Reducing overweight and obesity: closing the gap between primary care and public health

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Background. Although overweight and obesity are major risk factors for ill health and premature death, leading to significant increases in workload and prescribing costs, primary health care providers continue to find managing overweight and obesity a difficult business.

Objectives. Six questions are addressed in an attempt to close the gap between primary care activities and public health goals to reduce overweight and obesity: what is overweight and obesity; what is the health impact of overweight and obesity; is individually directed advice effective in reducing overweight and obesity; can we increase the involvement of primary care in reducing overweight and obesity; how can public health actions complement the role of primary care; and how do we chose cost-effective interventions?

Method. Systematic reviews and key texts were identified from literature searches to provide a narrative summary to answer the six questions.

Results. Overweight is defined as a body mass index (BMI) of $\geq 25$ and obesity as a BMI of $\geq 30$, where BMI = weight (kg)/height (m$^2$). There is a positive relationship between the level of BMI and a wide range of conditions, including cancers and cardiovascular diseases. There is evidence that individually directed advice can reduce overweight and obesity or its risk. There is mixed evidence for the effectiveness of strategies in increasing the involvement of primary care in reducing overweight and obesity. There are many examples of public health actions that complement the role of primary care in reducing overweight and obesity. Overall cost-effective policy analyses have not been done per se for overweight and obesity but have shown that a combination of personal and non-personal interventions can be effective and cost-effective in reducing cardiovascular events.

Conclusion. The gap between primary care and public health in reducing overweight and obesity can be closed, but it requires sustained political support and investment.

Keywords. Nutrition, obesity, primary care, public health.

Introduction

Overweight and obesity are major risk factors for ill health and premature death for individuals and populations and are set to become more important. The World Health Organization uses a summary measure of ill health, called the disability-adjusted life year (DALY). One DALY is a year of premature death, or ill health, adjusted for the severity of the ill health. It measures the gap between current health status and what could be achieved. In Europe, overweight is responsible for more than 7% of the total health gap, making it currently the fourth most important risk factor for ill health and premature death after tobacco, blood pressure and alcohol, and followed by a raised cholesterol level and inadequate physical activity.\textsuperscript{1} Overweight and obesity are not just European phenomena but occur throughout the world. The probability of being overweight is predicted to increase over the coming years, with attendant increases in overweight and obesity-related illnesses and health service costs.\textsuperscript{2,3} Nearly, two-thirds of the US population are overweight or obese, some one-third of the Brazilian population and some one-fifth of the Chinese population. Some of the greatest increases in the prevalence of overweight and obesity in recent years have occurred in South America and south-east Asia. Since the mid-70s, the prevalence of obesity has
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increased sharply among adults aged 20–74 years in the US from 15.0% to 33% in 2003, with overweight and obesity accounting for 9.1% of total US medical expenditures in 1998.

Overweight and obesity increase primary care workload and costs to primary care. For example, the Counterweight project team in the UK mapped general practice consultations of obese people [body mass index (BMI) ≥ 30 kg/m²] compared with a control group of normal weight people (BMI = 18.5–24.9 kg/m²) across 80 general practices. Odds ratios for four or more consultations over an 18-month period increased linearly from 1.48 for those with a BMI between 30 kg/m² and 32.49 kg/m² to 2.08 for those with a BMI of ≥40 kg/m², compared with normal weight people, and controlling for age, gender and deprivation score. The Second Dutch National Survey of General Practice similarly found a linear relationship between BMI and annual consultation and prescribing rates for both men and women. At a BMI of <25 kg/m², the proportion of men and women who consulted at least once during the year 2001 were 72.7% for men 85.6% for women, increasing to 76.1% and 88.0% for those with a BMI of >25 kg/m² to <30 kg/m² and 82.8% and 90.0% for those with a BMI >30 kg/m², respectively. At a BMI of <25 kg/m², the proportion of men and women who received at least one prescription from their GP during the year 2001 were 60.7% for men and 82.5% for women, increasing to 70.5% and 86.7% for those with a BMI of >25 kg/m² to <30 kg/m² and 79.8% and 90.0% for those with a BMI >30 kg/m², respectively. The average number of GP visits and of prescriptions showed similar trends. For example, among 55- to 74-year-old men and women, the number of GP visits increased from 5.2 (men) and 6.2 (women) for those with a BMI <25 kg/m² to 5.5 (men) and 7.1 (women) for those with a BMI of >25 kg/m² to <30 kg/m² to 5.8 (men) and 9.5 (women) for those with a BMI >30 kg/m². Among the same age group, the number of prescriptions increased from 8.3 (men) and 9.9 (women) for those with a BMI <25 kg/m² to 9.5 (men) and 12.8 (women) for those with a BMI of >25 kg/m² to <30 kg/m² to 12.7 (men) and 18.0 (women) for those with a BMI >30 kg/m².

Although primary care can be an important source of food and health information for the public, with patients who are advised to lose weight by a doctor being significantly more likely to attempt to do so than those not advised, and although primary care providers believe weight management is part of their role, they perceive their effectiveness as poor. Patients have a poor acceptance of such interventions and they rate physicians’ traditional approach to weight management as unhelpful. The approaches most likely to support patients in achieving lifestyle change such as long-term follow-up, self-monitoring and social support are the least likely to be considered important or practised in primary care. Primary care clinicians often hold negative attitudes towards overweight or obese patients and this may impede practitioner and patient interaction. Primary care providers rate the treatment of obesity as being significantly less effective than therapies for 9 out 10 chronic diseases.

Even though managing overweight and obesity in primary care seems a difficult business, there are extensive guidelines available for clinical practice. For example, the National Institute for Clinical Excellence in the UK has provided probably the most comprehensive set of clinical guidelines for the prevention, identification, assessment and management of overweight and obesity in adults and children. The clinical interventions for primary care providers are built around the Prochaska and DiClemente model of change, which primary care providers commonly use in advice to stop smoking and reduce alcohol consumption and include self-monitoring of behaviour and progress, stimulus control, goal setting, slowing rate of eating, ensuring social support, problem solving, assertiveness, cognitive restructuring (modifying thoughts), reinforcement of changes, relapse prevention and strategies for dealing with weight regain.

This paper discusses the role of primary care in reducing overweight and obesity, through addressing six questions: what is overweight and obesity; what is the health impact of overweight and obesity; is individually directed advice effective in reducing overweight and obesity; can we increase the involvement of primary care in reducing overweight and obesity; how can public health actions complement the role of primary care; how do we choose cost-effective interventions? By considering the answers to these questions, it is hoped that the gap between primary care and public health in reducing overweight and obesity can be closed.

**Question 1: what is overweight and obesity?**

Before it is possible to know with whom to intervene and to monitor and evaluate the effectiveness of interventions, an agreed and standardized definition of overweight and obesity is required. Overweight and obesity have been defined by the World Health Organization based on the BMI which is calculated as [weight (kg)/height (m²)]. A normal BMI for an adult is considered to lie between 18.5 and 24.9. Overweight is defined as a BMI of 25 or more and obese as a BMI of 30 or more. These levels are based on mortality risk in relation to BMI, which shows a J-shaped relationship with higher mortality at lower BMI levels. However, it should be noted that the cut-off levels occur in a relationship between BMI, at least from a value of 18.5 onwards, and the risk of premature mortality that is largely dose related and linear,
with no obvious upward flexion of the curve at BMIs of 25 or of 30. In addition to BMI, waste circumference is also an independent risk factor. Men with a waist circumference of 94 cm or more are at increased risk of health problems. If their waist circumference is 102 cm or more, even at a healthy weight (BMI 18.5–25 kg/m²) they are at increased risk.

Women with a waist circumference of 80 cm or more are at increased risk of health problems. If their waist circumference is 88 cm or more, even at a healthy weight (BMI 18.5–25 kg/m²) they are at increased risk.

**Question 2: what is the health impact of obesity?**

There is a wealth of epidemiological studies which describe the relationship between level of BMI, waste circumference and risk of a wide range of illnesses. The Table 1 below summarizes the relative risk for a number of conditions, some of which are described in more detail below.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Relative Risk</th>
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<tbody>
<tr>
<td>Type 2 diabetes</td>
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<td>Coronary heart disease</td>
<td>2–3</td>
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<tr>
<td>Cancer</td>
<td>1–2</td>
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<td>Gall bladder disease</td>
<td>3</td>
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<td>Hypertension</td>
<td>4</td>
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<td>Reproductive hormone abnormalities</td>
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<td>Dyslipidaemia</td>
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<td>Osteoarthritis (knees)</td>
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<td>Polycystic ovary syndrome</td>
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<td>Insulin resistance</td>
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<td>Hyperuricaemia and gout</td>
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<td>Impaired fertility</td>
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<td>Breathlessness</td>
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<td>Sleep apnoea</td>
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<td>Low back pain</td>
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<tr>
<td>Increased risk of anaesthetic complications</td>
<td>15</td>
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<tr>
<td>Foetal defects (associated with maternal obesity)</td>
<td>16</td>
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**Cancers**
The relative risk of death from cancer increases in a dose–response relationship with increasing BMI, such that at a BMI of 30, the risk is increased 1.5 times compared with a BMI of <21. The second World Cancer Research Fund/American Institute for Cancer Research (WCRF/AICR) report on Food, Nutrition, Physical Activity, and the Prevention of Cancer found convincing evidence that overweight and obesity increased the risk of cancers of the oesophagus, pancreas, colorectum, breast (in post-menopausal women), endometrium and kidney in dose response relationships. For cancer of the oesophagus, for example, the relative risk was 1.11 per kg/m². One of the main risk factors for being overweight or obese is decreased physical activity, and the second WCRF/AICR report on Food, Nutrition, Physical Activity, and the Prevention of Cancer found convincing evidence that physical activity decreased the risk of cancer of the colon and probable evidence for decreasing the risk of cancers of the breast (in post-menopausal women) and endometrium. The relative risk for breast cancer was 0.9/(7 metabolic equivalent hours/week).

**Cardiovascular disease**
The relative risk of death from cardiovascular disease increases in a dose response relationship with increasing BMI, such that at a BMI of 30, the risk is increased 3.5 times compared with a BMI of <21. Data from the Asia Pacific Cohort Studies Collaboration found a monotonic relationship between the risk of ischaemic heart disease events and BMI over 18, with a hazard ratio (HR) of 2.0 at a BMI of 30. There were similar relationships with haemorrhagic stroke (HR = 1.6) and ischaemic stroke (HR = 2.0).

**Diabetes**
Of all serious illnesses, Type 2 diabetes has the strongest association with obesity. The metabolic problems which give rise to this type of diabetes most commonly occur as a result of excess body weight, with the risk of developing Type 2 diabetes rising with increasing BMI. Women who are obese are 12 times more likely to develop non-insulin-dependent diabetes than women of a healthy weight and men five times as likely. The increase in risk of diabetes with increasing BMI is seen at all levels of physical activity.

**Osteoarthritis**
The prevalence of osteoarthritis increases from 0.4% in men and 7.8% in women with a BMI of <18.5 through 4.6% in men and 8.5% in women with a BMI between 25 and 30 to 10% in men and 17% in women with a BMI of 40 or more.

**Question 3: is individually directed advice effective in reducing obesity?**

A number of systematic reviews have tested the effectiveness of individually directed advice in reducing overweight and obesity or the risks for overweight and obesity. Systematic reviews of the Cochrane collaboration have found favourable outcomes for the effectiveness of individually directed advice.

One systematic review of the effectiveness of psychological interventions for overweight or obesity as a means of achieving sustained weight loss found a total of 36 studies that met the inclusion criteria. The majority of studies assessed behavioural and cognitive-behavioural weight reduction strategies.
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Behaviour therapy was found to result in significantly greater weight reductions than placebo when assessed as a stand-alone weight loss strategy [weighted mean difference (WMD) −2.5 kg; 95% confidence interval (CI) −1.7 to −3.3]. Increasing the intensity of the behavioural intervention significantly increased the weight reduction (WMD −2.3 kg; 95% CI −1.4 to −3.3). Cognitive-behaviour therapy, when combined with a diet/exercise intervention, was found to increase weight loss compared with diet/exercise alone (WMD −4.9 kg; 95% CI −7.3 to −2.4).

A second systematic review tested the effectiveness of exercise as a means of achieving weight loss in people with overweight or obesity, using randomized controlled clinical trials. Twenty-three studies with a total of 3476 participants who had an exercise prescription were included in the review. When compared with no treatment, exercise resulted in small weight losses across studies. Exercise combined with diet resulted in a greater weight reduction than diet alone (WMD −1.0 kg; 95% CI −1.3 to −0.7). Increasing exercise intensity increased the magnitude of weight loss (WMD −1.5 kg; 95% CI −2.3 to −0.7). Exercise as a sole weight loss intervention resulted in significant reductions in diastolic blood pressure (WMD −2 mmHg; 95% CI −4 to −1), triglycerides (WMD −0.2 mmol/l; 95% CI −0.3 to −0.1) and fasting glucose (WMD −0.2 mmol/l; 95% CI −0.3 to −0.1).

A third systematic review tested the impact of dietary advice to achieve sustained dietary changes or improved cardiovascular risk profile among healthy adults. Thirty-eight trials with 46 intervention arms (comparisons) comparing dietary advice with no advice were included in the review. Meta-analysis found that dietary advice reduced total serum cholesterol by 0.16 mmol/l (95% CI 0.06–0.25) and low-density lipoprotein (LDL) cholesterol by 0.18 mmol/l (95% CI 0.1–0.27) after 3–24 months. Dietary advice reduced blood pressure by 2.07 mmHg systolic (95% CI 0.95–3.19) and 1.15 mmHg diastolic (95% CI 0.48–1.85) and 24-hour urinary sodium excretion by 44.2 mmol (95% CI 33.6–54.7) after 3–36 months. Compared to no advice, dietary advice increased fruit and vegetable intake by 1.25 servings/day (95% CI 0.7–1.81) and dietary fibre intake by 5.99 g/day (95% CI 1.12–10.86). Dietary total fat as a percentage of total energy intake fell by 4.49% (95% CI 2.31–6.66) with dietary advice and saturated fat intake fell by 2.36% (95% CI 1.32–3.39).

Question 4: can we increase the involvement of primary care in reducing overweight and obesity

There are two main ways in which the involvement of primary care in reducing overweight and obesity could be increased: providing professional and organizational support and training and by offering financial incentives.

A systematic Cochrane review to assess whether health professionals' management or the organization of care for overweight and obese people could be improved found 18 studies involving 446 providers and 4158 patients. Six studies were identified for comparing professional-oriented interventions (the use of reminders and training) (5) and professional and organizational interventions of shared care. Twelve studies were identified for post hoc comparison of different organizational interventions, either the deliverer of weight loss interventions or the setting of interventions. Unfortunately, most of the studies had methodological shortcomings. Along with small sample sizes and reasonably high drop-out rates among patients, the review could not draw firm conclusions on how the management of obesity might be improved from the available evidence, although reminder systems, brief training interventions, shared care, in-patient care and dietician-led treatments may all be worth further investigation.

For example, a 4.5-hour training programme promoting an obesity management model found that patients from general practices who had received the training were more likely to have had their weight recorded in their medical records (61%) than patients of GPs who had not received training (42%). Further, a target weight and dietary targets were also more likely to have been recorded. However, 12 months after the training, there were no differences in BMI between the patients of the trained GPs and the patients of the non-trained GPs.

The limited available evidence for the impact of interventions changing primary health care providers behaviour in the management of overweight and obesity is in contrast to tobacco and alcohol, where there is good evidence that providing professional and organizational support and training leads to improved provider behaviour.

An example of paying for quality service is the English Quality and Outcomes Framework (QOF), which is an annual reward and incentive programme detailing GP practice achievement, introduced as part of the GP contract in 2004 as a voluntary process. QOF awards practices’ achievement for: managing some of the most common chronic diseases, e.g. asthma, diabetes; how well the practice is organized; how patients view their experience at the doctor and the amount of extra services offered such as child health and maternity services. For example, a QOF for the management of hypertension includes, among other things, the necessity to produce a register of patients with established hypertension, the percentage of patients with hypertension whose notes record smoking status at least once and the percentage of patients with hypertension in which there is a record of

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the blood pressure in the past 9 months. Currently, the measurement of BMI, which is positively related to blood pressure in a dose–response manner,\textsuperscript{32} is not part of the QOF, but could be easily incorporated. However, there have been no evaluative studies of the impact of paying for quality of services and client outcomes in terms of reduced overweight or obesity.

**Question 5: how can public health actions complement the role of primary care?**

Across populations, there is a strong relationship between the mean level of BMI and the proportion of the population that is overweight.\textsuperscript{1,16,33} This suggests that a reduction in the proportion of the population that is overweight or obese can also be achieved through a population-based approach that reduces the BMI of the total population.\textsuperscript{31} Evidence for this is also shown by simulations of future health care costs due to obesity by the UK Government’s Foresight programme.\textsuperscript{2} When modelling future BMI-related health care costs to the year 2050, a population-based approach in which the mean population BMI was reduced by 4 units from 27 kg/m\textsuperscript{2} to 23 kg/m\textsuperscript{2} in the adult population resulted in much smaller increases in BMI-related health care costs than a targeted approach that prevented 50% of the population at risk moving from overweight (BMI 25–30) into the obese category (BMI > 30).

From a public health perspective, the UK Government’s Foresight programme\textsuperscript{2} identified three broad clusters of interventions that could be used to reduce the prevalence of overweight and obesity: food production, environmental influences and individual-related activities.

A good example of how changes in food production can improve health comes from the UK’s salt initiative.\textsuperscript{34} Noting that around 75% of consumed salt comes from processed foods, the Food Standards Agency has been working with the food industry to encourage reductions in the levels of salt in 85 categories of food. As a result, the UK has a coherent, systematic, ongoing reduction of the salt content of nearly all foods to which salt has been added by the food industry. Major reductions in the salt content of many processed foods have already been made, i.e. over 30% in some foods, without any consumer rejection as this process has been introduced slowly over the course of a few years.\textsuperscript{35}

This is an example of where public health action can support individual action, since there is a clear relationship between salt intake and level of blood pressure,\textsuperscript{36} and the efficacy of reduced sodium intake in lowering blood pressure is well established. In a Cochrane systematic review (including 17 trials in individuals with normal blood pressure), a modest reduction in salt intake for a duration of 4 weeks or more was found to have a significant and, from a population viewpoint, important effect on blood pressure.\textsuperscript{37} In those with elevated blood pressure, the median reduction in 24-hour urinary sodium excretion was 78 mmol (4.6 g/day of salt); the mean reduction in blood pressure was 4.97 mmHg (systolic) and 2.74 mmHg (diastolic). In individuals with normal blood pressure, the median reduction in 24-hour urinary sodium excretion was 74 mmol (4.4 g/day of salt); the mean reduction in blood pressure was 2.03 mmHg (systolic) and 0.99 mmHg (diastolic). This meta-analysis also demonstrated a correlation between the magnitude of salt reduction and the magnitude of blood pressure reduction within the daily intake range of 3–12 g/day of salt. Another meta-analysis reviewed the results of all unconfounded randomized trials aiming to reduce sodium intake in healthy adults over at least 6 months.\textsuperscript{38} Three trials in normotensive people, five trials in those with untreated hypertension and three trials in people being treated for hypertension were included, with follow-up from 6 months to 7 years. Systolic and diastolic blood pressures were reduced (systolic by 1.1 mmHg and diastolic by 0.6 mmHg) at 13–60 months, as was urinary 24-hour sodium excretion.

There are many examples in which changes to the physical environment can support enhanced physical activity and thus reduce risk of overweight and obesity.\textsuperscript{39} For example, since 1977 the city of Groningen in The Netherlands has had an integrated policy for town and traffic planning aimed at reducing car traffic while enhancing accessibility and the use of public transport and walking and cycling. City planning requires new residential or office buildings to be built close to the existing city and restricts the car parking space available for these new developments. There are extensive car-free zones in the city centre, while facilities for bicycles have been extended. In 1990, the modal transport-to-work split was 17% walking, 48% bicycle use, 5% public transport and 30% car use.\textsuperscript{40}

The importance of the home environment in reducing overweight and obesity is illustrated by the second WCRF/AICR report on Food, Nutrition, Physical Activity, and the Prevention of Cancer which identified television viewing as an independent risk factor for obesity.\textsuperscript{3} Sixteen cohort studies were identified, of which 10 showed an increased risk of weight gain and/or obesity with increased television viewing, which were statistically significant in nine. Four studies stated that there was no significant association, and two studies found mixed results.

One US-based randomized controlled trial included 198 children randomized by school into an intervention or control group for 6 months.\textsuperscript{31} The intervention aimed to reduce television, videotape and videogame use with supporting lessons, encouragement not to eat
meals while watching television and 7 hours/week television budget. The intervention group showed a 0.45 kg/m² greater decrease in BMI (95% CI –0.73 to –0.17) than the control group. The intervention group showed statistically significant fewer hours of television viewing (P value for trend <0.001) and fewer meals eaten in front of the television (P value for trend <0.02). The importance of television is compounded by the impact of advertising on children’s food consumption behaviour. A systematic review found evidence from 11 studies that exposure to food promotion influences children’s food consumption behaviour; and evidence from 13 studies that food promotion influences children’s brand preferences and their category preferences.42

Question 6: how do we choose cost-effective interventions?

The World Health Organization’s CHOICE (CHOosing Interventions that are Cost-Effective) model provides estimates of the impact and cost of implementing policies in reducing DALYs due to various risk factors or disease groups. So far, analyses have not been published for interventions to reduce obesity, but estimates of the population health effects and costs of selected interventions to reduce the risks associated with high cholesterol concentrations and blood pressure have been reported for different regions of the world to illustrate the different effects and costs of non-personal health interventions, such as government action, and personal interventions such as treatment for cardiovascular risk factors.43 Systolic blood pressure above 115 mmHg accounts for two-thirds of strokes and almost half of ischaemic heart disease cases and cholesterol concentrations exceeding 3.8 mmol/l for 18% and 55%, respectively. Non-personal health interventions, including government action to stimulate a reduction in the salt content of processed foods, were estimated to be cost-effective ways to limit cardiovascular disease and could avert over 21 million DALYs per year worldwide. Combination treatment for people whose risk of a cardiovascular event over the next 10 years is above 35% were also found to be cost-effective, leading to substantial additional health benefits by averting an additional 63 million DALYs per year worldwide. The results illustrate the need for both primary health care and public health interventions, since, in the present case, a combination of personal and non-personal health interventions could lower the global incidence of cardiovascular events by as much as 50%.

Conclusions

1. There is an agreed and simple definition for overweight and obesity that is of practical use in primary care and public health, notwithstanding that there is a dose-dependent relationship between BMI and risk of illness for many disorders.

2. Overweight and obesity are important health determinants that impact on the workload and prescribing costs of primary care. Since primary care involves the treatment of many common obesity-related conditions (cardiovascular diseases, cancers and diabetes), it must address their causes in terms of an elevated BMI.

3. There is good evidence that individually directed interventions can be effective in leading to dietary change and reductions in overweight and obesity, at least in the short term. Further systematic reviews are needed, particularly of the specific impact of primary health care-based interventions.

4. There is potential evidence that the behaviour of primary health care providers in offering dietary advice can be increased through a range of strategies, although this has yet to be shown to lead to changes in BMI. Further implementation studies are needed to strengthen the evidence base.

5. Individual dietary and physical activity advice needs to be supported by environmental changes, for which there is a wealth of experience across different policy and programme options.

6. The tools for determining policy options are increasing, suggesting that combined personal and non-personal health interventions could lower the incidence of nutrition-related illnesses. Further cost-effective analyses need to be undertaken of the impact and costs of a range of different personal and non-personal policy and programme interventions.

Declaration

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References


