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The ‘School Foodshed’: Schools and fast-food outlets in a London borough.

Introduction

This research was undertaken in an east London district, Tower Hamlets, and focussed on secondary school pupils and the location and use of nearby food outlets selling fast-food. The purpose was to gather data and to inform local policy development in the area. The Borough was the site for one of the nine healthy towns funded by the Department of Health England in 2008 as part of its Healthy Community Challenge Fund ([www http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/DH_085328](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/DH_085328)). Other towns covered topics such as exercise, breastfeeding and gardening. The specific focus in Tower Hamlets was on the development of an ‘award scheme for businesses to sell healthy food’, with fast food outlets receiving particular attention. This research was intended to help inform the process of local policy delivery and provide an evidence base for on-going policy development.

There is considerable interest in the role of schools and healthy eating in the UK. The School Food Trust (2007), for England, introduced food based standards in 2006 and the final food based standards and nutrient based standards for primary schools in 2008 and for secondary schools in 2009. While there has been considerable focus on the situation within schools, it is only now that the wider food environment is receiving attention (School Food Trust, 2008). Concerns about the environment around the school take two forms; the first is the existence and availability of what are called ‘competitive foods’

those foods which compete with food sold in the school; the second is the proximity of fast-food and other outlets to schools (Institute of Medicine of the National Academies, 2007). To date there has been little academic work on these two aspects in the UK.

The term ‘foodshed’, in the title, is adapted from two concepts: firstly that of the watershed which describes the flow of water/food from the area into the place where it is used and consumed; and secondly from the old notion of the ‘school shed’ where nefarious, illicit and often unhealthy activities, such as smoking, took place. We have used the term ‘school foodshed’ to represent the area from which school pupils can obtain their food. The foodshed for those living in urban areas has expanded to include modern developments such as supermarkets and take-aways and fast-food outlets (FFOs) on the way to school. In essence the foodshed has widened for young people and now they have the power to source their food from a wider variety of outlets than in the past, which were confined to school and the home. Now their foodshed is like a series of tributaries which feed into their main food stream. Secondary school pupils have access to food outside of schools due to their spending power, travel patterns and the ability of some of them to access local shops. Their foodways have broadened beyond the traditional areas of home and school to include many informal eating out occasions and outlets (McDonalds and Allegra Strategies, 2009). Primary school children do not have access to the high street in the same way that secondary school pupils do, hence they are not the focus of this article.

The influences on eating choices and obesity are multi-factorial, the role of food retail environments around schools has been mooted as being linked to the causation of obesity (Fraser et al 2011; Jennings et al, 2011). The links between obesity and fast-food have been highlighted by others such as Popkin (2009); the link is not simply the food composition and calorific content but also related to issues such as choice, price, portion size and carbonated drinks (Lin Biing-Hwan and Guthrie, 1996). Some studies have found a concentration of FFOs in deprived areas and an area effect on food choice and consumption (MacDonald, Cummins, MacIntyre, 2007; Reidpath et al, 2002; Kavanagh et al, 2007; Kwate, 2008). Others have located the causation as an individual choice effect (Turrell and Giskes, 2008; Maher, Wilson and Signal, 2005). This issue of the location of fast-food and its impact on food choice and health has been highlighted by a number of research teams; in fact one group found no concentration of fast-food outlets in Glasgow but then found for the UK as a whole that four big trans-national companies were concentrated in areas of deprivation (Cummins, McKay and MacIntyre, 2005; Macdonald, Cummins and Macintyre, 2007; MacIntyre, 2007). The 2005 study in Glasgow found that those living in poorer areas were not more likely to be exposed to out-of home eating outlets in their neighbourhoods (MacIntyre, McKay, Cummins and Burns, 2005). The above were mostly concerned with the broader food environment and not focussed on schools and the location of FFOs relative to schools. A number of studies (mainly North American) have found fast food outlets to be located close to schools, particularly those in areas of high deprivation, and to be related to a higher prevalence of obesity (Austin et al., 2005, Davis and Carpenter, 2009, Simon et al., 2008, Sturm, 2008). This is one of the first to examine the phenomena from an English perspective.

Concerns over the purchasing and consumption of unhealthy foods, ‘fast foods’ among young people and low socio-economic groups, has led to calls to develop planning guidelines in England to restrict the siting and licensing of fast food outlets near schools (NICE, 2010). However such approaches reflect a view of the food environment/foodscape and behavior of young people within it which is represented by two diverging arguments, the first is to do with the primacy of environment and the second with the agenda of individual choice. This paper examines the relationship of the wider determinants of health particularly the symbiotic relationship between environment and individual choice. This is akin to what Counihan (1999) calls foodways which is the study of the various influences on food choice; here we combine the issues of behavior and culture with structural determinants which influence those discussions (Popkin, 2009; Marmot, 2010).

The focus on concentrations or clustering of FFOS while important (Austin, Melley et al, 2005; Day and Pearce, 2011) may be missing the wider issue of how people and in this instance pupils access the food and the influence of the ‘school foodshed’ which is wider ranging than concentrations of outlets. For example the concentration near schools may be important but the routes which children take to school may be as important, as FFOS near the school, in terms of the food choices students make. The findings from the literature can be divided into two arguments representing on the one hand the relative explanations of the impact of the wider determinants of health in an obesogenic

environment, and on the other hand personal choice and behaviours as a determinant of health.

Such individual behaviours, as noted above, are aided by the increasing power of young people as consumers and the increasing amounts of money available to them to spend on food. Those aged seven to fifteen have an average of £12.30 pocket-money per week, with girls more likely than boys to spend their money on clothing and footwear, and personal goods, such as toiletries and cosmetics (National Statistics, 2002). UK data from 2005, showed that that the amount children spend on the way to school has increased well above inflation from £0.77 in 2002 to £1.01; a further 74 pence is spent on the way home; the majority of this is spent on the four Cs of: Confectionery, Chocolate, Crisps and Canned drinks. This spending on the way to school can be contrasted with the amount provided by parents to pay for school meals which in 2002 was £1.84 per day (Sodexo, 2005). These are not foods from hot take-aways but what Winkler has called ‘cold take-aways’ and are usually corner shops and or supermarket outlets (Sinclair and Winkler, 2008). What Sinclair and Winkler argue is that the local food environment outside the school, the location/proximity of FFOs to school and the price of ‘competitive’ foods all need to be addressed as well as the school policy and food environment within the school (see also: Story, Nannery and Schwartz 2009; Lin Biing-Hwan and Guthrie, 1996).

Dissatisfaction with the school dining environment and value for money can lead to increased use of fast-food outlets, combined with the ubiquitous nature of the fast-food outlets near schools. In the US ‘competitive foods’ are still an issue on the school campus

(Institute of Medicine of the National Academies, 2007, Poppendieck, 2010), in England; the new school food standards have made all food in schools subject to the regulations. What has occurred in effect is a shifting of the public health focus to ‘competitive foods’ outside the school gates where the current regulations do not have an impact.

Background to the locality

The borough of Tower Hamlets has the third highest Index of Multiple Deprivation in England (Department for Communities and Local Government, 2007) and consequently is one of the most deprived areas in London. The population of Tower Hamlets is estimated at 232,000 (Greater London Authority, 2007). Mortality rates in the borough

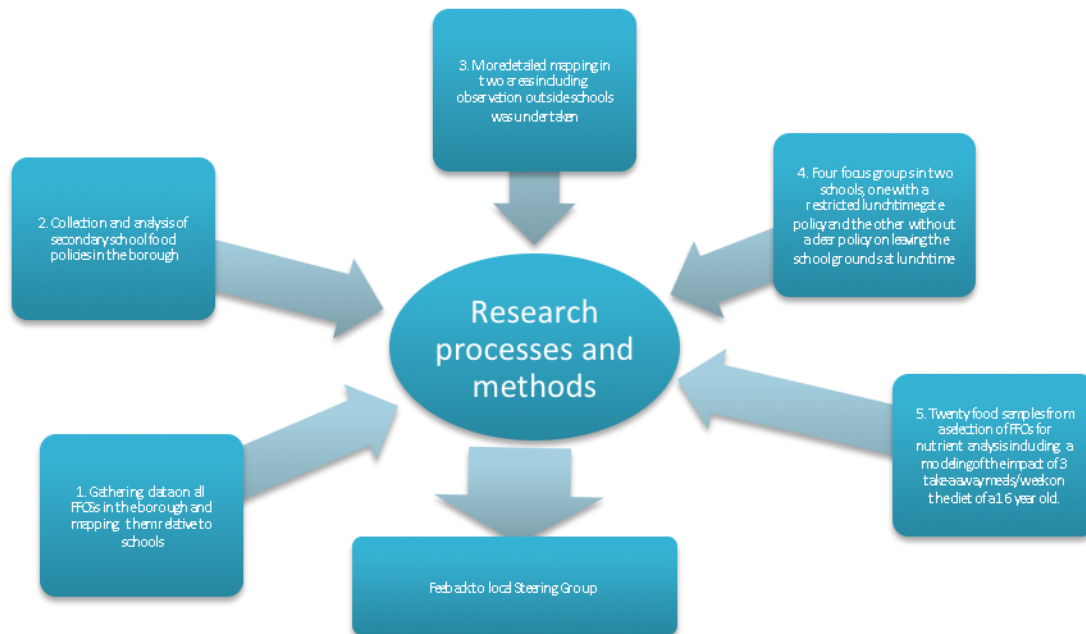
(Tower Hamlets PCT, 2007). Only 15 per cent of eleven, thirteen, and fifteen years old pupils in the borough eat 5 or more portions of fruit and vegetables compared to the national figure of 23 per cent (OFSTED, 2007). Fifteen per cent of four to five year old children are obese and this increases to 23 per cent for 11 year olds and is the most deprived borough for income deprivation affecting children (OFSTED, 2007). The majority of the population are from a non-white British background, with the largest minority ethnic group (34 per cent) being Bangladeshi with half of this community ‘third’ generation – born locally. A 2009 health and lifestyle survey in Tower Hamlets found among 16 year olds high use of fast-food take-aways and low levels of consumption of recommended amounts of fruit and vegetables (Ipsos Mori, 2009). Males report eating fast-food with a far greater frequency than females and members of ethnic groups such as those from a South Asian background reporting higher levels of eating out, 26.5 per cent as compared to 15.4 per cent from white backgrounds.

Methodology

The research used a number of distinct methods which were combined to provide triangulation of the data, here we used the methods to create an overall picture of eating and use of FFOs during the school day. This research sought to explore public health initiatives to improve the choices available in the local area related to the school age population, what Robinson and Sirard (2005) call a solution-orientated approach. In essence, a solution-orientated approach moves the focus of work away from developing more descriptions of the problem or attempts to show links between fast food and obesity or unhealthy lifestyles to a focus which is on solutions.

We used five methods which informed each other and also enabled us to triangulate the data, these are shown in Figure 1 and details set out below. Part of this critical/solution-orientated approach to the research work was the establishment of an advisory and policy group (Robinson and Sirard, 2005). We reported to this group and also advised them on policy formation but they also helped direct the research to areas that were of use to them. This was established by the local public health directorate and the membership was broad with planners, environmental health, public health specialists and the local community represented. This ensured a route back into the local policy making processes.

Figure 1 showing research methods and processes, including feedback loop to the Steering Group



We mapped all fast-food outlets in the borough relative to all schools. Figures 2 and 3. A copy of all the registered food businesses in Tower Hamlets was obtained from the local council. The database contained not only the names and address of food business but also the geographic coordinates and the assigned usage type. The primary classification used in the study was ‘takeaway’ and using local knowledge the database was further refined by the removal of takeaways that were not fast food outlets (e.g. sandwich bars in Canary Wharf) and the addition of outlets that although classed as restaurants were FFOs (e.g. fried chicken restaurants with some seating means they are classified as restaurants due to the presence of seating). The dataset was also checked for duplicates entries which were removed if found and for missing geo-codes (x & y coordinates) which were added if missing. We used GIS to create buffer zones, with straight-line boundaries of 400m and 800m around each school, and a count of food retailers was calculated for each school. These distances approximate a five and ten minute walk, respectively (Day and Pearce

2011).

Copies of all secondary school food policies in the borough were requested and obtained, (n= 15). The focus of the analysis of these policies was on the policy related to permissions to leave school grounds at lunchtime and any references to healthy eating policy. We used this data along with the mapping results to decide on the areas and schools to be observed. Given the nature of the policies and the concentrations of schools it was decided to concentrate the activities of food sampling, observation activity and focus groups in two areas this resulted in nine schools in the study (total of 15 for the borough). We included one school that did not a specific policy on access to the high street at lunchtime. The shaded yellow and green areas, in Figure 1, are the two areas where the detailed observations, focus groups, and food sampling took place.

Observational measurements and more detailed mapping was undertaken in two areas. This included observations outside schools. Initial observations focussed on four schools and following this scoping exercise, a 'purchase monitoring' pro-forma was developed, piloted, refined and then utilised by members of the research team (working in pairs). This was used to observe the buying behaviour of secondary school pupils around schools in the two areas. This was undertaken before school, at lunch time and after school. We collected data on 36 outlets in the study area. Activities in 20 FFOs were observed over a two week period at lunchtime and after school. This included observation of what was happening at lunch time, including:

- the most popular food/drink items in each of the five study areas during the lunch-

time break of each study area school (12- 2pm).

- whether promotional offers (e.g. free fizzy drink) influenced purchasing behavior, we took pictures of special offers.

All the above was observational and relied on judgment and the researchers worked in teams to ensure consistency. Data observation sheets were designed for each of the above two categories of outlet, again this was to ensure some consistency in reporting.

Four focus groups were conducted in two schools, one with a lunchtime gate policy and the other without a clear policy on leaving the school grounds at lunchtime. These consisted of 12 - 14 year olds, a total of 22 students; two with year 7/8 (12/13 year olds) students and two with year 9 pupils (14 year olds). The age range was chosen in order to gather data about differing health related behaviours in different age groups the elder of whom recalled school policy prior to the introduction of the government's food-based standards. Details of the groups were as follows:

- The two focus groups from school 1 consisted of four boys and five girls from three ethnic groups- South Asian, African Caribbean, and White British.
- The focus groups from school 2 consisted of 13 girls (this was an all girls school) again from a range of ethnic backgrounds including south Asian, African Caribbean, Turkish and White British.

The interview schedule focussed on attitudes to food in the school, use and purchasing behaviour at outlets on the way to/from school, attitudes towards school food and competitive foods and values related to school food.

Drawing on the data collected above regarding purchasing behaviour of pupils, researchers identified popular lunchtime purchases of foods and drinks in the study area and drew up a list of foods and drinks to be test-purchased, this was checked with the Steering Group. Twenty food samples from a selection of FFOs for nutrient analysis, see Table 1. These were purchased by local Environmental Health Officers and sent for analysis to a certified public analyst. When buying the food the smallest portions sizes available were chosen and all calculations assumed that there was no waste from the meal. The foods to be sampled were chosen on the basis of what was on offer in FFOs in the area and from what we observed the children buying and eating as well as information from the focus groups. Although there were a large number of outlets the food on offer was limited and students preferences were limited to a small number of items.

Table 1 Takeaways by type and food samples taken

Type of takeaway	Samples taken
Pizza bar	1. A small pizza with meat topping
Fish and chip bar	2. A portion of chips from the fish and chip shop 3. A portion of chicken 4. A small portion of fried fish 5. A pie medium
Chinese takeaway and fish and chip shop	6. A vegetable chow mein 7. A chicken chow mein 8. A portion of egg fried rice 9. A portion of boiled rice
Doner kebab takeaway	10. A small shish kebab 11. A small doner kebab 12. Chicken curry 13. Meat curry 14. A portion of boiled rice

Fried chicken takeaway	<ul style="list-style-type: none"> 15. A portion of chips 16. A 2 wing portion of fried chicken 17. A burger 18. A small cheese burger 19. A Halal burger
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From the analysis data we calculated a front of pack traffic light profile (Food Standards Agency, 2007), analysing the meal per 100g unless per portion criteria were indicated. The rationale for undertaking this was that we had to communicate our results to a mixed policy audience many of whom would not have a nutrition or science background. The front of pack signposting was an easy way of communicating a complex message in a simple way. The samples were analysed for energy, fat, saturated fat, trans fat, carbohydrate, sugars, protein, salt / sodium and fibre. Using the nutrient analysis from the food samples we profiled all the sampled food using the Food Standards Agency front of pack signpost labelling system which is based on a nutrient profiling model. We recognise that the traffic light system was not designed for analysing food from fast-food outlets; however we consider it to be a robust mechanism for providing a simple framework for understanding the nutrient content of these foods; and also a mechanism by which comparisons can be made between foods. In addition this system is understood by the average consumer (Van Kleef et al, 2007).

We modelled the impact of three meals from the foods that were sampled on dietary intake. We chose three meals because this was number of fast-food meals most of the children in our study reported eating over the period of a week and it reflects the data from an Ipsos MORI (2009) survey that nearly one third of males aged 16-24 were eating three or more meals week from take-aways with a soft drink accompanying each meal. The meals chosen were:

Meal 1: A cheese, tomato and pepperoni pizza (small).

Meal 2: Cod (small) and chips

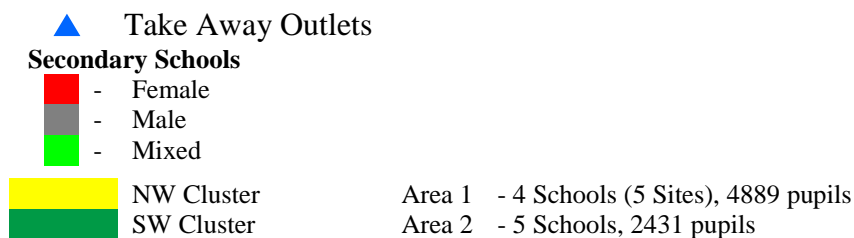
Meal 3: Chicken chow mein and egg fried rice.

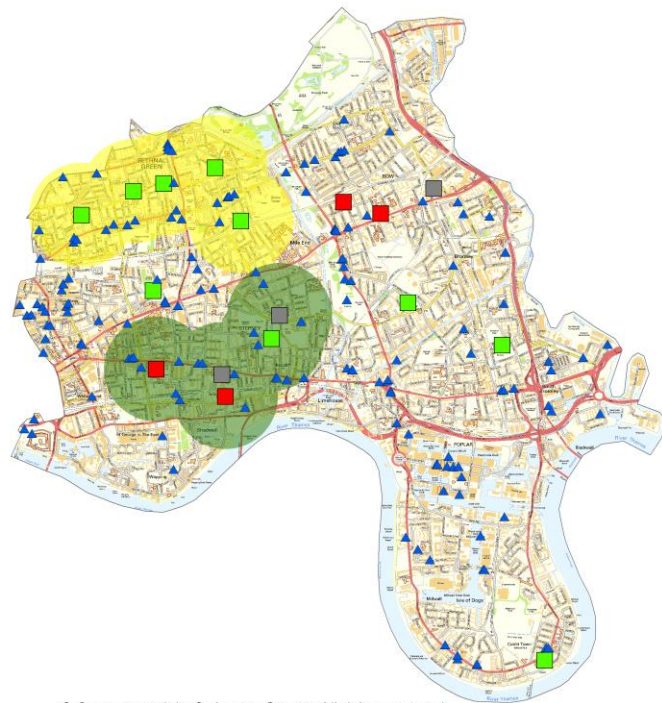
These foods are neither the best nor the worst options in nutritional terms but we chose these as they are representative of the range of take-away meals available and popularity of choice as noted in our observations of FFOs. Data on the choice of meals was also informed by our focus group results and the data from the local 2009 health and lifestyle survey quoted above. We calculated the values for energy (Calories), fat and saturated fat, because these nutrients are known to have the greatest impact on long-term health. Then undertook a comparison between the calculated nutrient content of the meals and the Dietary Reference Values for a 16 year old boy and a 16 year old girl. We did this in order to assess the Calories that fast-food *could potentially* contribute to a teenager's diet over the period of one week.

Results

The findings are presented under key themes using data from the various methods to build up an overall picture of pupil's behaviours and the local food environment.

Figure 2 - Clusters of schools showing areas around schools where observations were recorded (400m boundaries)





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Concentration ratios

In the borough there are 627 FFOs, newsagents and groceries providing a ratio using the School Food Trust (2008) methodology, outlined in the introduction, of 41.8 '*junk food outlets*' to every school, this compares to the national average ratio of 25 outlets per school, 36.7 for inner London, and 38.6 for the ten UK 'worst' local authorities. This could potentially be an underestimation the number of food outlets as a number of food premises classed as off-licences (44 in Tower Hamlets) will be selling sweets and confectionary and many operate in a similar fashion to grocer/mini markets. Aditionally some premises classified as restaurants (605 in Tower Hamlets) as they have

tables/seating essentially operate predominately as take away premises leading to further potential under reporting.

Figure 3 - Density of Fast-food Outlets Mapped in location to Secondary Schools (400m boundaries)

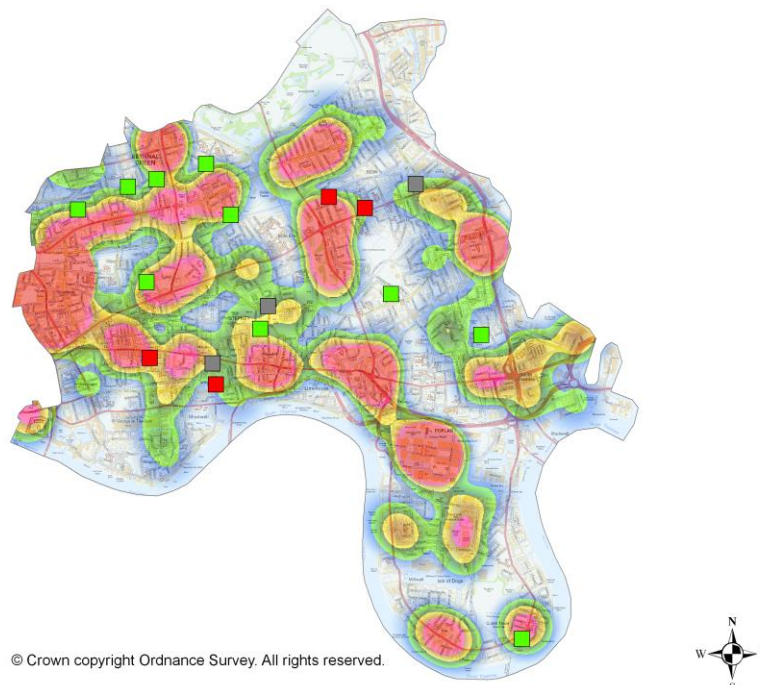
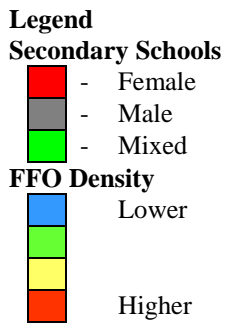


Figure 3 also displays a clustering of FFOs along the main thoroughfares in the borough, Whitechapel Road, Mile End Road, Commercial Road and Bethnal Green Road.

School policies and eating habits

In the borough 14 of 15 schools (the 15th – had a partial closed gate policy) reported operating closed gate policies, further examination showed that many of these operated a 'privilege system' with good behaviour resulting in permission to leave the school grounds, parental consent allowing the same and some senior groups being accorded this freedom. The 'partial' closed gate policy in the school in area 1 (Figure 2 SW cluster, green shaded area) resulted in more observable activity at lunchtime and after school in the surrounding shops than in the north west cluster (Figure 2, yellow shaded area). The focus groups provided us with a lot of detail and added to the observational data.

Specifically focus group participants reported that:

- They and their friends obtain food from local shops not from the school; some reported a deliberate abstinence from school lunches in order to be able to use their 'dinner money' to buy from a take-away on the way home from school.
- Many reported being hungry at the end of the school day and this was a reason for eating from FFOs on the way from school to home.
- When students were paying for school meals they were extremely price sensitive and reported that school meals offered poor value in relation to what they could buy from local shops and FFOs, where meals deals were often on offer for one pound or ninety nine pence.
- While there were some expressions of dissatisfaction with the quality of school meals, there was a greater concern with the canteen atmosphere in terms of queuing, noise and time allocations.

The focus group conducted in the school which had a partial closed gate policy, pupils reported giving money to those with permission to leave the school grounds to buy food to bring back in for them. This was always below the price of the school meal and was seen to offer value for money.

Purchasing patterns

From our observations in the two areas we found that there was some but very little purchasing activity in the morning and during the lunch hour period in the immediate areas around the schools. In area 1 (SW cluster) the observed activity mainly consisted of girls buying bottled water early in the morning. After school there was more observable activity with pupils buying food, specifically ice creams, and cans of drink from local newsagents. For area 2 (NW cluster) there was very little activity in the mornings – a small number of groups purchasing snacks and one group eating cheese on toast in a café. At lunch-time there was more group activity around only one school with both boys and girls buying crisps, coke, ice-cream etc from local newsagents, this was the school without a clear policy on leaving the school grounds at lunchtime. With the exception of several purchases of water and diet drinks, all the observed purchases were high in fat, salt or sugar. After school in this area some groups of pupils also bought cakes, sweets and drinks at a local bakery and newsagent. Many of the shops and FFOs offered meal deals usually with a soft drink for £0.99 or £1.50, see Figure 4 for such an example.

Figure 4 Picture showing ‘Kids Meals’ special offer



Older pupils in the focus groups (14 year olds) reported eating on the way to school spending on ‘breakfast on the move’ -up to £1.20, again many of these were on special offer in the shops on the school routes. This group of older pupils, in the focus groups, also reported buying crisps; drinks; chocolate; cream buns and cream cakes; orange juice and soft-drinks. Some of these were for later consumption during the school day as opposed to for eating on the way to school. A typical response was ‘*I eat a sausage roll in the morning*’ (girl, 14 year old). There was little reported use of the breakfast clubs from this older group of students. However, some younger pupils reported attending breakfast clubs, on some days during the week. The reasons given were:

- ‘*It’s free*’.
- ‘*Sometimes I like hot chocolate*’.
- ‘*Sometimes you just arrive early in school and you just want to go there*’.
- ‘*I wake up extra early just to eat.*’

A key issue reported across the focus groups was the school canteen environment as opposed to issues about the quality of the food served. Typical is this quote:

Because I can’t be bothered lining up because that means standing on my own sometimes. And it’s always gone by the time you get there anyway. (year 7, 12 year old girl)

Other comments referred to queues ‘at lunch time, like, the queues are really long so hardly any of us line up to get any food so we just end up going out to the corner and buying ... loads of people go to the ice cream van outside the school and buy hot dogs.’

This underlines the importance of addressing the school food environment as well as the ‘school foodshed’.

Nutrient content

The analysis of the nutrient content of frequently consumed meals found the following for fat, saturated fat, sugar, salt and trans fats.

Table 2 : Nutrient profile and trans fat content of all the fast-foods sampled, based on Food Standards Agency (2007) front of pack signpost labelling model.

Type of take-away	Meal	Front of pack traffic light signposts				
		Fat	Saturated Fat	Sugars *	Salt	Trans fats
Pizza bar	1. A small pizza with meat topping	Medium	High	Green	Medium	√
Fish and chip bar	2. A portion of chips from the fish and chip shop	High	High	Green	Green	√
	3. A portion of Halal chicken	Medium	Medium	Green	High	√
	4. A small portion of fried fish	High	High	Green	Green	√
	5. A medium sized pie	High	High	Green	Medium	√
Chinese take-away and fish and chip shop	6. A vegetable chow mein	Medium	Green	Green	High	√
	7. A chicken chow mein	High	Green	Green	High	√

	8. A portion of egg fried rice	High	Green	Green	High	√
	9. A portion of boiled rice	Green	Green	Green	Green	X
Kebab house	10. A small shish kebab	Medium	Medium	Green	Medium	√
	11. A small doner kebab	High	High	Green	High	√
	12. Chicken curry	High	Green	Green	High	X
	13. Meat curry	High	High	Green	High	√
	14. A portion of boiled rice	Green	Green	Green	Green	X
Fried chicken take-away	15. A portion of chips	High	High	Low	Low	√
	16. A 2 wing portion of fried chicken	Medium	Medium	Low	Medium	√
	17. A small burger	Medium	Medium	Low	Medium	√
	18. A small cheese burger	Medium	Medium	Low	Medium	√
	19. A vegetable burger	Medium	Medium	Low	Medium	√

Key:

* None of the meals analysed contained milk or fruit sugars

Per 100g unless per portion criteria apply

Red High content of nutrient **Amber** Medium content of nutrient ;
Green Low content of nutrient .

Fat

The small pizza which was tested was high in saturated fat, due to the cheese and pepperoni content. The fish and chip shop foods were high in fat and saturated fat with the exception of the chicken with the chips; the pie is likely to be high because of the type of fat used in the pastry; the chicken is lower in fat because the edible portion size was small, 76g.

The Chinese take-away chicken chow mein and the egg fried rice had high levels of fat, but low levels of saturated fat. The food in the kebab house, particularly the doner kebab, and the meat curry had high levels of fat, saturated fat and salt. The doner kebab which is a bought-in product is of particular concern as we found that this particular product is produced and sold centrally and therefore supplied to number of outlets, and potentially to a large number of outlets.

The food from the Fried chicken takeaway, as with the fish and chip shop, had a high fat and saturated fat profile, suggesting this is potentially due to the oil that is used to cook this product being saturated due to hydrolysis as a result of continual re-use.

Salt

While the sodium content of the chips and fish were of little concern the sodium content of the chicken was of concern being high, 0.55g/serving. The equivalent of 1.3g salt in product that was neither covered in a salt containing coating nor had any added visible salt.

The meals from the Chinese take-away showed high levels of sodium in the food, with the exception of the boiled rice which contained no salt, all the foods had a high level of sodium. The highest level reported was in the egg fried rice 1.33g/serving. The equivalent of 3.3g/serving of salt (more than 50 per cent of the recommended daily Eatwell level in one food).

All the foods with the exception of the shish kebab and the boiled rice had a red profile for sodium indicating a high content; it should be noted again that the boiled rice had an all green profile, clearly indicating that nothing is added to this product, not even salt. The samples from the fried chicken take away showed that the chicken wings, burger, cheeseburger, and vegeburger, all the smallest portions available, all had medium levels of fat, saturated fat, and salt. The chicken wings are of particular concern, the edible portion was only 57g and contained 0.18g/ serving sodium the equivalent of 0.5g salt.

Trans fat

Of particular note is that all the foods tested with the three exceptions of boiled rice (2) and chicken curry contained trans fatty acids. Trans fats do not generally occur naturally in foods; particularly foods of vegetable origin, while it is usual for a small amount of trans fat to be present in some foods of animal origin after processing responsible manufacturers are now aiming to reduce trans fats to the lowest level possible in these products. Current recommendations suggest limiting intake of trans fats to less than two per cent of energy intake (Scientific Advisory Committee on Nutrition, 2007). The doner kebab that was analysed contained 0.838g/100g trans fats and 259kcal/100g. This is equal to 2.9 per cent calories as energy for this product. Overall the fact that many of the vegetable foods contained trans fats and the trans fats in some of the animal products were very high when compared to the 2% trans fat as energy recommended by the Scientific Advisory Committee on Nutrition is of significant health concern (NICE, 2010).

Table 3 Energy supplied by three take-away meals + soft drink, compared with Estimated Average Energy (EAR)

Three fast-food meals per week - pizza + cod (small) and chips + chicken chow mein and egg fried rice	Calories needed each week (EAR)	Calories supplied by the three fast-food meals and 3 soft drinks	What % of the energy needed each week is supplied by 3 fast-food meals
Girl -16 years	2110/ day = 14,770 Calories	3665	25%
Boy - 16 years	2755/ day = 19,285 Calories	3665	19%

We used the estimated average daily requirement for girls (2110 Calories) and boys (2755 Calories) to calculate a **weekly** estimated average requirement for girls, 14,770 Calories) and boys, 19,285 Calories (Department of Health, 1991). Using the Calorie content of the three take-away meals, 3665 Calories, we calculated the percentage of Calories that these three meals would contribute to one week’s intake. We found that eating three take-away meals and drinking three soft drinks each week can contribute up to 25 per cent (almost one quarter) of a 16 year old girl’s estimated requirements in one week. For a boy this figure is slightly reduced, the take-away meal can contribute up to 19 per cent of a 16 year old boy’s estimated energy requirements.

DISCUSSION

Our analysis showed higher concentrations of FFOs near schools and in the most deprived areas of the borough when using national deprivation rankings. These concentrations do not persist when Tower Hamlets internal rankings of deprivation were used. This may partially address the concerns of Macintyre (2009) as to area effects. There may be area effects and these may be local and dependant on local issues such as

deprivation. The area of Tower Hamlets has such widespread poverty that the differences between the area are marginal whereas when a comparison with neighbouring boroughs is made this gives a clearer indication of the inequalities. This is due to the compact nature of the borough and the spread of inequality across the Borough; such patterns within a borough like Tower Hamlets are masked by overall population concentrations. There was also a concentration of FFOs along main thoroughfares in the north of the borough and near work sites in the south (see Figures 2 and 3). In reality food businesses of a similar nature cluster around one another on areas where there is high mobility and passing trade. This is often referred to as the ‘Starbucks effect’ where queues at one outlet result in customers going to the next outlet, hence why Starbucks often have two outlets within walking distance of one another (Thaller and Sunstein, 2008). Concentrations are often not to do with location near communities but may be more to do with operational and business issues (Melaniphy, 2007).

In 2008 the School Food Trust (SFT) published some findings on the number of ‘*junk food outlets*’ in and around schools, devising a crude index of schools to ‘*junk food outlets*’ (including confectionary shops) and ranking local authorities on this basis (School Food Trust, 2008). There was no separate figure for Tower Hamlets which was grouped with ten other London Boroughs to provide an index of 36.7, i.e. 36 outlets per secondary school. The national average was 23 outlets per school, with an urban average of 25 outlets per school and for London 28. Our estimates of the ratio of food outlets to secondary schools for Tower Hamlets provides a ratio of 41.8 outlets per school which compares to School Food Trust average ratios of 38.6 for the UK 10 ‘worst’ areas, and

second highest overall (School Food Trust, 2008). In an urban area such as Tower Hamlets concentrations of FFOs may be a consequence of the urban landscape but the sheer number of outlets does raise cause for concern. The debate over the role that geographic access and availability play in determining dietary outcomes has proved contentious and much of the work undertaken has not been on highly urbanised, geographically compact areas, such as Tower Hamlets. Specifically what we add with this research is an engagement with the motivations of the young people themselves. Food choice is influenced by both logical issues such as taste preferences, availability and price but there are also underlying issues of the social and cultural elements such as school queuing, the dining environment and value for money (Stead et al, 2011). The report by Sinclair and Winkler (2008), already mentioned, found that food shops in proximity to schools '*provide at least 23%*' of children's energy needs, that more pupils bought food from the local shops than the school canteen and that two-fifths never visited the school canteen (Sinclair and Winkler, 2008). The qualitative and observational parts of our study support this contention. The traffic light profile Our modelling of the potential impact of three popular take away meals on energy intake of children also supports Sinclair and Winkler's findings.

Our findings paint a complex picture of food choice for secondary students in Tower Hamlets, linking issues of of availability in the local environment with personal choice and behaviours. The impacts of the closed gate policy operated by the majority of schools was seen at lunchtime on high streets in Tower Hamlets with few groups of students eating from shops or FFOs. The focus group findings showed the ways in which children

circumvented these rules by getting others with permission to leave the school grounds at lunchtime to buy in for them, or by buying on the way to school and by taking in food in their lunchboxes or even going hungry until the end of the school day. Others told us of bringing sachets of salt to add to school food where salt, under the new regulations, is not available. So closed gate policies while essential are not on their own sufficient, as was noted in the introductory literature ‘competitive foods’ need to be tackled and the range of healthy options improved. It is clear that the school food standards have impacted in the school setting and the students reported some appreciation of these improvements. Yet there was huge dissatisfaction with the perceived value for money of school lunches and the overall dining room environment experience. The quality of the food was in all reported instances in the focus groups considered to be less important than concerns about value, queuing, lack of adequate time to sit and eat and the noise in the dining areas. So there is clearly work to be done on the school dining environment, but once this is addressed there is still a need to address the external environment and the availability and price of competitive foods.

Possible solutions to the control of the external environment lie in activities such as limiting opening times, taxation of fast-food, regulating the food sold and the prices of the food. Not only does public health practice need to address these issues but also to work in a smarter way to provide ‘nudges’ to healthier eating (Thaller and Sunstein, 2008) albeit ‘nudges’ at a more structural or upstream level of operation. This will include incentives and removing the tendency to view school food as bad value or non-competitive, which was common perception among those pupils in the focus groups.

Ways of achieving this might include:

- Provision of school meals free to all (as is happening in neighbouring boroughs), to remove the stigma of free school meals and to remove the notion of them being ‘non competitive’ or bad value (Poppendieck, 2010).
- Subsidies of healthy options in the school and or local fast-food outlets (NICE, 2010).
- Regulation on the siting, opening times and types of food sold by FFOs.

The findings have alerted the authorities in the area to the situation and the area and has resulted in work with local owners of fast food outlets to help them improve their products and offer healthy choices as well as the development of planning guidance for the opening of new FFOs (Sandelson, 2012). This is a two pronged approach necessary to address the existing situation and to plan for the future opening and control of new FFOs. At the local level the work carried out has informed a number of the activities locally under the healthy borough initiative which primarily target the environmental factors associated with increasing obesity rates, in particular;

- Working with fast-food owners to improve the nutrition of their products as well as promote healthier options and smaller portion sizes. Some of this has focused on working with suppliers of sauces and processed meat products to change the composition of food at source or ‘upstream’ (Sandelson, 2012).
- Reviewing the Council’s own commercial letting policies to promote healthier food on sale in local retail centres.
- Undertaking a social marketing programme to help overcome perceived barriers

- to healthy eating in Tower Hamlets, including identifying healthy options.
- Shaping emerging local development plans to enable spatial planning to manage the location and quantum of fast-food outlets in the borough.

As with other work on food in schools the lessons learned teach us to act by using both consultation and involvement so that regulation goes hand-in-hand with supportive education. (Samia, Pierce and Teret, 2005). In the US, Samia Mair and colleagues (2005) have examined how zoning laws might be used to combat obesity. They have suggested the following as possible ways forward restricting or banning:

- New openings of FFOs and/or drive through outlets.
- ‘Formula’ outlets (formula can be defined broadly to include local take-ways that have one or more outlets or narrowly to include only larger national chains).
- FFOs in certain areas or by directives specifying distance from schools, hospitals etc.
- By using quotas in certain areas either by number of shop frontage or by use of density.
- Restricting opening hours.
- Introducing labelling in fast food outlets (as has happened in New York City and many large scale FFOs have voluntarily introduced this measure).
- Using ‘choice editing’ and specifying the nutrient content of food sold, so the choice is made before the consumer purchases (the example of the kebab in the findings section provides one such example of this, where this was a product produced and sold centrally and not manufactured on individual premises).

Whilst legislative systems differ these merit further consideration in the context of UK planning laws. However local regulation and promotion while important can only have limited impact.

Conclusions

In the UK there has been much concern about the unregulated nature of fast food outlets leading to a call at the UK Public Health Association Annual Forum 2009 from ‘The Food & Nutrition special interest group’ stated that they would work to “*Local authorities should use their restrictive powers (by-laws) to create these opportunities by restricting fast food outlets and supermarkets. This should be enacted through Local Area Agreements.*” While this is welcome it does not address how this might be achieved or even begin to understand the planning system. It also suggests some links between communities growing their own and fast food and supermarket expansion, a link not immediately clear. This call for action was repeated in NICE (2010) public health document on coronary heart disease. The point is not that people should not eat out or that there is not a role for fast-food and take-aways, the problems, as seen from our research are fourfold:

1. The lack of healthy options and nutrition information in fast-food outlets.
2. The lack of other affordable healthy options in the local environment, the clustering and numbers of FFOs near schools.
3. Large numbers of take-aways contribute an obesogenic environment and lack of

healthy choice.

4. Pupils' foodways which currently favour the unhealthy and cheap food.

Rather than 'demonising' fast-food there are ways to modify the foodstuffs and production methods to make the options healthier. There is a long tradition of what are called 'street foods', with members from ethnic minorities both as customers and also as owners of such establishments. For example 'chat' or 'chaats' in India are street foods which in the UK have been transformed into starters on restaurant menus. 'Street food' has become more and more connected with take-out, junk food, snacks and fast-food as premises change to take account of the times. Key to this is standardisation and new technology which allows time to be saved in the preparation of such food. 'Street food' does not have to be unhealthy. In many cases such outlets can perform a useful function in terms of creating distinctiveness and contributing to a healthy diet within a busy lifestyle. The local work has focussed on developing some indicate labelling and the promotion of an award scheme which successful outlets can use on their advertising. However we judge that this will have limited impact on the choices of children who are not looking for healthy options. Nonetheless the other impact of this award linked to labelling is that it encourages reformulation of products as outlets do not want to have a 'red tick'.

The findings of this research were designed to help inform local policy and actions. The presentation of data with a local focus brought home to many of the public health and council officials what remains a nebulous argument in reports such as the 2007, World Cancer Research Fund / American Institute for Cancer Research global report. Working

with the local advisory group was important in this respect as a key issue was to use the findings to inform processes of training support, local health promotion activities and the development of local planning policy. The research information also had to be communicated in ways which were understandable and had meaning for a wide policy audience. Local data has local meaning and carries more weight in terms of influencing local policy development. Part of the reporting and review process involved informing the steering group of developments in other geographical areas. Key among these was the potential to develop policy for planning and regulating openings of new FFOs in the borough and for planning officials in the local authority to work with public health ones in the health agency. This has occurred after a number of council decisions and planning appeals. The local authority continues to develop this work and has commissioned further research (see

<http://moderngov.towerhamlets.gov.uk/ieListDocuments.aspx?CIid=320&MIid=3416&Ver=4>). The proposals are for restrictions on types of outlets in designated areas of the borough some of which are:

- In designated areas there will be no new openings of FFOs due to the adverse effect on the quality of life for local residents.
- FFOs will not be allowed to exceed five per cent of total shopping units.
- There must be two non food units between every new restaurant or take-away
- The proximity of a school of local authority leisure centre can be taken into consideration in all new applications for a FFO
- New FFOs will only be considered in town centres or retail areas and not in residential areas.

The attempt to link public health and planning is far from over, but the limited outcomes so far show how much can be achieved in attempting to influence the health of an area by a focus on the structural elements of place.

We would not claim success for all the activities undertaken since our work but would make some claim to this being the ‘kickstart’ for a body of work ranging from activities with local owners of outlets, some work on reformulation of foods, the training of food service staff, a registration scheme and the development of local planning guidance. The lessons from this research have been used to inform similar processes in areas such as Glasgow, Liverpool/Merseyside and Belfast.

Public health action needs to be taken to support take-aways to provide healthier alternatives and to help young people and parents understand the diet choices that they are making are impacting on their health. What we demonstrated here is the links that can be made across formal public health services and local authority planning services as well as nutrition and education services to deliver a comprehensive public health strategy, as envisaged by the original pioneers of public health such as Chadwick (Finer, 1953). There is also a need in the long-term to address how to control more carefully the number and location of fast food outlets in the local areas. Planning cannot be retrospective in its scope but changing the local regulations to make it harder for new openings in some areas, introducing local bye-laws to regulate opening hours, linking food hygiene registration more closely with local planning are all ways forward. In the light of this

local work one major national pizza chain seeking planning permission to open within 400m of a school proposed not to open at lunchtime due to public sensitivity.

From a health policy perspective approaches to tackling food consumption that are targeted at individuals should be balanced with upstream public health nutrition policy in order to influence the options available. There is a nexus of these two perspectives where choice is important but may be constrained by local availability, yet planning has avoided the area often citing the market and the inability of planning to interfere in the market process. Health sector policy documents have highlighted the problems of retail access, but locate the solutions in local food projects (social enterprises whether food co-ops or farmers markets), because retail and regeneration strategies are outside their capacity and possibly their understanding and skills base (Caraher and Cowburn, 2004; Dowler and Caraher, 2003).

To date, in England there has been no national action plan to specifically address this issue (NICE 2010), and while we acknowledge that existing legislation does offer some opportunity to address the local food environment (albeit with a need to merge planning and public health sensibilities and expertise) it falls somewhat far from being adequate. Also the lack of national guidelines means that the agenda is being reinvented area by area and local authorities all over the UK repeating and re-inventing the process of regulation locally.

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