4 | 14.2 | NA   |
|                     | <b>Singapore</b> |             |      |      |      |      |      |      |      |      |      |      |      |
|                     | Singapore        | 2515        | 2.57 | 16.8 | 31.1 | 32.7 | 19.4 | 11.9 | 17.4 | 14.2 | NA   | 13.2 | 10.7 |
|                     | <b>Indonesia</b> |             |      |      |      |      |      |      |      |      |      |      |      |
|                     | Bandung          | 1438        | 2.99 | 4.0  | 24.5 | 43.8 | 27.7 | 2.5  | 5.1  | 3.3  | 25.2 | 3.9  | 4.6  |
|                     | <b>Thailand</b>  |             |      |      |      |      |      |      |      |      |      |      |      |
|                     | Chiang Mai       | 2348        | 1.90 | 30.5 | 47.5 | 19.4 | 2.6  | 7.7  | 7.0  | 27.2 | 20.5 | 8.1  | 16.5 |

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Numbers in bold indicate the total number of participants per region of the world. NA: not available.

**Table S2.** Description and prevalence of the factors comprising the Healthy Lifestyle Index (HLI) in childhood, the ISAAC Phase Three.

| Lifestyle factor                        | Index points | Description                            | Prevalence (%) in the study population |                    |                      |
|---|--------------|--|--|--------------------|----------------------|
|   |              |  | Boys<br>(n=35122)                      | Girls<br>(n=35673) | Overall<br>(n=70795) |
| Parental smoking                        | 0            | Mother or father smoker                | 42.9                                   | 43.0               | 43.0                 |
|   | 1            | Mother & father non-smokers            | 57.1                                   | 57.0               | 57.0                 |
| Overweight and obesity <sup>1</sup>     | 0            | Overweight or obese                    | 25.3                                   | 26.5               | 25.9                 |
|   | 1            | Healthy weight                         | 74.7                                   | 73.5               | 74.1                 |
| Child's Mediterranean diet <sup>2</sup> | 0            | Unhealthy diet quality, score < median | 59.4                                   | 58.4               | 58.9                 |
|   | 1            | Healthy diet quality, score ≥ median   | 40.6                                   | 41.6               | 41.1                 |
| Child's physical activity               | 0            | Never or occasionally                  | 35.3                                   | 40.8               | 38.1                 |
|   | 1            | At least once per week                 | 64.7                                   | 59.2               | 61.9                 |
| Child's sedentary behaviour             | 0            | 1 or more TV viewing hours a day       | 84.5                                   | 82.5               | 83.5                 |
|   | 1            | Less than 1 TV viewing hour a day      | 15.5                                   | 17.5               | 16.5                 |

<sup>1</sup>Based on the cut-off points of body mass index reported by Cole et al [14]. <sup>2</sup>A score of the 'Mediterranean diet' pattern was developed according to the consumption frequency of eleven food items (fruit, fish, vegetables, pulses, cereals, pasta, rice, potatoes, meat, milk and fast food) based on the score used by Psaltopoulou et al.<sup>15</sup>

**Table S3.** Associations\* (odds ratio and 95% CI) between healthy lifestyle index and symptoms of asthma, rhino-conjunctivitis, and eczema at 6–7 years of age stratified by child’s sex, ISAAC Phase Three.

|  | N     | Healthy lifestyle index points |                   |                   |                   |
|--|-------|--------------------------------|-------------------|-------------------|-------------------|
|  |       | 0-1                            | 2                 | 3                 | 4-5               |
| <b>Males</b>   |       |                                |                   |                   |                   |
| Current wheeze <sup>1</sup>                          | 30181 | 1.0                            | 0.91 (0.82, 1.01) | 0.79 (0.71, 0.88) | 0.65 (0.57, 0.74) |
| Asthma ever <sup>2</sup>                             | 27461 | 1.0                            | 0.89 (0.79, 1.01) | 0.82 (0.73, 0.93) | 0.70 (0.60, 0.80) |
| Current symptoms of rhinoconjunctivitis <sup>3</sup> | 26038 | 1.0                            | 0.94 (0.84, 1.06) | 0.86 (0.77, 0.97) | 0.80 (0.70, 0.92) |
| Hay fever ever <sup>4</sup>                          | 26532 | 1.0                            | 0.98 (0.87, 1.11) | 0.96 (0.84, 1.08) | 0.84 (0.73, 0.97) |
| Current symptoms of eczema <sup>4</sup>              | 26015 | 1.0                            | 0.88 (0.77, 1.02) | 0.91 (0.79, 1.05) | 0.86 (0.73, 1.02) |
| Eczema ever <sup>5</sup>                             | 28709 | 1.0                            | 1.00 (0.91, 1.11) | 0.97 (0.88, 1.07) | 1.12 (1.00, 1.26) |
| <b>Females</b>                                       |       |                                |                   |                   |                   |
| Current wheeze <sup>1</sup>                          | 30941 | 1.0                            | 0.96 (0.86, 1.08) | 0.75 (0.67, 0.85) | 0.67 (0.58, 0.77) |
| Asthma ever <sup>2</sup>                             | 28033 | 1.0                            | 0.88 (0.77, 0.99) | 0.74 (0.65, 0.85) | 0.63 (0.54, 0.75) |
| Current symptoms of rhinoconjunctivitis <sup>3</sup> | 27328 | 1.0                            | 1.03 (0.91, 1.17) | 0.98 (0.87, 1.11) | 0.94 (0.81, 1.09) |
| Hay fever ever <sup>4</sup>                          | 27215 | 1.0                            | 1.09 (0.96, 1.24) | 1.02 (0.89, 1.16) | 1.01 (0.86, 1.18) |
| Current symptoms of eczema <sup>4</sup>              | 26674 | 1.0                            | 0.90 (0.79, 1.03) | 0.82 (0.72, 0.94) | 0.82 (0.71, 0.96) |
| Eczema ever <sup>5</sup>                             | 29455 | 1.0                            | 0.97 (0.88, 1.07) | 0.97 (0.88, 1.07) | 0.99 (0.88, 1.10) |

<sup>1</sup>Multivariate analysis (children with complete covariate data), adjusted for gross national income, region of the world, breastfeeding, pets at home, and paracetamol use for fever.

<sup>2</sup>Multivariate analysis (children with complete covariate data), adjusted for gross national income, region of the world, maternal education, siblings, pets at home, and paracetamol use for fever.

<sup>3</sup>Multivariate analysis (children with complete covariate data), adjusted for gross national income, region of the world, pets at home, and paracetamol use for fever.

<sup>4</sup>Multivariate analysis (children with complete covariate data), adjusted for gross national income, region of the world, maternal education, breastfeeding, siblings, and paracetamol use for fever.

<sup>5</sup>Multivariate analysis (children with complete covariate data), adjusted for gross national income, region of the world, maternal education, breastfeeding, and paracetamol use for fever.

**Table S4.** Associations\* (odds ratio and 95% CI) between healthy lifestyle index and symptoms of asthma, rhino-conjunctivitis, and eczema at 6–7 years of age stratified by region of the world, ISAAC Phase Three.

|  | N     | Healthy lifestyle index points |                   |                   |                   |  |
|--|-------|--------------------------------|-------------------|-------------------|-------------------|--|
|  |       | 0-1                            | 2                 | 3                 | 4-5               |  |
| <b>Western Europe</b>                                |       |                                |                   |                   |                   |  |
| Current wheeze <sup>1</sup>                          | 20225 | 1.0                            | 0.86 (0.75, 0.98) | 0.65 (0.57, 0.75) | 0.53 (0.45, 0.63) |  |
| Asthma ever <sup>2</sup>                             | 19560 | 1.0                            | 0.87 (0.76, 0.99) | 0.76 (0.66, 0.87) | 0.66 (0.56, 0.77) |  |
| Current symptoms of rhinoconjunctivitis <sup>3</sup> | 18014 | 1.0                            | 1.04 (0.89, 1.22) | 0.85 (0.73, 1.00) | 0.82 (0.69, 0.98) |  |
| Hay fever ever <sup>4</sup>                          | 19457 | 1.0                            | 1.13 (0.96, 1.33) | 0.98 (0.83, 1.16) | 0.88 (0.73, 1.06) |  |
| Current symptoms of eczema <sup>4</sup>              | 19267 | 1.0                            | 0.85 (0.72, 1.01) | 0.76 (0.64, 0.90) | 0.77 (0.64, 0.93) |  |
| Eczema ever <sup>5</sup>                             | 19696 | 1.0                            | 1.03 (0.93, 1.14) | 0.98 (0.88, 1.08) | 1.04 (0.93, 1.17) |  |
| <b>Northern and Eastern Europe</b>                   |       |                                |                   |                   |                   |  |
| Current wheeze <sup>1</sup>                          | 8275  | 1.0                            | 1.09 (0.89, 1.33) | 0.89 (0.71, 1.10) | 0.83 (0.64, 1.08) |  |
| Asthma ever <sup>2</sup>                             | 7188  | 1.0                            | 1.12 (0.84, 1.50) | 0.98 (0.71, 1.34) | 0.87 (0.57, 1.34) |  |
| Current symptoms of rhinoconjunctivitis <sup>3</sup> | 6321  | 1.0                            | 1.09 (0.83, 1.44) | 1.26 (0.96, 1.67) | 1.48 (1.07, 2.03) |  |
| Hay fever ever <sup>4</sup>                          | 7257  | 1.0                            | 1.04 (0.81, 1.34) | 1.15 (0.89, 1.49) | 1.18 (0.88, 1.60) |  |
| Current symptoms of eczema <sup>4</sup>              | 7107  | 1.0                            | 0.91 (0.71, 1.16) | 1.05 (0.81, 1.35) | 1.05 (0.77, 1.42) |  |
| Eczema ever <sup>5</sup>                             | 8128  | 1.0                            | 0.92 (0.77, 1.11) | 1.07 (0.89, 1.29) | 1.22 (0.98, 1.51) |  |
| <b>Eastern Mediterranean</b>                         |       |                                |                   |                   |                   |  |
| Current wheeze <sup>1</sup>                          | 7332  | 1.0                            | 0.91 (0.72, 1.15) | 0.73 (0.57, 0.94) | 0.81 (0.57, 1.14) |  |
| Asthma ever <sup>2</sup>                             | 5933  | 1.0                            | 0.70 (0.51, 0.96) | 0.76 (0.55, 1.06) | 0.82 (0.49, 1.35) |  |
| Current symptoms of rhinoconjunctivitis <sup>3</sup> | 6727  | 1.0                            | 0.75 (0.55, 1.03) | 0.74 (0.53, 1.03) | 1.00 (0.66, 1.53) |  |
| Hay fever ever <sup>4</sup>                          | 5951  | 1.0                            | 1.04 (0.76, 1.42) | 1.04 (0.74, 1.47) | 1.46 (0.91, 2.35) |  |
| Current symptoms of eczema <sup>4</sup>              | 5839  | 1.0                            | 0.58 (0.36, 0.93) | 0.81 (0.50, 1.30) | 1.03 (0.53, 2.01) |  |
| Eczema ever <sup>5</sup>                             | 6029  | 1.0                            | 0.91 (0.70, 1.18) | 0.89 (0.68, 1.18) | 1.27 (0.85, 1.89) |  |
| <b>Latin-America</b>                                 |       |                                |                   |                   |                   |  |
| Current wheeze <sup>1</sup>                          | 16283 | 1.0                            | 0.94 (0.81, 1.10) | 0.83 (0.71, 0.98) | 0.60 (0.49, 0.74) |  |
| Asthma ever <sup>2</sup>                             | 15960 | 1.0                            | 0.87 (0.72, 1.04) | 0.76 (0.63, 0.92) | 0.59 (0.46, 0.76) |  |
| Current symptoms of rhinoconjunctivitis <sup>3</sup> | 14614 | 1.0                            | 0.93 (0.81, 1.06) | 0.85 (0.74, 0.97) | 0.69 (0.59, 0.82) |  |
| Hay fever ever <sup>4</sup>                          | 14086 | 1.0                            | 0.98 (0.82, 1.17) | 0.93 (0.78, 1.11) | 0.81 (0.65, 1.00) |  |
| Current symptoms of eczema <sup>4</sup>              | 14109 | 1.0                            | 0.99 (0.83, 1.18) | 0.89 (0.75, 1.06) | 0.81 (0.66, 0.99) |  |
| Eczema ever <sup>5</sup>                             | 15515 | 1.0                            | 0.96 (0.79, 1.16) | 0.78 (0.64, 0.95) | 0.89 (0.71, 1.12) |  |
| <b>Asia-Pacific</b>                                  |       |                                |                   |                   |                   |  |
| Current wheeze <sup>1</sup>                          | 5679  | 1.0                            | 0.98 (0.78, 1.24) | 0.92 (0.71, 1.19) | 0.85 (0.60, 1.19) |  |
| Asthma ever <sup>2</sup>                             | 3539  | 1.0                            | 1.11 (0.78, 1.56) | 1.01 (0.69, 1.48) | 0.76 (0.46, 1.25) |  |
| Current symptoms of rhinoconjunctivitis <sup>3</sup> | 4735  | 1.0                            | 1.12 (0.85, 1.49) | 1.28 (0.95, 1.73) | 0.95 (0.64, 1.42) |  |
| Hay fever ever <sup>4</sup>                          | 3721  | 1.0                            | 0.97 (0.78, 1.21) | 1.05 (0.82, 1.34) | 1.08 (0.80, 1.47) |  |
| Current symptoms of eczema <sup>4</sup>              | 3228  | 1.0                            | 0.89 (0.68, 1.16) | 0.86 (0.63, 1.18) | 0.74 (0.44, 1.26) |  |
| Eczema ever <sup>5</sup>                             | 5503  | 1.0                            | 0.95 (0.78, 1.15) | 0.99 (0.80, 1.24) | 1.02 (0.75, 1.37) |  |
| <b>Oceania</b>                                       |       |                                |                   |                   |                   |  |
| Current wheeze <sup>1</sup>                          | -     | -                              | -                 | -                 | -                 |  |
| Asthma ever <sup>2</sup>                             | 3314  | 1.0                            | 0.88 (0.66, 1.17) | 0.80 (0.61, 1.06) | 0.75 (0.55, 1.00) |  |
| Current symptoms of rhinoconjunctivitis <sup>3</sup> | 2955  | 1.0                            | 1.02 (0.67, 1.56) | 1.09 (0.73, 1.63) | 1.24 (0.81, 1.88) |  |
| Hay fever ever <sup>4</sup>                          | 3275  | 1.0                            | 0.97 (0.69, 1.36) | 1.02 (0.74, 1.42) | 1.06 (0.75, 1.50) |  |
| Current symptoms of eczema <sup>4</sup>              | 3178  | 1.0                            | 0.74 (0.52, 1.06) | 0.81 (0.57, 1.13) | 0.75 (0.52, 1.07) |  |
| Eczema ever <sup>5</sup>                             | 3293  | 1.0                            | 0.90 (0.68, 1.20) | 1.08 (0.82, 1.42) | 1.11 (0.83, 1.49) |  |

<sup>1</sup>Multivariate analysis (children with complete covariate data), adjusted for child's sex, gross national income, breastfeeding, pets at home, and paracetamol use for fever.

<sup>2</sup>Multivariate analysis (children with complete covariate data), adjusted for child's sex, gross national income, maternal education, siblings, pets at home, and paracetamol use for fever.

<sup>3</sup>Multivariate analysis (children with complete covariate data), adjusted for child's sex, gross national income, pets at home, and paracetamol use for fever.

<sup>4</sup>Multivariate analysis (children with complete covariate data), adjusted for child's sex, gross national income, maternal education, breastfeeding, siblings, and paracetamol use for fever.

<sup>5</sup>Multivariate analysis (children with complete covariate data), adjusted for child's sex, gross national income, maternal education, breastfeeding, and paracetamol use for fever.



**Table S5.** Associations\* (odds ratio and 95% CI) between healthy lifestyle index and symptoms of asthma, rhino-conjunctivitis, and eczema at 6–7 years of age stratified by gross national income per capita, the ISAAC Phase Three.

|  | N     | Healthy lifestyle index points |                    |                    |                    |
|--|-------|--------------------------------|--------------------|--------------------|--------------------|
|  |       | 0-1                            | 2                  | 3                  | 4-5                |
| <b>Low-income</b>                                    |       |                                |                    |                    |                    |
| Current wheeze <sup>1</sup>                          | 1438  | 1.0                            | 1.24 (0.15, 10.23) | 1.62 (0.21, 12.5)  | 1.08 (0.13, 8.89)  |
| Asthma ever <sup>2</sup>                             | 1219  | 1.0                            | 1.42 (0.31, 6.49)  | 1.70 (0.39, 7.48)  | 0.78 (0.16, 3.71)  |
| Current symptoms of rhinoconjunctivitis <sup>3</sup> | 1320  | 1.0                            | 1.29 (0.16, 10.65) | 2.55 (0.34, 19.36) | 1.59 (0.20, 12.60) |
| Hay fever ever <sup>4</sup>                          | -     | -                              | -                  | -                  | -                  |
| Current symptoms of eczema <sup>4</sup>              | 1188  | 1.0                            | 1.06 (0.23, 4.89)  | 1.34 (0.31, 5.86)  | 0.90 (0.20, 4.11)  |
| Eczema ever <sup>5</sup>                             | 1438  | 1.0                            | 0.27 (0.08, 0.94)  | 0.41 (0.14, 1.26)  | 0.34 (0.11, 1.12)  |
| <b>Low-middle income</b>                             |       |                                |                    |                    |                    |
| Current wheeze <sup>1</sup>                          | 11227 | 1.0                            | 0.85 (0.72, 1.02)  | 0.73 (0.60, 0.89)  | 0.68 (0.52, 0.89)  |
| Asthma ever <sup>2</sup>                             | 10260 | 1.0                            | 0.83 (0.67, 1.04)  | 0.78 (0.62, 0.99)  | 0.68 (0.48, 0.95)  |
| Current symptoms of rhinoconjunctivitis <sup>3</sup> | 9984  | 1.0                            | 0.92 (0.74, 1.14)  | 0.97 (0.78, 1.22)  | 0.95 (0.71, 1.27)  |
| Hay fever ever <sup>4</sup>                          | 10402 | 1.0                            | 0.98 (0.82, 1.16)  | 0.99 (0.82, 1.19)  | 1.00 (0.78, 1.29)  |
| Current symptoms of eczema <sup>4</sup>              | 10120 | 1.0                            | 0.85 (0.69, 1.04)  | 0.81 (0.65, 1.01)  | 0.91 (0.68, 1.20)  |
| Eczema ever <sup>5</sup>                             | 10691 | 1.0                            | 0.89 (0.76, 1.04)  | 0.84 (0.71, 1.00)  | 0.94 (0.74, 1.21)  |
| <b>Upper-middle income</b>                           |       |                                |                    |                    |                    |
| Current wheeze <sup>1</sup>                          | 22827 | 1.0                            | 1.04 (0.91, 1.18)  | 0.87 (0.76, 0.99)  | 0.70 (0.59, 0.84)  |
| Asthma ever <sup>2</sup>                             | 20833 | 1.0                            | 0.93 (0.79, 1.09)  | 0.88 (0.67, 0.95)  | 0.66 (0.52, 0.83)  |
| Current symptoms of rhinoconjunctivitis <sup>3</sup> | 19468 | 1.0                            | 0.96 (0.85, 1.09)  | 0.89 (0.79, 1.01)  | 0.80 (0.68, 0.94)  |
| Hay fever ever <sup>4</sup>                          | 19041 | 1.0                            | 1.00 (0.86, 1.18)  | 0.99 (0.85, 1.17)  | 0.87 (0.72, 1.06)  |
| Current symptoms of eczema <sup>4</sup>              | 18936 | 1.0                            | 0.97 (0.83, 1.13)  | 0.96 (0.82, 1.12)  | 0.85 (0.70, 1.03)  |
| Eczema ever <sup>5</sup>                             | 21188 | 1.0                            | 0.96 (0.84, 1.11)  | 0.95 (0.82, 1.09)  | 1.11 (0.94, 1.31)  |
| <b>High income</b>                                   |       |                                |                    |                    |                    |
| Current wheeze <sup>1</sup>                          | 25630 | 1.0                            | 0.89 (0.79, 0.99)  | 0.71 (0.63, 0.79)  | 0.61 (0.54, 0.70)  |
| Asthma ever <sup>2</sup>                             | 23236 | 1.0                            | 0.88 (0.78, 0.99)  | 0.78 (0.69, 0.88)  | 0.68 (0.60, 0.78)  |
| Current symptoms of rhinoconjunctivitis <sup>3</sup> | 22594 | 1.0                            | 1.04 (0.90, 1.19)  | 0.92 (0.80, 1.05)  | 0.89 (0.77, 1.04)  |
| Hay fever ever <sup>4</sup>                          | 23085 | 1.0                            | 1.09 (0.95, 1.26)  | 0.99 (0.86, 1.15)  | 0.93 (0.79, 1.09)  |
| Current symptoms of eczema <sup>4</sup>              | 22445 | 1.0                            | 0.83 (0.72, 0.97)  | 0.78 (0.67, 0.91)  | 0.77 (0.66, 0.91)  |
| Eczema ever <sup>5</sup>                             | 24847 | 1.0                            | 1.03 (0.94, 1.13)  | 1.01 (0.92, 1.11)  | 1.07 (0.97, 1.18)  |

<sup>1</sup>Multivariate analysis (children with complete covariate data), adjusted for child's sex, region of the world, breastfeeding, pets at home, and paracetamol use for fever.

<sup>2</sup>Multivariate analysis (children with complete covariate data), adjusted for child's sex, region of the world, maternal education, siblings, pets at home, and paracetamol use for fever.

<sup>3</sup>Multivariate analysis (children with complete covariate data), adjusted for child's sex, region of the world, pets at home, and paracetamol use for fever.

<sup>4</sup>Multivariate analysis (children with complete covariate data), adjusted for child's sex, region of the world, maternal education, breastfeeding, siblings, and paracetamol use for fever.

<sup>5</sup>Multivariate analysis (children with complete covariate data), adjusted for child's sex, region of the world, maternal education, breastfeeding, and paracetamol use for fever.