

Preventing childhood obesity

June 2005





British Medical Association
Board of Science

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Foreword

The BMA has long been concerned with the health of the public and believes that the significant increase in the levels of childhood obesity are a cause for great concern. The health behaviour of the nation's children needs to be addressed immediately in order to ameliorate the long-term effects of poor nutrition and lack of exercise. Poor nutrition and exercise levels have adverse effects on children's health immediately and later in life. For example, an increase in childhood obesity has led to a resultant increase in childhood type 2 diabetes.

At the BMA's annual representative meeting (2004) it was decided that nutrition and exercise in childhood needed to be revisited given the significant increases in childhood obesity. We believe that general practitioners and other healthcare professionals have a pivotal role in tackling this epidemic, in terms of both preventive measures and treatment. The Westminster government's white paper on Public Health, *Choosing health, making healthy choices easier (2004)*, was launched during the writing of this report. Its recommendations will be commented on and discussed where appropriate in this report. The BMA welcomes the white paper and the government's plans to tackle the obesity epidemic.

The Board of Science has previously produced two reports that broadly cover childhood nutrition and exercise. The first, *Growing up in Britain: ensuring a healthy future for our children (1999)*, discusses child health, with a focus on nutrition rather than exercise, from conception to the age of five. The second, *Adolescent health (2003)* reviews nutrition, exercise and obesity in teenagers (13-19 year olds). This report serves in part to develop the 1999 report in order to cover children up to the age of 12 years. It highlights the main aspects of childhood nutrition and exercise, draws attention to the role of the clinician, and provides links to sources of further information. It also makes recommendations for tackling the obesity epidemic in the UK.

The Board of Science, a standing committee of the BMA, provides an interface between the medical profession, the government and the public. One major aim of the board is to contribute to the improvement of public health.

Please note that this report is a guide for general practitioners and other healthcare professionals on aspects of childhood obesity – it is not intended to be a comprehensive text.

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Introduction

The prevalence of obesity in all age groups poses such a serious problem that the World Health Organisation (WHO) has described it as a 'global epidemic'.¹ Worldwide, over 22 million children under the age of 5 are severely overweight,² as are 155 million school-age children. There are 14 million overweight school-age children in the European Union (EU), of whom three million are obese.³ The number of overweight children in the EU is rising by around 400,000 per annum, of whom 85,000 are obese.⁴ In the UK, there are approximately one million obese individuals who are less than 16 years of age.⁵

There is a responsibility on individuals to take action to halt this obesity crisis, and also on policy makers to provide an environment that assists individuals in making appropriate choices. Due to its overwhelming importance and global significance, childhood obesity and related co-morbidities will be the focus of this report. Other factors related to children's diet and exercise including undernutrition, food allergies/intolerance and eating disorders are outside the remit of this report.

Childhood obesity in the UK has increased significantly since 1995 and continues to do so. In 2002 in the UK, 22 per cent of boys and 28 per cent of girls aged 2 to 15 were either overweight or obese.^{6,7} The primary cause of this increase is related to energy balance: children are eating too much for the amount of physical activity they undertake.

An unhealthy diet in childhood can lead to poor health both in childhood and in adulthood. The evidence base with regard to the long-term consequences varies in strength, but the impact of childhood overweight/obesity is now becoming more apparent, both for the individual and society.

It is important to establish a healthy eating pattern early in life. Good nutrition is important for all, and especially for those younger than 5 years as these years are demanding for the developing child.⁸ They are the years in which children acquire many of the physical attributes and the social and psychological structures for life and learning.⁹ National diet and nutrition surveys of children show low levels of micronutrient intake and excess macronutrient intake.⁷ Certain major adult health problems, such as coronary heart disease (CHD) and diabetes, are linked to excess consumption of energy dense, micronutrient poor foods.^{10,11} Physical activity is also essential for good health at all ages, and is fundamental to energy balance and weight control. It has a range of benefits during childhood, including healthy growth and development, psychosocial wellbeing, and amelioration of risk factors such as hypertension and high cholesterol.

A child's physiological and psychological characteristics, as well as environmental factors, will influence their tendency to become obese.^a With regard to appetite control in obese children there are two key issues. First, the general understanding is that very young children regulate their energy intake based on physiological needs and cues. There does not seem to be any evidence that obese children when very young have any defect in this regulatory system. Quite early on,

^a There are those few children with genetic conditions such as Prader-Willi Syndrome who develop an increased interest in food, which may become an insatiable obsession leading to excessive weight gain.

perhaps between 2-4 years of age, other non-biological influences become incorporated into the regulatory system. These influences may be important to understanding individual differences in appetite control that relate to the development of obesity. Second, the best research on non-biological influences is that relating to parental feeding practices where there are practical implications regarding parenting. Evidence suggests that restrictive eating rules imposed by parents are associated with higher intakes in young children and with childhood obesity. Underlying mechanisms are less clear and it is possible that shared genetic susceptibilities to overweight may account for some of the association.¹² Further aspects of appetite control in obese children are discussed by Faith et al (2004).¹³

Myriad environmental factors influence the diet and exercise regimes of children. These include parental diet and behaviour, socio-economic status, and the influence of marketing. The determinants of what children choose to eat are complex, and the balance of influential factors changes as children get older. Parental behaviour shapes food acceptance, and early exposure to fruit and vegetables or to foods high in energy, sugar and fat, is related to children's liking for, and consumption of these foods.¹⁴ Access and availability are important concerns as the greater the availability the more likely that food is to be chosen.

Those from low socio-economic backgrounds have a greater risk of obesity than children in more affluent households.¹⁵ There is evidence that inequalities exist in the consumption of fruit and vegetables, with lower consumption among children from lower socio-economic households. The modern economy encourages the consumption of foods (often processed) which are high in fat, salt and sugar. Low income may also restrict access to food retailers where healthy food is available, and deny access to the equipment necessary for food storage and preparation.¹⁶ Food deserts (areas of relative exclusion where people experience physical and economic barriers to accessing healthy food)¹⁷ are more likely to be found in areas of socio-economic deprivation. Opportunities to exercise may also be limited in such environments; for example, there may be nowhere safe to play, no facilities for physical activities outside school and shortage of money to participate in such activities.

Marketing is effective in influencing food choices made by children and their parents, but the nutritional quality of the foods marketed at children often fails to fulfil requirements for a healthy diet. The media has an important role to play in forming attitudes to nutrition. It is difficult for parents to control their children's food choices as advertisers, fast food chains, food manufacturers and schools are explicitly encouraging the consumption of unhealthy foods. Parents are often overwhelmed by the demands of their children and give in to so-called 'pester power'.

Providing the public with accurate and clear information on which to base informed choices is essential, but is simply not enough when such choices are restricted. As highlighted earlier, there are also problems with accessibility and availability (food deserts, fast food menus and convenience store goods), costs ('cheap calories'), skills (food storage and preparation), and marketing that employs biased information, especially to children. People need impartial information but they also need the

opportunities and circumstances in which they can act on professional advice and guidance. Such opportunities also need sign posting, and popularising in terms of seeing other people use them. People also require the self-belief that they can make changes to their behaviour that will result in the desired changes. Approaches to tackling food poverty need to address poor knowledge and skills related to buying and preparing the food necessary for a healthy diet, as well as the question of retail access at a local level for those reliant on public transport. Also, it should be noted that physical access to healthy foods does not necessarily equate to economic access. Economic factors, such as subsidies that affect the cost of food and marketing of certain types of foods, also play a role.

A primary public service agreement target, held jointly between the Department of Health (DH), the Department for Education and Skills (DfES) and the Department for Culture, Media and Sport (DCMS) in England was announced in July 2004.¹⁸ The target aims to halt the year-on-year increase in the prevalence of obesity in children under 11 by 2010, in the context of a broader strategy to tackle obesity in the population as a whole. Other government initiatives have been introduced in an attempt to halt the rise in obesity levels. These initiatives include the *Food in Schools*¹⁹ programme and *Fitbods!*,²⁰ a programme aimed at increasing exercise in primary school children. The Westminster government drew up a number of suggestions in the autumn 2004 white paper, *Choosing health, making healthier choices easier*,²¹ and the spring 2005 paper *Delivering choosing health: making healthier choices easier*.²² In Scotland, the Scottish Executive and NHS Health Scotland have launched *healthyliving*,²³ a programme to promote healthy eating and physical activity. These initiatives were welcomed by the BMA although many of the proposals in the white paper could be strengthened.²⁴ There are profound implications for government, the food and marketing industry, healthcare professionals and the media (among others), and individuals, who remain ultimately responsible for their health and that of their children.

The dramatic increase in the prevalence of childhood overweight and obesity and its resultant co-morbidities is associated with significant health and financial burdens and warrants strong and comprehensive efforts at prevention. Good nutrition and physical exercise in childhood can minimise health complications in later life and optimal approaches need to combine both dietary and physical activity interventions. General practitioners and other healthcare professionals have a pivotal role in tackling this epidemic, in terms of both preventive measures and treatment.

This report highlights the current situation with regard to childhood obesity and the impact this can have on children's current and future health. It highlights the role of healthcare professionals and the environmental barriers to change that need to be overcome or removed. Current nutrition and exercise levels are considered alongside those that are ideal. Existing initiatives and measures implemented to improve these behaviours are discussed and recommendations are made for additional actions to halt the obesity epidemic among children.

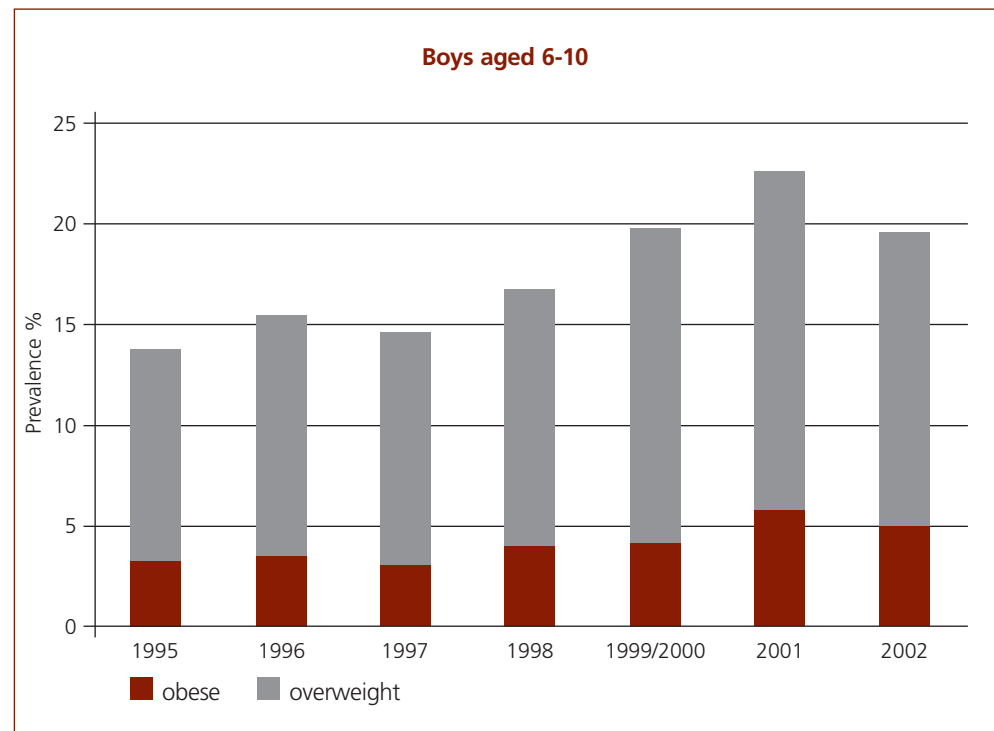
Websites providing further information are provided at the end of the document.

Obesity²

Between 1984 and 1994 the prevalence of obesity among children aged 6-10 rose significantly and has continued to accelerate.²⁵ Figures 1 and 2 show the rising levels in the period 1995-2002. By 2002, 22 per cent of boys and 28 per cent of girls aged 2-15 were overweight or obese^{6,7} (see below for definitions of childhood overweight and obesity).

Childhood obesity is a risk factor for a number of chronic diseases in adult life including heart disease, some cancers and osteoarthritis.²⁶ Some diseases, however, can become manifest during childhood, particularly type 2 diabetes (see below for more detail and appendix I for a list of physical consequences of childhood and adolescent obesity). It is thought that treating ill health caused by poor diet (in adults) costs the NHS at least £2 billion each year,²⁷ rising to an estimated £3.6 billion by 2010.²⁸

Figure 1: Prevalence of overweight/obesity among boys aged 6-10 years (England)^c

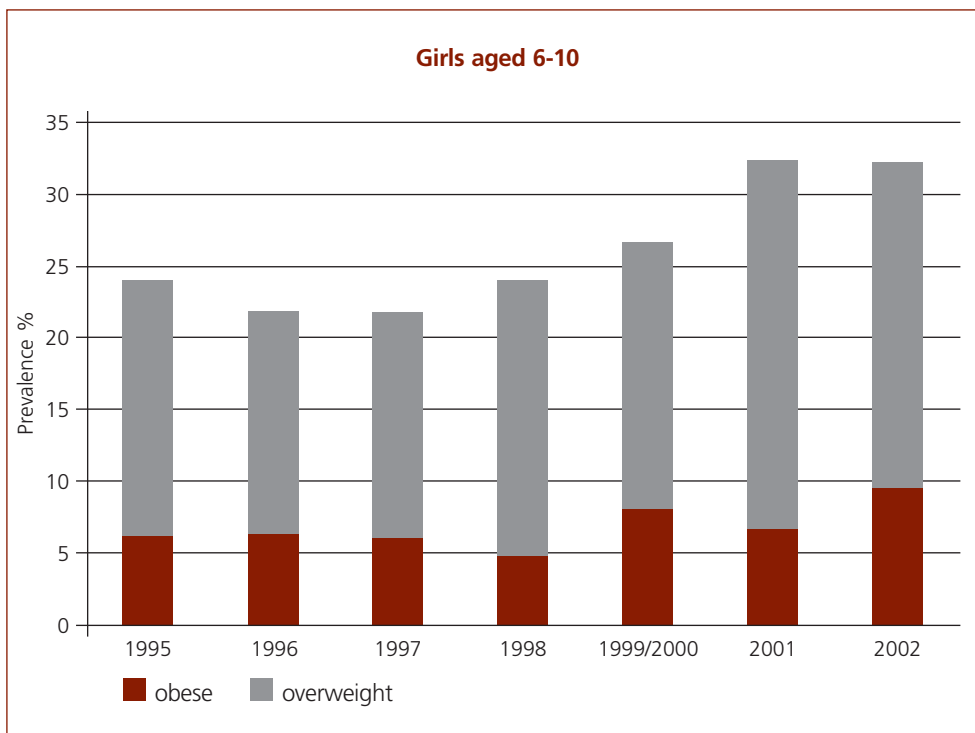


Source: Health Survey for England 2002 (using IOTF criteria for overweight and obesity)

^b Shortly before this report was published up-to-date data was released on behalf of the Department of Health presenting statistics about obesity amongst children under 11 in England (National Office of Statistics (2005) *Obesity among children under 11*. Available at www.dh.gov.uk/assetRoot/04/10/94/10/04109410.pdf (accessed May 2005))

^c Wales and Northern Ireland do not collect this data. Scotland has data for 4-6 and 13-15 year olds.

Figure 2: Prevalence of overweight/obesity among girls aged 6-10 years (England)



Source: Health Survey for England 2002 (using IOTF criteria for overweight and obesity)

Conservative estimates indicate that at least one fifth of boys and one third of girls will be obese by 2020. The evidence suggests that older children who are obese and the heaviest children at any age have an increased likelihood of being obese as adults.¹² Other evidence suggests that overweight children now have a 50 per cent chance of being overweight adults, and children of overweight parents have twice the risk compared to those with healthy weight parents.⁷

The rise in obesity has been too rapid to indicate that genetic factors are the primary cause. The epidemic must therefore reflect changes in eating patterns and levels of physical activity. We live in an environment that encourages and promotes high energy intake,^d which can often undermine parental efforts to give their children a balanced diet and healthy lifestyle. It is thought that the genes that predispose for obesity are likely to be commonplace, with only a small proportion of children able to resist gaining weight in such an environment.²⁹ This emphasises the need for a population approach to tackling this epidemic.

^d In the literature, this is sometimes referred to as an 'obesogenic' environment (Egger G and Swinburn B (1997) An 'ecological' approach to the obesity pandemic. *BMJ* 315(7106):477-80).

Environmental factors appear to have disproportionate effects on groups according to economic and social class. General trends in diet show that for children from lower socio-economic groups, more foods are consumed out of the home, more processed foods are consumed, and snacking and snack foods contribute greater proportions of energy to the diet.⁹ Among low income families, disposable income and the cost of food may be the most important factors when deciding which foods to eat.

More deprived communities can often be described as having food deserts. One study assessed the impact of introducing supermarkets to such communities in order to make produce more accessible and cheaper than that provided by the smaller local shops.³⁰ The change was found to have a positive effect on the diets of a third of the local community. This demonstrates that accessibility to affordable healthy food is one of the factors that can contribute to a healthy diet, in addition to other factors such as education about what foods are best to eat. These and other factors are discussed later in this report.

Definition of overweight and obesity in children

The primary purpose for defining overweight and obesity is to predict health risks and to provide comparisons between populations. Trends in childhood obesity need to be closely monitored because of their public health importance. A variety of definitions are in use. Body mass index (BMI = weight (kg)/height (m)²) is commonly used in adult populations. A cut-off point of 25kg/m² is recognised internationally as a definition of adult overweight, and 30 kg/m² for adult obesity. BMI in childhood changes substantially with age. There are international standards which define cut-off points related to age to define childhood overweight/obesity (appendix II).³¹

International Obesity TaskForce (IOTF)

The IOTF is among a number of organisations with a focus on tackling the global obesity epidemic. It is working to alert the world of the growing health crisis posed by soaring levels of obesity. The TaskForce collaborates with WHO and has working groups examining a range of issues. The IOTF's mission is to inform the world about the urgency of the problem and to persuade governments that the time to act is now.

For more information on health consequences of childhood obesity, please refer to the International Obesity TaskForce's 2004 report, *Obesity in children and young people, a crisis in public health*. www.ietf.org. Contact: childhood@ietf.org

Clinical aspects of obesity

There are a number of physical and mental health risks associated with being obese and inactive. The degree to which inactivity is responsible for the rising levels of obesity has not been established, although there are indications of a positive association. The clinical aspects of obesity and lack of exercise are obviously interlinked. It is also important to note that some researchers have suggested that activity levels in childhood could continue into adulthood.³² The evidence relating activity to health outcomes in adulthood is more conclusive than in childhood. Physical inactivity is estimated to cause two million deaths worldwide annually. Globally, it is estimated to cause about 10-16 per cent of cases each of breast cancer, colon cancers, and diabetes, and about 22 per cent of ischaemic heart disease.³³

Metabolic syndrome

The term metabolic syndrome denotes a cluster of conditions, including high levels of blood pressure, blood sugar and cholesterol, and abdominal obesity, which together greatly increase the risk of cardiovascular disease and type 2 diabetes.³⁴ A recent study in the USA showed that approximately one in eight school children have three or more of the risk factors involved in the metabolic syndrome. The same is happening in the UK in that some children are now starting to show the early signs of metabolic syndrome.³⁵ Childhood obesity appears not only to increase the likelihood of developing the syndrome in adults;³⁶ it is also associated with earlier development of the syndrome in children.

The diagnosis of the metabolic syndrome in a young patient might appear to hold promise for enhanced prevention of diabetes and cardiovascular disease. Substantial uncertainties remain, however, about the clinical definition of the syndrome and whether risk factor clusters collectively indicate a discrete, unifying disorder. Most importantly, it is unclear whether diagnosing the syndrome will confer benefit beyond risk assessments or strategies associated with diagnosing and treating the syndrome's component traits.³⁷

Diabetes

Type 2 diabetes, a disease largely found in adults but now increasingly seen in children^{38,39,40,41} represents a particularly alarming consequence of the obesity epidemic. The onset of diabetes in youth increases the risk in early adulthood of advanced complications of the disorder – cardiovascular disease, kidney failure, visual impairment and need for limb amputations.³ A review by the American Diabetes Association suggests that in the USA as many as 45 per cent of paediatric diabetes is now of the type 2 non-insulin dependent form. Obesity is the most important risk factor associated with type 2 diabetes in children. In another study, excess body weight was found in over 90 per cent of adolescents with type 2 diabetes and about 25 per cent of children with type 1 diabetes.⁴²

The term 'diabesity' was coined to reflect the fact that many patients with diabetes are also obese. Two large-scale intervention programmes have been implemented in Finland (focused on adults) to

tackle the problem of 'diabesity'. One of the programmes has three key characteristics:

- a whole population strategy
- a strategy for identifying and managing high risk patients
- early diagnosis and treatment.⁴³

Further details can be found at www.diabetes.fi/english/prevention/programme/index.html.

Finland appears to have halted the increase in obesity⁴⁴ and its approach is an example of good practice for the UK to consider. It should be noted, however, that the primary focus of the Finnish programme is on adults, and any similar programme aimed at preventing or treating childhood obesity would have to be appropriately adjusted.

Coronary heart disease

Overweight and obesity are associated with an increase in risk factors for cardiovascular disease.

Several studies have shown a link between weight gain in childhood and a subsequent increase in cardiovascular risk.^{45,46,47,48} In a study in Louisiana, overweight during adolescence was associated with:

- an 8.5-fold increase in hypertension
- a 2.4-fold increase in the prevalence of high total serum cholesterol values
- a 3-fold increase in high LDL serum cholesterol levels and
- an 8-fold increase in low HDL serum cholesterol levels in adults aged 27-31 years.⁴⁵

Data from a Finnish study also suggest that cardiovascular risk factors in adulthood – including hypertension, hypertriglyceridaemia, low HDL cholesterol and hyperinsulinaemia – are especially common^e among obese adults who were obese as children.^{36,46}

There may also be an inverse relationship between risk factors for cardiovascular disease and physical activity. Children with higher levels of physical activity have higher levels of aerobic fitness (risk factors).³²

Psychological consequences of obesity

Besides the physical effects of overweight and obesity, there are considerable psychological and social effects, including low self-esteem,¹⁶ depression, and body dissatisfaction.^{16,49} There are indications of a positive association between physical activity and well-being (independent of social class and health status), self-esteem, and possibly cognitive functioning.³² Psychological consequences of obesity seem to affect girls more than boys. In a study in 1961,⁵⁰ children (aged 10-11 years) were presented with pictures and asked who they would most like to be friends with. The pictures included children with varying 'handicaps'. The obese child was always ranked last, irrespective of the ranking child's gender, race, socio-economic status, living environment or disability. This study was repeated in 2001⁵¹ with the results indicating that social reaction to obese children has worsened since the study 40 years earlier.

Obese children are at increased risk of discrimination. Obese adolescent girls are less likely to be accepted into university, and less likely to be married and to be economically 'well off' in adulthood.⁵² Being overweight or obese is also more likely to have a negative impact on life satisfaction and the future life aspirations of young women. This may be because girls are judged specifically on body shape more than boys.

Factors contributing to obesity

Obesity is a complex condition that has contributing factors on a variety of levels. To best understand the impact of these factors, it is necessary to have a reference framework. One method of organisation within this framework is to identify levels based on proximity to the individual. These levels are: individual factors (eg food consumption), interpersonal (eg parental beliefs and/or knowledge), organisational (eg school lunch menus), and government/policy (eg food labelling guidelines). While not all contributing factors will fall easily into one of these levels, and while these levels are not mutually exclusive, this framework serves as useful tool in understanding this complex disorder. The model implies that interventions should be multilevel; for example, they should not only target individual-level factors without due regard for policy-level factors.

Individual-level factors

Factors that could be considered individual-based include genetic predisposition, behaviour, preferences, knowledge, and beliefs. While genetic factors are important, as mentioned before, they cannot explain the rapid increase of obesity in the general population. A child's preference for certain foods, as well as participation in physical exercise, is more likely to be influenced by psychosocial factors. This section begins with a discussion of the importance of nutrition on the individual level, and how it relates to the problem of obesity.

Nutrition

Every child should have a well-balanced diet in order to obtain all the nutrients required for physical and mental growth and development. Estimated average energy requirements (appendix III) for children are based on advice given by the Committee on Medical Aspects of Food and Nutrition Policy (COMA)^f. COMA has also suggested population average intakes for protein, carbohydrate, fat as a percentage of dietary energy and reference nutrient intakes for vitamins and minerals.⁵³

A balanced diet

A well-balanced diet should provide enough energy and nutrients for optimum health. The diet needs to be tailored to the individual as it depends, for example, on age^g and lifestyle. Guidelines from the Caroline Walker Trust (CWT) provide figures for the recommended nutrient content of an average school meal provided for children over a one week period^h. These are used as the basis for nutritional standards for children's food in schools in Scotland (appendix IV).ⁱ School meal content is discussed more fully in the section on organisational-level factors.

In a review of the health of young children, the Office for National Statistics (ONS) drew data from the National Diet and Nutrition Surveys (NDNS) of 1992/93 (1.5-4.5 year olds) and 1997 (4-18 year olds). They found that all age groups had a preference for high-fat content diets, concurrent with low consumption of fruits and vegetables. The NDNS of 2000 showed that high proportions of older children (7-14 year olds) were also failing to achieve healthy eating guidelines (table 2).

Table 2: Proportion of children aged 7-14 failing to achieve healthy eating guidelines in respect of various dietary components

	%
Non-milk extrinsic sugars	86
Total fat	58
Saturated fat	92
Salt	72
Dietary fibre	85
Fruits and vegetables	96

Source: NDNS 2000.

Experts recommend that a well-balanced diet should include at least five portions of fruit and vegetables a day. The objective is to protect against heart disease and cancer, reduce symptoms of asthma in childhood, and minimise the risk of other diseases that may develop later in life.⁵⁴ In 2000, less than 4 per cent of 4-6 year olds ate the recommended five portions or more of fruit and vegetables a day.⁵⁵ Another survey, conducted by the Consumer's Association in 2003 asked 246 children to compile a food diary. The results showed that most children ate two or fewer portions of fruit and vegetables per day and at least one bag of crisps per day, and many had sweets or chocolate every day.⁵⁶ It has been suggested that deaths from chronic diseases such as CHD, strokes and some cancers, can be reduced by up to 20 per cent if a population eats at least five portions of fruit and vegetables a day.⁵⁷ Reducing economic barriers could assist people in reaching this goal. A BBC survey found that 80 per cent of people would support government subsidies for fruit and vegetables.⁵⁸ Currently, all 4-6 year olds in publicly funded schools in England and Scotland are eligible for free fruit or vegetables.ⁱ

^f The Committee on Medical Aspects of Food and Nutrition Policy (COMA) was disbanded in March 2000. A new committee, The Scientific Advisory Committee on Nutrition (SACN), has been set up to advise the Health Departments and the Food Standard Agency on matters relating to food, diet and health. www.sacn.gov.uk

^g Serving sizes for children aged 2-3 may need to be smaller than those of adults, depending upon the child's age and stage of growth. For these children, portions which are at least half the adult size, when eaten as part of a well balanced diet, should be nutritionally adequate. Furthermore, because many children do not eat a lot all at once, they may need to eat smaller portions more frequently throughout the day. www.cdc.gov/nccdpdp/dnpa/5ADay/faq/size_2.htm

^h The CWT will publish revised and updated nutrition guidelines for schools in a new report 'Eating Well at School' in June 2005

ⁱ This is also the policy in Scotland.

^j In England, school children receive one piece of fruit per day; in Scotland at least three pieces per week. See BBC News article, 'Ministers Hail School Meal Deal' 30 March 2005. news.bbc.co.uk/1/hi/scotland/4393263.stm

There is concern that children are consuming too much sugar (appendix V). Fizzy drinks and sugar and chocolate confectionery are the top three sources of non-milk extrinsic sugars in children's diets (aged 7-10 years). Too much sugar in the diet can affect both weight and teeth.⁵⁹ The British Soft Drinks Association reported to the Health Committee on Obesity that children drink an average of 4.7 litres of soft drinks per week^k, of which only 10 per cent are water or fruit juice.⁵⁶ Other statistics indicate that over 70 per cent of children aged 4-18 had drunk soft drinks (other than fruit juice) in a typical week.⁵⁴ The Food Standards Agency (FSA) is currently reviewing its strategy on sugar, based on how well its salt reduction programme is implemented. Increasing the availability of water in school may also help reduce the intake of soft/carbonated drinks.

Fat provides energy and is needed in relatively small amounts for optimum health with no more than one third of energy intake attributed to it. Government research found that 94 per cent of 7-10 year olds consume more saturated fat than is recommended.⁶⁰ Another report highlighted that, over a seven day period, large proportions of pre-school children ate high fat content foods such as chips (71 per cent), savoury snacks (78 per cent), biscuits (88 per cent) and chocolate confectionery (74 per cent).⁵⁴ Similar foods were also the most popular for 4-18 year olds. As described in the white paper, the government is currently reviewing fat levels in food and plans to introduce long-term and interim targets.²¹

A healthy balanced diet should provide children with the micronutrients required for good health (Recommendations for micronutrient, fibre, and fluid intake are discussed in appendix VI). A public health approach is needed for the adoption of a healthy balanced diet which is low in salt and saturated and total fat, and rich in fruit, vegetables and complex carbohydrates. Some policies that might have an impact on these behaviours have been suggested in the white paper *Choosing health: making healthy choices easier*²¹, *Delivering choosing health: making healthy choice easier*²² and other documents related to various programmes such as Healthy Schools.⁶¹ These include 5-a-day health trainers, expansion of child centres, revision of school curricula, and revision of cookery clubs.

Exercise

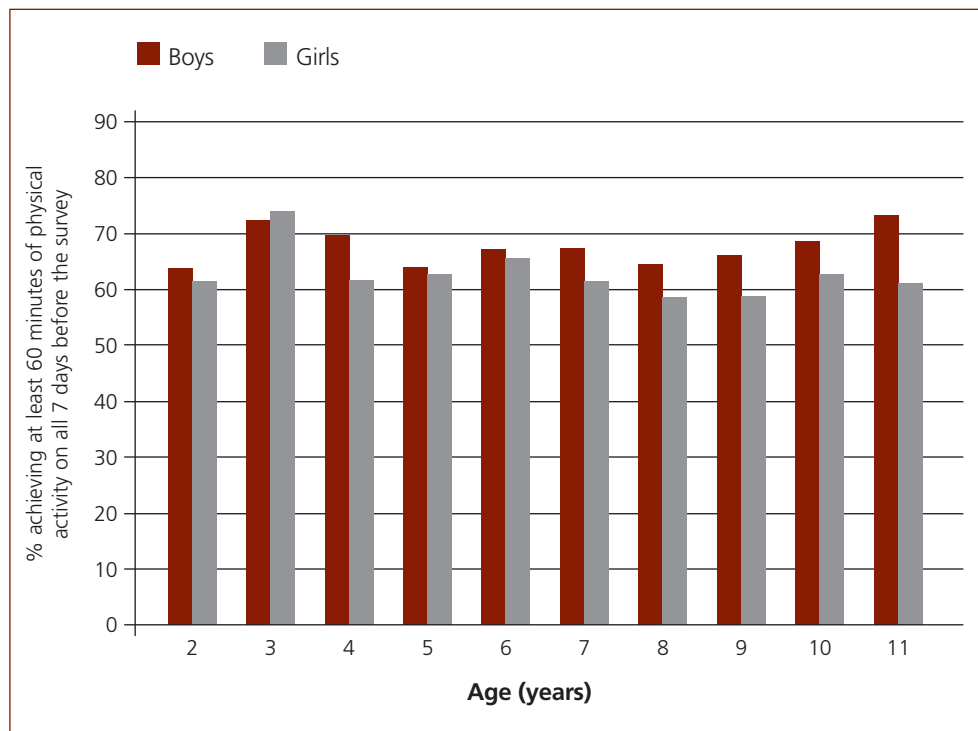
Physical activity is essential for good health at all ages. As a key determinant of energy expenditure, physical activity is fundamental to energy balance and weight control. It has a range of benefits during childhood, including healthy growth and development, maintenance of energy balance, psychological wellbeing, social interaction and reduction of risk factors such as hypertension and high cholesterol. Unfortunately, there is relatively little direct evidence (compared with adults) linking physical inactivity in children with childhood health outcomes.⁶² Physical activity is important for bone health and development. Exercises that produce physical stresses on the bones during the years of the growth spurt can help to increase bone mineral density and protect against

^k According to the British Soft Drinks Association, soft drinks include carbonated, still and dilutable drinks, fruit juices and bottled waters.

osteoporosis in later life. Children may engage in physical activity through play and recreation, which further enhances their social and mental growth as well as their physical growth.³² The prevalence of activity (at least 60 minutes of activity on all seven days prior to the survey) and inactivity (less than 30 minutes of activity) in children is shown in figures 3 and 4 respectively. It should be emphasised that although two thirds of children (2-11 year olds) are meeting the government's requirement of at least 60 minutes of moderate activity per day, this means that **one third** are not.

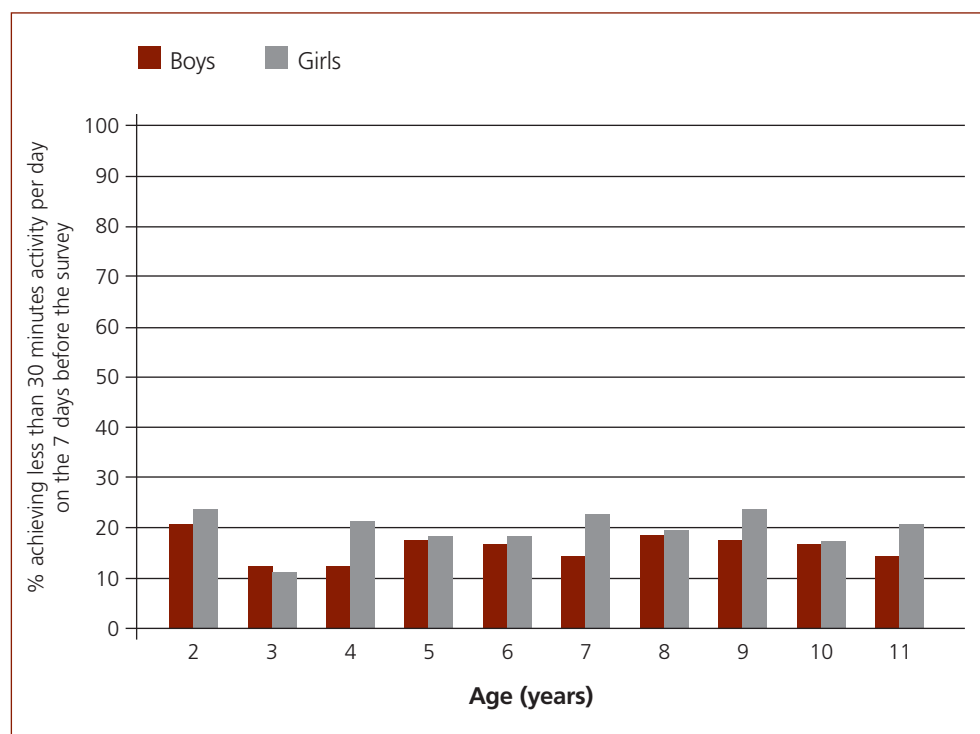
Figure 3: Prevalence of activity among children (age 2-11) in England, 2002^L

Source: Health Survey for England, 2002



^L Those children undertaking less than 60 minutes of moderate activity per day but more than 30 minutes are not represented in figures 3 and 4.

Figure 4: Prevalence of inactivity among children (by gender and age, England 2002)[†]



Source: Health Survey for England, 2002

In 1999, children aged 6-11 were spending less time^M on physical activity when in school than in 1994.⁵⁴ This observation reversed between 1999 and 2002,⁶² but the fact still remains that around half of young people are receiving less than two hours of physical education (PE) each week. This is despite a public service agreement target to provide two hours of PE and school sport each week to 70 per cent of pupils by 2006. In 1999, primary school children were participating in activity more often than secondary school children. However, there had also been a significant decrease in the proportion of primary school children walking to school from 63 per cent in 1992/1994 to 54 per cent in 1999/2001.⁶³

Out of school, almost all young people take part in some sort of activity at least once a week. A significant minority (over one in ten) had not taken part in sport outside school more than 10 times in the previous 12 months. Boys were significantly more likely to participate in sports competitions than girls. Motivation to participate in sports, however, was the highest it had been for boys and girls for the eight years from 1996 to 2002. Almost all young people now agree

^M Among children aged 6-11, spending two hours or more on PE at school reduced from 37 per cent to 15 per cent.

that it is 'important to keep fit'.⁶² The fact that motivation is high but engagement levels lower suggests that the facilities or the money required to access them are a significant part of the problem. Schools need appropriate indoor and outdoor facilities in which children can exercise. There has been particular concern that some schools have been selling land previously used as playing fields in order to gain extra funding.

There are a number of explanations for the observation that children today may be more inactive than those of previous generations. These include the increased use of cars, the reduction in likelihood that children can 'play outside' (for safety reasons) and the increase in more sedentary activities such as playing computer games and watching television. A different perspective was adopted by a group of researchers in Plymouth. The *EarlyBird Study* is monitoring the factors that lead to the development of insulin resistance in children.⁶⁴ As part of this longitudinal cohort study they are using electronic accelerometers to measure physical activity. Data suggest that physical activity in children (aged 5-16 years) is subject to tight central regulation, and may not easily be influenced by changing their environment. Another study found no difference in the overall weekly activity of children dependent on the school they attended, despite the fact that schools had significantly different opportunities for time-tabled physical education.⁶⁵ In yet another study, overall physical activity of 5 year olds did not differ significantly according to the mode of transport used for the 'school run'.^{66,N} This suggests that participation in physical activity may not reflect the opportunities provided, and depends on the individual child rather than their environment. It may be important to increase the opportunities for physical activity at school so as to encourage a baseline/minimum amount of activity and potentially increase the activity levels of the most sedentary children. There is strong evidence to suggest that it is the quality of physical activity that has a lasting impact: when students leave school with positive attitudes towards sport and their own ability, they are more likely to be physically active as adults.³²

The chief medical officer's 2004 report³² stated that 'for children and young people, a total of at least 60 minutes of at least moderate intensity physical activity each day is needed, and at least twice a week this should include activities to improve bone health (activities that produce physical stresses on the bones), muscle strength and flexibility'. The report concluded that:

- a mass shift in current activity levels is needed
- beneficial effects of exercise in children lie predominantly in amelioration of risk factors for degenerative disease, avoidance of weight gain, achieving high peak bone mass, and mental wellbeing
- the impact of different types of physical activity varies at each of the key life stages of childhood and adolescence, adulthood and older age.⁶⁷ Exposure to risk through inactivity begins in

^N Please note, this does not mean that the BMA would advocate driving children to school. Any physical activity is important for children. Furthermore, there are other pitfalls of driving children to school, for example, driving accidents, congestion and pollution.

childhood, but it is not until middle age that the resultant increase in morbidity and eventual premature mortality are seen.^o

- childhood (and adolescence) provides the greatest opportunity to influence attitudes towards activity. There is only weak to moderate evidence, however, that participation in physical activity continues from childhood to adulthood.

One third of children (aged 2-11) are not currently active at a moderate level (at least 60 minutes of at least moderate intensity physical activity each day). It is possible that the increasing rates of childhood obesity are found in this group of inactive children. It is also worth noting that overweight children may find exercise uncomfortable (sweaty, exhausting) and embarrassing (for example, having to use public changing rooms).³ 'As such they may be disinclined to take exercise of the traditional variety. Indeed there is some suggestion that the lack of exercise follows, rather than causes, weight gain. Anyhow, solutions tend to de-emphasise exercise per se, and to encourage socially acceptable activities like dancing, and skills-learning exercises like self-defence'.⁶⁸

Psychosocial influences

Both infants and children show evidence of being able to self-regulate food intake, eating as much as they need. Children will compensate for energy dense foods by eating less energy dense foods at other meals. Over time, however, natural behaviour is influenced by independent eating, influences from adults and peers, presentation of food by parents, and interaction with others at mealtimes. Eating becomes a complex behaviour that can become disordered. There is also some evidence for an 'obese' eating style that includes food choices and eating rates that differ from the norm.^{69,63}

Alarming, children can become weight conscious at a young age. A study of Hamburg schoolchildren, aged 7-16, found that only 48 per cent of the boys and 36 per cent of the girls surveyed thought their weight was appropriate.⁶⁹ The remainder thought they were 'fat'. Up to 75 per cent of the study group also reported trying to use weight control measures. This sort of behaviour is not always healthy: research has shown that the stigma of being perceived as overweight, and an inflexible approach to eating (meaning strict dieting or overeating) are barriers to healthy weight maintenance by overweight and obese children. Also, children tend to think in terms of short-term consequences to poor eating and so long-term consequences are not as important to them. Nutrition education should address not only the immediate health benefits of nutritious eating, but also how eating fits into a healthy social context, in which meals are part of a stable pattern (as opposed to 'grazing').^{69,63}

It is important to ensure that children receive consistent messages about healthy eating at home, in school and from food advertisers. Schools and parents should be at the core of any health promotion schemes as they are essential for the success of such initiatives.⁵ While some adults heed the 5 a day message and respond to talk of preventing cancer, children do not reason in the

^o NB: Some effects of obesity are beginning to be seen in childhood, for example, the increase in children with type 2 diabetes.

same way about long-term implications of their behaviour.⁷⁰ The educational needs of children with regard to food knowledge and behaviour can be addressed in schools. Changes in curricular designs and requirements, including health and science classes, food technology classes, and cookery clubs are included as part of the Food in Schools programme.¹⁹ Particularly crucial is the setting of institutional standards for school dinners which will encourage healthy eating behaviour. Again, this is discussed more fully in the section on organisational-level factors.

Experience shows that it is often the same groups of people who respond to each activity campaign. Therefore, 'non-responder' groups need to be targeted to ensure that health campaigns and information messages are consistent and reach people throughout society. Information needs to be in many different languages and in a format that can be understood by those from different countries.

Interpersonal-level factors

Interpersonal factors denote those influences found in the individual's immediate social environment. In the case of childhood obesity, these include the parents (their beliefs, knowledge, behaviour, attitudes and role as pertains to infant nutrition), the GP and other healthcare professionals.

Infant nutrition

Infant nutrition can be regarded as an interpersonal factor because of the enormous amount of control that parents exercise over their young children's diets. The diet of children in their early years needs to be relatively more 'nutrient dense' than in the middle years. This is because the physiological requirements for nutrients must be met within a relatively small number of calories and generally smaller quantities of food.⁹ Parents may be unaware of the changing nutrient needs of their children.

Research has shown that skilled support is required in order to feed infants adequately. The WHO has produced useful guidelines in this area.^p In 2000, 69 per cent of mothers in the UK initially breastfed their babies, an increase of 3 per cent from the survey conducted in 1996.⁷¹ In 2000, however, over 30 per cent did not breastfeed at all, and nearly 80 per cent had stopped breastfeeding before completing the recommended six months.

Children, particularly babies, should be continuously gaining weight (after the expected fall in weight in the first week of life). Regular check-ups with a healthcare professional ensure that any weight loss/gain is monitored and appropriate interventions carried out. In the UK, each new baby is issued with a record book, either called the red or the blue book in which details of their health are recorded following regular check-ups from birth until the age of 5. At each visit parents have the option to have their child weighed and they can discuss progress and concerns with their health visitor and/or GP. Routine weighing and measuring of infants and children is carried out after birth at 6-8 weeks, 6 months, 3 years old, and at school entry.⁷²

^p see further information on www.who.int/topics/breastfeeding/en/ (accessed August 2004)

Infant feeding

A possible causal link between methods of infant feeding and subsequent obesity has been debated for some time.⁷³ Several studies have shown a protective effect of breastfeeding on childhood obesity.^{74,75,76,77,78,79} Only two studies seem to have followed this up to adulthood: one suggested no lasting effect⁸⁰ whereas the other suggested an adverse effect.⁸¹ Recent reviews suggest that once confounding factors^Q have been controlled, any effect seen in adulthood is insignificant or undetectable.^{82,73} Another recent review of the literature concludes that eight out of 11 studies show a lower risk after controlling for potential confounding factors; the effect is probably small compared with other obesity risk factors, but may still be of public health significance.⁸³

The protective effect of breastfeeding against later obesity may not last through to adulthood, but obesity in later childhood is itself a predictor of adult disease, even if weight is lost and the adult is not obese. Therefore if breastfeeding protects against childhood obesity, that in itself may reduce the risk of adult diseases (overall morbidity and mortality from heart disease are both linked to adolescent obesity, irrespective of adult weight).⁸⁴

The Scientific Advisory Committee on Nutrition (SACN) subgroup on maternal and child nutrition is currently preparing a review on the influence of maternal, foetal and child nutrition on the development of disease later in life.⁸⁵

Role of the healthcare professional – prevention and management of obesity

There is a limited amount of high quality data regarding the effectiveness of obesity prevention programmes for children and thus very little evidence on which to base treatment. There are too few dietitians, only a small number of specialist secondary care centres and limited resources in primary care. Despite these difficulties there are steps that GPs can take to help the obese child. Primary care is the ideal setting for opportunistic delivery of dietary advice⁸⁶ because 70 per cent of a practice population see their general practitioner in any year and this rises to 90 per cent over a five-year period.⁸⁷ The public (parents) perceive primary care staff as credible and acceptable sources of lifestyle advice.⁸⁸

‘Obesity and malnutrition is now a common presentation in the GP surgery. Over half my children patients are malnourished, many are obese.’ (GP, BMA Member)

‘To cure obesity you have to treat and involve the whole family; where they shop, what they buy and what and how they cook. All these things are crucial in curing obesity’ (GP, BMA Member)

‘Good nutrition is critical for physical and mental health and has a direct relationship with intellectual development. It’s a national scandal that any school offers a bad diet and little exercise when this will, without doubt, lead to a lower educational attainment and poor health.’ (GP, BMA Member)

^Q Confounding factors included social class, mother’s BMI, and mother’s smoking in pregnancy.

Dietary advice

The *whole family* should have a balanced diet.
Regular family meals should be held around the table; grazing should be avoided.
Snacks as rewards should be avoided.
Healthy snacks such as fruit should be used as alternatives to sweets, crisps and biscuits.
The diet should include more whole foods that take time to eat and break down, such as wholemeal bread and fruit.
At least five portions of fruit and vegetables per day should be consumed.
Drinks should be low calorie, preferably water.
Food should be grilled, boiled or baked, rather than fried.
Less energy-dense food such as semi-skimmed milk should be consumed.

Activity advice

Any increase in activity helps.
Sustainable lifestyle activity such as walking, cycling and using stairs instead of lifts should be encouraged.
The whole family should develop an active lifestyle.
Children should be encouraged to walk or cycle to school.
Active play that is enjoyable and does not cause embarrassment should be encouraged.
Excess television viewing, playing computer games and other sedentary behaviours should be discouraged.

UK guidance on weight management and treatment

In 2004, a toolkit to fight food poverty was produced by the National Heart Forum, the Faculty of Public Health and a number of other partners. This toolkit helps professionals within primary care trusts and local strategic partnerships to develop strategies and programmes which take a 'life course' and 'food-chain' approach to improve the nutrition of those living in food poverty. Examples of good practice are also included.¹²⁴ (available at www.heartforum.org.uk)
Royal College of Paediatrics and Child Health (2002) *An approach to weight management in children and adolescents in primary care*. RCPCH: London. (Available on: www.rcpch.ac.uk/publications/recent_publications/Approach_2PAGES_TOGETHER.pdf)
NHS Centre for Reviews and Dissemination (2002) *The Prevention and treatment of childhood obesity. Effective health care 7: 6.*
Scottish Intercollegiate Guidelines Network (2003) *Obesity in children and young people. A national clinical guideline*. SIGN. (Available on www.sign.ac.uk/pdf/sign69.pdf)
International Obesity TaskForce (2004) *Obesity in children and young people, a crisis in public health*. (Available on request from childhood@iotf.org)
There are plans for the National Institute for Health and Clinical Excellence to draw up guidance by 2007.

The Royal College of Paediatrics and Child Health has issued guidance for weight management in children and adolescents (aged 2-18 years), a summary of which is provided below.⁸⁹

The National Obesity Forum believes that there is a general lack of awareness of this problem in the medical field, particularly as it relates to specialist services. It also recommends that interventions begin at a young age, with emphasis on everyday activities.⁹¹

In March 2004, a group of 65 physicians and other health professionals convened in Israel to discuss the widespread public health crisis in childhood obesity. Their aim was to explore the available evidence and develop a consensus on the way forward. In developing a consensus statement this international group has presented evidence and produced recommendations that need to be addressed in planning services.⁹²

While a great deal of focus must be placed on the prevention of obesity, it must be remembered that this may not be completely effective. For those who are already overweight or obese, appropriate treatments and regimes should be recommended by a healthcare professional. Successful interventions involve the family and are tailored to each individual.⁹³ Regulations, guidance and advice need to be drafted and agreed at a national level.

Recent figures have demonstrated that childhood obesity continues to be a major concern with 13.7 per cent of 2-10 year olds and 15-22 per cent of 11-15 year olds currently being classified as obese.⁹⁴ Childhood obesity has independent health risks, above and beyond its simple association with adult obesity.⁹⁵ These include insulin resistance (and type 2 diabetes in susceptible individuals), sleep abnormalities, non-alcoholic hepatitis and a clustering of cardiovascular risk factors that has become known as the metabolic syndrome.⁹⁶ Despite this, the evidence base for the prevention and treatment of childhood obesity remains weak.^{97,98}

Of primary importance is the recognition of young children with obesity as they are likely to benefit most from a simple clinic-based approach offering regular education and support⁹⁹ and health professionals such as school nurses and health visitors should play an important role in this process. Success in primary school aged children, compared with adolescents, is likely to be due to the lack of learnt behaviours and the larger parental influence on diet and activity levels. When a child with obesity is referred to their GP, simple steps in weight management within the setting of primary care should be followed.⁹³ The overall aim for the majority of children should be stabilisation of weight so that the child's BMI decreases as they continue with normal longitudinal growth. Rapid weight loss and strict dieting are inappropriate and should not be recommended. Where these measures have been followed and little success has been achieved (or where the level of obesity is severe or there are associated co-morbidities) then referral to secondary care is indicated. Throughout the UK, however, there is a lack of specialist childhood obesity services to which GPs can refer children with weight problems. Those children for whom there are concerns regarding growth or possible endocrine abnormalities should be referred to a paediatric endocrinologist, although it should be noted that such cases are uncommon and the majority of children with obesity have simple lifestyle-related causes. Children with an underlying endocrine cause for obesity will typically be short relative to weight while those with simple obesity will have a height commensurate with weight.

Registered dietitians are in a good position to tackle obesity by having the skills to provide advice and support for families as well as training other healthcare professionals,¹⁰⁰ who should recognise the key roles of balanced nutrition and exercise in the prevention and management of disease and the promotion of good health. Obesity is a chronic condition that requires on-going management and it is imperative that the whole family engages in lifestyle change. All healthcare professionals should, whenever possible, provide advice on healthy living to the child and parents that is relevant, manageable and directed to their individual circumstances. It is also important to note cultural differences when attempting to implement policies to prevent and manage weight problems.⁴³

Case study: The holistic approach to tackling obesity

The Bromley By Bow centre is a pioneering voluntary organisation led by the local community. Their aim is that Bromley By Bow will become a healthy, learning community within the economic mainstream. The centre offers over a 100 activities each week. These are organised through interconnected projects broadly grouped around enterprise, education, environment, art and health.

When it comes to healthcare, a holistic approach has been adopted by the entire staff. Aspects of healthy living are tackled from the point of view of the community and family, rather than individual. They aim to be proactive in giving advice and information about diet and exercise. When an overweight or obese child is being treated the view is taken that if one member of the family is eating a poor diet it is likely that they all are and therefore the whole family is treated not just the child. They try to educate the family about eating and cooking healthily. Children are encouraged to keep a food diary and become actively involved in things like drawing up a shopping list and helping with shopping and cooking.

The centre also has an extensive programme of activities and initiatives aimed at promoting all aspects of a healthy lifestyle within the whole community. Some of the work that will help address obesity includes:

Diabetes workshops: these include weekly walking groups and trips to the supermarket in order to educate patients on which products are best to buy.

'Exercise on prescription': patients can be prescribed a tailor made exercise plan and can also attend one of the many physical activities aimed at all ages, including weekly 'mums and kids' classes and children's classes during the school holidays.

Raising awareness about iron deficiency: mothers are targeted through baby clinics and encouraged to breastfeed their babies. They are also educated about the importance of iron in their diet. Free iron-rich snacks are often available and advice is given about making and buying foods on a budget that are essential for a healthy diet. This programme has enjoyed 'stunning success' in increasing the number of mothers who choose to breastfeed.

Dr Sam Everington, GP Partner, Bromley By Bow Healthy Living Centre.
www.bbhc.org.uk

Parents' attitudes, beliefs, knowledge and behaviours

Developing interventions that encourage children to choose more types of fruit and vegetables requires consideration of psychological factors that are often overlooked. Familiarity is an important determinant of food choice, associated with both increased preference and increased consumption. Some parents are imposing child-feeding practices that they believe will have beneficial effects when they may in fact be doing the opposite. For example, sweets are sometimes used in a positive context to reward good behaviour. In contrast, vegetables are used in a negative context to obtain access to something pleasurable (for example, the child cannot go out and play until they eat their vegetables). The result is that sweets, already well liked, are even more rewarding, while initially-disliked vegetables become even more disliked.¹⁴

Parents need advice on a variety of topics, such as how to resist the pressure of 'pester power' from their children. Information campaigns aimed at parents should not only emphasise both the physical and psychological consequences of obesity, but also how they can more effectively parent.¹⁰¹ Most important, however, is that before parents can be expected to change their own behaviour and that of their children, they need an enabling environment – meaning that government policies and organisations must provide them with adequate support. It would be near futile and in fact disempowering, for example, if parents in economically deprived areas were taught the importance of eating five fruits and vegetables a day and could not easily afford to buy these foods.

As mentioned before in the context of individual-level factors, children may have innate controls over their eating behaviour that are unwittingly sabotaged by well-meaning parents. A focus group of low-income mothers in the USA found that they generally preferred their children to be overweight rather than underweight, as it signalled to them that the infant was getting enough to eat, and therefore adequate nutrition. Despite professional advice or recommendations, they tended to follow the advice of their maternal forebears, and introduced solid foods early and of a kind which they (the mothers) liked to eat. They also tended to feed children when the adults were hungry, possibly interfering with natural regulation of food intake in their children.¹⁰² Parents frequently use food to reinforce behaviour, further influencing children's perceptions of food.¹⁰² Parents play a key role in the development of internal factors that will govern their children's behaviour. Interventions that target children's beliefs, attitudes, knowledge and behaviours must also involve the parents. The concept of the healthy living centre, discussed above, is one way to address whole families as part of addressing risk behaviour.

Other immediate social influences (which usually involve the parents/guardians) include the circumstances of poverty and food insecurity (being unsure of the continuity of the food supply). These factors have been found to have an influence on psychosocial problems in children and some relationship to BMI in children, though the connection is not straightforward.¹⁰³ It should be noted that the social context of eating, especially in westernised cultures, has changed dramatically over time. Children may face an overabundance of food not seen by previous generations, and

marketing and trade have removed much food from the context in which it is produced. Seasonal variations are unimportant because many people do not eat foods produced locally.¹⁰⁴ It seems quite likely that most children have no idea where each meal actually originated, and may find such information an exciting part of a nutrition education curriculum.

Organisational-level factors

Organisational-level factors can include any organisations that have an impact on the health problem in question. Examples are hospitals, health centres, religious institutions, social organisations, and employers. In the case of childhood obesity, however, one of the most obvious organisations that has an impact is the school. Indeed, children and adolescents are in a sense a 'captive audience' during the hours of each day they are at school.

Both the ONS¹⁰⁵ and the WHO¹⁰⁶ recommend schools as an important venue in tackling childhood obesity. When rating causative factors, the WHO rated schools as a 'probable' causative factor in relation to obesity.¹⁰⁷ As such, it might seem obvious that any intervention regarding childhood obesity should utilise the school as a mode of intervention. In fact, this has proved to be controversial, and in recent months has attracted much media attention, particularly with the popularity of programmes such as *Jamie's School Dinners* and the campaign associated with it.¹⁰⁸ However, schools are not the only mode of intervention for tackling childhood obesity. Other organisations that should be included are sports clubs and authorities, parent-teacher associations, health authorities (especially child centres), food retailers and manufacturers, and local councils (particularly with regard to urban planning).

Nutrition in schools

A recent report from the Office for Standards in Education (Ofsted) and the FSA found that in England nurseries are much better at promoting and including food and nutrition in every aspect of learning when compared with primary schools. Inspectors found that a lack of coherent 'food policy' in some primary schools resulted in children having poor knowledge of food and nutrition because they were given mixed and sometimes inaccurate messages about healthy eating. The report also highlighted the problem that compulsory standards for school lunches were not being met. Some schools did not offer enough portions of the healthier options. The report emphasised the need for parents, teachers and supervisors to have a better knowledge of what constitutes a good balanced diet and how to prepare food that is interesting and enjoyable for children.¹⁰⁹ In 2004, the Soil Association carried out a detailed nutritional analysis of five meals typically served in primary schools over a week. The analysis showed that children eating the meals for five days would consume 40 per cent more salt, 28 per cent more saturated fat and 20 per cent more sugar than is recommended. Children would also only receive 80 per cent of the amount of iron needed and 70 per cent of the recommended level of zinc. The reference level of recommended nutrients used were those provided by the CWT¹¹⁰ for children aged 7-10 (appendix IV). Current government guidelines in England and Wales for primary school dinners do not place any upper limits on fat, sugar, and salt content, nor lower limits on beneficial vitamins and minerals.¹¹¹

National food standards for nursery and primary school lunches are provided by the Department for Education and Skills (DfES) for England and Wales (appendix VII). The following are recommendations (although not compulsory):

- drinking water should be available for all pupils
- schools should offer some hot food
- milk should be available as an option.

There are also recommendations for good catering practice which include actively encouraging children to have a balanced diet and to use a variety of cooking methods.¹¹²

It could be argued that in England and Wales schools do not have **nutritional** standards but rather **food** standards. Scotland has nutritional standards (eg proportions of sugar, fat. See appendix IV), based on the CWT recommendations. Ideally, *nutrition* based standards are assessed on the nutritional content of food served to children at school. England and Wales have food standards (frequency of serving starch, foods, fruit, chips, etc) with no clear link between what is actually chosen and what is offered (appendix VII). The government is now considering introducing nutrient-based standards in England.²¹

Government policy to delegate funding for school meals from local education authorities to individual schools has had a mixed impact on the quality of meals provided. A DfES study¹¹³ found that some schools in England had negotiated a supply of healthier meals whereas others, for commercial reasons, offered popular, but not necessarily nutritionally well-balanced meals. Where schools had raised the prices of their meals, and utilised a cash cafeteria, pupils entitled to free meals had to either subsidise the meal with their own money or select a less than adequate meal. Furthermore, many schools may not get involved in schemes such as that for free fruit and vegetables because such programmes are considered bureaucratic and complex to run.

In addition to tackling school dinners, other sources of food during the school day must be considered, particularly at the secondary school level. Many schools have vending machines that provide snacks and drinks that are high in sugar, fat, and salt. School clubs may provide snacks that may or may not have good nutritional value. Also, many schools allow their students to travel off-site, providing them with the opportunity to purchase foods with high macronutrient and low micronutrient value. Some have pointed out that having a curriculum that teaches the value of nutritious food and then providing so-called junk food sends mixed messages to students.¹¹⁴

The Food in Schools programme seeks to make changes both to health curricula and the food provided in the schools. Part of that programme, Fruit in Schools, provides one piece of fruit a day to primary school students,¹¹⁵ and under the Welfare Food Scheme (now covered by SureStart and HealthyStart programmes) children under 5 can receive free milk.¹¹⁶ The BMA recommends that all sources of food in schools should be evaluated for nutrition content, and that access to alternative sources should be restricted. It also recommends that, as is being implemented in some schools already, students should be provided fresh, drinkable water throughout the day.

A variety of local projects have taken place at schools in England. Teachernet provides a link to case studies of local schools making changes,¹⁰⁷ the Soil Association provides an education and action pack,¹¹⁷ and the Jamie Oliver's programme website includes links to action plans for school communities.¹⁰⁸ Jamie Oliver's petition was successful in achieving an additional £280,000 over three years in government funding for improvement in ingredients and food service in the schools of England.¹¹⁸ At one forum on diet and health, two parent governors described their successful but challenging efforts to change the food that was served in their school.⁶¹ Despite these successes and projects, it should be noted that many schools will require larger, policy-level change that reaches down to the organisation. Many parents and teachers do not have the time, resources, energy, or opportunities to single-handedly bring such a large change to their schools, particularly when faced with competing factors such as economics or current policy.

Physical education/sport opportunities

As shown earlier in figures 3 and 4, one third of children continue to be inactive (participating in less than 60-minutes of activity per day) and one half of young people are not yet receiving two hours per week of physical education in school.¹¹⁹ The Qualifications and Curriculum Authority provides recommendations for incorporation of physical education into pupils' schedules. One approach is to schedule four 30-minute lessons per week for key stage 1 pupils and two 45-minute, one 30-minute lesson a week for key stage 2 pupils. Curricula should include a variety of activities and skills. Policy support from government can help boost physical education quality and participation and is discussed in the next section. Funding issues can have an impact on teacher training, maintenance of buildings and facilities, funding for sports and school sport partnerships, and preservation of school playing fields and other green spaces.

Healthcare organisations

While GPs can provide crucial assistance in preventing obesity, they must have access to other services and resources. The Health Development Agency (HDA) recommends that specialist obesity centres be available for GPs to refer patients to. Such services should include programmes that target the entire family and teach diet, physical activity and life skills. The concept of the healthy living centre incorporates other community-level activities, such as courses in a variety of topics. For example, the Bromley By Bow Healthy Living Centre, mentioned above, offers a programme that includes weekly 'mums and kids' exercise classes, a programme of activities to encourage breastfeeding, an after school club where exercise and healthy living is promoted and various individual awareness raising community events. A pioneering programme in Walsall Primary Care Trust mixes education and activities that involve both children and their parents.¹²⁰

Policy/government-level factors

The number of factors and possible interventions discussed above are highly subject to influence at policy-level. Changes will, often, be minimal without the support of policies that are sweeping, clear, and enforced. Changes in schools, local environments, and healthcare organisations cannot happen without government support and guidance. In this section some current policies and recommendations for future policies are discussed.

In addition, this section addresses two issues which are perhaps as controversial as school dinners: advertising/promotion of food, particularly to children, and labelling systems for food products. There are a variety of stakeholders deeply involved in these issues, including children, food manufacturers, the media, and even European Union law makers. A recent Westminster Forum on Diet and Nutrition that focused on advertising food to children involved a number of different interests and opinions.¹²¹

Also important are subsidies for food, particularly beef and milk, as well as food distribution networks, sustainable development, and the use of fresh local produce. The use of local resources is supported by both the Soil Association and the Jamie Oliver programme. Sustainable development is cited by the WHO as an important factor in creating an enabling environment for the consumption of healthier foods.¹⁰⁷

Advertising and marketing

The content of children's diets and the choices they make are heavily influenced by parental diet and behaviour. Marketing is effective in influencing food choices made by children and parents, but unfortunately there is often a marked discrepancy between the nutritional quality of the foods marketed at children and the requirements for a healthy diet. It is likely that some children are not able to make informed judgements about the advertisements they see. The media has an important role to play in forming attitudes to nutrition and there is scope to harness this potential and further regulate its more harmful impact.

All European Union member states are subject to the Television without Frontiers Directive,^R which restricts advertising. Some countries have gone further and banned advertising aimed at children. For example, since 1991, no advertising in Sweden is allowed during children's programming and advertisements at other times must not target children under 12.²⁸ Furthermore, in Canada, the Quebec Consumer Protection Act, which has been in force since 1980, bans all advertising and marketing (in all media) aimed at children under 13. In both cases, however, the law does not extend to satellite TV. A study into the effects of advertising in Canada has shown that families where the children watch more US satellite TV buy more of the breakfast cereals advertised on those channels.²⁸ It is difficult to design a study to quantify the specific effect of advertising on obesity. This is primarily because it would be difficult (if not impossible) to ascertain a baseline, and control for confounding factors.

^R This Directive dates from 1989, although it has been updated since. The Directive states that advertising must not take advantage of children's inexperience, and must not directly encourage children to persuade their parents or carers to buy the products being advertised. All EU member states are subject to these rules.

In 2003, the FSA commissioned the University of Strathclyde to carry out a systematic review of research into advertising and the promotion of food to children. The report concluded that:¹²²

- there is much food advertising to children
- the advertised diet is less healthy than the recommended one
- children enjoy and engage with food promotion
- food promotion is having an effect, particularly on children's preferences, purchase behaviour and consumption.

In July 2004, the Office of Communications (Ofcom) published the results of its research into the impact of television advertising on childhood obesity. They concluded that television advertising has a modest effect on children's food consumption when compared to other factors potentially linked to childhood obesity. Other factors included:

- exercise
- trends in family eating habits inside and outside the home
- parent demographics
- school policy
- public understanding of nutrition
- food labelling
- other forms of food promotion.

On this basis, Ofcom concluded that a total ban on such advertising would be both ineffective and disproportionate in its wider impact.¹²³ At a recent forum, representatives from the British Labour, Conservative, and Liberal Democrat parties all stated that a total ban might be too hasty.¹¹⁴

It is important to note that there are other forms of food promotion other than television advertising, including print and radio, text messaging, celebrity endorsements, sponsorship of educational materials, point-of-sale promotions, vending machines and voucher schemes. For example, Gary Lineker (ex-England football captain and television celebrity) promotes a brand of crisps through advertisements. The FSA recognises that the promotion of foods is one of the many influences on children's diets. Full details of its action plan on the promotion of foods to children can be found on its website. It recommends restrictions on advertising but not an outright ban.

Much of this debate centres on consumer choice, with several parties highlighting the fact that some manufacturers have already started to respond to consumer demand for healthier options by reducing fat, sugars, and salt in their products.¹¹⁷ This heightens concern about the accuracy of what labels say. For example, in March 2005 Ofcom requested a consultation on guidance rules for broadcast advertising of alcoholic drinks that claim to be 'low carbohydrate' or 'low calorie.' Even if consumer pressure does appear to be enough to prompt manufacturers to respond by providing 'healthier' options, the positive health impact of this will be negated if consumers are not actually getting what they think they are buying. This is particularly true for children who may need to be careful of specific ingredients, because of allergies or other health concerns.

The WHO rated 'heavy marketing' as a 'probable' causative factor in childhood obesity.¹⁰⁶ The European Heart Network, with funding from the European Commission, commenced a three-year pan-European project on obesity in 2004. The initial focus was to measure and analyse the impact of food marketing to children and young people.¹²⁴ A good example of a scheme that promotes healthy eating is 'yummy apples' in New Zealand. Children can collect the stickers on 'yummy apples' and trade them in for sports equipment for their schools. 'Yummy apples' are now the highest selling brand of apples in New Zealand.²⁸

The BMA provided a response to the white paper of November 2004, *Choosing health: making healthier choices easier*. Both the white paper and subsequent delivery paper in March 2005 suggested that there should be a voluntary period of modification of advertising of food to children. Food advertisers would have until 2007 to change such advertising. The BMA recommends an outright ban and has expressed concerns that imposing a voluntary period is not a strong enough action.²⁴

Labelling

To help parents provide children with a balanced diet, the nutritional labels on food need to be clear and easy to understand. Food labels can be very confusing with their different terms and symbols, and there are no regulatory requirements for labelling consistently. Consumers are well advised to treat claims like 'low-fat', 'reduced-sodium' and 'high-fibre' with care. Although by law these claims should not be misleading, there are no legal definitions for quantities (except for butter, margarine and other spreadable fats). Nutrition labelling is currently only required by law on those products that make nutrition claims. The FSA is currently assessing which form of signposting will be most useful to consumers, alongside a study to deliver a scheme to categorise foods on the basis of the nutrients they contain. This study could help underpin some of the signposting options.¹²⁵ The government has indicated that any new coding system should be in place by 2006. This coding system would be in 'common use', however, implying that it would not necessarily be compulsory.²¹

In its written evidence to the Health Select Committee regarding the white paper, the BMA stated that it supports a coding system but that any voluntary coding be monitored closely. It also recommended close monitoring of the FSA's Food and Health Action Plan.¹²⁶ The National Heart Forum, in responding to the white paper, also recommended that the UK secure an amendment to the EU Directive to prevent that law from inadvertently interfering with the introduction of signposting.¹²⁷ In March 2005, the House of Commons Environment, Food and Rural Affairs Committee released a report on Food Information (House of Commons Environment, Food, and Rural Affairs Report).¹²⁸ It called for mandatory nutrition labelling on all prepacked food as well as signposting for non-prepacked food.

Accurate food labelling and clear information is imperative to encourage the public to make informed choices about their diet. Nutritional labelling must be clear, simple and easy to

understand. Accurate and clear information must not be limited to the labelling of products. Information can be presented in many formats, including leaflets and posters, newspaper, television and radio advertisements and information on the internet. Complete information on advertised products should be made available, for example the full nutritional facts regarding convenience foods should be imparted to consumers.

Manufacturers should submit scientific evidence to support their labelling claims and Europe-wide guidelines should be set on what constitutes acceptable evidence. For example, the scientific evidence should be independent and peer reviewed by a panel of experts. The involvement of healthcare professionals, including nutrition experts and physicians in various relevant specialties, is vital to assess evidence and provide advice.

At the Westminster Diet and Health Forum in October 2003¹²⁹ the issue of food content, and how it can be manipulated as a means of influencing diet was discussed. As one participant stated, it is easier to change the content of food than the eating habits of people. Food content change includes examining energy density, macronutrient ratios, glycaemic loads, functional ingredients (those that enhance or reduce absorption), appetite control, and nutrigenomics⁵. In its response to the white paper of November 2004, the National Heart Forum suggested legislation that would underpin voluntary changing of food formulation by the food industry.¹²⁷

School nutrition

As described previously, schools are currently affected by a myriad of government policies, programmes, pilots, and other initiatives. The largest of these includes Food in Schools and the current review of nutritional policy; smaller initiatives include local action plans and professional training for secondary teachers. It cannot be overstated that a problem of this magnitude, with such an enormous health impact for children and the adults they are to become, will require full support and funding at policy level.

Several attempts at new legislation have been made in Westminster to address these issues. A School Meals and Nutrition Bill published in February 2005 proposed: statutory nutritional guidelines that are assessed by Ofsted, banning certain categories of food on certain days, healthy options in vending machines, and the empowerment of schools to stop children leaving premises to buy food during the school day.¹³⁰ The Children's Food Bill, supported by Sustain,^T would also require nutrition standards in school meals, restrict other sources of food in schools, and expand food education in school. It would regulate the marketing to children of unhealthy food. The School Meals and Nutritional Bill was partly designed to complement the Children's Food Bill.¹³¹

⁵ Nutritional genomics, or nutrigenomics, is the study of how food and our genes interact. (Institute of Food Research Issue 1:04) www.ifr.ac.uk/publications/ifrnews104.pdf

^T Sustain – The Alliance for Better Food and Farming. For more information, the website is www.sustainweb.org/child_index.asp

Physical activity

Increasing the level of physical activity among children is a key priority within government. It has been agreed that school playing fields should only be sold as a last resort and that proceeds from sales should be invested in activities that will contribute to health. Significant investment is being made to transform physical education, school sport and club links over the next three years. For example, Local Exercise Action Pilots are locally run programmes to test and evaluate new ways of encouraging people to take up more physical activity.¹³² Other programmes involve the DCMS, DfES, and Department for Transport (DfT). Many children from deprived areas are unlikely to have access to sports facilities for local and economic reasons, emphasising the need for subsidies and investment in public facilities.

The HDA^u recommended that local authorities should assess the impact of all development to ensure an environment that promotes activity (as well as access to healthy food).⁶¹ The WHO has emphasised the role that urban planning plays in creating an enabling environment for physical exercise to take place.¹⁰⁶ In its response to the white paper, the BMA noted with some dismay that it was accepted that school playing fields could still be sold, even as a last resort. The BMA would prefer to see school playing fields enjoy far greater protection.²⁴

The BMA has previously commented on the promotion of cycling as a means of promoting health. It recognises the multiple health benefits of cycling, not only for the individual who uses a bicycle, but also for the population as a whole in terms of reduced vehicle traffic. It supports public transport patronage, including bicycle lanes and the provision of facilities for carrying bicycles on buses and trains. The National Driving Test should also include awareness of cyclists.¹³³

A second recent briefing paper published by the BMA urges the compulsory wearing of bicycle helmets by all riders. It notes that numerous studies have demonstrated that helmets can reduce brain and head injuries by between 65 to 88 per cent in the event of an accident. There is some concern that helmet legislation will reduce the number of riders, a negative health outcome. However, a study from Canada found that legislation that mandated helmet wearing did not reduce the overall numbers of children cycling. The BMA therefore believes that mandated helmet wearing, coupled with education and environmental changes that support cyclists, such as cycle lanes and reduced vehicle speeds, is the optimal approach to promoting cycling.¹³⁴

^u On 1 April 2005 the Health Development Agency joined with the National Institute for Clinical Excellence to become the new National Institute for Health and Clinical Excellence (to be known as NICE). www.nice.org.uk

The National Healthy Schools Standard promotes a whole school approach to healthy eating *and* physical activity (see: wiredforhealth.gov.uk).¹³⁵ Fitness Scotland is the official governing body in Scotland for exercise, health and fitness. It is a non-profit making organisation with the aim of creating and maintaining the highest possible standards wherever fitness sessions or exercise activities take place.²⁴

The *Delivering choosing health: making healthy choices easier* paper of March 2005 included measures designed to target physical activity in children, such as drawing up personal health plans and using pedometers to measure 'number of steps' walked/run. The paper also discussed the funding and encouragement of clubs and partnerships.²² The idea of sports partnerships is a popular one. One of the government's goals, through its Physical Education, Schools Sport and Club Links plan, is to increase funding so that by 2006 three quarters of schools will be involved in a school sport partnership.¹³⁶ One drawback of the partnerships is the lack of impact that they have on primary pupils. The Department of Education and Skills conducted a survey in 2003/2004 regarding the proportion of students at schools in sports partnerships who participated in high-quality PE and school sport for at least two hours per week. They found that while as many of 86 per cent of year 7 students, for example, had such a participation level, this was only 37 per cent and 40 per cent for students in years 1 and 2.¹³⁷

Healthcare funding

In March 2005, an initial £1.2 million was made available for pilot projects targeting public health, including those relating to obesity. This was especially meant to target health deprived local authorities and primary care trusts. At the same time, the government released a resources pack: *Creating Healthier Communities*. This provides guidance and support to local authorities as they attempt to deliver the November 2004 white paper (available: www.neighbourhood.gov.uk).

In its response to the white paper, the Heart Forum recommended an increase in the number of community dietitians.²⁸ As of 2003, there were only 12 specialty clinics available in England for referrals of obese patients.¹²⁹ The government has also expressed a wish to utilise child centres more, as a way of preventing childhood obesity.²¹ If the current trends in obesity prevalence are to be reversed specific measures will be needed to improve the success of prevention and treatment strategies. Policy change will be important in prevention strategies, and will need to target the advertising of energy dense products to young children and the promotion of physical activity both within and outside school. Successful treatment approaches, for those who are currently obese, will need to involve healthcare professionals from many specialties offering a 'joined-up' approach to treatment.

The BMA would like to see the development of the personal trainer role (as described in the white paper November 2004) specifically for families with an obese child(ren). There needs to be funding to establish and sustain training programmes for those who are involved in the care of children with obesity. This includes specialist school nurses, health visitors and GPs. This should be followed

by the availability of resources allowing children from any region within the UK access to specialist regional obesity services as they are developed. Only if we can improve upon current measures of prevention and treatment, and then roll these services out across the UK to children with obesity, are we likely to reduce the prevalence of childhood obesity and stem the emerging epidemic of obesity-related heart disease and type 2 diabetes.

Conclusions

The BMA agrees with the International Obesity TaskForce that in order to halt the obesity epidemic, **'interventions at the family or school level will need to be matched by changes in the social and cultural context so that the benefits can be sustained and enhanced. Such prevention strategies will require a coordinated effort between the medical community, health administrators, teachers, parents, food producers and processors, retailers and caterers, advertisers and the media, recreation and sport planners, urban architects, city planners, politicians and legislators'**.³ Environments that encourage healthy eating and active living are vitally important.^v The focus of such strategies should be to make it easier for the public to make healthy choices. Such strategies require funding for implementation, but should ultimately lead to a reduction in the costs to the NHS from obesity related ill health.

At the 2003 Westminster Nutrition and Health Forum, the Institute of Food Research asked whether the UK will eventually need major legislation and regulation on the same level as has been needed to effect changes in tobacco-related behaviour.⁶¹ Given the number of factors that have an impact, and the health consequences of childhood obesity, major changes from the level of policy through to individual behaviour are needed to halt this epidemic now. The *Delivering choosing health: making healthy choices easier* paper included tackling obesity as a priority but listed three key principles that focused either on the behaviour of the individual and/or support for research and workforce development.²² While these steps are helpful, more meaningful changes in policy are needed on such issues as school nutrition, healthier environments, advertising and promotion of food to children, and food labelling. Cooperation from the European Union is particularly crucial with regard to food advertising and labelling. The European Commission's platform on obesity is a good example of an opportunity for member nations to work together.¹³⁸

There is no single UK body with an overall remit, function or policy role to take a lead on food and health policy. This makes coordination of work by government departments, non-governmental organisations and community organisations very difficult.¹³⁹ The government's health select

^v Examples are provided below. (RCP, RCPCH & FPH (2004) Storing up Problems. *The medical case for a slimmer nation*. RCP, RCPCH, FPH: London.)

- Buildings should be designed to permit stair use and discourage lift/escalator use by those able to use stairs.
- Improved public transport and cycling routes to school should be increased/improved.
- Safe walking routes to school should be increased/improved.
- Town planning should discourage car use.
- There should be safe and accessible parks.
- The availability of fresh fruit and vegetables in convenience stores (reducing the incidence of food deserts) should be improved.
- Parents should be educated on healthy eating and activity levels (including the amount of time children spend in front of the television/computer).
- There should be a media created ethos that a healthy active lifestyle is 'cool'.
- Snacks and sweets should be removed from checkouts and other 'impulse buy' locations.

committee⁵⁶ report made numerous recommendations, one of which was the creation of a new Council of Nutrition and Physical Activity to 'improve coordination and inject independent thinking into strategy'. The National Obesity Forum, as well as other similar organisations, is also calling for a 'National Obesity Institute' to improve collaboration between stakeholder groups. The BMA strongly supports these recommendations and hopes that these proposals will be implemented effectively. We suggest that the council's remit should cover food, nutrition, physical activity and the environment.^w Similar 'Food and Exercise Councils' exist in Norway and Sweden, for example, and are moving toward including environmental implications in their remit. We also suggest that the DH encourages the development of local policy councils which could start work now and feed into and receive guidance from such an institute/organisation immediately.

The rise in obesity has exposed the poverty of surveillance arrangements and collection of key data such as population BMIs and children's weights in the UK. With the new UK National Programme for Information Technology (NPfIT) being developed, consideration should be given to how key factors relating to obesity in the population could be monitored from secondary data. An important role is also played by specific surveillance systems supported by professional bodies (for example, the British Paediatric Association surveillance systems) who could undertake more refined monitoring on the rise in type 2 diabetes in children through their networks.

We recognise the difficulty for the government in implementing these strategies and for individuals to take heed of advice and make the necessary adjustments to their lives to eat sensibly and be active. We hope the recommendations made in the next section will go some way to highlighting the action required in this process.

^w In order to attempt to address the problems associated with the obesogenic environment.

Recommendations

Information provision

- 1. Government should mount a *sustained and consistent* public education campaign to improve parents' and children's understanding of the benefits of healthy living.**
 - Families should be educated and empowered through guidance that recognises the impact they have on their children's development of life-long habits of eating and activity. Information and advice should appeal to 'positives' where possible.¹⁴⁰
- 2. The BMA strongly supports and calls for a 'National Obesity Institute' or 'Nutrition Council' to improve collaboration between stakeholder groups.**

Nutrition in schools

- 2. Schools should provide food that conforms to nutritional guidelines and use the curriculum to reinforce messages around healthy eating.**
 - Food education and the acquisition of related practical skills should be compulsory. There should also be special emphasis on how to provide healthy meals on a low income. In order to do this effectively, teachers should receive training on what constitutes a good, balanced diet and how to prepare food.¹⁰⁹
 - There should be mandatory nutrient and compositional standards for school meals. Maximum/minimum levels should be set for fat, sugar, salt, vitamins and minerals. In order to ensure compliance, the profile of health in Ofsted inspections should be raised.
 - School food contractors should be encouraged to use different approaches to food preparation more frequently, such as boiling, grilling and baking.
 - The sale of unhealthy food and drink products from school vending machines should be banned in secondary and upper schools to continue the healthy eating message given in primary schools.
 - The free fruit and vegetable scheme should be expanded to *all* primary and nursery school children.
 - All schools should make free water available from clean and hygienic sources.
- 3. The government should subsidise the cost of fruit and vegetables to encourage healthy eating.**
- 4. All manufacturers should be legally obliged to reduce salt, sugar and fat in pre-prepared meals to an agreed level within a defined time frame.**

The role of healthcare professionals

5. **Existing primary care health professionals are not well placed to meet the needs of obese children.** The International Consensus⁹² document gives very specific recommendations that need to be addressed when planning services. Staff with time and motivational skills are urgently needed.
6. **There needs to be funding to establish and sustain training programmes for those who are involved in the care of children with obesity.** This includes specialist school nurses, health visitors and GPs.
7. **This should be complemented by resources to allow children from any region within the UK to gain access to specialist regional obesity services.**
8. **There needs to be clearer guidance and advice as to the most effective ways of losing weight and maintaining weight loss.**

Exercise

9. **Government should increase funding and improve access to sport and recreation facilities within schools and communities.**
 - There should be increased access to subsidised sporting facilities for both children and their parents. Ready access for those from lower socio-economic groups is particularly important. 'Exercise on prescription' (eg reduced cost/free access to local authority sports centres) should be expanded.
 - Choice in the style of exercise offered to children is desirable, as not all children want to play competitive or mixed sports. The needs of disabled children should also be reflected in the choice available.
10. **The BMA remains deeply concerned by the sale of the school playing fields, even when this is regarded as a last resort. The protection offered to school playing fields should be strengthened.**

Advertising

11. There should be a ban on the advertising of unhealthy foodstuffs, including inappropriate sponsorship programmes, targeted at school children.

- Celebrities and children's television characters should only endorse healthy products that meet nutritional criteria laid down by the FSA. The media has a role to play in encouraging improvements in children's diet and exercise. Supermarkets should consider price promotions for healthy food instead of chocolates, sweets and crisps.

12. New standards in nutritional content, food labelling, and food marketing and promotion should be developed by the FSA for adoption by the food industry.

Improvements in labelling would underpin the drive to improve the salt, fat and sugar content of food products and assist consumer pressure.

13. The BMA strongly advocates that nutritional labelling and health claims should be regulated.

- Regulations must apply to all traders, suppliers, manufacturers, caterers, agencies, retailers and importers of foods. They must be adequately policed and monitored by a board such as the FSA.^x

Research

14. Research is still needed on:

- The longitudinal impact of obesity on individuals and society
- Effectiveness of policy interventions
- The effectiveness of weight management and treatment programmes
- The best measure to use to assess childhood overweight
- Achieving behavioural change
- The impact of physical activity (by type) on obesity and co-morbidities
- The relationship between environmental factors and obesity prevalence

15. There should be UK-wide surveillance of factors that lead to childhood obesity, developed by the public health observatories.

^x This is currently a voluntary initiative that should be made a regulatory body.

Further information

Websites are suggested for further information only and this does not suggest an endorsement of their content in any way by the BMA. Furthermore, the BMA can make no warranty, expressed or implied, as to the accuracy of any information or advice provided by external sources for which links are provided here. The views of other organisations do not necessarily reflect those of the BMA.

Obesity

- **All Party Parliamentary Group on Obesity:** www.parliament.uk
- **Association for the Study of Obesity,** has three key objectives: to promote professional awareness of obesity and its impact on health; to educate and disseminate recent research on the causes, consequences, treatment, and prevention of obesity; and to prioritise obesity and provide opinion leadership in the UK. It is also part of the larger IASO and includes links to several other obesity organisations. The association organises conferences, including those on childhood obesity, and provides a series of factsheets on a range of obesity topics. www.aso.org.uk
- **British Dietetic Association:** has a campaign, *Eat 2b fit*, which is aimed at children. It has also published resources to support this campaign. www.bda.uk.com
- **British Heart Foundation:** has a wide variety of helpful information. www.bhf.org.uk
- **British Nutrition Foundation:** the foundation promotes the nutritional wellbeing of society through the impartial interpretation and effective dissemination of scientifically based nutritional knowledge and advice. www.nutrition.org.uk
- **DfES:** aims to give children an excellent start in education, enable young people to equip themselves with life and work skills, and encourage adults to achieve their full potential through learning. www.dfes.gov.uk
- **European Childhood Obesity Group (ECOG):** is a group of scientists and clinicians concerned with childhood obesity in Europe. www.childhoodobesity.net
- **European Platform on Diet, Physical Activity and Health:** www.ephpa.org
- **Health for all children:** copies of *Growth assessment in the community* can be ordered from this website. Discounts are available for health organisations. www.health-for-all-children.co.uk
- The **healthyliving** website is a joint collaboration between NHS Health Scotland and the Scottish Executive to promote Scotland's healthy living programme. It is designed to help individuals attain a healthier diet and a more active lifestyle by providing resources, advice and support on healthy eating and physical activity. www.healthyliving.gov.uk
- **International Obesity TaskForce:** part of the International Association for the Study of Obesity, this organisation is working to alert the world of the growing health crisis threatened by soaring levels of obesity. The taskforce collaborates with WHO and has working groups examining a number of issues, including childhood obesity. www.iotf.org

- **The National Obesity Forum:** has guidelines on weight management in children and adolescents. Through its activities it aims for the delivery of best practice in the management of obesity and its co-morbidities. www.nationalobesityforum.org.uk
- **NHS Health Scotland:** Health Scotland is a special health board created on 1 April 2003 by bringing together the Public Health Institute of Scotland (www.phis.org.uk), and the Health Education Board for Scotland (www.hebs.com). NHS Health Scotland provides a national focus for improving health, and will work with the Scottish Executive and other key partners to take action to improve health and reduce inequalities in Scotland. www.healthscotland.com
- **NHS Improvement Scotland:** audits the quality of service provided by the NHS in Scotland including monitoring public health. http://www.nhshealthquality.org/nhsqis/nhsqis_sub_home.jsp
- **Royal College of General Practitioners:** aims to encourage, foster and maintain the highest possible standards in general medical practice. www.rcgp.org.uk
- **Royal College of Paediatrics and Child Health:** publishes guidelines on the management of childhood obesity. www.rcpch.ac.uk
- **Royal College of Physicians:** aims to ensure high quality care for patients by improving standards and influencing policy and practice in modern medicine. www.rcplondon.ac.uk
- RCP (2002) *Nutrition and patients, a doctors responsibility*. This report underlines how under- and overnutrition are closely linked to illness and disease processes, affecting both the response to medical treatments and eventual recovery. It clearly sets out doctors' roles within a multidisciplinary approach to both preventive and therapeutic nutritional care in the community and the hospital.
- **Royal Institute of Public Health:** is an independent organisation promoting public health and hygiene through education and training, information, quality testing and policy development. www.riphh.org.uk
- RCPCH, RCGP and RIPH (2004) *Storing up the problems: a medical case for a slimmer nation*. This report is aimed at government, local authorities, health professionals in all disciplines, educators, food manufacturers, retailers, advertisers and the public and makes a number of recommendations. It also includes detailed examples of local initiatives which can be taken as part of an overall strategy, and covers the complex factors that influence obesity levels such as energy balance, exercise, activity and other lifestyle elements. www.rcplondon.ac.uk
- **Scottish Executive Education and Training department:** www.scotland.gov.uk/Topics/Education
- **Scottish Intercollegiate Guidelines Network:** publishes guidelines on the management of obesity in children and young people (Guideline 69). www.sign.ac.uk/guidelines/published/index.html#Child
- **The weight management learning programme:** is a collaboration between the Health Education Board for Scotland (now NHS Health Scotland), the Scottish National Board for Nursing, Midwifery and Health Visiting, and the Scottish Council for Post-graduate Medical and Dental Education. It is a very practical and helpful site for planning a weight management programme. www.hebs.scot.nhs.uk/learningcentre/weightmanagement/childhood

- **WHO global strategy on diet, physical activity and health (2004)**: states that ‘the role of government is crucial in achieving lasting change in public health. Governments have a primary steering and stewardship role in initiating and developing the strategy, ensuring that it is implemented and monitoring its impact in the long term’.

Diabetes

- **Diabetes UK**: a charity with information on diabetes. www.diabetes.org.uk
- **International Diabetes Federation**: www.idf.org

CHD

- **European Heart Network (EHN)**: the EHN plays a leading role in the prevention and reduction of cardiovascular disease through advocacy, networking and education, so that it is no longer a major cause of premature death and disability throughout Europe. www.ehnheart.org
- **National Heart Forum**: is a leading alliance of over 40 national organisations working to reduce the risk of coronary heart disease in the UK. www.heartforum.org.uk
- **World Heart Federation**: In 2004, the theme of World Heart Day was ‘Children, Adolescents and Heart Disease’. www.worldheart.org. The World Heart Day website provides detailed information on the events organised in each country. www.worldheartday.com/Home/index.as

A balanced diet

- **British Nutrition Foundation**: promotes the nutritional wellbeing of society through the impartial interpretation and effective dissemination of scientifically based nutritional knowledge and advice. www.nutrition.org.uk
- **Expert group on vitamins and minerals**: was set up in 1998 to evaluate the safety of all the vitamins and minerals essential to health, plus those currently available as food supplements or those used in fortified foods. www.food.gov.uk
- **‘Get Sussed’ – health professional resources**: This information is for health professionals involved in the management of childhood obesity. It is one element of the ‘Get Sussed’ campaign which aims to encourage 11-15 year olds to begin thinking about their health and the control they have over their diet and lifestyle. It has been developed to address the escalating rates of overweight and obesity in children and in response to DPP members requests. Other elements of the campaign include a media release, which can be found in the media section of this website, and a website for young people which can be found at www.sussed.uk.net
- **Scientific Advisory Committee on Nutrition**: is an advisory committee of independent experts that provides advice to the FSA and DH as well as other government agencies and departments. Its remit includes matters concerning nutrient content of individual foods, advice on diet and the nutritional status of people. www.food.gov.uk/multimedia/pdfs/saltandhealth0503.pdf

- **Scottish Community Diet Project:** the project's over-riding aim is to help improve Scotland's diet and health by supporting work within low-income communities which improves access to and take-up of a healthy diet. The project is based within the Scottish Consumer Council and is assisted by a Steering Group made up of a range of groups and agencies, which advises on the nature and direction of the work. www.dietproject.org.uk
- **Scottish Healthy Choices Award:** was launched in 1997 by Sam Galbraith, the then Minister of Health. The Award Scheme was a direct recommendation from *Eating for Health: A Diet Action Plan for Scotland*, commonly known as the Scottish Diet Action Plan. The project was set up in partnership between the Scottish Consumer Council and the Health Education Board for Scotland HEBS (now known as NHS Health Scotland). The key aim of the Award Scheme is to encourage caterers to provide healthy food in a healthier environment. It forms part of a wider national initiative to improve Scotland's poor health record. www.shcas.co.uk/index.htm

Exercise

- **DH:** At least five a week. Evidence on the impact of physical activity and its relationship to health can be found in a report from the chief medical officer. www.dh.gov.uk
- **Move4Health:** a new campaigning organisation launched in April 2004. It works towards making the physical, cultural, political and social environments more conducive for people to be physically active. www.move4health.org.uk.
- **ONS:** provides National Statistics. www.statistics.gov.uk
- **Physical Activity in Scottish Schoolchildren:** is part of the ongoing work within the European Network of Health Promoting Schools project in Scotland. It is a longitudinal study which will track a cohort of young people with over 1,600 children from eight school clusters in four local authority areas across Scotland which are taking part in the project. www.education.ed.ac.uk/cahru

Infant nutrition

- BMA (1999) *Growing up in Britain: ensuring a healthy future for our children*. BMA: London. Includes chapters on childhood nutrition and foetal origins of adult disease.
- **Food tips for mums-to-be:** healthy eating advice in pregnancy. www.food.gov.uk
- For information on '**Healthy Start**' and other government initiatives refer to the maternal and infant nutrition section of the DH website: www.dh.gov.uk/PolicyAndGuidance/HealthAndSocialCareTopics/MaternalAndInfantNutrition/fs/en
- **Infant and Dietetic Foods Association:** is the trade association representing manufacturers of baby foods and specialist nutrition products in the UK. The site provides information and statistics eg breastfeeding statistics. www.idfa.org.uk
- **Infant nutrition cluster projects:** EU childhood obesity early programming by infant nutrition. www.wye.ic.ac.uk/Cluster/Projects.html
- **Is your child a fussy eater?:** information leaflet containing tips and advice on encouraging your child to eat well. www.hebs.com/services/pubs/pdf/HLFussyEaterleaflet.pdf

- Patrick H et al (2005) The benefits of authoritative feeding style: caregiver feeding styles and children's food consumption patterns, *Appetite*, **44(2)**: 243-9. This paper discusses the relationship between parenting and the eating habits of children and the positive impact that authoritative parenting can have on better choice and consumption of healthy foods.
- **WHO**: information on infant and young child nutrition. www.who.int/child-adolescent-health/NUTRITION/complementary.htm

Nutrition in nurseries and primary schools

- **DfES**: Healthy school lunches for pupils in nursery schools/units. Healthy school lunches for pupils in primary schools. www.dfes.gov.uk
- **Hungry for Success**: a Whole School Approach to School Meals in Scotland. www.scotland.gov.uk/library5/education/hfs-00.asp
- **ONS**: provides National Statistics. www.statistics.gov.uk
- **Schools Health Education Unit**: aims to promote objective debate about the best ways to serve and educate young people and students about health and social issues. www.sheu.org.uk
- **Sodexo School Meals Survey 2005**: provides information on school meals in England, responds to the white paper of November 2004 on health, and discusses school meals in Scotland¹⁴¹
- **Soil Association School Meals Pack**: provides guidelines for school-based change based on Caroline Walker Trust guidelines. Available on www.soilassociation.org, link to Food for Life page
- **Wiredforhealth.org**: a website sponsored by the HDA providing a variety of links about health and fitness information

Milk

- **The Food and Agriculture Organisation of the United Nations**: has set up a global e-forum on school milk for those involved in school feeding programmes. www.fao.org
- **Milk For Schools**: this charitable organisation aims to see all primary schools offering access to the European Commission school milk subsidy scheme. www.milkforschools.org.uk

Water

- **ONS**: provides National Statistics. www.statistics.gov.uk
- **Water UK**: is the industry association that represents all UK water and wastewater service suppliers at national and European level. www.water.org.uk

Advertising and marketing

- **Food Standards Agency**: provides advice on how to interpret labels on food. www.food.gov.uk and www.food.gov.uk/scotland
- **Ofcom**: independent regulator and competition authority for the UK communications industries, with responsibilities across television, radio, telecommunications and wireless communications services. www.ofcom.org.uk
- **Television Without Frontiers Directive**: europa.eu.int/comm/avpolicy/regul/twfv/newint_en.htm

Appendix I: Physical consequences of childhood and adolescent obesity

Organ System	Obesity-related disorders
Pulmonary	Sleep apnoea Asthma Pickwickian syndrome
Orthopaedic	Slipped capital epiphyses Blount's disease (tibia varia) Tibial torsion Flat feet Ankle sprains Increased risk of fractures
Neurological	Idiopathic intracranial hypertension
Gastroenterological	Cholelithiasis Liver steatosis/non-alcoholic fatty liver Gastro-oesophageal reflux
Endocrine	Insulin resistance/impaired glucose tolerance Type 2 diabetes Menstrual abnormalities Polycystic ovary syndrome Hypercorticism
Cardiovascular	Hypertension Dyslipidaemia Fatty streaks Left ventricular hypertrophy
Other	Systemic inflammation/raised C-reactive protein

Source: IOTF report (2004)

Appendix II: International cut-off points for body mass index (BMI) for overweight and obesity in children

International obesity cut-off points for BMI for overweight and obesity by gender between 2 and 12 years, defined to pass through BMI index of 25 and 30 kg/m² at age 18, obtained by averaging data from Brazil, Great Britain, Hong Kong, Netherlands, Singapore and United States.

Age (years)	BMI 25 kg/m ²		BMI 30 kg/m ²	
	Males	Females	Males	Females
2	18.4	18.0	20.1	20.1
2.5	18.1	17.8	19.8	19.5
3	17.9	17.6	19.6	19.4
3.5	17.7	17.4	19.4	19.2
4	17.6	17.3	19.3	19.1
4.5	17.5	17.2	19.3	19.1
5	17.4	17.1	19.3	19.2
5.5	17.5	17.2	19.5	19.3
6	17.6	17.3	19.8	19.7
6.5	17.7	17.5	20.2	20.1
7	17.9	17.8	20.6	20.5
7.5	18.2	18.0	21.1	21.0
8	18.4	18.3	21.6	21.6
8.5	18.8	18.7	22.2	22.2
9	19.1	19.1	22.8	22.8
9.5	19.5	19.5	23.4	23.5
10	19.8	19.9	24.0	24.1
10.5	20.2	20.3	24.6	24.8
11	20.6	20.7	25.1	25.4
11.5	20.9	21.2	25.6	26.1
12	21.2	21.7	26.0	26.7

Source: Cole TJ et al (2000) Establishing a standard definition for child overweight and obesity worldwide: international survey. *BMJ* 320:1240-3.

Appendix III: Estimated average requirements (EARs) for energy of children aged 0-18 years

Age	EAR MJ/d (kcal/d)	
	Boys	Girls
0-3 months	2.28 (545)	2.16 (515)
4-6 months	2.89 (690)	2.69 (645)
7-9 months	3.44 (825)	3.20 (765)
10-12 months	3.85 (920)	3.61 (865)
1-3 years	5.15 (1,230)	4.86 (1,165)
4-6 years	7.16 (1,715)	6.46 (1,545)
7-10 years	8.24 (1,970)	7.28 (1,740)
11-14 years	9.27 (2,220)	7.72 (1,845)
15-18 years	11.51 (2,755)	8.83 (2,110)

Source: The Committee on the Medical Aspects of Food and Nutrition Policy (COMA) Report Dietary Reference Values for Food Energy and Nutrients for the United Kingdom, London, HMSO, 1991

Appendix IV: Summary of nutritional guidelines for school meals

Food Source	Recommended intake		Unit	Infants 5-6 years	Juniors 7-10 years
Energy	30% of EAR* Mean of girl and boy		MJ/Kcal	2.04 MJ 489 Kcal	2.33 MJ 557 Kcal
Fat	Not more than 35% of food energy	Max	g	19	21.7
Saturated Fatty Acids	Not more than 11% of food energy	Max	g	6	6.8
Carbohydrates	Not less than 50% of food energy	Min	g	65.2	74.3
NME (non-milk extrinsic) sugars**	Not more than 11% of food energy	Max	g	14.3	16.3
Fibre/NSP (non-starch polysaccharides)^a	Not less than 30% of calculated reference value	Min	g	3.9	4.5
Protein	Not less than 30% RNI ^b	Min	g	5.9	8.5
Iron	Not less than 40% RNI	Min	mg	2.4	3.5
Calcium	Not less than 35% RNI	Min	mg	158	193
Vitamin A (retinol equivalents)	Not less than 30% RNI	Min	mg	150	150
Folate	Not less than 40% RNI	Min	mg	40	60
Vitamin C	Not less than 35% RNI	Min	mg	11	11
Sodium^c	Not more than 33% of SACN recommendations	Max	mg	393	655
Fruit and vegetables	1/3 of 5 portions per day		Portions	2	2

Source: Nutrient standards for school lunches for pupils in primary schools in Scotland (revised November 2003) based on those devised by the Caroline Walker Trust.

* Estimated average requirement

** These are added sugars rather than the sugar that is integrally present in food (eg table sugar, honey, sugar in fruit juice and soft drinks)

^a Here calculated as 8g per 1,000 kcal

^b Reference nutrient intake

^c Scientific Advisory Committee on Nutrition (2003) *Salt and Health*. London HMSO

Appendix V: Top 10 sources of non-milk extrinsic (NME) sugars in children's diets (aged 7-10 years)

Sources of NME sugars in children diets	%
Fizzy drinks, squashes	12
Chocolate confectionery	11.5
Sugar confectionery	11
Squashes and juice drinks	10.5
Breakfast cereals	8
Biscuits	8
Cakes and pastries	8
Milk products	7.5
Fruit juices	6.5
Table sugar	5.5

Source: NDNS 2000.

Appendix VI: Recommendations on salt, fibre, vitamins, minerals and water intake

Salt

Evidence of the short and long-term effects of salt in the diets of children is limited but does suggest that current levels could be potentially harmful later in life. A large percentage of sodium in the diet comes from its presence in processed foods. In 2003, the FSA issued salt intake targets for children based on a new report by the SACN (appendix VIII).¹⁴² For these levels to be achieved a substantial reduction in current intake is required. Food manufacturers are also being asked by the Minister of Public Health to provide action plans to reduce salt levels in processed foods.

Fibre

The recommended intake of dietary fibre for adults is 18g per day and proportionately less for children depending on body size.⁵³ Children under 2 years should not take such food at the expense of more energy rich foods that are required for adequate growth. In the UK most people do not eat enough fibre (the average adult intake is 12g per day). A low fibre intake is associated with constipation and some gut diseases such as bowel cancer.⁶⁰ Statistics show that around 50 per cent of all children do not consume vegetables in a typical week, with even fewer consuming green vegetables.⁵⁴ Adults in the UK do not consume enough fibre, and one could predict that this is also the case in children.

Vitamins and minerals

Vitamins and minerals are only required in small amounts but are essential for children's growth and metabolism. Most vitamins cannot be made by the body, so have to be provided by the diet. Some minerals are needed in larger amounts than others, for example, calcium, phosphorus, magnesium, sodium, potassium and chloride. Others are required in smaller quantities, for example, iron, zinc, iodine, fluoride, selenium and copper. Despite being required in smaller amounts, trace minerals are no less important than other minerals. Prolonged deficiencies in either can affect children's health in a number of ways depending on the function of the vitamin or mineral concerned.⁵⁴ For example, deficiencies in vitamin A can affect sight. In the 1997 NDNS, it was found that significant proportions of children were not meeting the recommended reference nutrient intake levels for some vitamins and minerals (table 3), particularly vitamin A and C and folate.

Table 3: Proportion of schoolchildren falling below recommended levels of mineral intake

	Boys (%)		Girls (%)	
	7-10years	11-14 years	7-10 years	11-14 years
Iron	40	61	59	98
Calcium	19	79	29	79
Magnesium	56	86	75	97
Potassium	43	88	47	97
Zinc	73	84	83	97
Copper	33	35	49	60
Iodine	24	37	39	61

Source: NDNS 2000

Calcium

Calcium is important for child bone and dental health. A lack of calcium in the diet is starting to become evident,¹⁴³ for example in the NDNS survey approximately 10 per cent of older boys and 20 per cent of older girls had intakes lower than recommended.¹⁴⁴ Milk is a good source of calcium; two glasses (300ml) of milk per day will provide enough calcium for children aged 1-3.¹⁴⁵ There are other sources of calcium, for example flour, fruit and vegetables, pulses and nuts. Furthermore, calcium needs vitamin D (eg sunlight) and exercise to make strong bones. (See appendix IX for further details on the EC milk subsidy scheme.)

Fluids

The FSA recommends that adults drink around six to eight cups of fluid per day, amounting to approximately two litres. In the UK there are no specific recommendations for children, although it is noted that a smaller person will require a proportionally lower quantity of water (see appendix X for US guidelines). Children who do not drink enough fluids to remain hydrated may suffer problems with health, behaviour and learning ability.¹⁴⁶ There have been few attempts to measure people's actual water intakes, although, one study found that children under 12 years of age (in Australia and New Zealand) consumed, on average, only 2.9 glasses per day.¹⁴⁷ A UK survey conducted in 2000 revealed that drinking facilities in primary schools were highly unsatisfactory.¹⁴⁸

Appendix VII: National food standards for nursery and primary school lunches (England and Wales)

Nursery schools	There must be available every day at least one item from each of the following food groups: <ul style="list-style-type: none">• starchy foods• fruit and vegetables• milk and dairy foods• meat, fish and other non-dairy sources of protein
Primary schools	There must be available every day at least one item from each of the following food groups: <ul style="list-style-type: none">• starchy foods, starchy food cooked in oil or fat should not be served more than three times a week• fruit and a vegetable must be available every day, fruit based desserts must be available twice a week• milk and dairy foods• meat, fish and alternative sources of protein, red meat must be served at least twice a week and fish at least once a week.

Source: DfES

Appendix VIII: Daily target salt intake for infants and children

Age	Target average salt intake (g/d)
0-6 months	<1
7-12 months	1
1-3 years	2
4-6 years	3
7-10 years	5
11-14 years	6

Source: SACN report

Appendix IX: EC School Milk Subsidy Scheme

All European children (nursery and primary school age) are eligible to receive benefit from the EC School Milk Subsidy Scheme. In the UK, an average price for 189ml (a third of a pint) of subsidised milk is 12 pence. Some authorities top up the subsidy, but this often leads to considerable problems, such as the withdrawal of milk programmes when the funds run out or a policy change occurs. Such top up schemes are often age restricted to the under sevens, which means it is almost impossible to expand them to those aged 11 without adverse political repercussions. The UK governments only operate the scheme on the minimum limit and only allow primary age children to benefit (and children in middle school classed as primary school age). School milk is something of a postcode lottery as its provision is the responsibility of the local authority and much depends on where you live. Furthermore, some local authorities do not provide a playtime milk service, some devolve school milk supply to agencies and others operate their own schemes. In all these cases the final decision whether school milk is on offer rests with the school itself. In the UK, only 10 per cent of primary aged children over 5 years of age are provided with access to subsidised milk.¹⁴⁹

Appendix X: Recommended dietary intakes of water by age group (USA)

		Age	Total water intake per day (including water contained in food)	Water obtained from drinks per day
Infants		0-6 months	0.7 litres assumed to be from human milk	
		7-12 months	0.8 litres from milk and complementary foods and beverages	0.6 litres
Children		1-3 years	1.3 litres	0.9 litres (4 cups)
		4-8 years	1.7 litres	1.2 litres (5 cups)
	Boys	9-13 years	2.4 litres	1.8 litres (8 cups)
	Girls		2.1 litres	1.6 litres (7 cups)

Source: *Dietary Reference Intakes for Water, Potassium, Sodium, Chloride and Sulfate (2004)* Institute of Medicine of the National Academies. Washington DC: The National Academies Press.

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Board of Science
British Medical Association
BMA House
Tavistock Square
London
WC1H 9JP
Tel: +44 (0) 20 7383 6164
Fax: +44 (0) 20 7383 6383
Email: info.science@bma.org.uk

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