**Table S1:** Early life, maternal, and household characteristics by study participation status, Birth to Twenty Plus cohort (n = 3273). Values shown are mean (standard deviation) or n (%), with p-values calculated using Kruskal-Wallis non-parametric ANOVA for continuous variables and a χ2 test for categorical variables

|  |  |  |  |
| --- | --- | --- | --- |
|  | Excluded from AL sample  (n = 2237) | Included in AL sample  (n = 1036) | p |
| Birthweight (kg) | 3.07 (0.52) | 3.07 (0.5) | 0.8631 |
| Gestational age (weeks) | 38.22 (1.93) | 37.99 (1.88) | < 0.001 |
| Maternal parity | 2.23 (1.35) | 2.29 (1.44) | 0.539 |
| Maternal age (years) | 25.95 (6.01) | 25.99 (6.24) | 0.839 |
| Maternal education (years) | 9.56 (3.14) | 9.54 (2.7) | 0.475 |
| Asset score 0-2 years | 3.68 (1.98) | 3.46 (1.66) | 0.012 |
| Sex |  |  |  |
| * Male | 1099 (49%) | 495 (48%) | 0.496 |
| * Female | 1138 (51%) | 541 (52%) |  |
| Ethnicity |  |  |  |
| * Black | 1595 (71%) | 973 (94%) | < 0.001 |
| * Other2 | 642 (29%) | 63 (6%) |  |
| Small for gestational age |  |  |  |
| * No | 1832 (85%) | 883 (87%) | 0.235 |
| * Yes | 319 (15%) | 134 (13%) |  |

1 Significance assessed by ANOVA due to normal distribution of outcome

2 ‘Other’ includes White, Coloured, and Indian

**Table S2:** Early life, maternal, and household characteristics among those with allostatic load measures by inclusion/exclusion from early life regression models, Birth to Twenty Plus cohort (n = 1036). Values shown are mean (standard deviation) or n (%), with p-values calculated using Kruskal-Wallis non-parametric ANOVA for continuous variables and a χ2 test for categorical variables

|  |  |  |  |
| --- | --- | --- | --- |
|  | Excluded from regression models  (n = 440) | Included in regression models  (n = 596) | p |
| Birthweight (kg) | 3.06 (0.49) | 3.07 (0.51) | 0.6441 |
| Gestational age (weeks) | 38.17 (1.94) | 37.86 (1.83) | < 0.001 |
| Maternal parity | 2.45 (1.5) | 2.17 (1.39) | < 0.001 |
| Maternal age (years) | 26.52 (5.95) | 25.6 (6.42) | 0.006 |
| Maternal education (years) | 9.44 (2.82) | 9.61 (2.61) | 0.369 |
| Asset score 0-2 years | 3.12 (1.76) | 3.65 (1.57) | < 0.001 |
| Sex |  |  |  |
| * Male | 213 (48%) | 282 (47%) | 0.775 |
| * Female | 227 (52%) | 314 (53%) |  |
| Ethnicity |  |  |  |
| * Black | 377 (86%) | 596 (100%) | < 0.001 |
| * Other2 | 63 (14%) | 0 (0%) |  |
| Small for gestational age |  |  |  |
| * No | 366 (86%) | 517 (87%) | 0.638 |
| * Yes | 59 (14%) | 75 (13%) |  |

1 Significance assessed by ANOVA due to normal distribution of outcome

2 ‘Other’ includes White, Coloured, and Indian

**Table S3:** Unadjusted associations of age 22 y allostatic load score with early life growth as potentially mediated by childhood/adolescent body mass index and adolescent pubertal trajectories in the Birth to Twenty Plus cohort (n = 596). Values displayed are unadjusted risk ratios (95% CI) estimated by Poisson regression.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Males (n = 282) | | | |  | Females (n = 314) | | | |
|  | Model 1 | Model 2 | Model 3 | Model 4 |  | Model 1 | Model 2 | Model 3 | Model 4 |
| Birthweight | 1.01 (0.88, 1.17) | 1.03 (0.89, 1.19) | 1.02 (0.88, 1.18) | 1.03 (0.89, 1.20) |  | 1.04 (0.91, 1.19) | 1.03 (0.90, 1.18) | 1.04 (0.91, 1.20) | 1.04 (0.90, 1.19) |
| Conditional height 0-2 y | 0.98 (0.91, 1.06) | 0.99 (0.92, 1.07) | 0.98 (0.91, 1.06) | 0.99 (0.92, 1.07) |  | 1.03 (0.96, 1.10) | 1.03 (0.96, 1.11) | 1.02 (0.94, 1.09) | 1.02 (0.95, 1.10) |
| Conditional height 2-5 y | 1.04 (0.96, 1.12) | 1.02 (0.94, 1.10) | 1.03 (0.96, 1.11) | 1.02 (0.94, 1.10) |  | 1.06 (0.98, 1.14) | 1.04 (0.96, 1.12) | 1.05 (0.97, 1.14) | 1.03 (0.95, 1.11) |
| Conditional weight 0-2 y | 1.07 (1.00, 1.15) | 1.07 (0.99, 1.14) | 1.07 (1.00, 1.14) | 1.07 (0.99, 1.14) |  | 1.00 (0.93, 1.07) | 1.01 (0.94, 1.08) | 0.99 (0.92, 1.06) | 1.00 (0.93, 1.07) |
| Conditional weight 2-5 y | 1.07 (0.99, 1.15) | 1.07 (0.99, 1.15) | 1.07 (0.99, 1.15) | 1.07 (0.99, 1.15) |  | 1.03 (0.96, 1.09) | 1.01 (0.95, 1.08) | 1.02 (0.95, 1.09) | 1.00 (0.94, 1.07) |
| BMI trajectory1 |  |  |  |  |  |  |  |  |  |
| * 1 | X | Ref | X | Ref |  | X | Ref | X | Ref |
| * 2 | X | 1.19 (0.85, 1.66) | X | 1.18 (0.84, 1.66) |  | X | 1.24 (0.89, 1.73) | X | 1.21 (0.87, 1.69) |
| * 3 | X | 1.76 (0.99, 3.13) | X | 1.73 (0.97, 3.09) |  | X | 1.52 (1.12, 2.04) | X | 1.48 (1.09, 2.01) |
| * 4 | - | - | - | - |  | X | 1.23 (1.00, 1.51) | X | 1.26 (1.02, 1.55) |
| Pubic hair trajectory2 |  |  |  |  |  |  |  |  |  |
| * 1 | X | X | Ref | Ref |  | X | X | Ref | Ref |
| * 2 | X | X | 1.07 (0.83, 1.39) | 1.06 (0.82, 1.37) |  | X | X | 1.12 (0.94, 1.33) | 1.14 (0.96, 1.36) |
| * 3 | X | X | 1.05 (0.74, 1.48) | 1.04 (0.74, 1.47) |  | X | X | 1.09 (0.84, 1.41) | 1.11 (0.86, 1.45) |
| Breast/genital development trajectory2 |  |  |  |  |  |  |  |  |  |
| * 1 | X | X | Ref | Ref |  | X | X | Ref | Ref |
| * 2 | X | X | 0.97 (0.75, 1.26) | 0.97 (0.74, 1.26) |  | X | X | 0.94 (0.76, 1.16) | 0.90 (0.73, 1.12) |
| * 3 | X | X | 0.99 (0.73, 1.34) | 0.98 (0.72, 1.32) |  | X | X | 0.94 (0.75, 1.18) | 0.92 (0.74, 1.16) |
| * 4 | X | X | 0.91 (0.63, 1.32) | 0.91 (0.63, 1.31) |  | X | X | 1.09 (0.85, 1.39) | 1.02 (0.80, 1.31) |

1 BMI trajectory definitions: 1 – normal weight; 2 – early onset overweight to normal weight (males) or early onset obese to overweight (females); 3 – early onset overweight to obese (males) or early onset obese to morbidly obese (females); 4 – late onset overweight (females only)

2 Trajectory 1 represents children who started puberty late and progresses slowly, with higher trajectories having progressively earlier pubertal start and faster tempo.

**Table S4:** Adjusted associations of age 22 y allostatic load with early life growth as potentially mediated by childhood/adolescent body mass index and adolescent pubertal trajectories in the Birth to Twenty Plus cohort (n = 596). Values displayed are adjusted risk ratios (95% CI) estimated by Poisson regression.1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Model 1 | Model 2 | Model 3 | Model 4 |
| Birthweight | 1.04 (0.93, 1.16) | 1.04 (0.93, 1.16) | 1.04 (0.93, 1.17) | 1.04 (0.93, 1.17) |
| Conditional height 0-2 y2 | 1.00 (0.95, 1.05) | 1.00 (0.95, 1.06) | 0.99 (0.94, 1.05) | 1.00 (0.95, 1.05) |
| Conditional height 2-5 y2 | 1.04 (0.99, 1.10) | 1.02 (0.97, 1.08) | 1.04 (0.99, 1.10) | 1.02 (0.97, 1.08) |
| Conditional weight 0-2 y2 | 1.03 (0.98, 1.08) | 1.03 (0.99, 1.09) | 1.03 (0.98, 1.08) | 1.03 (0.98, 1.09) |
| Conditional weight 2-5 y2 | 1.05 (1.00, 1.10) | 1.04 (0.99, 1.09) | 1.05 (1.00, 1.10) | 1.04 (0.99, 1.09) |
| BMI trajectory3 |  |  |  |  |
| * 1 | X | Ref | X | Ref |
| * 2 | X | 1.21 (0.95, 1.53) | X | 1.19 (0.94, 1.51) |
| * 3 | X | 1.54 (1.18, 2.01) | X | 1.54 (1.18, 2.00) |
| * 4 | X | 1.24 (1.01, 1.51) | X | 1.26 (1.02, 1.54) |
| Pubic hair trajectory4 |  |  |  |  |
| * 1 | X | X | Ref | Ref |
| * 2 | X | X | 1.10 (0.95, 1.26) | 1.11 (0.96, 1.28) |
| * 3 | X | X | 1.04 (0.85, 1.28) | 1.06 (0.87, 1.30) |
| Breast/genital development trajectory4 |  |  |  |  |
| * 1 | X | X | Ref | Ref |
| * 2 | X | X | 0.94 (0.81, 1.10) | 0.92 (0.78, 1.08) |
| * 3 | X | X | 0.96 (0.81, 1.14) | 0.94 (0.79, 1.11) |
| * 4 | X | X | 1.03 (0.84, 1.25) | 0.98 (0.80, 1.20) |

1 All models adjusted for sex, gestational age, maternal age, maternal years of education, parity, and age 0-2y physical asset score.

2 Coefficients for conditional values represent the adjusted risk ratio for a one standard deviation increase in the given residual value

3 BMI trajectory definitions: 1 – normal weight; 2 – early onset overweight to normal weight (males) or early onset obese to overweight (females); 3 – early onset overweight to obese (males) or early onset obese to morbidly obese (females); 4 – late onset overweight (females only)

4 Trajectory 1 represents children who started puberty late and progresses slowly, with higher trajectories having progressively earlier pubertal start and faster tempo.

**Table S5:** Sex-specific adjusted associations of age 22 y allostatic load excluding 28 item General Health Questionnaire score with early life growth as potentially mediated by childhood/adolescent body mass index and adolescent pubertal trajectories in the Birth to Twenty Plus cohort (n = 596). Values displayed are adjusted risk ratios (95% CI) estimated by Poisson regression.1

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Males (n = 282) | | | |  | Females (n = 314) | | | |
|  | Model 1 | Model 2 | Model 3 | Model 4 |  | Model 1 | Model 2 | Model 3 | Model 4 |
| Birthweight | 1.06 (0.90, 1.24) | 1.07 (0.91, 1.27) | 1.06 (0.90, 1.25) | 1.08 (0.92, 1.27) |  | 1.03 (0.87, 1.23) | 1.02 (0.86, 1.22) | 1.05 (0.88, 1.25) | 1.04 (0.87, 1.24) |
| Conditional height 0-2 y2 | 0.98 (0.90, 1.05) | 0.99 (0.91, 1.07) | 0.98 (0.90, 1.06) | 0.99 (0.91, 1.07) |  | 1.04 (0.96, 1.12) | 1.04 (0.96, 1.13) | 1.02 (0.94, 1.10) | 1.03 (0.95, 1.11) |
| Conditional height 2-5 y2 | 1.06 (0.98, 1.14) | 1.04 (0.96, 1.13) | 1.05 (0.97, 1.14) | 1.04 (0.96, 1.12) |  | 1.09 (1.00, 1.18) | 1.06 (0.97, 1.15) | 1.08 (1.00, 1.17) | 1.05 (0.97, 1.14) |
| Conditional weight 0-2 y2 | 1.06 (0.99, 1.14) | 1.06 (0.99, 1.14) | 1.06 (0.99, 1.14) | 1.06 (0.99, 1.14) |  | 0.99 (0.92, 1.07) | 1.00 (0.93, 1.08) | 0.98 (0.91, 1.06) | 1.00 (0.92, 1.08) |
| Conditional weight 2-5 y2 | 1.08 (1.00, 1.17) | 1.08 (1.00, 1.17) | 1.08 (1.00, 1.17) | 1.08 (0.99, 1.17) |  | 1.02 (0.95, 1.09) | 1.00 (0.93, 1.07) | 1.01 (0.94, 1.08) | 0.99 (0.92, 1.06) |
| BMI trajectory3 |  |  |  |  |  |  |  |  |  |
| * 1 | X | Ref | X | Ref |  | X | Ref | X | Ref |
| * 2 | X | 1.21 (0.85, 1.71) | X | 1.20 (0.84, 1.71) |  | X | 1.25 (0.87, 1.79) | X | 1.22 (0.85, 1.75) |
| * 3 | X | 1.76 (0.98, 3.17) | X | 1.76 (0.97, 3.19) |  | X | 1.64 (1.21, 2.24) | X | 1.60 (1.17, 2.20) |
| * 4 | - | - | - | - |  | X | 1.32 (1.06, 1.63) | X | 1.35 (1.08, 1.68) |
| Pubic hair trajectory4 |  |  |  |  |  |  |  |  |  |
| * 1 | X | X | Ref | Ref |  | X | X | Ref | Ref |
| * 2 | X | X | 1.07 (0.82, 1.41) | 1.06 (0.81, 1.39) |  | X | X | 1.19 (0.99, 1.44) | 1.22 (1.01, 1.47) |
| * 3 | X | X | 1.09 (0.76, 1.57) | 1.09 (0.76, 1.56) |  | X | X | 1.13 (0.86, 1.50) | 1.17 (0.88, 1.54) |
| Breast/genital development trajectory4 |  |  |  |  |  |  |  |  |  |
| * 1 | X | X | Ref | Ref |  | X | X | Ref | Ref |
| * 2 | X | X | 0.94 (0.71, 1.24) | 0.94 (0.71, 1.23) |  | X | X | 0.93 (0.74, 1.16) | 0.88 (0.70, 1.11) |
| * 3 | X | X | 0.96 (0.70, 1.31) | 0.94 (0.68, 1.28) |  | X | X | 0.88 (0.70, 1.12) | 0.86 (0.67, 1.09) |
| * 4 | X | X | 0.86 (0.58, 1.26) | 0.85 (0.58, 1.26) |  | X | X | 1.07 (0.83, 1.39) | 1.00 (0.76, 1.30) |

1 All models adjusted for gestational age, maternal age, maternal years of education, parity, and age 0-2y physical asset score.

2 Coefficients for conditional values represent the adjusted risk ratio for a one standard deviation increase in the given residual value

3 BMI trajectory definitions: 1 – normal weight; 2 – early onset overweight to normal weight (males) or early onset obese to overweight (females); 3 – early onset overweight to obese (males) or early onset obese to morbidly obese (females); 4 – late onset overweight (females only)

4 Trajectory 1 represents children who started puberty late and progresses slowly, with higher trajectories having progressively earlier pubertal start and faster tempo.

**Table S6:** Sex-specific adjusted associations of age 22 y allostatic load excluding body mass index with early life growth as potentially mediated by childhood/adolescent body mass index and adolescent pubertal trajectories in the Birth to Twenty Plus cohort (n = 596). Values displayed are adjusted risk ratios (95% CI) estimated by Poisson regression.1

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Males (n = 282) | | | |  | Females (n = 314) | | | |
|  | Model 1 | Model 2 | Model 3 | Model 4 |  | Model 1 | Model 2 | Model 3 | Model 4 |
| Birthweight | 1.02 (0.87, 1.20) | 1.03 (0.87, 1.21) | 1.03 (0.88, 1.21) | 1.04 (0.88, 1.22) |  | 1.01 (0.85, 1.21) | 1.00 (0.84, 1.20) | 1.02 (0.85, 1.23) | 1.01 (0.85, 1.22) |
| Conditional height 0-2 y2 | 1.00 (0.92, 1.08) | 1.00 (0.93, 1.08) | 1.00 (0.93, 1.08) | 1.00 (0.93, 1.09) |  | 1.03 (0.95, 1.11) | 1.03 (0.95, 1.11) | 1.02 (0.94, 1.10) | 1.02 (0.94, 1.10) |
| Conditional height 2-5 y2 | 1.02 (0.94, 1.10) | 1.01 (0.94, 1.10) | 1.02 (0.94, 1.10) | 1.01 (0.94, 1.10) |  | 1.01 (0.93, 1.10) | 0.99 (0.91, 1.08) | 1.01 (0.93, 1.09) | 0.99 (0.91, 1.08) |
| Conditional weight 0-2 y2 | 1.06 (0.99, 1.13) | 1.06 (0.98, 1.13) | 1.06 (0.98, 1.13) | 1.06 (0.98, 1.13) |  | 1.00 (0.93, 1.08) | 1.01 (0.94, 1.09) | 1.00 (0.93, 1.08) | 1.00 (0.93, 1.08) |
| Conditional weight 2-5 y2 | 1.06 (0.98, 1.14) | 1.06 (0.98, 1.14) | 1.06 (0.98, 1.14) | 1.06 (0.98, 1.15) |  | 0.99 (0.92, 1.06) | 0.98 (0.91, 1.06) | 0.98 (0.91, 1.06) | 0.98 (0.91, 1.05) |
| BMI trajectory3 |  |  |  |  |  |  |  |  |  |
| * 1 | X | Ref | X | Ref |  | X | Ref | X | Ref |
| * 2 | X | 1.07 (0.74, 1.55) | X | 1.07 (0.74, 1.55) |  | X | 1.06 (0.72, 1.56) | X | 1.04 (0.71, 1.54) |
| * 3 | X | 1.32 (0.68, 2.55) | X | 1.30 (0.67, 2.52) |  | X | 1.42 (1.01, 2.00) | X | 1.41 (1.00, 1.99) |
| * 4 | - | - | - | - |  | X | 1.10 (0.88, 1.39) | X | 1.13 (0.89, 1.43) |
| Pubic hair trajectory4 |  |  |  |  |  |  |  |  |  |
| * 1 | X | X | Ref | Ref |  | X | X | Ref | Ref |
| * 2 | X | X | 1.02 (0.78, 1.33) | 1.02 (0.78, 1.33) |  | X | X | 1.14 (0.95, 1.38) | 1.15 (0.96, 1.39) |
| * 3 | X | X | 0.98 (0.68, 1.40) | 0.98 (0.68, 1.40) |  | X | X | 1.10 (0.83, 1.46) | 1.11 (0.83, 1.48) |
| Breast/genital development trajectory4 |  |  |  |  |  |  |  |  |  |
| * 1 | X | X | Ref | Ref |  | X | X | Ref | Ref |
| * 2 | X | X | 0.98 (0.74, 1.28) | 0.97 (0.74, 1.28) |  | X | X | 0.91 (0.72, 1.14) | 0.88 (0.70, 1.11) |
| * 3 | X | X | 1.01 (0.74, 1.37) | 1.00 (0.73, 1.36) |  | X | X | 0.91 (0.71, 1.15) | 0.89 (0.70, 1.14) |
| * 4 | X | X | 0.91 (0.62, 1.34) | 0.91 (0.62, 1.34) |  | X | X | 1.02 (0.78, 1.33) | 0.98 (0.75, 1.28) |

1 All models adjusted for gestational age, maternal age, maternal years of education, parity, and age 0-2y physical asset score

2 Coefficients for conditional values represent the adjusted risk ratio for a one standard deviation increase in the given residual value

3 BMI trajectory definitions: 1 – normal weight; 2 – early onset overweight to normal weight (males) or early onset obese to overweight (females); 3 – early onset overweight to obese (males) or early onset obese to morbidly obese (females); 4 – late onset overweight (females only)

4 Trajectory 1 represents children who started puberty late and progresses slowly, with higher trajectories having progressively earlier pubertal start and faster tempo.

**Table S7:** Sex-specific unadjusted associations of high (top 25%) age 22 y allostatic load with early life growth as potentially mediated by childhood/adolescent body mass index and adolescent pubertal trajectories in the Birth to Twenty Plus cohort (n = 596). Values displayed are unadjusted odds ratios (95% CI) estimated by logistic regression.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Males (n = 282) | | | |  | Females (n = 314) | | | |
|  | Model 1 | Model 2 | Model 3 | Model 4 |  | Model 1 | Model 2 | Model 3 | Model 4 |
| Birthweight | 1.01 (0.47, 2.20) | 1.04 (0.47, 2.28) | 0.99 (0.45, 2.18) | 1.01 (0.45, 2.24) |  | 1.23 (0.64, 2.35) | 1.18 (0.61, 2.30) | 1.22 (0.63, 2.38) | 1.19 (0.61, 2.34) |
| Conditional height 0-2 y1 | 0.90 (0.61, 1.33) | 0.93 (0.63, 1.39) | 0.89 (0.60, 1.33) | 0.93 (0.62, 1.39) |  | 1.11 (0.79, 1.55) | 1.14 (0.80, 1.63) | 1.06 (0.75, 1.49) | 1.10 (0.76, 1.58) |
| Conditional height 2-5 y1 | 1.16 (0.78, 1.72) | 1.06 (0.70, 1.61) | 1.15 (0.77, 1.72) | 1.06 (0.69, 1.62) |  | 1.38 (0.96, 1.98) | 1.26 (0.86, 1.86) | 1.36 (0.94, 1.98) | 1.24 (0.84, 1.85) |
| Conditional weight 0-2 y1 | 1.17 (0.83, 1.65) | 1.14 (0.79, 1.62) | 1.15 (0.81, 1.64) | 1.13 (0.79, 1.62) |  | 1.24 (0.89, 1.73) | 1.31 (0.92, 1.85) | 1.22 (0.87, 1.70) | 1.29 (0.91, 1.83) |
| Conditional weight 2-5 y1 | 1.66 (1.09, 2.52) | 1.60 (1.04, 2.48) | 1.66 (1.09, 2.55) | 1.60 (1.03, 2.50) |  | 1.00 (0.73, 1.36) | 0.92 (0.67, 1.26) | 0.96 (0.70, 1.33) | 0.89 (0.64, 1.24) |
| BMI trajectory2 |  |  |  |  |  |  |  |  |  |
| * 1 | X | Ref | X | Ref |  | X | Ref | X | Ref |
| * 2 | X | 2.54 (0.62, 10.40) | X | 2.52 (0.59, 10.81) |  | X | 2.71 (0.64, 11.45) | X | 2.46 (0.58, 10.51) |
| * 3 | X | 6.23 (0.44, 87.23) | X | 6.31 (0.43, 91.66) |  | X | 4.86 (1.31, 18.08) | X | 4.44 (1.15, 17.12) |
| * 4 | - | - | - | - |  | X | 2.58 (1.00, 6.62) | X | 2.73 (1.04, 7.15) |
| Pubic hair trajectory3 |  |  |  |  |  |  |  |  |  |
| * 1 | X | X | Ref | Ref |  | X | X | Ref | Ref |
| * 2 | X | X | 0.90 (0.22, 3.68) | 0.83 (0.20, 3.39) |  | X | X | 1.16 (0.49, 2.72) | 1.27 (0.52, 3.07) |
| * 3 | X | X | 1.38 (0.25, 7.75) | 1.28 (0.23, 7.05) |  | X | X | 1.06 (0.32, 3.53) | 1.18 (0.34, 4.15) |
| Breast/genital development trajectory3 |  |  |  |  |  |  |  |  |  |
| * 1 | X | X | Ref | Ref |  | X | X | Ref | Ref |
| * 2 | X | X | 0.86 (0.21, 3.55) | 0.87 (0.21, 3.58) |  | X | X | 0.92 (0.32, 2.67) | 0.78 (0.26, 2.34) |
| * 3 | X | X | 1.28 (0.26, 6.18) | 1.21 (0.25, 5.83) |  | X | X | 0.90 (0.30, 2.74) | 0.82 (0.26, 2.57) |
| * 4 | X | X | 0.81 (0.12, 5.34) | 0.81 (0.13, 5.13) |  | X | X | 1.62 (0.51, 5.10) | 1.26 (0.38, 4.21) |

1 Coefficients for conditional values represent the adjusted risk ratio for a one standard deviation increase in the given residual value

2 BMI trajectory definitions: 1 – normal weight; 2 – early onset overweight to normal weight (males) or early onset obese to overweight (females); 3 – early onset overweight to obese (males) or early onset obese to morbidly obese (females); 4 – late onset overweight (females only)

3 Trajectory 1 represents children who started puberty late and progresses slowly, with higher trajectories having progressively earlier pubertal start and faster tempo.

**Table S8:** Sex-specific adjusted associations of high (top 25%) age 22 y allostatic load excluding body mass index with early life growth as potentially mediated by childhood/adolescent body mass index and adolescent pubertal trajectories in the Birth to Twenty Plus cohort (n = 596). Values displayed are adjusted odds ratios (95% CI) estimated by logistic regression.1

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Males (n = 282) | | | |  | Females (n = 314) | | | |
|  | Model 1 | Model 2 | Model 3 | Model 4 |  | Model 1 | Model 2 | Model 3 | Model 4 |
| Birthweight | 0.84 (0.32, 2.18) | 0.93 (0.35, 2.44) | 0.84 (0.31, 2.27) | 0.90 (0.33, 2.42) |  | 0.88 (0.44, 1.77) | 0.85 (0.41, 1.73) | 0.90 (0.44, 1.84) | 0.86 (0.42, 1.79) |
| Conditional height 0-2 y2 | 0.99 (0.62, 1.57) | 1.04 (0.65, 1.67) | 1.02 (0.64, 1.64) | 1.08 (0.67, 1.75) |  | 1.20 (0.88, 1.63) | 1.21 (0.88, 1.68) | 1.18 (0.86, 1.62) | 1.21 (0.87, 1.67) |
| Conditional height 2-5 y2 | 1.27 (0.79, 2.02) | 1.18 (0.72, 1.93) | 1.24 (0.77, 2.01) | 1.17 (0.70, 1.94) |  | 1.19 (0.85, 1.66) | 1.12 (0.79, 1.57) | 1.17 (0.84, 1.64) | 1.10 (0.77, 1.56) |
| Conditional weight 0-2 y2 | 1.11 (0.73, 1.68) | 1.11 (0.73, 1.69) | 1.10 (0.72, 1.68) | 1.11 (0.72, 1.71) |  | 1.23 (0.91, 1.66) | 1.26 (0.92, 1.71) | 1.22 (0.90, 1.65) | 1.26 (0.92, 1.72) |
| Conditional weight 2-5 y2 | 1.86 (1.12, 3.11) | 1.91 (1.11, 3.28) | 1.89 (1.11, 3.23) | 1.94 (1.10, 3.41) |  | 0.80 (0.60, 1.07) | 0.76 (0.57, 1.02) | 0.78 (0.58, 1.05) | 0.74 (0.55, 1.01) |
| BMI trajectory3 |  |  |  |  |  |  |  |  |  |
| * 1 | X | Ref | X | Ref |  | X | Ref | X | Ref |
| * 2 | X | 1.52 (0.24, 9.84) | X | 1.43 (0.19, 10.74) |  | X | 1.84 (0.44, 7.78) | X | 1.71 (0.40, 7.36) |
| * 3 | X | 7.95 (0.47, 134.12) | X | 7.26 (0.42, 125.05) |  | X | 3.76 (1.02, 13.88) | X | 3.90 (1.03, 14.78) |
| * 4 | - | - | - | - |  | X | 1.54 (0.61, 3.85) | X | 1.62 (0.64, 4.10) |
| Pubic hair trajectory4 |  |  |  |  |  |  |  |  |  |
| * 1 | X | X | Ref | Ref |  | X | X | Ref | Ref |
| * 2 | X | X | 0.77 (0.15, 3.88) | 0.73 (0.14, 3.78) |  | X | X | 1.05 (0.50, 2.21) | 1.09 (0.51, 2.31) |
| * 3 | X | X | 1.02 (0.13, 8.29) | 1.03 (0.12, 8.48) |  | X | X | 0.88 (0.29, 2.70) | 0.91 (0.29, 2.85) |
| Breast/genital development trajectory4 |  |  |  |  |  |  |  |  |  |
| * 1 | X | X | Ref | Ref |  | X | X | Ref | Ref |
| * 2 | X | X | 0.73 (0.14, 3.77) | 0.71 (0.14, 3.74) |  | X | X | 0.70 (0.28, 1.73) | 0.63 (0.25, 1.59) |
| * 3 | X | X | 1.91 (0.33, 10.90) | 1.82 (0.31, 10.52) |  | X | X | 0.86 (0.33, 2.22) | 0.82 (0.32, 2.14) |
| * 4 | X | X | 0.42 (0.03, 6.03) | 0.40 (0.03, 5.91) |  | X | X | 1.11 (0.40, 3.12) | 0.93 (0.32, 2.69) |

1 All models adjusted for gestational age, maternal age, maternal years of education, parity, and age 0-2y physical asset score

2 Coefficients for conditional values represent the adjusted risk ratio for a one standard deviation increase in the given residual value

3 BMI trajectory definitions: 1 – normal weight; 2 – early onset overweight to normal weight (males) or early onset obese to overweight (females); 3 – early onset overweight to obese (males) or early onset obese to morbidly obese (females); 4 – late onset overweight (females only)

4 Trajectory 1 represents children who started puberty late and progresses slowly, with higher trajectories having progressively earlier pubertal start and faster tempo.

**Table S9:** Sex-specific adjusted associations of high (top 25%) age 22 y allostatic load excluding 28 item General Health Questionnaire score with early life growth as potentially mediated by childhood/adolescent body mass index and adolescent pubertal trajectories in the Birth to Twenty Plus cohort (n = 596). Values displayed are adjusted odds ratios (95% CI) estimated by logistic regression.1

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Males (n = 282) | | | |  | Females (n = 314) | | | |
|  | Model 1 | Model 2 | Model 3 | Model 4 |  | Model 1 | Model 2 | Model 3 | Model 4 |
| Birthweight | 1.19 (0.46, 3.10) | 1.29 (0.49, 3.39) | 1.13 (0.43, 3.01) | 1.23 (0.46, 3.26) |  | 0.96 (0.36, 2.56) | 0.90 (0.33, 2.46) | 1.09 (0.40, 2.93) | 1.02 (0.37, 2.81) |
| Conditional height 0-2 y2 | 0.92 (0.59, 1.42) | 0.98 (0.62, 1.54) | 0.91 (0.58, 1.41) | 0.97 (0.61, 1.53) |  | 1.10 (0.71, 1.70) | 1.11 (0.70, 1.75) | 1.04 (0.66, 1.63) | 1.04 (0.65, 1.68) |
| Conditional height 2-5 y2 | 1.36 (0.87, 2.13) | 1.19 (0.74, 1.91) | 1.36 (0.86, 2.15) | 1.21 (0.75, 1.95) |  | 1.64 (1.05, 2.55) | 1.51 (0.94, 2.43) | 1.68 (1.06, 2.65) | 1.55 (0.95, 2.52) |
| Conditional weight 0-2 y2 | 1.33 (0.89, 1.99) | 1.32 (0.87, 2.00) | 1.31 (0.87, 1.98) | 1.31 (0.86, 2.01) |  | 0.97 (0.63, 1.50) | 1.00 (0.64, 1.56) | 0.95 (0.62, 1.48) | 0.99 (0.63, 1.55) |
| Conditional weight 2-5 y2 | 1.88 (1.13, 3.13) | 1.81 (1.05, 3.11) | 1.90 (1.13, 3.19) | 1.82 (1.05, 3.16) |  | 1.14 (0.76, 1.72) | 1.05 (0.69, 1.59) | 1.09 (0.72, 1.65) | 1.00 (0.65, 1.55) |
| BMI trajectory3 |  |  |  |  |  |  |  |  |  |
| * 1 | X | Ref | X | Ref |  | X | Ref | X | Ref |
| * 2 | X | 3.20 (0.67, 15.30) | X | 3.37 (0.69, 16.39) |  | X | 2.32 (0.42, 12.75) | X | 2.23 (0.39, 12.64) |
| * 3 | X | 10.32 (0.61, 174.62) | X | 11.30 (0.63, 203.18) |  | X | 4.31 (1.04, 17.83) | X | 3.94 (0.90, 17.20) |
| * 4 | - | - | - | - |  | X | 2.22 (0.71, 6.94) | X | 2.27 (0.71, 7.28) |
| Pubic hair trajectory4 |  |  |  |  |  |  |  |  |  |
| * 1 | X | X | Ref | Ref |  | X | X | Ref | Ref |
| * 2 | X | X | 0.85 (0.17, 4.16) | 0.74 (0.15, 3.68) |  | X | X | 1.47 (0.48, 4.53) | 1.61 (0.50, 5.13) |
| * 3 | X | X | 1.10 (0.15, 8.11) | 0.99 (0.14, 7.09) |  | X | X | 0.84 (0.17, 4.25) | 0.91 (0.17, 4.90) |
| Breast/genital development trajectory4 |  |  |  |  |  |  |  |  |  |
| * 1 | X | X | Ref | Ref |  | X | X | Ref | Ref |
| * 2 | X | X | 1.04 (0.21, 5.20) | 1.03 (0.21, 5.17) |  | X | X | 1.36 (0.31, 5.96) | 1.21 (0.27, 5.53) |
| * 3 | X | X | 1.27 (0.20, 7.91) | 1.17 (0.19, 7.34) |  | X | X | 1.34 (0.29, 6.15) | 1.21 (0.25, 5.80) |
| * 4 | X | X | 1.32 (0.16, 10.85) | 1.40 (0.18, 10.71) |  | X | X | 2.43 (0.49, 12.07) | 1.92 (0.36, 10.26) |

1 All models adjusted for gestational age, maternal age, maternal years of education, parity, and age 0-2y physical asset score.

2 Coefficients for conditional values represent the adjusted risk ratio for a one standard deviation increase in the given residual value

3 BMI trajectory definitions: 1 – normal weight; 2 – early onset overweight to normal weight (males) or early onset obese to overweight (females); 3 – early onset overweight to obese (males) or early onset obese to morbidly obese (females); 4 – late onset overweight (females only)

4 Trajectory 1 represents children who started puberty late and progresses slowly, with higher trajectories having progressively earlier pubertal start and faster tempo.

**Table S10:** Adjusted associations of high (top 25%) age 22 y allostatic load with early life growth as potentially mediated by childhood/adolescent body mass index and adolescent pubertal trajectories in the Birth to Twenty Plus cohort (n = 596). Values displayed are adjusted odds ratios (95% CI) estimated by logistic regression.1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Model 1 | Model 2 | Model 3 | Model 4 |
| Birthweight | 1.11 (0.68, 1.82) | 1.11 (0.67, 1.82) | 1.09 (0.66, 1.80) | 1.08 (0.65, 1.80) |
| Conditional height 0-2 y2 | 1.00 (0.78, 1.28) | 1.03 (0.80, 1.33) | 0.98 (0.76, 1.26) | 1.01 (0.78, 1.31) |
| Conditional height 2-5 y2 | 1.23 (0.94, 1.60) | 1.11 (0.84, 1.47) | 1.21 (0.92, 1.58) | 1.10 (0.83, 1.46) |
| Conditional weight 0-2 y2 | 1.22 (0.96, 1.55) | 1.23 (0.96, 1.57) | 1.21 (0.96, 1.54) | 1.23 (0.96, 1.57) |
| Conditional weight 2-5 y2 | 1.23 (0.96, 1.57) | 1.16 (0.90, 1.49) | 1.21 (0.95, 1.56) | 1.14 (0.88, 1.47) |
| BMI trajectory3 |  |  |  |  |
| * 1 | X | Ref | X | Ref |
| * 2 | X | 2.73 (1.02, 7.28) | X | 2.63 (0.98, 7.05) |
| * 3 | X | 5.13 (1.62, 16.22) | X | 5.04 (1.56, 16.29) |
| * 4 | X | 2.22 (0.89, 5.54) | X | 2.38 (0.94, 6.03) |
| Pubic hair trajectory4 |  |  |  |  |
| * 1 | X | X | Ref | Ref |
| * 2 | X | X | 1.08 (0.53, 2.18) | 1.13 (0.55, 2.33) |
| * 3 | X | X | 1.23 (0.47, 3.19) | 1.32 (0.49, 3.53) |
| Breast/genital development trajectory4 |  |  |  |  |
| * 1 | X | X | Ref | Ref |
| * 2 | X | X | 0.80 (0.36, 1.79) | 0.71 (0.31, 1.62) |
| * 3 | X | X | 0.91 (0.39, 2.15) | 0.81 (0.34, 1.95) |
| * 4 | X | X | 1.17 (0.46, 3.01) | 0.95 (0.36, 2.51) |

1 All models adjusted for sex, gestational age, maternal age, maternal years of education, parity, and age 0-2y physical asset score

2 Coefficients for conditional values represent the adjusted risk ratio for a one standard deviation increase in the given residual value

3 BMI trajectory definitions: 1 – normal weight; 2 – early onset overweight to normal weight (males) or early onset obese to overweight (females); 3 – early onset overweight to obese (males) or early onset obese to morbidly obese (females); 4 – late onset overweight (females only)

4 Trajectory 1 represents children who started puberty late and progresses slowly, with higher trajectories having progressively earlier pubertal start and faster tempo.

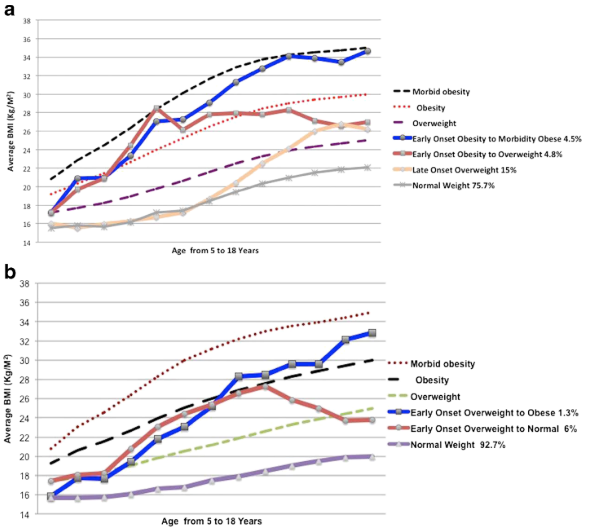
**Table S11:** Associations of model covariates with age 22 y allostatic load, Birth to Twenty Plus cohort (n = 596). Values displayed are unadjusted risk ratios (95% CI) estimated using pooled Poisson regression, with each covariate modeled individually.

|  |  |  |
| --- | --- | --- |
|  | Males  (n = 282) | Females  (n = 314) |
| Gestational age (weeks) | 0.99 (0.95, 1.03) | 1.01 (0.97, 1.05) |
| Maternal parity | 1.00 (0.95, 1.05) | 0.99 (0.94, 1.04) |
| Maternal age (years) | 1.00 (0.99, 1.01) | 1.00 (0.99, 1.01) |
| Maternal education (years) | 1.05 (1.00, 1.10) | 1.01 (0.97, 1.06) |
| Asset score 0-2 years | 1.01 (0.98, 1.04) | 1.00 (0.98, 1.03) |

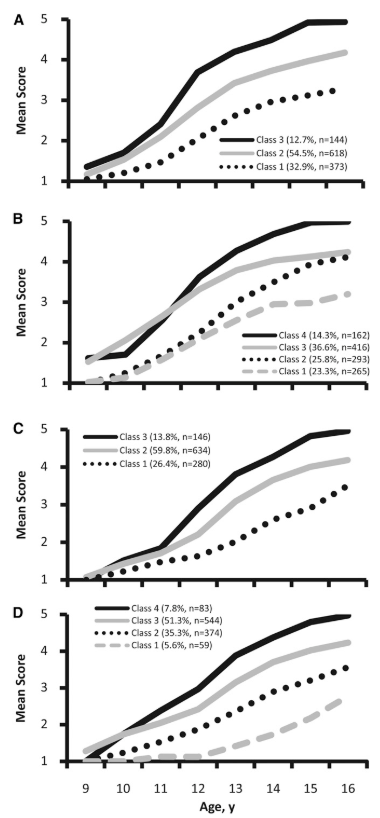
**Table S12:** Associations of individual outcome values with age 22 y allostatic load, Birth to Twenty Plus cohort (n = 596). Values displayed are standardized, unadjusted risk ratios (95% CI) estimated using pooled Poisson regression, with each outcome modeled individually.

|  |  |  |
| --- | --- | --- |
|  | Males  (n = 282) | Females  (n = 314) |
| Cardiovascular Markers |  |  |
| Systolic blood pressure (mm Hg) | 1.28 (1.22, 1.35) | 1.17 (1.11, 1.23) |
| Diastolic blood pressure (mm Hg) | 1.27 (1.21, 1.34) | 1.25 (1.19, 1.31) |
| Resting heart rate (bpm) | 1.18 (1.12, 1.24) | 1.17 (1.12, 1.23) |
| Metabolic Markers |  |  |
| Body mass index (kg/m2) | 1.20 (1.15, 1.25) | 1.28 (1.23, 1.34) |
| Waist-to-hip ratio | 1.19 (1.13, 1.26) | 1.21 (1.15, 1.26) |
| Total cholesterol (mmol/L) | 1.14 (1.08, 1.20) | 1.10 (1.05, 1.16) |
| High density lipoprotein (mmol/L) | 0.94 (0.89, 0.99) | 0.93 (0.89, 0.98) |
| Triglycerides (mmol/L) | 1.23 (1.17, 1.28) | 1.09 (1.06, 1.12) |
| Fasting glucose (mmol/L) | 1.20 (1.14, 1.27) | 1.14 (1.09, 1.20) |
| Inflammation Markers |  |  |
| C-reactive protein (mg/L) | 1.15 (1.09, 1.22) | 1.21 (1.15, 1.26) |
| Emotional Distress |  |  |
| GHQ-28 score | 1.12 (1.07, 1.18) | 1.12 (1.07, 1.18) |

**Figure S1**: Body mass index trajectories in females (A) and males (B) from age 5 to 18y, Birth to Twenty Plus cohort. Trajectories for both sexes are plotted along with Extended International Obesity Task Force Cut-Offs for overweight, obesity, and morbid obesity. Reprinted from Munthali et al 2016.1



**Figure S2**: Mean Tanner sexual maturity scale score by trajectory of pubertal development from ages 9 to 16 y, Birth to Twenty Plus cohort. A) female pubic hair development; B) female breast development; C) male pubic hair development; D) male genital development. Reprinted from Lundeen et al 2016.2



**References**

1. Munthali RJ, Kagura J, Lombard Z, Norris SA. Childhood adiposity trajectories are associated with late adolescent blood pressure: birth to twenty cohort. *BMC public health* 2016; **16**: 665.

2. Lundeen EA, Norris SA, Martorell R, et al. Early Life Growth Predicts Pubertal Development in South African Adolescents. *The Journal of Nutrition* 2016; **146**(3): 622-9.