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CHILDHOOD OBESITY

Obesity is a growing problem in the UK and elsewhere and is currently the subject of a Commons Health Committee inquiry. The most recent (2001) estimates for England suggest that some 8.5% of 6 year olds and 15% of 15 year olds are obese. This is a concern because obesity is an important risk factor for mortality and a range of chronic diseases in adult life. This note builds on the POST report *Improving children's diet*[1] and describes recent trends in obesity, examines possible causes and analyses policy responses.

What is obesity?

Obesity is a condition where weight gain has got to the point that it poses a serious threat to health. It is measured in terms of a person's body mass index (bmi, see box 1) which is determined both by weight and height. Bmi cut-off points have been agreed for obese and overweight adults, but for children the situation is more complex. Because a child's bmi varies with age, different cut-off points have to be used to define overweight and obese children depending on age.

Box 1 Body mass index (bmi), overweight and obesity

Obesity and overweight are defined using body mass index: *bmi=bodyweight (kilogrammes) / (height [metres])*^{2}.

Adults

For adults, the cut off points used are: bmi <20, a person is underweight; bmi 20-25 is the desirable or healthy range; bmi 25-30 is classified as overweight; and bmi 30+ is classified as obese.

Children

Different researchers have used different ways of defining obesity. An International Obesity Task Force proposed cut-offs for children at various ages in 2000. These were based on surveys of variations in bmi with age and their clinical consequences and have been used to obtain prevalence estimates for 1984-94 in table 1. Other researchers have used a different approach by selecting a bmi reference point from the past, and comparing the proportion of the population exceeding the threshold now with that in the past. A commonly used reference point for obesity is the bmi threshold above which the top 5% of the bmi range lay in 1990. This is the approach used to obtain the most recent estimates in table 1.

Recent trends

Data on children's height and weight was collected in the National Study of Health and Growth (NSHG) between 1974-94 and since 1995 by the Health Survey for England (HSE). As illustrated in table 1, the prevalence of obesity doubled between 1984 and 1994 among 4-12 year olds in England, rising from 0.6% to 1.7% in boys and from 1.3 to 2.6% in girls. The most recent estimates suggest that by 2001, some 8.5% of 6 year olds and 15% of 15 year olds were obese. But, as explained in box 1, the different studies used different definitions of obesity and overweight, and are thus not strictly comparable. A similar rise in the prevalence of obesity has also been reported in children in Scotland.

This increase in childhood obesity reflects a wider trend among the adult population in the UK and in other countries. Prevalence of obesity among adults in England has almost trebled in the last 20 years. The years 1980 to 1998 saw obesity rise from 6% to 17% among men and from 8% to 21% among women. The National Audit Office (NAO) has projected that by 2010, 1 in 4 of the adult population will be obese and that the total (direct and indirect) cost to the NHS and wider economy will be around £3.6 billion.[2]

Table 1 Prevalence of overweight & obese children (England)

Year	Data	Age	% overweight		% obese	
			boys	girls	boys	girls
1984	NSHG[1]	4-12	5.4	9.3	0.6	1.3
1994	NSHG	4-12	9.0	13.5	1.7	2.6
1997	HSE[2]	5	18.2	19.3	8.1	6.1
2001	HSE[3]	6			8.5 boys & girls	
2001	HSE	15			15 boys & girls	

1 Chinn S & Rona RJ, British Medical Journal, 322, 24-26, 2001.

2 Reilly JJ et al, British Medical Journal, 319, 1039, 1999.

3 *Chief Medical Officer's Annual Report 2002*, DoH, 2003.

Consequences

As well as increasing mortality, obesity is a risk factor for a range of chronic diseases. Most of these are diseases of adult life (overweight adolescents have a 70% chance of becoming overweight or obese adults), but some directly affect children themselves. They include:

- Type 2 (adult-onset) diabetes is strongly associated with obesity – women who are obese are 12 times more likely to develop type 2 diabetes than women of a healthy weight. NAO estimates that obesity directly caused more than 250,000 cases of type 2 diabetes in England in 1998. Of particular concern is the emergence of type 2 diabetes, previously considered to be a disease of adulthood, in obese schoolchildren.[3]
- Social and psychological consequences – including stigmatisation, discrimination and prejudice. Research has linked obesity with low self-image, low self-confidence and depression in children and adults.
- Coronary heart disease - the most common cause of premature death among obese people. NAO estimates that obesity caused some 28,000 heart attacks and ~750,000 cases of hypertension in England in 1998.
- Cancers – the links between cancer and obesity are less clear cut. The evidence is strongest for colon cancer: obesity increases the risk of this type of cancer by nearly three times in both men and women.
- Osteoarthritis and back pain are often associated with obesity, most likely resulting from excess weight.

Causes

Obesity occurs when an individual takes in more energy than they expend, although some people are genetically more susceptible than others. The rise in obesity has been too rapid to be attributed to genetic factors, and must thus reflect changes in eating patterns and levels of physical activity. A joint WHO/FAO expert group recently considered the strength of the evidence for various potential factors (summarised in table 2).[4]

Dietary factors

A key dietary factor is energy intake. Evidence from the National Food Survey (NFS) suggests that average energy intakes in the UK have been declining since the early 1970s. Some see this as evidence that dietary factors have not contributed much to the rise in obesity. But others disagree, pointing out that the NFS does not take full account of alcoholic drinks, confectionery brought for consumption in the home and food and drink consumed outside the home over this period; it may also be subject to under-reporting. A range of dietary factors that could cause obesity have been identified; these are summarised in box 2. The WHO/FAO expert group found 'convincing' evidence that high intake of energy dense foods is a risk factor for obesity. It also found that heavy marketing of fast foods and high intakes of sugar sweetened drinks were 'probable' risk factors and that large portion sizes was a 'possible' risk factor (see table).

Physical activity

Changes in patterns of physical activity and the adoption of more sedentary lifestyles are also likely to be important factors behind obesity. However, as the Health Development Agency has noted, data on trends in physical activity among young people are sparse and there is little direct evidence of a rise in sedentary lifestyles.[5] The data that are available reveal:

- A decline in the number of young people playing sport at school. A survey commissioned by Sport England showed that the proportion of young people spending two or more hours a week on sport in school declined from 46% in 1994 to 33% in 1999.[6]
- A fall in the proportion of children walking to school. Since 1989/91, the proportion of primary school children walking to school has fallen from 62% to 56%, while over the same period the number being driven to school has risen from 27% to 36%.
- A decline in the proportion of children cycling to school. Just 2% of secondary pupils currently cycle to school compared with 5% in 1989/91.
- A possible rise in sedentary pastimes such as watching TV, playing computer games or accessing the internet. An Independent Television Commission survey shows that the average 4-15 year old watches ~2.5 hours of TV a day (research also shows a strong correlation between the number of hours spent watching TV and increased risk of obesity). In 2002, ~50% of households with children had home internet access; on average children log on 10 times a month.

Table 2 WHO/FAO conclusions on obesity

Evidence strength	Decreases risk of obesity	Increases risk of obesity
Convincing	Regular physical activity High dietary intake of fibre	Sedentary lifestyles High dietary intake of energy-dense, micronutrient-poor foods
Probable	Home & school environments that support healthy food choices for children Breastfeeding	Heavy marketing of energy-dense foods and fast food outlets High intakes of sugar-sweetened soft drinks and fruit juices Adverse socio-economic conditions (especially for women in developed countries)
Possible	Low-glycaemic (see box 2) index foods	Large portion sizes High proportion of food prepared outside the home (developed countries) Eating patterns (e.g. strict dieting/ periodic bingeing behaviour)
Insufficient	Increased eating frequency	Alcohol

Source *Diet, nutrition & the prevention of chronic diseases*, Joint WHO/FAO expert consultation, WHO, Geneva, 2002.

Current policy

Prevention and management of obesity requires a range of co-ordinated policies to improve diet and physical activity levels in the early years, at schools, and in families and communities. Current policies in these areas that are most relevant to preventing and managing obesity are outlined below.

Early years

- Infant feeding - the NHS has a target to increase breastfeeding by 2% per year focusing on women from disadvantaged groups; the Department of Health (DoH) has an infant feeding initiative to this end.

Box 2 Potential dietary factors behind obesity

Fat - population studies do not show any consistent links between dietary fat intakes and bodyweight in children/ young adults. Moreover, in the US the rise in childhood obesity has come at a time when the proportion of energy derived from fat by children has fallen. Current advice is that it is the type of dietary fat consumed that is important, rather than the overall amount.

Glycaemic index (GI) - foods such as potatoes, breads, soft drinks, cakes and biscuits have a high GI – i.e. cause a significant rise in blood glucose levels shortly after being eaten. A high GI diet stimulates hunger and causes over-eating in adolescents and is linked with flab, heart disease and type 2 diabetes in adults.

Sugars and sugar sweetened soft drinks - the WHO/ FAO report recommended restricting consumption of free sugars to less than 10% of total energy since this was "likely to contribute to reducing the risk of unhealthy weight gain". It suggested that free sugars contribute to the overall energy density of diets and promote a positive energy balance and that drinks that are rich in free sugars may increase overall energy intake by reducing appetite control. But these findings are controversial, since other studies suggest that people whose diet is high in free sugars may have lower total fat intakes. Overall, research in this area demonstrates the plausibility of the hypothesis that diets high in free sugars can contribute to excess energy intakes and weight gain, but does not reveal whether this has been a factor in the rise in childhood obesity.

Energy density and satiety - fatty foods are energy dense, containing more than twice as much energy as the same weight of high protein or carbohydrate food. Satiety is a measure of the extent to which a food is reported as satisfying hunger. Foods that have low energy density but high satiety scores (e.g. boiled potatoes and many fruits) can reduce overall energy intakes. Those with high energy density and low satiety (e.g. fatty foods) may encourage 'snacking' and increase energy intakes.

'Fast' food and portion size - increased consumption of 'fast' food – which tends to be energy dense, high in fat, have a high GI, and is increasingly marketed in large portion sizes – has also been suggested as a possible cause of rising obesity rates. The WHO/FAO expert group concluded that heavy marketing of 'fast' (energy-rich, micronutrient-poor) foods was a probable causative agent in obesity. However, while research suggests that overall energy intakes are greater among adolescents who regularly consume 'fast' foods, there is no firm evidence directly linking fast food with obesity in children.

- Healthy Start – a new initiative to be launched in 2004 to replace the Welfare Foods Scheme. It will provide the means for disadvantaged families to buy fruit and vegetables, cereal-based and other foods for weaning, as well as providing milk and infant formula.
- Sure Start – focuses on families and children up to age four living in the most deprived areas. It provides access to family support, advice on nurturing, health services and early learning. By 2004, some 524 local programmes will involve ~400,000 children.
- Other initiatives such as the provision of nursery education for all 3 year olds (by 2004), the establishment of early excellence centres and neighbourhood child care initiatives.

Box 3 School-based initiatives

Nutritional initiatives

- Compulsory nutrition standards for school lunches (reintroduced in England and Wales in 2001).
- All primary schools are expected to teach food preparation, cooking and hygiene as it forms part of the National Curriculum up to age 11. Most schools teach some cooking to pupils in the 11-14 age range, but this is not a compulsory part of the curriculum.
- National school fruit scheme (NSFS), entitles all 4-6 year olds to a free piece of fruit each day. Following evaluation of pilot schemes, the NSFS is currently being scaled up to cover over 2 million 4-7 year olds in all 18,000 state primary schools across England.
- Food labelling – the Food Standards Agency (FSA) is developing a range of resources (with DfES) for use in schools to explain how to use food labels effectively.

Physical activity, PE and sport initiatives

- The government is deploying 1,000 school sport co-ordinators by 2004 to build links between schools, develop competitive sports and after school activities, co-ordinate training of teachers and promote physically active lifestyles.
- PE is a compulsory part of the National Curriculum up to age 16. While the government is committed to every child receiving at least two hours PE and sport each week at school, a poll by Sport England shows only 1 in 5 primary schools meet this target.
- The government is investing ~£750M in new opportunities funding to build/refurbish school sports facilities that will also be available for community use. It also recently announced increased investment in PE and school sport of over £450 million.
- Healthy travel to school – a School Travel Advisory Group publishes guidance for local authorities to encourage children to walk or cycle to school. DoH and DfES also support a Safe and Sound Challenge to encourage 'walking buses', cycle clubs, etc.
- The Department of Culture Media and Sport (DCMS), DfeS and DoH host the School Sports Alliance to take a strategic overview of physical education and school sport. It is committed to raise year on year the time spent on sport/physical activity by 6-16 year olds.

School based programmes

School provides an ideal setting for initiatives to improve dietary and physical activity patterns. The framework for such initiatives is provided by the national healthy schools standard (NHSS), an accreditation scheme for schools, funded jointly by the DoH and the Department for Education and Skills (DfES). In addition to the NHSS, there are a range of initiatives specifically aimed at improving nutrition and physical activity levels in schools, and these are outlined in box 3.

The role of communities and families

The close involvement of families and communities is essential in any overall strategy for improving children's diets and levels of physical activity. Sure Start funds a variety of community-based projects – from cooking clubs to community cafes and food co-ops - in disadvantaged areas, and the DoH funds a 5 A DAY initiative to encourage families to eat more fruit and vegetables. Positive Futures, a nationwide scheme to encourage 10-19 year olds to get involved with sport, has helped 25,000 young people since its launch in 2000.

Policy priorities

Consumer and health groups see scope for further national and local initiatives to build on the policies outlined on the previous page.[7]

Co-ordinating policy

The need to improve co-ordination at all levels was a recurring theme of an NAO report in 2001.[2] Co-ordination has improved in recent years; for instance, the appointment of school sports co-ordinators and healthy school co-ordinators should improve partnerships at the local level. At national level, key developments include the setting up of a Cabinet Committee on Children and Young People's Services, creating a Minister for Young People and a Children and Young People's Unit (CYPU) to join up policy-making. The National Heart Forum (NHF) has suggested that this would be best achieved by relocating CYPU within Cabinet Office.

Healthy schools

Groups such as the NHF and Health Education Trust wish to see a statutory requirement for all schools to implement policies on nutrition and physical activity (schools are currently encouraged but not obliged to seek accreditation under the NHSS). Such groups have also called for new nutrition targets to be set and monitored to improve the nutritional quality of school meals. They suggest that such assessment and monitoring should become part of each school's Ofsted inspection.

Child poverty

One of the risk factors associated with obesity and overweight is low socio-economic grouping. The Department of Work and Pensions has consulted on how to measure child poverty and income. The Child Poverty Action Group has called for an independent commission to monitor, evaluate and advise government on eradicating child poverty and suggested adopting a minimum income standard to ensure all families with children have an adequate and secure income.

Corporate responsibility

While the WHO/FAO has assessed energy-dense fast foods, sugary drinks and increasing portion sizes as probable or possible risk factors for obesity, the evidence is not clear cut and the assessment is contested by the food sector. The industry is working with the FSA and DoH to reduce the fat and sugar content of some its products. This trend is likely to continue. Partly motivated by fear of litigation in the US, at least one food company has announced its intention to lower the fat/sugar levels of its products and reduce portion size.

Fiscal policy

It is often suggested that a tax on fatty foods (a 'fat tax') would provide an incentive for industry to reduce the fat content of its products and raise revenue for health promotion projects. However, the potential impact of any such move would have to be carefully assessed. The Institute of Fiscal Studies is conducting research in this area to assess the likely effect of a range of fiscal options on consumption among different socio-economic groups.

Advertising and promotion of foods to children

TV advertising targeted at children

A large proportion of TV advertising targeted at children is for processed foods; the vast majority of this promotes foods high in fat, sugars or salt.[8] The available research does not allow an assessment of the impact this may have had on children's eating behaviour, although the FSA is currently evaluating new research in this area.

Most within the food and advertising industries see no need to change the current regulatory system. They argue that various codes of practice ensure that no individual advert violates specific health concerns, for instance by actively disparaging good dietary practice or by encouraging excessive consumption. Moreover they suggest that further regulation would economically damage the TV industry, and that measures to promote a healthy diet and increase levels of physical activity would prove more effective in tackling childhood obesity.

Some consumer and health groups are calling for stricter regulation. They are concerned about the *cumulative* effect of advertising targeted at children. The NHF has suggested a national inquiry to look at the impact of advertising and commercial promotions on family and child health. Foodaware has called for measures to prevent advertising or marketing of fatty, sugary or salty foods, not just on children's TV but also in other places frequented by children (schools, websites, clubs, etc.). A Bill to prevent food and drink advertising during pre-school children's television received its first reading in May 2003 and may be reintroduced in the new session.

Commercial activities in schools

These range from the use of sponsored teaching materials in classrooms, to collection schemes (e.g. where schools redeem chocolate wrappers in return for sports equipment). Schools can benefit from such schemes, and best practice principles have been drawn up to give clear guidance on the standards expected. But there are concerns that such activities may undermine initiatives that encourage schools to deliver consistent policies on healthy eating. Such concerns have led to calls for stricter regulation of commercial activities in schools, with some groups wishing to see an outright ban on such activities.

Endnotes

1 *Improving children's diet*, report 199, POST September 2003.
2 *Tackling obesity in England*, NAO, 2001.
3 Shield J et al, Archives of Disease in Childhood, 86, 207-08, 2002.
4 *Diet, nutrition & the prevention of chronic diseases*, World Health Organisation/FAO expert consultation, WHO, 2002.
5 www.hda-online.org.uk/html/research/pa_trends.html
6 *Young people and sport in England 1999*, Sport England, 2000.
7 *Young@Heart: A healthy start for a new generation*, NHF, 2002.
8 *TV Dinners*, Sustain July 2001 (www.sustainweb.org).

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