

Addendum for October 2008 to June 2009

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In October 2008, the National Preventative Health Taskforce released its Discussion Paper,(1) with three accompanying technical papers on obesity,(2) tobacco(3) and alcohol.(4) Since then, a range of key reports, research and policy documents have been released which are relevant to policies proposed in the Taskforce's reports.

This addendum summarises the major studies and developments since October 2008 considered relevant to the Taskforce's work on obesity, and includes updates and additional evidence on potential initiatives. For example, additional evidence is provided on the link between sedentary behaviour and chronic disease, and the need to ensure strategies to reduce sedentary behaviour are part of an obesity prevention approach.

Major developments in Australia have included the release of the House of Representative's Inquiry into Obesity. Their report, 'Weighing it Up', released in May 2009, complements the National Preventative Health Taskforce process. The report has made general recommendations on the role of governments, industry, individuals and the community, and has provided a platform for the sharing of ideas, views and stories from a wide range of stakeholders. Their recommendations are consistent with the strategic actions outlined in the Taskforce's National Preventative Health Strategy.(5)

The Senate Standing Committee on Community Affairs released its report on the Protecting Children from Junk Food Advertising (Broadcast Amendment) Bill 2008 in December 2008. The Committee stated that they considered it was premature to bring forward legislative changes to food and beverage advertising whilst the National Preventative Health Taskforce was developing a national strategy and before the industry's voluntary initiatives had been assessed. They also referred their report and the information received by the Committee to the Taskforce.(6)

Internationally, a number of countries and jurisdictions are recognising the urgency of the obesity situation and moving to address the causes of overweight and obesity. The California Department of Health Services (CDHS), for example, released its Obesity Prevention Plan in 2006, detailing strategies for action and outlining responsibilities for state and local government, employers, healthcare insurers and providers, families, schools, the food and beverage industry, and entertainment and professional sports. The development of the strategic plan to guide a statewide response to the obesity crisis was mandated by legislation, under the 2005 Budget Act. The plan's strategic actions are organised under four goals:

- Ensure state-level leadership and coordination that reaches into communities across the state.
- Create a statewide public education campaign that frames healthy eating and active living as California living.
- Support local assistance grants and implement multi-sectoral policy strategies to create healthy eating and active living community environments.
- Create and implement a statewide tracking and evaluation system.(7)

Another report recently released in the United States was 'Reversing Obesity in New York City: An action plan for reducing the promotion and accessibility of unhealthy food'. This report was prepared by the City University of New York Campaign Against Diabetes and the Public Health Association of New York, and is a document intended to educate and to spark debate on food policy issues in New York.(8)

Authorities in the United Kingdom continued to release reports on their comprehensive approach to obesity prevention and control, and updates on these initiatives are reported later in this addendum.





1. New evidence on global perspectives on obesity

Being overweight or obese is one of the most common risk factors associated with increased mortality and morbidity globally. Other common preventable risks include poor infant feeding practices, low birthweight, childhood and maternal under-nutrition, unsafe sex, use of tobacco, harmful use of alcohol, unsafe water and lack of sanitation. Worldwide, these preventable risks contribute each year to over 40% of the 58 million deaths and one-third of the loss of healthy life-years.(9)

Recent data from the Organisation for Economic Co-operation and Development (OECD) indicate that the most marked shifts in body mass index (BMI) distributions over the past two decades in a range of OECD countries have occurred in Australia, England and the United States.

Based on past trends, the prevalence of obesity and overweight in Australia is predicted to increase significantly over the next decade across all age groups to around two-thirds of the population.(10) The report examined past and projected future trends in adult overweight and obesity in 11 OECD countries. The authors found a projected continued increase in obesity prevalence for all countries. While there were differences between countries, trends suggested greater levelling-off or even decreases in rates of overweight alone. They considered the results to suggest that diverging forces are pushing overweight and obesity prevalence in opposite directions: it appears that the strong effects of obesity-promoting environments (that is, aspects of physical, social and economic environments promoting the development of obesity) have been consolidating over the course of the past two to three decades.

In addition, they postulate that successive generations have become increasingly aware of the health risks associated with lifestyle choices, and in some cases are more capable of dealing with environmental pressures due to the long-term effects of changing education and socioeconomic conditions.

The authors found that the distribution of overweight and obesity in these countries showed consistent and pronounced disparities by education and socioeconomic condition in women, with higher levels of education and socioeconomic status (SES) associated with significantly lower prevalence, while mixed patterns were found for men. The analysis also found that inequalities in obesity related to education levels in women seemed to increase in Australia. The findings also emphasised the spread of overweight and obesity within households, which was concluded to suggest that health-related behaviours, especially those concerning diet and physical activity, are likely to play a larger role than genetic factors in determining the convergence of BMI levels within households.(10)

The authors highlighted the implications of the gender difference in socioeconomic gradients. These included the higher prevalence of obesity in women in disadvantaged socioeconomic groups, meaning that children of women in these groups are more likely to be overweight or obese, which will be likely to perpetuate the link between obesity and socioeconomic disadvantage as these children will most likely experience fewer opportunities of attaining higher SES.(10)



A report released in December 2008 on the 2005–2006 National Health and Nutrition Examination Survey (NHANES) reveals a disturbing trend in the United States: based on measured height and weight, an estimated 32.7% of US adults 20 years and older were classified as overweight, 34.3% as obese and 5.9% as extremely obese (BMI of 40 and above). Compared with US health survey data collected since 1988, the 2005–06 survey was the first in which the prevalence of adult obesity exceeded the level of adult overweight. While the prevalence of obesity in the United States has more than doubled since 1980 (although the increase between 2003–04 of 32.2%, and 2005–06 of 34.3%, was not statistically significant), the prevalence of overweight has remained stable over the same time period.(11)



2. New evidence on obesity in Australia

Trends and scale of the problem

The results of two recent national surveys involving measured height and weight data were released in 2009. Results of both surveys indicate rises in obesity and overweight among male and female adults and children compared with comparable earlier data.(12)

Prevalence of overweight and obesity in adults

The height and weight of adults and children was measured in the 2007–08 National Health Survey for the first time since 1995. Preliminary results suggest that overweight and obesity prevalence in adults has continued to increase. Data from the 2004–05 health survey indicated that 62% of men and 45% of women were overweight or obese,(13) continuing to rise from 2001 levels when 58% of men and 42% of women were overweight or obese (both surveys were based on self-reported height and weight).(14) Results from the 2004–05 survey showed that, for men, those in the 45–54-year age group had the highest rates of obesity (23.2%), while those in the 55–64-year age group had the highest rates of overweight (45.9%). For women, those in the 55–64-year age group had the highest rates of obesity (21.7%), while overweight was highest among those aged 65–74 years (30.8%).(13)

Prevalence of overweight and obesity in children

Of particular concern is the increasing prevalence of overweight and obesity in children. Results from the National Children's Nutrition and Physical Activity Survey (conducted February–August 2007) based on measured height and weight found that 23% of 2–16-year-old children were classified as overweight or obese (6% as obese and 17% as overweight), while 72% of 2–16-year-olds were classified as normal weight.(15)

Recent trend data

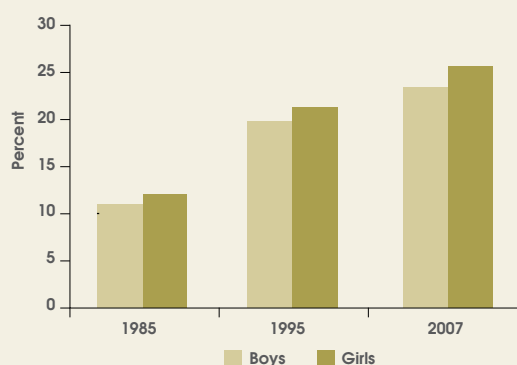
Comparison of the National Children's Nutrition and Physical Activity Survey data with data from previous studies shows a clear and disturbing upward trend in overweight and obesity rates in children over the last 20 years. Analysis of overweight and obesity levels among young Australians from comparable age groups at three time points over more than 20 years, using the same internationally accepted definitions of childhood overweight and obesity, is presented in Figure 1. These data indicate the change in overweight and obesity levels among 7–15-year-old Australian children between 1985, 1995 and 2007.

As illustrated, the prevalence of overweight and obesity in boys aged 7–15 years has risen from 11.0% (95% CI 10.99–11.01) in 1985 to 20.0% (95% CI 19.97–20.03) in 1995, and 23.7% (95% CI 23.68–23.72) in 2007. In 7–15-year-old girls, the prevalence of overweight and obesity has increased from 12.2% (95% CI 12.19–12.21) in 1985 to 21.5% (95% CI 21.47–21.53) in 1995, and 25.8% (95% CI 25.78–25.82) in 2007.(16) While further data from a greater number of points in time are required to identify national trends more comprehensively, this analysis clearly indicates a rising trend in overweight and obesity for 7–15-year-old boys and girls between 1985, 1995 and 2007.



Figure 1:

Prevalence of overweight and obesity in Australian children aged 7–15 years, 1985–2007.(16)



* Data weighted for age, gender and region.

Children at special risk

In the Technical Report we described some significant differences which have been observed in overweight and obesity prevalence for children from different cultural backgrounds. For example, among adolescents, those most likely to be obese (four to five times more likely) were boys and girls of Pacific Islander or Middle Eastern/Arabic background.(17)

There is also evidence that obesity and overweight is also an issue for Indigenous children.(18, 19) For example, the school-based study conducted by O’Dea in 2006 among 7889 6–11-year-old children across Australia found that obesity rates were higher for Indigenous boys than Anglo/Caucasian boys.(20) Indigenous children and adolescents aged 6–11 years were 1.4 times more likely to be obese than non-Indigenous Australians of the same age group.(20)

Data from 2004–05 for 15–19-year-olds indicate that Indigenous teenagers were more than twice as likely (2.6 times) to be obese as non-Indigenous teenagers. Similar proportions of Indigenous and non-Indigenous teenagers were overweight but not obese.(20)

This study conducted by O’Dea also found that students in the most disadvantaged schools had higher rates of overweight and obesity

than students in the least disadvantaged schools. The social gradient was greater for obese children than for overweight (excluding obese) children.(20)

There is some evidence that children from South East Asian backgrounds may have a significantly higher risk of high systolic blood pressure (SBP) with increases in obesity indices compared to those of Australian origin. A study examining the relationship between obesity and blood pressure in school-aged children from South East Asian backgrounds in Sydney found that in nine-year-old children, SBP increased 1.51 mm Hg for each of BMI increase for South East Asian children compared to 1.05 mm Hg for Australian children.(21)

Children’s nutrition and physical activity levels

The National Children’s Nutrition and Physical Activity Survey was the first national survey of Australian children’s nutrient intake since 1995 and the first national children’s physical activity survey since 1985.(15) Food, beverage, dietary supplement intake, activity patterns and physical measurements (weight, height and waist circumference) were recorded in 4487 children aged 2–16 years. Key findings included:(15)

- Only 22% of 4–8-year-olds, 14% of 9–13-year-olds and 5% of 14–16-year-olds met the dietary guidelines for vegetable intake.
- A large proportion of children did not meet the recommendations for fruit intake: 61% of 4–8-year-old boys and girls and 51% of 9–13-year-olds met the requirements, compared with only 1% of 14–16-year-olds.
- The majority of children in each age group met the estimated average requirements for all of the assessed nutrients (for example, calcium, protein and iron) except for calcium. The majority (82–89%) of 12–16-year-old girls did not meet the estimated average requirement for calcium.



- The consumption of sodium in all age groups exceeded the recommended upper level of intake.
- Few 9–16-year-olds met the guidelines for electronic media use (around one-fifth). Girls met the guidelines more often than boys, and younger children more often than older children.
- Most 9–16-year-olds met the guidelines for moderate-vigorous physical activity every day. Girls met the guidelines less often than boys and there was a drop-off with age, extremely marked in older girls (13% of 14–16-year-old girls compared with 33% of 9–13-year-olds met the guidelines using the ‘all days’ method.)

Whether or not children met the guidelines for moderate-vigorous physical activity was assessed in four different ways in this survey. Using the most stringent method (a child meets the guidelines if he or she accumulates at least 60 minutes of moderate-vigorous physical activity on each of the four days sampled), fewer than one-third (32%) of all children (38% of 9–16-year-old boys and 25% of 9–16-year-old girls) met the guidelines. Using other estimates, 58% overall complied (using the proportion who met guidelines on most days) or there was 82% compliance (if children averaged 60 minutes a day over four days).⁽¹⁵⁾

For free play, sport and active transport, girls reported lower levels of moderate-vigorous physical activity than boys. The results showed that the overall amount of moderate-vigorous physical activity decreased by about 10 minutes per day with each year of age.⁽¹⁵⁾

Few of the 9–16-year-olds met the guidelines for electronic media use (no more than two hours a day for entertainment). Only 19% or almost one-fifth met the guidelines using the most days method. Girls met the guidelines more often than boys, and younger children more often than older children. The proportion of children who met the guidelines every day out of four days of surveying was only 7%: 4% of 9–16-year-old boys and 9% of 9–16-year-old girls.⁽¹⁵⁾



3. New studies on the impact of obesity

There is some evidence that more recently born generations are at greater risk of becoming overweight and obese. A study on the 'Age, period and birth cohort effects on prevalence of overweight and obesity in Australian adults from 1990 to 2000' examined the effects of age (20 to 74 years and over), survey period (1990, 1995 and 2000) and birth cohort (in five-year periods from 1915 and earlier to 1976–80) on the prevalence of self-reported overweight and obesity in Australian adults between 1990 and 2000. The prevalence of combined overweight/obesity increased with age, recency of survey period and with cohorts born since 1960. While most of the findings were demonstrated for both men and women, for overweight/obesity combined the overall effect of birth cohort was significant among women but not men.(22)

There is increasing evidence of comorbidities associated with overweight and obesity. A recent study found that both overweight and obesity are associated with the incidence of multiple comorbidities, including type II diabetes, cancer and cardiovascular diseases. Maintenance of a healthy weight could be important in the prevention of the large disease burden in the future.(23)

A review of recent data on the prevalence, severity and racial/ethnic differences in childhood obesity found obesity to be associated with significant health problems in the paediatric age group and to be an important early risk factor for much of adult morbidity and mortality. The authors noted that many obese children and adolescents already manifest some metabolic complications, and that these children are at high risk for the development of early morbidity.(24)

Obesity and life expectancy

A range of studies indicate a link between life expectancy and overweight and obesity prevalence. For example, estimates based on Australian data indicate that life expectancy at age 20 is about one year less among overweight Australian adults compared with Australians within the healthy weight range, and an average of around four years lower for obese Australian adults. The largest ever investigation of how obesity affects mortality analysed the link between weight and longevity in nearly 900,000 people internationally, and found that moderately obese people (BMI of between 30 and 35) died 2–4 years earlier than those with an ideal weight. A BMI of 40–45 reduced life expectancy by 8–10 years, comparable with the effects of lifelong smoking.(25) Similarly, other research estimating the impact of obesity on life (from age 40) found a mean loss of seven years associated with obesity – similar to the life expectancy loss from smoking.(26)

Recent work commissioned by the Taskforce indicates that if current trends in overweight and obesity continue, there will be approximately 1.75 million deaths at ages 20+ years and 10.3 million premature years of life lost (PYLL)¹ at ages 20–74 years caused by overweight/obesity in Australia in 2011 to 2050.(27) Each Australian aged 20–74 years who dies from overweight/obesity in 2011 to 2050 will lose, on average, 12 years of life before the age of 75 years.

Stopping the increase would save half a million lives: if current trends are halted and overweight/obesity levels are stabilised at 2005 levels, there will be around 1.25 million deaths

¹ The person-years of life lost as a result of exposure of the population to a particular condition, in this case overweight/obesity.



at ages 20+ years. For each additional 1% proportional reduction in overweight/obesity that can be achieved beyond a stabilisation at 2005 prevalences, around an additional 10,000 deaths and 60,000 PYLL will be prevented.(27)

Obesity and diabetes

Obesity has been disproportionately prevalent among women and minorities, accompanied by an increased risk for diabetes mellitus (DM). Women have experienced an increased risk for metabolic syndrome, DM and cardiovascular disease after onset of menopause. Maternal obesity has been a risk factor for gestational diabetes mellitus (GDM). Obesity and DM represent crises for the healthcare system and the health of the public, incurring costs and disease burden for adults and children, with increasing costs and prevalence expected unless more coordinated efforts to address the causes of these conditions at the national level are implemented. An investment in infrastructure to promote increased physical activity and reward weight management may be budget neutral in the long term by reducing the costs of morbidity and mortality. About two-thirds of the costs from DM complications could be averted with appropriate primary care.(28)

Obesity and cancer risk

In November 2007, the 'Second Expert Report on Food, Nutrition, Physical Activity and the Prevention of Cancer: A global perspective' was launched. This is the most current and comprehensive analysis of the literature on diet, physical activity and cancer, building on the foundation established by the World Cancer Research Fund International (WCRF) in the 1980s to analyse, interpret and make public the available scientific evidence to help individuals reduce their risk of developing cancer. The Second Expert Report was commissioned and funded by the WCRF and the American Institute for Cancer Research (AICR), with the content driven by an independent panel of 21 world-renowned scientists.(29)

The main focus of the Second Expert Report is on nutritional and other biological and associated factors that modify the risk of cancer. However, it was recognised that the risk of cancer and other diseases is also modified by social, cultural, economic and ecological factors. That is, the food and drink that people consume are not purely because of personal choice, and similarly opportunities for physical activity can be constrained.

For this reason, a companion report, 'Policy and Action for Cancer Prevention', was published in February 2009,(30) which identifies a wider range of policy recommendations and options. This report provides advice and guidance on what can be done to influence and change the lifestyle choices that people make, as they relate to their risk of cancer. The report sets out changes that can be made at all levels of society to reduce the number of cancer cases.

The Expert Report concludes that there is convincing evidence that excess body fat increases risk of cancers of the bowel, oesophagus, pancreas, kidney, endometrium and breast (in postmenopausal women). Being overweight also probably increases the risk of gallbladder cancer. The report recommends being as lean as possible within the normal range of body weight across the life course, and cites maintenance of a healthy weight throughout life as possibly one of the most important ways to protect against cancer. Being physically active as part of everyday life is recommended, as all forms of physical activity protect against some cancers, as well as against weight gain, overweight and obesity. Correspondingly, sedentary ways of life are a cause of these cancers and of weight gain, overweight and obesity. Weight gain, overweight and obesity are also causes of some cancers independently of the level of physical activity.

The Expert Report(29) recommends limiting the consumption of energy-dense foods and avoiding sugary drinks, with the main purpose of the recommendation to prevent and to control weight gain, overweight and obesity.



The evidence shows that it is not specific dietary constituents that are problematic, so much as the contribution these make to the energy density of diets. The report also recommends eating mostly foods of plant origin, and that these probably protect against weight gain as they are typically low in energy density. Other recommendations include limiting intake of red meat and salt, and avoiding processed meat.

The recommendations contained in the companion report(30) included the following statements:

Action is needed:

'Incidence and trends of cancer, and of obesity – a cause of a number of cancers – now amount to a global public health crisis. While there is more to be learned about the causes of cancer and of obesity, enough is known to justify policies and actions at all levels from international to personal.'

The public health approach:

'Public health is a public good, requiring protection that needs leadership and concerted and determined action across many sectors taken at all levels. Citizens have a right to expect that decisions determining availability of foods and drinks and opportunities for physical activity in any societal sector are taken with public health as a top priority.'

Women and weight gain

Women aged 25–45 years represent a high risk group for weight gain, and those with children are at increased risk because of weight gain associated with pregnancy and subsequent lifestyle change. An Australian study investigated the baseline weight-related behaviours and feasibility of recruiting and delivering a low-intensity self-management lifestyle intervention to community-based women with children in order to prevent weight gain, compared to standard education.

The recruitment and delivery of the cluster-randomised controlled intervention was in conjunction with 12 primary (elementary) schools. Nearly all women (90%) reported being dissatisfied with their weight and 72% attempted to self-manage their weight. The women were more confident of changing their diet (mean score 3.2) than physical activity (mean score 2.7). This population perceived they were engaging in prevention behaviours, with 71% reporting actively trying to prevent weight gain, yet they consumed a mean of 68g fat per day (SD30g) and 27g saturated fat per day (SD12g), representing 32% and 13% of energy respectively. The women had a high rate of dyslipidemia (33%) and engaged in an average of 9187 steps per day (SD 3671).

The study concluded that delivery of a low-intensity intervention to a broad cross-section of community-based women with children is feasible. Women with children are engaging in lifestyle behaviours which do not confer adequate health benefits. They appear to be motivated to attend prevention programs by their interest in weight management. Interventions are required to strengthen and sustain current attempts at achieving healthy lifestyle behaviours in women to prevent weight gain.(31)



While physical activity is important for the health of all individuals, the determinants of physical activity behaviour for women who are overweight remain largely unexplored. A preliminary analysis of barriers, intentions and attitudes towards moderate physical activity in a small group of overweight women explored a range of factors influencing participation in physical activity for the women.(32) The 30 participants were aged 25–71 years, with a mean age of 46.8 years and an average BMI of 31.2 (+5.6). Self-reported level of physical activity, perceived barriers and facilitators of physical activity, attitudes, intentions and perceived behavioural control to physical activity were measured.

Seventeen participants were generally active, with self-reported moderate physical activity of 218.53 minutes in the last seven days, whereas 13 participants reported being less active (43.46 minutes). Active participants were more likely to identify social reasons for participating in physical activity, while inactive participants perceived that their laziness prevented them from being physically active. There were no significant differences between active and inactive overweight women in attitude, intention or subjective norm for moderate-intensity physical activity. There was a significant difference between these women in perceived behavioural control for moderate-intensity physical activity; women who felt more in control of their physical activity behaviour were more likely to engage in physical activity than inactive women.

The authors concluded that future research should investigate interventions to increase behavioural control of moderate-intensity physical activity in women who are overweight.(32)



4. New initiatives for obesity prevention and control

UK experience: Change4Life and other initiatives

While small changes may lead to a significant public health impact across the whole population, the community still requires assistance from government and industry to make healthier choices.

The United Kingdom's Change4Life initiative, which commenced in January 2009, is a multi-pronged approach to encourage behaviour change within the entire population, with strategies including an advertising campaign, website, resources and partnership opportunities where healthy messages and the Change4Life brand are promoted to encourage people to eat well, move more and live longer². The campaign also includes a children's health survey.

With the focus on long-term prevention, the initiative aims to target the issue of obesity by highlighting to parents the links between poor diet and sedentary lifestyles and preventable illnesses, as well as their responsibility to ensure their children eat better and are physically active regularly. The initial target is families with young children (aged 0–11). The initiative will establish national, regional and local partners with healthcare professionals, teachers, charities, government agencies, the media, big businesses and community organisations. It supports the United Kingdom's overall obesity strategy *Healthy Weight, Healthy Lives* and links into the National Child Measurement Programme. The campaign is expected to cost £75 million over three years.⁽³³⁾

Financial incentives to help individuals

Financial incentives (including payments and vouchers) for individuals to achieve sustained weight loss and adopt healthy eating and physical activity behaviours are included in the United Kingdom's cross-government strategy *Healthy Weight Healthy Lives*. For example, the *Well @ Work* program (led by the British Heart Foundation with funding from Active England and the Department of Health) is a £1.5 million, two-year program to pilot ways to make England's workplaces healthier.³ The program has included weight loss competitions offered to employees with rewards of fruit baskets and trophies to teams and store gift vouchers to individuals.

Another scheme aimed at overweight people is being trialled in the United Kingdom by a private health firm for 400 people, with National Health Service backing and funding. Under the scheme, overweight people would sign up to a 13-month slimming program and be paid only if they completed it. They would have seven months to get down to their target weight and would have their weight checked monthly at their GP's surgery or health clinic. Six months later, they would have to show that they had not put on weight. Payments would increase with the amount of weight lost: a loss of 23kg would be rewarded with the maximum amount of £425 (\$865); 13.5kg weight loss would be rewarded with £160, and 7kg with £70⁴.

² See www.dh.gov.uk/en/News/Currentcampaigns/Change4Life/DH_092080.

³ See www.bhf.org.uk/thinkfit/index.asp?SecID=1590&secondlevel=1593.

⁴ See www.smh.com.au/world/rolls-of-fat-can-lead-to-rolling-in-the-money-20090413-a417.html.



In a range of UK cities, the Department of Health has been funding subsidised gym memberships since April 2009 for 16–22-year-olds who regularly go to the gym over a 12-month period. The pilot will look at the effect that a financial incentive has in recruiting, retaining and affecting behaviour change in young people who are at risk of inactive lifestyles. The Department of Health is commissioning a national evaluation of such incentive schemes (of which there is a range being introduced in the United Kingdom). (34)

US initiative: a partnership to tackle childhood obesity

In February 2009, the US Alliance for a Healthier Generation, a joint initiative of the American Heart Association and the William J. Clinton Foundation, announced the formation of the Alliance Healthcare Initiative, a collaborative effort with national medical associations, leading insurers and employers to offer comprehensive health benefits to children and families for the prevention, assessment and treatment of childhood obesity.

The goal of the initiative is to reimburse health professionals for the provision of obesity-related care and nutrition counselling, and to provide parents with educational and nutritional information for fighting childhood obesity.

Through the program, visits to doctors and registered dietitians will be provided to children as part of their health insurance benefits. The Alliance Healthcare Initiative will also educate parents about childhood obesity and the expanded services available to children as part of the initiative. Doctors will be reimbursed for bringing children back for follow-up visits and for working with them on the adoption of healthy behaviours, while registered dietitians will be reimbursed for providing in-depth nutrition counselling over multiple visits to those children referred by their doctors.

Participating companies will have access to materials and resources developed by the Alliance to inform parents about childhood obesity prevention and treatment. Several

health insurance organisations and major corporations are participants, while the American Academy of Pediatrics and the American Dietetic Association will assist clinicians provide education, improve care coordination, offer resources to eligible families, and help with recruitment of medical professionals. The initiative represents the first time a group of organisations such as this has worked together to provide children with insurance coverage to address obesity, as well as the first time outcomes will be monitored to ensure the benefits are being used. (35)

Improving diets and changing the food supply

There are numerous potential dietary health benefits in reducing salt, saturated fat and sugar consumption, including a reduction in mortality and morbidity linked to high consumption of these nutrients. Analyses conducted in the United Kingdom by the Food Standards Agency (FSA) and the Department of Health have estimated cancer risk reductions through increased fruit consumption in childhood, as well as the number of deaths that could be prevented annually by a unit reduction in salt, saturated fat and sugar. A change in children's diets extrapolated into adulthood could prevent over 50,000 deaths annually in the United Kingdom (or around 5000 deaths annually if the policy were 10% successful). (36)

- An increase of 100g in the childhood daily intake of fruit equates to an annual prevention of 31,050 adult deaths due to cancer.
- An approximate 6.25% reduction in food energy intake for non-milk extrinsic sugars (NMES) would save 12,500 lives.
- An average daily reduction of 0.9g in a child's salt intake extrapolated to the adult population would equate to an annual prevention of 6050 deaths.
- 1550 lives would be saved from a 1% reduction in saturated fat.



Table 1 Illustration of the numbers of deaths which could be prevented by a reduction in salt, saturated fat and sugar and through increased fruit intake.(36)

	Deaths prevented for 100% policy success	Deaths prevented for 10% policy success
Reduction of 0.9g of salt	6,050	605
Reduction of 1% in saturated fat	1,550	155
Reduction of 1% for NMES	12,500	1,250
Increase of 100g of fruit	31,050	3,105
Total deaths prevented	51,150	5,115

The benefits to the public health of the United Kingdom of achieving recommended levels of consumption of fruit and vegetables, saturated fat, salt and added sugar are potentially as great as £20 billion a year in terms of quality-adjusted life-years.(37) Almost 70,000 premature deaths could potentially be prevented each year if UK diets matched nutritional guidelines, more than 10% of current annual mortality. For example, reaching the target for everyone to consume five portions of fruit and vegetables per day could see 42,000 premature deaths a year avoided (compared to 20,200 for salt and 3500 for saturated fat targets).(37)

Update on the UK Food Standards Agency initiative to reduce population salt intake

As described in the Technical Report, the UK FSA set voluntary targets for the level of salt in 85 categories of food in March 2006, involving around 70 firms and trade associations, and a broad range of products. The Agency made a commitment to review the targets in 2008 to formally assess progress and to establish what further reductions were necessary to maintain progress towards the 6g daily intake target.

In May 2009 the UK FSA published revised salt reduction targets for 2012, for 80 categories of foods. These are more challenging than the previous targets for 2010.(38)

Outcomes of meetings held in early 2008 (at which industry was asked to report on progress towards achieving the targets, any significant challenges experienced and what further levels of salt reduction might be achieved) were used to help the FSA develop proposals for revised targets, together with data on the levels of salt in food on the market in 2007 and current intakes, expert advice on technical and safety issues, and ongoing research.(38)

The revised targets have been set at challenging levels that will have a real impact on consumers' intakes, while taking into account the reductions that have already been achieved by the industry and technical and safety issues. Targets were set considering and reflecting reductions that had already been achieved by industry. These include:(38)

- The average amount of salt found in branded pre-packed, sliced bread has been reduced by around one-third.
- Reductions in salt of about 44% have been achieved in branded breakfast cereals.
- Reductions of between 16% and 50% have been achieved in some top-selling cakes and biscuits between 2006 and 2007.
- Reductions in the snack sector; for example, 13% reduction of salt in standard crisps in 2007.
- Reductions in processed cheese products of 21–50%.
- Reductions among a wide range of own-brand products for the United Kingdom's major retailers: some have met the 2010 targets ahead of time in most or all of their products, and one retailer is using the original 2010 targets as maximum salt levels for all relevant products.

The FSA has stated that developments in food technology – including alternatives to salt and other sodium-based ingredients, manufacturing and distribution chain processes, and acceptable food safety testing – will all be necessary to ensure further progress, as will rebalancing product



flavours to maintain consumer acceptability. The FSA has acknowledged that the current economic climate may make it more difficult for companies to fund this kind of work. It has reiterated its commitment to working in partnership with stakeholders to review barriers and solutions to achieving the targets and the timescales proposed, including providing ongoing support through research and dissemination of the results of research.(38)

The Agency plans to next review progress towards the end of 2010, and then every two years. Monitoring of salt intakes in the United Kingdom will continue and will be carried out through urinary sodium surveys undertaken as part of the new rolling program of the National Diet and Nutrition Survey, which began fieldwork in April 2008. The method used for collecting and analysing the samples will be comparable with previous surveys. The first set of results will be available at the same time as the results of the next review of industry progress.(38)

Soft drinks and obesity

At the same time as obesity rates have increased, a steep increase in consumption of soft drinks has been seen. In the United States, soft drink consumption has tripled in recent decades, paralleling the dramatic increases in obesity prevalence.

Several countries have targeted taxation policies on widely available popular foods and beverages such as soft drinks, which are inherently high in energy and empty of any important nutrients. Results of a meta-analysis found that the intake of sugared beverages displaces the consumption of healthier beverages, and is associated with higher body weight and poor nutrition.(39) In addition, the risk of obesity and diabetes increases with rising intake. Drinks such as soft drinks that are rich in sugars (both added and natural) have also been shown to reduce appetite control, leading to increases in weight gain and increased risk of obesity.(40) Increased liquid carbohydrate consumption is not accompanied by a reduction in solid food consumption;(40) in fact, soft drink intake has been identified in a range

of research as a key contributor to increasing levels of overweight and obesity,(39) as well as increased rates of dental decay.(41)

A clinical review by Wolff and Dansinger published in 2008 evaluated the extent to which current scientific evidence supports a causal link between sugar-sweetened soft drink (SSD) consumption and weight gain.(42) Six of 15 cross-sectional and six of 10 prospective cohort studies identified statistically significant associations between soft drink consumption and increased body weight. There were five clinical trials; the two that involved adolescents indicated that efforts to reduce SSD consumption slowed weight gain. In adults, three small experimental studies suggested that consumption of SSD caused weight gain; however, no trial in adults was longer than 10 weeks or included more than 41 participants. The authors concluded that observational studies support the hypothesis that SSD consumption causes weight gain; they also called for more clinical trials to clarify the specific effects of SSD on body weight and other cardiovascular risk factors.(42)

Gibson completed a systematic review re-examining the evidence on SSD and obesity from epidemiological studies and interventions up to July 2008.(43) Forty-four original studies (23 cross-sectional, 17 prospective and four interventions) in adults and children, as well as six reviews, were identified. These were critically examined for methodology, results and interpretation. Approximately half the cross-sectional and prospective studies found a statistically significant association between SSD consumption and BMI, weight, adiposity or weight gain in at least one subgroup. The majority of evidence was dominated by American studies in which SSD consumption tends to be higher and formulations different. Most studies suggest that the effect of SSD is small except in susceptible individuals or at high levels of intake. Methodological weaknesses meant that many studies could not detect whether soft drinks or other aspects of diet and lifestyle have contributed to excess body weight.



The authors concluded that progress in reaching a definitive conclusion on the role of SSD in obesity is hampered by the paucity of good-quality interventions which reliably monitor diet and lifestyle and adequately report effect sizes. Of the three long-term (>6 months) interventions, one reported a decrease in obesity prevalence but no change in mean BMI, while two found a significant impact only among children already overweight at baseline. Of the six reviews, two concluded that the evidence was strong, one that an association was probable, while three described it as inconclusive, equivocal or near zero.(43)

A literature review on associations between intake of calorically sweetened beverages and obesity relative to adjustment for energy intake found that the majority of the prospective studies found positive associations between intake of calorically sweetened beverages and obesity. The authors concluded that a high intake of calorically sweetened beverages can be regarded as a determinant for obesity.(44)

Removing soft drinks from schools

In 2006, former President Bill Clinton and the American Heart Association (through a partnership launched in 2005, the Alliance for a Healthier Generation) brokered a deal with the beverage industry in the United States, removing most soft drinks from almost every US primary and secondary school by the 2009–10 school year.⁵ Following the introduction of the agreement, the level of calories due to beverages delivered to schools in the 2007–08 school year decreased by 58%.(45) Under further agreements with the Alliance involving more than 30 companies and trade associations in the beverage, food and dairy industries, there has been a 41% decrease in calories shipped to school vending machines.⁶

Pricing and taxation policies

Pricing policies are a potential policy instrument to address the increasing prevalence of obesity. A recent comprehensive review of evidence on the effects of food prices on weight outcomes examined whether altering the cost of unhealthy, energy-dense foods compared with healthy, less-dense foods through the use of fiscal pricing (tax or subsidy) policy instruments would, in fact, change food consumption patterns and overall diet enough to significantly reduce individuals' weight outcomes.(46)

The review examined empirical evidence regarding the food and restaurant price sensitivity of weight outcomes in peer-reviewed English-language articles published between 1990 and 2008. When statistically significant associations were found between food and restaurant prices (taxes) and weight outcomes, the effects were generally small in magnitude, although in some cases they were larger for low SES populations and for those at risk for overweight or obesity. The authors found the evidence supported a multi-pronged approach to changing prices – that is, taxing unhealthy foods and subsidising healthier products.

The review concluded that fiscal policies could be used to improve weight outcomes, noting that substantial price changes are required to ensure significant improvements. Small taxes on unhealthy foods or small subsidies applied to healthy food products were unlikely to be associated with substantial reductions in BMI or obesity rates. Importantly, these effects were particularly likely to be observed among populations of low SES, those most at risk for overweight, and children and adolescents. The authors also concluded that, while price interventions might only affect individual behaviour to a small degree, if applied broadly these policies had a potentially large population-level impact.(46)

5 See www.parentsjury.org.au/tpj_browse.asp?ContainerID=soft_drink_ban_in_us_schools.

6 See www.clintonfoundation.org/what-we-do/alliance-for-a-healthier-generation/what-we-ve-accomplished.



In the United States, soft drink taxes have been introduced by individual states to reduce consumption, raise revenue and improve public health (as the taxes have been extremely low, impacts on health would not be expected to be large). During the 1990s, around half of all states taxed soft drinks and 20 states changed their soft drink tax rate. An evaluation of the impact of changes in state soft drink taxes on BMI indicated that soft drink taxes modestly reduced BMI. The impact varied across demographic groups. The results were extrapolated to conclude that if the soft drink tax was as high as cigarette tax, the proportion of obese adults would decrease by nearly 1 percentage point.⁽³⁹⁾ Using taxation revenue from a tax on sugared beverages to subsidise healthy foods has been described as the most 'defensible' approach, countering any regressive effect of the tax and demonstrating to consumers the association between tax and benefit.⁽⁴⁷⁾

In Denmark, it has been estimated that the population's diet would be consistent with national guidelines if tax exemptions for 'healthy' products such as fruit, vegetables, rice, pasta and fish products were combined with a 30% tax increase on 'unhealthy' products.⁽⁴⁸⁾ In February 2009, the Danish Government announced extensive restructuring of its income tax system. While the reform will result in a deficit in the short term in order to stimulate the economy, the government plans to generate additional revenues through increasing taxation on unhealthy lifestyles. Under the government's proposals, pollution, cigarettes and unhealthy food (foods and drinks with a high sugar and fat content) will be subject to higher taxation. Ice cream, candy and chocolate will see a duty increase of 25%, while saturated fats in dairy products and oils will be levied at 20 kroner per kilo.⁷

Forty states in the United States have small taxes on sugared beverages and snack foods.⁽⁴⁷⁾ Large taxes on sugared beverages have been proposed in Maine and New York (NY) State; in New York, for instance, an 18% tax on non-diet soft drinks has been proposed for implementation in June 2009. While the tax is part of the state's strategy to tackle childhood obesity, it has also been cited as one component of a raft of measures to address the state's projected budget shortfall of US\$14 billion.⁽⁴⁹⁾ It has been estimated that a tax of a penny per ounce could reduce consumption by more than 10% and raise US\$1.2 billion a year in New York State alone.⁽⁴⁷⁾ There is significant community support for the introduction of a tax (52%) among New Yorkers, rising to 72% if taxation revenue were to be used for obesity prevention.⁽⁴⁷⁾

To counter the inequitable impact of taxes on unhealthy foods, it has been proposed that any such taxes be introduced in combination with subsidies or tax reductions for healthier options,⁽⁴⁹⁾ particularly if it was possible to target these to low-income households.⁽⁴⁶⁾ For example, Denmark is considering the exemption of healthier food products from a national value added tax of 25% on all foods.⁽⁴⁹⁾ The US Department of Agriculture Economic Research Service has estimated that providing a price discount on fruit and vegetables for low-income Americans would have a small but statistically significant positive effect on consumption. The study concluded that a 10% subsidy would increase low income earners' fruit intake by 2.1–5.2% and vegetable intake by 2.1–4.9%. The study also concluded that these increases would not result in low income earners meeting recommended levels of consumption for fruit and vegetable, however.⁽⁵⁰⁾

7 See www.cphpost.dk/culture/denmark-through-the-looking-glass/44873.html?task=view;www.forbes.com/feeds/reuters/2009/03/01/2009-03-01T182848Z_01_L1437267_RTRIDST_0_DENMARK-TAXES.html;www.lawandtax-news.com/asp/story.asp?storyname=35321.



Food subsidies

International examples of food subsidy programs and equitable access to healthy foods

Local community-based initiatives can promote equitable access to healthy food. In Thailand, the major food and small goods market in the city of Sam Chuk was restored with the help of local intersectoral action including community architects, supporting local traders and tourism. (51) The London Development Agency plans to establish a sustainable food distribution hub to supply independent food retailers, restaurants and city-based institutions. (51)

US food subsidies for low income earners

Low-income individuals and families in the United States can access subsidised food through several programs, including the federal *Food Stamp Program (Supplemental Nutrition Assistance Program)* or SNAP, run by the Department of Agriculture); the *Women, Infants and Children (WIC) Supplemental Nutrition Program*; the *Child and Adult Care Food Program*; and the *National School Lunch and Breakfast Programs*. (46)⁸

Funding of US\$20 million has been provided through the 2008 Farm Bill for a project to examine point-of-purchase incentives for healthy foods through SNAP.⁹ In addition, under recently introduced legislation in California, a *Healthy Purchase* pilot program will target SNAP subsidies: for each dollar of food stamps spent on fresh produce, participants will be subsidised a portion of the cost. (46)

The Farmers' Market Nutrition Program (FMNP),¹⁰ associated with the WIC, was established by Congress in 1992 to provide fresh, unprepared, locally grown fruits and vegetables to WIC participants, and to expand the awareness, use of and sales at farmers' markets. FMNP

is administered through a federal/state partnership in which the Food and Nutrition Service (FNS) provides cash grants to state agencies including agriculture or health departments. WIC participants are issued FMNP coupons in addition to their regular WIC food instruments. These coupons can be used to buy fresh, unprepared fruits, vegetables and herbs from state agency-approved farmers, farmers' markets or roadside stands, and farmers then submit coupons for reimbursement.¹¹

Nutrition education is provided through both the SNAP and WIC programs. There are some restrictions on the types of foods and products which may be purchased through the SNAP (for example, alcohol, tobacco and pet food are excluded). Federal regulations specify minimum nutritional requirements for WIC-eligible foods, which include juice, iron-fortified cereal, eggs, cheese, milk, peanut butter, dried beans or peas, iron-fortified infant formula, tuna and carrots. Foods in the program are high in one or more of the nutrients shown to be lacking in the diets of the population WIC serves.

UK food voucher system

The Healthy Start program in the United Kingdom¹² provides eligible low-income pregnant women and parents/carers of children under the age of four with vouchers to exchange for fresh fruit and other products. (52)

Food marketing to children

As discussed in the Technical Report, the most authoritative and comprehensive reviews of studies on the nature and extent of food marketing to children have been conducted in the United Kingdom, initially in 2003, (53) updated in 2006 (54) and in 2008 (unpublished). (55) This work reviewed studies on the extent and nature of food marketing to children from over 25 countries. These reviews and updates indicate that children are exposed to high

8 See www.fns.usda.gov/fsp/.

9 See www.fns.usda.gov/fsp/rules/Legislation/about.htm.

10 See www.fns.usda.gov/wic/FMNP/FMNPfaqs.htm.

11 See www.fns.usda.gov/wic/FMNP/FMNPfaqs.htm.

12 See www.healthystart.nhs.uk/.



levels of food advertising and marketing, and that the advertised diet is dramatically different from recommended diets, as it predominantly promotes energy-dense nutrient-poor (EDNP) foods. These findings are consistent with evidence from the work conducted by the Institute of Medicine in the United States,(56) as covered in the Technical Report.

There is a substantial and accumulating body of Australian research on food marketing patterns, including studies related to television, magazines, the internet, outdoor settings and point-of-sale.(57-66) This research indicates that food marketing is pervasive, and that children are exposed to high levels in each of these media throughout daily life. The research shows consistently that the content of food marketing directed at children is predominantly for unhealthy foods.

Restrictions on unhealthy food advertising targeted at children and others are proposed as part of a comprehensive approach and only one of a large range of measures required to address obesity. While current evidence is not sufficient to assess the impact of comprehensive advertising restrictions on obesity prevalence in children, especially in conjunction with public education (as this has not occurred in any jurisdiction), even a small association between television advertising and adiposity means limiting advertising would have significant impact across the entire population of children and young people.(56) Small influences can be significant when they affect a large population, are ongoing and cumulative. It is important to note that food marketing has as much impact on food consumption as any other single factor, and is amenable to change.(67, 68)

Persuasive marketing techniques are frequently used to advertise non-core foods to children, as well as to promote children's brand recognition and preference for advertised products. Recent Australian research examined children's exposure to the use of persuasive marketing within television food advertisements.(69) Advertisements broadcast on all three commercial Australian television channels

were recorded for an equivalent one-week period in May 2006 and 2007 (714 hours). Food advertisements were analysed for their use of persuasive marketing, including premium offers, such as competitions, and the use of promotional characters, including celebrities and cartoon characters. Advertised foods were categorised as core, non-core or miscellaneous foods. Commercial data were purchased to determine children's peak viewing times and popular programs. A total of 20,201 advertisements were recorded, 25.5% of which were for food.(69)

The study found that significantly more food advertisements broadcast during children's peak viewing times contained promotional characters and premium offers, compared with food advertisements during non-peak times. During programs most popular with children, there were 3.3 non-core food advertisements per hour containing premium offers, compared with 0.2 per hour during programs most popular with adults. The majority of advertisements containing persuasive marketing during all viewing periods were for non-core foods.(69)

Future debate relating to television advertising regulations must consider the need to restrict the use of persuasive marketing techniques to children, including premium offers such as competitions, and the use of promotional characters such as celebrities and cartoon characters.

Food marketing is linked to childhood obesity through its influence on children's food preferences, purchase requests and food consumption. A study by Kelly, Cretikos, Rogers and King aimed to describe the volume and nature of outdoor food advertisements and factors associated with outdoor food advertising in the area surrounding Australian primary schools. Forty NSW primary schools in Sydney and Wollongong were selected using random sampling within population density and socioeconomic strata. The area within a 500-metre radius of each school was scanned and advertisements coded according to pre-defined criteria, including food or non-food



product advertisement, distance from the school, size and location. Food advertisements were further categorised as core foods, non-core foods and miscellaneous drinks (tea and coffee). The number of advertisements identified was 9151, of which one-quarter (25% or 2286) were for food.

There were 1834 non-core food advertisements: this accounted for 80% of food advertisements. Soft drinks and alcoholic beverages were the food products most commonly advertised around primary schools (24% and 22% of food advertisements, respectively). Non-core food products were twice as likely to be advertised close to a primary school (95 non-core food advertisements per square kilometre within 250 metres compared to 46 advertisements per square kilometre within 250–500 metres). The authors concluded that the density of non-core food advertisements within 500 metres of primary schools, and the potential for repeated exposure of children to soft drink and alcoholic beverage advertisements in particular, highlights the need for outdoor food marketing policy intervention. The authors argued that outdoor advertising is an important food marketing tool that should be considered in future debates on the regulation of food marketing to children.(66)

A 2009 review of existing knowledge regarding the impact of marketing addressed the value of various legal, legislative, regulatory and industry-based approaches to change.(70) While reducing food marketing to children has been proposed as one means for addressing the global crisis of childhood obesity, there are significant barriers (social, legal, financial and public perception) associated with this. According to the authors, scientific literature documents that food marketing to children is:

- (a) Massive
- (b) Expanding in number of venues (product placements, video games, the internet, mobile telephones)
- (c) Composed almost entirely of messages for nutrient-poor, calorie-dense foods

(d) Having harmful effects

(e) Increasingly global and therefore difficult to regulate by individual countries

The food industry, governmental bodies and advocacy groups have proposed a variety of plans for altering the marketing landscape.(70)

A recent publication in the *European Journal of Public Health* reported on a mathematical simulation model that estimated the potential effects of reducing the exposure of 6–12-year-old US children to television food advertising on the prevalence of overweight and obesity.(71)

The study concluded that from one in seven up to one in three obese children in the United States might not have been obese in the absence of advertising for unhealthy food on television: reducing the exposure to zero would lower the prevalence of obesity from 17.8% to 15.2% for boys and from 15.9% to 13.5% for girls. This study provides support for limiting the exposure of children to marketing of energy-dense food as a part of a comprehensive approach to improving children's diets.(71)

The UK experience

Previously in the Technical Report we reported on the phasing in of restrictions on the advertising of food products high in fat, salt and sugar (HFSS products) to children in 2007 in the United Kingdom by the UK's broadcasting regulator Ofcom. In summary, HFSS advertisements were banned from children's programming (aimed at children aged under 16 years) on most television channels, and progressively reduced on children's channels.

The first review of these restrictions compared children's exposure to HFSS advertising in 2005 with July 2007–June 2008.(72) The review estimated that over this period the amount of HFSS advertising seen by children on television fell by 34%. Children were also reportedly exposed to less food and drink advertising using licensed characters such as cartoon and film characters; there were fewer advertisements with brand equity characters, free gifts and health claims, but more with celebrities.



Ofcom expects further reductions in children's exposure to advertising to have occurred since the implementation of the final phase of restrictions in January 2009, when all remaining HFSS advertising on children's channels (on Pay TV) was required to be removed.

The review also found that much of the HFSS advertising seen by children is broadcast between 6 pm and 9 pm. While the amount children saw in this period fell by an estimated 29%, the British Heart Foundation and other health and consumer groups have called for full bans due to limitations of the current regulations, which apply to programs aimed at under-16s rather than programs most popular with under-16s.¹³ The UK regulations are based on children as a proportion of the audience, and do not apply at times when the largest absolute numbers of children are watching. Programs with a small total audience, of which a high relative proportion are children, would be covered by the regulations, while a program with a large total viewing audience, with higher absolute numbers of children viewing but a relatively lower proportion of children compared to adults, would not be covered. A large number of children therefore are still exposed to food marketing on television⁽⁷³⁾, despite the specific intent of the restrictions to limit such exposure.

While children's channels in the United Kingdom saw a decline in food and drink advertising revenue, this was more than offset by a growth in advertising revenue overall. The four main commercial channels saw an overall reduction in advertising revenues, with a 6% decline in food and drink advertising revenue. Most other digital commercial channels increased their revenue from food and drink advertising, and children's exposure to HFSS advertising was increased by 7% on these channels.⁽⁷²⁾ This highlights the importance of applying

restrictions across media, including free-to-air and Pay TV, as the latest Ofcom restrictions have been doing since 1 January 2009.

Voluntary regulation in Australia

In October 2008, the Australian Food and Grocery Council (AFGC) announced the Responsible Children's Marketing Initiative of the Australian Food and Beverage Industry to 'address community concerns about inappropriate advertising' to children.⁽⁷⁴⁾ The initiative was developed in collaboration with the Australian Association of National Advertisers (AANA) as part of the system of advertising and marketing self-regulation in Australia.⁽⁷⁵⁾ The initiative commenced on 1 January 2009. Monitoring of food and beverage advertising to children over a period of 12 months from the commencement of this initiative is to be undertaken through a study commissioned by the AFGC, to be repeated periodically.⁽⁷⁵⁾ The study's aim is to measure the industry's response, determine the nature of improvements in performance and to report on the findings.

The initiative is voluntary: 15 member organisations of the AFGC were signed up as of 4 June 2009¹⁴. The core principles to which participating companies must commit include:⁽⁷⁵⁾

- Participants will not advertise food and beverage products to children under 12 in media unless the products represent healthy dietary choices, consistent with established scientific or Australian Government standards; AND the advertising and/or marketing communication activities reference, or are in the context of, a healthy lifestyle, designed to appeal to the intended audience through messaging that encourages good dietary habits (consistent with established scientific or government criteria) and physical activity.

13 For example, see www.telegraph.co.uk/health/healthnews/3812954/Call-for-full-ban-on-junk-food-adverts-for-children-after-Ofcom-says-part-ban-is-working.html.

14 Companies sign up to the initiative as a minimum commitment and must publish individual *Company Action Plans* outlining how they will meet the initiative's core principles. See AFGC website for Company Action Plans at www.afgc.org.au/index.cfm?id=771 (Accessed 4 June 2009).



- Other core principles relate to the use of popular personalities and licensed characters; product placement; use of products in interactive games; advertising in schools; and the use of premium offers.

Limitations of the initiative include: (75)

- Its voluntary nature.
- The lack of specific nutrient criteria to define healthy dietary choice foods and beverages (products covered by the code are as defined by individual participating organisations, making monitoring difficult).
- While sanctions, complaints and compliance systems are to be developed, including a public complaints program, there are no specified deterrents to ensure food companies will comply with the code.
- The code does not cover food marketing on food companies' own websites, only paid advertising on third-party websites.
- Specific times/program types when the code applies are not specified, and are to be interpreted by individual companies. The AFGC has specified definitions for *Advertising or Marketing Communications to Children* (for example, as defined by the AANA Code for Advertising and Marketing Communications to Children – advertising or marketing communications which, having regard to the theme, visuals and language used, are directed primarily to children) and definitions for *Media* (television, radio, print, cinema and third-party internet sites where the audience is predominantly children and/or having regard to the theme, visuals and language used are directed primarily to children). However, in some of the participating

company's action plans, 'targeting children under 12 years' on television is defined to be when the majority of the audience is under 12 years, which is extremely rare.¹⁵

Australian Communications and Media Authority (ACMA) review of the Children's Television Standards (CTS)

Since the original Technical Report which described the ACMA review of the CTS (which regulate the content of children's programs and advertising during designated children's viewing times on commercial free-to-air television) there has been no further update of the standards. The final CTS are expected to be gazetted in mid-2009.¹⁶

The Taskforce also considered a review commissioned by the Foundation for Advertising Research for Frontier Economics and produced in December 2008, which examined the evidence for the effectiveness of introducing advertising bans on the consumption of targeted foods and beverages, and potential impacts on obesity, as well as the implications of the implementation of a ban in Australia. This analysis concluded that unintended consequences from regulation (due to substitution of advertising to other types of media) and the need to have an agreed set of definitions for EDNP foods cast doubt over the effectiveness of any such regulation. (76)

This review highlighted for the Taskforce the need for any regulatory approach to restrictions on advertising and marketing of EDNP foods to be carefully developed and implemented in a comprehensive manner.

15 For example, the Coca-Cola, Pepsico, Nestlé and Cereal Partners Worldwide commitments each define 'targeting children under 12 years' on television as an ACMA classified C or P program, or where predominantly or >50% of the audience is under 12 years. OzTAM ratings data for January–June 2006 indicate no time slots across weekdays or across weekends when children 0–14 years comprise the majority of the overall viewing audience across commercial channels. While specific programs (on particular channels and particular days) may have predominantly children in their audience, this is a very limited occurrence. Reference 10.

16 See www.acma.gov.au/WEB/STANDARD/pc=PC_310262.



Improve public education and information

Effective social marketing programs need to motivate community members to participate in a supportive social movement, such as programs designed to make lives healthier. The *Healthy Weight Healthy Lives* social marketing campaign in the United Kingdom, for example, aims to engage stakeholders from the public and commercial sectors, and create a practical healthy living campaign driven by ordinary people.(77) It is based on research indicating that people want help to live healthier lives and want to be broadly supported to do this, including by government and commercial organisations.

Food and menu labelling

Evidence suggests that displaying information about restaurant menu items at point of sale or on menus is more effective than making this information available to the public via other means, such as on the internet, and may be associated with lower calorie purchases by consumers who see the information.(78)

In the Technical Report, we described the introduction of restaurant menu labelling into various US jurisdictions. Several initiatives have commenced in the United Kingdom concerning menu labelling:

- The UK Department of Health is developing the Healthy Food Mark for the public sector, to signal where public sector caterers are providing healthier, nutritious food and encouraging healthier eating. The initial focus of the Healthy Food Mark will be on meeting general guidelines on food, macronutrients and salt. Caterers will also be asked to meet agreed environmental standards as part of the criteria. Guidelines on making the procurement of food more sustainable will be developed for this purpose. The Healthy Food Mark will be developed and piloted throughout 2009 in central government staff canteens, prison

service and National Health services, to assess its practicality and impact in each institutional setting.(34)

- The FSA introduced a voluntary scheme for food service outlets to display calorie counts in January 2009.(79) By June 2009, more than 450 food outlets, including workplace caterers, sit down and quick-service restaurants, theme parks and leisure attractions, pub restaurants, cafes and sandwich chains, are expected to introduce calorie information, some on a pilot basis.(80) Outlets include 18 major catering companies and businesses such as Burger King, KFC, Marks and Spencer, Sainsbury's Cafes, Pizza Hut, Subway, and Tesco and Unilever staff restaurants. Each company will:

- Display calorie information for most food and drink they serve
- Print calorie information on menu boards, paper menus or on the edge of shelves
- Ensure the information is clear and easily visible at the point where people choose their food

Research is planned to assess customer understanding and use of the system, as well as practicalities and costs. This will be used to inform the next steps for a wider roll-out of calorie labelling on menus.

Reshape urban environments towards healthy options

Tackling obesity is about reshaping behaviours for positive outcomes in an environment of nutritional abundance that serves aesthetic and emotional needs as well as nutritional requirements. Food and alcohol play an important part in the social fabric of life, as does sedentary social behaviour; simply lecturing people or taking a prohibitionist approach is unlikely to be successful or appropriate.



The energy balance equation is strongly affected by dietary and physical activity patterns – ‘the major modifiable factors through which many of the external forces promoting weight gain act’.(81) The relative contributions of eating and activity patterns have been subject to substantial scientific debate;(82) however, it is clear that there is a strong and positive relationship between dietary factors (including fat and energy intake) and excess body weight, while decreasing physical activity levels and increased sedentary behaviour also play a key role in weight gain and the development of obesity.(81)

In August 2008, an independent expert panel was appointed to make recommendations and investigate reforms on improving the ways in which sport is run, promoted and managed in Australia.(83) Chaired by David Crawford, the expert panel is examining sport at the elite and grassroots community level. The review will pay particular attention to the most effective way in which sport and physical activity can play a strong role in building a healthier Australia, and will form part of the Australian Government’s preventative health agenda. This is included as one of the Terms of Reference to which recommendations will be particularly directed: *Better place sport and physical activity as a key component of the Government’s preventative health approach.* This covers:

- Examining Australian Government frameworks to ensure an on-going focus on grassroots and community sport and physical activity
- Examining Australian Government programs to increase participation rates in sport and physical activity, including analysis of existing programs

- Identifying and recommending opportunities to break down barriers to participation at junior, adult and senior ages with a view to making it simpler and easier for Australians to participate in the sport or physical activity of their choice, including for women, the disabled and Indigenous people
- Recommending strategies to increase the effectiveness of the promotion of sport by the Australian Government to better communicate positive health and activity messages to the broader community

The Panel is due to report to the Australian Government in 2009.¹⁷

Cycling strategy

In April 2009, the Australian Government announced a \$40 million cycle path fund for bicycle infrastructure to be administered by the Department of Infrastructure, Transport, Regional Development and Local Government. The funding was made under the Local and Community Infrastructure Program (CIP). Applications were due in May 2009 for funding to commence in July 2009 and to end in June 2011.¹⁸ Over 100 councils have committed to allocating some of the funding received through the CIP for cycling and shared path infrastructure.(84)

The funding may be provided for new routes and extensions or refurbishment of existing infrastructure, including off-road bicycle paths (but not dedicated mountain bike trails); on-road bicycle lanes (for example, road-widening and marking bike lanes on an existing road); and bicycle parking facilities. Projects of up to \$2 million could be funded, with a requirement for a 50% joint funding contribution from each project.

17 See www.sportpanel.org.au/internet/sportpanel/publishing.nsf/Content/home.

18 See www.infrastructure.gov.au/local/cip/index.aspx; www.deewr.gov.au/Employment/Documents/Jobs%20Fund%20Guidelines%20APPROVED%20FINAL%20_2_.pdf?utm_source=MailingList&utm_medium=email&utm_content=Cycling+Promotion+Fund+Information+Bulletin+-+Government+announces+details+of+%2440m+Cycle+Path+Fund.



Urban planning and design

It is worth noting that more disadvantaged areas have more retail outlets selling fruits and vegetables, but also more fast food outlets. (85) One effective regulatory action for local government to reduce access to foods high in fats and salt is the adoption or strengthening of planning regulations to manage the proliferation of fast food outlets in particular areas; for example, near schools and in socially disadvantaged neighbourhoods. Research from the United States and Australia indicates that less-advantaged areas tend to have greater access to fast food retailers. (86)

An Australian study examined the association between neighbourhood fast food outlets and obesity in children and adults (the CLAN Study). Children's measured and parents' self-reported heights and weights were used to calculate BMI, while locations of major fast food outlets were geocoded. Bivariate linear regression analyses examined associations between the presence of any fast food outlet within a 2km buffer around participants' homes, fast food outlet density within the 2km buffer, and distance to the nearest outlet and BMI. Each independent variable was also entered into separate bivariate logistic regression analyses to predict the odds of being overweight or obese.

Among older children, lower BMI z-scores were found among those with at least one outlet within 2km. Fathers' BMI increased with the distance from an outlet. Among 13–15-year-old girls and their fathers, the likelihood of overweight/obesity was reduced by 80% and 50%, respectively if they had at least one fast food outlet within 2km of home. Among older girls, the likelihood of being overweight/obese was reduced by 14% with each additional outlet within 2km. The odds of fathers being overweight/obese increased by 13% for each additional kilometre to the nearest outlet.

The authors concluded that while consumption of fast food has been shown to be associated with obesity, the study provided little support for the concept that exposure to fast food outlets in the local neighbourhood increases risk of obesity. (87)

A systematic review examining the relationship between obesity and the community and/or consumer food environment identified the need for additional research in this area. (88) The authors identified only seven studies for review. These studies used cross-sectional designs to examine the community food environment defined as the number per capita, proximity or density of food outlets. The studies varied substantially in sample populations, outcome variables, units of measurement and data analysis. Two studies did not find any significant association between obesity rates and community food environment variables, while five studies found significant results. Many of the studies were subject to limitations that may have mitigated the validity of the results.

The authors identified several gaps in knowledge in this area and concluded that research examining obesity and the community or consumer food environment is at an early stage. They suggested that future research should directly measure multiple levels of the food environment and key confounders at the individual level. (88)

Consumption of fast food products, which have high energy densities and glycaemic loads, and expose customers to excessive portion sizes, may be greatly contributing to and escalating the rates of overweight and obesity in the United States. A systematic review of the relationship between weight gain and fast food consumption found that while more research needs to be conducted, specifically in regard to the effects of fast food consumption among subpopulations such as children and adolescents, sufficient evidence exists for public health recommendations to limit fast food consumption and facilitate healthier menu selection. (89)

The author concluded that the scientific findings and corresponding public health implications of the association between fast food consumption and weight are critical, due to the increase of the fast food industry globally. (89)



Interventions for children

Since the Technical Report was published, several evidence reviews relating to the management and prevention of obesity have been released. In January 2009, an updated Cochrane review examining the evidence on interventions for treating obesity in children was published.⁽⁹⁰⁾ It concludes that family-based, lifestyle interventions, which include a behavioural program aimed at changing diet and physical activity, provide significant and clinically meaningful decreases in overweight and obesity in both children and adolescents compared with standard care or self-help regimes. Family-based lifestyle interventions that not only modify diet and physical activity but also include behaviour therapy programs can help obese children lose weight and maintain that loss for at least six months. The review also found that in adolescents the effect lasts for at least 12 months. Adding the weight-controlling drugs orlistat or sibutramine to behaviour change programs for adolescents may provide additional benefits.

These findings represent a difference from a systematic review performed in 2003 which could not find enough data to draw any conclusions about the effects of different programs.⁽⁹¹⁾ This time the researchers identified 64 randomised controlled trials involving 5230 participants, enabling them to see some definite effects.⁽⁹⁰⁾

Research gaps identified include what types or aspects of different interventions work better for different groups of children, depending on their age, gender, socioeconomic background, faith or ethnic groups; the importance of self-esteem in influencing how successful an intervention will be; and whether there are any characteristics of individual families or patients that could help to identify success.⁽⁹⁰⁾

A systematic review and meta-analysis of randomised trials on behavioural interventions to prevent childhood obesity was published in 2008.⁽⁹²⁾ The objective was to summarise evidence on the efficacy of interventions aimed

at changing lifestyle behaviours (increased physical activity and decreased sedentary activity, increased healthy dietary habits and decreased unhealthy dietary habits) to prevent obesity. Trials with interventions lasting more than six months (compared with shorter trials) and trials with post-intervention outcomes (compared with in-treatment outcomes) yielded marginally larger effects.

The authors concluded that paediatric obesity prevention programs caused small changes in target behaviours and no significant effect on BMI compared with control. The authors also concluded that trials evaluating promising interventions applied over a long period, using responsive outcomes and with longer measurement timeframes, are urgently needed.⁽⁹²⁾

Pre-school setting

A study examining the relationships between weight status and child, parent and community characteristics in pre-school children in Australia collected cross-sectional data from 140 children and their parents from 11 randomly selected pre-schools in New South Wales. Compared with non-overweight children, overweight children spent more time in quiet play and watching television and less time in active play and physical activity. Perceived competence and motor development were similar for both overweight and non-overweight children. The study concluded that the results showed little difference between overweight and non-overweight children in relation to a variety of child, parent and community variables. However, for some characteristics, differences in older children have been reported.

The authors concluded that longitudinal studies are required to confirm when these characteristics begin to differ, what effects these differences have on behaviour and weight status, and therefore when targeted treatment should be provided during a child's development.⁽⁹³⁾



School-based programs

A Cochrane systematic review of studies on physical activity programs in schools published in January 2009 concluded that school-based health and exercise programs have positive outcomes despite having little effect on children's weight or the amount of exercise they do outside of school. The researchers reviewed data from 26 studies of physical activity promotion programs in schools in Australia, South America, Europe and North America. Most studies tried to encourage children to exercise by explaining the health benefits and changing the school curriculum to include more physical activity for children during school hours. Programs included teacher training, educational materials and providing access to fitness equipment.(94)

The review showed that school-based programs increased the time children spent exercising and reduced the time spent watching television. Programs also reduced blood cholesterol levels and improved fitness – as measured by lung capacity. However, programs made little impact on weight, blood pressure or leisure time activities.(94)

The lead researcher suggested that physical activity classes may be too closely associated with school work, meaning some students may feel like they are being made to do more work. In this case, a key strategy would be to promote physical activity by getting children and adolescents to 'play' in ways that represent fun and adventurous activities, while at the same time promoting better fitness levels.(95)

A systematic review of school-based interventions that focus on changing dietary intake and physical activity levels to prevent childhood obesity was conducted to update the obesity guidelines produced by the National Institute for Health and Clinical Excellence and published in 2009. The review found that school-based physical activity interventions may help children maintain a healthy weight but the results were inconsistent and short term. Physical activity interventions may be more successful in younger children and in girls.

Studies were heterogeneous, making it difficult to draw conclusions on what interventions were effective. While the findings were inconsistent, they suggested overall that combined diet and physical activity school-based interventions may help prevent children becoming overweight in the long term. Physical activity interventions, particularly in girls in primary schools, may help to prevent these children from becoming overweight in the short term.(96)

As with the Cochrane systematic review,(94) a systematic review and meta-analysis undertaken by Canadian researchers found that school-based physical activity interventions did not improve BMI, although they had other beneficial health effects.(97) The review to determine the effect of school-based physical activity interventions on BMI in children found that BMI did not improve with physical activity interventions (weighted mean difference -0.05kg per square metre, 95% confidence interval -0.19 to 0.10). The authors concluded that current population-based policies that mandate increased physical activity in schools are unlikely to have a significant effect on the increasing prevalence of childhood obesity.(97)

Ecological approaches that recognise the interaction between individuals and the settings in which they spend their time are currently at the forefront of public health action. In a literature review published in 2009, Canadian researchers examined schools as a setting for action on physical inactivity, as they have been identified as a key setting for health promotion.(98) The review addressed the promotion of physical activity in schools and showed that school-based strategies (elementary or high school) using classroom-based education only did not increase physical activity levels; one notable exception was screen time interventions. The authors concluded that although evidence is sparse, active school models and environmental strategies (interventions that change policy and practice) appear to promote physical activity in elementary schools effectively. The review also found strong evidence to support multi-component models in high schools,



particularly models that incorporate a family and community component. An emerging trend is to involve youth in the development and implementation of interventions.

The authors highlighted the importance of modest increases in physical activity levels in school-based trials in the context of childhood obesity and sedentary lifestyles.

The review also concluded that school initiatives must be supported and reinforced in other community settings. The key role of health professionals as champions in the community, based on their influence and credibility, was also identified: health professionals can lend support to school-based efforts by asking about and emphasising the importance of physical activity with patients, encouraging family-based activities, supporting local schools to adopt an 'active school' approach, and advocating for support to sustain evidence-based and promising physical activity models within schools. (98)

An Australian study examining the predictors of BMI changes in Victorian 5–10-year-old primary school children found BMI change (measured in 1997 and 2000/2001) to be positively associated with frequency of takeaway food, food quantity, total weekly screen time, non-Australian paternal country of birth, maternal smoking during pregnancy, and maternal and paternal BMI. (99) Inverse associations were noted for the presence of siblings and rural residence. Multivariable models suggested individual determinants have a cumulative effect on BMI change. The authors found that while it was hard to identify predictors of change based on strong short-term tracking of BMI, putative determinants across all six domains assessed (children's diet, children's activity level, family composition, sociodemographic factors, prenatal factors and parental adiposity) were independently associated with adiposity change.

The study concluded that multifaceted solutions are likely to be required to successfully deal with the complexities of childhood overweight. (99)

A systematic literature review published in 2009 examined the effectiveness of school-based food and nutrition policies in improving diet and reducing obesity. (100) Drawing on published and unpublished literature, most evidence of effectiveness was found for the impact of both nutrition guidelines and price interventions on intake and availability of food and drinks, with less conclusive research on product regulation. Despite the introduction of school food policies worldwide, few large-scale or national policies have been evaluated. All included studies were from the United States and Europe. The authors concluded that while some current school policies have been effective in improving the food environment and dietary intake in schools, there is little evaluation of their impact on BMI. As schools have been proposed worldwide as a major setting for tackling childhood obesity, it is essential that future policy evaluations assess the long-term effectiveness of a range of school food and nutrition policies in tackling both dietary intake and overweight and obesity.

A 2009 article by Story et al. (101) explored the role of schools in obesity prevention efforts in relation to four key areas: school food environments and policies; school physical activity environments and policies; school BMI measurements; and school wellness policies. Focusing on the US context, the authors concluded that:

- Competitive foods (foods sold outside federally reimbursed school meals) are widely available in schools, especially secondary schools. Studies have related the availability of snacks and drinks sold in schools to students' high intake of total calories, soft drinks, total fat and saturated fat, and lower intake of fruits and vegetables.
- Physical activity can be added to the school curriculum without academic consequences and can also offer physical, emotional and social benefits. Policy leadership has come predominantly from the districts, then the states, and, to a much lesser extent, the federal government.



- Few studies have examined the effectiveness or impact of school-based BMI measurement programs.
- Early comparative analyses of local school wellness policies suggest that the strongest policies are found in larger school districts and districts with a greater number of students eligible for a free or reduced-price lunch.

The authors found that while studies show schools have been making some progress in improving the school food and physical activity environments, much more work is needed. Stronger policies are needed to provide healthier meals to students at schools; limit their access to low-nutrient, energy-dense foods during the school day; and increase the frequency, intensity and duration of physical activity at school.(101)

In the European Union (EU), public health, particularly obesity, is for the first time being seen as a driver of agricultural policy.(102) In 2007, European Ministers of Agriculture were asked to back new proposals for school fruit and vegetable programs as part of agricultural reforms, and in 2008 the European Commission (EC) conducted an impact assessment to assess the potential impact of this new proposal on health, agricultural markets, social equality and regional cohesion.

A systematic review published in 2008 examined the effectiveness of interventions to promote fruit and/or vegetable consumption in children in schools.(102) The review was conducted to inform the EC policy development process. The results showed that school schemes are effective at increasing both fruit and vegetable intake and knowledge. Of the 30 studies included, 70% increased fruit and vegetable intake, with none decreasing intake. The majority of the studies (23) had follow-up periods of more than one year and provided some evidence that fruit and vegetable schemes can have long-term impacts on consumption. One study led to both increased fruit and vegetable intake and reduction in weight, while one study showed that school

fruit and vegetable schemes can also help to reduce inequalities in diet. Effective school programs have used a range of approaches and been organised in ways which vary nationally depending on differences in food supply chain and education systems.

The authors concluded that EU agriculture policy for school fruit and vegetable schemes should be an effective approach, resulting in both public health and agricultural benefits. Aiming to increase fruit and vegetable intake amongst a new generation of consumers, it will support a range of EU policies including obesity and health inequalities.(102)

A systematic review and meta-analysis published in 2008 was undertaken to determine the effectiveness of school-based strategies for obesity prevention and control.(103) Peer-reviewed studies published between 1966 and October 2004 were considered for review, with criteria including 3–18-year-olds targeted in a school setting, reported weight-related outcomes, control measurement included and at least a six-month follow-up period. Studies employed interventions related to nutrition, physical activity, reduction in television viewing or combinations of these. Twenty-one papers describing 19 studies were included in the systematic review, with eight of these included in the meta-analysis. Nutrition and physical activity interventions resulted in significant reductions in body weight compared with control. Parental or family involvement of nutrition and physical activity interventions also induced weight reduction. Combination nutrition and physical activity interventions were effective at achieving weight reduction in school settings.

The authors concluded that several promising strategies for addressing obesity in the school setting were suggested, warranting replication and further testing.(103)

A related article by Katz(104) published in 2009 drew on the same evidence as in the systematic review and meta-analysis described above(103) and concluded that available research evidence does present a case for school-based



interventions. The author found that despite marked variation in measures, methods and populations in studies examining school-based interventions for obesity prevention and control and for related health promotion, evidence clearly demonstrated that school-based interventions had significant effects on weight. Katz states that the urgency of the obesity and diabetes epidemics demands action, in spite of limited evidence to date; intervention and methodologically robust evaluation is necessary based on current evidence and common sense. (104)

Community setting

In spite of greater awareness of the need for action to reduce obesity, the evidence on sustainable community approaches to prevent childhood and adolescent obesity is surprisingly sparse. A paper published in 2008 described the design and methodological components of a demonstration site for obesity prevention in the Barwon south-west region of Victoria, Australia, that aims to build the programs, skills and evidence necessary to attenuate and eventually reverse the obesity epidemic in children and adolescents. (105) The Sentinel Site for Obesity Prevention is based on a partnership between the region's Deakin University and the health, education and local government agencies. The three basic foundations of the Sentinel Site are: multi-strategy interventions across multiple settings; building community capacity; and undertaking program evaluation and population monitoring. While three intervention projects cover different age groups – pre-school (2–5-year-olds), primary school (5–12-year-olds) and secondary school (13–17-year-olds) – each project has many common characteristics. These include community participation and ownership of the project; intervention duration of at least three years; and full evaluations with behavioural impact and anthropometric outcome measures compared with regionally representative comparison populations. (105)

It is well known that obesity prevention initiatives must consider both physical activity and nutrition to be effective. Community sports venues have the capacity to promote healthy lifestyles through physical activity as well as healthy food choices. In research published in 2008, a telephone survey was conducted among parents of children aged 5–17 years in New South Wales to determine the nature of food and beverages purchased by children at community sporting venues, and to determine parental perceptions of the role that government should play in regulating the types of food and beverages sold at these outlets. (106)

The majority of canteens at children's sporting venues were considered to sell mostly unhealthy food and beverages (53%). Very few parents reported that canteens sold mostly healthy food and beverages. Parents reported that the food and beverage items their children most frequently purchased at outdoor sports fields were water, chocolate and confectionery, soft drink and sports drinks, and ice cream. At community swimming pools, the most frequently purchased items were ice cream, followed by snack foods, including chips, cakes and biscuits. Most parents (63%) agreed that government should restrict the types of food and beverages that can be sold at children's sporting venues. The authors concluded that children are receiving inconsistent health messages at sporting venues, with healthy lifestyles being promoted through sports participation, but unhealthy dietary choices being provided at sports canteens. (106)

While overweight is often established by school entry age, not all mothers of children who are overweight at this point report weight concerns. Enhancing maternal concern might assist lifestyle change, but could lead to child body dissatisfaction. A prospective community study conducted in Melbourne investigated perceived/desired body size and body dissatisfaction in mothers and their 6.5-year-old children, and the impact of earlier maternal concern about overweight on children's BMI status and body dissatisfaction. (107) BMI correlated with perceived body size for all three



actual BMI perceived size pairings: mother self-report, mother's report about her child, and child self-report. Similarly, all three dissatisfaction scores were greater with increasing BMI status. Children's own dissatisfaction scores correlated with their actual BMI, but were not related to mothers' own body dissatisfaction scores or with mothers' dissatisfaction with children's body size. Maternal concern about overweight at the age of four years was not associated with BMI change, or child body dissatisfaction by the age of 6.5 years.

The authors concluded that despite low rates of recognition of child overweight, maternal perceptions of the child's body correlated strongly with the child's actual BMI. Maternal concerns about child BMI did not appear to impact on child BMI change or child body dissatisfaction.(107)

Australian research published in 2008 examined associations between family physical activity and sedentary environment and changes in BMI among 10–12-year-old children over three years.(108) The study measured height and weight at baseline and follow-up; aspects of the family physical activity and sedentary environment (parental and sibling modelling, reinforcement, social support, family-related barriers, rules/restrictions, home physical environment) were measured with a questionnaire completed by parents at baseline. At baseline, 29.6% of boys and 21.9% of girls were overweight or obese. Over the study period there was a significant change in BMI z-score among girls but not boys. The authors concluded that sibling physical activity and environmental stimuli for sedentary behaviours and physical activity within the home may be important targets for prevention of weight gain during the transition from childhood to adolescence.(108)

Workplace setting

A joint report by the World Health Organization (WHO) and the World Economic Forum notes there is clear and persuasive evidence that many workplace health promotion programs targeting non communicable disease have been successful at improving employees' health by reducing risk factors, increasing employees' fruit and vegetable consumption, improving employee engagement and productivity, and producing return on investment (through cost savings and increased productivity).(109)

A systematic review examining obesity status and sick leave was published in 2009.(110) While 36 studies on the relation between obesity status and sick leave were identified, pooling of effect estimates was not possible due to great heterogeneity between studies regarding definition of sick leave (short term/long term), measure of obesity (BMI/waist circumference/percentage body fat), definition of obesity status (WHO standards/other), study population (sex/age/occupation/country) and exposure and outcome ascertainment (self-reported/objectively assessed). Nevertheless, a clear trend towards greater sick leave among obese compared with normal weight workers could be discerned, especially for spells of longer duration. In studies from the United States, which consistently reported around five times a lower number of sick leave days per person-year than European studies, obese workers had approximately one to three extra days of absence per person-year compared with their normal weight counterparts. In European studies, the corresponding difference was about 10 days. The data were conflicting for overweight workers, indicating either increased or neutral level of sick leave compared with normal weight.

Studies examining underweight were very few and concerns regarding direction of causality were greater. The review identified four interventional studies; all of these found that substantial weight loss in obese subjects resulted in at least temporary reductions in sick leave.



The authors concluded that increasing obesity in children and adults is likely to negatively affect future productivity as obesity increases the risk of sick leave, disability pension and death.(110)

A recent literature review for the New Zealand Ministry of Health cites the workplace as a pivotal location for promoting and supporting wellness, as described in the Technical Report. The review states: 'in terms of importance, the workplace is matched only by the education system as the most effective front line approach to preventing chronic disease and promoting health' (page 6). Reasons for this crucial role of workplaces include ease of access to a large number of people, existing infrastructures in the workplace (for example, communication channels, teams), the cost-efficiency of workplace health promotion programs relative to clinical or community-based programs, and the opportunity to address multiple levels of influence, including individual, interpersonal, organisational and environmental factors on health.(111)

Examples of workplace health promotion programs cited in the report include: stress management, smoking cessation, weight management, back care, health screenings, nutrition education, workplace safety, prenatal and well baby care, CPR and first aid classes, employee assistance programs (EAP), work-life balance policies, flexi-time, exercise/fitness groups, discounts to local fitness facilities, healthful food choices at work meetings, events, training programs and family-friendly policies and facilities (such as bicycle racks, showers and gym equipment).(111)

Benefits to employees include health benefits (such as physical wellbeing and clinical health improvements: reduced cholesterol, reduced risk of chronic disease, reduced incidence of musculoskeletal disorders); increased mental wellbeing, energy and resilience, reduced

stress and depression, and increased quality of life; financial benefits; and improved job satisfaction.(111)

Benefits to employers from workplace health promotion programs include:(111)

- A healthy, happy and present workforce with reduced absenteeism and presenteeism; improved employee engagement, recruitment and retention; a happier, more resilient workforce; a positive workplace culture; and improved industrial relations.
- Increased employee performance and productivity.
- Financial benefits including reduced healthcare costs; reduced costs relating to absenteeism and presenteeism; return on investment (from improved productivity or cost savings).

The review cites research showing that the economic return on investment for various workplace health promotion programs ranged from US\$1.50 to US\$5.96 saved for every US\$1 spent.(111)

The review notes that 'the challenge for organisations today is no longer whether or not workplace health promotion programs should be implemented but rather how they should be designed, implemented and evaluated to achieve optimal benefits (i.e. health and cost-effectiveness)'(111) (page 7). Effectiveness of such initiatives can be achieved through careful planning and informed design; long-term focus and strategic goals; creating a culture of health (that is, a culture supportive of workplace health promotion, including active leadership and a healthy environment); maximising employee engagement and participation; having an appealing communications strategy; and research and evaluation.(111)



The review provides an outline of the design and implementation components of successful workplace health promotion programs based on the literature:(111)

Aspects of successful workplace health promotion program design:

- Being based on theory (for example, on improving self-efficacy, stage of change etc)
- Having clear goals and objectives (linked to organisational objectives)
- Being comprehensive (holistic, multi-component)
- Including tailored/targeted interventions (based on employee characteristics)
- Focusing on modifiable risk factors (for example, things employees can change such as diet and level of physical activity) and improving employees' self-efficacy (belief in their ability to achieve certain outcomes)
- Promoting the inclusion of existing social support systems (for example, involving spouses/family) and the creation of new social support systems (such as weight loss teams, sports teams)
- Including a participatory approach to development and implementation (involving employees – using peers for design, promotion and delivery)
- Offering flexibility (for example, holding additional sessions in work time at different times of day, offering different options for participation)
- Including health risk assessments/screenings
- Having a long-term focus
- Removing barriers to participation
- Including research and evaluation

Aspects of successful workplace health promotion program implementation:

- Fostering networks and partnerships (for example, potential wellness collaborators)
- Using a variety of communication/education strategies
- Including environmental support (for example, environmental modifications such as healthy foods in vending machines, signage promoting healthy behaviours, provision of facilities such as bicycle racks, showers and changing rooms)
- Including the use of incentives and rewards
- Having strong management support (for example, endorsement, resourcing and policy sign-off)



Update on Victorian WorkHealth program

The Victorian WorkHealth pilot, delivered by WorkSafe, ran in 2008 and involved 657 workers in nine Victorian workplaces taking part in health checks at their workplaces. In March 2009 the Premier announced that the pilot of the initiative to screen workers for preventable diseases has been highly effective, with two in three workers referred to a GP for further medical attention.(112)

The five-year program commenced roll-out in regional Victoria in March 2009, with roll-out in Melbourne to start in mid-2009. The remainder of regional areas will follow in early 2010.

As part of the program, participating workers fill out a questionnaire about lifestyle, personal and family medical history, followed by a one-on-one session with a trained health professional to assess health risk through waist circumference, blood pressure, blood cholesterol, diabetes score and blood glucose.

Employers with an annual remuneration of less than \$10 million will be fully reimbursed the cost of health checks, meaning they are free, whilst those employers with annual remuneration greater than \$10 million will be required to pay a \$30 contribution per worker. Some organisations in regional areas will be eligible for a grant for health and wellbeing activities.

Town planning and building design

The built environment plays an important role in influencing participation in physical activity. Australian research published in 2009 examined whether urban sprawl in Sydney was associated with overweight/obesity and levels of physical activity.(113) The authors used a cross-sectional multilevel study design to relate urban sprawl (based on population density) measured at an area level to overweight/obesity and levels of physical activity measured at an individual level, controlling for individual and area level covariates in metropolitan Sydney. Information was available on 7290 respondents using data from the 2002 and 2003 New South Wales Population Health Survey. The study found that

living in more sprawling suburbs increases the risk of overweight/obesity and inadequate physical activity, despite the relatively low levels of urban sprawl in metropolitan Sydney. For an inter-quartile increase in sprawl, the odds of being overweight were 1.26 (95% CI=1.10–1.44), the odds of being obese were 1.47 (95% CI=1.24–1.75), the odds of inadequate physical activity were 1.38 (95% CI=1.21–1.57), and the odds of not spending any time walking during the past week were 1.58 (95% CI=1.28–1.93). The authors concluded that modifications to the urban environment to increase physical activity may be worthwhile.(113)

Active environments

A review of active transportation (walking, cycling and public transport) and obesity rates in Europe, North America and Australia between 1994 and 2006 was published in 2008. (114) Countries with the highest levels of active transportation generally had the lowest obesity rates. Europeans walked more than United States residents (382km versus 140km per person per year) and bicycled further (188km versus 40km per person per year) in 2000. Walking and bicycling were far more common in European countries than in the United States, Australia and Canada. Active transportation was found to be inversely related to obesity in these countries. While the results do not prove causality, they suggest that active transportation could be one of the factors explaining international differences in obesity rates.(114)

Recent declines in children's active commuting (walking or cycling) to school has become an important public health issue. Recent programs have promoted the positive effects of active commuting on physical activity and overweight. However, the evidence supporting such interventions among schoolchildren has not been previously evaluated. A systematic review of the association between active commuting to school and outcomes of physical activity, weight and obesity in children was published in 2008.(115) The review identified 32 studies assessing the association between active commuting to school and physical



activity or weight in children. Most studies that assessed physical activity outcomes found a positive association between active commuting and overall physical activity levels. However, almost all studies were cross-sectional in design and did not indicate whether active commuting leads to increased physical activity or whether active children are simply more likely to walk. Only three of 18 studies examining weight found consistent results, suggesting that there might be no association between active commuting and reduced weight or BMI. The authors concluded that although there are consistent findings from cross-sectional studies associating active commuting with increased total physical activity, interventional studies are needed to help determine causation.(115)

A review of interventions, policies and research on physical activity and food environments published in 2009 concluded that numerous cross-sectional studies have consistently demonstrated that some attributes of built and food environments are associated with physical activity, healthful eating and obesity. (116) Residents of walkable neighbourhoods who have good access to recreation facilities are more likely to be physically active and less likely to be overweight or obese. Residents of communities with ready access to healthy foods also tend to have healthier diets. Disparities in environments and policies that disadvantage low-income communities and racial minorities have been documented as well. Evidence from multilevel studies, prospective research and quasi-experimental evaluations of environmental changes are just beginning to emerge.

The authors recommend environmental, policy and multilevel strategies to improve diet, physical activity and obesity control, based on a rapidly growing body of research and the collective wisdom of leading expert organisations. They also conclude that a public health imperative to identify and implement solutions to the obesity epidemic warrants the use of the most promising strategies while continuing to build the evidence base.(116)

Walking and physical activity

Australian research published in 2009 examined population trends in lifestyle walking in New South Wales between 1998 and 2006.(117) Telephone surveys were conducted in 1998 and annually from 2002 to 2006. The weighted and standardised prevalence estimates of any walking (AW) for exercise, recreation or travel (greater than or equal to 10 minutes per week) and of regular walking (RW; greater than or equal to 150 minutes per week over greater than or equal to five occasions) in population sub-groups were determined for each year. Adjusted annual change was calculated using multiple regression analyses.

The study found that the prevalence of AW was high in 1998 (80.0%), increasing to 83.5% in 2006. The prevalence of RW was stable at around 29% between 1998 and 2003, gradually increasing between 2004 (32.9%) and 2006 (36.5%). The annual increases differed in magnitude but were significant for all population sub-groups including 75 years and older, the obese, people living in remote locations and those in the most disadvantaged SES quintile. Socioeconomic differential in RW was no longer significant in 2006.

The authors concluded that over time, everyday walking has the potential to reduce health inequalities due to inactivity. Public health efforts to promote active living and address obesity, as well as a rise in petrol prices, might have contributed to this trend.(117)

A systematic review published in 2009 examining the effectiveness of walking in relation to prevention of cardiovascular disease in men and women found that generally there were dose-dependent reductions in cardiovascular disease risk with higher walking duration, distance, energy expenditure and pace.(118)



The need to increase physical activity in all aspects of daily life

Increasing participation in leisure-time physical activity has been central to strategies aimed at preventing major chronic diseases (type 2 diabetes, cardiovascular disease, breast and colon cancer) and obesity in developed and developing nations.(119, 120) The main focus of a wide range of strategies (from clinical practice to community programs and mass-media campaigns) has been encouraging and supporting individuals to be more active, largely during discretionary or leisure time. However, for most people, discretionary, leisure-time activity accounts for a small proportion of overall activity levels. Significant improvements in the physical inactivity of the population have therefore not been achieved using this focus.(121) The promotion of active commuting (using public transport, walking and cycling) must therefore feature more prominently in approaches from public health and other sectors such as urban planning and transport.

Sedentary behaviour

Lifestyle intervention programs encompassing exercise and healthy diets are an option for the treatment and management of obesity and type 2 diabetes, and have long been known to exert beneficial effects on whole-body metabolism, in particular leading to enhanced insulin-sensitivity. Obesity is associated with increased risk of several illnesses and premature mortality. However, physical inactivity is itself associated with a number of similar risks, independent of BMI, and is an independent risk factor for more than 25 chronic diseases, including type 2 diabetes and cardiovascular disease.(122)

In the context of chronic disease prevention, the impacts on health of *too* much sitting need to be considered, in addition to the well-established preventative health concerns about too little exercise. A recent body of work has identified sedentary behaviour (time spent sitting at work, at home and in various modes of transport) as a novel and potentially important risk factor for the development of chronic disease. Changes in transport, occupations, domestic tasks and leisure activities have had negative effects on daily energy expenditure. Sedentary behaviours represent those behaviours for which energy expenditure is low, including prolonged sitting time in transport, at work, at home and in leisure time.(123, 124)

A body of new evidence identifies the time that adults spend sitting as being an important ingredient of the physical activity and health equation.(123) Findings from the national AusDiab study(123, 125) have shown television viewing time – which may reflect some people’s broader dispositions to spending a large amount of time sitting(126) – to be significantly related to metabolic health. Prolonged television viewing time (particularly more than four hours a day) has been shown to be associated with greater waist circumference, higher blood sugar levels, higher blood fat levels and greater risk of metabolic syndrome. These detrimental associations of television viewing time with metabolic health were observed even in adults who met the criteria for the National Physical Activity Guidelines.(127)

AusDiab findings also show that the average person spends more than half of their waking hours (~9 hours) in sedentary behaviours – primarily prolonged sitting. The remainder of the day is spent in light-intensity activities, with only 4–5% of the day spent in moderate-to-vigorous



intensity physical activity.(124, 128) Importantly, participation in light-intensity activities (which can include housework, standing and moving about in office environments, or shopping) has been shown to be beneficially associated with blood sugars and waist circumference.(123, 128) Additionally, those who interrupted their sedentary time more frequently (for example, got up to get a drink, stood up to answer the phone) had a better health profile than those whose sitting time was mostly uninterrupted.(128)

While further evidence from prospective studies and controlled trials is required, both national and international evidence strongly suggest that we may be sitting our way to poor health. (123) In order to address the high volumes of prolonged sitting time that now characterise the typical lifestyles of Australian adults and children, specific recommendations on reducing, and breaking up, sedentary time should be considered.



5. Strengthen, upskill and support primary healthcare and public health workforce to support people in making healthier choices

A systematic review published in 2009 of primary care physicians' knowledge, attitudes, beliefs and practices regarding childhood obesity showed that while almost all physicians agreed on the necessity to treat childhood obesity, they perceived themselves to have a low self-efficacy regarding such treatment. (129) They also experienced a negative feeling regarding obesity management. Although extensive heterogeneity in the assessment of childhood obesity between the different studies was observed, awareness of the importance of using BMI increased among physicians over the period of the review (1987–2007). Almost all of the identified studies noted that physicians recommended dietary advice, exercise or referral to a dietitian.

The authors concluded that the results of the review indicated a clear need for the education of primary care physicians to increase the uniformity of the assessment and to improve physicians' self-efficacy in managing childhood obesity. They identified multidisciplinary treatment (including GPs, paediatricians and specialised dietitians) as a key component in addressing the growing obesity epidemic and cited the importance of primary care physicians in initiating, coordinating and participating in obesity prevention initiatives. (129)

The management of overweight and obesity presents many challenges for primary healthcare providers. An article by Anderson in 2008 addressed six questions in an attempt to close the gap between primary care activities and public health goals to reduce overweight and obesity. (130) The issues covered included:

- 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?

Systematic reviews and key texts were identified from literature searches to provide a narrative summary to respond to these questions. The author found 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, and 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. While overall cost-effective policy analyses per se for overweight and obesity were not identified in this review, the author reported that a combination of personal and non-personal interventions can be effective and cost-effective in reducing cardiovascular events.

The study concluded that the gap between primary care and public health in reducing overweight and obesity can be closed, but it requires sustained political support and investment.(130)

As gatekeepers to the health system, GPs are placed in an ideal position to manage obesity. Yet, very few consultations address weight management. Australian research published in 2008 explored reasons why patients are not engaging with their GP for weight management.(131) It also examined patients' perceptions of the GP's role in managing their weight. Conducted in 2006, the study involved 367 17–64-year-olds recruited from three general practices in Melbourne. Participants completed a self-administered questionnaire in the waiting room. Questions included basic demographics, the role of the GP in weight management, the likelihood of the patient bringing up weight management with their GP and reasons why they would not, and their nominated ideal person to consult for weight management. Physical measurements to determine weight status were then completed.

Almost three-quarters (74%) of patients reported that they were not likely to bring up weight management when they visited their GP; negative reasons reported included time limitation on both the patient's and doctor's part, and the doctor lacking experience. The GP was the least likely person to tell a patient to lose weight after partner, family and friends. Of the 14% of participants who had been told by their GP to lose weight, 90% had cardiovascular obesity-related comorbidities. Participants cited GPs as fourth in the list of ideal people to

manage weight. The authors concluded that patients do not have confidence in their GPs for weight management, preferring other health professionals who may lack evidence-based training. They also concluded that it appeared currently GPs target only those with obesity-related comorbidities.

The authors recommended further studies evaluating GPs' opinions about weight management, and the development and implementation of effective strategies that can be implemented in primary care, including coordination of a team approach.(131)

Further Australian research examined the prevalence and rate of management of childhood overweight and obesity in Australian general practice.(132) A cross-sectional study was conducted among 3978 GPs, randomly selected using Medicare Australia claims, who recorded 42,515 encounters with 2–17-year-olds – including 12,925 sub-sampled encounters with self- or carer-reported height and weight collected. A total of 29.6% of sub-sampled children were classified as overweight (18.3%) or obese (11.4%). GPs managed overweight and obesity during 215 encounters, or once per 200 encounters with children aged 2–17 years, and once per 58 encounters with overweight or obese children.

The content of encounters in overweight and non-overweight children did not differ. Children who were managed for overweight or obesity presented with these conditions as reasons for the encounter significantly more often and were managed for more problems, particularly depression, than average per 100 encounters. Consultations for overweight or obesity were significantly longer than average. The authors concluded that while overweight and obesity are prevalent in children presenting to Australian general practice, GPs do not use most of the available opportunities to manage this problem.(132)

While a common policy response to the childhood obesity epidemic is to recommend that primary care physicians screen for and offer counselling to the overweight/obese,



there is evidence to suggest this may not be the most effective approach. For example, an economic evaluation of a primary care trial – *Live Eat and Play* (LEAP) – to reduce weight gain in overweight/obese children was undertaken in Victoria in 2002–03.⁽¹³³⁾ LEAP was a randomised controlled trial of a brief secondary prevention intervention delivered by family physicians and targeting overweight/mildly obese children aged 5–9 years. Primary care use was audited prospectively using medical records; parents reported family resource use by written questionnaire. Outcome measures were BMI and parent-reported physical activity and dietary habits in intervention compared with control children. The cost of LEAP per intervention family was \$4094 greater than for control families, mainly due to increased family resources devoted to child physical activity. Total health sector costs were \$873 per intervention family and \$64 per control. At 15 months, intervention children did not differ significantly in adjusted BMI or daily physical activity scores compared with the control group, but dietary habits had improved.

The authors concluded that this brief intervention resulted in higher costs to families and the healthcare sector, which could have been devoted to other uses creating benefits to health and/or family wellbeing; this has implications for countries such as the United States, the United Kingdom and Australia, where current guidelines recommend routine surveillance and counselling for high child BMI in the primary care sector.⁽¹³³⁾



6. Maternal and child health

Obesity has become a serious global public health issue and has consequences for nearly all areas of medicine. Within obstetrics, obesity not only has direct implications for the health of a pregnancy but also impacts on the weight of the child in infancy and beyond. As such, maternal weight may influence the prevalence and severity of obesity in future generations. Pregnancy may be a good time to target health behaviour changes by using the extra motivation women tend to have at this time to maximise the health of their child.

A 2009 review of the current evidence for interventions to promote weight control or weight loss in women around the time of pregnancy found few intervention strategies to have been suggested in the published literature, in spite of numerous reports of the prevalence and complications of maternal obesity.(134) The review also concluded that there is a deficiency of appropriately designed interventions for maternal obesity and highlights areas for developing a more effective strategy.(134)

A systematic review and meta-analysis examined the association between increasing maternal BMI and elective/emergency caesarean delivery rates.(135) Caesarean delivery risk was found to increase by 50% in overweight women and to be more than double for obese women compared with women with normal BMI.(135)

A review published in 2009 on obesity, gestational diabetes and pregnancy outcomes noted the rising prevalence of both obesity and gestational diabetes mellitus (GDM) globally.(136) Evidence on the complications of diabetes affecting the mother and foetus is clear: maternal complications include preterm labour, pre-eclampsia, nephropathy, birth trauma, caesarean section and postoperative wound complications. Foetal complications

include foetal wastage from early pregnancy loss or congenital anomalies, macrosomia, shoulder dystocia, stillbirth, growth restriction and hypoglycaemia. The presence of obesity among diabetic patients compounds these complications. The review found that short-term complications can be mediated by achieving the desired level of glycaemic control during pregnancy. However, GDM during pregnancy is associated with increased risk of early obesity, type 2 diabetes during adolescence and the development of metabolic syndrome in early childhood. In addition, GDM is a marker for the development of overt type 2 diabetes and metabolic syndrome for the mother in the early future.(136)

WHO published a report in 2007 entitled 'Evidence of the long-term effects of breastfeeding: systematic reviews and meta-analysis'. The report concluded that 'the evidence suggests that breastfeeding may have a small protective effect on the prevalence of obesity', and that the protective effect of breastfeeding was not likely to be due to publication bias. A overview by Cope and Allison(137) published in 2008 which critiqued the section of the WHO report on breastfeeding and obesity concluded that, while breastfeeding may have benefits beyond any putative protection against obesity, and the benefits of breastfeeding most likely outweigh any harms, any statement that a strong, clear or consistent body of evidence shows that breastfeeding causally reduces the risk of overweight or obesity is unwarranted at this time.(137)

A US review used 1990 US Institute of Medicine (IOM) gestational weight gain recommendations to determine healthy weight gain during pregnancy.(138) The review examined the relationship of gestational weight



gain to infant size at birth; pregnancy, labour and delivery complications; neonatal, infant and child outcomes; and maternal weight and health outcomes in US and European populations. It was found that pregnancy weight gains within IOM recommendations are associated with better outcomes. The possible exception is very obese women, who may benefit from weight gains less than the 7kg recommended. Review findings indicated that only about 33% to 40% of US women gained weight within IOM recommendations. Excessive gestational weight gain was found to be more prevalent than inadequate gain, and women's gestational weight gains tended to follow the recommendations of healthcare providers. The review identified opportunities for advice and intervention to minimise weight gain among pregnant women, with current interventions demonstrating efficacy in influencing gestational weight gain in low-income women with normal and overweight BMI in the United States and obese women in Scandinavia.(138)

A review published in 2008 examining the impact of obesity on female fertility and fertility treatment highlighted the extent of the impact obesity and overweight have on reproductive health.(139) The authors found there to be a high prevalence of obese women in the infertile population, with numerous studies demonstrating the link between obesity and infertility. Obesity contributes to anovulation and menstrual irregularities, reduced conception rate and a reduced response to fertility treatment, as well as increasing

miscarriage and contributing to maternal and perinatal complication. Reduction in obesity, particularly abdominal obesity, is associated with improvements in reproductive functions; the authors therefore recommended that treatment of obesity itself should be the initial aim in obese infertile women, before embarking on ovulation-induction drugs or assisted reproductive techniques. Despite the existence of weight-reduction strategies such as pharmacological and surgical interventions, the authors concluded that lifestyle modification continues to be of paramount importance.(139)



7. Disadvantaged communities

A review of psycho-behavioural obesity interventions targeting multi-ethnic and minority adults in the United States examined data from 24 controlled intervention studies, representing 23 programs and involving 13,326 adults. (140) Results suggested that future obesity prevention interventions targeting these populations might benefit from incorporating individual sessions, family involvement and problem solving strategies into multi-component programs that focus on lifestyle changes. (140)



8. The National Aboriginal and Torres Strait Islander Nutrition Strategy and Action Plan (NATSINSAP) 2000–2010


NATSINSAP¹⁹ provides a framework for action to improve Aboriginal and Torres Strait Islander health and wellbeing through better nutrition. NATSINSAP was designed to build on existing efforts to improve access to nutritious and affordable food across urban, rural and remote communities across all levels of government, in conjunction with partners from industry and the non-government sector. Developed in recognition that poor diet is central to the poor health and disproportionate burden of chronic disease experienced by Indigenous Australians, NATSINSAP highlights seven key areas for action to improve Aboriginal and Torres Strait Islander health and wellbeing through better nutrition:

- Food supply in remote and rural communities
- Food security and SES
- Family-focused nutrition promotion: resourcing programs, disseminating and communicating 'good practice'
- Nutrition issues in urban areas
- The environment and household infrastructure
- Aboriginal and Torres Strait Islander nutrition workforce
- National food and nutrition information systems

Independent evaluation of the plan has been commissioned by DoHA and is to be completed by October 2009. Although NATSINSAP is due to run until 2010, the key role of NATSINSAP Project Officer is funded only until 30 June 2009.

In order to achieve improvements in Indigenous nutrition, clear and specific objectives, actions and goals with adequate resourcing for implementation are required. The results of the NATSINSAP evaluation should be used to identify successful components of the project. Initiatives for improving indigenous nutrition must be better positioned to be central to the funding available within indigenous health rather than outsourced; similarly, a central coordinating body is required. Clearly established lines of accountability for implementation are also essential.

¹⁹ See www.health.gov.au/internet/main/publishing.nsf/Content/health-pubhlth-strateg-food-nphp.htm.



9. Build the evidence base, monitor and evaluate effectiveness of actions

In 2007, the US National Cancer Institute convened a meeting to discuss priorities for a research agenda to inform obesity policy, based on the serious implications for public health and the economy associated with the dramatic rise in obesity levels in the United States over the past several decades.⁽¹⁴¹⁾ The power of public policy as a tool to effect structural change modifying population-level behaviour has been demonstrated through experiences in other public health initiatives such as tobacco control. Issues considered were how to define obesity policy research, key challenges and key partners in formulating and implementing an obesity policy research agenda, criteria by which to set research priorities, and specific research needs and questions. Five key themes that emerged were:

- The embryonic nature of obesity policy research
- The need to conduct 'natural experiments' resulting from policy-based efforts to address the obesity epidemic
- The importance of research focused beyond individual-level behaviour change
- The need for economic research across several relevant policy areas
- The overall urgency of taking action in the policy arena

The meeting concluded that timely evaluation of natural experiments is of especially high priority for future work. The variety of policies intended to promote healthy weight in children and adults being implemented in communities and at the state and national levels were explored. While some of these policies were supported by the findings of intervention research, the need for additional research to evaluate the implementation and to quantify the impact of new policies designed to address obesity was also highlighted.⁽¹⁴¹⁾



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