**Supplementary Table 1.** Foods/drinks and groups of foods/drinks enquired about, by age, wave and cohort\*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Age (years)** | **2-3** | **4-5** | **6-7** | **8-9** | **10-11** | **12-13** | **14-15** |
| **Wave and cohort (B=B Cohort, K=K Cohort)** | **2B** | **3B** | **1K** | **4B** | **2K** | **5B** | **3K** | **6B** | **4K** | **5K** | **6K** |
| Fresh fruit | ● | ● | ● | ● | ● | ● | ● |  |  |  |  |
| Fruit juice | ● | ● | ● | ● | ● | ● | ● |  |  |  |  |
| Fresh juice |  |  |  |  |  |  |  |  |  |  |  |
| Cooked vegetables | ● | ● | ● | ● | ● | ● | ● |  |  |  |  |
| Raw vegetables or salad | ● | ● | ● | ● | ● | ● | ● |  |  |  |  |
| Meat pie, hamburger, hot dog, sausage or sausage roll | ● | ● | ● | ● | ● | ● | ● |  |  |  |  |
| Hot chips or French fries | ● | ● | ● | ● | ● | ● | ● |  |  |  |  |
| Potato chips or savoury snacks, such as ‘Twisties’ | ● | ● | ● | ● | ● | ● | ● |  |  |  |  |
| Biscuits, doughnuts, cake, pie or chocolate | ● | ● | ● |  | ● |  | ● |  |  |  |  |
| Biscuits, doughnuts, cake or chocolate |  |  |  | ● |  | ● |  |  |  |  |  |
| Full cream milk or full cream milk products | ● | ● | ● | ● | ● | ● | ● |  |  |  |  |
| Milk or milk products (e.g. yoghurt or cheese) |  |  |  |  |  |  |  |  |  |  |  |
| Skim, reduced or no fat milk or milk products | ● | ● | ● | ● | ● | ● | ● |  |  |  |  |
| Soy milk or soy milk products |  |  |  |  |  |  |  |  |  |  |  |
| Water | ● | ● | ● | ● | ● | ● | ● |  |  |  |  |
| Non-diet soft drink or cordial | ● | ● | ● | ● | ● | ● | ● |  |  |  |  |
| Diet or sugar-free soft drink or cordial | ● | ● |  | ● | ● | ● | ● |  |  |  |  |
| Bread or toast |  |  |  |  |  |  |  |  |  |  |  |
| Energy drinks (e.g. Redbull, Mother or V) |  |  |  |  |  |  |  |  |  |  |  |
| Coffee |  |  |  |  |  |  |  |  |  |  |  |

B, B Cohort; K, K Cohort.

\*Numbers to the left of ‘B’ and ‘K’ denote waves of LSAC. Dots denote the waves in which each food or drink item or group was enquired about. Solid dots (●) denote items reported by parents for the last 24 hours and hollow dots () denote items reported by children for the previous day (‘yesterday’). Response options for all items were ‘not at all’, ‘once’ and ‘more than once’ for wave one of the K Cohort, wave two of the B Cohort and wave two of the K Cohort; and ‘not at all’, once’, ‘twice’ and either ‘more than twice’ or ‘three or more times’ for all other waves of both cohorts. For questions with more than three response options, the upper category was collapsed into ‘twice or more’ for the purposes of the statistical analyses, in order to keep all categories consistent between waves.

Table closely adapted from Gasser CE, Kerr JA, Mensah FK *et al.* (2017) Stability and change in dietary scores and patterns across six waves of the Longitudinal Study of Australian Children. *Br J Nutr* **117**,1137-1150, with permission of the British Journal of Nutrition.

**Supplementary Table 2.** Distribution of anthropometric and dietary variables, by wave and cohort\*

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **B Cohort** |  | **K Cohort** |
| **Wave 2 (2-3 years)** | **Wave 3 (4-5 years)** | **Wave 4 (6-7 years)** | **Wave 5 (8-9 years)** | **Wave 6 (10-11 years)** |  | **Wave 1 (4-5 years)** | **Wave 2 (6-7 years)** | **Wave 3 (8-9 years)** | **Wave 4 (10-11 years)** | **Wave 5 (12-13 years)** | **Wave 6 (14-15 years)** |
| **Child BMI z-score** |  |  |  |  |  |  |  |  |  |  |  |  |
|  Mean | 0.5  | 0.5  | 0.4  | 0.4 | 0.3  |  | 0.5  | 0.4  | 0.4  | 0.4  | 0.4  | 0.4  |
|  SD | 1.1 | 1.1 | 1.0 | 1.1 | 1.2 |  | 1.0 | 1.0 | 1.0 | 1.0 | 1.1 | 1.2 |
| **Child waist-height ratio** |  |  |  |  |  |  |  |  |  |  |  |
|  Mean | 0.5  | 0.5  | 0.5  | 0.5  | 0.5 |  | 0.5  | 0.5  | 0.5  | 0.5 | 0.5  | 0.4  |
|  SD | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 |  | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 |
| **Child overall dietary score** |  |  |  |  |  |  |  |  |  |  |  |
|  Mean | 10.3  | 10.4  | 10.2  | 10.2  | 9.5  |  | 9.7  | 9.8  | 9.9  | 9.2 | 9.4  | 9.5  |
|  SD | 2.1 | 2.1 | 2.1 | 2.1 | 2.3 |  | 2.2 | 2.2 | 2.2 | 2.2 | 2.3 | 2.4 |
| **Child healthy factor score** |  |  |  |  |  |  |  |  |  |  |  |
|  Mean | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
|  SD | 0.6 | 0.6 | 0.6 | 0.7 | 0.8 |  | 0.7 | 0.7 | 0.6 | 0.7 | 0.7 | 0.8 |
| **Child unhealthy factor score** |  |  |  |  |  |  |  |  |  |  |  |
|  Mean | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
|  SD | 0.7 | 0.7 | 0.7 | 0.7 | 0.8 |  | 0.7 | 0.7 | 0.7 | 0.8 | 0.8 | 0.8 |

BMI, body mass index; SD, standard deviation.

\**n* ranged from 3174 to 4930.

**Supplementary Table 3.** Fully-adjusted\* multivariable associations between dietary scores, ‘healthy’ patterns and ‘unhealthy’ patterns as exposure variables, and BMI z-score in the subsequent wave† as outcome variables, for both cohorts, from cross-lagged analyses accounting for correlations.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Exposure time point** | **Dietary scores (*n*=2502 (B Cohort) and *n*=2014 (K Cohort)** |  | **‘Healthy’ patterns (*n*=2493 (B Cohort) and *n*=2009 (K Cohort))** |  | **‘Unhealthy’ patterns (*n*=2493 (B Cohort) and *n*=2009 (K Cohort))** |
| **Coefficient** | **95% confidence interval** | **p-value** |  | **Coefficient** | **95% confidence interval** | **p-value** |  | **Coefficient** | **95% confidence interval** | **p-value** |
| **B Cohort** |  |  |  |  |  |  |  |  |  |
|  Wave 2: 2-3 years | 0.01 | (-0.03, 0.04) | 0.70 | 0.01 | (-0.02, 0.05) | 0.41 | 0.02 | (-0.03, 0.06) | 0.46 |
| Wave 3: 4-5 years | -0.02 | (-0.05, 0.02) | 0.34 | 0.02 | (-0.02, 0.05) | 0.35 | 0.01 | (-0.03, 0.05) | 0.54 |
| Wave 4: 6-7 years | -0.01 | (-0.04, 0.02) | 0.57 | 0.01 | (-0.02, 0.05) | 0.53 | 0.02 | (-0.01, 0.05) | 0.24 |
| Wave 5: 8-9 years | -0.03 | (-0.06, 0.01) | 0.17 | -0.03 | (-0.07, 0.02) | 0.22 | 0.01 | (-0.02, 0.05) | 0.37 |
| **K Cohort** |  |  |  |  |  |  |  |  |  |
|  Wave 1: 4-5 years | 0.01 | (-0.03, 0.04) | 0.76 | 0.00 | (-0.04, 0.03) | 0.83 | 0.00 | (-0.04, 0.03) | 0.87 |
|  Wave 2: 6-7 years | 0.01 | (-0.02, 0.04) | 0.55 | -0.01 | (-0.04, 0.02) | 0.47 | 0.00 | (-0.03, 0.03) | 0.93 |
| Wave 3: 8-9 years | 0.00 | (-0.03, 0.03) | 0.84 | -0.01 | (-0.04, 0.02) | 0.42 | 0.01 | (-0.02, 0.04) | 0.61 |
| Wave 4: 10-11 years | 0.00 | (-0.02, 0.03) | 0.83 | 0.01 | (-0.02, 0.03) | 0.52 | 0.00 | (-0.03, 0.03) | 0.88 |
| Wave 5: 12-13 years | 0.02 | (-0.02, 0.07) | 0.36 | 0.01 | (-0.03, 0.04) | 0.73 | 0.00 | (-0.05, 0.04) | 0.94 |

\*Analyses adjusted for child Indigenous status, language other than English spoken at home, television viewing, pubertal status, physical activity, age and sex; birthweight z-score and socioeconomic position. We included covariates that remained relatively stable throughout the duration of LSAC (child Indigenous status, language other than English spoken at home and sex) from wave one of each cohort. For the remaining covariates which each had the potential to change over time, we included the measure from the same time point as the relevant exposure variable. If covariates were unavailable at a particular wave, we took them from the previous wave.

†In both cohorts and for each analysis, BMI z-score was taken at the wave after the wave at which the exposure variable was taken (i.e. if the exposure variables were taken at wave 2, BMI z-score was taken at wave 3).

**Supplementary Table 4.** Fully-adjusted\* multivariable associations between BMI z-score as the exposure variable, and dietary scores, ‘healthy’ patterns and ‘unhealthy’ patterns in the subsequent wave† as outcome variables, for both cohorts, from cross-lagged analyses accounting for correlations.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Exposure time point** | **Dietary scores (*n*=2502 (B Cohort) and *n*=2014 (K Cohort)** |  | **‘Healthy’ patterns (*n*=2493 (B Cohort) and *n*=2009 (K Cohort))** |  | **‘Unhealthy’ patterns (*n*=2493 (B Cohort) and *n*=2009 (K Cohort))** |
| **Coefficient**  | **95% confidence interval** | **p-value** |  | **Coefficient** | **95% confidence interval** | **p-value** |  | **Coefficient** | **95% confidence interval** | **p-value** |
| **B Cohort** |  |  |  |  |  |  |  |  |  |
|  Wave 2: 2-3 years | 0.03 | (-0.01, 0.06) | 0.18 | -0.02 | (-0.05, 0.02) | 0.42 | -0.04 | (-0.08, -0.01) | 0.02 |
| Wave 3: 4-5 years | -0.01 | (-0.05, 0.02) | 0.52 | -0.01 | (-0.05, 0.03) | 0.52 | 0.00 | ( -0.03, 0.04) | 0.89 |
| Wave 4: 6-7 years | 0.01 | (-0.03, 0.05) | 0.62 | 0.00 | (-0.04, 0.04) | 0.97 | 0.01 | (-0.03, 0.05) | 0.63 |
| Wave 5: 8-9 years | 0.03 | (-0.01, 0.07) | 0.13 | 0.03 | (-0.01, 0.07) | 0.14 | 0.00 | (-0.05, 0.04) | 0.83 |
| **K Cohort** |  |  |  |  |  |  |  |  |  |
|  Wave 1: 4-5 years | 0.00 | (-0.04, 0.05) | 0.84 | -0.02 | (-0.06, 0.03) | 0.47 | 0.00 | (-0.04, 0.05) | 0.92 |
|  Wave 2: 6-7 years | 0.01 | (-0.04, 0.05) | 0.79 | 0.02 | (-0.03, 0.06) | 0.42 | 0.02 | (-0.02, 0.07) | 0.30 |
| Wave 3: 8-9 years | 0.06 | (0.01, 0.10) | 0.02 | 0.03 | (-0.02, 0.08) | 0.19 | -0.05 | (-0.09, -0.00) | 0.04 |
| Wave 4: 10-11 years | 0.06 | (0.02, 0.10) | 0.003 | 0.01 | (-0.03, 0.05) | 0.74 | -0.05 | (-0.09, -0.01) | 0.02 |
| Wave 5: 12-13 years | 0.06 | (0.02, 0.11) | 0.003 | -0.01 | (-0.05, 0.04) | 0.81 | -0.06 | (-0.09, -0.02) | 0.002 |

\*Adjusted for child Indigenous status, language other than English spoken at home, television viewing, pubertal status, physical activity, age and sex; birthweight z-score and socioeconomic position. We included covariates that remained relatively stable throughout the duration of LSAC (child Indigenous status, language other than English spoken at home and sex) from wave one of each cohort. For the remaining covariates which each had the potential to change over time, we included the measure from the same time point as the relevant exposure variable. If covariates were unavailable at a particular wave, we took them from the previous wave.

†In both cohorts and for each analysis, dietary variables were taken at the wave after the wave at which the exposure variable, BMI z-score, was taken (i.e. if BMI z-score was taken at wave 2, dietary variables were taken at wave 3).

**Supplementary Table 5.** Fully-adjusted\* multivariable associations between dietary scores, ‘healthy’ patterns and ‘unhealthy’ patterns as exposure variables, and waist-height ratio in the subsequent wave† as outcome variables, for both cohorts, from cross-lagged analyses accounting for correlations.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Exposure time point** | **Dietary scores (*n*=2447 (B Cohort) and *n*=1977 (K Cohort))** |  | **‘Healthy’ patterns (*n*=2437 (B Cohort) and *n*=1972 (K Cohort))** |  | **‘Unhealthy’ patterns (*n*=2437 (B Cohort) and *n*=1972 (K Cohort))** |
| **Coefficient** | **95% confidence interval** | **p-value** |  | **Coefficient** | **95% confidence interval** | **p-value** |  | **Coefficient** | **95% confidence interval** | **p-value** |
| **B Cohort** |  |  |  |  |  |  |  |  |  |
|  Wave 2: 2-3 years | 0.00 | (-0.03, 0.03) | 0.90 | 0.01 | (-0.02, 0.04) | 0.45 | 0.01 | (-0.03, 0.05) | 0.62 |
| Wave 3: 4-5 years | -0.02 | (-0.06, 0.01) | 0.21 | 0.00 | (-0.03, 0.03) | 0.76 | 0.04 | (0.00, 0.07) | 0.03 |
| Wave 4: 6-7 years | -0.03 | (-0.06, 0.00) | 0.06 | -0.03 | (-0.06, 0.01) | 0.10 | 0.03 | (0.00, 0.06) | 0.03 |
| Wave 5: 8-9 years | -0.04 | (-0.07, 0.00) | 0.05 | -0.05 | (-0.08, -0.01) | 0.007 | 0.04 | (0.00, 0.07) | 0.03 |
| **K Cohort** |  |  |  |  |  |  |  |  |  |
|  Wave 1: 4-5 years | -0.01 | (-0.05, 0.03) | 0.52 | -0.04 | (-0.08, 0.00) | 0.07 | -0.01 | (-0.05, 0.03) | 0.57 |
|  Wave 2: 6-7 years | -0.01 | (-0.05, 0.02) | 0.45 | -0.01 | (-0.04, 0.02) | 0.47 | 0.03 | (-0.01, 0.07) | 0.18 |
| Wave 3: 8-9 years | -0.03 | (-0.07, 0.01) | 0.12 | -0.02 | (-0.06, 0.02) | 0.40 | 0.04 | (-0.00, 0.08) | 0.07 |
| Wave 4: 10-11 years | -0.01 | (-0.04, 0.02) | 0.58 | -0.03 | (-0.06, -0.00) | 0.03 | -0.03 | (-0.07, -0.00) | 0.03 |
| Wave 5: 12-13 years | -0.03 | (-0.07, 0.01) | 0.16 | -0.05 | (-0.09, -0.00) | 0.03 | 0.00 | (-0.03, 0.04) | 0.86 |

\*Adjusted for child Indigenous status, language other than English spoken at home, television viewing, pubertal status, physical activity, age and sex; birthweight z-score and socioeconomic position. We included covariates that remained relatively stable throughout the duration of LSAC (child Indigenous status, language other than English spoken at home and sex) from wave one of each cohort. For the remaining covariates which each had the potential to change over time, we included the measure from the same time point as the relevant exposure variable. If covariates were unavailable at a particular wave, we took them from the previous wave.

†In both cohorts and for each analysis, waist-height ratio was taken at the wave after the wave at which the exposure variable was taken (i.e. if the exposure variables were taken at wave 2, waist-height ratio was taken at wave 3).

**Supplementary Table 6.** Fully-adjusted\* multivariable associations between waist-height ratio as the exposure variable, and dietary scores, ‘healthy’ patterns and ‘unhealthy’ patterns in the subsequent wave† as outcome variables, for both cohorts, from cross-lagged analyses accounting for correlations.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Exposure time point** | **Dietary scores (*n*=2447 (B Cohort) and *n*=1977 (K Cohort))** |  | **‘Healthy’ patterns (*n*=2437 (B Cohort) and *n*=1972 (K Cohort))** |  | **‘Unhealthy’ patterns (*n*=2437 (B Cohort) and *n*=1972 (K Cohort))** |
| **Coefficient** | **95% confidence interval** | **p-value** |  | **Coefficient** | **95% confidence interval** | **p-value** |  | **Coefficient** | **95% confidence interval** | **p-value** |
| **B Cohort** |  |  |  |  |  |  |  |  |  |
|  Wave 2: 2-3 years | 0.01 | (-0.03, 0.05) | 0.54 | -0.01 | (-0.06, 0.03) | 0.51 | -0.02 | (-0.06, 0.01) | 0.21 |
| Wave 3: 4-5 years | -0.01 | (-0.05, 0.03) | 0.58 | -0.02 | (-0.07, 0.02) | 0.28 | 0.02 | (-0.02, 0.05) | 0.43 |
| Wave 4: 6-7 years | 0.02 | (-0.02, 0.06) | 0.32 | -0.03 | (-0.07, 0.01) | 0.15 | 0.01 | (-0.04, 0.06) | 0.63 |
| Wave 5: 8-9 years | 0.01 | (-0.03, 0.05) | 0.63 | -0.02 | (-0.07, 0.02) | 0.28 | -0.01 | (-0.05, 0.03) | 0.53 |
| **K Cohort** |  |  |  |  |  |  |  |  |  |
|  Wave 1: 4-5 years | -0.01 | (-0.06, 0.03) | 0.59 | -0.01 | (-0.05, 0.04) | 0.78 | 0.03 | (-0.03, 0.08) | 0.33 |
|  Wave 2: 6-7 years | -0.03 | (-0.08, 0.02) | 0.19 | 0.00 | (-0.04, 0.05) | 0.85 | 0.05 | (-0.00, 0.11) | 0.06 |
| Wave 3: 8-9 years | 0.05 | (0.00, 0.09) | 0.04 | 0.02 | (-0.03, 0.07) | 0.51 | -0.04 | (-0.09, 0.01) | 0.10 |
| Wave 4: 10-11 years | -0.01 | (-0.06, 0.04) | 0.70 | -0.07 | (-0.12, -0.02) | 0.007 | -0.02 | (-0.06, 0.03) | 0.43 |
| Wave 5: 12-13 years | -0.01 | (-0.06, 0.04) | 0.70 | -0.06 | (-0.11, -0.01) | 0.02 | -0.03 | (-0.07, 0.01) | 0.20 |

\*Adjusted for child Indigenous status, language other than English spoken at home, television viewing, pubertal status, physical activity, age and sex; birthweight z-score and socioeconomic position. We included covariates that remained relatively stable throughout the duration of LSAC (child Indigenous status, language other than English spoken at home and sex) from wave one of each cohort. For the remaining covariates which each had the potential to change over time, we included the measure from the same time point as the relevant exposure variable. If covariates were unavailable at a particular wave, we took them from the previous wave.

†In both cohorts and for each analysis, dietary variables were taken at the wave after the wave at which the exposure variable, waist-height ratio, was taken (i.e. if waist-height ratio was taken at wave 2, dietary variables were taken at wave 3).