

Supplementary Material

for

Association of sugar-sweetened beverage frequency with adiposity: evidence from the “Children of 1997” Birth Cohort

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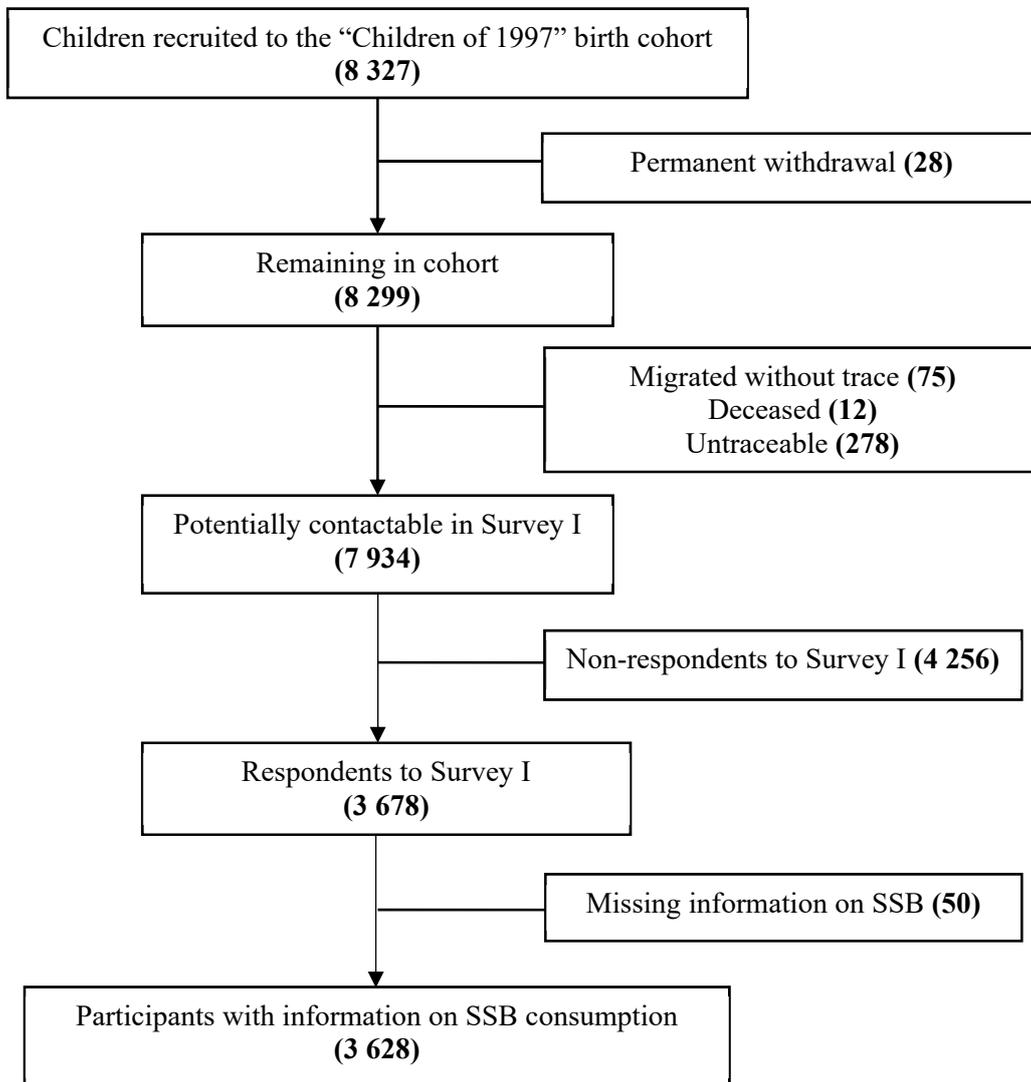
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Figure S1. Participant flow chart in the “Children of 1997” Birth Cohort.



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Table S1. Characteristics of children with ($n=3\ 628$) and without ($n=4\ 670$) information on SSB consumption at 11 years in “Children of 1997” birth cohort.

Characteristics	Items	Children with SSB		Children without SSB		Cohen effect size ¹	P-value ²
		N	column %	N	column %		
Sex	Girls	1863	51.4	2050	44.2	0.09	<0.001
	Boys	1765	48.6	2584	55.8		
Maternal age at birth	<=24y	346	9.5	662	14.8	0.08	<0.001
	25-29y	1129	31.1	1383	31.0		
	30-34y	1438	39.7	1646	36.9		
	>=35y	713	19.7	767	17.2		
Mother's birthplace	Non-HK	1419	39.2	1633	38.7	0.01	0.66
	HK	2200	60.8	2587	61.3		
Highest parental education	Grade 9 or below	1029	28.4	1438	32.2	0.05	<0.001
	Grade 10-11	1558	42.9	1889	42.3		
	Grade 12 or above	1041	28.7	1142	25.6		
Highest parental occupation	Professional	842	26.7	872	22.3	0.06	<0.001
	Managerial	469	14.9	653	16.7		
	Non-manual skilled	918	29.1	1128	28.9		
	Manual skilled	518	16.4	697	17.9		
	Semiskilled	318	10.1	408	10.5		
	Unskilled	93	2.9	146	3.7		
Household income	1 st quintile	588	18.3	863	21.5	0.06	<0.001
	2 nd quintile	626	19.5	858	21.4		
	3 rd quintile	630	19.6	799	19.9		
	4 th quintile	670	20.9	749	18.7		
	5 th quintile	699	21.8	741	18.5		
Weight status at 11y	Overweight/obese	592	20.7	801	26.9	0.07	<0.001

1 Cohen effect size has three levels: 0.1 for small, 0.3 for medium, and 0.5 for large. For categorical variables, Cohen's w effect size is calculated as $w = \sqrt{(\sum_{i=1}^N (P_{0i} - P_{1i})^2 / P_{0i})}$ where P_{0i} and P_{1i} are cell probabilities under the null and alternative hypotheses, respectively. Also $w = \sqrt{\chi^2 / N}$ where χ^2 is chi-squared statistic and N is the total number of respondents and non-respondents.

2 Chi-squared tests.

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Table S2. Associations of SSB consumption at 11 years with BMI z-score, BMI centile and overweight (including obesity) from 12 to 18 years (complete case analysis).

Model	SSB consumption	N ¹	BMI z-score (WHO 2007)			BMI z-score (IOTF 2012)			BMI centile (IOTF 2012)			Overweight (including obesity) ²		
			Beta	SE	95% CI	Beta	SE	95% CI	Beta	SE	95% CI	OR	SE of logOR	95% CI
1	<weekly	1098	Ref			Ref			Ref			Ref		
	1-3 times/week	1682	0.025	0.043	-0.060, 0.109	0.016	0.041	-0.064, 0.095	0.121	1.131	-2.100, 2.340	1.20	0.10	0.99, 1.46
	4-6 times/week	310	0.036	0.074	-0.109, 0.182	0.036	0.070	-0.101, 0.173	0.826	1.908	-2.910, 4.570	1.15	0.16	0.83, 1.58
	Daily	210	0.042	0.082	-0.119, 0.203	0.043	0.078	-0.109, 0.195	0.674	2.212	-3.660, 5.010	1.07	0.19	0.73, 1.56
2	<weekly	867	Ref			Ref			Ref			Ref		
	1-3 times/week	1367	0.016	0.048	-0.078, 0.110	0.004	0.045	-0.085, 0.093	-0.224	1.268	-2.709, 2.261	1.13	0.11	0.91, 1.41
	4-6 times/week	258	0.022	0.084	-0.143, 0.187	0.019	0.079	-0.135, 0.174	0.273	2.140	-3.921, 4.466	1.18	0.18	0.83, 1.68
	Daily	159	0.003	0.092	-0.178, 0.184	-0.005	0.088	-0.177, 0.166	-0.411	2.487	-5.286, 4.464	0.79	0.23	0.50, 1.26
3	<weekly	754	Ref			Ref			Ref			Ref		
	1-3 times/week	1171	0.036	0.051	-0.065, 0.136	0.021	0.048	-0.074, 0.116	0.494	1.351	-2.154, 3.142	1.15	0.12	0.90, 1.46
	4-6 times/week	222	0.026	0.089	-0.148, 0.200	0.018	0.084	-0.146, 0.183	0.238	2.263	-4.197, 4.674	1.16	0.20	0.78, 1.72
	Daily	135	0.056	0.098	-0.136, 0.249	0.041	0.093	-0.141, 0.222	0.542	2.648	-4.647, 5.731	0.92	0.24	0.57, 1.48
4	<weekly	621	Ref			Ref			Ref			Ref		
	1-3 times/week	944	-0.013	0.025	-0.063, 0.037	-0.018	0.024	-0.064, 0.029	-0.587	0.717	-1.990, 0.818	0.87	0.20	0.59, 1.27
	4-6 times/week	172	0.051	0.043	-0.032, 0.135	0.055	0.041	-0.025, 0.135	1.412	1.255	-1.050, 3.870	1.09	0.30	0.61, 1.96
	Daily	97	-0.047	0.055	-0.156, 0.061	-0.058	0.052	-0.161, 0.044	-1.041	1.666	-4.310, 2.220	0.82	0.44	0.35, 1.95

BMI: body mass index; SSB, sugar-sweetened beverage; SE: standard error; CI: confidence interval; OR: odds ratio.

All values were derived from GEE models. Model 1 adjusted for age and sex; Model 2 additionally adjusted for maternal age at birth, maternal birthplace, parental highest education level, parental highest occupation, household income per head, and interaction of maternal birthplace with parental highest education level; Model 3 additionally adjusted for main caregiver, general health, and physical activity; Model 4 additionally adjusted for fruit, vegetable, and meat consumption and BMI z-score at 11 years.

1 Number of observations with SSB consumption, covariates, and at least one measurement of BMI.

2 Reference: normal weight.

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Table S3. Associations of SSB consumption at 11 years with WC, WHR and BFP at 16-19 years (complete case analysis).

Model	SSB consumption	WC				WHR				BFP			
		N	Beta	SE	95% CI	N	Beta	SE	95% CI	N	Beta	SE	95% CI
1	<weekly	578	Ref			576	Ref			578	Ref		
	1-3 times	846	0.82	0.48	-0.11, 1.75	843	0.003	0.003	-0.003, 0.009	845	0.57	0.34	-0.09, 1.23
	4-6 times	157	-0.41	0.79	-1.96, 1.14	157	-0.003	0.005	-0.012, 0.007	158	-0.44	0.56	-1.53, 0.65
	Daily	90	0.45	1.00	-1.50, 2.40	90	-0.001	0.006	-0.013, 0.011	91	0.50	0.70	-0.87, 1.88
2	<weekly	459	Ref			457	Ref			459	Ref		
	1-3 times	688	1.05	0.54	-0.01, 2.10	685	0.003	0.003	-0.003, 0.009	687	0.78	0.38	0.04, 1.52
	4-6 times	129	-0.18	0.88	-1.91, 1.54	129	0.001	0.005	-0.010, 0.011	130	-0.53	0.62	-1.74, 0.67
	Daily	67	0.35	1.16	-1.93, 2.62	67	-0.003	0.007	-0.017, 0.010	67	0.26	0.82	-1.33, 1.86
3	<weekly	397	Ref			396	Ref			397	Ref		
	1-3 times	581	1.36	0.56	0.25, 2.47	579	0.006	0.004	-0.001, 0.013	580	0.96	0.40	0.18, 1.73
	4-6 times	112	0.37	0.92	-1.43, 2.17	112	0.003	0.006	-0.009, 0.014	113	-0.26	0.64	-1.52, 1.00
	Daily	59	0.77	1.20	-1.58, 3.11	59	0.000	0.007	-0.015, 0.015	59	0.43	0.84	-1.22, 2.08
4	<weekly	321	Ref			320	Ref			321	Ref		
	1-3 times	466	0.49	0.50	-0.48, 1.47	465	0.002	0.004	-0.006, 0.009	465	0.57	0.33	-0.07, 1.21
	4-6 times	88	-0.15	0.81	-1.74, 1.44	88	0.000	0.006	-0.012, 0.012	89	-0.59	0.53	-1.62, 0.45
	Daily	46	-0.27	1.07	-2.36, 1.82	46	0.003	0.008	-0.013, 0.019	46	-0.54	0.70	-1.91, 0.83

BFP, body fat percentage; SE: standard error; CI: confidence interval; OR: odds ratio; SSB, sugar-sweetened beverage; WC, waist circumference; WHR, waist-to-hip ratio. All values were derived from multivariable linear regression models. Model 1 adjusted for age and sex; Model 2 additionally adjusted for maternal age at birth, maternal birthplace, parental highest education level, parental highest occupation, household income per head, and interaction of maternal birthplace with parental highest education level; Model 3 additionally adjusted for main caregiver, general health, and physical activity; Model 4 additionally adjusted for fruit, vegetable, and meat consumption and BMI z-score at 11 years.

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Table S4. Misclassification of SSB consumption at 11 years (complete case analysis).

SSB frequency	N			Overweight (including obesity) ²		
	Normal weight	Overweight ¹	Total	OR	95% CI	P-value
Observed						
<weekly	607	137	744	Ref		
1-3 times/week	901	260	1161	1.15	0.90, 1.47	0.274
4-6 times/week	176	44	220	1.12	0.75, 1.68	0.578
Daily	103	28	131	0.93	0.58, 1.51	0.779
Non-differential misclassification, 20% of “1-3 times/week” under-reported as “<weekly”						
<weekly	384	72	456	Ref		
1-3 times/week	1124	325	1449	1.36	1.01, 1.83	0.041
4-6 times/week	176	44	220	1.31	0.84, 2.04	0.227
Daily	103	28	131	1.09	0.65, 1.83	0.735
Non-differential misclassification, 15% of “1-3 times/week”, “4-6 times/week” and “Daily” under-reported as “<weekly”, “1-3 times/week” and “4-6 times/week”, respectively						
<weekly	458	93	551	Ref		
1-3 times/week	1015	297	1312	1.33	1.01, 1.75	0.041
4-6 times/week	193	46	239	1.20	0.79, 1.82	0.385
Daily	121	33	154	1.09	0.68, 1.73	0.724
Non-differential misclassification, 30% of “1-3 times/week”, “4-6 times/week” and “Daily” misclassified as “<weekly”, “1-3 times/week” and “4-6 times/week”, respectively						
<weekly	251	32	283	Ref		
1-3 times/week	1205	352	1557	2.38	1.56, 3.65	<0.001
4-6 times/week	181	44	225	1.96	1.15, 3.35	0.013
Daily	150	41	191	2.12	1.23, 3.65	0.007
Non-differential misclassification, 10% (male) and 20% (female) of “1-3 times/week”, “4-6 times/week” and “Daily” under-reported as “<weekly”, “1-3 times/week” and “4-6 times/week”, respectively						
<weekly	446	96	542	Ref		
1-3 times/week	1038	296	1334	1.36	1.04, 1.79	0.027
4-6 times/week	181	42	223	1.16	0.76, 1.78	0.493
Daily	122	35	157	1.22	0.78, 1.93	0.385

OR: odds ratio; CI: confidence interval.

¹ Being overweight for at least one age between 12-18 y.

² Compared with non-overweight, all values were derived from GEE model adjusted for all covariates.

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Table S5. Associations of composite SSB consumption at 11 and 13 years with BMI z-score and overweight from 12-18 years.

SSB consumption	N ¹	BMI z-score			Overweight (including obesity) ²		
		Beta	SE	P-value	OR	SE of logOR	P-value
Both <weekly	241	Ref			Ref		
<weekly at 11 but more at 13	237	0.076	0.043	0.080	1.44	0.360	0.313
1-3 times/week at 11 but less at 13	218	-0.016	0.046	0.732	0.82	0.334	0.542
Both 1-3 times/week	395	-0.008	0.040	0.839	0.73	0.319	0.324
1-3 times/week at 11 but more at 13	130	0.028	0.054	0.595	1.43	0.377	0.346
4-6 times/week at 11 but less at 13	85	0.079	0.058	0.169	1.25	0.421	0.600
Both 4-6 times/week	27	0.193	0.092	0.037	1.98	0.700	0.329
4-6 times/week at 11 but more at 13	19	0.012	0.142	0.932	2.65	0.616	0.113
Daily at 11 but less at 13	48	-0.057	0.078	0.463	0.53	0.655	0.338
Both daily	22	0.117	0.095	0.218	0.52	0.785	0.408

OR: odds ratio; SE: standard error.

All values were derived from GEE models adjusted for all covariates.

1 Number of observations with SSB at both timepoints, covariates, and at least one measurement of BMI.

2 Reference: normal weight.