

Table 1. Maternal and newborn details in the study cohorts, and fetal and maternal genetic scores for the study cohorts and European cohorts

Traits	PMNS (N=515)	PS (N=511)	MMNP (N=466)	MBRC (N=684)	Dhaka-WP2 (N=53)	Dhaka-WP3 (N=314)	UK-Bang (N=150)	UKBB-SAS* (N=2732)	EFSOCH* (N=674)
Birthweight (kg)	2.68 (0.34)	2.91 (0.41)	2.64 (0.37)	2.76 (0.42)	2.90 (0.38)	2.84 (0.42)	3.12 (0.45)	3.10 (0.68)	3.52 (0.47)
Birth length (cm)	47.8 (1.97)	48.8 (2.11)	48.2 (2.26)	48.0 (2.95)	46.2 (2.56)	49.6 (2.60)	46.6 (2.03)	NA	50.3 (2.12)
Ponderal index (kg/m ³)	24.5 (2.44)	25.0 (2.75)	23.6 (2.60)	25.3 (4.85)	29.5 (4.42)	23.3 (3.50)	28.9 (4.27)	NA	27.7 (2.58)
Head circumference (cm)	33.1 (1.24)	33.9 (1.28)	33.2 (1.20)	35.6 (1.58)	33.4 (1.39)	33.0 (2.40)	33.6 (1.31)	NA	35.2 (1.26)
Chest circumference (cm)	31.2 (1.59)	32.0 (1.64)	30.9 (1.75)	NA	NA	NA	33.4 (1.97)	NA	34.2 (1.86)
Abdomen circumference (cm)	28.7 (1.91)	30.0 (1.92)	28.4 (2.08)	NA	NA	NA	31.4 (2.56)	NA	NA
Mid-upper arm circumference (cm)	9.7 (0.88)	10.4 (0.92)	9.7 (0.82)	NA	9.9 (0.71)	10.2 (2.09)	10.9 (2.13)	NA	11.1 (0.90)
Triceps skinfold (mm)	4.3 (0.87)	4.3 (0.90)	4.2 (1.05)	NA	NA	NA	5.0 (1.93)	NA	4.86 (1.08)
Subscapular skinfold (mm)	4.2 (0.89)	4.5 (0.91)	4.2 (0.99)	NA	NA	NA	5.3 (1.87)	NA	4.87 (1.08)
Gestational age (weeks)	39.0 (1.06)	39.5 (1.14)	39.3 (1.17)	NA	40.3 (1.17)	39.2 (1.53)	40.0 (3.44)	NA	40.1 (1.22)
Maternal Age (years)	21.4 (3.56)	23.8 (4.24)	24.8 (3.83)	NA	19.9 (2.45)	22.7 (4.29)	29.7 (5.40)	NA	30.5 (5.19)
Maternal Height (cm)	152.1(4.9)	154.5(5.4)	151.3(5.4)	NA	151.1 (5.8)	150.9 (5.7)	156.0 (5.8)	NA	165.0 (6.3)
Maternal BMI (kg/m ²)	18.0 (1.9)	23.6 (3.55)	20.3 (3.67)	NA	20.6 (3.40)	22.7 (4.03)	26.2 (4.34)	NA	24.0 (4.34)
Maternal GDM status [n (%)]	3 (0.6)	31 (6.1)	32 (6.9)	NA	13 (24.5)	81 (25.8)	75 (50.0)	NA	NA
Year of birth	1994-95	1998-99	2006-12	1934-66	2011-12	2015-16	2011-15	1934-70	2000-04
Fetal Genetic Score	191.0 (9.0)	191.0 (9.6)	189.0 (9.4)	189.0 (9.6)	191.0 (8.1)	188.0 (9.4)	188.0 (9.3)	192.0 (9.9)	192.0 (9.8)
Maternal Genetic Score	215.0 (10.3)	215.0 (10.4)	215.0 (10.5)	NA	218.0 (10.2)	217.0 (10.2)	216.0 (9.3)	NA	214.0 (10.8)

All values are mean (SD); N, subjects included in this study; SD, standard deviation; GDM, Gestational diabetes mellitus; PMNS, Pune Maternal Nutrition Study; PS, Parthenon Study; MMNP, Mumbai Maternal Nutrition Project; MBRC, Mysore Birth Records Cohort; Dhaka-WP2, Work Package 2 of GIFTS; Dhaka-WP3, Work Package 3 of GIFTS; UK-Bang, London UK Bangladeshi cohort; UKBB-SAS, UK Biobank South Asian component; EFSOCH, The Exeter Family Study of Childhood Health study; * Not used for meta-analysis. Fetal and maternal genetic scores were calculated from 196 birthweight-associated variants in children and mothers , respectively.

Table 2A: Associations of fetal genetic score (fGS) with own birthweight in South Asian populations

Cohort	fGS adjusted for sex and GA [@]					fGS adjusted for sex, GA and mGS [#]				
	N	Effect	L95	U95	P	N	Effect	L95	U95	P
PMNS	515	0.009	0.000	0.018	0.042	443	0.010	0.001	0.020	0.040
PS	511	0.021	0.012	0.029	3.8x10 ⁻⁶	458	0.021	0.012	0.030	1.0x10 ⁻⁵
MMNP*	466	0.013	0.003	0.022	0.007	460	0.013	0.004	0.022	0.006
MBRC*	684	0.006	-0.002	0.013	0.154	NA	NA	NA	NA	NA
Dhaka-WP2	53	0.020	-0.015	0.055	0.277	53	0.019	-0.014	0.052	0.269
Dhaka-WP3	314	0.013	0.003	0.024	0.015	314	0.013	0.002	0.023	0.022
UK-Bang	150	0.024	0.008	0.040	0.004	150	0.021	0.004	0.037	0.015
Meta-analysis	2693	0.013	0.009	0.017	9.1x10⁻¹¹	1878	0.015	0.01	0.020	1.1x10⁻¹⁰

@, $I^2 = 32.8$ and Het-P = 0.177; #, $I^2 = 0$ and Het-P = 0.643

Table 2B: Associations of maternal genetic score with offspring birthweight in South Asian populations

Cohort	mGS adjusted for sex and GA [@]					mGS adjusted for sex, GA and fGS [#]				
	N	Effect	L95	U95	P	N	Effect	L95	U95	P
PMNS	461	0.000	-0.008	0.008	0.976	443	0.001	-0.008	0.009	0.876
PS	475	0.011	0.003	0.020	0.013	458	0.011	0.003	0.019	0.011
MMNP*	467	-0.001	-0.009	0.007	0.804	460	0.000	-0.009	0.008	0.957
Dhaka-WP2	53	0.034	0.009	0.059	0.011	53	0.034	0.009	0.059	0.011
Dhaka-WP3	314	0.010	0.001	0.020	0.040	314	0.009	0.000	0.019	0.060
UK-Bang	150	0.016	0.001	0.032	0.041	150	0.012	-0.004	0.028	0.150
Meta-analysis	1903	0.006	0.002	0.010	0.003	1878	0.006	0.002	0.010	0.004

@, $I^2 = 63.5$ and Het-P = 0.018; #, $I^2 = 53.7$ and Het-P = 0.056

Association analysis was performed using linear regression with standardized birthweight adjusted for sex and gestational age as the dependent variable for each cohort separately and finally the summary results were meta-analyzed. *In MMNP, allocation group was additionally adjusted for, and in MBRC only sex was adjusted for, since gestational age data was not available for the majority of the sample. The effect size is in standard deviation units of birthweight per unit change in genetic score. The standard deviation of birthweight in kg in all these cohorts ranged from 0.34 to 0.45 kg. N, number of term babies; GA, gestational age; L95, U95, 95% confidence interval; I^2 , heterogeneity; Het-P, P value for heterozygosity; P, P value; fGS, fetal genetic score; mGS, maternal genetic score; GA, gestational age. PMNS, Pune Maternal Nutrition Study; PS, Parthenon Study; MMNP, Mumbai Maternal Nutrition Project; MBRC, Mysore Birth Records Cohort; Dhaka-WP2, Work Package 2 of GIFTS; Dhaka-WP3, Work Package 3 of GIFTS; UK-Bang, London UK Bangladeshi cohort.

Table 3: Associations of fetal and maternal genetic scores with other birth measures in South Asian populations

Trait	fGS adjusted for sex and gestational age*							mGS adjusted for sex and gestational age*						
	N	Effect	L95	U95	P	I ²	Het-P	N	Effect	L95	U95	P	I ²	Het-P
Birth length (Z)	2544	0.004	0.000	0.009	0.048	44.1	0.097	1820	0.003	-0.002	0.008	0.153	42.5	0.122
Ponderal Index (Z)	2517	0.009	0.004	0.013	2.1x10 ⁻⁴	28.3	0.213	1796	0.000	-0.004	0.006	0.906	14.3	0.323
Head circumference (Z)	2564	0.005	0.000	0.009	0.030	48.0	0.073	1844	0.002	-0.002	0.007	0.425	0	0.741
Chest circumference (Z)	1586	0.012	0.007	0.017	8.2x10 ⁻⁶	23.1	0.273	1477	0.002	-0.002	0.007	0.383	3.7	0.374
Abdominal circumference (Z)	1586	0.014	0.008	0.019	3.4x10 ⁻⁷	68.5	0.023	1477	0.002	-0.003	0.007	0.554	62.0	0.048
Mid-upper arm circumference (Z)	1953	0.014	0.009	0.019	1.3x10 ⁻⁷	0	0.485	1844	0.005	0.000	0.010	0.045	0	0.982
Triceps skinfold (Z)	1564	0.013	0.007	0.018	3.6x10 ⁻⁶	44.6	0.144	1455	0.003	-0.001	0.009	0.181	61.7	0.050
Subscapular skinfold (Z)	1563	0.012	0.006	0.017	2.4x10 ⁻⁵	42.3	0.158	1454	0.003	-0.002	0.008	0.260	25.7	0.258

Association analysis was performed using linear regression with standardized birth measures adjusted for sex and gestational age as the dependent variables for each cohort independently and finally the summary results were meta-analyzed. The effect size is in standard deviation units of the birth measure per unit change in genetic score. The South Asian populations include PMNS, Pune Maternal Nutrition Study; PS, Parthenon Study; MMNP, Mumbai Maternal Nutrition Project from India; MBRC, Mysore Birth Records Cohort; Dhaka-WP2 of GIFTS; Dhaka-WP3 of GIFTS; UK-Bang, London UK Bangladeshi cohort. *In MMNP, allocation group was additionally adjusted for, and in MBRC only sex was adjusted for since gestational age data was not available for the majority of the sample. N, number of term babies; L95, U95, 95% confidence interval; I², heterogeneity; Het-P, P value for heterozygosity; P, P value; fGS, fetal genetic score; mGS, maternal genetic score. The N was different for each trait due to missingness of some phenotype data in MBRC, Dhaka-WP2 and Dhaka-WP3.

Table 4: Meta-analysis[#] of associations of fetal genetic score with anthropometric and cardiometabolic traits in early childhood, adolescence and adults in Indians

Traits	Children					Adolescents					Adults				
	N	Effect	P	I ²	Het-P	N	Effect	P	I ²	Het-P	N	Effect	P	I ²	Het-P
Weight (<u>Z</u>)	1866	0.008	0.001	0	0.830	1120	0.002	0.592	0	0.641	3311	0.002	0.341	0	0.698
Height (<u>Z</u>)	1865	0.006	0.017	0	0.846	1120	0.002	0.437	0	0.889	3307	0.003	0.037	0	0.574
Body mass index (<u>Z</u>)	1865	0.007	0.007	0	0.666	1120	0.001	0.844	0	0.581	3306	0.000	0.977	0	0.438
Head circumference (<u>Z</u>)	1866	0.007	0.003	0	0.999	1115	0.004	0.223	0	0.633	3256	0.006	5.5x10 ⁻⁴	32.2	0.194
Waist circumference (<u>Z</u>)	1864	0.010	5.5x10 ⁻⁵	0	0.463	1096	0.004	0.254	0	0.918	3251	0.001	0.528	13.8	0.326
Hip circumference (<u>Z</u>)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3256	0.001	0.456	0	0.680
Waist to hip ratio (<u>Z</u>)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3247	0.001	0.603	9.8	0.353
Mid upper arm circumference (<u>Z</u>)	1865	0.005	0.032	0	0.705	1112	0.000	0.976	0	0.595	3258	0.000	0.852	0	0.645
Triceps skinfold (<u>Z</u>)	1865	0.002	0.511	0	0.760	1114	0.002	0.487	0	0.790	3259	0.001	0.748	0	0.725
Subscapular skinfold (<u>Z</u>)	1865	0.003	0.280	52.2	0.123	1113	0.002	0.603	0	0.825	3238	-0.001	0.673	0	0.926
Fat percentage (<u>Z</u>)	1860	0.003	0.254	50.3	0.133	1085	0.002	0.475	45.8	0.174	NA	NA	NA	NA	NA
Systolic blood pressure (<u>Z</u>)*	1847	-0.002	0.411	0	0.410	1102	-0.005	0.112	88.6	0.003	3081	0.000	0.801	0	0.454
Diastolic blood pressure (<u>Z</u>)*	1848	0.000	0.989	0	0.765	1102	0.000	0.904	92.4	0.000	3082	0.000	0.922	0	0.467
Fasting glucose (<u>Z</u>)*	1840	-0.002	0.483	0	0.497	1110	0.000	0.908	92.8	0.000	2601	-0.006	9.3x10 ⁻⁴	30.5	0.218
120 minutes glucose (<u>Z</u>)*	1809	0.002	0.321	0	0.434	NA	NA	NA	NA	NA	1320	0.000	0.905	0	0.707
Fasting insulin (<u>Z</u>)*	1831	0.002	0.369	18.9	0.291	1111	0.002	0.463	47.7	0.167	2596	-0.002	0.359	0	0.823
HOMA-IR (<u>Z</u>)*	1756	0.002	0.401	0	0.997	1110	0.002	0.407	74.4	0.048	2432	-0.005	0.022	0	0.802
Total cholesterol (<u>Z</u>)*	1838	-0.005	0.050	50.7	0.131	1111	0.004	0.224	0	0.488	2601	-0.003	0.118	0	0.968
LDL-cholesterol (<u>Z</u>)*	1847	-0.003	0.280	52.9	0.119	1111	0.006	0.070	0	0.676	2600	-0.001	0.594	0	0.957
HDL cholesterol (<u>Z</u>)*	1849	-0.005	0.059	0	0.513	1111	0.002	0.632	0	0.631	2584	0.000	0.867	0	0.809
Triglycerides (<u>Z</u>)*	1838	-0.001	0.666	0	0.668	1111	-0.002	0.440	37.8	0.205	2601	-0.006	0.002	0	0.673

Association analysis was performed using linear regression with standardized log10 transformed traits as the dependent variable for each cohort independently and finally the summary results were meta-analyzed. Age and sex were included as covariates in the regression model for all traits; BMI was additionally included as a covariate for analysis of traits marked with an asterisk (*). Allocation group was additionally adjusted for in MMNP. #, Meta-analysis for children included those from Pune Maternal Nutrition Study at 6 yrs, Parthenon Study at 5 yrs, and Mumbai Maternal Nutrition Project at 7 yrs of age; for adolescents from Pune Maternal Nutrition Study at 12 yrs and Parthenon Study at 13.5 yrs; and for adults from parents from Pune Maternal Nutrition Study and Parthenon Study, mothers from Mumbai Maternal Nutrition Project, and individuals from Mysore Birth Records Cohort; P, P value; I², heterogeneity; Het-P, P value for heterozygosity; SNP, single nucleotide polymorphism; HOMA-IR, homeostasis model assessment of insulin resistance, LDL, low density lipoprotein; HDL, high density lipoprotein, NA, not available. Those passing the Bonferroni corrected P_≤0.001 were considered as statistically significant.

