

Action on sugar—lessons from UK salt reduction programme

See [Comment](#) page 935

Obesity has increased worldwide during the past 30 years in both high-income and low-income countries and in all divisions of society.¹ The estimated numbers of overweight and obese adults worldwide in 2005 were 937 million (922–951 million) and 396 million (388–405 million), respectively.² If recent trends continue, it is estimated that there would be 2.16 billion overweight people and 1.12 billion obese individuals by 2030.² Overweight and obesity increase health-care costs³ and threaten the economic growth on which a country's future prosperity and wellbeing depend.⁴ A complex web of multiple factors is implicated in obesity, with more than 100 variables directly or indirectly influencing energy balance, ranging from the accessibility, availability, and promotion of food to physical activity.⁵ However, evidence shows that obesity is largely preventable and increased energy intake is an important contributor to the global rise in obesity.^{5,6} Although the changes needed to reverse the obesity epidemic are likely to require many sustained interventions in various domains,⁷ one way to tackle overweight and obesity is to reduce calorie intake.

Added sugar is a major hidden source of calories and contributes to obesity,^{8,9} type 2 diabetes,¹⁰ and dental caries.¹¹ Some studies suggest that the role of sugar, particular in sugar-sweetened soft drinks,¹² in obesity might be key because it provides no feeling of satiation. More controversial evidence suggests that sugar might have an effect on the development of fatty liver and metabolic syndrome.^{13,14} Indeed, recent research has shown increased benefits to human health, particularly in preventing dental caries, from reducing added sugar intake from 10% to 5% of total energy intake.¹¹ This has resulted in WHO releasing new draft guidelines on sugar intake for consultation this month, suggesting that a reduction to below 5% of total energy intake per day would have additional benefits to human health.¹⁵

Sugar added to food and drink has little or no nutritional value and contributes to calorie intake. Consumers may be largely unaware of the amount of added sugar in products—eg, some sugar-sweetened soft drinks have 35 g in a 330 mL can; yoghurts, particularly low-fat yoghurts, can have up to 18 g in a 125 g pot; and some canned soups contain up to 15 g of sugar. Various attempts have been made to try to reduce sugar consumption. New York City tried, but

failed, to ban the sale of supersized sugar-sweetened soft drinks.¹⁶ France and, as of 2009, 33 states in the USA have initiated a tax on sugar-sweetened drinks but have so far been largely unsuccessful because of vigorous opposition by the sugar and soft drink industry.¹⁷

In the UK, obesity is a major public health problem: about 25% of adults were obese in 2012¹⁸ and obesity costs the National Health Service more than £5 billion every year, with an overall cost to society and the economy of almost £16 billion in 2007.⁴ If obesity rates were to continue unchecked, it is estimated that 60% of adult men, 50% of adult women, and 25% of children in the UK could be obese by 2050,¹⁹ with a potential cost of just under £50 billion.⁴ To combat this rise in obesity, a group of academics behind the UK's Consensus Action on Salt and Health (CASH) campaign launched Action on Sugar in January, 2014, with the aim of reducing added sugar intake in the UK by following the same model as the successful UK salt reduction strategy.²⁰

Since 2003–04 the UK has undertaken a voluntary salt reduction programme initiated by CASH in collaboration with the Food Standards Agency and now the Department of Health.²¹ Mean estimated salt intake for adults fell from 9.5 g in 2000–01 to 8.1 g in 2011, with a predicted saving of almost 9000 lives a year from strokes and heart attacks.²⁰ Overall, in the UK there has been about a 30% reduction in the amount of salt added by the food industry.²¹ This was done by setting incremental targets for each food group with a specified deadline to be achieved



using maximum and average or sales-weighted average targets. Since there has been a gradual, progressive reduction in salt, the UK population has adjusted to the taste of lower salt concentrations. There has been no loss of sales or switching between products as a result of salt reduction, or addition of salt at the table.²²

Given the progress made with the salt reduction programme in the UK, Action on Sugar proposes that sugar intake could also be reduced slowly so that people's taste receptors can adjust to the taste of foods with less sugar. According to the UK National Diet and Nutrition Survey, the average consumption of added sugars in the UK is 62 g per day, which is the equivalent to 248 Kcal and contributes to 12.6% of our energy intake.²³ A 30–40% reduction in the amount of added sugar with no substitution would reduce calorie intake on average by 100 Kcal per day per person and would help to prevent obesity and diabetes.⁴ Ideally, such a reduction could be achieved in the next 3–4 years by gradually reducing sugar by about 10% each year. This policy would particularly benefit people from lower income households who currently consume more added sugar than people in higher income households.²⁴

Action on Sugar propose a systematic and unobtrusive reformulation programme for manufacturers to gradually reduce the amount of sugar that is added to soft drinks and foods, by setting targets with a maximum limit and either an average or sales-weighted limit in each food and soft drink category that has sugar added. Importantly, there would be no substitution with artificial sweeteners, so that the taste receptors would adjust, and, in solid foods, no addition of other foods to make up for the reduction in sugar content. In some food products this will cause a reduction in weight or serving size. The setting of progressive targets for each food group would allow for an incremental reduction of added sugar and provide a level playing field to industry, which is vital for a voluntary policy and has been successful with salt reduction in the UK. This is a major opportunity for the UK's food and soft drink manufacturers to seize the initiative and show they can lead the world in reducing sugar as they have done with salt. Most of the large branded food companies in the UK are global, and there is no reason why they could not make the same reductions in salt that have already been made in the UK and for sugar in the future.

We call on the UK Government and the Department of Health (England) to start setting targets now so that

reductions can be made to the amounts of sugar that are added to our food, which will help to curb obesity and diabetes. If the Department of Health and the food and soft drink industry fail to do this, then regulation, legislation, or a punitive sugar tax must be introduced to reduce the large and unnecessary amounts of sugar that are added to our diet. Clearly, there are other strategies that can help to reduce calorie intake, particularly reducing saturated fat content by a similar incremental reformulation programme, and Action on Sugar plan to follow on with this once we have established a sugar reduction programme in the UK. Our intention is to promote the concept of incremental reduction of sugar added to food globally, as we have done with the worldwide action group World Action on Salt and Health, in conjunction with WHO and other supporting organisations. We encourage all countries to implement a similar programme.

**Graham A MacGregor, Kawther M Hashem*

Wolfson Institute of Preventive Medicine, Barts and the London School of Medicine and Dentistry, Queen Mary University of London, London EC1M 6BQ, UK
g.macgregor@qmul.ac.uk

GAM is Chairman of Blood Pressure UK (BPUK), Consensus Action on Salt and Health (CASH), World Action on Salt and Health (WASH), and Action on Sugar and does not receive any financial support from any of these organisations. BPUK, CASH, and WASH are non-profit charitable organisations. KMH is an employee of CASH and works for the Action on Sugar project.

- 1 Finucane MM, Stevens GA, Cowan MJ, et al. National, regional, and global trends in body-mass index since 1980: systematic analysis of health examination surveys and epidemiological studies with 960 country-years and 9.1 million participants. *Lancet* 2011; **377**: 557–67.
- 2 Kelly T, Yang W, Chen CS, Reynolds K, He J. Global burden of obesity in 2005 and projections to 2030. *Int J Obes (Lond)* 2008; **32**: 1431–37.
- 3 Wang YC, McPherson K, Marsh T, Gortmaker SL, Brown M. Health and economic burden of the projected obesity trends in the USA and the UK. *Lancet* 2011; **378**: 815–25.
- 4 Department of Health. Healthy lives, healthy people: a call to action on obesity in England. London: Department of Health, 2011. <https://www.gov.uk/government/publications/healthy-lives-healthy-people-a-call-to-action-on-obesity-in-england> (accessed Sept 10, 2013).
- 5 Swinburn BA, Sacks G, Hall KD, et al. The global obesity pandemic: shaped by global drivers and local environments. *Lancet* 2011; **378**: 804–14.
- 6 Prentice A, Jebb S. Energy intake/physical activity interactions in the homeostasis of body weight regulation. *Nutr Rev* 2004; **62**: S98–104.
- 7 Gortmaker SL, Swinburn BA, Levy D, et al. Changing the future of obesity: science, policy, and action. *Lancet* 2011; **378**: 838–47.
- 8 Vartanian LR, Schwartz MB, Brownell KD. Effects of soft drink consumption on nutrition and health: a systematic review and meta-analysis. *Am J Public Health* 2007; **97**: 667–75.
- 9 Te Morenga L, Mallard S, Mann J. Dietary sugars and body weight: systematic review and meta-analyses of randomised controlled trials and cohort studies. *BMJ* 2013; **346**: e7492.
- 10 Johnson RK, Appel LJ, Brands M, et al. Dietary sugars intake and cardiovascular health: a scientific statement from the American Heart Association. *Circulation* 2009; **120**: 1011–20.
- 11 Moynihan PJ, Kelly SA. Effect on caries of restricting sugars intake: systematic review to inform WHO guidelines. *J Dent Res* 2014; **93**: 8–18.

- 12 DiMeglio DP, Mattes RD. Liquid versus solid carbohydrate: effects on food intake and body weight. *Int J Obes Relat Metab Disord* 2000; **24**: 794–800.
- 13 Hu FB, Malik VS. Sugar-sweetened beverages and risk of obesity and type 2 diabetes: epidemiologic evidence. *Physiol Behav* 2010; **100**: 47–54.
- 14 Lustig RH, Schmidt LA, Brindis CD. Public health: the toxic truth about sugar. *Nature* 2012; **482**: 27–29.
- 15 WHO. WHO opens public consultation on draft sugars guideline. March 5, 2014. <http://www.who.int/mediacentre/news/notes/2014/consultation-sugar-guideline/en/> (accessed March 6, 2014).
- 16 The Lancet. Taking on big soda? *Lancet* 2013; **381**: 963.
- 17 Mytton OT, Clarke D, Rayner M. Taxing unhealthy food and drinks to improve health. *BMJ* 2012; **344**: e2931.
- 18 Health and Social Care Information Centre. Health Survey for England 2012: trend tables. Leeds: Health and Social Care Information Centre, 2012. <http://www.hscic.gov.uk/catalogue/PUB13219/HSE2012-Trend-commentary.pdf> (accessed Feb 13, 2014).
- 19 UK Government's Foresight Programme. Foresight tackling obesity: future choices—project report. London: Stationery Office, 2007.
- 20 He FJ, Brinsden HC, MacGregor GA. Salt reduction in the United Kingdom: a successful experiment in public health. *J Hum Hypertens* 2013; published online Oct 31. DOI:10.1038/jhh.2013.105.
- 21 Wyness LA, Buttriss JL, Stanner SA. Reducing the population's sodium intake: the UK Food Standards Agency's salt reduction programme. *Public Health Nutr* 2012; **15**: 254–61.
- 22 Sutherland J, Edwards P, Shankar B, Dangour AD. Fewer adults add salt at the table after initiation of a national salt campaign in the UK: a repeated cross-sectional analysis. *Br J Nutr* 2013; **110**: 552–58.
- 23 Department of Health. National Diet and Nutrition Survey: headline results from Years 1 and 2 (combined) of the rolling programme 2008/9–2009/10. London: Department of Health, 2011. <https://www.gov.uk/government/publications/national-diet-and-nutrition-survey-headline-results-from-years-1-and-2-combined-of-the-rolling-programme-2008-9-2009-10> (accessed Feb 11, 2014).
- 24 Food Standards Agency. Low income diet and nutrition survey: summary of key findings. London: Stationery Office, 2007. <http://www.food.gov.uk/multimedia/pdfs/lidnsummary.pdf> (accessed Feb 11, 2014).

Warfarin or novel oral anticoagulants for atrial fibrillation?



Stroke prevention is central to the management of atrial fibrillation and, until recently, the focus was to identify high-risk patients who would be given a so-called inconvenient drug, warfarin. Nowadays, the landscape for stroke prevention has changed with the availability of novel oral anticoagulants, and an increased appreciation that vitamin K antagonists (eg, warfarin) work best with high-quality anticoagulation control (shown by the average individual time in therapeutic range at an international normalised ratio of 2.0–3.0).¹ Thus, contemporary guidelines have focused on the initial identification of low-risk patients (ie, those aged <65 years with lone atrial fibrillation, or those with a CHA₂DS₂-VASc score of 0 [if male] or 1 [if female]).² Subsequent to this step, stroke prevention can then be offered to patients with atrial fibrillation and one or more stroke risk factors, and the bottom line is that effective stroke prevention means oral anticoagulation, whether given as a vitamin K antagonist or a novel oral anticoagulant.²

Several novel oral anticoagulants now exist, offering similar (or better) effectiveness, safety, and convenience to the vitamin K antagonists;^{2,3} those with evidence from large randomised trials of stroke prevention in patients with atrial fibrillation fall into two drug classes: the direct thrombin inhibitors (eg, dabigatran), and the oral factor Xa inhibitors (eg, rivaroxaban, apixaban, and, most recently, edoxaban).

In *The Lancet*, Christian Ruff and colleagues⁴ present findings from their meta-analysis of all 71 683 patients included in the four phase 3 randomised trials of patients

with atrial fibrillation who were randomised to receive new oral anticoagulants or warfarin. The investigators conclude that, compared with warfarin, high-dose regimens of new oral anticoagulants significantly reduced stroke or systemic embolism events by 19% compared with warfarin (RR 0.81, 95% CI 0.73–0.91), mainly driven by a reduction in haemorrhagic stroke (0.49, 0.38–0.64). High-dose regimens also significantly reduced all-cause mortality (0.90, 0.85–0.95) and intracranial haemorrhage (0.48, 0.39–0.59), but increased gastrointestinal bleeding (1.25, 1.01–1.55; *p*=0.04), with no difference in myocardial infarction (0.97, 0.78–1.20). Low-dose regimens had similar efficacy to that of warfarin for the composite of stroke or systemic embolism events (1.03, 0.84–1.27), but were associated with an increase in ischaemic stroke (1.28,

Published Online
December 4, 2013
[http://dx.doi.org/10.1016/S0140-6736\(13\)62376-4](http://dx.doi.org/10.1016/S0140-6736(13)62376-4)
See **Articles** page 955

	Definitions	Points
S	Sex (female)	1
A	Age (<60 years)	1
M	Medical history*	1
e	..	..
T	Treatment (interacting Rxt)	1
T	Tobacco use (within 2 years)	2
R	Race (non-white)	2
Maximum points	..	8

SAME-TT₂R₂=Sex female, Age less than 60, Medical history, Treatment strategy (rhythm control), Tobacco use (doubled), Race (doubled). *Two of the following: hypertension, diabetes, coronary artery disease, myocardial infarction, peripheral artery disease, congestive heart failure, previous stroke, pulmonary disease, hepatic or renal disease. †Eg, amiodarone for rhythm control.

Table: Definition of the SAME-TT₂R₂ score