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Table 1. Dietary intake, anthropometry and cardiometabolic risk factors of participants, at 21-23y, in the Determinants of Adolescent, now young Adults, Social well-being and Health study

	Whole cohort (n=665)	White British (n=107)	Black Caribbean (n=102)	Black African (n=132)	Indian (n=98)	Pakistani Bangladeshi (n=111)	Other (n=115)	<i>p</i>
	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	
Male/Female (n)	329/336	52/55	47/55	58/74	52/46	62/49	57/57	0.842
Age (y)	22.7 (22.7, 22.8)	22.7 (22.5, 22.8)	22.7 (22.5, 22.9)	22.6 (22.4, 22.9)	22.9 (22.7, 23.1)	22.6 (22.7, 23.1)	22.8 (22.6, 23.0)	0.129
Weight (kg)	71.6 (70.0, 73.3)	72.5 (68.8, 76.2)	76.6 ^a (71.7, 81.5)	77.1 ^b (73.0, 81.2)	66.3 ^{a,b} (62.7, 69.9)	68.0 ^{a,b} (64.1, 71.9)	69.9 (66.5, 73.3)	<0.001
Height (cm)	170 (169, 171)	172 ^a (170, 175)	170 (168, 173)	172 ^b (170, 174)	168 ^{a,b} (166, 171)	168 ^{a,b} (165, 170)	169 (167, 171)	<0.001
BMI (kg/m ²)	24.7 (24.2, 25.2)	24.2 ^{a,c} (23.1, 25.4)	26.2 ^{a,b} (24.8, 27.7)	26.1 ^{c,d} (24.8, 27.4)	23.4 ^{b,d} (22.2, 24.5)	24.0 (22.9, 25.2)	24.4 (23.4, 25.5)	<0.001
Overweight/obese (%) ^a	39	35	50	44	36	36	35	0.063
Waist (cm)	82.2 (80.9, 83.5)	83.0 (80.2, 85.8)	83.6 (80.0, 87.3)	83.0 (79.9, 86.1)	80.8 (77.6, 84.1)	81.7 (79.0, 84.4)	81.2 (78.4, 84.1)	0.878
Waist:height ratio	0.48 (0.48, 0.49)	0.48 (0.46, 0.50)	0.49 (0.47, 0.51)	0.48 (0.46, 0.50)	0.48 (0.46, 0.50)	0.49 (0.47, 0.50)	0.48 (0.46, 0.50)	0.429
Total cholesterol (mmol/l)	4.35 (4.26, 4.43)	4.34 (4.17, 4.52)	4.34 (4.14, 4.54)	4.07 ^a (3.93, 4.22)	4.36 (4.21, 4.51)	4.53 ^a (4.35, 4.72)	4.33 (4.14, 4.52)	0.007
HDL cholesterol (mmol/l)	1.54 (1.50, 1.57)	1.56 (1.49, 1.64)	1.61 ^a (1.53, 1.70)	1.60 ^b (1.52, 1.67)	1.41 ^{a,b} (1.34, 1.48)	1.47 (1.40, 1.54)	1.55 (1.46, 1.64)	0.003
HbA1c (mmol/mol)	34 (34, 35)	34 (33, 35)	35 (34, 36)	35 (34, 36)	35 (34, 36)	34 (33, 35)	34 (33, 35)	0.164
Systolic blood pressure (mmHg)	114 (113, 115)	117 (114, 120)	116 (113, 119)	116 (113, 119)	113 (110, 116)	112 (109, 115)	113 (110, 115)	0.090
Diastolic blood pressure (mmHg)	72 (72, 73)	73 (71, 75)	74 (72, 76)	74 (72, 76)	72 (70, 74)	72 (70, 74)	70 (68, 72)	0.073
Energy intake	2192	2008	2242	1976	2423	2260	2238	0.255

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(kcal/day)	(2097, 2288)	(1811, 2205)	(2018, 2466)	(1766, 2186)	(2164, 2682)	(2001, 2520)	(1982, 2494)	
Fat intake	38.0	37.9	38.5	36.5	35.6	41.1	38.6	0.168
(% of energy)	(37.0, 39.0)	(35.5, 40.2)	(36.4, 40.5)	(33.7, 39.3)	(33.0, 38.3)	(38.9, 43.4)	(36.1, 41.1)	
Saturated fat intake	14.4	15.5	13.9	13.0 ^a	13.1 ^a	16.4 ^a	14.5	0.031
(% of energy)	(13.9, 15.0)	(14.2, 16.9)	(12.7, 15.2)	(11.7, 14.3)	(11.8, 14.4)	(14.9, 17.9)	(13.3, 15.6)	
Carbohydrate intake	47.4	46.1	48.1	47.9	50.4	45.6	46.5	0.170
(% of energy)	(46.3, 48.5)	(43.8, 48.4)	(45.4, 50.7)	(44.8, 51.0)	(47.8, 53.0)	(42.9, 48.3)	(43.8, 49.2)	
Protein intake	16.4	16.0	15.9	17.1	15.7	16.6	16.8	0.953
(% of energy)	(15.7, 17.1)	(14.4, 17.6)	(14.2, 17.6)	(14.8, 19.5)	(13.9, 17.4)	(15.1, 18.1)	(15.6, 18.2)	
Sugar intake	17.1	16.6	19.5	18.8	16.2	14.5	17.1	0.151
(% of energy)	(16.2, 18.0)	(14.5, 18.8)	(17.0, 22.0)	(16.1, 21.6)	(14.2, 18.2)	(12.7, 16.2)	(15.0, 19.3)	
Fibre intake	8.1	9.3 ^a	7.3 ^{a,c}	7.7 ^{b,c}	8.8 ^{b,c}	7.3 ^c	8.0	<0.001
(g/1000kcal)	(7.7, 8.5)	(8.1, 10.5)	(6.3, 8.2)	(6.8, 8.7)	(7.6, 9.9)	(6.3, 8.3)	(6.9, 9.0)	
Sodium intake	1285	1407	1320	1122	1192	1314	1345	0.082
(mg/1000kcal)	(1231, 1340)	(1270, 1544)	(1157, 1483)	(1010, 1235)	(1054, 1330)	(1191, 1436)	(1218, 1471)	
Sedentary time	738	798	670	833	772	720	692	0.234
(mins/day)	(683, 792)	(650, 947)	(573, 767)	(6565, 1000)	(654, 889)	(560, 880)	(575, 807)	
Skipping breakfast (%)	56	53	66	64	46	51	54	0.118
Low fruit consumption (%)	57	52	59	65	55	56	52	0.373
Low vegetable consumption (%)	63	54	75	73	55	73*	51*	<0.001
Smoker (%)	24	47*	21	11*	24	24	24	0.001
Educated to degree level (%)	47	40	34*	58*	57	49	44	0.001

BMI, body mass index. Overweight/obese defined as BMI>25kg/m². Low fruit consumption defined as less than 2 portions per day; low vegetable consumption defined as less than 3 portions per day; skipping breakfast defined as not eating breakfast every day of the week. Continuous variables are shown as mean (95% CI), categorical variables shown as n or %, as indicated in the variable label. Differences between ethnic groups in continuous variables were tested with one-way ANOVA with post-hoc analysis, the same superscript letters within a row denote significant differences between those ethnic groups; ethnic differences in frequency variables were tested with chi-square test with post-hoc analysis, differences are denoted with *.

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Table 2. Influence of dietary behaviours at 11-13 years and at 21-23years on cardiometabolic risk factors at 21-23 years. The Determinants of Adolescent, now young Adults, Social well-being and Health study.

	BMI		Waist:height ratio		Total cholesterol		HDL-cholesterol		HbA1c		Systolic blood pressure	
	Coef. (95% CI)	<i>p</i>	Coef. (95% CI)	<i>p</i>	Coef. (95% CI)	<i>p</i>	Coef. (95% CI)	<i>p</i>	Coef. (95% CI)	<i>p</i>	Coef. (95% CI)	<i>p</i>
11-13y												
Skipping breakfast (No - Ref)												
Yes	1.41 (0.57, 2.26)	<0.001	0.02 (0.01, 0.03)	<0.001	0.15 (-0.01, 0.31)	0.063	0.01 (-0.06, 0.08)	0.725	0.43 (-0.53, 1.39)	0.379	0.74 (-0.89, 2.38)	0.370
Not stated	0.78 (-0.70, 2.26)	0.302	0.01 (-0.01, 0.03)	0.353	0.16 (-0.12, 0.45)	0.266	0.02 (-0.12, 0.15)	0.820	0.05 (-1.66, 1.75)	0.958	0.33 (-2.54, 3.19)	0.823
Fruit (≥ 2 serves/day - Ref)												
<2 serves/day	0.68 (-0.17, 1.53)	0.115	0.01 (0.00, 0.03)	0.034	-0.004 (-0.16, 0.16)	0.958	-0.05 (-0.12, 0.02)	0.197	-0.16 (-1.11, 0.79)	0.742	0.66 (-0.97, 2.30)	0.425
Not stated	0.65 (-0.58, 1.90)	0.299	0.01 (-0.01, 0.03)	0.225	0.03 (-0.20, 0.27)	0.779	-0.003 (-0.11, 0.10)	0.951	-0.70 (-2.10, 0.70)	0.325	0.21 (-2.17, 2.59)	0.865
Vegetables (≥ 3 serves/day - Ref)												
<3 serves/day	-0.03 (-0.89, 0.82)	0.941	0.002 (-0.01, 0.01)	0.723	-0.17 (-0.33, -0.01)	0.033	-0.007 (-0.06, 0.08)	0.838	0.18 (-0.75, 1.12)	0.702	-0.003 (-1.64, 1.63)	0.997
Not stated	-1.70 (-1.00, 1.29)	0.788	-0.004 (-0.03, 0.02)	0.709	-0.11 (-0.40, 0.17)	0.427	-0.007 (-0.12, 0.14)	0.905	-0.38 (-2.07, 1.30)	0.656	-0.79 (-3.66, 2.09)	0.591
Fizzy drinks (No - Ref)												
Yes	0.03 (-0.89, 0.84)	0.947	0.001 (-0.01, 0.01)	0.888	0.05 (-0.11, 0.21)	0.542	-0.04 (-0.11, 0.03)	0.240	-0.34 (-1.30, 0.62)	0.488	1.77 (0.12, 3.43)	0.036
Not stated	0.06 (-1.44, 1.56)	0.938	-0.002 (-0.02, 0.02)	0.858	0.05 (-0.24, 0.34)	0.742	-0.007 (-0.14, 0.12)	0.920	-0.53 (-2.25, 1.19)	0.546	1.22 (-1.64, 4.09)	0.403
21-23y												
Skipping breakfast (No - Ref)												
Yes	1.05 (0.22, 1.89)	0.014	0.02 (0.01, 0.03)	0.002	0.22 (0.06, 0.37)	0.007	0.0002 (-0.07, 0.07)	0.995	0.73 (-0.22, 1.67)	0.130	0.44 (-1.18, 2.05)	0.597
Not stated	-1.32 (-4.44, 1.80)	0.406	-0.01 (-0.05, 0.04)	0.731	0.30 (-0.26, 0.85)	0.292	0.07 (-0.17, 0.32)	0.556	0.12 (-2.93, 3.18)	0.937	-3.56 (-9.56, 2.44)	0.244
Fruit (≥ 2 serves/day - Ref)												
<2 serves/day	-0.26 (-1.11, 0.59)	0.552	0.001 (-0.01, 0.01)	0.912	-0.12 (-0.28, 0.04)	0.147	-0.04 (-0.11, 0.03)	0.270	-0.50 (-1.46, 0.46)	0.305	0.26 (-1.37, 1.88)	0.758
Not stated	-1.65 (-4.32, 1.02)	0.225	-0.008 (-0.05, 0.03)	0.676	0.25 (-0.23, 0.74)	0.301	0.03 (-0.19, 0.24)	0.809	-0.11 (-2.95, 2.74)	0.940	-0.39 (-5.51, 4.73)	0.881

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Vegetables (≥ 3 serves/day - Ref)												
<3 serves/day	-0.07 (-0.99, 0.84)	0.873	0.001 (-0.01, 0.01)	0.859	-0.06 (-0.24, 0.11)	0.456	-0.02 (-0.09, 0.06)	0.630	0.29 (-0.72, 1.30)	0.571	-0.72 (-2.49, 1.04)	0.420
Not stated	-1.40 (-3.66, 0.85)	0.221	-0.01 (-0.04, 0.02)	0.574	-0.12 (-0.51, 0.28)	0.559	0.08 (-0.10, 0.25)	0.385	-0.17 (-2.49, 2.15)	0.884	-3.27 (-7.58, 1.05)	0.137

BMI, body mass index. Skipping breakfast defined as eating breakfast less than 5 days per week; low fruit consumption defined as less than 2 portions per day; low vegetable consumption defined as less than 3 portions per day; fizzy drink consumption defined as consuming fizzy drinks every day or most days. Multivariate linear regression models for BMI, waist:height ratio, total cholesterol, HDL-cholesterol, HbA1c and systolic blood pressure (separate models); coefficients were estimated with linear regression, adjusted for gender and ethnicity at 11-13 years, and additionally adjusted for educational attainment (attainment/non-attainment of higher education degree), physical activity (based on tertiles of sitting/sedentary time), smoking (current smoker/non-smoker), energy intake and saturated fat intake at 21-23 years. N=664, 635, 499, 484, 481, and 664, respectively, for linear regression models with BMI, waist:height ratio, total cholesterol, HDL-cholesterol, HbA1c, and systolic blood pressure, respectively, as the outcome.

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Table 3. Influence of dietary behaviours at 11-13 years and at 21-23years on nutritional composition of the diet at 21-23years. The Determinants of Adolescent, now young Adults, Social well-being and Health study.

	Energy intake (kcal)		Fat (% of energy)		Saturated fat (% of energy)		Sugar (% of energy)		Fibre (g/1000kcal)		Sodium (mg/1000kcal)	
11-13y	Coef. (95% CI)	<i>p</i>	Coef. (95% CI)	<i>p</i>	Coef. (95% CI)	<i>p</i>	Coef. (95% CI)	<i>p</i>	Coef. (95% CI)	<i>p</i>	Coef. (95% CI)	<i>p</i>
Skipping breakfast (No - Ref)												
Yes	-116.25 (-263.65, 31.15)	0.122	-0.19 (-1.86, 1.48)	0.826	0.42 (-0.48, 1.31)	0.361	0.11 (-1.43, 1.65)	0.889	-0.81 (-1.49, -0.12)	0.022	-58.83 (-184.66, 67.00)	0.359
Not stated	-176.37 (-435.51, 82.77)	0.182	0.14 (-2.80, 3.08)	0.927	0.66 (-0.92, 2.24)	0.411	2.13 (-0.58, 4.85)	0.123	-0.74 (-1.95, 0.47)	0.230	50.38 (-170.84, 271.61)	0.655
Fruit (≥ 2 serves/day - Ref)												
<2 serves/day	142.89 (-4.17, 289.95)	0.057	-0.57 (-2.24, 1.10)	0.503	-0.44 (-1.33, 0.46)	0.339	-0.14 (-1.68, 1.40)	0.859	-0.36 (-1.04, 0.33)	0.312	-5.49 (-131.17, 120.19)	0.932
Not stated	23.48 (-191.86, 238.83)	0.830	-0.84 (-3.29, 1.60)	0.498	-0.65 (-1.96, 0.66)	0.330	1.34 (-0.92, 3.59)	0.244	0.16 (-0.85, 1.17)	0.752	68.67 (-115.37, 252.70)	0.464
Vegetables (≥ 3 serves/day - Ref)												
<3 serves/day	-48.49 (-197.09, 100.11)	0.522	-1.15 (-2.83, 0.53)	0.178	-0.60 (-1.50, 0.30)	0.193	1.32 (-0.23, 2.86)	0.095	-0.31 (-1.00, 0.39)	0.383	-27.77 (-154.45, 98.91)	0.667
Not stated	-108.10 (-368.68, 152.47)	0.416	-1.23 (-4.17, 1.72)	0.414	-0.07 (-1.65, 1.51)	0.930	3.56 (0.85, 6.27)	0.010	-0.10 (-1.32, 1.12)	0.869	47.31 (-174.83, 269.45)	0.676
Fizzy drinks (No - Ref)												
Yes	34.82 (-115.70, 185.35)	0.650	0.04 (-1.66, 1.74)	0.964	0.34 (-0.58, 1.25)	0.469	-0.08 (-1.65, 1.48)	0.915	-0.72 (-1.42, -0.02)	0.045	-51.30 (-179.49, 76.89)	0.432
Not stated	-47.59 (-308.79, 213.60)	0.721	-0.27 (-3.23, 2.69)	0.857	0.66 (-0.93, 2.25)	0.414	3.15 (0.44, 5.87)	0.023	-0.66 (-1.88, 0.56)	0.287	70.21 (-152.23, 292.64)	0.536
21-23y												
Skipping breakfast (No - Ref)												
Yes	-68.16 (-214.82, 78.49)	0.362	1.10 (-0.56, 2.75)	0.195	0.26 (-0.63, 1.15)	0.565	-0.49 (-2.02, 1.04)	0.530	-1.33 (-2.01, -0.65)	<0.001	-35.13 (-160.14, 89.88)	0.581
Not stated	-144.67 (-689.91, 400.57)	0.602	1.70 (-4.46, 7.87)	0.587	-0.99 (-4.30, 2.33)	0.558	-2.17 (-7.87, 3.54)	0.456	0.00 (-2.52, 2.52)	0.998	-199.83 (-664.60, 264.93)	0.399
Fruit (≥ 2 serves/day - Ref)												
<2 serves/day	27.47 (-119.98, 174.91)	0.715	0.70 (-0.97, 2.37)	0.411	0.89 (-0.01, 1.78)	0.052	-0.47 (-2.01, 1.07)	0.547	-1.22 (-1.90, -0.54)	<0.001	-29.32 (-154.98, 96.35)	0.647
Not stated	-7.71 (-473.24, 457.83)	0.974	1.19 (-4.08, 6.45)	0.658	0.14 (-2.68, 2.96)	0.921	-3.14 (-8.00, 1.72)	0.205	0.67 (-1.48, 2.82)	0.542	-33.96 (-430.73, 362.82)	0.867

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Vegetables (≥ 3 serves/day - Ref)												
<3 serves/day	-27.94 (-187.19, 131.32)	0.731	1.50 (-0.29, 3.30)	0.100	1.06 (0.09, 2.02)	0.032	0.11 (-1.55, 1.78)	0.896	-1.30 (-2.04, -0.56)	0.001	-101.31 (-236.80, 34.18)	0.143
Not stated	26.10 (-366.17, 418.37)	0.896	4.01 (-0.42, 8.43)	0.076	1.27 (-1.10, 3.65)	0.294	-1.83 (-5.93, 2.27)	0.380	-0.76 (-2.58, 1.05)	0.410	18.78 (-314.96, 352.51)	0.912

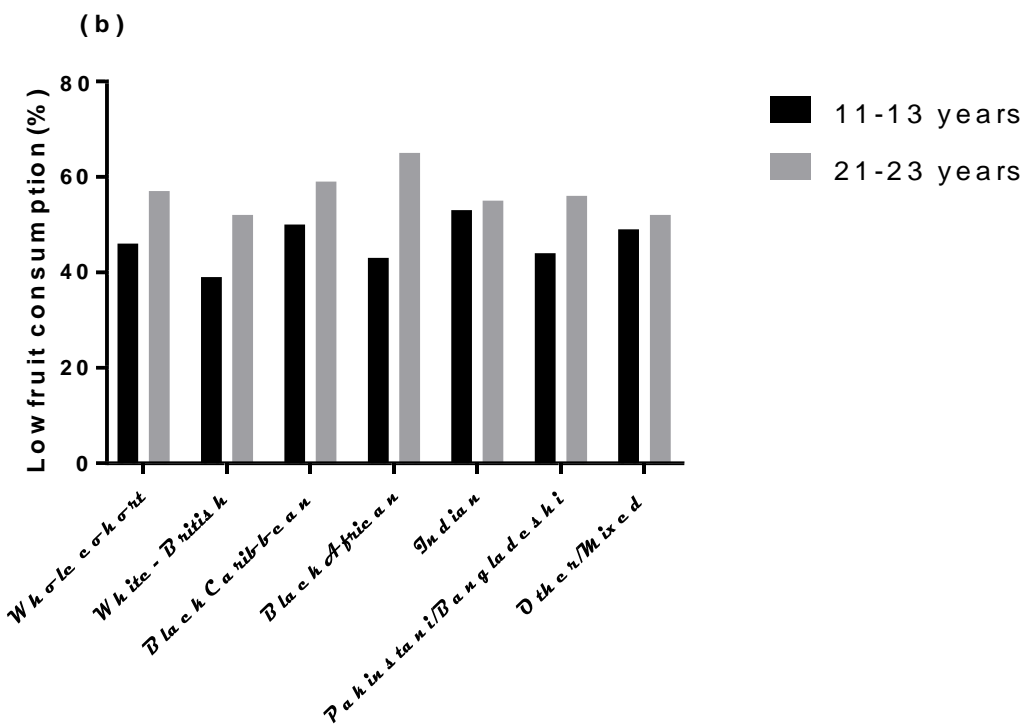
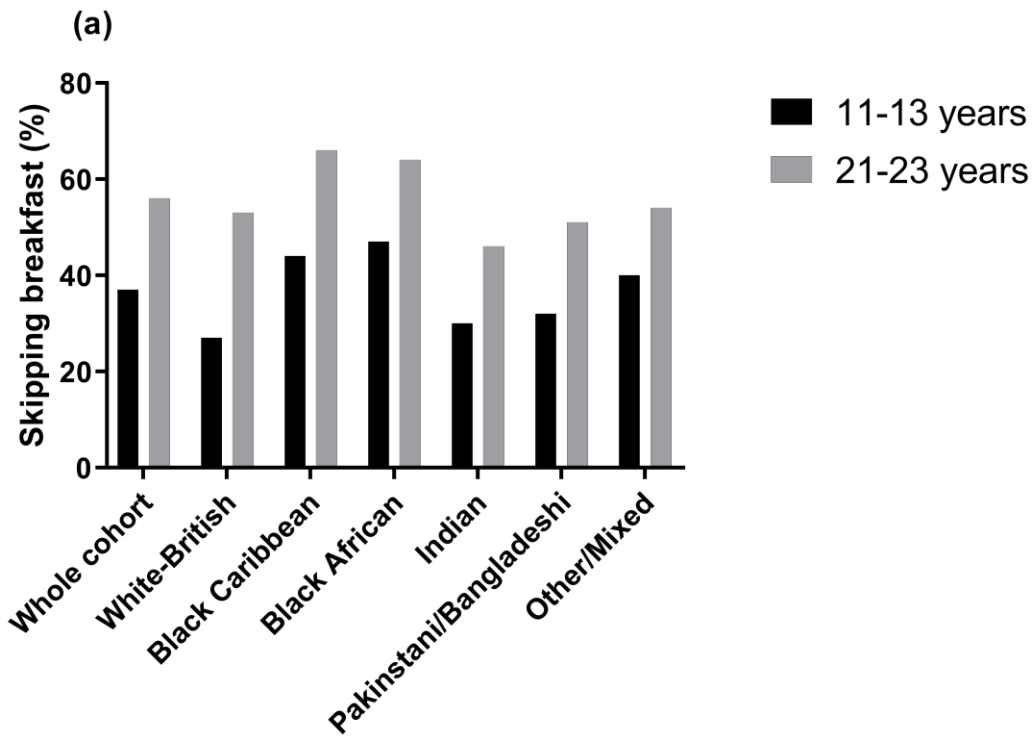
Skipping breakfast defined as eating breakfast less than 5 days per week; low fruit consumption defined as less than 2 portions per day; low vegetable consumption defined as less than 3 portions per day; fizzy drink consumption defined as consuming fizzy drinks every day or most days. Multivariate linear regression models for energy intake, % energy from fat, % energy from saturated fat, % energy from sugar, fibre intake, sodium intake (separate models); coefficients were estimated with linear regression, adjusted for gender, and ethnicity at 11-13 years, and additionally adjusted for educational attainment (attainment/non-attainment of higher education degree), physical activity (based on tertiles of sitting/sedentary time), and smoking (current smoker/non-smoker) at 21-23 years. N=628 for linear regression models for all six nutritional composition variables as the outcome.

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FIGURE LEGENDS

Figure 1. Rates of (a) regularly skipping breakfast, (b) low daily fruit and (c) low daily vegetable consumption according to ethnicity at 11-13 years and at 21-23 years. The Determinants of Adolescent, now young Adults, Social well-being and Health study.

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