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Supplementary Table 1. Characteristics of the TEDDY study population (N=7522)

Characteristic		IA negative	Any IA	IAA-first IA	GADA-first IA	T1D
	N (%)	6761 (89.9)	761(10.1)	287 (3.8)	329 (4.4)	290 (3.9)
Country	US	2782 (41.1)	254 (33.4)	85 (29.6)	127 (38.6)	91 (31.4)
	Finland	1493 (22.1)	192 (25.2)	94 (32.8)	63 (19.1)	88 (30.3)
	Germany	457 (6.8)	56 (7.4)	20 (7.0)	17 (5.2)	28 (9.7)
	Sweden	2029 (30.0)	259 (34.0)	88 (30.7)	122 (37.1)	83 (28.6)
Family history of T1D	FDR: Mother	275 (4.1)	35 (4.6)	11 (3.8)	14 (4.3)	22 (7.6)
	FDR: Father	339 (5.0)	76 (10.0)	29 (10.1)	34 (10.3)	37 (12.8)
	FDR: Sibling	90 (1.3)	37 (4.9)	21 (7.3)	9 (2.7)	20 (6.9)
	No	6057 (89.6)	613 (80.6)	226 (78.7)	272 (82.7)	211 (72.8)
Sex	Male	3422 (50.6)	422 (55.5)	165 (57.5)	176 (53.5)	151 (52.1)
	Female	3339 (49.4)	339 (44.5)	122 (42.5)	153 (46.5)	139 (47.9)
HLA DR-DQ genotype	DR3/4	2570 (38.0)	371 (48.8)	137 (47.7)	162 (49.2)	156 (53.8)
	DR4/4	1342 (19.8)	141 (18.5)	53 (18.5)	51 (15.5)	54 (18.6)
	DR4/8	1174 (17.4)	120 (15.8)	61 (21.3)	40 (12.2)	41 (14.1)
	FDR specific*	216 (3.2)	27 (3.5)	13 (4.5)	4 (1.2)	14 (4.8)
	DR3/3	1459 (21.6)	102 (13.4)	23 (8.0)	72 (21.9)	25 (8.6)
Duration of exclusive breastfeeding	< 3 months	5103 (75.5)	560 (73.6)	206 (71.8)	244 (74.2)	212 (73.1)

	≥ 3 months	1658 (24.5)	201 (26.4)	81 (28.2)	85 (25.8)	78 (26.9)
Autoantibody at seroconversion (first appearing autoantibody)	None	6761 (100)	0 (0)	0 (0)	0 (0)	18 (6.2)
	GADA only	0 (0)	329 (43.2)	0 (0)	329 (100)	66 (22.8)
	IAA only	0 (0)	287 (37.7)	287 (100)	0 (0)	112 (38.6)
	IA2A only	0 (0)	20 (2.6)	0 (0)	0 (0)	9 (3.1)
	Multiple	0 (0)	125 (16.4)	0 (0)	0 (0)	85 (29.3)
Birth weight (kg)	Mean (SD)	3.49 (0.55)	3.56 (0.51)	3.56 (0.56)	3.58 (0.48)	3.56 (0.50)
Birth length (cm)	Mean (SD)	50.75 (2.74)	50.93 (2.45)	50.91 (2.60)	51.08 (2.34)	50.82 (2.58)
Gestational age adjusted birth weight (kg)	Mean (SD)	-0.0 (0.5)	0.0 (0.4)	0.0 (0.5)	0.1 (0.4)	0.1 (0.4)
Gestational age adjusted birth height (kg)	Mean (SD)	-0.01 (2.39)	0.10 (2.21)	-0.03 (2.35)	0.26 (2.07)	0.16 (2.35)
Weight growth rate in infancy (kg/year)	Mean (SD)	8.78 (1.37)	8.95 (1.39)	8.99 (1.41)	8.95 (1.42)	8.99 (1.39)
Weight growth rate in early childhood (kg/year)	Mean (SD)	2.49 (0.46)	2.49 (0.46)	2.51 (0.45)	2.47 (0.46)	2.53 (0.43)
Age at weight growth phase transition (mo)	Mean (SD)	7.74 (1.78)	7.73 (1.76)	7.61 (1.68)	7.83 (1.88)	7.69 (1.90)
Height growth rate in infancy (cm/year)	Mean (SD)	30.29 (2.78)	30.67 (2.64)	30.81 (2.53)	30.55 (2.69)	30.46 (2.66)
Height growth rate in early childhood (cm/year)	Mean (SD)	9.41 (0.73)	9.45 (0.73)	9.44 (0.69)	9.43 (0.76)	9.55 (0.68)
Age at height growth phase transition (mo)	Mean (SD)	9.07 (1.09)	8.95 (1.05)	8.90 (1.07)	8.98 (1.03)	9.00 (1.07)

*FDR-specific HLA-DR-DQ genotypes are DR4/4b, DR4/1, DR4/13, DR4/9, and DR3/9.
Data are presented as number (percentage) unless otherwise indicated.

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Supplementary Table 2. Hazard ratio (95% CI) and associated p-value of the factors' effects from multiple Cox PH regression analysis of weight and height on the risk of IA, IAA-first IA and GADA-first IA, adjusting for gestational age-adjusted birth measurement (i.e., birth weight in the weight model; birth length in the height model), duration of exclusive breastfeeding, HLA-DR-DQ genotype, family history of type 1 diabetes, sex and country of residence.

Factor		Any IA HR (95% CI), p	IAA-first IA HR (95% CI), p	GADA-first IA HR (95% CI), p
Weight				
Rate in infancy (/kg/year)		**1.09 (1.02,1.17), 0.015**	1.06 (0.94,1.19), 0.352	**1.15 (1.04,1.28), 0.009**
Rate in early childhood (/kg/year)		0.97 (0.82,1.15), 0.741	1.08 (0.83,1.41), 0.569	0.80 (0.62,1.03), 0.087
Age at phase transition (/mo)		1.01 (0.96,1.06), 0.633	0.99 (0.92,1.07), 0.810	1.04 (0.96,1.11), 0.335
Gestational age-adjusted birth weight (/kg)		**1.19 (1.02,1.41), 0.031**	1.06 (0.81,1.39), 0.664	**1.39 (1.09,1.78), 0.008**
Duration of exclusive breastfeeding	≥ 3 months vs. < 3 months	0.98 (0.83,1.16), 0.831	1.08 (0.83,1.40), 0.572	0.96 (0.75,1.24), 0.749
Sex	Female vs. Male	0.91 (0.77,1.07), 0.247	0.80 (0.61,1.05), 0.114	1.06 (0.82,1.36), 0.675
Country	Finland vs. US	**1.29 (1.06,1.57), 0.010**	**1.85 (1.36,2.51), < 0.001**	0.87 (0.64,1.19), 0.391
	Germany vs. US	1.28 (0.95,1.73), 0.107	1.23 (0.74,2.03), 0.419	0.86 (0.51,1.45), 0.576
	Sweden vs. US	**1.22 (1.02,1.46), 0.028**	1.29 (0.95,1.74), 0.106	1.12 (0.87,1.45), 0.373
Family history of T1D	FDR: Mother vs No	1.27 (0.88,1.83), 0.204	1.14 (0.60,2.18), 0.694	1.34 (0.76,2.36), 0.313
	FDR: Father vs. No	**2.53 (1.95,3.28), < 0.001**	**2.57 (1.68,3.93), < 0.001**	**3.02 (2.08,4.39), < 0.001**
	FDR: Sibling vs. No	**3.64 (2.59,5.11), < 0.001**	**5.80 (3.65,9.21), < 0.001**	**2.14 (1.10,4.18), 0.026**
HLA DR-DQ genotype	DR3/4 vs. DR 4/4	**1.35 (1.12,1.64), 0.002**	1.31 (0.95,1.80), 0.095	**1.66 (1.21,2.27), 0.002**

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	DR4/8 vs. DR 4/4	0.99 (0.77,1.27), 0.930	1.23 (0.85,1.80), 0.272	0.98 (0.65,1.49), 0.930
	FDR specific* vs. DR 4/4	**0.55 (0.35,0.85), 0.008**	0.67 (0.35,1.31), 0.243	**0.22 (0.08,0.63), 0.005**
	DR3/3 vs. DR 4/4	**0.67 (0.52,0.86), 0.002**	**0.41 (0.25,0.66), < 0.001**	1.29 (0.90,1.84), 0.170
Height				
Rate in infancy (/cm/year)		1.05 (0.97,1.14), 0.214	1.08 (0.95,1.23), 0.240	1.06 (0.94,1.19), 0.361
Rate in early childhood (/cm/year)		1.06 (0.94,1.20), 0.356	1.06 (0.86,1.29), 0.599	0.98 (0.82,1.18), 0.871
Age at phase transition (/mo)		**0.86 (0.74,0.99), 0.034**	**0.78 (0.61,0.99), 0.040**	0.89 (0.72,1.11), 0.312
Gestational age-adjusted birth length (/cm)		1.00 (0.97,1.04), 0.977	0.97 (0.92,1.03), 0.381	1.04 (0.98,1.09), 0.199
Duration of exclusive breastfeeding	≥ 3 months vs. < 3 months	0.97 (0.82,1.14), 0.708	1.06 (0.82,1.38), 0.656	0.95 (0.74,1.22), 0.683
Sex	Female vs. Male	1.38 (0.85,2.24), 0.188	1.72 (0.77,3.81), 0.185	1.43 (0.69,2.96), 0.334
Country	Finland vs. US	**1.33 (1.09,1.63), 0.006**	**1.83 (1.33,2.52), < 0.001**	0.93 (0.67,1.29), 0.678
	Germany vs. US	1.19 (0.88,1.61), 0.256	1.15 (0.70,1.91), 0.583	0.78 (0.47,1.32), 0.360
	Sweden vs. US	**1.22 (1.02,1.47), 0.034**	1.23 (0.90,1.68), 0.203	1.16 (0.89,1.51), 0.275
Family history of T1D	FDR: Mother vs. No	1.35 (0.94,1.94), 0.104	1.21 (0.64,2.30), 0.558	1.44 (0.82,2.52), 0.204
	FDR: Father vs. No	**2.50 (1.93,3.23), < 0.001**	**2.57 (1.68,3.93), < 0.001**	**2.92 (2.01,4.24), < 0.001**
	FDR: Sibling vs. No	**3.67 (2.62,5.16), < 0.001**	**5.88 (3.70,9.35), < 0.001**	**2.13 (1.09,4.16), 0.027**
HLA DR-DQ genotype	DR3/4 vs. DR 4/4	**1.36 (1.12,1.65), 0.002**	1.32 (0.96,1.81), 0.090	**1.66 (1.21,2.28), 0.002**
	DR4/8 vs. DR 4/4	0.98 (0.77,1.26), 0.901	1.24 (0.85,1.80), 0.267	0.97 (0.64,1.47), 0.882

	FDR specific* vs. DR 4/4	**0.56 (0.36,0.88), 0.011**	0.68 (0.35,1.32), 0.258	**0.23 (0.08,0.67), 0.007**
	DR3/3 vs. DR 4/4	**0.68 (0.53,0.88), 0.003**	**0.41 (0.25,0.67), < 0.001**	1.31 (0.91,1.87), 0.143

*FDR-specific HLA-DR-DQ genotypes are DR4/4b, DR4/1, DR4/13, DR4/9, and DR3/9.

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Supplementary Table 3. Hazard ratio (95% CI) and associated p-value of the factors' effects from multiple Cox PH regression analysis of weight and height on the risk of progression to T1D from IA, and from subgroup analysis stratified by the type of first appearing autoantibody (IAA only, GADA only or multiple autoantibodies), adjusting for gestational age-adjusted birth measurement (i.e., birth weight in the weight model; birth length in the height model), duration of exclusive breastfeeding, age at the development of IA, type of first appearing autoantibody (if applicable), HLA-DR-DQ genotype, family history of type 1 diabetes, sex and country of residence.

			Subgroup analysis stratified by the first appearing autoantibody		
Factor		Overall (n=761) HR (95% CI), p	IAA only (n=287) HR (95% CI), p	GADA only (n=329) HR (95% CI), p	multiple autoantibodies (n=145) HR (95% CI), p
Weight					
Rate in infancy (/kg/year)		1.01 (0.90,1.13), 0.860	1.08 (0.90,1.28), 0.404	0.87 (0.68,1.10), 0.241	0.93 (0.74,1.16), 0.504
Rate in early childhood (/kg/year)		1.19 (0.92,1.52), 0.183	0.96 (0.60,1.53), 0.861	**2.57 (1.34,4.91), 0.004**	1.13 (0.73,1.75), 0.580
Age at phase transition (/mo)		0.99 (0.91,1.08), 0.853	0.93 (0.81,1.08), 0.343	**1.15 (1.02,1.30), 0.021**	**0.83 (0.70,0.99), 0.039**
Gestational age-adjusted birth weight (/kg)		1.30 (0.98,1.73), 0.064	1.12 (0.73,1.71), 0.604	**2.04 (1.03,4.04), 0.040**	1.70 (0.98,2.97), 0.059
Duration of exclusive breastfeeding	≥ 3 months vs. < 3 months	1.04 (0.78,1.38), 0.781	0.98 (0.63,1.52), 0.936	1.00 (0.53,1.86), 0.989	1.16 (0.68,1.96), 0.587
Sex	Female vs. Male	1.20 (0.90,1.58), 0.211	1.42 (0.89,2.26), 0.136	1.18 (0.65,2.13), 0.587	1.21 (0.75,1.97), 0.438
Country	Finland vs. US	1.32 (0.95,1.82), 0.095	1.37 (0.82,2.28), 0.225	**2.70 (1.48,4.94), 0.001**	0.71 (0.38,1.32), 0.279
	Germany vs. US	1.03 (0.64,1.66), 0.887	1.20 (0.55,2.63), 0.650	0.65 (0.15,2.80), 0.566	1.07 (0.50,2.29), 0.861
	Sweden vs. US	0.85 (0.62,1.17), 0.327	0.97 (0.57,1.66), 0.918	**0.44 (0.22,0.86), 0.016**	1.00 (0.57,1.74), 0.999

|					
Family history of T1D	Yes vs. No	**1.49 (1.11,2.00), 0.007**	1.53 (0.98,2.38), 0.061	**2.42 (1.31,4.48), 0.005**	1.16 (0.64,2.09), 0.624
HLA DR-DQ genotype	DR3/4 vs. other	1.23 (0.96,1.57), 0.107	**1.77 (1.18,2.63), 0.005**	1.07 (0.65,1.79), 0.781	0.67 (0.42,1.06), 0.084
Age at seroconversion (/month)		**0.98 (0.98,0.99), < 0.001**	**0.97 (0.95,0.98), < 0.001**	**0.98 (0.96,0.99), < 0.001**	**0.99 (0.98,1.00), 0.013**
Type of first appearing autoantibody	Multiple autoantibodies vs. IAA only	**3.28 (2.45,4.38), < 0.001**			
	GADA only vs. IAA only	0.79 (0.57,1.09), 0.149			
Height					
Rate in infancy (/cm/year)		**0.79 (0.70,0.90), < 0.001**	0.90 (0.74,1.11), 0.343	**0.72 (0.55,0.94), 0.017**	**0.75 (0.59,0.95), 0.019**
Rate in early childhood (/cm/year)		**1.48 (1.22,1.79), < 0.001**	1.28 (0.94,1.75), 0.123	**2.01 (1.32,3.06), 0.001**	**1.59 (1.09,2.31), 0.015**
Age at phase transition (/mo)		**0.76 (0.58,0.99), 0.044**	0.71 (0.46,1.08), 0.111	1.14 (0.69,1.89), 0.608	**0.55 (0.34,0.91), 0.020**
Gestational age-adjusted birth length (/cm)		1.00 (0.94,1.06), 0.937	0.98 (0.88,1.08), 0.620	0.98 (0.86,1.10), 0.698	1.01 (0.90,1.13), 0.868
Duration of exclusive breastfeeding	≥ 3 months vs. < 3 months	0.95 (0.72,1.26), 0.729	0.95 (0.61,1.46), 0.801	0.85 (0.45,1.60), 0.620	1.04 (0.62,1.74), 0.892
Sex	Female vs. Male	0.67 (0.28,1.56), 0.350	1.45 (0.36,5.84), 0.603	0.23 (0.05,1.06), 0.060	0.90 (0.18,4.50), 0.900
Country	Finland vs. US	**1.75 (1.24,2.48), 0.002**	1.70 (0.99,2.91), 0.053	**2.89 (1.52,5.51), 0.001**	0.95 (0.49,1.86), 0.889
	Germany vs. US	1.04 (0.64,1.68), 0.878	1.16 (0.52,2.58), 0.711	0.49 (0.12,2.11), 0.341	0.87 (0.39,1.90), 0.720

	Sweden vs. US	0.99 (0.71,1.39), 0.970	1.04 (0.60,1.79), 0.902	0.61 (0.31,1.20), 0.152	0.97 (0.54,1.73), 0.913
Family history of T1D	Yes vs. No	**1.48 (1.11,1.98), 0.008**	1.54 (0.99,2.41), 0.056	**1.87 (1.04,3.36), 0.037**	1.03 (0.56,1.91), 0.919
HLA DR-DQ genotype	DR3/4 vs. other	1.18 (0.93,1.52), 0.178	**1.69 (1.14,2.50), 0.008**	1.06 (0.63,1.75), 0.836	0.73 (0.46,1.14), 0.163
Age at seroconversion (/month)		**0.98 (0.98,0.99), < 0.001**	**0.97 (0.95,0.98), < 0.001**	**0.98 (0.97,0.99), < 0.001**	**0.99 (0.98,1.00), 0.007**
Type of first appearing autoantibody	Multiple autoantibodies vs. IAA only	**3.47 (2.58,4.66), < 0.001**			
	GADA only vs. IAA only	0.81 (0.58,1.11), 0.185			

SUPPLEMENTARY DATA

Supplementary Figure 1. Weight growth by the status of A: islet autoimmunity (IA), B: IAA-first IA and C: GADA-first IA. In each panel, (1) scatterplot (Yes=pink, No=light blue) and smoothing (loess) mean curves (Yes=red, No=blue); (2) smoothing (loess) mean curves (Yes=red, No=blue) alone and (3) boxplots of growth parameters (prerate=rate in infancy (kg/year), postrate=rate in early childhood (kg/year), changept=age at phase transition (months)).
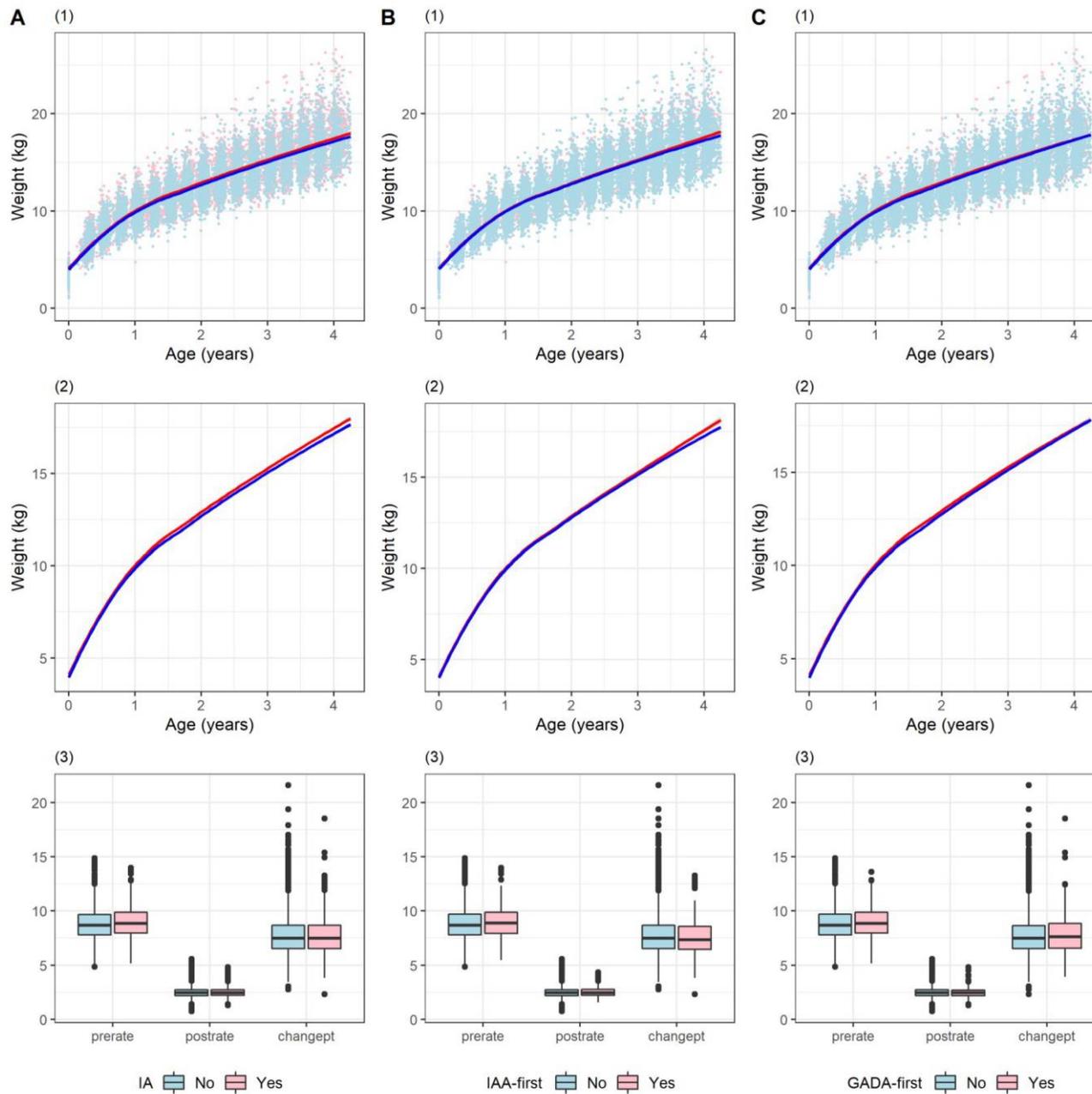
SUPPLEMENTARY DATA

Supplementary Figure 2. Height growth by the status of A: islet autoimmunity (IA), B: IAA-first IA and C: GADA-first IA. In each panel, (1) scatterplot (Yes=pink, No=light blue) and smoothing (loess) mean curves (Yes=red, No=blue); (2) smoothing (loess) mean curves alone (Yes=red, No=blue) and (3) boxplots of growth parameters (prerate=rate in infancy (cm/year), postrate=rate in early childhood (cm/year), changept=age at phase transition (months)).

SUPPLEMENTARY DATA
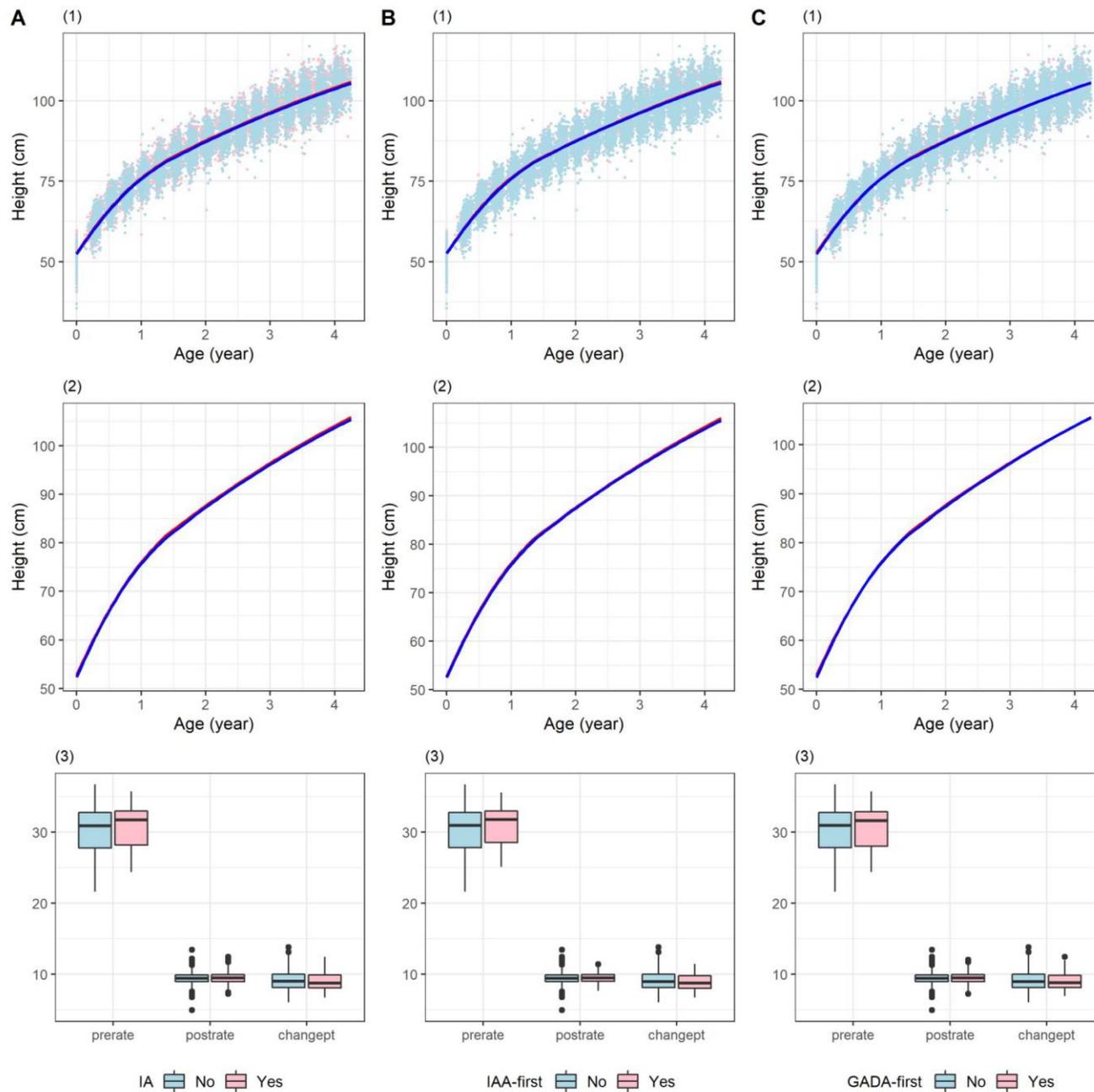
SUPPLEMENTARY DATA

Supplementary Figure 3. Weight growth by the status of T1D among subjects having, A: IA, B: IAA-only at initial seroconversion, C: GADA-only at initial seroconversion, and D: multiple autoantibodies at initial seroconversion. In each panel, (1) scatterplot (Yes=pink, No=light blue) and smoothing (loess) mean curves (Yes=red, No=blue); (2) smoothing (loess) mean curves (Yes=red, No=blue) alone and (3) boxplots of growth parameters (prerate=rate in infancy (kg/year), postrate=rate in early childhood (kg/year), changept=age at phase transition (months)).

SUPPLEMENTARY DATA
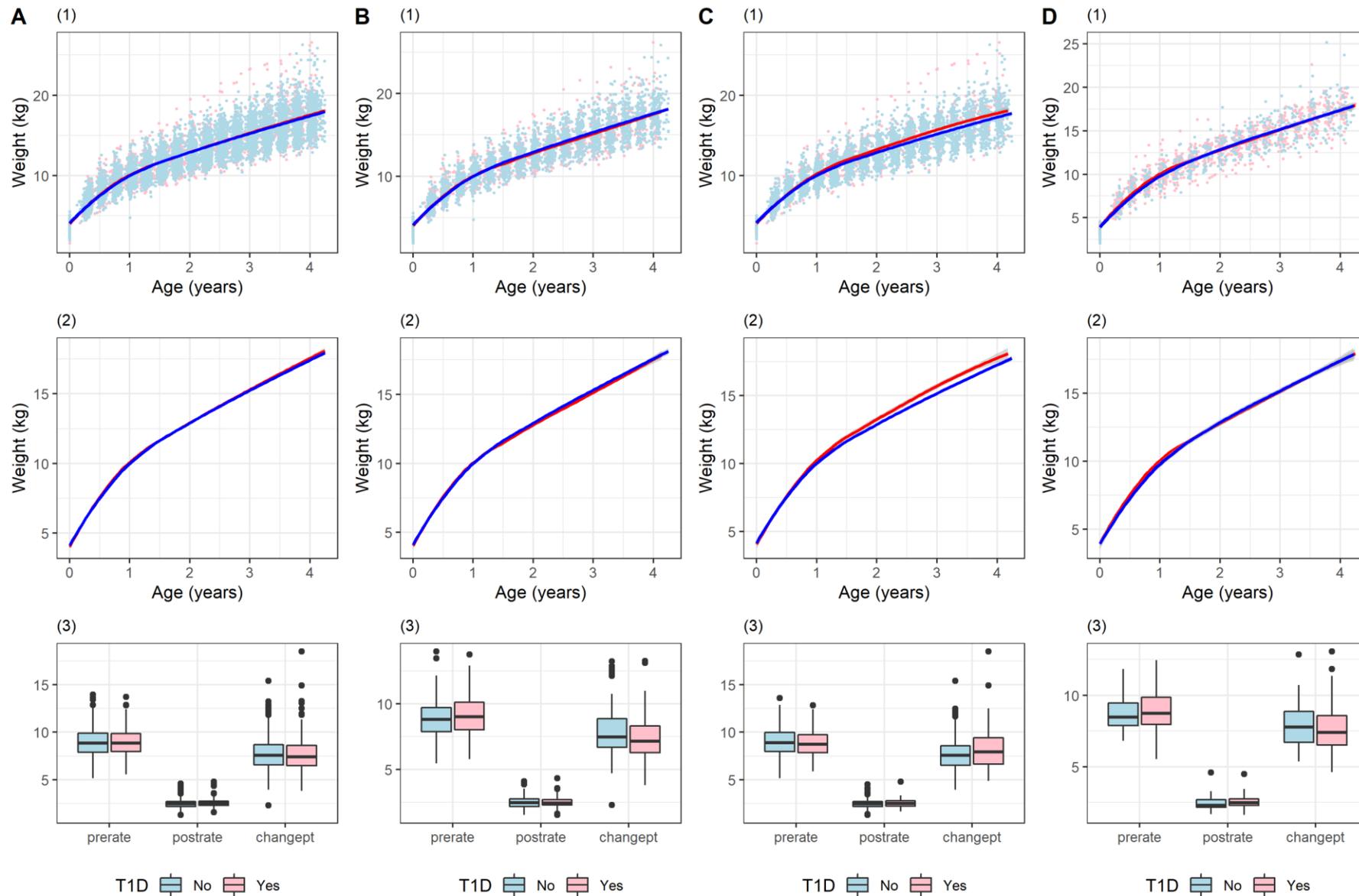
SUPPLEMENTARY DATA

Supplementary Figure 4. Height growth by the status of T1D among subjects having A: IA, B: IAA-only at initial seroconversion, C: GADA-only at initial seroconversion, and D: multiple autoantibodies at initial seroconversion. In each panel, (1) scatterplot (Yes=pink, No=light blue) and smoothing (loess) mean curves (Yes=red, No=blue); (2) smoothing (loess) mean curves (Yes=red, No=blue) alone and (3) boxplots of growth parameters (prerate=rate in infancy (cm/year), postrate=rate in early childhood (cm/year), changept=age at phase transition (months)).

SUPPLEMENTARY DATA
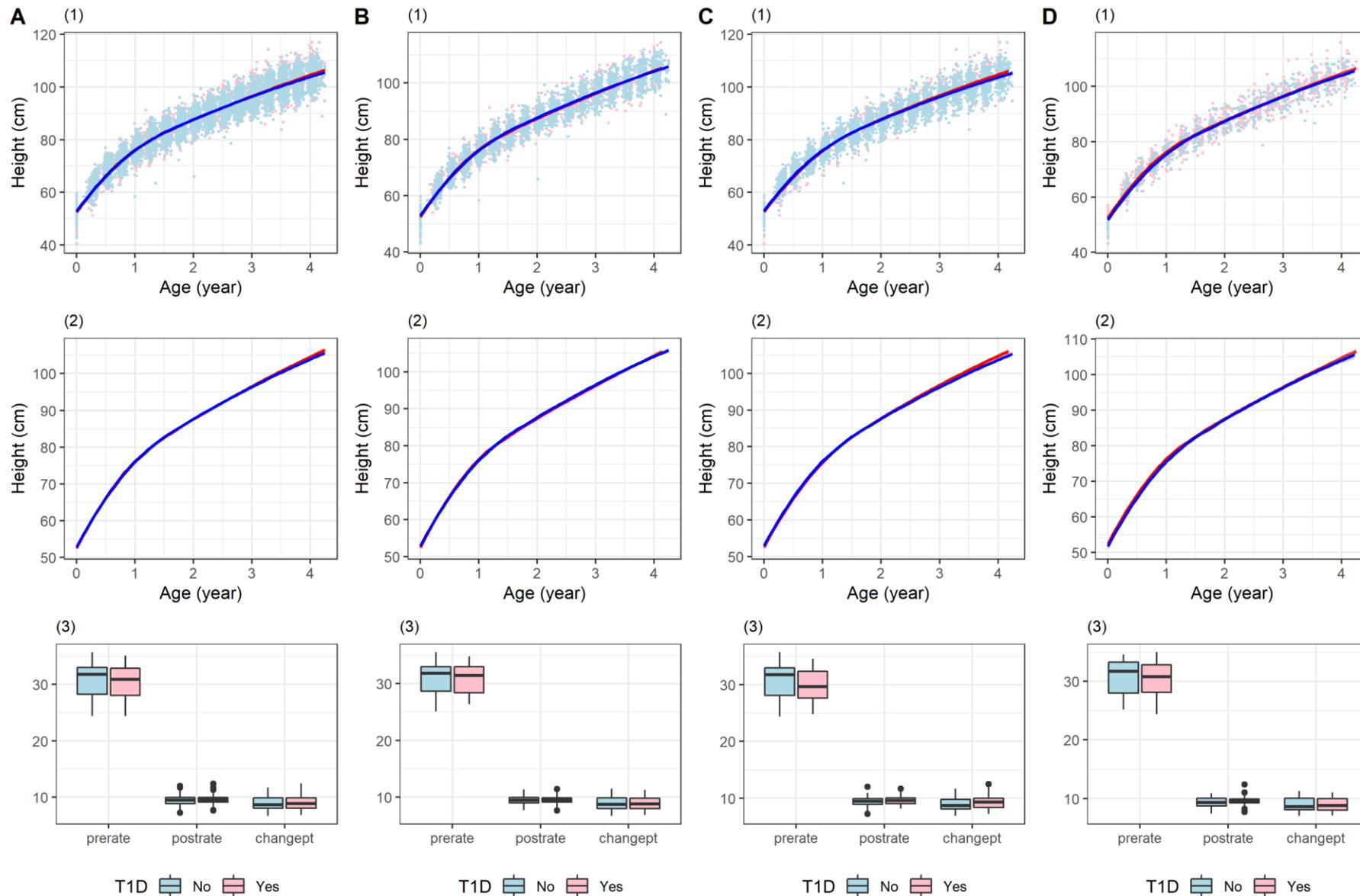
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