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Is climate at the time of birth related to obesity 9–10 years later?

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Climate affects health and fluctuations in body weight and fasting blood glucose concentrations occur with the seasons[1,2] (weight tends to fall in the summer and rise in winter). Several studies have suggested that climate at the time of birth is associated with obesity as an adolescent and adult. A study of 9103 patients has found more overweight subjects born in March and September compared with those born in October and November[3]. It has been concluded that obesity is related to higher birth weight and early cold exposure; assessed as temperature at the time of birth[4]. A study of 585 adolescents has found greater risk of overweight in female African Americans born in warmer weather[5].

Data were analysed from 9–10-year-old children in Liverpool taking part in the SportsLinx project between September 2003 and June 2006. Birth date was recorded, weight and height measured and BMI calculated. Mean daily air temperatures for 37 months from December 1993 to December 1996 were obtained from the weather station at Crosby, Merseyside. Data were analysed on a month-by-month basis and by season (winter comprising December, January and February) giving a total of thirty-seven consecutive months and twelve consecutive seasons. Associations were assessed as differences in mean BMI and prevalence of BMI categories using correlations, ANOVA and contingency tables.

Data were available for 5106 boys and 5063 girls. The mean BMI of the boys was 18.0 kg/m^2 and of the girls 18.5 kg/m^2. The prevalence of obesity (%) is shown in the Table according to month of birth.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Boys: *n*	428	384	405	406	404	446	415	410	431	418	387	418
Normal	72.0	75.5	71.6	75.9	74.3	73.8	75.4	78.5	71.7	73.2	71.8	76.1
Overweight	20.6	15.4	19.8	17.7	18.3	19.7	17.3	16.8	20.6	17.5	17.1	16.7
Obese	7.5	9.1	8.6	6.4	7.4	6.5	7.2	4.6	7.7	9.3	11.1	7.2
Girls: *n*	378	372	361	423	430	411	412	442	439	424	397	403
Normal	66.7	66.7	69.8	66.4	68.8	70.1	69.9	70.6	62.4	62.7	64.2	64.0
Overweight	23.8	22.0	20.8	23.6	21.6	20.2	22.6	19.0	26.4	27.8	25.2	25.1
Obese	9.5	11.3	9.4	9.9	9.5	9.7	7.5	10.4	11.2	9.4	10.6	10.9

There was no association between category of BMI and month of birth for boys or girls ($P>0.05$) but ANOVA of mean BMI by month suggested some variation ($P<0.001$) while Scheffe *post hoc* test did not identify any homogenous subset of months ($P>0.05$). Mean BMI declined from January to August and then rose to higher values from September to December. These data give evidence of a weak relationship between climate at birth and BMI at the age of 9–10 years (BMI slightly higher in those born in Autumn and lower in Spring and Summer birth cohorts), but is likely to be of little practical relevance.

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