Can we prevent child obesity?

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A dramatic increase in the prevalence of overweight and obesity among children and adolescents has occurred in the last half of the 20th century in virtually every country of the world. The rise is particularly apparent in the last ten years, so that by 2002 some 155 million school-age children worldwide were estimated to be overweight or obese. The prevalence differs considerably across different regions (see Figure 1 next page).

Overweight and obese children are at a raised risk of co-morbidities including type 2 diabetes, fatty liver disease, and endocrinical and orthopaedic disorders. Overweight children enter adulthood with a raised risk of adult obesity of up to 17-fold (after adjusting for parental obesity) and adult obesity in turn carries an increased likelihood of metabolic and cardiovascular diseases, certain cancers and a range of other disorders including psychiatric problems. Even if subsequent weight loss is achieved and maintained, there is evidence that mortality rates are higher among those adults who had been obese as adolescents.

If obesity could be effectively treated in childhood this might reduce subsequent disease risk and health service costs. However, effective treatment for the majority of obese children and adolescents remains elusive. Management protocols, involving behaviour modification, family support, and lifestyle change are difficult to put into practice and may require the input of multi-disciplinary professional teams. Lifestyle modification requires motivation and active participation by the family and young person and is a particular challenge as the child grows into adolescence. Yet, obesity in adolescence is a major risk factor for adult obesity and its co-morbidities. There is an urgent need, therefore, to focus on obesity prevention.

Muller et al, Lissau et al and others have identified several different uses of the term ‘prevention’ in the context of overweight children. In the context of clinical practices involving obese children, prevention refers to measures designed to prevent an obese child from becoming more extremely obese, and to prevent the worsening of co-morbidities and disabilities associated with the child’s condition, which can be referred to as prevention-oriented management of obesity or tertiary prevention. In the context of population screening and monitoring, prevention can consist of measures usually in the school or in the family targeted at children identified as being especially at risk (eg, children of obese parents, or children overweight but not obese), which can be referred to as targeted prevention of obesity, or secondary prevention. In the context of the population at large, prevention refers to the range of measures aimed at ensuring that normal weight children do not become overweight, or overweight children become further overweight, which can be described as population-based prevention of overweight and obesity or primary prevention.

Although public health practitioners would normally agree that population-based, primary prevention is the most desirable approach, and likely to be the most cost effective for the health services, the scientific effort being put into creating an adequate evidence base for such a population approach is limited, and far less than the effort being put into targeted interventions or, especially, into treatment.

A Cochrane systematic review conducted in 2001 found only ten trials that were sufficiently large and of sufficient duration and sufficient quality to be included in the review, all of which involved children who were already overweight. Of the four long-term studies that combined dietary education and physical activity interventions, three resulted in showing no significant effect on overweight. In two studies of the effect of dietary education alone, a multimedia action strategy appeared to be effective but other strategies did not. The one long term study that focussed on physical activity resulted in a slightly greater reduction in overweight in favour of the intervention group, as did two short term studies of physical activity. The reviewers acknowledged the difficulties researchers face when attempting to control the relevant variables and to introduce the necessary preventive measures in a consistent, uniform manner in school or family settings.

Other literature reviews have suggested that the chances of successful prevention at the community level are increased if measures are broad-based and well integrated into children’s lives, such as:
school health policies involving cafeterias, vending machines and snack bars, plentiful physical activity classes and recess activities

- classroom teaching linked to the school’s food and activity practices
- school practices linked to home and community policies and practices
- prolonged and integrated interventions rather than short-term initiatives
- interventions involving staff and/or parents as well as children, and
- the use of techniques sensitive to the cultural, ethnic and gender characteristics of the children.

A review of interventions designed to encourage healthy eating patterns in children also suggested that a ‘whole school’ approach is better than a targeted or piecemeal intervention strategy, and that access and affordability issues need further research. A ‘whole school’ approach is one which integrates the various opportunities for health promotion in the school, including classroom teaching, physical activity sessions, canteen food choices and vending machine sales. It involves children in the formation of policy, and it affects not only the children but the staff and can extend into the community through the wider use of school facilities.

‘Obesogenic’ environments

The school is only one of the many environments in which children may be exposed to ‘obesogens’—eg, to the external influences that encourage weight gain. Family customs and practices will have a strong influence on a child’s food preferences and activity patterns, and as the child grows older he or she may experience social pressure from peers to purchase certain foods, or to undertake sedentary activities. Beyond these local influences, food advertising and labelling policies, road transport policies and a range of other factors will also contribute to the list of potential obesogens.

In terms of recent social trends, several investigators have suggested that hours spent watching television may be strongly associated with weight gain in childhood, although whether this is due to the concomitant sedentary behaviour, or a tendency to consume snack foods while watching television, or the effects on dietary behaviour of the advertising of energy-dense foods during television programmes, is not clear.

Furthermore, television watching may be symptomatic of other factors which encourage weight gain but which are even harder to study in controlled trials. Studies are needed which examine, for example, the relative availability or price of different food products in neighbourhood shops and their impact on food consumption, or the level of safety in streets or parks which might affect play activities.

There have been no trials of the effects of removing local fast food outlets, or the provision of safe cycling schemes for children, in terms of reducing the prevalence or risk of obesity. These environmental and social obesogens, and the societal forces that underpin them, such as growth in road traf-
fic, urbanization of populations and globalization of food supplies\textsuperscript{15}, are not easily controlled for research purposes although some natural variations can be exploited. These potential obesogens are widely distributed in the community, and affect the population at large. Policies concerning their appearance, modulation or removal are shaped at city, national or international level and involve interested parties, such as car users, fast food companies and advertising agencies. Can we do more to assess the relative impact of these different factors than simply compare their changing prevalence over time (Figure 2)

**The Angelo model**

An attempt to structure the debate on interventions has been made by Egger and Swinburn\textsuperscript{16} in their proposed analysis grid for environments linked to obesity (Angelo). This identifies various settings (eg, physical environment, economic environment, socio-cultural environment), various proximities (eg, local neighbourhood, national policy) and the two principal links to obesity (physical activity levels, dietary patterns). Examples of the sorts of obesogenic factors which can be placed into this grid are shown in Table 1 (next page).

The Angelo model helps to highlight significant current factors which may be contributing to obesity. In order to look more carefully into how these might then be controlled it is necessary to examine the processes that are involved in the formation of these obesogens—the way in which the built environment or the food environment is produced. In the case of food, it is necessary to consider the food chain from the farm, through processing, distribution, marketing, retailing and catering to final consumption. This in turn highlights a range of potential areas for investigation: agricultural policy, for example, and its encouragement of certain types of food commodity (dairy, beef, vegetable oil, sugar) and the discouragement of others (the removal of orchards, the destruction of fish, fruit and vegetables). These not only affect the relative availability of different foods but also their relative price.

In the area of food processing, analysis leads to questions of food composition, product formulation, and the tendency for processed foods to be more energy dense and nutrient poor compared with less processed foods. It raises questions about the use of ingredients such as salt and other preservatives, flavouring and colouring additives designed to give processed foods longer shelf-life and greater customer appeal, compared with more perishable foods. How do these activities affect purchasing and consumption patterns?

A third example is the use of various marketing and promotional techniques to encourage purchasing of foods and their subsequent impact on diet. Taken as a whole, television advertisements for foods are largely for energy dense, nutrient poor foods, and the numbers of such advertisements can be as high as 12 per hour during children’s television programmes.\textsuperscript{17}

**Stakeholder involvement**

Analysis of the production of the obesogenic environment inevitably focuses attention on the pract-
the various agents—often commercial—involves in the production process. The differing views of the interested parties, or stakeholders, may lead to challenges to the scientific basis and strength of evidence underlying any suggested policy proposals. The absence of strong evidence for obesity and overweight prevention will undermine the political will to make changes in local or national policy to alter a child’s environment. Policy-makers may find it hard to support policies which limit, for example, commercial freedom or personal choice, without having compelling evidence of the benefit of these policies.

Until such evidence becomes available, it is usual to urge that precautionary activities need to be undertaken based on the best available evidence supported by a consensus of scientific opinion. In this respect, professional practitioners with expertise in child obesity and related health problems have a significant role to play. Every opportunity should be taken by those with direct experience of child obesity to express their opinions on the need for appropriate action.

However it is valuable to look at the role of the other stakeholders in the policy arena and to identify their characteristics. It is, for example, possible to list several of the interested parties (such as parents, school staff, environmental planners, food companies, advertising agencies, government ministries) and to place them on a multidimensional map which helps identify their relative position, and the scope for change. Such research is being undertaken at present in various universities, using a range of techniques.

At a very crude level, a notional example can be given, in which a range of stakeholders can be placed on a two-dimensional graph, showing their relative influence on policy-making and their relative interest in seeing children consume healthier diets or less healthy diets. Figure 3 (next page) shows a purely theoretical example of this, in which various agencies are placed according to a judgement of their relative influence on policy (X axis) and their interest in promoting nutrient rich, low energy foods (Y axis, positive) or energy-dense, nutrient poor foods (Y axis, negative).

When such a mapping exercise is undertaken it can reveal useful information for those trying to influence policy. For example, in Figure 3, the general trend of the scatter of data points is from top left to bottom right, ie, the data indicates that those with the greatest influence are either neutral with regard to diet or interested in making it unhealthy. Conversely, those with the greatest interest in improving children’s diets appear to have the least influence on policy.

In order to influence policy, and to restructure the graph in favour of healthier children, it might be valuable to look at trying to move the various components on the graph—for example by strengthening the influence of those who are currently in the top left corner of the graph and encouraging them to be noticed and their views considered. Equally it could be valuable to reduce the influence or alter the relatively negative influence of those who are currently in the lower right hand part of the graph, by finding incentives for them to change their interests so that they support healthier diets. Finally, those with the most influence on policy (suggested in this graph as being national presidents, treasury secretaries) need to become more interested in the promotion of healthier diets—through showing the economic damage that obesity may cause and by increasing the political pressure for action.

References


3. Hauner H. Transfer into adulthood. In Kiess W, Marcus C, Wahitsch M (eds) Obesity in Childhood and

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Using a grid to analyse potential obesogens in the environment: the Angelo model


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