Cost-effectiveness of obesity treatment

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Abstract

Limitations in epidemiological data means that most health economic analyses have provided incomplete estimates of the total financial burden of obesity on healthcare: more complete data are needed on multiple disease risks and costs attributable to overweight and obesity, stratified by age, sex and BMI, particularly for severe and complicated obesity. UK primary care data indicate that the annual healthcare costs of patients with BMI 20–21 kg/m^2 (ideal body weight) are about half those at BMI 40 kg/m^2, for both men and women. Cost-effectiveness of structured weight management is high over patients' lifetimes (potentially cost-saving). Drug treatments and bariatric surgery are also highly cost-effective, but have greater unit costs and so afford less net benefit at a population level. Before these interventions can reduce the spiralling healthcare costs associated with obesity, short-term spending is necessary to establish services that will become cost-effective over a longer period.

Keywords Cost-avoidance; cost-effectiveness; healthcare resource; weight management

Obesity treatments have been viewed as frivolous, ineffective or highly expensive. However, the rising, avoidable cost of leaving obesity untreated may exceed the costs of treatments.

The Foresight Report predicted that indirect costs of obesity would reach £27billion by 2015,[1] while Dr Foster Research estimated that obesity-related inpatient stays cost £148 million in England in 2006/2007.[2] The Scottish Government Route Map Towards Healthy Weight reported that the total societal cost of obesity in Scotland in 2006/2007 was between £600million and £1.4billion.[3]

Many publications have reported the clinical burden of obesity compared with the 'normal weight' range (i.e. body mass index (BMI) 18.5–25 kg/m^2) and most health economic analyses have related costs of obesity to the BMI associated with the lowest health costs (i.e. <21 kg/m^2), which is not an achievable target for interventions. Interventions do not shift the entire obese or overweight population into the normal weight range. Indeed, most successful weight-losers remain in the obese or overweight categories.

Some important facts need to be considered:

- About 25% of adults have BMI >30 kg/m^2, but by age 65, 40% are obese and 5% reach BMI >40 kg/m^2.
- Increasing weight brings increasing health and economic costs that continue into older age groups, who accumulate more medical consequences of overweight/obesity.
- The healthcare and social costs of overweight and obesity are very high, greater for men than for women, and start to rise as BMI exceeds 23 kg/m.[2]
- Moderate (5–10 kg) weight loss is achievable using a variety of low-cost measures and can be sustained long term by 30–40% of patients.
- Rapid and substantial weight reduction (>15 kg) is achievable by 33% of patients with severe and complicated obesity using structured programmes, involving a phase of total diet replacement followed by intensive support to maintain weight loss.
- Bariatric surgery is increasingly accepted as a safe and highly effective treatment generating sustained weight losses of 20–60 kg.

Unlike other diseases in which new treatments are compared with old, the health economic debate for obesity treatment currently hinges on the impact of a realistic (moderate) level of weight loss, maintained for a feasible period, on the current cost of doing nothing (the cost of an unhalted age-related weight increase).

Cost-effectiveness

Cost-effectiveness, or 'efficiency', analysis estimates net benefits in relation to cost in a real-life, or routine-care setting. A 'treatment' or management has costs that may include investigations, monitoring and multidisciplinary support. For some diseases, and treatments such as bariatric surgery for obesity, there may be need for life-long support. The aim of treatment is to prevent some future medical consequences of obesity. This has two economic components. First, better quality of life, for longer, which is quantified using 'QALYs' (quality-adjusted life years; a QALY is the estimated number of future years during which the person enjoys perfect quality of life). Delaying a consequence of obesity, such as diabetes, will add QALYs, and the amount can be computed from epidemiological data on the incidence of diabetes in relation to sex, age and BMI. The second economic outcome is the reduction in lifetime healthcare costs that result from delaying secondary medical consequences. For a consequence such as diabetes, this can be very large. This cost-avoidance offsets the cost of treatment when computing the cost per QALY gained.

The economic costs of any disease include the costs of treatment of the disease itself, plus the cost of conditions caused or aggravated by it. For obesity, this secondary component is by far the larger. Most complications of obesity are multifactorial, so the attributable fraction (by how much the complications would

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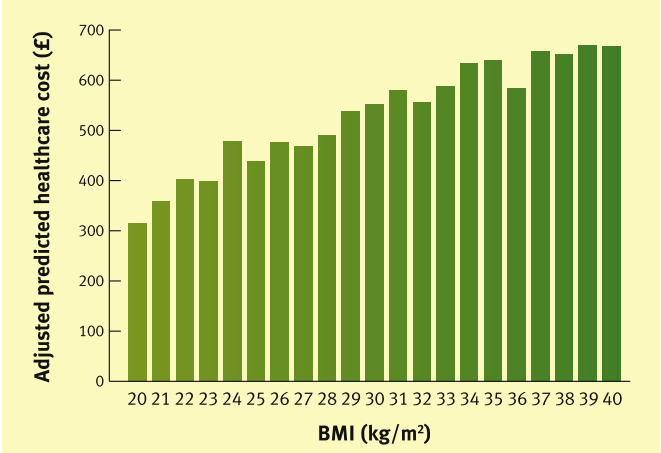
be reduced if obesity had not developed) must be determined. Conventionally, this is estimated from data on the excess prevalence of diseases in people with BMI >30 kg/m^2, as compared to a reference BMI category without obesity, and then applying a standard figure for the cost of having the secondary disease. To be able to do this, it is necessary to have data on disease prevalence broken down by sex, age and BMI. Such data are available for only a few diseases that may occur as a consequence of obesity — coronary heart disease (CHD), diabetes, colon cancer, and gall bladder disease. Many other medical conditions are aggravated by obesity (as shown by greater drug usage in almost all pharmaceutical categories) but these cannot be used for conventional cost-effectiveness analysis as the estimates of the attributable costs of obesity are incomplete. Moreover, for many diseases, the treatment costs are likely to be greater for the obese — bigger drug doses, longer periods of treatment and longer hospital stays with more complications. Thus, using standard costs for disease treatments is likely to underestimate total costs of obesity.

An alternative approach, used by the UK Counterweight Programme, was to collect data on all healthcare costs for people across a wider range of BMI, from primary care records. Figures 1 and 2 show the composite costs of total NHS expenditure calculated by adding the costs of drug prescriptions, GP attendances, secondary care referrals for medical and paramedical appointments, and hospital admissions. The costs were adjusted for age, physical activity level, alcohol consumption and smoking status. It was not possible to capture all the costs of items such as GP investigations. The annual healthcare costs of patients with BMI 20–21 kg/m^2 (ideal body weight) are about half those at BMI 40 kg/m^2, for both men and women. This method also allows estimation of the reduction in costs that might result from weight loss achieved by realistic treatment. Treatments cannot return all patients to the low-cost reference category used in most health economic analyses (e.g. BMI <25 kg/m^2, <22 kg/m^2 in some studies, or even <30 kg/m^2). It is tempting to apply the weight/BMI reduction achieved by treatment to these graphs, to predict the cost savings of effective treatment. However, there may have been permanent damage as a result of a period of obesity, the costs of which cannot entirely be reversed. Preventing weight gain in the first place is more likely to avoid the extra attributable costs.



Calculated by adding the costs of drug prescriptions, GP attendances, secondary care referrals for medical and paramedical appointments, and hospital admissions. After adjusting for age, sex, smoking, physical activity and alcohol consumption, annual healthcare cost increased with increasing BMI.

Figure 1 Total annual healthcare costs by unit increments in BMI among patients whose weight had been measured in UK primary care.

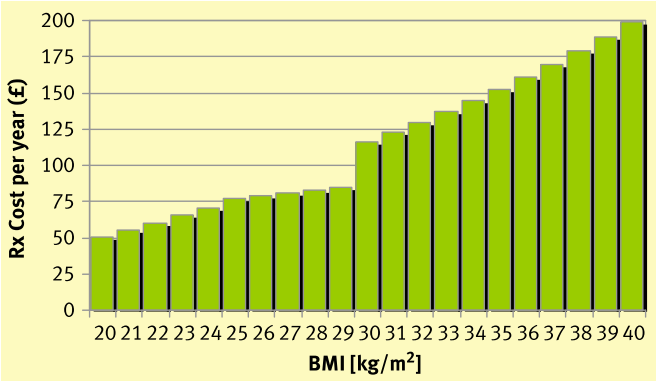


Figure 2 Increase in total annual drug prescribing costs by one-unit increments of BMI among men whose weight had been measured in primary care.[4]

The cost of intervention for weight impact

Treatments for obesity need to provide for initial weight loss, for long-term maintenance, and for priority treatment of risk factors. All these components involve costs over periods of time. 'One-off' treatments such as bariatric surgery still require life-long supporting and monitoring measures for weight maintenance and nutritional status/adequacy of intake, and there are additional anticipated costs (e.g. for revisionary surgery, plastic surgery).

The cost-saving and cost-avoidance from realistic interventions

There are few short-term economic savings from effective weight management, but savings emerge through a reduced burden of secondary diseases attributable to obesity (especially type 2 diabetes mellitus (T2DM), CHD, colon cancer, arthritis and depression). These are all multifactorial conditions that develop over time. In thinner people, including those who have lost weight, they all develop more slowly with a longer disease-free span before healthcare costs arise.

Drug prescribing accounts for around 12% of total UK National Health Service expenditure, and 25% of total primary care budgets. Figures 2 and 3 demonstrate the comparative resource implications of normal weight, overweight and obesity. Increasing cost for each unit increase in BMI is observed from a BMI of 20 kg/m^2 through to a BMI of 40 kg/m^2. The steeper gradient in males is not surprising, females being more likely to be regular GP attenders in the absence of chronic illness, whereas males tend to attend once clinical problems such as cardiovascular disease and diabetes have developed. At a BMI of 40 kg/m^2 drug prescription costs are about four times more than at a BMI of 20–21 kg/m^2 in men, and three times more in women.[4]