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Linking household level GIS-generated environmental exposure scores with individual level anonymised health data

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Introduction

The dose-response relationship between exposure to food and BMI, has not been widely investigated. Furthermore, household-level, GIS-generated food environment exposure scores have not previously been linked with individual-level, anonymised BMI data. This study linked GIS-generated residential level environmental exposure scores with historical anonymised, health data held in the SAIL databank.

Objectives and Approach

Household level GIS-generated exposure data for a region of about 1 million people were anonymised into SAIL using the 'split-file' method. All individuals living in the 633,884 homes at the time of data collection (2009-2010) were flagged using a population register. Separately, a cohort of 1147, 11-13 year old pupils were linked to their health data before joining to their environmental exposures. Two subgroups were established within the linked dataset: individuals living at 4.8km or less from the school they attended were assumed to walk to school ("walkers") and pupils who lived further than 4.8km were flagged as "non-walkers".

Results

A total of 916 pupils (80%) were successfully linked to the population register. The BMIs were collected in 2009-2010, but more recent data is likely to have a greater proportion of successful links (more recently, 97% of individuals and their health data have been linked to their home and exposures in SAIL). Erroneous BMIs were removed (n=33, 2.9%). Anonymised exposure data were linked with the remaining 883 (77%) individuals. The dataset contained 352 males (39.9%) and 531 females (60.1%); of these, 38% were from deprived areas and 62% lived in affluent areas. There were 431 (48.8%) pupils in the "walkers" group and 452 (51.2%) in the "non-walkers" group. In the "walkers" group, 13% were obese compared with 22% of "non-walkers" (chi-squared = 12.3, p <0.05).

Conclusion/Implications

We generated novel regional exposures to combine with historical anonymised health data. Household and individual level linkage of environmental data to health cohorts contributed to the literature to help develop beneficial societal policies. We recommend routine national collections of height and weight for children to allow longitudinal retrospective analyses.

