**Supplementary Table 1:** Technical error of measurement (TEM) and coefficient of variation (CV) used for assessment of reliability of measurements.

|  |  |  |
| --- | --- | --- |
| **Measures** | **Technical error of measurement(TEM)** | **Coefficient of variation (%)** |
|  |  |  |
| Weight (kg) | 0.09 | 0.19 |
| Length (cm) | 0.26 | 0.16 |
| Head Circumference (cm) | 0.71 | 1.39 |
| Mid-arm circumference (cm) | 0.65 | 2.57 |
| Abdominal circumference (cm) | 0.30 | 0.50 |
| Triceps skinfolds (mm) | 0.80 | 6.00 |
| Subscapular skinfolds (mm) | 0.83 | 4.18 |

**Supplementary Table 2**. Comparison of maternal and infant characteristics between main study cohort and subset

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | **Main cohort** | | **Subset** | | ***p-value*** |
|  |  | *n=* *807* | | *n=* *399* | |
|  |  | Mean/N1 | SD/%2 | Mean/N1 | SD/%2 |
| *Maternal characteristics* | |  |  |  |  |  |
| **Maternal vitamin D plasma conc (nmol/L)** | | 80.9 | 27.0 | 83.0 | 25.6 | 0.198 |
| **Maternal age** | | 30.6 | 5.1 | 31.1 | 5.0 | 0.089 |
| **Maternal BMI** | | 26.2 | 4.4 | 26.2 | 4.4 | 0.797 |
| **Total maternal energy intake (kcal)** | | 2046 | 1325 | 2059 | 1336 | 0.869 |
| **Ethnicity** | |  |  |  |  | 0.150 |
|  | Chinese | 449 | 55.6 | 237 | 59.4 |  |
|  | Malay | 209 | 25.9 | 106 | 26.6 |  |
|  | Indian | 149 | 18.5 | 56 | 14.0 |  |
| **Education** | |  |  |  |  | 0.964 |
|  | Primary and Secondary | 237 | 29.4 | 120 | 30.1 |  |
|  | Post-Secondary | 282 | 34.9 | 137 | 34.3 |  |
|  | University | 288 | 35.7 | 142 | 35.6 |  |
| **Smoked regularly during pregnancy** | |  |  |  |  | 1.000 |
|  | No | 788 | 97.6 | 389 | 97.5 |  |
|  | Yes | 19 | 2.4 | 10 | 2.5 |  |
| **Maternal vitamin D status** | |  |  |  |  | 0.175 |
|  | Deficient | 109 | 13.5 | 39 | 9.8 |  |
|  | Insufficient | 215 | 26.6 | 109 | 27.3 |  |
|  | Sufficient | 483 | 59.9 | 251 | 62.9 |  |
| *Infant characteristics* | |  |  |  |  |  |
| **Birth weight (g)** | | 3193.5 | 370.7 | 3210.4 | 370.4 | 0.456 |
| **Birth length (cm)** | | 49.0 | 1.9 | 49.1 | 2.0 | 0.566 |
| **Birth Order** | |  |  |  |  | 0.287 |
|  | First Child | 347 | 43.0 | 158 | 39.6 |  |
|  | Not First Child | 460 | 57.0 | 241 | 60.4 |  |
| **Infant sex** | |  |  |  |  | 0.223 |
|  | Female | 379 | 47.0 | 203 | 50.9 |  |
|  | Male | 428 | 53.0 | 196 | 49.1 |  |
| **SGA** | |  |  |  |  | 0.343 |
|  | No | 736 | 91.2 | 371 | 93.0 |  |
|  | Yes | 71 | 8.8 | 28 | 7.0 |  |

1 reflects mean of continuous variables or frequency for categorical variables

2 reflects standard deviation of continuous variables or percentages of categorical variables

**Supplementary Table 3**. Subset analysis for association of maternal vitamin D status in pregnancy (independent variable) with infant weight-for-age z-scores, length-for-age z-scores and conditional change in weight-for-age z-scores and length-for-age z-scores (dependent variables) (n=399)1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | **Vitamin D**  **Deficiency**  **(<50 nmol/L)** | **Vitamin D**  **Insufficiency (≥50 and <75 nmol/L)** | **Vitamin D**  **Sufficiency**  **(>75 nmol/L)** |
|  | | *n=* *39* | *n=* *109* | *n=* *251* |
|  | | β (95%CI) | β (95%CI) | β |
| **Weight-for-age z-score** | | |  |  |
|  | 0 m | -0.05 (-0.33, 0.22) | 0.19 (0.01, 0.37) | Ref |
|  | 3 m | -0.35 (-0.69, -0.02) | 0.12 (-0.10, 0.34) | Ref |
|  | 6 m | -0.33 (-0.69, 0.02) | 0.04 (-0.19, 0.27) | Ref |
|  | 9 m | -0.36 (-0.70, -0.01) | 0.05 (-0.18, 0.28) | Ref |
|  | 12 m | -0.38 (-0.73, -0.03) | 0.11 (-0.12, 0.34) | Ref |
|  | 15 m | -0.42 (-0.77, -0.07) | 0.10 (-0.13, 0.33) | Ref |
|  | 18 m | -0.45 (-0.80, -0.10) | 0.12 (-0.11, 0.35) | Ref |
|  | 24 m | -0.43 (-0.80, -0.06) | 0.02 (-0.22, 0.26) | Ref |
| **Conditional change in weight-for-age z-scores** | | |  |  |
|  | 0-3 m | -0.38 (-0.73, -0.03) | 0.01 (-0.22, 0.24) | Ref |
|  | 3-6 m | -0.04 (-0.39, 0.30) | -0.12 (-0.35, 0.10) | Ref |
|  | 6-9 m | -0.15 (-0.51, 0.20) | 0.04 (-0.19, 0.27) | Ref |
|  | 9-12 m | -0.13 (-0.47, 0.20) | 0.19 (-0.03, 0.41) | Ref |
|  | 12-15 m | -0.19 (-0.53, 0.15) | -0.02 (-0.24, 0.20) | Ref |
|  | 15-18 m | -0.13 (-0.47, 0.21) | 0.07 (-0.15, 0.29) | Ref |
|  | 18-24 m | 0.00 (-0.35, 0.36) | -0.22 (-0.46, 0.01) | Ref |
| **Length-for-age z-score** | | |  |  |
|  | 0 m | 0.09 (-0.27, 0.46) | 0.23 (-0.01, 0.47) | Ref |
|  | 3 m | -0.37 (-0.73, 0.00) | 0.14 (-0.11, 0.38) | Ref |
|  | 6 m | -0.51 (-0.91, -0.12) | 0.01 (-0.25, 0.27) | Ref |
|  | 9 m | -0.38 (-0.79, 0.02) | 0.05 (-0.21, 0.32) | Ref |
|  | 12 m | -0.22 (-0.64, 0.20) | 0.15 (-0.13, 0.43) | Ref |
|  | 15 m | -0.41 (-0.81, -0.01) | 0.03 (-0.23, 0.30) | Ref |
|  | 18 m | -0.41 (-0.79, -0.02) | 0.18 (-0.08, 0.43) | Ref |
|  | 24 m | -0.35 (-0.74, 0.03) | 0.14 (-0.12, 0.39) | Ref |
| **Conditional change in length-for-age z-scores** | | |  |  |
|  | 0-3 m | -0.42 (-0.76, -0.07) | 0.02 (-0.20, 0.24) | Ref |
|  | 3-6 m | -0.30 (-0.67, 0.07) | -0.10 (-0.34, 0.14) | Ref |
|  | 6-9 m | -0.02 (-0.38, 0.34) | 0.05 (-0.18, 0.29) | Ref |
|  | 9-12 m | 0.11 (-0.25, 0.48) | 0.14 (-0.10, 0.38) | Ref |
|  | 12-15 m | -0.33 (-0.67, 0.02) | -0.11 (-0.34, 0.12) | Ref |
|  | 15-18 m | -0.14 (-0.49, 0.21) | 0.22 (-0.01, 0.45) | Ref |
|  | 18-24 m | -0.05 (-0.44, 0.34) | 0.00 (-0.26, 0.25) | Ref |

1 adjusted for maternal ethnicity, education, smoking during pregnancy, age, pregnancy BMI, total maternal energy intake and infant birth order

**Supplementary Table 4**. Subset analysis for association of maternal vitamin D status in pregnancy (independent variable) with infant head, abdominal and mid-arm circumference (dependent variables) (n=399)1

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Vitamin D**  **Deficiency**  **(<50 nmol/L)** | | | **Vitamin D**  **Insufficiency (≥50 and <75 nmol/L)** | | | **Vitamin D**  **Sufficiency**  **(>75 nmol/L)** | |
|  | | N | β (95%CI) | | N | | β (95%CI) | N | β |
| **Head circumference2** | | | |  | |  | |  |  |
|  | 0 m | 36 | -0.13 (-0.58, 0.32) | | 100 | | 0.20 (-0.09, 0.50) | 231 | Ref |
|  | 3 m |  | -0.03 (-0.47, 0.42) | |  | | 0.25 (-0.04, 0.54) |  | Ref |
|  | 6 m |  | 0.15 (-0.33, 0.62) | |  | | 0.22 (-0.09, 0.53) |  | Ref |
|  | 9 m |  | 0.08 (-0.42, 0.58) | |  | | 0.19 (-0.14, 0.52) |  | Ref |
|  | 12 m |  | 0.10 (-0.40, 0.60) | |  | | 0.25 (-0.08, 0.57) |  | Ref |
|  | 15 m |  | 0.04 (-0.47, 0.54) | |  | | 0.16 (-0.17, 0.48) |  | Ref |
|  | 18 m |  | -0.10 (-0.66, 0.46) | |  | | 0.31 (-0.06, 0.67) |  | Ref |
|  | 24 m |  | -0.56 (-1.10, -0.02) | |  | | 0.03 (-0.33, 0.38) |  | Ref |
| **Abdominal circumference2** | | | |  | |  | |  |  |
|  | 0 m | 37 | 0.08 (-0.77, 0.92) | | 97 | | 0.24 (-0.32, 0.80) | 230 | Ref |
|  | 3 m |  | -1.03 (-2.13, 0.07) | |  | | 0.18 (-0.55, 0.91) |  | Ref |
|  | 6 m |  | -0.49 (-1.60, 0.62) | |  | | 0.25 (-0.49, 0.98) |  | Ref |
|  | 9 m |  | -1.42 (-2.63, -0.20) | |  | | -0.08 (-0.89, 0.72) |  | Ref |
|  | 12 m |  | -1.32 (-2.53, -0.10) | |  | | -0.60 (-1.40, 0.20) |  | Ref |
|  | 15 m |  | -1.04 (-2.19, 0.11) | |  | | -0.21 (-0.97, 0.55) |  | Ref |
|  | 18 m |  | -1.38 (-2.63, -0.13) | |  | | -0.12 (-0.94, 0.71) |  | Ref |
|  | 24 m |  | -1.36 (-2.66, -0.06) | |  | | -0.23 (-1.09, 0.63) |  | Ref |
| **Mid-arm circumference2** | | | |  | |  | |  |  |
|  | 0 m | 36 | -0.07 (-0.40, 0.26) | | 102 | | 0.04 (-0.18, 0.26) | 229 | Ref |
|  | 3 m |  | -0.27 (-0.71, 0.17) | |  | | 0.25 (-0.04, 0.53) |  | Ref |
|  | 6 m |  | -0.23 (-0.70, 0.23) | |  | | 0.05 (-0.26, 0.35) |  | Ref |
|  | 9 m |  | -0.30 (-0.76, 0.16) | |  | | 0.00 (-0.29, 0.30) |  | Ref |
|  | 12 m |  | -0.29 (-0.71, 0.13) | |  | | 0.05 (-0.23, 0.32) |  | Ref |
|  | 15 m |  | -0.18 (-0.62, 0.27) | |  | | 0.07 (-0.22, 0.36) |  | Ref |
|  | 18 m |  | -0.53 (-0.99, -0.07) | |  | | -0.10 (-0.40, 0.20) |  | Ref |
|  | 24 m |  | -0.48 (-0.97, 0.01) | |  | | -0.09 (-0.41, 0.23) |  | Ref |

1 adjusted for maternal ethnicity, education, smoking during pregnancy, age, pregnancy BMI, total maternal energy intake, infant birth order and infant gender

2 total N does not add up to 399 due to missing measurements

**Supplementary Table 5**. Subset analysis for association of maternal vitamin D status in pregnancy (independent variable) with infant BMIZ and conditional change in BMIZ (dependent variables) (n=399)1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Vitamin D**  **Deficiency**  **(<50 nmol/L)** | | | **Vitamin D**  **Insufficiency (≥50 and <75 nmol/L)** | | | | **Vitamin D**  **Sufficiency**  **(>75 nmol/L)** | | | | |
|  |  | N | β (95%CI) | | N | | | β (95%CI) | N | | | | β |
| **BMI-for-age z-score** | | | |  | | |  | |  | |  | | |
|  | 0 m | 39 | -0.16 (-0.50, 0.18) | | | 109 | | 0.11 (-0.11, 0.33) | | 251 | | Ref | |
|  | 3 m |  | -0.21 (-0.57, 0.16) | | |  | | 0.05 (-0.19, 0.29) | |  | | Ref | |
|  | 6 m |  | -0.06 (-0.47, 0.35) | | |  | | 0.03 (-0.24, 0.30) | |  | | Ref | |
|  | 9 m |  | -0.19 (-0.57, 0.19) | | |  | | 0.02 (-0.23, 0.27) | |  | | Ref | |
|  | 12 m |  | -0.37 (-0.72, -0.01) | | |  | | 0.04 (-0.20, 0.27) | |  | | Ref | |
|  | 15 m |  | -0.26 (-0.63, 0.10) | | |  | | 0.11 (-0.13, 0.35) | |  | | Ref | |
|  | 18 m |  | -0.30 (-0.67, 0.07) | | |  | | 0.03 (-0.21, 0.27) | |  | | Ref | |
|  | 24 m |  | -0.30 (-0.69, 0.09) | | |  | | -0.09 (-0.35, 0.17) | |  | | Ref | |
| **Conditional change in BMI-for-age z-scores** | | | |  | | |  | |  | |  | | |
|  | 0-3 m | 39 | -0.17 (-0.52, 0.18) | | | 109 | | 0.03 (-0.20, 0.26) | | 251 | | Ref | |
|  | 3-6 m |  | 0.12 (-0.25, 0.49) | | |  | | -0.01 (-0.25, 0.24) | |  | | Ref | |
|  | 6-9 m |  | -0.21 (-0.56, 0.15) | | |  | | 0.00 (-0.23, 0.23) | |  | | Ref | |
|  | 9-12 m |  | -0.34 (-0.67, 0.00) | | |  | | 0.03 (-0.19, 0.25) | |  | | Ref | |
|  | 12-15 m |  | 0.02 (-0.34, 0.38) | | |  | | 0.12 (-0.12, 0.36) | |  | | Ref | |
|  | 15-18 m |  | -0.16 (-0.51, 0.20) | | |  | | -0.08 (-0.31, 0.16) | |  | | Ref | |
|  | 18-24 m |  | -0.08 (-0.45, 0.28) | | |  | | -0.17 (-0.41, 0.07) | |  | | Ref | |

1 adjusted for maternal ethnicity, education, smoking during pregnancy, age, pregnancy BMI, total maternal energy intake and infant birth order

**Supplementary Table 6**. Subset analysis for association of maternal vitamin D status in pregnancy (independent variable) with infant skinfold measurements (dependent variables) (n=399)1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Vitamin D**  **Deficiency**  **(<50 nmol/L)** | | | **Vitamin D**  **Insufficiency (≥50 and <75 nmol/L)** | | | | **Vitamin D**  **Sufficiency**  **(>75 nmol/L)** | | | | |
|  |  | N | β (95%CI) | | N | | | β (95%CI) | N | | | | β |
| **Triceps skinfold2** | | | |  | | |  | |  | |  | | |
|  | 0 m | 34 | 0.04 (-0.44, 0.52) | | | 92 | | 0.04 (-0.28, 0.36) | | 204 | | Ref | |
|  | 18 m |  | -0.19 (-0.83, 0.45) | | |  | | -0.15 (-0.57, 0.28) | |  | | Ref | |
|  | 24 m |  | -0.30 (-1.01, 0.42) | | |  | | -0.52 (-1.00, -0.05) | |  | | Ref | |
| **Biceps skinfold2** | | | |  | | |  | |  | |  | | |
|  | 18 m | 33 | -0.14 (-0.72, 0.44) | | | 91 | | -0.09 (-0.48, 0.30) | | 203 | | Ref | |
|  | 24 m |  | -0.52 (-1.07, 0.04) | | |  | | -0.20 (-0.57, 0.17) | |  | | Ref | |
| **Subscapular skinfold2** | | | |  | | |  | |  | |  | | |
|  | 0 m | 32 | -0.38 (-0.82, 0.05) | | | 91 | | 0.09 (-0.19, 0.37) | | 204 | | Ref | |
|  | 18 m |  | -0.17 (-0.75, 0.42) | | |  | | -0.27 (-0.64, 0.11) | |  | | Ref | |
|  | 24 m |  | -0.32 (-0.98, 0.34) | | |  | | -0.64 (-1.07, -0.22)\* | |  | | Ref | |

1 adjusted for maternal ethnicity, education, smoking during pregnancy, age, pregnancy BMI, total maternal energy intake, infant birth order and infant gender

2 total N does not add up to 399 due to missing measurements

**Supplementary Table 7.** Association of maternal vitamin D status in pregnancy (independent variable) with conditional change in infant WAZ and LAZ (dependent variables) (n= 807)1

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Vitamin D**  **Deficiency**  **(<50 nmol/L)** | | **Vitamin D**  **Insufficiency (≥50 and <75 nmol/L)** | | | **Vitamin D**  **Sufficiency**  **(>75 nmol/L)** | |
|  | | N | β (95%CI) | N | | β (95%CI) | N | β |
| **Conditional change in weight-for-age z-scores** | | | | |  | |  |  |
|  | 0-3 m | 98 | -0.07 (-0.29, 0.15) | 203 | | -0.12 (-0.28, 0.05) | 458 | Ref |
|  | 3-6 m | 84 | 0.09 (-0.15, 0.33) | 189 | | -0.03 (-0.20, 0.15) | 430 | Ref |
|  | 6-9 m | 75 | 0.03 (-0.22, 0.29) | 174 | | 0.13 (-0.05, 0.31) | 412 | Ref |
|  | 9-12 m | 79 | 0.03 (-0.20, 0.26) | 171 | | 0.19 (0.02, 0.36) | 409 | Ref |
|  | 12-15 m | 83 | -0.10 (-0.34, 0.14) | 177 | | 0.03 (-0.15, 0.20) | 423 | Ref |
|  | 15-18 m | 80 | -0.09 (-0.34, 0.16) | 176 | | 0.00 (-0.18, 0.19) | 399 | Ref |
|  | 18-24 m | 71 | 0.11 (-0.16, 0.38) | 176 | | -0.09 (-0.28, 0.10) | 389 | Ref |
| **Conditional change in length-for-age z-scores** | | | | |  | |  |  |
|  | 0-3 m | 98 | -0.15 (-0.37, 0.07) | 201 | | -0.08 (-0.25, 0.08) | 458 | Ref |
|  | 3-6 m | 85 | -0.19 (-0.44, 0.06) | 190 | | 0.03 (-0.15, 0.21) | 432 | Ref |
|  | 6-9 m | 76 | 0.04 (-0.22, 0.29) | 175 | | -0.02 (-0.20, 0.17) | 414 | Ref |
|  | 9-12 m | 79 | 0.21 (-0.04, 0.47) | 173 | | 0.09 (-0.10, 0.27) | 410 | Ref |
|  | 12-15 m | 83 | -0.14 (-0.38, 0.10) | 177 | | -0.10 (-0.28, 0.07) | 419 | Ref |
|  | 15-18 m | 69 | -0.05 (-0.31, 0.21) | 157 | | 0.23 (0.04, 0.42) | 342 | Ref |
|  | 18-24 m | 55 | -0.01 (-0.32, 0.30) | 143 | | -0.04 (-0.26, 0.17) | 304 | Ref |

1 adjusted for maternal ethnicity, education, smoking during pregnancy, age, pregnancy BMI, total maternal energy intake and infant birth order

**Supplementary Table 8.** Association of maternal vitamin D status in pregnancy (independent variable) with conditional change in infant BMIZ (dependent variable) (n= 807)1

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Vitamin D**  **Deficiency**  **(<50 nmol/L)** | | | **Vitamin D**  **Insufficiency (≥50 and <75 nmol/L)** | | | **Vitamin D**  **Sufficiency**  **(>75 nmol/L)** | |
|  | | N | β (95%CI) | | N | | β (95%CI) | N | β |
| **Conditional change in BMI-for-age z-scores** | | | |  | |  | |  |  |
|  | 0-3 m | 98 | 0.01 (-0.21, 0.23) | | 201 | | -0.07 (-0.24, 0.10) | 458 | Ref |
|  | 3-6 m | 84 | 0.20 (-0.04, 0.45) | | 189 | | -0.06 (-0.23, 0.12) | 430 | Ref |
|  | 6-9 m | 75 | 0.00 (-0.27, 0.26) | | 174 | | 0.09 (-0.10, 0.28) | 412 | Ref |
|  | 9-12 m | 79 | -0.17 (-0.42, 0.07) | | 171 | | 0.04 (-0.14, 0.22) | 409 | Ref |
|  | 12-15 m | 83 | 0.04 (-0.20, 0.28) | | 176 | | 0.11 (-0.07, 0.29) | 418 | Ref |
|  | 15-18 m | 69 | -0.04 (-0.30, 0.23) | | 157 | | -0.14 (-0.33, 0.06) | 341 | Ref |
|  | 18-24 m | 55 | -0.03 (-0.33, 0.28) | | 142 | | 0.00 (-0.21, 0.21) | 304 | Ref |

1 adjusted for maternal ethnicity, education, smoking during pregnancy, age, pregnancy BMI, total maternal energy intake and infant birth order

**Supplementary Table 9.** Association of maternal vitamin D status in pregnancy (independent variable) with SGA and pre-term risk (dependent variables) (n=910)1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | **Vitamin D**  **Deficiency**  **(<50 nmol/L)** | **Vitamin D**  **Insufficiency (≥50 and <75 nmol/L)** | **Vitamin D**  **Sufficiency**  **(>75 nmol/L)** |
|  | | *n=120* | *n=241* | *n=549* |
|  | | OR (95%CI) | OR (95%CI) | OR (95%CI) |
| **SGA2** | | 1.21 (0.57, 2.54) | 0.88 (0.37, 2.07) | Ref |
| **Pre-term2** | | 0.99 (0.47, 2.10) | 1.16 (0.49, 2.53) | Ref |

1 Unadjusted

2 No statistically significant differences were seen between maternal vitamin D deficiency status with SGA and pre-term outcomes.

**Supplementary Table 10.** Association of maternal vitamin D status in pregnancy (independent variable) with infant weight-for-age z-scores ,length-for-age z-scores, head, abdominal and mid-arm circumferences from 0 -24 months (dependent variables) (n= 807)1

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  | **Vitamin D**  **Deficiency**  **(<50 nmol/L)** | | | **Vitamin D**  **Insufficiency (≥50 and <75 nmol/L)** | | | **Vitamin D**  **Sufficiency**  **(>75 nmol/L)** | |
|  | | | N | β (95%CI) | | N | | β (95%CI) | N | β |
| **Weight-for-age z-score2** | | | | |  | |  | |  |  |
|  | 0 m | | 109 | 0.04 (-0.11, 0.20) | | 215 | | 0.66 (-0.60, 0.19) | 483 | Ref |
|  | 3 m | | 98 | -0.24 (-0.45, -0.04) | | 203 | | -0.19 (-0.35, -0.04) | 458 | Ref |
|  | 6 m | | 86 | -0.10 (-0.32, 0.12) | | 195 | | -0.03 (-0.19, 0.13) | 448 | Ref |
|  | 9 m | | 85 | -0.04 (-0.26, 0.17) | | 181 | | -0.03 (-0.19, 0.13) | 428 | Ref |
|  | 12 m | | 89 | -0.08 (-0.22, 0.21) | | 186 | | 0.06 (-0.10, 0.22) | 436 | Ref |
|  | 15 m | | 86 | -0.03 (-0.25, 0.18) | | 190 | | 0.05 (-0.11, 0.21) | 442 | Ref |
|  | 18 m | | 86 | -0.50 (-0.28, 0.18) | | 184 | | 0.11 (-0.05, 0.29) | 414 | Ref |
|  | | 24 m | 79 | 0.00 (-0.25, 0.25) | | 189 | | 0.31 (-0.15, 0.21) | 418 | Ref |
| **Length-for-age z-score2** | | | | |  | |  | |  |  |
|  | | 0 m | 109 | 0.13 (-0.08, 0.34) | | 213 | | 0.11 (-0.05, 0.28) | 483 | Ref |
|  | | 3 m | 98 | -0.28 (-0.52, -0.04) | | 203 | | -0.16 (-0.34, 0.01) | 458 | Ref |
|  | | 6 m | 87 | -0.33 (-0.59, -0.06) | | 196 | | -0.07 (-0.27, 0.12) | 450 | Ref |
|  | | 9 m | 85 | -0.26 (-0.52, 0.00) | | 181 | | -0.90 (-0.29, 0.10) | 428 | Ref |
|  | | 12 m | 89 | -0.09 (-0.36, 0.18) | | 188 | | -0.05 (-0.25, 0.12) | 437 | Ref |
|  | | 15 m | 86 | -0.16 (-0.43, 0.10) | | 189 | | -0.12 (-0.32, 0.10) | 437 | Ref |
|  | | 18 m | 75 | -0.19 (-0.46, 0.07) | | 164 | | 0.16 (-0.04, 0.37) | 357 | Ref |
|  | | 24 m3 | 70 | -0.20 (-0.48, 0.08) | | 168 | | -0.10( -0.21, 0.19) | 371 | Ref |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Head circumference2(cm)** | | | | |  | |  | |  | |  | |  | |
| 0 m | | 103 | -0.00 (-0.27, 0.26) | | 206 | | -0.01 (-0.21, 0.19) | | 469 | | Ref | |
| 3 m | | 97 | -0.28 (-0.56, -0.00) | | 203 | | -0.19 (-0.40, 0.01) | | 458 | | Ref | |
| 6 m | | 87 | -0.08 (-0.41, 0.24) | | 193 | | -0.14 (-0.38, 0.10) | | 443 | | Ref | |
| 9 m | | 85 | -0.08 (-0.41, 0.26) | | 180 | | -0.24 (-0.49, 0.01) | | 428 | | Ref | |
| 12 m | | 89 | -0.11 (-0.45, 0.21) | | 188 | | -0.16 (-0.40, 0.08) | | 436 | | Ref | |
| 15 m | | 86 | -0.01 (-0.35, 0.33) | | 190 | | -0.11 (-0.36, 0.13) | | 443 | | Ref | |
| 18 m | | 82 | -0.01 (-0.39, 0.36) | | 183 | | -0.06 (-0.34, 0.21) | | 410 | | Ref | |
| 24 m | 80 | | -0.36 (-0.72, 0.00) | | 186 | | -0.09 (-0.36, 0.17) | | 410 | | Ref | |
| **Abdominal circumference2(cm)** | | | | | |  | |  | |  | |  | |
| 0 m | 102 | | 0.15 (-0.35, 0.64) | | 206 | | 0.10 (-0.27, 0.48) | | 469 | | Ref | |
| 3 m | 98 | | -0.66 (-0.13, -0.00) | | 202 | | -0.44 (-0.95, 0.05) | | 457 | | Ref | |
| 6 m | 87 | | -0.16 (-0.88, 0.56) | | 194 | | -0.27 (-0.79, 0.26) | | 446 | | Ref | |
| 9 m | 85 | | -0.43 (-1.16, 0.30) | | 180 | | -0.17 (-0.71, 0.37) | | 427 | | Ref | |
| 12 m | 89 | | -0.26 (-0.98, 0.46) | | 188 | | -0.37 (-0.91, 0.17) | | 437 | | Ref | |
| 15 m | 86 | | -0.47 (-1.17, 0.24) | | 188 | | -0.19 (-0.72, 0.32) | | 443 | | Ref | |
| 18 m | 80 | | -0.06 (-0.82, 0.70) | | 176 | | 0.10 (-0.46, 0.67) | | 394 | | Ref | |
| 24 m | 78 | | -0.33 (-1.16, 0.49) | | 178 | | 0.02 (-0.58, 0.64) | | 402 | | Ref | |
| **Mid-arm circumference2(cm)** | | | | | |  | |  | |  | |  | |
| 0 m | 102 | | 0.26 (-0.16, 0.21) | | 206 | | -0.07 (-0.21, 0.07) | | 470 | | Ref | |
| 3 m | 98 | | -0.28 (-0.58, -0.01) | | 202 | | -0.02 (-0.49, -0.06) | | 456 | | Ref | |
| 6 m | 86 | | -0.12 (-0.41, 0.17) | | 195 | | -0.11 (-0.32, 0.10) | | 447 | | Ref | |
| 9 m | 85 | | -0.19 (-0.48, 0.10) | | 180 | | -0.19 (-0.41, 0.02) | | 427 | | Ref | |
| 12 m | 89 | | 0.02 (-0.24, 0.29) | | 188 | | -0.09 (-0.29, 0.10) | | 437 | | Ref | |
| 15 m | 86 | | 0.09 (-0.19, 0.37) | | 190 | | 0.00 (-0.20, 0.20) | | 443 | | Ref | |
| 18 m | 83 | | 0.05 (-0.24, 0.34) | | 181 | | 0.06 (-0.15, 0.28) | | 403 | | Ref | |
| 24 m | 78 | | 0.26 (-0.04, 0.56) | | 187 | | -0.04 (-0.19, 0.27) | | 404 | | Ref | |

1 Unadjusted

2 No statistically significant differences were seen between maternal vitamin D deficiency status with weight-for-age, length-for-age z-score, head circumference, abdominal circumference and mid-arm circumference.

3 No statistically significant differences were seen between maternal vitamin D deficiency status with Height-for-age –scores were measured only at 24 months

**Supplementary Table 11.** Association of maternal vitamin D status in pregnancy (independent variable) with infant BMI-z score from 0- 24 months, and infant skinfold measurements at 0, 18 and 24 months (dependent variable) (n= 807)1

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Vitamin D**  **Deficiency**  **(<50 nmol/L)** | | | **Vitamin D**  **Insufficiency (≥50 and <75 nmol/L)** | | | **Vitamin D**  **Sufficiency**  **(>75 nmol/L)** | |
|  | | N | β (95%CI) | | N | | β (95%CI) | N | β |
| **BMI-for-age z-score2** | | | |  | |  | |  |  |
|  | 0 m | 109 | -0.04 (-0.24, 0.16) | | 213 | | -0.00 (-0.16, 0.15) | 483 | Ref |
|  | 3 m | 98 | -0.12 (-0.35, 0.10) | | 203 | | -0.14 (-0.31, 0.03) | 458 | Ref |
|  | 6 m | 86 | 0.10 (-0.15, 0.36) | | 195 | | -0.06 (-0.25, 0.12) | 448 | Ref |
|  | 9 m | 85 | 0.13 (-0.11 0.38) | | 181 | | 0.03 (-0.15, 0.20) | 428 | Ref |
|  | 12 m | 89 | 0.05 (-0.17, 0.28) | | 186 | | 0.11 (-0.16, 0.29) | 436 | Ref |
|  | 15 m | 86 | 0.07 (-0.16, 0.31) | | 189 | | 0.16 (-0.01, 0.33) | 437 | Ref |
|  | 18 m | 75 | 0.06 (-0.19, 0.30) | | 163 | | 0.04 (-0.15, 0.23) | 356 | Ref |
|  | 24 m | 70 | 0.12 (-0.17, 0.40) | | 168 | | -0.01 (-0.18, 0.21) | 371 | Ref |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Triceps skinfold3** | |  | | |  | |  | |  | |  | |
| 0 m | 103 | | 0.09 (-0.17, 0.36) | 206 | | -0.02 (-0.23, 0.18) | | 470 | | Ref | |
| 18 m | 78 | | 0.42 (-0.00, 0.84) | 166 | | 0.05 (-0.27, 0.37) | | 365 | | Ref | |
| 24 m | 72 | | 0.10 (-0.38, 0.49) | 171 | | -0.08 (-0.43, 0.26) | | 378 | | Ref | |
| **Biceps skinfold3** | |  | | |  | |  | |  | |  | |
| 18 m | 76 | | 0.37 (-0.01, 0.77) | 159 | | -0.00 (-0.30, 0.29) | | 341 | | Ref | |
| 24 m | 69 | | -0.03 (-0.36, 0.42) | 167 | | -0.02 (-0.25, 0.29) | | 371 | | Ref | |
| **Subscapular skinfold3** | | | | |  | |  | |  | |  | |
| 0 m | 103 | | -0.09 (-0.35, 0.15) | 206 | | 0.03 (-0.16, 0.22) | | 469 | | Ref | |
| 18 m | 69 | | 0.09 (-0.27, 0.45) | 155 | | -0.18 (-0.45, 0.09) | | 341 | | Ref | |
| 24 m | 74 | | 0.16 (-0.25, 0.57) | 178 | | -0.34 (-0.63, -0.05) | | 385 | | Ref | |

1 Unadjusted

2 No statistically significant differences were seen between maternal vitamin D deficiency status with BMI-for-age z-score.

3 No statistically significant differences were seen between maternal vitamin D deficiency status with triceps skinfold, biceps skinfold and subscapular skinfold.