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Research report

Changing foodscapes 1980–2000, using the ASH30 Study

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ABSTRACT

There has been a dramatic change in the UK 'foodscape', accompanied by increasing rates of overweight and obesity. This study explores dietary change and change in BMI recorded longitudinally (1980–2000) against the change in food availability recorded retrospectively. Over 20 years the foodscape changed dramatically, with the total number of food outlets increasing by 79.4%. Analysis did not find a relationship between the foodscape and food intake patterns in 1980 or 2000. However statistically significant associations were found between 1980 foodscape and percent change in BMI. Adding geographical elements to a dietary study adds an interesting dimension in exploring the change in eating and BMI from adolescence to adulthood.

Introduction

Nutrition and health are inextricably linked and improving nutrition is a priority in global public health policy (World Health Organisation, 2003). Unhealthy diets are linked with numerous chronic diseases including obesity, which has been described as one of the largest societal challenges (Foresight, 2007). In the UK, predictions suggest that 60% of the population could be obese by 2050 (McPherson, Marsh, et al., 2007). This predicted rise in Body Mass Index (BMI) by 2050 will be associated with increases in diseases attributable to obesity including 30% increase for stroke, 20% for coronary heart disease and greater than 70% increase in type 2 diabetes (McPherson et al., 2007). Obesity is also a major risk factor for some of the most common cancers (World Cancer Research Fund/American Institute for Cancer Research, 2007).

While it is accepted that the food choices made by an individual are dependent on their 'personal food system' (Connors, Bisogni, et al., 2001) the context in which these choices are made is important in understanding the reasons for particular choices (Feather, Norman, et al., 1998). Most of the models of food choice indicate that both food choice and health behaviours are influenced by biological, demographic, social/cultural and environmental considerations as well as food-related government policies (Booth, Sallis, et al., 2001) and economic factors (Mela, 1999). An emerging body of literature has suggested environmental factors can influence individuals' dietary behaviour (Giskes, Kamphuis, et al., 2007). The underlying biological tendency for humans to acquire and store energy and the desensitisation of our appetite control system (Foresight, 2007) within the context of an obesogenic environment ('the sum of influences that the surroundings, opportunities, or conditions of life have on promoting obesity in individuals or populations' (Swinburn & Egger, 2002)) means individuals exert less control and choice over their lifestyle patterns which impacts on their weight (King & Thomas, 2007). It has been suggested that 'human biology has become out of step with the structure of society' (King & Thomas, 2007). King and Thomas (2007) refer to the abundance of 'high energy and cheap food' contributing to the overwhelming obesogenic environment of modern life. This structure of society in terms of the food environment or the 'foodscape' has changed rapidly in the UK over the last 20 years. Alongside this change has been an exponential increase in the prevalence of overweight and obesity. This has stimulated research across the world to explain the relationship between aspects of food retailing, diet and health (White, 2007).

Since the 1960s there has been a 'major retail revolution' (White, 2007); large food retailers have emerged and have captured the majority of the food market through supermarkets

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and hypermarkets (Atkins & Bowler, 2001). During the 1980s British food retailing was transformed by a small group of retail corporations (Wrigley, 1998). By 1990, 60% of the UK 'grocery market' was controlled by five food retailers (Sainsbury, Tesco, Argyll (Safeway), Asda and Gateway (Somerfield)) (Henderson & Crosthwaite, 1992). The dominant position of these large companies with their considerable buying powers was facilitated by a revolution in the sourcing and physical distribution of products via enhanced logistics and development of sophisticated IT systems which allowed "just-in-time" supply (Wrigley, 1998). The rise of the large supermarkets was accompanied by the demise of smaller independent grocery shops (Atkins & Bowler, 2001).

During the 1980s, food supply outlets in British cities moved to out-of-town sites, which created the idea of 'food deserts', defined as 'populated urban areas where residents do not have access to an affordable and healthy diet' (Cummins & MacIntyre, 1999) with strong implications for accessibility to certain groups of disadvantaged consumers.

To date there has been little research on the impact of food access on obesity risk (White, 2007). A UK study found no significant relationship between food outlet availability, proximity or price and dietary patterns (White, Bunting, et al., 2004). Evidence from this and other studies appears to indicate that in the UK, food access does not have a significant effect on food consumption (White, 2007).

Between 1960 and 1993 the UK Family Expenditure Survey described an increase from 10% to about 21% in the proportion of food expenditure on food eaten away from the home (Warde, 1997). Eating out has increased markedly in the last decade and has become 'embedded' in our culture (Riley, 1994). From the 1960s, foods consumed outside of the home have been influenced as a result of immigrants from South Asia and Hong Kong. Additionally, since the 1980s there have been increasing numbers of American owned or inspired fast food outlets (Atkins & Bowler, 2001). The catering industry has expanded to provide an increased number and more varied choice of food outlets. The venue choice for eating out is related to education level, social class, ethnic group and age (Warde & Martens, 1998). Several recent studies including Ellaway, Anderson, and Macintyre (1997) in Glasgow, have demonstrated a significant association between deprivation and BMI, along with many other health outcomes. An individual's geographical location when they wish to eat out is also important. National level data has indicated that McDonald's outlets are more likely to be found in economically/socially deprived neighbourhoods in Scotland and England (Cummins, McKay, et al., 2005).

The dynamic nature of diet and its strong relationship with demographic, economic, social and health factors, mean that in order to understand dietary change and to promote a healthier diet we need to understand this change in its context. Understanding this change or transition in nutritional patterns may be of value in combating diet related chronic diseases (Popkin, 1993).

A recent review (Giskes et al., 2007) highlighted a number of understudied environmental factors that are 'implicated' in the obesity epidemic including fast food/convenience stores, marketing of unhealthy foods and availability of larger portions. This study addresses that evidence gap by examining the influence of the foodscape on dietary patterns and BMI. The hypothesis is that the food environment influences food intake and BMI both cross-sectionally and longitudinally. Using personal information, cross-sectional and longitudinal dietary and anthropometric data (ASH30 Study) in combination with foodscape information (sourced retrospectively from the Yellow Pages–Business telephone directory listings) this study links the changing foodscape to changes in diet and anthropometry over 20 years (1980–2000).

Methods

The ASH30 longitudinal study methods and dietary results have been described in detail previously (Lake, Adamson, et al., 2004; Lake, Rugg-Gunn, et al., 2004; Lake, Mathers, et al., 2006).

The ASH30 Study in brief

In 1980 dietary and anthropometric information was collected from 405 11–12-year olds attending seven state schools in Northumberland, North East England (Hackett et al., 1984a,b). Between 1997 and 2000 a range of methods were used to contact these original participants. The result was that 298 of the original cases (aged 32–33 years) were retraced throughout the UK and 208 consented to take part in a subsequent study in 2000/01 (the ASH30 Study). The majority of the sample (78%) remained within the Northumberland and Tyne and Wear area (Lake et al., 2006). This analysis focuses on the 115 individuals who remained within the original study areas of Morpeth, Newbiggin and Ashington.

Dietary survey, anthropometric measurements and socio-economic status

In both 1980 and 2000, food intake was characterised and quantified by two 3-day food diaries followed by an interview on the fourth day to clarify uncertainties and to determine portion sizes. In 1980, food portion sizes were estimated using calibrated food models (Hackett, Rugg-Gunn, et al., 1983) while in 2000 a photographic food atlas (Nelson, Atkinson, et al., 1997) was used. Foods consumed were allocated to one or a combination of up to five groups which comprise The Balance of Good Health food groups (BGH) from the National Food Guide (Food Standards Agency, 2001) according to specifications suggested by Gatenby, Hunt, and Rayner (1995). Consumption of foods within groups was quantified by expressing the weight of food consumed from each of the five BGH food groups as a percentage of total weight of food consumed. Dietary change was expressed as the difference in percentage contribution made by each BGH food group to total weight of food eaten comparing 2000 with 1980 (2000 − 1980).

Between 1980 and 2000 intakes of foods containing fat and/or sugar, and milk and dairy foods decreased ($p < 0.01$ and $p = 0.031$ respectively), while intakes of fruit and vegetables increased ($p < 0.01$). Intakes of bread, other cereals and potatoes ($p = 0.002$, $r = +0.219$), fruit and vegetables ($p < 0.01$ $r = +0.256$) and meat, fish and alternatives ($p = 0.026$ $r = +0.158$) 'tracked' (preservation of relative position (Wardle, 1995)), from adolescence to adulthood (Lake et al., 2006).

In 1980 and 2000 height and weight were measured by a trained researcher and BMI calculated. Earlier work in the ASH30 Study established that relative BMI, an index of adiposity, tracks from adolescence to adulthood (Craigie et al., 2009).

Socio-economic status (SES) was assessed at the individual, rather than neighbourhood level. Using the 1970 Registrar General's definitions (Registrar General, 1970) of social class and following the pattern used in 1980 (Hackett et al., 1984a,b) social class was divided into four groups. Group 1 defined as 'high' combined social classes I and II, group 2, labelled 'middle' was social class III, group 3 described as 'low' was made up of classes IV and V. Group 4 comprised of the unclassifiable VI, the retired or unemployed VII and the unknown VIII. This assessment was conducted in the same way at both time points to ensure comparability between 1980 and 2000 socio-economic groupings.