The fundamental drivers of the obesity epidemic

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Summary

Most policy makers do not yet understand that the obesity epidemic is a normal population response to the dramatic reduction in the demand for physical activity and the major changes in the food supply of countries over the last 40 years. A national focus on individual behaviour reflects a failure to confront the facts. Thus, the changes in food supply and physical environment are socioeconomically driven, and the health sector simply picks up the consequences. Urbanization alone in China has reduced daily energy expenditure by about 300–400 kcal d\(^{-1}\) and cycling/bussing or going to work by car determines another variation of 200 kcal d\(^{-1}\). Thus, energy demands may have dropped with additional TV/media, mechanization and computerized changes by 400–800 kcal d\(^{-1}\), so weight gain and obesity are inevitable for most or all the population. Food intake should have fallen substantially despite the community’s focus on the value of food after all the food crises of the past. Yet, Chinese fat and sugar intakes are escalating, and these policy-mediated features are amplified by the primeval biological drive for those commodities with specialized taste buds for fatty acids, meat, sugar and salt. Yet, traditionally, Chinese diets had negligible sugar, and 25-year-old data show that the optimum diet for Chinese contains 15\% fat. Policies relating to food imports, agriculture, food quality standards, appropriate food traffic light labelling, price adjustments and controlled access to unhealthy foods are all within the grasp of the Chinese government. China has traditionally been far more responsive to the value of policies which limit inequalities and establish standards of care than many western governments, who have yet to recognize that the individualistic free-market approach to obesity prevention is guaranteed to fail. China could therefore lead the way: if it follows western approaches, the health and economic burden will become unsustainable.

Keywords: diet, obesity, physical activity, prevention.

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Introduction

China presents a vivid example of the speed with which the problem of obesity can develop in a country as it goes through what is termed the ‘nutritional transition’. This is particularly remarkable because it is only in 1980 that China provided, from major epidemiological analyses, an example of a country with what we might now consider the optimum distribution of body mass index (BMI) in adults. The average BMI was about 20, and less than 1\% of adults had BMIs of either <16, i.e. extreme underweight or ≥30, i.e. obesity. Therefore, in asking what the principal drivers are which underlie the development of obesity, we need to accept that the forces are so strong that they change the circumstances in which the whole society lives. These changes also occur very rapidly, i.e. within a very few years.

The major changes in population health do not deny the importance of individual susceptibility to obesity. In the west, it is common to think that we need to study those who remain weight-stable and compare them with those who are putting on weight. Then by finding the difference in their eating habits or exercise patterns, we can advise the weight gainers what they should do. This we used to attempt to do 30 years ago until it became clear that our methods of
monitoring people's diets and physical activity are often too crude to pick up differences. With great care and the use of 7-d weighted food intakes, it is possible, e.g. in the UK national survey, to identify those on higher-fat intakes as heavier, but there is a great deal of overlap (1). Now it is clear that within a population living in reasonably similar environments, 40–70% of the difference in BMIs in adults reflects the impact of genetic susceptibility to various environmental factors (2). The impact of the genetic contribution to individual weight gain was vividly demonstrated by Bouchard in his classic overfeeding studies of identical twins. The different pairs of twins put on surprisingly different amounts of weight when deliberately overfed the same amount of food in very standardized circumstances, yet each individual responded in an almost identical manner to their twin pair (3).

Subsequently, analyses have relied on studying cohorts of adults followed up over a 5- to 15-year period, but much of our understanding has also come from physiological intervention studies, which then need to be integrated with other analyses of environmental changes.

Urbanization and the importance of physical inactivity

In China, the average weight of the population is probably increasing by about 0.5 kg per year, with a small proportion of subjects increasing their weight by as much as 2 kg per year. Yet, when calculated on an average daily basis, these differences only amount, given a crude estimate of 7000 kcal kg⁻¹ weight gained, to excess intakes of about 10–40 kcal per day. If we then estimate the traditional Chinese worker as having had a busy physical life working in the field, a man of 60 kg would have been using up about 3125 kcal (assuming a man of 40 years of age and with a very high physical activity level, PAL, of 2.0), so the error in controlling body weight amounts to only about 0.3–1.2% of daily energy intake, despite the evident wide range in daily physical activity patterns and changes in daily food intake. Furthermore, when a man moves from the rural environment into a city to look for work, the expected fall in physical activity may be modest, e.g. with a PAL falling from 2 (i.e. twice the value of his basal metabolic rate, BMR) to a PAL of 1.8. This city work may reflect the demand for work on a building site or in ferrying goods around the town. This would then amount to a daily saving of energy needs of about 315 kcal, because he now needs about 2810 kcal daily. If the man did not have the normal sophisticated unconscious biological control of his intake, which in practice means that he automatically drops his food consumption, he would then put on 1 kg a month, i.e. perhaps 10–12 kg per year, rather than perhaps an observed single kilogram. This illustrates how difficult it is to discriminate simultaneous changes in energy expenditure and intake so that one can assign the proportion of weight gain to changes in physical activity rather than intake. Similarly, the labourer's wife may follow him and, instead of working exceptionally hard in the field with a PAL of 1.9, she now obtains domestic work, a cleaning job or a sewing job in a factory where she has to sit working for many hours at a time. Then her PAL may drop to about 1.6. Her former intake was about 2380 kcal [which, in the new Food and Agriculture Organization (FAO)/World Health Organization (WHO) report on energy requirements (4) for a 50 kg woman, was rounded off to a value of 2400 kcal)]. Now in the city, she needs to eat about 375 kcal less every day to bring her new intake down to only 2005 kcal.

These calculations are set out to illustrate how foolish it is to focus on only one of the two parts of the energy balance equation. The calculations also illustrate the magnitude of the required drop in intake, given the transformation in our working conditions. These include the introduction of mechanical aids at work and the huge increase in computer technology, the use of household aids with the introduction of refrigerators to limit shopping trips, and the fact that cooking and living in the cities immediately leads to a much more confined life than in the broader social context of a village. To this collapse in the demands for physical work, we must now add the use of transport in the towns, so that instead of walking to their fields, the couple now takes buses to work and, when they become more affluent, they attempt to purchase first a motorbike, and then a car. Thus, intakes may need to fall by 400–800 kcal d⁻¹ for each Chinese adult as their working and living conditions change, and the physical revolution transforms working conditions and transport, with city living and home entertainment with television and cinema taking over from the major sustained demands of an agricultural life.

Children's energy needs affected by urbanization

Traditionally, children living in villages had to contribute substantially to the work of the village, and would have been quite active for most of the day. In towns and cities, however, children are much more confined, with parents and grandparents concerned about the dangers of traffic and the ease with which children will get lost if allowed to wander away from home. Thus, children's food needs are also probably dropping. The latest energy requirement estimates, based on D₂O¹⁸ data used in the FAO report, suggest that a 6-year-old boy weighing 20 kg may normally require about 1520 kcal with a PAL of 1.55, but perhaps in China, they actually expended more energy in the fields at perhaps a PAL of 1.65 and, when confined to towns with attendance at school etc., the energy demands drop to a PAL of
1.45. This means that their energy needs would also drop by about 200 kcal daily. This compares at that stage of their development with a need for about 10 kcal day\(^{-1}\) to grow at their normal rate.

**Implications for policies on physical activity in China: urban transport**

Clearly, with the transformation of the economy and living conditions in China, one cannot expect to devise systems for physical activity which would reverse the major trend in falling energy requirements observed over the last two decades. To try to do so would probably be very foolish, because there is reasonable evidence that given the opportunity, human beings – particularly in adulthood – opt for a leisurely and not a physically demanding life. The population will therefore welcome the reduced energy demands and the chance to have more leisure and entertainment with TV, computers, videos etc., at home. Yet the remarkable investment in motor cars and the infrastructure for motorways in the big Chinese cities means not only a major increase in environmental pollution, but also the introduction of a big constraint on the use of bicycles. This feature has become dramatically apparent in Beijing in the last 5 years. The implications of this policy need to be considered.

Table 1 shows a summary of the estimates of energy expenditure (5) when adults travel to work by bike rather than by car or bus. These analyses relate to the 2 h a day which somebody might spend travelling. The physical activity ratio is a similar measure to the metabolic equivalents (METs) used by exercise and sports physiologists, and simply specifies the energy expenditure in kJ or kcal per minute, which is then expressed as a ratio of the BMR. We discovered that this use of BMRs and PALs was a convenient way of standardizing for sex and size differences.

Thus the differences between the 2 h spent in the day travelling to work represent the true additional cost above the BMR of different modes of transport. These data are in-keeping with the finding that possessing a car in China is associated with higher rates of overweight and obesity (6).

When these values are compared with the remarkably small energy excess deposited when somebody is steadily gaining an excess weight of about 0.5 kg in a year, it may then seem clear that the differences in energy use depending on how a population gets to work could make a contribution to limiting the weight gain in the population.

### Are small changes needed?

The low rates of weight gain lead to the idea of trying to promote small changes in energy intake and expenditure, as these seem entirely appropriate for controlling the possibility of putting on only an average of 10 kcal per day. However, one has to remember the remarkable ability of the unconscious but powerful adaptive changes in food intake regulation, which has short-, medium- and long-term components to buffer any change in energy expenditure. This is why weight stability probably used to be the norm despite substantial changes in daily, weekly and seasonal activity. This buffering of any induced energy imbalance implies that we need to change our environmental circumstances much more. Thus, we may need to consider how to induce environmental changes of greater magnitude, e.g. amounting to perhaps 500 kcal per day so that we counteract the small increment in energy stored. Both energy output and intake need to be involved, because in China, where everybody’s appetite control used to be operating daily to boost intake so that energy needs were satisfied, now most Chinese neuronal systems are in a constant mode of trying to shut food intake down.

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**Table 1** The energetic impact of different modes of transport to work in China

<table>
<thead>
<tr>
<th>Time allocated</th>
<th>Cost in METs or physical activity ratio</th>
<th>Total kcal for single activity</th>
<th>Total impact: kcal d(^{-1})</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy imbalance if annual weight gain 0.5 kg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cycle to work</td>
<td>60 min x 1 h each way</td>
<td>4.0</td>
<td>240 x 2</td>
</tr>
<tr>
<td>Take public transport</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walk to bus (min)</td>
<td>10 each way</td>
<td>4.0</td>
<td>80</td>
</tr>
<tr>
<td>Stand in bus (min)</td>
<td>40</td>
<td>1.6</td>
<td>66</td>
</tr>
<tr>
<td>Read in office/home with last spare minute</td>
<td>10 x 2</td>
<td>1.3</td>
<td>26</td>
</tr>
<tr>
<td>Total energy cost of taking public transport</td>
<td></td>
<td></td>
<td>316</td>
</tr>
<tr>
<td>Take car to work</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drive car (min)</td>
<td>30</td>
<td>1.6</td>
<td>48 x 2</td>
</tr>
<tr>
<td>Walk from and to car park (min)</td>
<td>5 each way</td>
<td>4.0</td>
<td>40</td>
</tr>
<tr>
<td>Spare reading or TV time (min)</td>
<td>25 x 2</td>
<td>1.3</td>
<td>32.5 x 2</td>
</tr>
<tr>
<td>Total energy cost of car journey to and from work</td>
<td></td>
<td></td>
<td>201</td>
</tr>
</tbody>
</table>

METs, metabolic equivalents.
This conclusion is reinforced, because a whole range of studies show that the multiple mechanisms to prevent food deprivation are much more powerful than the mechanisms for suppressing food intake.

Table 1 emphasizes that environmentally induced changes in energy needs are important and substantial and, in practice, it is difficult for an individual to counteract these economic forces. If individuals decide to compensate for their driving to work, then every day of the week they would need to go out and walk for 80 min instead of sitting at home. Only by this amount of exercise would they achieve the equivalent extra 280 kcal, which they used to consume when they had to cycle to work. Few individuals are going to do this.

This perspective has major implications for China – instead of investing so heavily in western modes of transport, it would clearly, on the basis of these calculations, be important to limit car use as much as possible, and do everything possible to maintain the long-standing tradition for using bicycles. This approach was recognized a long time ago in the Netherlands and in Denmark, where there has been a systematic promotion of bicycle use. The image for cycling is now so good that the elite and professional groups travel by bike whenever possible. The challenge for China is how to adjust the evident cultural perception that cars are a wonderful and public sign of success and affluence, whereas bicycles may be stigmatized as indicating a failure to use the new economic opportunities. Only governments can create the physical economic and cultural traditions which promote physical activity.

**Dietary changes associated with the onset of obesity in China**

China now has magnificent data showing the astonishing rate at which overweight and obesity have developed over the last 25 years. In the early 1980s, the data on the distribution of adult BMIs in community studies, such as that by Chen and his colleagues involved in the cooperative Cornell/Oxford/China study (7), are extremely informative, and the accompanying data on the dietary patterns are remarkably valuable. At that time, the average fat intake amounted to only 14% of dietary energy, with a range, across the different communities, of 4%–24% and with sugar-negligible intakes. As Popkin and his colleagues have emphasized (8), however, there has been an astonishing increase in fat intake, so that although by 1989 young adults had an average fat intake which had risen to 19.3%, in the subsequent 8 years it jumped to 27.3%, with urban societies having an average fat consumption of 32.8%. Since then, there have been further marked increases, and the latest data from the US Department of Agriculture (9) emphasize the remarkable increases in imports of vegetable oils. Given the major increase in oil imports between 2002 and 2004, we can expect a dramatic increase in obesity and diabetes rates shortly.

**The biological and industrial drivers of fat intake and its consequences**

The usual response to the question of why fat intakes have risen is that fat provides a very attractive component of the diet, which in some way reflects the impact of fat not only on the ‘mouth feel’ of foods, but also on the ability of fat to dissolve volatile fat-soluble compounds which often have extremely pleasant flavours. Humans have a remarkable array of olfactory receptors which respond in a highly complex and integrated way to individual aromas, which also lock in physiologically to our pleasure centres in the amygdala and the frontal cortex. Now, however, there is also increasing evidence that mammals have a specific taste receptor for long-chain fatty acids, which is localized to the circumvallate taste receptors on the tongue but not in those on the palate. These CD36 fatty acid transporters behave as selective receptors for dietary fat, and are the specific mechanism explaining fat preferences (10). Even more interesting is that these responses to fat – at least in rodents – are confined to longer-chain fatty acids with at least one double bond, and the most marked effects are seen with the essential fatty acids (EFAs) linoleic and linolenic acid.

Although these complex animal experiments may seem irrelevant to a public health assessment for China, they are in practice very important, because it now becomes evident that the four biologically active primary and specific taste receptors, i.e. salt, sugar, umami and now EFA receptors are those which relate to what, during our evolution as hunter gatherers, were scarce but essential needs for our survival. Sugar receptors developed not because sugar is at all essential, but because in early evolutionary times the energy demands were being met by fruits and vegetables, so sugar was a good surrogate marker for the need for more food energy. The umami receptor responds to sodium monoglutamate and savoury tastes, such as those in cooked meat which is an extremely valuable source of micronutrients, as well as amino-acids, nucleotides and other bioactive molecules. Now the EFA receptors may explain the great emphasis that hunter gatherers place on the availability of fat in their diet. It would also then be a mistake if we neglected the implications of this in terms of the Chinese diet.

We know that the fat content of foods is not readily detected if one manipulates the fat content of different menus, and Stubbs showed several years ago that volunteers fed 20%, 40% or even 60% fat diets continue to eat the same quantity of food for at least a week (11) without the normal short- or medium-term regulatory measures responding to reduce consumption. Thus inevitably, those
on a high-fat diet – at least in the short term – do not compensate for their extra energy intake. So whether the individual puts on weight then depends on their normal level of physical activity and the increase in their dietary fat content. Stubbs then went on to manipulate the carbohydrate content of the diet and showed that essentially, it was the energy density of the diet which seemed most important (12). In terms of fat, however, volunteers in Cambridge, England could only stay in energy balance when inactive if they eat a diet which contained only 20% fat, i.e. the fat intake consumed in China in the early 1980s. On this basis, it is not surprising that overweight and obesity rates have risen in China in response to the major increase in the fat content of the Chinese diet. Bray and Popkin (13) have shown that the higher the national intake of fat, the greater the national rates of overweight and obesity.

**Do fat intakes always have to rise?**

These studies may indicate that once fat becomes readily available, then overweight and obesity are inevitable if energy expenditure falls appreciably. Is this true? First we have to recognize that the new evidence on specific olfactory receptors shows that saturated fatty acids have no impact, and oleic acid (18:1) – found in olive oil – has only a very little effect. The maximum effects were seen with linolenic acid, the n-3 EFA, and a more modest effect with the n-6 EFA, linoleic acid. These findings would fit the idea that in evolutionary terms, there needed to develop a good responsive system for ensuring intakes of n-3 fatty acids, which were indeed a feature of the hunter gatherer’s diets. There are therefore two important properties of fatty diets – the ability of dietary fat to deliver fat soluble odours and to provide essential fats. Perhaps then, the drive for fat is really reflecting a biological drive for n-3 fatty acids. On this basis, it still seems clear that a minimum amount of fat might be needed, but there is no reason to believe that this amount should exceed perhaps about 20% fat, i.e. the fat intake of China in the late 1980s. This is very different from the original cardiovascular-based policy suggesting an upper limit of 30% fat. This was a pragmatic target aimed at reducing western saturated fat intakes, and was not based on scientific assessments – indeed, the same WHO report (14) proposed that 15% fat intakes were also acceptable, because these were the intakes in Asia and Africa, and therefore applied to the majority of the world!

If fat intakes increase above 20%, we will have major problems, because as physical activity levels decline with age, there is now increasing evidence that older people lose their longer-term ability to spontaneously down-regulate their food intake to bring their weights back into balance over a period of several months after overfeeding. This defective regulation is not seen when young adults are overfed about 1000 kcal d⁻¹ for 3 weeks, but older people fail to lose spontaneously their excess weight (15,16). These studies emphasize the importance of trying to limit the weight gain in younger Chinese adults, because once they are somewhat older and become overweight, their brain regulatory mechanisms are defective in limiting intake. In addition, there is now increasing evidence that overweight/obese adults resist weight losses, because hypothalamic mechanisms for regulating body weight respond by hormonal and neurological mechanisms which adjust food intake in order to prevent weight loss, even though the overweight subjects may have many hundreds of thousands of excess kilocalories stored in their fat depots (17). This hypothalamic adaptation to maintain the excess weight is little understood.

**Factors promoting fat intake**

It has long been recognized that food purchases are dependent not only on the attractiveness of the product – which we have already dealt with – but also on three fundamental influences on a population’s behaviour (i) the relative cost of a product; (ii) its general availability in terms of both easy physical access for the general population and their ability to afford to buy the product and (iii) the marketing of the products. This marketing either influences the direct purchase of the particular food and/or changes the cultural perception of a food.

It is now well recognized that the response to price fluctuations in a population varies according to the commodity, with fats and oils showing the most resistance to price fluctuations, compared with fish, meat, dairy products and fruit and vegetables (18). Nevertheless, in relatively poor communities, the population is extremely responsive to price changes, and this also applies to fats and oils. The price of fats and oils have fallen on the world market to between 20% and 50% of their original cost 40 years ago, and the expectation is that the production of fats, oils and meat will continue to rise over the next 10 years, which is then likely to further reduce their costs (19). China, as it develops economically, is clearly responding politically to the sense that the population has been limited in its ability to buy more expensive foods before. This cultural feature is seen in most countries, and leads to the view that people may now indulge in more pleasurable activities after times of deprivation.

The fatty acids of the different sources of fat also need some careful consideration, given the new WHO/FAO/United Nations University (UNU) report (20) suggesting that care should be taken to ensure that there is enough of the EFA linolenic (18:3; n-3) fatty acid in the diet. In practice, it is now clear that China is importing substantial amounts of palm oil and soya beans, as well as soya oil, the beans being processed in China to produce both animal feed and edible oil. Palm oil provides substantial amounts...
(42%) of the saturated fatty acid, palmitic acid (16:0) and very modest amounts (8%) of linoleic (18:2n-6), and contains negligible amounts of linolenic acid (18:3n-3). Soya on the other hand does have 52% of its fatty acids as linoleic acid, but only about 7% as linolenic acid. This n-6/n-3 ratio is not optimum, e.g. 2–5 as in the original Japanese dietary studies. These optimum values contrast with olive oil containing 11% of linoleic acid and only 1% of linolenic acid. There are negligible amounts of the two essential EFAs in beef, butter or lamb. The amount in pork varies, but again in modern production systems, the EFAs rarely exceed >10% of the fatty acids.

Not only is fat being imported in alarming amounts, but the development of the fast food industry in China is also another major hazard. Clearly, the intense marketing of these products is shifting the traditional diet of the Chinese, and needs constraining from a health point of view. In many parts of the world, *trans* fats are also a common feature of the fast-food industrial products (21), and this, combined with the consumption of rapeseed oil containing appreciable amounts of erucic acid in China, is of real concern (22).

**Measures to limit fat intakes**

**Food labelling**

There are several ways by which fat intakes may be constrained. Consider first a consumer-orientated approach. There is new evidence that a labelling system, which is based on selecting low, medium and high criteria for the fat content of the food and then labelling it graphically with a traffic light system of green, yellow and red warnings, leads to immediate consumer recognition (23) and changes in food purchases, if this has been accompanied by clear publicity telling people that a high-fat diet is bad for them. This labelling system is also used for the other components of the diet, e.g. the sugar and salt content, and can be applied in shops, canteens and restaurants so that people can immediately realize that they are eating the wrong foods. The criteria for foods with a high-fat content in a Chinese context should probably be those fatty foods and diets containing >20% of fat, as this value fits the assessment in the first WHO obesity report (24), and also matches the Chinese experience of fat intakes in association with overweight and obesity rates.

**Food standards – trade restrictions?**

Then there is the need to establish food product, catering and restaurant standards to limit the fat content of foods – this is a method which, when applied throughout the country, might help to limit imports of inappropriate foods, but will not infringe China’s recent signing of the World Trade Organization (WTO) agreements, which inhibit the limitation of trade except on health grounds. China could in theory impose heavy import duties on all unhealthy products, including fats and oils, and invoke the special sub-clauses of the WTO treaty which, under the phyto-sanitary regulations, allow foods harmful to health to be banned or discriminated against. This would then probably require China to go through an international trade dispute, and a simpler way of avoiding this is to manipulate the composition of any standard foods in China itself. This then overcomes any trade objection.

**Food prices**

In addition to imposing new food standards, China could readily manipulate the relative price of fats and sugars in the diet by imposing a tax, and then using this tax to subsidise better commodities, such as vegetables and fruit. There is very good evidence from numerous studies on relative prices that price changes affect the poor more than the rich (25), so there would be a need for China to consider the overall tax and support systems to the rural communities to allow the optimum diets of China to be preserved.

**Marketing to children**

One immediate feature which warrants attention is the need to limit, if not eradicate, any food marketing to children. Children have been shown to be intrinsically vulnerable to messages which often manipulate them to persuade their parents to purchase products which are far from beneficial to their health. There is already a drive to develop marketing restrictions at a WHO level.

**Food availability: promoting local farm produce in cities**

It is apparent that in many countries, rapid urbanization is often accompanied by very poor transport and storage facilities for perishable commodities and, as towns and cities expand, this becomes an ever bigger problem. People then rapidly discover that foods rich in fats and sugars are readily stored for a long time, so when home conditions and storage facilities are bad, purchasing these unhealthy foods becomes very convenient. To counter this requires special measures by local and central government to ensure that food products can come in rapidly from the countryside with effective distribution and sale within the new expanding city areas. This is a major challenge for many governments. In Chile, new measures are being taken to ensure that food products can come in rapidly from the countryside with effective distribution and sale within the new expanding city areas. This is a major challenge for many governments. In Chile, new measures are being taken to ensure that food products can come in rapidly from the countryside with effective distribution and sale within the new expanding city areas. This is a major challenge for many governments.
the vegetables, fruit and other crops which now substitute for the original high-fat/sugary foods provided with the same amount of government money. These economic policies are already helping to reduce the obesity rates of children, and are also helping the local farming communities at no extra cost to the government.

Food businesses in China

The role of the food businesses in China also needs careful consideration. Obviously, it would be ideal if Chinese businesses developed rapidly and provided high-quality, attractive foods which fitted the traditional tastes of the Chinese people. Meanwhile, however, the international food businesses see China as a marvellous opportunity to respond to the relentless demand from their shareholders for an increased turnover and profits on a year-by-year basis. Obtaining and increasing their penetration of Chinese and Indian markets is a top priority for most, if not all, the international food companies. The unfortunate feature of the free-market system which demands constantly increasing profits will mean that many food companies will naturally hope to sell their existing products and market them on the basis of the attractiveness of the western lifestyle. Ideally, however, they should be encouraged to develop new products more in-keeping with the health needs of the Chinese people. Experience suggests that only the imposition of regulatory and marketing standards can facilitate these changes. This then is a complicated economic and political issue.

Conclusions

A British banker, Derek Wanless, when asked by the British Treasury to assess how best to limit the escalating medical costs in the UK, specified that there were three unsustainable risks to the health budget – smoking, obesity and physical inactivity. Wanless then pointed out that obesity was a socioeconomic issue – not a direct health issue. In other words, it was the policies pursued by other government departments that affected food supply and food quality, as well as the built environment. This combination of bad food and poor urban conditions for being active is now described as the ‘obesogenic toxic environment’. Thus, the dominant reasons for having to cope with the major economic handicaps imposed by the medical and work-related costs of chronic diseases associated with obesity require socioeconomic, not health sector reforms (26). This then is the great challenge – how can the community of doctors and others concerned with nutrition and physical activity engage the policy makers at the highest government level? It is probably only at this level that major reforms can be made.

References