Section 1 Background to Obesity, Epidemiology and Anthropology

Chapter 1

The Obesity Problem and its Relationship to Healthcare

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Introduction

Obesity is defined by the World Health Organization (WHO) as 'abnormal or excessive fat accumulation that may impair health.' Body mass index (BMI), is the most widely used measure to classify overweight and obesity. It is calculated as a person's weight in kilograms divided by the square of their height in meters (kg/m^2). In adults, WHO defines overweight as a BMI greater than or equal to 25, and obesity as a BMI greater than or equal to 30.

The global prevalence of obesity more than doubled between 1980 and 2014, and there are now almost two million people with overweight or obesity worldwide. The problem has increased rapidly across most high-income countries and is now growing in many low- and middle-income countries as well. In the UK, around 60% of adults are either overweight or obese, and around a quarter are obese. The problem is linked to deprivation, with the highest levels in the most deprived groups.

Obesity is implicated in many health conditions, including cardiovascular disease, some cancers (such as breast cancer and liver cancer), musculoskeletal problems and poor mental health. It is also a stigmatised condition, and people with obesity may find themselves discriminated against in public, in education, employment and elsewhere.

Despite significant media and political attention in many countries, for at least a decade, there has been little progress in reversing the global epidemic of obesity. Although the prevalence is stabilising in some countries, and some population groups, no country has yet successfully turned the tide and seen a persistent reduction in population prevalence. Tackling the complex problem of obesity will require a major increase in both the extent and intensity of prevention, and in the delivery of treatment. Bariatric surgery is an essential ingredient in this mix.

The Scale of the Problem

A proportion of the population has always been overweight, but the numbers started to climb slowly during the latter part of the twentieth century. In England adult obesity prevalence has increased steadily, rising from 15% in 1993 to 27% in 2015. The combined prevalence of both overweight and obesity is 68% in men and 58% in women. The geographical distribution shows a higher prevalence in the Midlands and the North of England, and the lowest in London and the South. There is relatively little variation by socio-economic status in men, but in women the range is from 17% in the highest-income quintile to 39% in the second lowest.

The patterns are different in children. In 1984 only 1.2% of boys were obese, compared to 6.0% in 2002–2003, while in girls the figures ranged from 1.8% in 1984 to 6.6% in 2002–2003. This compares with obesity prevalence in 2015–2016 of 9% in 4–5-year-olds and 20% among 10–11-year-olds.

These figures are linked to stark socioeconomic differences, with an obesity prevalence of 13% among 4–5-year-olds living in the most deprived areas of the country compared to 5% among those in the least deprived. In 10–11-year-olds the figures were 26% in the most deprived areas, compared to 12% in the least deprived areas. In both age groups the size of these inequalities has increased over time and continues to widen. These differences are reflected in appreciable geographical variation, which is largely driven by differences in socio-economic status between different parts of the country.

There are wide differences between countries, with a prevalence of almost 40% in the United States of America, and high levels in countries such as Mexico, Canada, Australia and New Zealand, as well as the UK. Japan and Korea, however, both have an adult obesity prevalence of less than 5%, and countries such

as Norway, Switzerland and the Netherlands all have low levels of around 10% prevalence.

The Burden of Obesity

Obesity is very closely associated with type 2 diabetes mellitus, and hypertension is twice as common among obese adults as it is in those of normal weight – around 40% of the former compared to around 20% of the latter. Obesity-related liver disease is increasing rapidly, and although the progression of the condition is not yet fully understood there is a high likelihood that it will become a major problem in the coming years.

Obesity is increasingly classified as a disease in its own right, although this remains contentious. The American Medical Association adopted the classification in 2013, and the World Obesity Federation followed suit in 2017. The World Obesity Federation took an epidemiological approach, in which food is viewed as the primary disease agent, acting on the body to produce disease. Positioning obesity in this way may be helpful in a healthcare context as a strong argument in favour of allocating resources towards prevention and treatment of the condition. This approach is not, however, without its critics, who have voiced concerns that obesity is primarily a risk factor for other conditions, rather than a disease in its own right, and medicalising a condition that is largely driven by the circumstances in which people live may place undue focus on individual-level rather than population-level responses.

Effects on Morbidity and Life Expectancy

In 2001, a report by the National Audit Office estimated that approximately 6% of all deaths in England in 1998 were caused by obesity – amounting to 30 000 excess deaths in that year. This is comparable to another study that found that 8.7% of deaths in the UK were attributable to obesity, the highest proportion in Europe.

Adults with severe obesity (with a BMI greater than 40) have increased risks of dying at a young age from many causes, including cancer, heart disease, stroke, diabetes and kidney and liver diseases, and experience dramatically reduced life expectancy compared with people of normal weight.

A major meta-analysis of data from long-term cohort studies involving almost 900 000 participants found that mortality was lowest at about 22·5–25 kg/m^2 in both men and women, and each 5 kg/m^2 BMI above this was on average associated with increased mortality of around 30%. Median life expectancy was reduced by 2–4 years in the BMI range 30–35 kg/m^2, and by 8–10 years in the BMI range 40–50 kg/m^2.

Effects on Healthcare Costs and the Wider Economy

A 2014 report found that obesity is a greater burden on the UK's economy than armed violence, war and terrorism, costing the country nearly £47bn a year and generating an annual loss equivalent to 3% of GDP. More than 2.1 billion people around the world – or nearly 30% of the global population – are overweight or obese, with the figure set to rise to almost half of the world's adult population by 2030.

Estimates of the direct costs to the NHS for treating overweight and obesity, and related morbidity in England, have ranged from £479.3 million in 1998 to £4.2 billion in 2007. Estimates of the indirect costs (those costs arising from the impact of obesity on the wider economy, such as loss of productivity) over the same time ranged between £2.6 billion and £15.8 billion.

Modelled projections suggest that indirect costs could be as much as £27 billion by 2015. In 2006–2007, obesity and obesity-related illness was estimated to have cost £148 million in inpatient stays in England. In Scotland, the total societal cost of obesity and overweight in 2007–2008 was estimated to be between £600 million and £1.4 billion; the NHS cost may have contributed as much as £312 million.

Drivers of Obesity

At the most basic level, overweight and obesity are the result of long-term overconsumption of food energy relative to energy expenditure through physical activity. Even a small excess of under 100 kcal/day can result in appreciable weight loss when maintained over the medium to long term.

Underpinning these outcomes is a multitude of factors, ranging from the behaviour of multinational food companies, through urban design and patterns of travel, to individual level preferences, behaviours, physiology and genetics. The common outcome of excess body fat may be driven by widely varied factors in different individuals and across different population groups.

The dominant framing of obesity is of a condition that is driven by a failure of self-control on the part of individuals, but the overwhelming scientific consensus is that this is not an appropriate conceptualisation of the problem. There is no evidence of a decline in levels of willpower or self-control across populations that have experienced large rises in the prevalence of obesity, but the environments in which people live have changed hugely in recent decades. It is unquestionably possible to eat a healthy diet and engage in adequate levels of physical activity, but the ubiquity of cheap, appealing, energy-dense food, and widespread barriers to regular physical activity, stack the odds against many of us. Obesity is in large part driven by these kinds of factors, which are collectively known as the 'obesogenic environment'. Individual-level factors still play a part, but they have played a much smaller part in the rise in prevalence of obesity over recent decades than these environmental factors. Effective responses to obesity thus need to take account of these underpinning drivers of the problem, striking a balance between upstream population-level actions and downstream individual-level interventions.

Prevention and Treatment

A balance is also needed between prevention and treatment of obesity, which overlap considerably. Obesity in childhood has a tendency to track through into adulthood and once excess weight is established it is very hard to lose it. There is thus a strong rationale for policy to focus on preventing children from becoming overweight or obese in the first place, and for minimising the likelihood of weight gain across the population. There are, however, large numbers of people who are already obese, many of whom might benefit from treatment, as well as ongoing prevention of further increases in weight.

Obesity is a complex problem. The choices we make about the food we buy, cook and eat, and the physical activity we engage in, are shaped by multiple factors that interact in often unpredictable non-linear ways across dynamic systems, ranging, for example, from agricultural policy and the price of fuel, to density of fast food restaurants and the availability of cycle lanes on one's commute. Effective responses to obesity will need to act across all levels of these systems, using many different mechanisms, and it is likely to take several decades for all the required changes for a comprehensive response to be in place.

Despite overwhelming scientific consensus on the need for strong, upstream action, and political endorsement of this, there is a consistent bias towards downstream individual-level actions, which tend to require high levels of agency for maximal effect; this is known as 'lifestyle drift'. This needs to be recognised, and strong and effective upstream actions taken to reverse these biases.

A wide range of actions is needed across food and physical activity systems. These should address the physical, socio-cultural, economic and political environments within which people live. This could lead to a range of responses, such as infrastructure for safe cycling, restrictions on advertising and marketing of unhealthy foods to children, taxes on sugar-sweetened drinks and national planning policy on walkable cities. Achieving a comprehensively healthy environment that truly promotes healthy eating and adequate physical activity will take many years, and steady progress will be required, with sustained action across these and other domains at global, national, regional and local levels.

Treatment options range from weight management programmes to drugs and bariatric surgery. There is evidence of effectiveness of some commercial weight-loss programmes in adults, but the evidence of effectiveness of these kinds of interventions in children is weaker.

A number of medications have been used for weight loss, but as a result of safety concerns most have either not been licensed for use in the UK or have been withdrawn from sale. Orlistat, which reduces dietary absorption of fat, is available at the time of writing and other medications may well be developed in the future.

The mainstay of treatment of severe obesity is bariatric surgery, which is addressed in detail later in this book (see Section 6). Bariatric surgery is a major undertaking for the person concerned, requiring lifelong changes to eating habits in ways that many people find challenging, but in appropriately selected individuals it can lead to rapid resolution of type 2 diabetes, effective and maintained weight loss, and improvement or resolution of hyperlipidaemia, hypertension, obstructive sleep apnoea and musculoskeletal disorders, with improved quality of life.

Guidance from the National Institute for Health and Care Excellence (NICE) recommends bariatric surgery for people with a BMI greater than 40 kg/m^2 and people with a BMI between 35 and 40 kg/m^2 with

other significant disease. It may also be beneficial in people with a BMI greater than 30 who have poorly controlled type 2 diabetes and people of Asian origin with recent-onset type 2 diabetes, as Asian people are more vulnerable to complications of diabetes than people from other population groups.

The NICE guidance is very clear about the need for support from a multidisciplinary team that is able to conduct thorough pre-operative assessment, regular post-operative assessment, including specialist dietetic and surgical follow-up, and psychological support before and after surgery. In order to be eligible for bariatric surgery in England an individual should have exhausted all appropriate non-surgical measures, and have received intensive weight loss support.

Although bariatric surgery is expensive (around £6000 per procedure in 2015) it is cost-effective because of the significant health benefits it can lead to. However, despite its importance as an individual-level intervention, it has limited impact at population level: there are well over a million people with a BMI over 40 in the UK, but only around 6000 bariatric procedures are conducted each year.

Conclusions

Obesity represents one of the most pressing health problems of our time. It has increased rapidly across the world over recent decades, and shows no signs of abating. Almost two-thirds of the population of the United Kingdom is overweight or obese at a level that increases the risk of multiple health problems. This not only carries major personal and financial costs for those individuals, it also has significant impacts on health systems and society as a whole.

Despite widespread policy attention, and some investment, no country has yet reversed this trend. But there are positive signs in some high-income countries that the increase in prevalence is slowing, and perhaps even stopping. However, even if there is a major decline in population prevalence over the coming years, a large proportion of the population will remain overweight and obese, and many of these people would stand to benefit from treatment.

Bariatric surgery is a cost-effective procedure that has the potential to transform the lives of severely obese individuals, attenuating or even reversing many of the important health consequences of the condition. Well under 1% of potentially eligible patients receive this procedure each year, but as the obesity epidemic progresses it seems highly likely, not only that the level of activity in bariatric surgery will increase, but that the case mix is also likely to change and include greater numbers of severely obese individuals. Greater knowledge and understanding of how best to respond to this is essential, across the health system and among the professionals who will have to deliver this care.

Further Reading

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