Supplementary Table 1 Regression coefficients for the association between birth weight and inverse normalized cardiometabolic traits with monozygotic (MZ) and dizygotic (DZ) twins

|  |  |  |
| --- | --- | --- |
| Outcome | MZ | DZ |
| Within-pair | Between-pair |   | Within-pair | Between-pair |   |
| Effect size | SE | P | Effect size | SE | P | npairs | Effect size | SE | P | Effect size | SE | P | npairs |
| SBP | 0.05 | 0.17 | 0.77 | 0.08 | 0.14 | 0.54 | 120 | 0.12 | 0.16 | 0.46 | -0.07 | 0.10 | 0.46 | 148 |
| DBP | -0.07 | 0.17 | 0.69 | 0.12 | 0.15 | 0.44 | 119 | 0.17 | 0.17 | 0.30 | -0.20 | 0.11 | 0.07 | 148 |
| BMI | -0.10 | 0.15 | 0.51 | 0.02 | 0.17 | 0.91 | 119 | 0.40 | 0.17 | 0.02 | -0.15 | 0.12 | 0.21 | 144 |
| ApoA | 0.08 | 0.16 | 0.59 | -0.22 | 0.15 | 0.15 | 71 | -0.24 | 0.20 | 0.24 | -0.09 | 0.11 | 0.45 | 104 |
| ApoB | -0.05 | 0.18 | 0.78 | -0.25 | 0.14 | 0.08 | 87 | 0.05 | 0.18 | 0.79 | 0.00 | 0.11 | 0.97 | 130 |
| Chol | -0.03 | 0.19 | 0.89 | -0.30 | 0.15 | 0.05 | 88 | 0.02 | 0.18 | 0.90 | -0.07 | 0.10 | 0.49 | 131 |
| LDL | -0.02 | 0.19 | 0.92 | -0.25 | 0.16 | 0.12 | 88 | 0.04 | 0.18 | 0.82 | -0.02 | 0.10 | 0.84 | 131 |
| LpA | 0.03 | 0.09 | 0.72 | 0.07 | 0.16 | 0.65 | 61 | 0.29 | 0.24 | 0.22 | -0.18 | 0.13 | 0.19 | 94 |
| HDL | 0.04 | 0.15 | 0.79 | -0.21 | 0.13 | 0.11 | 72 | -0.22 | 0.20 | 0.28 | -0.04 | 0.12 | 0.76 | 106 |
| TG | -0.12 | 0.19 | 0.54 | -0.09 | 0.13 | 0.50 | 88 | 0.23 | 0.19 | 0.23 | -0.10 | 0.10 | 0.33 | 131 |
| Glucose | -0.19 | 0.28 | 0.50 | 0.07 | 0.13 | 0.60 | 91 | -0.09 | 0.23 | 0.69 | -0.03 | 0.10 | 0.78 | 100 |
| HbA1c | -0.16 | 0.16 | 0.32 | -0.06 | 0.14 | 0.65 | 109 | -0.21 | 0.19 | 0.25 | 0.06 | 0.12 | 0.61 | 127 |
| IGF1 | 0.32 | 0.16 | 0.04 | 0.04 | 0.14 | 0.75 | 108 | -0.11 | 0.18 | 0.55 | -0.01 | 0.11 | 0.91 | 125 |
| CRP | -0.42 | 0.17 | 0.02 | -0.02 | 0.17 | 0.90 | 108 | 0.01 | 0.21 | 0.98 | -0.24 | 0.12 | 0.05 | 133 |
| Urate | -0.24 | 0.15 | 0.11 | -0.04 | 0.14 | 0.76 | 109 | -0.06 | 0.15 | 0.69 | -0.12 | 0.09 | 0.17 | 133 |

SE standard error; P: P-value; npairs: pair numbers of twins; SBP: systolic blood pressure; DBP: diastolic blood pressure; BMI: body mass index; ApoA: apolipoprotein A; ApoB: apolipoprotein B; TC: total cholesterol; low-density lipoprotein cholesterol: LDL-C; Lp(a): lipoprotein A; HDL-C: high-density lipoprotein cholesterol; TG: triglycerides; Glucose: non-fasting glucose; HbA1c: glycated haemoglobin ; IGF1: insulin-like growth factor 1; CRP: C-reactive protein.

Supplementary Table 2 Regression coefficients for the association between birth weight and later life cardiometabolic traits with monozygotic (MZ) and dizygotic (DZ) twins treated as individuals

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Outcome | Effect size | SE | P | npairs |
| SBP | -0.08 | 1.30 | 0.95 | 268 |
| DBP | -0.58 | 0.78 | 0.46 | 267 |
| BMI | 0.00 | 0.01 | 0.69 | 263 |
| ApoA | -0.04 | 0.02 | 0.07 | 196 |
| ApoB | -0.02 | 0.02 | 0.18 | 237 |
| TC | -0.15 | 0.08 | 0.05 | 239 |
| LDL | -0.08 | 0.06 | 0.17 | 239 |
| LpA | -0.03 | 0.09 | 0.77 | 171 |
| HDL | -0.05 | 0.03 | 0.07 | 199 |
| TG | -0.03 | 0.04 | 0.33 | 240 |
| Glucose | -0.01 | 0.05 | 0.88 | 191 |
| HbA1c | -0.16 | 0.29 | 0.57 | 236 |
| IGF1 | -0.07 | 0.38 | 0.85 | 233 |
| CRP | -0.18 | 0.08 | 0.03 | 241 |
| Urate | -8.20 | 4.63 | 0.08 | 242 |

SE standard error; P: P-value; npairs: pair numbers of twins; SBP: systolic blood pressure; DBP: diastolic blood pressure; BMI: body mass index; ApoA: apolipoprotein A; ApoB: apolipoprotein B; TC: total cholesterol; low-density lipoprotein cholesterol: LDL-C; Lp(a): lipoprotein A; HDL-C: high-density lipoprotein cholesterol; TG: triglycerides; Glucose: non-fasting glucose; HbA1c: glycated haemoglobin ; IGF1: insulin-like growth factor 1; CRP: C-reactive protein

Supplementary Table 3 Power to detect within-pair association in simulated data

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| N | βW | SDW | βB | SDB | Variance explained by within-pair birth weight difference% | Power | Power corrected |
| 120 | 0 | 0.23 | 0 | 0.6 | 0.00% | 4.40% | 0.30% |
| 120 | 0.2 | 0.23 | 0 | 0.6 | 0.21% | 19.80% | 2.90% |
| 120 | 0.2 | 0.23 | 0.2 | 0.6 | 0.21% | 20.30% | 3.10% |
| 120 | 0.4 | 0.23 | 0 | 0.6 | 0.85% | 66.20% | 26.30% |
| 120 | 0.4 | 0.23 | 0.4 | 0.6 | 0.85% | 72.00% | 32.80% |
| 120 | 0.45 | 0.23 | 0 | 0.6 | 1.07% | 75.70% | 38.60% |
| 120 | 0.45 | 0.23 | 0.45 | 0.6 | 1.07% | 83.80% | 49.60% |
| 120 | 0.5 | 0.23 | 0 | 0.6 | 1.32% | 84.50% | 53.40% |
| 120 | 0.5 | 0.23 | 0.5 | 0.6 | 1.32% | 91.00% | 66.10% |
| 120 | 0.55 | 0.23 | 0 | 0.6 | 1.60% | 89.60% | 63.60% |
| 120 | 0.55 | 0.23 | 0.55 | 0.6 | 1.60% | 96.70% | 79.70% |
| 120 | 0.6 | 0.23 | 0 | 0.6 | 1.90% | 94.20% | 73.70% |
| 120 | 0.6 | 0.23 | 0.6 | 0.6 | 1.90% | 98.90% | 90.40% |
| 120 | 0.65 | 0.23 | 0 | 0.6 | 2.24% | 97.10% | 82.20% |
| 120 | 0.65 | 0.23 | 0.65 | 0.6 | 2.24% | 99.80% | 97.50% |
| N: number of simulated twin pairs; βW: within-pair coefficient; SDW: standard deviation of within-pair birth weight difference. βB: between-pair coefficient; SDB: standard deviation of between-pair birth weight difference. Power: power to detect within-pair association (P< 0.05); Power corrected: power to detect within-pair association with Bonferroni correction (P < 0.05/15 = 0.0033) |