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## Daily exposure to the retail food environment and the association with child BMI

Mizen, A<sup>1\*</sup>, Rodgers, S<sup>1</sup>, and Fry, R<sup>1</sup>

<sup>1</sup>Swansea University

### Background

The dose-response relationship between exposure to food environments and obesity has not been widely investigated. This study examined whether increased retail food environment (RFE) exposure in children was associated with a larger body mass index (BMI).

### Objectives

Generate household level daily exposure to the RFE for children aged 11-13 years and link these environmental exposure with health data in an anonymised data safe haven.

### Methods

Individually tailored environmental exposures were calculated in a GIS for home and school locations, and modelled walking routes to and from school. Local Authority food outlet data were used to generate the temporally accurate exposures. Exposures were linked to individual level health data in the SAIL databank for a cohort of individuals from south Wales aged 11-13 years, with BMI measurements. A fully adjusted multi-level regression model was fitted to investigate the association of RFE exposure with BMI.

### Findings

Home exposure and exposure along the walk to school was significantly greater for children living in deprived catchments, compared with affluent school catchments ( $t = -5.25$ ,  $p < 0.05$ ;  $t = -0.277$ ,  $p < 0.05$ , respectively). The RFE exposure along the walk home was the only environmental exposure positively associated with a higher BMI (0.22,  $p < 0.05$ ).

### Conclusions

Increased BMI was associated with greater REF exposure along the walk home from school. The findings suggest that the walk home from school may be important for developing interventions and policies to discourage unhealthy eating. Research should be undertaken to better understand child purchasing habits.

\*Corresponding Author:

Email Address: [amy@chi.swan.ac.uk](mailto:amy@chi.swan.ac.uk) (A Mizen)

