

Supplemental Table S1. Back transformed value for BMI, glucose, and insulin for z-scores of -1, 0, 0.5, and 1

Variable	Sex	z-score	Age 3-5	Age 6-8	Age 9-11	Age 12-14	Age 15-17	Age 18-19
BMI (kg/m2)	Male	-1	14.2	14.3	14.9	16.3	18.1	19.0
		0	15.9	16.6	18.1	20.1	22.0	23.1
		0.5	16.8	17.8	19.7	22.0	24.0	25.2
		1	17.7	18.9	21.2	23.9	25.9	27.2
	Female	-1	13.8	14.0	14.8	16.5	17.7	18.0
		0	15.8	16.5	18.3	20.8	22.5	23.6
		0.5	16.8	17.8	20.1	23.0	24.9	26.5
		1	17.7	19	21.8	25.2	27.2	29.3
Glucose (mg/dl)	Male	-1	70.8	71.7	75.1	78.4	76.8	74.8
		0	81.0	82.3	84.5	87.3	86.1	86.1
		0.5	86.1	87.6	89.2	91.7	90.7	91.7
		1	91.1	92.9	93.9	96.1	95.2	97.3
	Female	-1	69.5	71.5	74.1	75.7	67.3	67.7
		0	78.9	80.4	84.9	85.1	80.9	83.6
		0.5	83.8	84.8	90.4	89.9	87.8	91.5
		1	88.4	89.2	95.8	94.6	94.6	99.4
Insulin (microM/L)	male	-1	2.1	3.3	4.3	5.5	5.9	5.7
		0	4.6	6.2	7.4	9.7	10.5	10.2
		0.5	7.5	8.9	10.2	13.3	14.7	14.3
		1	10.3	11.6	12.9	16.9	18.8	18.3
	female	-1	2.4	3.8	4.9	7.1	7.0	5.5
		0	5.1	7.0	9.3	12.1	11.9	10.0
		0.5	8.1	9.9	13.5	16.4	16.2	14.1
		1	11.0	12.7	17.6	20.6	20.5	18.1

BMI: Body mass index

Supplemental Table S2. Descriptive characteristics in participants included in the analytic sample (black and white participants with childhood BMI and glucose measures both available) vs. not included (all others with followup age ≥ 20 years and with any childhood anthropometric or laboratory measure available), Total N = 18,626.

	Included in analytic sample	Not included in analytic sample	P difference
N (otherwise noted)	6,738	11,888	
Adult T2DM, n (%)	436 (6.5%)	713 (6.0%)	0.20
Male, n (%)	2,722 (40.4%)	5,517 (46.4%)	<0.001
Race, n (%)			<0.001
US Black	1,926 (28.6%)	257 (2.2%)	
Others	0 (0.0%)	363 (3.1%)	
Cohort, n (%)			<0.001
Bogalusa Heart Study	3,326 (47.9%)	205 (1.7%)	
Childhood Determinants of Adult Health Study	0 (0.0%)	3,036 (25.5%)	
Minneapolis Children's Cohort	490 (7.3%)	686 (5.8%)	
Muscatine Study	0 (0.0%)	6,039 (50.8%)	
National Heart, Lung, and Blood Institute Growth and Health Study	437 (6.5%)	62 (0.5%)	
Princeton Lipid Research Study	788 (11.7%)	71 (0.6%)	
Young Finns Study	1,797 (26.7%)	1,789 (15.1%)	
Child BMI z-score	-0.06 (0.99)	-0.12 (0.80)*	<0.001
Child Glucose z-score	0.01 (0.82)	1.10 (3.77)†	0.020
Child ln(insulin) z-score	-0.02 (0.82)	0.09 (0.83)‡	<0.001
Age of first child measurement, year	12.1 (3.1)	12.5 (3.1)*	<0.001

BMI: body mass index; T2DM: type-2 diabetes mellitus

*N=11,882 (not included due to missing glucose)

†N=68 (not included due to participant being of other race)

‡N=5,196 (included) and 1,818 (not included due to missing glucose, mostly in the Young Finn study, where glucose was not assessed at study baseline, but was assessed at a later visit after some participants had aged out of childhood)

Supplemental Table S3. Multivariable analysis for the association of childhood BMI and ln(Insulin) z-scores with adult T2DM *

Model		Overall	BHS	YFS	NHGS+MN Insulin
	n T2DM/N	388/6,576	199/2,610	174/3,560	15/794
Multivariable model					
BMI	HR (95% CI)	1.50 (1.37, 1.65)	1.41 (1.26, 1.57)	1.79 (1.47, 2.17)	1.61 (1.09, 2.35)
	P	<0.001	<0.001	<0.001	0.016
ln(insulin)	HR (95% CI)	1.31 (1.14, 1.49)	1.31 (1.11, 1.55)	1.15 (0.92, 1.45)	2.30 (1.30, 4.08)
	P	<0.001	0.001	0.222	0.004
Risk score model					
Mean of BMI and ln(insulin)	HR (95% CI)	2.03 (1.81, 2.28)	1.89 (1.63, 2.18)	2.17 (1.70, 2.76)	3.33 (2.06, 5.38)
	P	<0.001	<0.001	<0.001	<0.001

BMI: Body mass index; T2DM: type-2 diabetes mellitus

* Cox regression analysis with childhood BMI and ln(Insulin) z-scores. Z-scores are age-sex standard deviates based on the i3C distribution. Adjustment is for individual mean age and calendar year across child visits, sex, race, country, and cohort. The time to event was computed as age at T2DM occurrence or censoring minus individual mean age across childhood visits. Princeton has no childhood insulin data.

Supplemental Table S4. Multivariable analysis for the association of childhood BMI and glucose z-scores with adult T2DM, according to childhood BMI levels *

Risk factor models	BMI below age- and sex- average		BMI at or above age- and sex- average	
	Hazard ratio (95% CI)	P	Hazard ratio (95% CI)	P
BMI and glucose				
n T2DM/N	215/4,400		221/2,338	
Multivariable model				
BMI z-score	1.35 (0.92, 1.97)	0.123	1.46 (1.30, 1.63)	<0.001
Glucose z-score	1.21 (1.07, 1.36)	0.002	1.33 (1.12, 1.59)	0.001
Risk score model:				
Mean of BMI and glucose z-scores	1.49 (1.19, 1.86)	<0.001	2.00 (1.69, 2.36)	<0.001
BMI, glucose, and ln(insulin)				
n T2DM/N	133/3,363		151/1,833	
Multivariable model				
BMI z-score	1.30 (0.79, 2.12)	0.302	1.31 (1.14, 1.50)	<0.001
Glucose z-score	1.21 (1.05, 1.39)	0.008	1.31 (1.03, 1.68)	0.029
ln(insulin) z-score	1.15 (0.92, 1.44)	0.227	1.47 (1.20, 1.79)	<0.001
Risk score model:				
Mean of BMI, glucose, and ln(insulin) z-scores	1.70 (1.22, 2.38)	0.002	2.50 (1.99, 3.14)	<0.001

BMI: Body mass index; T2DM: type-2 diabetes mellitus

* Cox regression analysis with childhood BMI and glucose z-scores. Z-scores are age-sex standard deviates based on the i3C distribution. Adjustment is for individual mean age and calendar year across child visits, sex, race, country, and cohort. The time to event was computed as age at T2DM occurrence or censoring minus individual mean age across childhood visits. P for interaction >0.10 except for comparison of mean of BMI and glucose z-scores, P for interaction = 0.03.

Supplemental Table S5. Multivariable analysis for comparison of the association of childhood BMI, glucose, and ln(insulin) z-scores with adult T2DM in Black and White participants

Model		Overall	Black	White
	N T2DM/N	436/6,738	144/1,926	292/4,812
Multivariable model				
BMI	HR (95% CI) P	1.55 (1.44, 1.67) <0.001	1.40 (1.24, 1.57) <0.001	1.66 (1.51, 1.83) <0.001
Glucose	HR (95% CI) P	1.24 (1.13, 1.35) <0.001	1.20 (0.98, 1.48) 0.080	1.26 (1.14, 1.39) <0.001
	N T2DM/N	284/5,196	98/1,529	186/3,667
Multivariable model				
BMI	HR (95% CI) P	1.44 (1.31, 1.59) <0.001	1.31 (1.12, 1.53) <0.001	1.54 (1.36, 1.74) <0.001
Glucose	HR (95% CI) P	1.23 (1.10, 1.37) <0.001	1.20 (0.90, 1.61) 0.212	1.24 (1.10, 1.39) <0.001
ln(insulin)	HR (95% CI) P	1.34 (1.16, 1.56) <0.001	1.35 (1.07, 1.71) 0.011	1.31 (1.08, 1.60) 0.007

BMI: Body mass index; T2DM: type-2 diabetes mellitus

* Cox regression analysis with childhood variable z-scores. Z-scores are age-sex standardized deviates based on the i3C distribution. Adjustment is for individual mean age and calendar year across child visits, sex, race, country, and cohort.

The time to event was computed as age at T2DM occurrence or censoring minus individual mean age across child visits.

P values for interaction by race in the analysis of BMI, glucose and insulin were all greater than 0.15.