The future challenge of obesity

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In 2007, during my time as Chief Scientific Adviser to the UK Government, the Foresight programme, which I oversaw, published a report on obesity.[1] One of the key findings of the report was that individuals had much less choice in the matter of their weight than they would assume, and that the present epidemic of obesity is not really down to laziness or overeating but that our biology has stepped out of kilter with society. As a result, most adults in the UK are already overweight and modern living ensures every generation is heavier than the last. This is known as passive obesity.

By 2050, 60% of men and 50% of women could be clinically obese. Without action, obesity-related diseases will cost the UK £45·5 billion per year. Research and action should therefore be undertaken to avoid what could develop into a massive problem, not just for the UK but also globally.

Science is a driver of technological innovation and a medium to influence and shape public policy—we need to ensure that the very best science helps us make the best decisions about our future health.

The Lancet's Obesity Series develops new scientific methods[2] to address the complexity of this wide-ranging environmental threat to our public health. Normal reactions to such threats are complex enough. An example is exposure to tobacco smoking, which has turned out to be resistant over decades to effective public policy despite a very thorough and precise understanding of its causes and effects. Obesity threatens to have a great impact on public health worldwide[3] but the mechanisms of its increase in prevalence and its consequences are far less well understood in policy terms. This lack of knowledge presents a serious challenge to public health policy.

The Foresight report was an innovative methodological break with public health tradition by explicitly linking from the start policy options with epidemiology, physiological science, and modelling. It also set the stage for the developments described in the *Lancet* Series. In essence, the obesity systems map from Foresight served to illustrate that a reductive approach along a small group of causal pathways would not be sufficient. It is hoped that combining the role of modelling at all levels of the growing obesity prevalence process can help us to understand better the nature of the phenomenon and how to respond effectively to its threats. This Series is part of this process, the results of collaboration over 4 years between groups from several countries with the same objectives.

The aspects analysed and discussed in the Obesity Series are a description of the trajectory of the global pandemic of overweight and obesity,[4] the estimation of future trends from the past and their health consequences,[5] the physiological response to energy imbalance,[6] and finally the assessment of the cost effectiveness of diverse interventions.[7] These are the essential ingredients of all public health policy. To pursue the tobacco analogy, they have all been core to a process that has been followed up for nearly a century.

This Series provides contemporary reviews of present understanding of the causes, consequences, and possible solutions for an overweight and obese world. First, Boyd Swinburn and colleagues[4] draw our attention to the fact that nowhere has the obesity epidemic been reversed by public health means, unlike the tobacco and cardiovascular disease epidemics. The reasons for this failure are grounded in changes in global food supply systems towards the end of the past century, and in concomitant environmental changes requiring less energy expenditure. This followed a trend towards a decrease in activity accompanied by declines in food energy supply. As soon as the supply changed, largely for commercial reasons, a tipping point was reached, forcing weight upwards.

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Second, Claire Wang and colleagues[5] take forward the work of Foresight to predict body-mass index (BMI) among the population of the USA and UK for the next several decades, with a microsimulation to estimate the health consequences—for various scenarios describing the future. The health consequences are clear qualitatively, but these methods put estimates on the actual extent of attributable effect on disease in the future, and on life expectancy. Although the predicted health service costs to 2020 are large, a 1% reduction in predicted BMI prevalence in the USA could prevent 2·4 million cases of type 2 diabetes, for example.

Third, Kevin Hall and colleagues[6] investigate a validated dynamic mathematical model of human metabolism to predict individual weight change after changes in energy balance. The authors show that previous methodologies greatly overestimate expectations for weight loss. Moreover, the model is able to predict the lag times associated with interventions as well as how much more energy is needed to maintain the present high average weights.

Finally, Steven Gortmaker and colleagues[7] summarise the range of requirements, based on the previous analyses, to deal effectively with the obesity epidemic, recognising that sustained prevention efforts have hardly begun. The conclusions are unambiguous. We need collaborative societal changes in many aspects of our environment to avoid the morbid consequences of overweight and obesity. This change will require global political leadership across public policy, considerably broader than that of health policy, and far better monitoring.

I hope that this work will play a significant role in the upcoming UN High-level Meeting on Non-communicable Diseases in New York, USA, in September, 2011, and in further national and international policy programmes.

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I declare that I have no conflicts of interest.

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Reversing the tide of obesity

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The accompanying four papers in *The Lancet*[1–4] address several crucial areas relevant to the impact and future course of the obesity epidemic. In the past 30 years, obesity has increased in most countries and regions of the world.[5] Boyd Swinburn and colleagues[1] emphasise that obesity control will require policy interventions to improve the environments that promote poor dietary intake and physical inactivity rather than individually focused interventions, and that the necessary policy changes are fraught with political challenges not associated with clinical interventions that focus on individuals.

Claire Wang and colleagues[2] model the effect of increasing rates of obesity on the incidence and costs of type 2 diabetes, cardiovascular disease and stroke, arthritis, and several types of cancer in the USA and UK. If US trends based on historical data for 1988–2008 continue, the prevalence of obesity in US adults will increase from its present level of about 32% to about 50% by 2030, with increased costs of up to US$66 billion per year for treatment of obesity-associated diseases. If the UK trends for 1993–2008 continue, the prevalence of obesity will rise from 26% to 35–48% by 2030, depending on the sex considered, and the costs will increase by £2 billion per year. In both countries, the rate of increase in the prevalence of obesity has slowed in the past decade. Nonetheless, even when the more recent trends are taken into account, annual US and UK costs are still projected to increase by $48 billion and £1·9 billion, respectively, by 2030. As the authors show, even a modest 1% reduction in body-mass index (BMI) would substantially reduce the number of obesity-related diseases and their costs.