OPRU Briefing Paper   Modelling the impact of reductions in energy intake (estimated)

Background

We used data from the Avon Longitudinal Study of Parents and Children (ALSPAC). To estimate calorie intake at 7 years, we used the Henry equations.[1] A marginal structural modelling (MSM) framework was used to predict

Results

The observed (CDE) prevalence of obesity was 19.0%; overweight and obesity prevalence was 35.2% (Table 2).

The simulated scenario (a universal reduction to meet EAR) reduced overall obesity prevalence by 5.3% (a reduction of 28.1% on the observed prevalence). With the combined overweight and obesity outcome, the simulation reduced prevalence by 8.8% (a reduction of 24.9% on the observed prevalence).

- Following this simulation, the proportion of children consuming equal to or less than EAR increased from 46.2% to 63.9% for boys and from 14.8% to 33.5% for girls.
- Reductions in overweight/obesity prevalence were similar across the social classes.
- There was no decrease in relative inequalities (risk ratio) but a small decrease in absolute inequalities (risk difference). This decrease was the result of large reductions in overweight/obesity prevalence across all social class groups.

Table 2. Prevalences and relative and absolute inequalities in child overweight/obesity at age 11 years, observed and after modelling the simulated scenario

Scenario	% consuming <=RDI kcals (boys/girls)	Prevalence of obesity at 11 years (>=95th centile)				Inequalities in overweight/obesity[a]	
		Overall (% change vs CDE)	Maternal social class			Risk ratio (CIs)	Risk difference (CIs)
			Lowest (% change vs CDE)	Mid (% change vs CDE)	Highest (% change vs CDE)		

Discussion

Summary

Simulating a reduction in children's estimated energy intake resulted in a large decrease in population overweight and obesity prevalences. These analyses suggest that reducing estimated energy intake at age 7 could have profound implications for BMI at age 11.

Limitations

The ALSPAC cohort is not nationally representative and comprises children born in the early 1990s. Energy intake was estimated using BMI data recorded in 1998 and these data have less relevance to contemporary populations. Participants were also less deprived and likely to be leaner than their contemporary counterparts, meaning energy intake was likely to be underestimated.

Total daily energy intake for children age 7 years was c

References

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Appendices

Methods

Analyses were undertaken using ALSPAC, a geographically-defined longitudinal birth cohort in the old administrative county of Avon in Southwest England. After restricting the total sample to children with completed data for maternal social class, multiple imputation was carried out to generate 50 datasets, which gave an analytic sample of 10,680.

Description of measures

Exposure (maternal social class) - Maternal occupational social class was used as a household measure of social inequalities. Reported at baseline (32 weeks gestation), classes were combined into three groups: higher social class (professional, managerial and technical), middle social class (skilled non-manual), and lower social class (skilled manual, part-skilled and unskilled).

Outcome (overweight and obesity) - Height and weight were recorded objectively at age 11 years. BMI was calculated and risk of overweight/k of ovBTti8

Appendix Figure 1. Directed Acyclic Graph showing the theoretical model

This diagram can be understood in temporal terms, where the exposure (maternal occupational social class) was measured at pregnancy, the mediator (estimated energy intake) was measured at age

Appendix Table 1. Descriptive statistics of ALSPAC for

Appendix Table 2. Relationship between confounding and exposure, mediator and outcome variables (n=10,680)