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Supplementary Material for

TITLE: Precision Medicine, Developmental Plasticity and Prevention of Non-Communicable Disease

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Supplementary Table 1. SNP list for variants used to develop the BW-PGS

Locus	SNP	CHR	BP	EFFECT ALLELE	OTHER ALLELE	EAF	BETA	SE	P_value
WNT4-ZBTB40	rs2473248	1	22536643	C	T	0.889	0.033	0.006	1.1x10-8
ZBTB7B	rs3753639	1	154986091	C	T	0.2285	0.031	0.004	7.3x10-12
DTL	rs61830764	1	212289976	A	G	0.3513	0.022	0.004	5.6x10-8
FCGR2B	rs72480273	1	161644871	C	A	0.1848	0.031	0.005	8.0x10-10
EPAS1	rs1374204	2	46484205	T	C	0.6829	0.047	0.004	6.2x10-29
ATAD2B	rs7575873	2	23962647	A	G	0.8737	0.038	0.006	1.3x10-11
CPA3	rs10935733	3	148622968	T	C	0.4422	0.022	0.004	9.2x10-9
ADCY5	rs11719201	3	123068744	T	C	0.2281	0.046	0.004	2.4x10-26
CCNL1-LEKR1	rs13322435	3	156795468	A	G	0.431	0.053	0.004	3.7x10-41
PTH1R	rs2242116	3	46941116	A	G	0.3756	0.022	0.004	1.4x10-8
HHIP	rs6537307	4	145601863	G	A	0.4957	0.025	0.004	9.5x10-12
LCORL	rs925098	4	17919811	G	A	0.2701	0.034	0.004	5.4x10-16
EBF1	rs7729301	5	157886953	A	G	0.7156	0.024	0.004	1.6x10-8
5q11.2	rs854037	5	57091783	A	G	0.8214	0.027	0.005	2.2x10-8
ESR1	rs1101081	6	152032917	C	T	0.7629	0.038	0.004	1.6x10-19
L3MBTL3	rs1415701	6	130345835	G	A	0.7541	0.025	0.004	2.6x10-9
CDKAL1	rs35261542	6	20675792	C	A	0.7448	0.044	0.004	4.4x10-27
HMGA1	rs7742369	6	34165721	G	A	0.1817	0.028	0.005	1.0x10-8
HIST1H2BE	rs9379832	6	26186200	A	G	0.6946	0.023	0.004	6.6x10-8
IGF2BP3	rs11765649	7	23479013	T	C	0.753	0.027	0.004	5.8x10-10
YKT6-GCK	rs138715366	7	44246271	C	T	0.9885	0.241	0.023	7.2x10-26
MLXIPL	rs62466330	7	73056805	C	T	0.0604	0.049	0.008	1.2x10-12

TBX20	rs6959887	7	35295365	A	G	0·6185	0·023	0·004	1·5x10-9
GNA12	rs798489	7	2801803	C	T	0·755	0·023	0·004	2·0x10-8
SLC45A4	rs12543725	8	142247979	G	A	0·5898	0·023	0·004	1·2x10-9
ANK1-NKX6-3	rs13266210	8	41533514	A	G	0·7962	0·031	0·005	1·3x10-11
TRIB1	rs6989280	8	126508746	G	A	0·7179	0·022	0·004	2·2x10-7
LPAR1	rs2150052	9	113945067	T	A	0·49636	0·021	0·004	2·2x10-8
PTCH1	rs28510415	9	98245026	G	A	0·08407	0·056	0·007	1·5x10-17
STRBP	rs700059	9	125824055	G	A	0·15355	0·033	0·005	4·7x10-10
PHF19	rs7847628	9	123631225	G	A	0·68935	0·023	0·004	1·0x10-8
PLEKHA1	rs2421016	10	124167512	T	C	0·47441	0·021	0·004	1·8x10-8
HHEX-IDE	rs61862780	10	94468643	T	C	0·54487	0·028	0·004	3·0x10-14
ADRB1	rs7076938	10	115789375	T	C	0·74435	0·036	0·004	4·7x10-18
NT5C2	rs74233809	10	104913940	C	T	0·07945	0·037	0·007	5·2x10-8
MTNR1B	rs10830963	11	92708710	G	C	0·25784	0·023	0·004	2·9x10-8
INS-IGF2	rs72851023	11	2130620	T	C	0·06912	0·048	0·008	2·9x10-10
APOLD1	rs11055034	12	12890626	C	A	0·69934	0·022	0·004	1·8x10-7
ITPR2	rs12823128	12	26872730	T	C	0·53331	0·021	0·004	1·9x10-8
HMGA2	rs1351394	12	66351826	T	C	0·47709	0·044	0·004	1·9x10-32
ABCC9	rs139975827	12	22068161	G	A	0·58773	0·025	0·004	1·1x10-8
IGF1	rs7964361	12	102994878	A	G	0·09501	0·039	0·007	4·7x10-9
RNF219-AS1	rs1819436	13	78580283	C	T	0·8636	0·033	0·006	6·3x10-9
LINC00332	rs2324499	13	40662001	G	C	0·67402	0·022	0·004	7·3x10-8
RB1	rs2854355	13	48882363	G	A	0·29964	0·023	0·004	9·8x10-8
FES	rs12906125	15	91427612	G	A	0·69747	0·023	0·004	1·7x10-8

IGF1R	rs7402982	15	99193269	A	G	0.43915	0.023	0.004	2.3x10-9
GPR139	rs1011939	16	19992996	G	A	0.30875	0.022	0.004	1.3x10-7
CLDN7	rs113086489	17	7171356	T	C	0.44908	0.031	0.004	9.1 x10-16
SP6-SP2	rs12942207	17	45968294	C	T	0.29883	0.022	0.004	5.1x10-8
SUZ12P1-CRLF3	rs144843919^	17	29037339	G	A	0.97222	0.066	0.012	1.4x10-8
PEPD	rs10402712	19	33926013	A	G	0.27166	0.022	0.004	4.4x10-7
ACTL9	rs61154119	19	8787750	T	G	0.83999	0.028	0.005	1.1x10-7
C20orf203	rs28530618	20	31275581	A	G	0.48052	0.026	0.004	7.7x10-12
MAFB	rs6016377	20	39172728	T	C	0.43974	0.024	0.004	9.5x10-10
JAG1	rs6040076	20	10658882	C	G	0.49462	0.023	0.004	2.0x10-9
NRIP1	rs2229742	21	16339172	G	C	0.89414	0.036	0.006	2.2x10-9
KREMEN1	rs134594	22	29468456	C	T	0.34844	0.023	0.004	1.0x10-8
SREBF2	rs62240962	22	42259524	C	T	0.92035	0.047	0.007	9.7x10-12
PLAC1	rs11096402^	X	133827868	G	A	0.5528	0.028	0.005	1.3x10-9

^denotes variant not used in the development of the BW-PGS due to poor imputation score; CHR – Chromosome number; BP – Base position, EFFECT ALLELE – Allele corresponding to increasing birth weight; OTHER ALLELE- Allele corresponding to decreasing birth weight; EAF – Effect allele frequency; BETA- Beta coefficient from GWAS meta-analysis of birth weight; SE – Standard error from GWAS meta-analysis of birth weight; P-value - P-value from GWAS meta-analysis of birth weight

Supplementary Table 2. Association Analyses for body mass index (kg/m²)

	Model 1 ^ε	
Predictors	Estimate (95% CI)	P
Intercept	25.19 (24.61 – 25.78)	<0.001
BW-PGS [§]	0.18 (-0.25 – 0.61)	0.41
Duration BF (months) [†]	-0.05 (-0.11 – 0.01)	0.11
Sex (M)	0.24 (-0.58 – 1.06)	0.57
EAT ₁ score [‡]	-0.57 (-0.99 – -0.14)	0.0090
Principal component 1 ^δ	-5.62 (-21.24 – 10.00)	0.48
Principal component 2 ^δ	-4.54 (-20.19 – 11.11)	0.57
BW-PGS * Duration BF	-0.06 (-0.11 – -0.00)	0.037
	Model 2 ^ϕ	
Predictors	Estimate (95% CI)	P
Intercept	25.14 (24.52 – 25.75)	<0.001
BW-PGS [§]	0.36 (-0.09 – 0.81)	0.11
Duration BF (months) [†]	-0.29 (-0.09 – 0.03)	0.34
Sex (M)	0.11 (-0.74 – 0.97)	0.80
EAT ₃ score [‡]	-0.46 (-0.91 – -0.02)	0.043
Principal component 1 ^δ	-3.12 (-18.32 – 12.08)	0.69
Principal component 2 ^δ	0.60 (-16.00 – 17.19)	0.94
BW-PGS * Duration BF	-0.08 (-0.13 – -0.03)	0.0040

[§] BW-PGS = birth weight polygenic score (standardised); [†] Duration of BF = Duration of any breastfeeding (mean-centred); [‡] EAT₁ score (standardised) = quality of early life nutrition in first year of life; ^δ adjustment for population stratification; [‡] EAT₃ score (standardised) = quality of early life nutrition in third year of life; ^ε Model 1 examines the effect of duration of breastfeeding and EAT₁ score; ^ϕ Model 2 examine the effect of duration of breastfeeding and EAT₃ score; All models adjusting for BW-PGS, sex and the first two principal components

Supplementary Table 3. Association Analyses for Obesity

Overweight (BMI ≥ 25 kg/m ²)	Model 1 ^ε		Model 2 ^φ	
Predictors	Log Odds (95% CI)	P	Log Odds (95% CI)	P
Intercept	0.28 (-0.50 – 1.07)	0.48	0.12 (-0.68 – 0.91)	0.77
BW-PGS (High Score) [§]	0.13 (-0.29 – 0.54)	0.54	1.01 (0.35 – 1.71)	0.0033
Duration BF (≥ 6 months)	-0.39 (-0.75 – -0.04)	0.031	-0.07 (-0.48 – 0.34)	0.72
Sex (M)	0.42 (0.08 – 0.76)	0.016	0.48 (0.14 – 0.83)	0.0063
EAT ₁ score [‡]	-0.02 (-0.04 – 0.00)	0.055	-0.02 (-0.04 – -0.00)	0.039
Principal component 1 ^δ	-2.76 (-9.87 – 3.74)	0.42	-2.55 (-9.69 – 4.01)	0.46
Principal component 2 ^δ	-0.38 (-6.93 – 5.95)	0.91	0.27 (-6.31 – 6.62)	0.93
BW-PGS (High Score) * Duration BF (≥ 6 months)			-1.50 (-2.40 – -0.62)	0.00096
Obese (BMI ≥ 30 kg/m ²)	Model 3 ^ε		Model 4 ^φ	
Predictors	Log Odds (95% CI)	P	Log Odds (95% CI)	P
Intercept	-0.08 (-1.17 – 1.00)	0.88	-0.25 (-1.35 – 0.84)	0.65
BW-PGS (High Score) [§]	-0.19 (-0.83 – 0.40)	0.54	0.60 (-0.19 – 1.35)	0.13
Duration BF (≥ 6 months)	-0.59 (-1.08 – -0.10)	0.018	-0.24 (-0.79 – 0.31)	0.39
Sex (M)	-0.40 (-0.89 – 0.08)	0.10	-0.340 (-0.83 – 0.15)	0.17
EAT ₁ score [‡]	-0.03 (-0.05 – -0.00)	0.030	-0.03 (-0.06 – -0.00)	0.024
Principal component 1 ^δ	-1.89 (-13.42 – 7.05)	0.71	-1.46 (-12.93 – 7.54)	0.77
Principal component 2 ^δ	2.10 (-7.18 – 10.23)	0.63	2.85 (-6.52 – 11.11)	0.52
BW-PGS (High Score) * Duration BF (≥ 6 months)			-2.23 (-4.18 – -0.75)	0.0079

[§] BW-PGS (High Score) = birthweight polygenic score $\geq 80^{\text{th}}$ percentile of BW-PGS; [‡] EAT₁ score = quality of early life nutrition in first year of life; ^δ adjustment for population stratification; ^ε Models 1 and 3 examine the effect of duration of breastfeeding on the risk of being overweight and obese, respectively, adjusting for BW-PGS, sex and EAT₁ score; ^φ Models 2 and 4 examines the effect modification of duration of breastfeeding by BW-PGS on the risk of being overweight and obese, respectively, adjusting for sex and EAT₁ score

Supplementary Table 4. Association Analyses for Obesity

	Model 1 ^a		Model 2 ^b	
Predictors	Log Odds (95% CI)	P	Log Odds (95% CI)	P
Intercept	-0.69 (-1.06 – -0.32)	0.48	-1.50 (-1.97 – -1.02)	<0.001
BW-PGS (High Score) [§]	1.01 (0.34 – 1.69)	0.54	0.60 (-0.17 – 1.36)	0.13
Duration BF (≥ 6 months)	-0.07 (-0.48 – 0.33)	0.031	-0.24 (-0.79 – 0.31)	0.39
Sex (M)	0.48 (0.14 – 0.83)	0.016	-0.34 (-0.83 – 0.15)	0.17
EAT ₁ score [‡]	-0.19 (-0.37 – -0.01)	0.055	-0.29 (-0.54 – -0.04)	0.024
Principal component 1 ^δ	-2.55 (-9.32 – 4.22)	0.42	-1.46 (-11.42 – 8.51)	0.77
Principal component 2 ^δ	0.27 (-6.15 – 6.69)	0.91	2.85 (-5.87 – 11.57)	0.52
BW-PGS (High Score) * Duration BF (≥ 6 months)	-1.50 (-2.38 – -0.61)	0.001	-2.23 (-3.87 – -0.58)	0.0080
	Model 3 ^e		Model 4 ^φ	
Predictors	Log Odds (95% CI)	P	Log Odds (95% CI)	P
Intercept	-0.87 (-1.27 – -0.47)	<0.001	-1.59 (-2.10 – -1.07)	<0.001
BW-PGS (High Score) [§]	1.19 (0.48 – 1.91)	0.001	0.61 (-0.22 – 1.44)	0.15
Duration BF (≥ 6 months)	0.13 (-0.30 – 0.55)	0.56	-0.13 (-0.71 – 0.45)	0.65
Sex (M)	0.45 (0.09 – 0.81)	0.014	-0.32 (-0.83 – 0.20)	0.23
EAT ₃ score [‡]	-0.04 (-0.22 – 0.15)	0.70	-0.25 (-0.52 – 0.02)	0.066
Principal component 1 ^δ	-1.49 (-8.02 – 5.04)	0.65	1.44 (-7.60 – 10.49)	0.76
Principal component 2 ^δ	1.07 (-5.73 – 7.87)	0.76	1.96 (-7.26 – 11.17)	0.68
BW-PGS (High Score) * Duration BF (≥ 6 months)	-1.62 (-2.55 – -0.69)	0.0010	-2.84 (-5.01 – -0.67)	0.010

[§] BW-PGS (High score)= birthweight polygenic score ≥ 80th percentile of BW-PGS; [‡] EAT₁ score (standardised) = quality of early life nutrition in first year of life; ^δ adjustment for population stratification; [‡] EAT₃ score (standardised) = quality of early life nutrition in third year of life; ^a Model 1 examines the effect of duration of breastfeeding and EAT₁ score on the risk of being overweight; ^b Model 2 examines the effect of duration of breastfeeding and EAT₁ score on the risk of being obese; ^e Model 3 examines the effect of duration of breastfeeding and EAT₃ score on the risk of being overweight; ^φ Model 4 examines the effect of duration of breastfeeding and EAT₁ score on the risk of being obese; All models adjusting for BW-PGS, sex and the first two principal components

Supplementary Table 5. Association analyses for percent body fat (at 20 years of age) by DEXA

Percent Optimal Birth Weight (POBW)	Model 1 ^α		Model 2 ^β	
Predictors	Estimate (95% CI)	P	Estimate (95% CI)	P
Intercept	43.69 (40.68 – 46.70)	<0.0001	43.69 (40.67 – 46.71)	<0.0001
POBW ^γ	0.31 (-0.34 – 0.97)	0.35	0.31 (-0.34 – 0.97)	0.35
Duration BF (months) [†]	-0.10 (-0.20 – -0.01)	0.033	-0.10 (-0.20 – -0.01)	0.034
Sex (M)	-17.94 (-19.24 – -16.65)	<0.0001	-17.95 (-19.25 – -16.65)	<0.0001
EAT ₁ score [‡]	-0.10 (-0.16 – -0.03)	0.0047	-0.10 (-0.16 – -0.03)	0.0047
POBW * Duration BF			-0.00 (-0.08 – 0.08)	0.097
Birthweight Polygenic Score (BW-PGS)	Model 3 ^ε		Model 4 ^φ	
Predictors	Estimate (95% CI)	P	Estimate (95% CI)	P
Intercept	43.73 (40.71 – 46.75)	<0.0001	43.57 (40.55 – 46.59)	<0.0001
BW-PGS [§]	0.00 (-0.65 – 0.65)	1.0	0.07 (-0.58 – 0.72)	0.83
Duration BF (months) [†]	-0.09 (-0.19 – 0.00)	0.056	-0.09 (-0.19 – 0.00)	0.054
Sex (M)	-17.91 (-19.20 – -16.62)	<0.0001	-17.84 (-19.14 – -16.55)	<0.0001
EAT ₁ score [‡]	-0.10 (-0.16 – -0.03)	0.0042	-0.09 (-0.16 – -0.03)	0.0054
Principal component 1 ^δ	-14.54 (-38.61 – 9.54)	0.24	-14.15 (-38.19 – 9.88)	0.25
Principal component 2 ^δ	-11.26 (-34.42 – 11.91)	0.34	-11.49 (-34.60 – 11.64)	0.33
BW-PGS * Duration BF			-0.08 (-0.17 – 0.01)	0.069

[†] POBW = Percent Optimal Birth Weight (standardised); [‡] Duration of BF = Duration of any breastfeeding (mean-centred); [§] EAT₁ score = quality of early life nutrition in first year of life; [§] BW-PGS = birth weight polygenic score (standardised); ^δ adjustment for population stratification; ^α Model 1 examines the effect of duration of breastfeeding adjusting for POBW, sex and EAT₁ score; ^β Model 2 examines the effect modification of duration of breastfeeding by POBW adjusting for sex and EAT₁ score; ^ε Model 3 examines the effect of duration of breastfeeding adjusting for BW-PGS, sex, EAT₁ score and population stratification; ^φ Model 4 examines the effect modification of duration of breastfeeding by BW-PGS adjusting for sex and EAT₁ score

Supplementary Table 6. Sensitivity analyses for body mass index (kg/m²)
(Results from pooled imputation analysis)

Percent Optimal Birth Weight (POBW)	Model 1 ^α		Model 2 ^β	
Predictors	Estimate (SE)	P	Estimate (SE)	P
Intercept	28.26 (0.79)	<0.0001	28.26 (0.79)	<0.0001
POBW ^γ	0.35 (0.16)	0.033	0.35 (0.16)	0.032
Duration BF (months) [†]	-0.05 (0.02)	0.032	-0.05 (0.02)	0.032
Sex (M)	0.11 (0.34)	0.74	0.11 (0.34)	0.74
EAT ₁ score [‡]	-0.07 (0.02)	0.00021	-0.07 (0.02)	0.00021
POBW * Duration BF			0.00 (0.02)	0.93
Birthweight Polygenic Score (BW-PGS)	Model 3 ^ε		Model 4 ^ϕ	
Predictors	Estimate (SE)	P	Estimate (SE)	P
Intercept	28.36 (0.80)	<0.0001	28.30 (0.79)	<0.0001
BW-PGS [§]	0.06 (0.18)	0.74	0.07 (0.18)	0.71
Duration BF (months) [†]	-0.05 (0.02)	0.058	-0.05 (0.02)	0.053
Sex (M)	0.11 (0.34)	0.74	0.14 (0.34)	0.69
EAT ₁ score [‡]	-0.07 (0.02)	0.00015	-0.07 (0.02)	0.00017
Principal component 1 ^δ	-10.51 (5.61)	0.061	-10.39 (5.60)	0.064
Principal component 2 ^δ	-1.31 (6.36)	0.84	-1.47 (6.35)	0.82
BW-PGS * Duration BF			-0.05 (0.02)	0.038

[†] POBW = Percent Optimal Birth Weight (standardised); [‡] Duration of BF = Duration of any breastfeeding (mean-centred); [§] EAT₁ score = quality of early life nutrition in first year of life; [§] BW-PGS = birth weight polygenic score (standardised); ^δ adjustment for population stratification; ^α Model 1 examines the effect of duration of breastfeeding adjusting for POBW, sex and EAT₁ score; ^β Model 2 examines the effect modification of duration of breastfeeding by POBW adjusting for sex and EAT₁ score; ^ε Model 3 examines the effect of duration of breastfeeding adjusting for BW-PGS, sex, EAT₁ score and population stratification; ^ϕ Model 4 examines the effect modification of duration of breastfeeding by BW-PGS adjusting for sex and EAT₁ score

Supplementary Table 7. Association Analyses for systolic blood pressure (mmHg)

	Model 1 ^ε	
Predictors	Estimate (95% CI)	P
Intercept	113.77 (112.65 – 114.89)	<0.001
BW-PGS [§]	0.20 (-0.62 – 1.02)	0.63
Duration BF (months) [†]	0.12 (0.01 – 0.23)	0.041
Sex (M)	9.59 (8.01 – 11.16)	<0.001
EAT ₁ score [‡]	-0.97 (-1.78 – -0.16)	0.020
Principal component 1 ^δ	-10.86 (-40.66 – 18.93)	0.47
Principal component 2 ^δ	-10.82 (-40.16 – 18.51)	0.47
BW-PGS * Duration BF	-0.12 (-0.22 – -0.01)	0.030
	Model 2 ^ϕ	
Predictors	Estimate (95% CI)	P
Intercept	113.71 (112.49 – 114.92)	<0.001
BW-PGS [§]	0.34 (-0.54 – 1.21)	0.45
Duration BF (months) [†]	0.10 (-0.01 – 0.22)	0.086
Sex (M)	9.35 (7.66 – 11.03)	<0.001
EAT ₃ score [‡]	0.29 (-0.58 – 1.17)	0.51
Principal component 1 ^δ	-14.45 (-44.13 – 15.24)	0.34
Principal component 2 ^δ	-22.11 (-54.32 – 10.10)	0.18
BW-PGS * Duration BF	-0.15 (-0.25 – -0.04)	0.0080

[§] BW-PGS = birth weight polygenic score (standardised); [†] Duration of BF = Duration of any breastfeeding (mean-centred); [‡] EAT₁ score (standardised) = quality of early life nutrition in first year of life; ^δ adjustment for population stratification; [‡] EAT₃ score (standardised) = quality of early life nutrition in third year of life; ^ε Model 1 examines the effect of duration of breastfeeding and EAT₁ score; ^ϕ Model 2 examine the effect of duration of breastfeeding and EAT₃ score; All models adjusting for BW-PGS, sex and the first two principal components

Supplementary Table 8. Sensitivity analyses for systolic blood pressure (mmHg)
(Results from pooled imputation analysis)

Percent Optimal Birth Weight (POBW)	Model 1 ^α		Model 2 ^β	
Predictors	Estimate (SE)	P	Estimate (SE)	P
Intercept	117.34 (1.76)	<0.0001	117.31 (1.77)	<0.0001
POBW ^γ	-0.41 (0.35)	0.24	-0.41 (0.35)	0.24
Duration BF (months) [†]	0.10 (0.05)	0.059	0.10 (0.05)	0.065
Sex (M)	9.72 (0.70)	<0.0001	9.74 (0.70)	<0.0001
EAT ₁ score [‡]	-0.09 (0.04)	0.024	-0.09 (0.04)	0.025
POBW * Duration BF			0.02 (0.04)	0.71
Birthweight Polygenic Score (BW-PGS)	Model 3 ^ε		Model 4 ^ϕ	
Predictors	Estimate (SE)	P	Estimate (SE)	P
Intercept	117.39 (1.77)	<0.0001	117.31 (1.78)	<0.0001
BW-PGS [§]	0.05 (0.37)	0.89	0.06 (0.37)	0.88
Duration BF (months) [†]	0.10 (0.05)	0.059	0.10 (0.05)	0.063
Sex (M)	9.75 (0.70)	<0.0001	9.79 (0.70)	<0.0001
EAT ₁ score [‡]	-0.09 (0.04)	0.023	-0.09 (0.04)	0.026
Principal component 1 ^δ	-13.22 (12.73)	0.30	-13.04 (12.72)	0.31
Principal component 2 ^δ	-16.20 (13.03)	0.21	-16.44 (13.04)	0.21
BW-PGS * Duration BF			-0.07 (0.05)	0.15

^γ POBW = Percent Optimal Birth Weight (standardised); [†] Duration of BF = Duration of any breastfeeding (mean-centred); [‡] EAT₁ score = quality of early life nutrition in first year of life; [§] BW-PGS = birth weight polygenic score (standardised); ^δ adjustment for population stratification; ^α Model 1 examines the effect of duration of breastfeeding adjusting for POBW, sex and EAT₁ score; ^β Model 2 examines the effect modification of duration of breastfeeding by POBW adjusting for sex and EAT₁ score; ^ε Model 3 examines the effect of duration of breastfeeding adjusting for BW-PGS, sex, EAT₁ score and population stratification; ^ϕ Model 4 examines the effect modification of duration of breastfeeding by BW-PGS adjusting for sex and EAT₁ score

Supplementary Table 9. Association Analyses for elevated systolic blood pressure (SBP $\geq$ 120mmHg)

SBP $\geq$ 120 mmHg	Model 1 ^ε		Model 2 ^φ	
Predictors	Log Odds (95% CI)	P	Log Odds (95% CI)	P
Intercept	-0.39 (-1.16 – 0.37)	0.31	-0.62 (-1.41 – 0.16)	0.12
BW-PGS (High Score) [§]	0.03 (-0.38 – 0.44)	0.88	0.83 (0.18 – 1.49)	0.012
Duration BF ($\geq$ 6 months) [†]	0.19 (-0.17 – 0.55)	0.31	0.47 (0.07 – 0.88)	0.023
Sex (M)	1.53 (1.20 – 1.88)	<0.0001	1.61 (1.27 – 1.96)	<0.0001
EAT ₁ score [‡]	-0.02 (-0.04 – -0.00)	0.021	-0.02 (-0.04 – -0.00)	0.022
Principal component 1 ^δ	3.62 (-2.66 – 9.92)	0.26	4.11 (-2.29 – 10.56)	0.21
Principal component 2 ^δ	0.28 (-5.82 – 6.38)	0.93	0.67 (-5.47 – 6.81)	0.83
BW-PGS (High Score) * Duration BF ($\geq$ 6 months)			-1.34 (-2.20 – -0.49)	0.0022

[†] Duration of BF = Duration of any breastfeeding (mean-centred); [‡] EAT₁ score = quality of early life nutrition in first year of life; [§] BW-PGS = birth weight polygenic score (standardised); ^δ adjustment for population stratification; ^ε Models 1 and 3 examine the effect of duration of breastfeeding adjusting for BW-PGS, sex and EAT₁ score; ^φ Models 2 and 4 examines the effect modification of duration of breastfeeding by BW-PGS adjusting for sex and EAT₁ score

Supplementary Table 10. Association Analyses for elevated systolic blood pressure (SBP $\geq$ 120 mmHg)

	Model 1 ^a	
Predictors	Log Odds (95% CI)	P
Intercept	-1.50 (-1.89 – -1.11)	<0.001
BW-PGS (High Score) [§]	0.83 (0.18 – 1.48)	0.012
Duration BF ($\geq$ 6 months)	0.47 (0.07 – 0.88)	0.023
Sex (M)	1.61 (1.26 – 1.95)	<0.001
EAT ₁ score [‡]	-0.20 (-0.38 – -0.03)	0.022
Principal component 1 ^δ	4.11 (-2.28 – 10.49)	0.21
Principal component 2 ^δ	0.67 (-5.44 – 6.78)	0.83
BW-PGS (High Score) * Duration BF ($\geq$ 6 months)	-1.34 (-2.19 – -0.48)	0.0022
	Model 2 ^e	
Predictors	Log Odds (95% CI)	P
Intercept	-1.51 (-1.92 – -1.10)	<0.001
BW-PGS (High Score) [§]	1.13 (0.45 – 1.82)	0.001
Duration BF ($\geq$ 6 months)	0.49 (0.06 – 0.91)	0.024
Sex (M)	1.53 (1.17 – 1.89)	<0.001
EAT ₃ score [‡]	-0.07 (-0.25 – 0.12)	0.47
Principal component 1 ^δ	2.00 (-4.16 – 8.16)	0.53
Principal component 2 ^δ	-2.48 (-9.09 – 4.13)	0.46
BW-PGS (High Score) * Duration BF ($\geq$ 6 months)	-1.68 (-2.56 – -0.78)	<0.001

[§] BW-PGS (High score)= birthweight polygenic score $\geq$ 80th percentile of BW-PGS; [‡] EAT₁ score (standardised) = quality of early life nutrition in first year of life; ^δ adjustment for population stratification; [‡] EAT₃ score (standardised) = quality of early life nutrition in third year of life; ^a Model 1 examines the effect of duration of breastfeeding and EAT₁ score on the risk of SBP $\geq$ 120mmHg; ^e Model 2 examines the effect of duration of breastfeeding and EAT₃ score on the risk of SBP $\geq$ 120mmHg; All models adjusting for BW-PGS, sex and the first two principal components

Supplementary Table 11. Association analyses for diastolic blood pressure (mmHg)

Percent Optimal Birth Weight (POBW)	Model 1 ^α		Model 2 ^β	
Predictors	Estimate (95% CI)	P	Estimate (95% CI)	P
Intercept	69.43 (66.89 – 71.96)	<0.0001	69.31 (66.76 – 71.85)	<0.0001
POBW ^γ	-0.08 (-0.64 – 0.47)	0.77	-0.11 (-0.67 – 0.45)	0.70
Duration BF (months) [†]	0.08 (0.00 – 0.16)	0.046	0.08 (-0.00 – 0.15)	0.060
Sex (M)	-0.26 (-1.35 – 0.82)	0.63	-0.18 (-1.28 – 0.91)	0.74
EAT ₁ score [‡]	-0.05 (-0.11 – 0.00)	0.060	-0.05 (-0.11 – 0.00)	0.067
POBW * Duration BF			0.04 (-0.03 – 0.10)	0.30
Birthweight Polygenic Score (BW-PGS)	Model 3 ^ε		Model 4 ^φ	
Predictors	Estimate (95% CI)	P	Estimate (95% CI)	P
Intercept	69.65 (67.11 – 72.19)	<0.0001	69.56 (67.02 – 72.10)	<0.0001
BW-PGS [§]	-0.24 (-0.80 – 0.32)	0.40	-0.19 (-0.76 – 0.37)	0.51
Duration BF (months) [†]	0.08 (0.00 – 0.16)	0.039	0.08 (0.01 – 0.16)	0.036
Sex (M)	-0.29 (-1.37 – 0.80)	0.60	-0.25 (-1.33 – 0.83)	0.65
EAT ₁ score [‡]	-0.06 (-0.11 – -0.00)	0.043	-0.06 (-0.11 – -0.00)	0.049
Principal component 1 ^δ	-13.29 (-33.78 – 7.20)	0.20	-13.15 (-33.63 – 7.34)	0.21
Principal component 2 ^δ	-11.83 (-32.00 – 8.35)	0.25	-12.04 (-32.21 – 8.13)	0.24
BW-PGS * Duration BF			-0.04 (-0.11 – 0.03)	0.25

^γ POBW = Percent Optimal Birth Weight (standardised); [†] Duration of BF = Duration of any breastfeeding (mean-centred); [‡] EAT₁ score = quality of early life nutrition in first year of life; [§] BW-PGS = birth weight polygenic score (standardised); ^δ adjustment for population stratification; ^α Model 1 examines the effect of duration of breastfeeding adjusting for POBW, sex and EAT₁ score; ^β Model 2 examines the effect modification of duration of breastfeeding by POBW adjusting for sex and EAT₁ score; ^ε Model 3 examines the effect of duration of breastfeeding adjusting for BW-PGS, sex, EAT₁ score and population stratification; ^φ Model 4 examines the effect modification of duration of breastfeeding by BW-PGS adjusting for sex and EAT₁ score

Supplementary Table 12. Association Analyses for Fasting Serum Insulin (Natural Log Transformed)

	Model 1 ^ε	
Predictors	Estimate (95% CI)	P
Intercept	2·10 (2·05 – 2·15)	<0·001
BW-PGS [§]	-0·02 (-0·05 – 0·02)	0·43
Duration BF (months) [†]	-0·00 (-0·01 – 0·00)	0·13
Sex (M)	-0·19 (-0·26 – -0·11)	<0·001
EAT ₁ score [‡]	-0·04 (-0·08 – 0·00)	0·066
Principal component 1 ^δ	0·56 (-0·81 – 1·92)	0·42
Principal component 2 ^δ	0·41 (-0·95 – 1·76)	0·56
BW-PGS * Duration BF	0·00 (-0·00 – 0·01)	0·81
	Model 2 ^ϕ	
Predictors	Estimate (95% CI)	P
Intercept	2·10 (2·04 – 2·15)	<0·001
BW-PGS [§]	-0·02 (-0·06 – 0·03)	0·46
Duration BF (months) [†]	-0·00 (-0·01 – 0·00)	0·23
Sex (M)	-0·19 (-0·27 – -0·11)	<0·001
EAT ₃ score [‡]	0·00 (-0·04 – 0·05)	0·83
Principal component 1 ^δ	0·39 (-0·95 – 1·73)	0·57
Principal component 2 ^δ	0·02 (-1·45 – 1·49)	0·98
BW-PGS * Duration BF	-0·00 (-0·01 – 0·01)	0·96

[§] BW-PGS = birth weight polygenic score (standardised); [†] Duration of BF = Duration of any breastfeeding (mean-centred); [‡] EAT₁ score (standardised) = quality of early life nutrition in first year of life; ^δ adjustment for population stratification; [‡] EAT₃ score (standardised) = quality of early life nutrition in third year of life; ^ε Model 1 examines the effect of duration of breastfeeding and EAT₁ score; ^ϕ Model 2 examine the effect of duration of breastfeeding and EAT₃ score; All models adjusting for BW-PGS, sex and the first two principal components

Supplementary Table 13. Association analyses for Plasma Glucose_F (Log Transformed)

Percent Optimal Birth Weight (POBW)	Model 1 ^α		Model 2 ^β	
Predictors	Estimate (95% CI)	P	Estimate (95% CI)	P
Intercept	1.59 (1.56 – 1.62)	<0.0001	1.59 (1.56 – 1.62)	<0.0001
POBW ^γ	-0.01 (-0.01 – -0.000)	0.030	-0.01 (-0.01 – -0.00)	0.022
Duration BF (months) [†]	-0.00 (-0.00 – 0.00)	0.064	-0.00 (-0.00 – -0.00)	0.048
Sex (M)	0.05 (0.04 – 0.06)	<0.0001	0.05 (0.04 – 0.06)	<0.0001
EAT ₁ score [‡]	-0.00 (-0.00 – 0.00)	0.36	-0.00 (-0.00 – 0.00)	0.40
POBW * Duration BF			0.00 (-0.00 – 0.00)	0.17
Birthweight Polygenic Score (BW-PGS)	Model 3 ^ε		Model 4 ^φ	
Predictors	Estimate (95% CI)	P	Estimate (95% CI)	P
Intercept	1.59 (1.56 – 1.62)	<0.0001	1.59 (1.56 – 1.62)	<0.0001
BW-PGS [§]	0.00 (-0.00 – 0.01)	0.43	0.00 (-0.00 – 0.01)	0.40
Duration BF (months) [†]	-0.00 (-0.00 – -0.00)	0.043	-0.00 (-0.00 – -0.00)	0.044
Sex (M)	0.05 (0.04 – 0.06)	<0.0001	0.05 (0.04 – 0.06)	<0.0001
EAT ₁ score [‡]	-0.00 (-0.00 – 0.00)	0.43	-0.00 (-0.00 – 0.00)	0.44
Principal component 1 ^δ	0.02 (-0.20 – 0.23)	0.89	0.02 (-0.20 – 0.23)	0.89
Principal component 2 ^δ	-0.15 (-0.36 – 0.07)	0.17	-0.15 (-0.36 – 0.07)	0.17
BW-PGS * Duration BF			-0.00 (-0.00 – 0.00)	0.72

[†] POBW = Percent Optimal Birth Weight (standardised); [‡] Duration of BF = Duration of any breastfeeding (mean-centred); [§] EAT₁ score = quality of early life nutrition in first year of life; [§] BW-PGS = birth weight polygenic score (standardised); ^δ adjustment for population stratification; ^α Model 1 examines the effect of duration of breastfeeding adjusting for POBW, sex and EAT₁ score; ^β Model 2 examines the effect modification of duration of breastfeeding by POBW adjusting for sex and EAT₁ score; ^ε Model 3 examines the effect of duration of breastfeeding adjusting for BW-PGS, sex, EAT₁ score and population stratification; ^φ Model 4 examines the effect modification of duration of breastfeeding by BW-PGS adjusting for sex and EAT₁ score

Supplementary Table 14. Association analyses for Homeostatic Model Assessment for Insulin Resistance_F (HOMA-IR_F) (Log Transformed)

Percent Optimal Birth Weight (POBW)	Model 1 ^α		Model 2 ^β	
Predictors	Estimate (95% CI)	P	Estimate (95% CI)	P
Intercept	0.76 (0.57 – 0.94)	<0.0001	0.76 (0.58 – 0.95)	<0.0001
POBW ^γ	-0.06 (-0.10 – -0.02)	0.0064	-0.06 (-0.10 – -0.02)	0.0075
Duration BF (months) [†]	-0.00 (-0.01 – 0.00)	0.16	-0.00 (-0.01 – 0.00)	0.17
Sex (M)	-0.14 (-0.22 – -0.06)	0.00050	-0.14 (-0.22 – -0.06)	0.00046
EAT ₁ score [‡]	-0.00 (-0.01 – -0.00)	0.031	-0.01 (-0.01 – -0.00)	0.030
POBW * Duration BF			-0.00 (-0.01 – 0.00)	0.67
Birthweight Polygenic Score (BW-PGS)	Model 3 ^ε		Model 4 ^φ	
Predictors	Estimate (95% CI)	P	Estimate (95% CI)	P
Intercept	0.73 (0.54 – 0.92)	<0.0001	0.73 (0.55 – 0.92)	<0.0001
BW-PGS [§]	-0.01 (-0.05 – 0.03)	0.55	-0.01 (-0.05 – 0.03)	0.54
Duration BF (months) [†]	-0.01 (-0.01 – 0.00)	0.084	-0.01 (-0.01 – 0.00)	0.084
Sex (M)	-0.14 (-0.22 – -0.06)	0.00068	-0.14 (-0.22 – -0.06)	0.00067
EAT ₁ score [‡]	-0.00 (-0.01 – 0.00)	0.065	-0.00 (-0.01 – 0.00)	0.064
Principal component 1 ^δ	0.57 (-0.87 – 2.02)	0.44	0.57 (-0.88 – 2.02)	0.44
Principal component 2 ^δ	0.26 (-1.18 – 1.69)	0.73	0.26 (-1.18 – 1.69)	0.73
BW-PGS * Duration BF			0.00 (-0.01 – 0.01)	0.86

[†] POBW = Percent Optimal Birth Weight (standardised); [‡] Duration of BF = Duration of any breastfeeding (mean-centred); [§] EAT₁ score = quality of early life nutrition in first year of life; [§] BW-PGS = birth weight polygenic score (standardised); ^δ adjustment for population stratification; ^α Model 1 examines the effect of duration of breastfeeding adjusting for POBW, sex and EAT₁ score; ^β Model 2 examines the effect modification of duration of breastfeeding by POBW adjusting for sex and EAT₁ score; ^ε Model 3 examines the effect of duration of breastfeeding adjusting for BW-PGS, sex, EAT₁ score and population stratification; ^φ Model 4 examines the effect modification of duration of breastfeeding by BW-PGS adjusting for sex and EAT₁ score

Supplementary Table 15. Association Analyses for Fasting Low-Density-Lipoprotein-Cholesterol (mmol/L)

	Model 1 ^ε	
Predictors	Estimate (95% CI)	P
Intercept	2.75 (2.67 – 2.83)	<0.001
BW-PGS [§]	0.02 (-0.04 – 0.08)	0.52
Duration BF (months) [†]	0.00 (-0.01 – 0.01)	0.61
Sex (M)	0.02 (-0.09 – 0.13)	0.71
EAT ₁ score [‡]	-0.09 (-0.15 – -0.03)	0.0020
Principal component 1 ^δ	-0.02 (-2.07 – 2.04)	0.99
Principal component 2 ^δ	2.29 (0.25 – 4.32)	0.028
BW-PGS * Duration BF	-0.01 (-0.01 – 0.00)	0.20
	Model 2 ^ϕ	
Predictors	Estimate (95% CI)	P
Intercept	2.74 (2.65 – 2.83)	<0.001
BW-PGS [§]	0.04 (-0.03 – 0.10)	0.24
Duration BF (months) [†]	0.00 (-0.01 – 0.01)	0.72
Sex (M)	0.02 (-0.10 – 0.14)	0.75
EAT ₃ score [‡]	-0.05 (-0.11 – 0.01)	0.080
Principal component 1 ^δ	0.35 (-1.66 – 2.35)	0.74
Principal component 2 ^δ	2.84 (0.65 – 5.04)	0.011
BW-PGS * Duration BF	-0.01 (-0.02 – -0.00)	0.048

[§] BW-PGS = birth weight polygenic score (standardised); [†] Duration of BF = Duration of any breastfeeding (mean-centred); [‡] EAT₁ score (standardised) = quality of early life nutrition in first year of life; ^δ adjustment for population stratification; [‡] EAT₃ score (standardised) = quality of early life nutrition in third year of life; ^ε Model 1 examines the effect of duration of breastfeeding and EAT₁ score; ^ϕ Model 2 examines the effect of duration of breastfeeding and EAT₃ score; All models adjusting for BW-PGS, sex and the first two principal components

Supplementary Table 16. Association analyses for Total Cholesterol_F (mmol/L)

Percent Optimal Birth Weight (POBW)	Model 1 ^α		Model 2 ^β	
Predictors	Estimate (95% CI)	P	Estimate (95% CI)	P
Intercept	5.11 (4.80 – 5.41)	<0.0001	5.10 (4.79 – 5.40)	<0.0001
POBW ^γ	-0.06 (-0.13 – 0.00)	0.061	-0.07 (-0.13 – 0.00)	0.050
Duration BF (months) [†]	0.01 (-0.00 – 0.02)	0.15	0.01 (-0.00 – 0.02)	0.18
Sex (M)	-0.21 (-0.34 – -0.08)	0.0017	-0.20 (-0.33 – -0.07)	0.0028
EAT ₁ score [‡]	-0.01 (-0.02 – -0.00)	0.011	-0.01 (-0.02 – -0.00)	0.013
POBW * Duration BF			0.00 (-0.00 – 0.01)	0.33
Birthweight Polygenic Score (BW-PGS)	Model 3 ^ε		Model 4 ^φ	
Predictors	Estimate (95% CI)	P	Estimate (95% CI)	P
Intercept	5.08 (4.78 – 5.39)	<0.0001	5.08 (4.77 – 5.38)	<0.0001
BW-PGS [§]	-0.01 (-0.07 – 0.06)	0.89	-0.00 (-0.07 – 0.07)	0.97
Duration BF (months) [†]	0.01 (-0.00 – 0.02)	0.24	0.01 (-0.00 – 0.02)	0.23
Sex (M)	-0.21 (-0.34 – -0.08)	0.0017	-0.21 (-0.34 – -0.08)	0.0020
EAT ₁ score [‡]	-0.01 (-0.02 – -0.00)	0.017	-0.01 (-0.02 – -0.00)	0.019
Principal component 1 ^δ	0.50 (-1.89 – 2.88)	0.68	0.51 (-1.88 – 2.89)	0.68
Principal component 2 ^δ	2.25 (-0.11 – 4.62)	0.062	2.24 (-0.13 – 4.61)	0.063
BW-PGS * Duration BF			-0.00 (-0.01 – 0.01)	0.51

[†] POBW = Percent Optimal Birth Weight (standardised); [†] Duration of BF = Duration of any breastfeeding (mean-centred); [‡] EAT₁ score = quality of early life nutrition in first year of life; [§] BW-PGS = birth weight polygenic score (standardised); ^δ adjustment for population stratification; ^α Model 1 examines the effect of duration of breastfeeding adjusting for POBW, sex and EAT₁ score; ^β Model 2 examines the effect modification of duration of breastfeeding by POBW adjusting for sex and EAT₁ score; ^ε Model 3 examines the effect of duration of breastfeeding adjusting for BW-PGS, sex, EAT₁ score and population stratification; ^φ Model 4 examines the effect modification of duration of breastfeeding by BW-PGS adjusting for sex and EAT₁ score

Supplementary Table 17. Association analyses for Triglycerides_F (Log Transformed)

Percent Optimal Birth Weight (POBW)	Model 1 ^α		Model 2 ^β	
Predictors	Estimate (95% CI)	P	Estimate (95% CI)	P
Intercept	0.04 (-0.10 – 0.19)	0.57	0.05 (-0.10 – 0.20)	0.52
POBW ^γ	-0.04 (-0.07 – -0.01)	0.023	-0.04 (-0.07 – -0.00)	0.030
Duration BF (months) [†]	0.00 (-0.00 – 0.01)	0.80	0.00 (-0.00 – 0.01)	0.72
Sex (M)	0.04 (-0.02 – 0.11)	0.17	0.04 (-0.02 – 0.10)	0.22
EAT ₁ score [‡]	-0.00 (-0.00 – 0.00)	0.47	-0.00 (-0.00 – 0.00)	0.44
POBW * Duration BF			-0.00 (-0.01 – 0.00)	0.34
Birthweight Polygenic Score (BW-PGS)	Model 3 ^ε		Model 4 ^φ	
Predictors	Estimate (95% CI)	P	Estimate (95% CI)	P
Intercept	0.03 (-0.12 – 0.17)	0.74	0.03 (-0.12 – 0.18)	0.71
BW-PGS [§]	-0.00 (-0.03 – 0.03)	0.93	-0.00 (-0.04 – 0.03)	0.86
Duration BF (months) [†]	0.00 (-0.00 – 0.00)	0.98	0.00 (-0.00 – 0.00)	0.99
Sex (M)	0.05 (-0.02 – 0.11)	0.15	0.05 (-0.02 – 0.11)	0.16
EAT ₁ score [‡]	-0.00 (-0.00 – 0.00)	0.62	-0.00 (-0.00 – 0.00)	0.60
Principal component 1 ^δ	0.27 (-0.88 – 1.41)	0.65	0.26 (-0.88 – 1.41)	0.65
Principal component 2 ^δ	-0.04 (-1.18 – 1.09)	0.94	-0.04 (-1.17 – 1.10)	0.95
BW-PGS * Duration BF			0.00 (-0.00 – 0.01)	0.58

[†] POBW = Percent Optimal Birth Weight (standardised); [‡] Duration of BF = Duration of any breastfeeding (mean-centred); [§] EAT₁ score = quality of early life nutrition in first year of life; [§] BW-PGS = birth weight polygenic score (standardised); ^δ adjustment for population stratification; ^α Model 1 examines the effect of duration of breastfeeding adjusting for POBW, sex and EAT₁ score; ^β Model 2 examines the effect modification of duration of breastfeeding by POBW adjusting for sex and EAT₁ score; ^ε Model 3 examines the effect of duration of breastfeeding adjusting for BW-PGS, sex, EAT₁ score and population stratification; ^φ Model 4 examines the effect modification of duration of breastfeeding by BW-PGS adjusting for sex and EAT₁ score

Supplementary Table 18. Association analyses for High Density Lipoprotein Cholesterol_F (HDL-C_F) (mmol/L)

Percent Optimal Birth Weight (POBW)	Model 1 ^α		Model 2 ^β	
Predictors	Estimate (95% CI)	P	Estimate (95% CI)	P
Intercept	0.32 (0.24 – 0.40)	<0.0001	0.32 (0.24 – 0.40)	<0.0001
POBW ^γ	-0.02 (-0.03 – 0.00)	0.086	-0.02 (-0.03 – 0.00)	0.093
Duration BF (months) [†]	0.00 (0.00 – 0.01)	0.0098	0.00 (0.00 – 0.01)	0.0093
Sex (M)	-0.17 (-0.20 – -0.13)	<0.0001	-0.17 (-0.21 – -0.13)	<0.0001
EAT ₁ score [‡]	0.00 (-0.00 – 0.00)	0.26	0.00 (-0.00 – 0.00)	0.27
POBW * Duration BF			-0.00 (-0.00 – 0.00)	0.73
Birthweight Polygenic Score (BW-PGS)	Model 3 ^ε		Model 4 ^φ	
Predictors	Estimate (95% CI)	P	Estimate (95% CI)	P
Intercept	0.32 (0.23 – 0.40)	<0.0001	0.32 (0.24 – 0.40)	<0.0001
BW-PGS [§]	-0.01 (-0.03 – 0.01)	0.15	-0.02 (-0.03 – 0.00)	0.11
Duration BF (months) [†]	0.00 (0.00 – 0.01)	0.022	0.00 (0.00 – 0.01)	0.024
Sex (M)	-0.17 (-0.20 – -0.13)	<0.0001	-0.17 (-0.21 – -0.14)	<0.0001
EAT ₁ score [‡]	0.00 (-0.00 – 0.00)	0.20	0.00 (-0.00 – 0.00)	0.22
Principal component 1 ^δ	0.29 (-0.35 – 0.93)	0.37	0.29 (-0.35 – 0.93)	0.38
Principal component 2 ^δ	-0.14 (-0.77 – 0.50)	0.67	-0.13 (-0.76 – 0.51)	0.69
BW-PGS * Duration BF			0.00 (-0.00 – 0.00)	0.22

[†] POBW = Percent Optimal Birth Weight (standardised); [‡] Duration of BF = Duration of any breastfeeding (mean-centred); [§] EAT₁ score = quality of early life nutrition in first year of life; [§] BW-PGS = birth weight polygenic score (standardised); ^δ adjustment for population stratification; ^α Model 1 examines the effect of duration of breastfeeding adjusting for POBW, sex and EAT₁ score; ^β Model 2 examines the effect modification of duration of breastfeeding by POBW adjusting for sex and EAT₁ score; ^ε Model 3 examines the effect of duration of breastfeeding adjusting for BW-PGS, sex, EAT₁ score and population stratification; ^φ Model 4 examines the effect modification of duration of breastfeeding by BW-PGS adjusting for sex and EAT₁ score

Supplementary Table 19. Three-way interaction association analysis to examine the effect of breastfeeding by POBW and sex for body mass index (kg/m²)

Percent Optimal Birth Weight (POBW)		
Predictors	Estimate (95% CI)	P
Intercept	27.82 (25.88 – 29.77)	<0.0001
POBW [‡]	0.67 (0.05 – 1.28)	0.033
Duration BF (months) [†]	-0.10 (-0.18 – -0.0)	0.029
Sex (M)	0.13 (-0.70 – 0.97)	0.75
EAT ₁ score [‡]	-0.06 (-0.10 – -0.02)	0.0055
POBW * Duration BF	0.03 (-0.04 – 0.09)	0.48
POBW * Sex (M)	-0.50 (-1.35 – 0.35)	0.25
Duration BF * Sex (M)	0.05 (-0.07 – 0.17)	0.45
POBW * Duration BF * Sex (M)	-0.11 (-0.21 – 0.00)	0.053

[†]POBW = Percent Optimal Birth Weight (standardised) [‡]Duration of BF = Duration of any breastfeeding (mean-centred); [‡] EAT₁ score = quality of early life nutrition in first year of life

Supplementary Table 20. Three-way interaction association analysis to examine the effect modification of duration of breastfeeding by POBW and sex on systolic blood pressure (mmHg)

Percent Optimal Birth Weight (POBW)		
Predictors	Estimate (95% CI)	P
Intercept	118.23 (114.53 – 121.94)	<0.0001
POBW [§]	-0.65 (-1.82 – 0.53)	0.28
Duration BF (months) [†]	0.06 (-0.10 – 0.23)	0.46
Sex (M)	9.52 (7.91 – 11.12)	<0.0001
EAT ₁ score [‡]	-0.11 (-0.19 – -0.02)	0.012
POBW * Duration BF	0.07 (-0.07 – 0.21)	0.31
POBW * Sex (M)	-0.06 (-1.70 – 1.58)	0.94
Duration BF * Sex (M)	0.08 (-0.15 – 0.31)	0.51
POBW * Duration BF * Sex (M)	-0.136 (-0.36 – 0.05)	0.14

[†] POBW = Percent Optimal Birth Weight (standardised) [†] Duration of BF = Duration of any breastfeeding (mean-centred); [‡] EAT₁ score = quality of early life nutrition in first year of life

Supplementary Table 21. Three-way interaction association analysis to examine the effect modification of duration of breastfeeding by BW-PGS and sex for body mass index (kg/m²)

Birthweight Polygenic Score (BW-PGS)		
Predictors	Estimate (95% CI)	P
Intercept	27.55 (25.60 – 29.50)	<0.0001
BW-PGS [§]	0.25 (-0.36 – 0.87)	0.42
Duration BF (months) [†]	-0.07 (-0.15 – 0.01)	0.087
Sex (M)	0.21 (-0.62 – 1.04)	0.62
EAT ₁ score [‡]	-0.06 (-0.10 – -0.01)	0.011
Principal component 1 ^δ	-6.04 (-21.78 – 9.69)	0.45
Principal component 2 ^δ	-4.19 (-19.90 – 11.53)	0.60
BW-PGS * Duration BF	-0.09 (-0.16 – -0.02)	0.0095
BW-PGS * Sex (M)	-0.17 (-1.03 – 0.69)	0.70
Duration BF * Sex (M)	0.04 (-0.08 – 0.15)	0.56
BW-PGS * Duration BF * Sex (M)	0.08 (-0.03 – 0.20)	0.14

[§] BW-PGS = birth weight polygenic score (standardised); [†] Duration of BF = Duration of any breastfeeding (mean-centred); [‡] EAT₁ score = quality of early life nutrition in first year of life; ^δ adjustment for population stratification

Supplementary Table 22. Three-way interaction association analysis to examine the effect modification of duration of breastfeeding by BW-PGS and sex on systolic blood pressure (mmHg)

Birthweight Polygenic Score (BW-PGS)		
Predictors	Estimate (95% CI)	P
Intercept	118.14 (114.43 – 121.86)	<0.0001
BW-PGS [§]	0.29 (-0.87 – 1.45)	0.62
Duration BF (months) [†]	0.06 (-0.09 – 0.21)	0.43
Sex (M)	9.48 (7.89 – 11.077)	<0.0001
EAT ₁ score [‡]	-0.10 (-0.18 – -0.02)	0.016
Principal component 1 ^δ	-13.20 (-43.25 – 16.85)	0.39
Principal component 2 ^δ	-9.78 (-39.29 – 19.74)	0.52
BW-PGS * Duration BF	-0.09 (-0.22 – 0.05)	0.20
BW-PGS * Sex (M)	-0.20 (-1.83 – 1.43)	0.81
Duration BF * Sex (M)	0.14 (-0.08 – 0.36)	0.22
BW-PGS * Duration BF * Sex (M)	-0.09 (-0.30 – 0.13)	0.42

[§] BW-PGS = birth weight polygenic score (standardised); [†] Duration of BF = Duration of any breastfeeding (mean-centred); [‡] EAT₁ score = quality of early life nutrition in first year of life; ^δ adjustment for population stratification

Supplementary Table 23. Association Analyses for Body Mass Index (BMI, kg/m²)

	Model 1 ^ε	
Predictors	Estimate (95% CI)	P
Intercept	27.71 (25.76 – 29.66)	<0.001
BW-PGS [§]	0.10 (-0.33 – 0.52)	0.66
Duration BF (months) [†]	-0.06 (-0.14 – 0.02)	0.14
Sex (M)	0.17 (-0.66 – 1.00)	0.69
EAT ₁ score [‡]	-0.06 (-0.10 – -0.02)	0.0080
Principal component 1 ^δ	-6.07 (-21.85 – 9.71)	0.45
Principal component 2 ^δ	-4.26 (-19.98 – 11.45)	0.59
Duration BF * Sex (M)	0.03 (-0.09 – 0.14)	0.67

[§] BW-PGS = birth weight polygenic score (standardised); [†] Duration of BF = Duration of any breastfeeding (mean-centred); [‡] EAT₁ score (standardised) = quality of early life nutrition in first year of life; ^δ adjustment for population stratification; [‡] EAT₃ score (standardised) = quality of early life nutrition in third year of life; ^ε Model 1 examines the effect of duration of breastfeeding and EAT₁ score; All models adjusting for BW-PGS, sex and the first two principal components

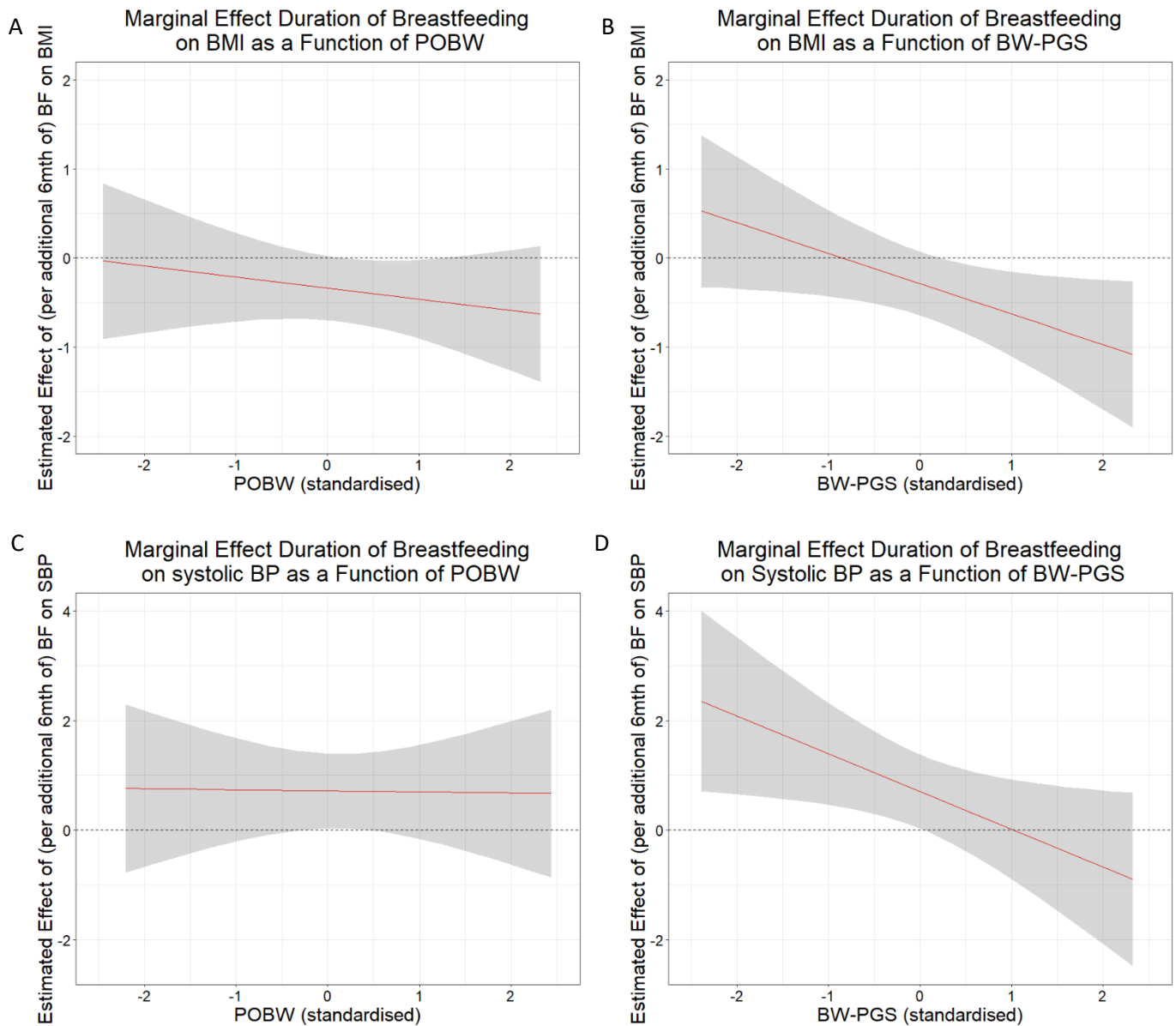
Supplementary Table 24. Association Analyses for Systolic Blood Pressure (SBP, mmHg)

	Model 1 ^ε	
Predictors	Estimate (95% CI)	P
Intercept	118.28 (114.57 – 121.99)	<0.001
BW-PGS [§]	0.05 (-0.77 – 0.86)	0.91
Duration BF (months) [†]	0.07 (-0.09 – 0.20)	0.38
Sex (M)	9.39 (7.80 – 10.98)	<0.001
EAT ₁ score [‡]	-0.10 (-0.19 – -0.02)	0.014
Principal component 1 ^δ	-12.94 (-43.05 – 17.17)	0.39
Principal component 2 ^δ	-9.68 (-39.12 – 19.77)	0.52
Duration BF * Sex (M)	0.10 (-0.12 – 0.32)	0.81

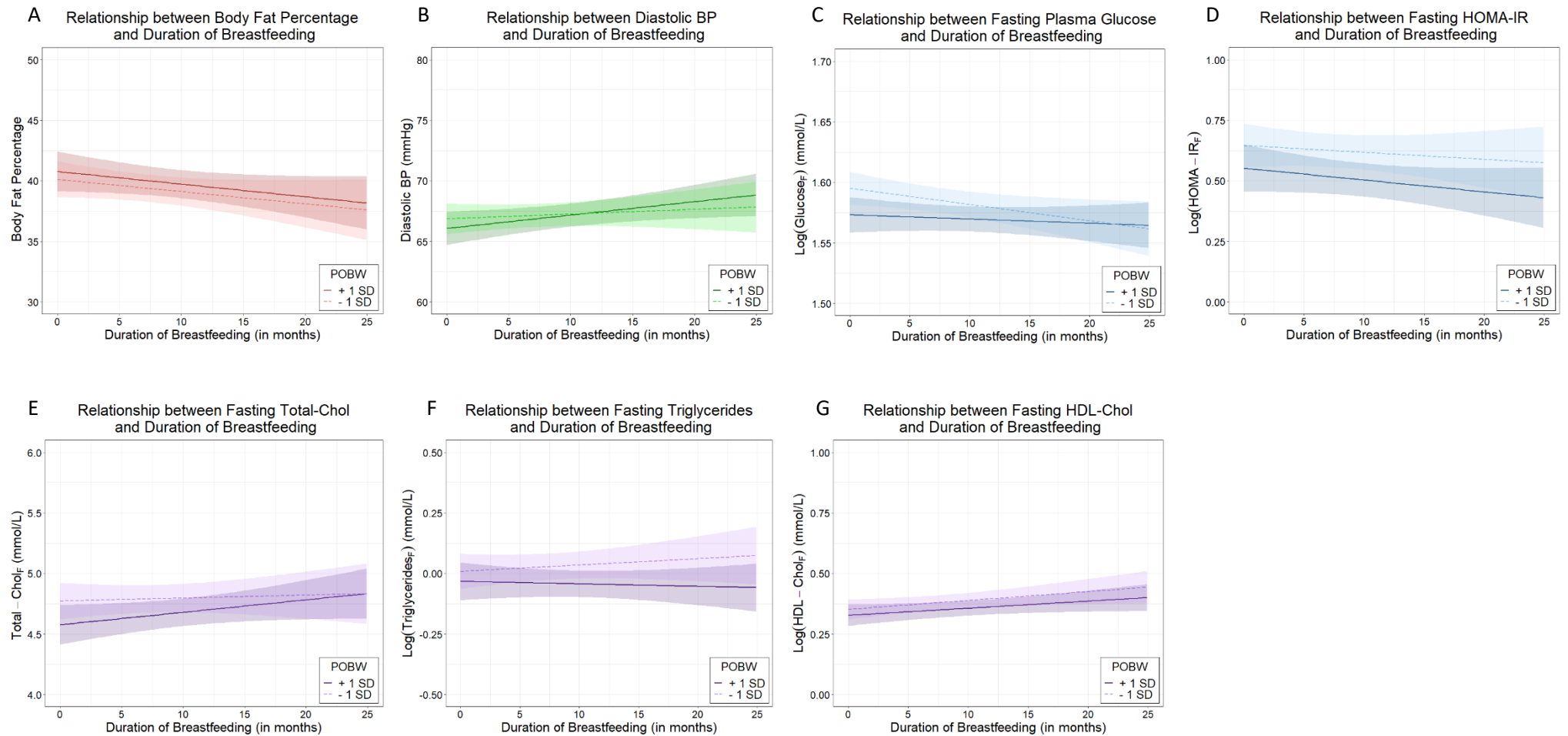
[§] BW-PGS = birth weight polygenic score (standardised); [†] Duration of BF = Duration of any breastfeeding (mean-centred); [‡] EAT₁ score (standardised) = quality of early life nutrition in first year of life; ^δ adjustment for population stratification; ^ε Model 1 examines the effect of duration of breastfeeding and EAT₁ score; All models adjusting for BW-PGS, sex and the first two principal components

Supplementary Figures

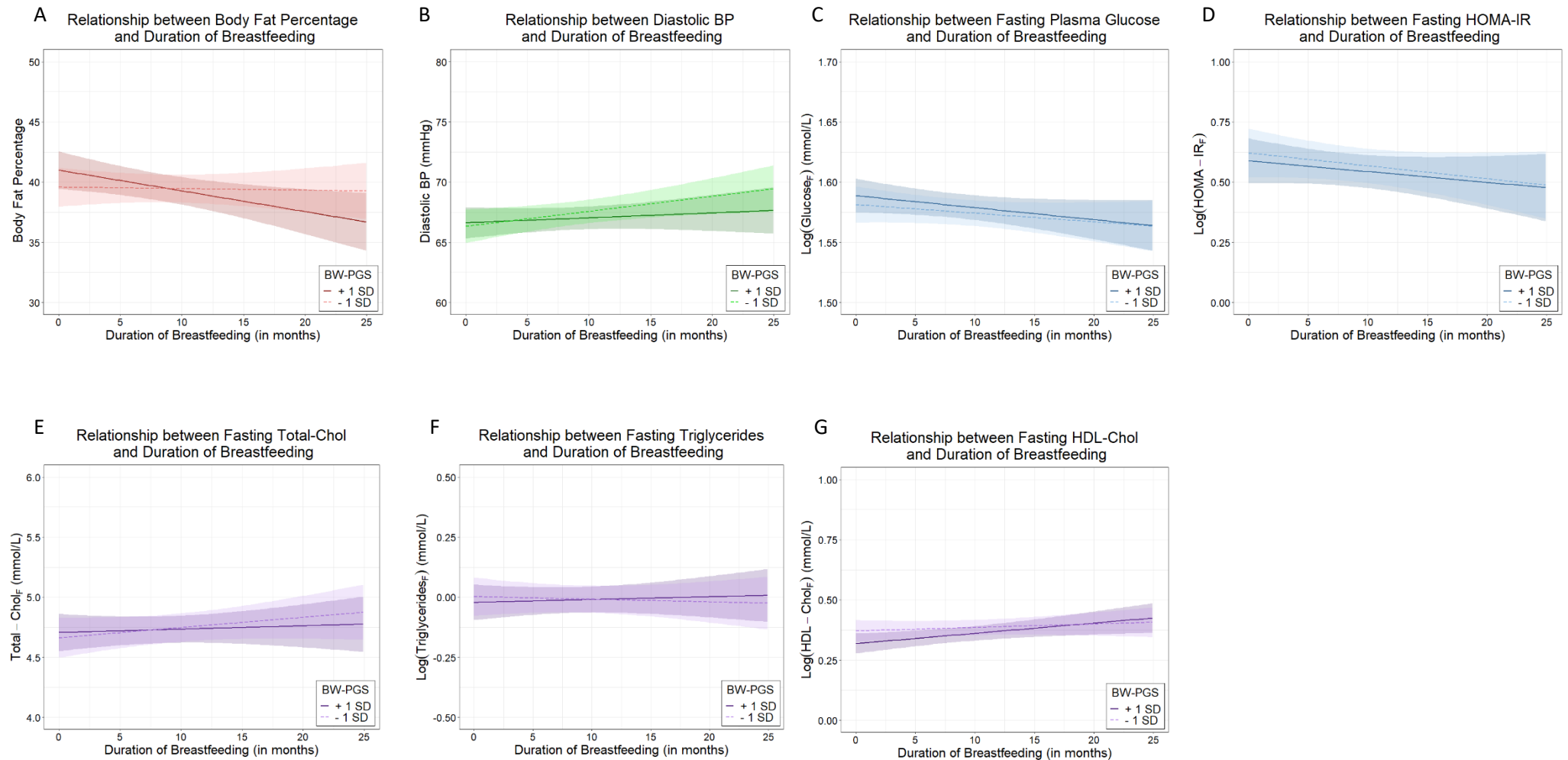
Supplementary Figure 1	Marginal effect of the duration of any breastfeeding on: a) BMI across the POBW (standardised) spectrum b) BMI across the BW-PGS (standardised) spectrum c) SBP across the POBW (standardised) spectrum d) SBP across the BW-PGS (standardised) spectrum
Supplementary Figure 2	The relationship between duration of any breastfeeding (by POBW) and health measures at 22 years of age: a) DEXA measured body fat percentage b) Diastolic BP (mmHg) c) Fasting Plasma Glucose (mmol/L) d) Fasting HOMA-IR e) Fasting Total Cholesterol (mmol/L) f) Fasting Triglycerides (mmol/L) g) Fasting HDL-c (mmol/L)
Supplementary Figure 3	The relationship between duration of any breastfeeding (by BW-PGS) and health measures at 22 years of age: a) DEXA measured body fat percentage b) Diastolic BP (mmHg) c) Fasting Plasma Glucose (mmol/L) d) Fasting HOMA-IR e) Fasting Total Cholesterol (mmol/L) f) Fasting Triglycerides (mmol/L) g) Fasting HDL-c (mmol/L)



Supplementary Figure 1. Marginal effect of duration of breastfeeding on BMI and systolic BP at 22 years of age across the POBW and BW-PGS spectrum. The effect of breastfeeding on the outcome is not significant different to zero where the confidence interval crosses the horizontal line of zero. (A): Marginal effect of duration of breastfeeding on BMI at 22 years of age across the POBW (standardised) spectrum adjusting for sex and diet quality in the first year of life (EAT₁); (B): Marginal effect of duration of breastfeeding on systolic BP at 22 years of age across the POBW (standardised) spectrum adjusting for sex and diet quality in the first year of life (EAT₁); (C): Marginal effect of duration of breastfeeding on BMI at 22 years of age across the BW-PGS (standardised) spectrum adjusting for sex, diet quality in the first year of life (EAT₁) and population stratification (PC1 and PC2); (D): Marginal effect of duration of breastfeeding on systolic BP at 22 years of age across the BW-PGRS (standardised) spectrum adjusting for sex, diet quality in the first year of life (EAT₁) and population stratification (PC1 and PC2)



Supplementary Figure 2. The relationship between duration of any breastfeeding and cardiovascular risk factor s in four areas of health outcomes for POBW that is one standard deviation above the mean, and for POBW that is one standard deviation below the mean; all models are adjusted for sex and diet quality in the first year of life (EAT₁). _F denotes fasting. (A): DEXA measured Body Falt Percentage at 20 years of age; (B): Diastolic blood pressure (DBP) at 22 years of age; (C): Fasting plasma glucose level at 22 years of age; and (D): Fasting HOMA-IR level at 22 years of age; (E): Fasting total cholesterol level at 22 years of age; (F): Fasting triglycerides level at 22 years of age; (G): Fasting high density lipoprotein (HDL-c) level at 22 years of age



Supplementary Figure 3. The relationship between duration of any breastfeeding and cardiovascular risk factors in four areas of health outcomes for BW-PGS that is one standard deviation above the mean, and for BW-PGS that is one standard deviation below the mean all models are adjusted for sex, diet quality in the first year of life (EAT₁), and population stratification (PC1 and PC2). _F denotes fasting. (A): DEXA measured Body Fat Percentage at 20 years of age; (B): Diastolic blood pressure (DBP) at 22 years of age; (C): Fasting plasma glucose level at 22 years of age; and (D): Fasting HOMA-IR level at 22 years of age; (E): Fasting total cholesterol level at 22 years of age; (F): Fasting triglycerides level at 22 years of age; (G): Fasting high density lipoprotein (HDL-c) level at 22 years of age