Obesity

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by Edwina Schneller
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Obesity

by

Edwina Schneller
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SUMMARY

This Briefing Paper seeks to present an overview of the debate on obesity, presenting key statistical data, discussing the factors that contribute to obesity and reviewing the government policies, national and NSW, formulated to address the issue. The paper starts with a comment on the health and economic impacts of obesity.

Please note that a detailed technical review of obesity in terms of scientific literature, prevention options and effective initiatives undertaken both nationally and internationally is provided in the National Preventative Health Taskforce (NPHT) report, Technical Report 1, Obesity in Australia: a need for urgent action, including addendum for October 2008 to June 2009. A systematic scientific literature review was recently released by the National Health and Medical Research Council (NHMRC), in support of the revision of the Australian Dietary Guidelines: A review of the evidence to address targeted questions to inform the revision of the Australian Dietary Guidelines.

Issues in the obesity debate [2]: The World Health Organization (WHO) defines overweight and obesity as "abnormal or excessive fat accumulation that may impair health." The recognition of obesity as a public health problem has only occurred in recent decades. In 2005 the disease was described as a "global epidemic" and considered by WHO as a worldwide public-health crisis.

There is clinical evidence that overweight and obesity is a risk factor for a range of diseases, including cardiovascular disease, Type II diabetes, some musculoskeletal conditions and cancers. Further, the longer a person is obese, the higher the risk of premature mortality.

In 2008, the economic cost of obesity to Australia was estimated to be $58.2 billion; with a cost of $19 billion in NSW.

Classifying overweight and obesity [3]: Body Mass Index (BMI) is the main measure used in international obesity guidelines and is relied on by WHO as a population measure for obesity. BMI is defined as a person's weight in kilograms divided by the square of their height in meters.

Prevalence of Obesity [4]: According to the WHO 2012 report, 2.8 million people world-wide die each year as a result of being overweight or obese. In 2008, it was estimated that half a billion men and women over the age of 20 were obese, with women more likely to be obese than men. Worldwide the prevalence of obesity almost doubled between 1980 and 2008.

In 2011-12, based on measured BMI, 28.3% of Australian adults and 7.6% of children (aged 5-17) were obese. This represents a 3.3% increase of Australian adults since the last National Health Survey 2007-08, when there were approximately 3 million obese Australians. The national rates of overweight and obesity do not differ markedly between the States or Territories with Western Australia having the highest prevalence of overweight or obesity (63%) and the ACT the lowest (59%). Australia's obesity prevalence is comparable to Canada,
the United Kingdom and Ireland (20-24%), and reflects the same level recorded for the United States in the early 1990s.

Although obesity is widely distributed amongst the Australian population, its distribution is not even. The greatest prevalence occurs in the following population sub-groups: Aboriginal and Torres Strait Islanders peoples; those in the most disadvantaged socioeconomic groups; those living in rural and remote areas as opposed to urban areas; and people born overseas in particular in Southern & Eastern Europe, the Pacific Islands and the Middle East.

**New South Wales Prevalence and Trends [5]:** The NSW Adult Population Health Survey results for 2011 reveal that there has been a significant increase in the proportion of adults who are overweight or obese (41.5% in 1997 compared to 52.6% in 2011), with the prevalence being higher amongst males than females.

The NSW Child Population Health Survey for 2009-2010 reported that 18.5% of children were overweight and 10.1% were obese. The findings for NSW reflect the national trend of obesity being more prevalent amongst certain population sub-groups.

**Factors Contributing to the Development of Overweight and Obesity [6]:** Australia's Health 2012 states that "A person's health and well-being is influenced by a complex interplay of societal, environmental, socio-economic, biological and lifestyle factors". Each of these is considered.

**Biology [6.1]**
The NHMRC acknowledges that genetics and epigenetic changes (changes in gene expression caused by mechanisms other than changes in the DNA sequence) may in part explain why some individuals have an increased risk of developing overweight and obesity than others.

**Environment [6.2]**
There are five key urban characteristics comprising both the natural and built environment that influence physical activity and may therefore impact on obesity:
- Transport infrastructure, foot paths and cycle ways;
- Facilities for physical activities, which may include outdoor sports facilities, playgrounds and natural green spaces such as bushland and parks.
- Street connectivity and design, which reflects the ease of travel between households, shops and places of employment.
- Mixed land uses (residential, commercial, industrial and agricultural) as well as community and recreation facilities are often associated with shorter travel distances.
- Residential density, a higher residential density may mean that there are more people to use a range of activities and institutions within a smaller area, often leading to shorter walking distances (as opposed to use of a car) to such destinations.
**Lifestyle Behaviours [6.3]**
The following life-style choices are modifiable risk factors for obesity: Dietary behaviours; Level of physical activity; Smoker status; and Alcohol consumption. This Briefing Paper focuses on dietary behaviours and physical activity levels at both a national and State level.

**Dietary behaviours**
The most current detailed national data for Australian adults' food and nutrient intake was conducted 16 years ago in the 1995 **National Nutrition Survey** and five years ago for children aged 2-16 in the **2007 Australian National Children's Nutrition and Physical Activity Survey**. The data is therefore "rather dated."

The **NHS 2007-08** provides the latest national data on selected dietary behaviours (the intake of fruit and vegetables). It warned that the data should be interpreted with care, as survey respondents had difficulty in estimating quantities consumed. According to the **NHS 2007-08** only (51%) of the Australian population aged 15 years and over consumed the recommended two or more serves of fruit per day; while only 1 in 11 (9%) consumed the recommended five or more serves of vegetables. The just released first results of the **AHS 2011-13** indicate a further decrease with (48.3%) of Australians consuming the recommended two or more serves of fruit per day; while only (8.3%) consumed the recommended five or more serves of vegetables.

For NSW, in 2010, 56.4% of adults consumed the recommended two serves of fruit per day. However, only 9.5% of adults consumed the recommended five serves of vegetables per day. The 2011 NSW 'Adult' Population Health Survey (persons aged 16 years and over) below shows that this consumption has further decreased, with 52% of adults consuming the recommended serves of fruit per day and only 8.6% of adults consuming the recommended serves of vegetables per day.

The 2010 Schools Physical Activity and Nutrition Survey (SPANS) Report found that 95.9% of primary school aged children and 42.1% of high school aged children met fruit consumption recommendations. However, only 43.6% of primary school aged children and 20.1% of high school aged children met recommendations for vegetable consumption.

**Level of physical activity**
Nationally, the **NHS 2007-08** provides the latest data about physical activity for adults and children aged 5-17 years old. The survey included questions about exercising for sport, recreation and fitness, as well as walking for transport. The Children's Survey 2007 provides data for slightly younger children aged 2-16 years. The physical activity module used in the **NHS 2007-08** is being repeated in the Australian Bureau of Statistics, **AHS 2011-2013**.

According to NSW Health, in 2011, 54% of adults undertook adequate levels of physical activity each week. More men (59.6%) than women (48.5%) reported adequate levels of physical activity. These proportions have declined slightly when compared with the **1998 NSW Health Survey**, which reported that (65%) of all males and (57%) of females undertook a minimum of 150 minutes of accumulated physical activity throughout a week.
In respect of children, the 2010 Schools Physical Activity and Nutrition Survey (SPANS Report) indicated that less than half (46.4%) of Years K, 2 and 4 students spent 60 minutes or more per day in physical activity. Boys (50.5%) were more likely to do so than girls (42.2%); from 2004 to 2010, there was a significant decline in physical activity among students in Years 6, 8 and 10, with the exception of Year 10 girls. This is a reversal of the gains observed between 1997 and 2000.

**Government Responses - National [7]:** In November 2008, the States, Territories and the Commonwealth entered into a [National Partnership Agreement on Preventative Health (NPAPH)](https://www.npaph.gov.au) "In an attempt to improve the health of Australians and reduce pressure on the health system". The Agreement commits the Australian Government as well as State and Territory Governments to address the rising prevalence of lifestyle-related chronic diseases, including obesity, by implementing programs and activities that promote healthy behaviours in the daily lives of Australians. The NPAPH initially provided $872.1 million for health prevention over six years from 2009-10, extended on 28 June 2012 to June 2018.

**Government Responses - NSW [7]:** Over the past decade or so NSW Governments have sought to address the obesity issue by various means. In 2002, for example, the Carr Government convened the *Childhood Obesity Summit*. In 2010, NSW was the first Australian jurisdiction to introduce mandatory nutrition information labelling for certain prescribed food businesses. As a result, from 1 February 2012 any food business that sells standard food items at 20 or more locations in New South Wales or at 50 or more locations in Australia is required to display the nutritional information of their standard food items.

Subsequent to the "NSW 2021: A Plan to Make NSW Number One", the NSW Office of Preventative Health was opened on 29 June 2012 with Professor Chris Rissell of the University of Sydney's School of Public Health being the inaugural Director. A Ministerial Advisory Committee on Preventive Health was also established in June 2012. The NSW 2021 plan includes the performance benchmarks for obesity set under the NPAPH and the following specific targets for overweight and obesity:

- Reduce overweight and obesity rates of children and young people (5-16 years) to 21% by 2015; and
- Stabilise overweight and obesity rates in adults by 2015, and then reduce by 5% by 2020.

The NSW Ministry of Health is in the process of developing the *NSW Strategy for the Prevention of Overweight and Obesity 2012-2016.*
1. INTRODUCTION

If the level of media coverage is any measure then the issue of obesity is one that is high on the agenda of public debate. Over the past few months alone overweight and obesity related issues have featured in a range of newspaper reports. On 2 October 2012 the Sydney Morning Herald reported the results of a Sydney University study of more than 500 children aged up to five that "the home environment was the most significant factor contributing to their weight", with 70 per cent of parents of overweight kindergarten children thinking that their child "was the right weight". On 30 October 2012 the Sydney Morning Herald reported that "Australians are smoking and drinking less but they are still putting on weight, with 63 per cent of the population deemed overweight or obese". Some good news is that childhood obesity has not increased in recent years, although as The Australian reported 17.7 per cent of Australian children were overweight and 7.6 per cent obese.

As an indication of the seriousness of the issues involved, on 8 November the Sydney Morning Herald reported that "Australians support a tax on unhealthy foods and many want a total ban on junk-food advertising". Earlier, however, on 27 October 2012 the Australian Financial Review reported that Denmark's experiment with a "fat tax" had had mixed results at best, with support for the tax eroding among consumers. Two of the causes often blamed for the increase in obesity are the food we eat in modern societies and the relatively sedentary lifestyles we tend to lead. However, an article headed "Could obesity be a gut reaction?" on 6 September 2012 in the Sydney Morning Herald also suggested that the causes may be more complex than is sometimes stated in public health messages, with difference in microbiology between individuals perhaps explaining "why sometimes exercise and diet alone just do not work as well for some people as for others".

Whatever the causes, the obesity problem is real enough. A recent Australian Institute of Health and Welfare (AIHW) report, Australia's Health 2012, which compared Australia's adult obesity prevalence to 13 other member countries of the Organisation for Economic Co-operation and Development (OECD), found that Australia had the second highest rate of obesity for males and the highest for females. In 2009 an OECD report predicted that overweight and obesity levels in Australia would continue to rise across all age groups over the next decade to two-thirds of the population. On the health front, Australia's most recent national study of the burden of illness and injury found that tobacco smoking contributed the greatest burden (7.8%), followed in third position by overweight and obesity status (7.5%). According to the 2011-12 Australian Health Survey, 28.3% of Australian adults and 7.6% of children (aged 5-17) were obese.

This Briefing Paper seeks to present an overview of this debate, presenting key statistical data on overweight and obesity in Australia and NSW, discussing the factors that contribute to obesity and reviewing the government policies, national and NSW, formulated to address the issue. The paper starts with a
comment on the health and economic impacts of obesity.

Please note that a detailed technical review of obesity in terms of scientific literature, prevention options and effective initiatives undertaken both nationally and internationally is provided in the National Preventative Health Taskforce (NPHT) report, Technical Report 1, Obesity in Australia: a need for urgent action, including addendum for October 2008 to June 2009. A systematic scientific literature review was recently released by the National Health and Medical Research Council (NHMRC), in support of the revision of the Australian Dietary Guidelines: A review of the evidence to address targeted questions to inform the revision of the Australian Dietary Guidelines.

2. HEALTH AND ECONOMIC IMPACTS OF OBESITY

2.1 The medical recognition of obesity

18th-century medical literature first recorded the health consequences of obesity. However, medical opinion throughout most of the 19th and early 20th-century considered that "carrying an extra 20-50 pounds of excess flesh was healthy," as it "provided a reserve of 'vitality' that would keep a person from being run down through an extended illness." It was only in the 1920s when insurance actuaries noted increase death claims of obese policy holders and an association between cardiac disease and diabetes that the medical profession altered their position and accepted that excess fat was a health problem. By the 1960s the study of obesity was recognised as a legitimate scientific field, one result of which was the foundation for the growing diet and exercise industry that represents $30-$50 billion worldwide.

2.2 The health risks associated with obesity

There is clinical evidence that overweight and obesity is a risk factor for a range of diseases including cardiovascular disease, Type II diabetes, some musculoskeletal conditions and some cancers. Further, the longer a person is obese, the higher the risk of premature mortality. The table below details the diseases associated with obesity and overweight status in adults. Further:

The association between BMI (a measurement discussed below) and many of these diseases appears to be continuous, starting from BMI levels of about 20–21 kg/m.

<table>
<thead>
<tr>
<th>Body System</th>
<th>Health Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular</td>
<td>Stroke, Coronary heart disease, Hypertension</td>
</tr>
<tr>
<td>Endocrine</td>
<td>Type 2 diabetes</td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>Gallbladder disease, Gastro-oesophageal reflux disease, Hepatic, biliary and pancreatic disease, Cancers of the bowel, oesophagus, gall bladder and pancreas</td>
</tr>
</tbody>
</table>
### Table: Body System and Health Risk

<table>
<thead>
<tr>
<th>Body System</th>
<th>Health Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genitourinary</td>
<td>Chronic kidney disease</td>
</tr>
<tr>
<td></td>
<td>End-stage renal disease</td>
</tr>
<tr>
<td></td>
<td>Kidney cancer</td>
</tr>
<tr>
<td></td>
<td>Glomerulopathy</td>
</tr>
<tr>
<td></td>
<td>Kidney stones</td>
</tr>
<tr>
<td></td>
<td>Prostate cancer</td>
</tr>
<tr>
<td></td>
<td>Stress urinary incontinence – women</td>
</tr>
<tr>
<td>Pulmonary</td>
<td>Obstructive sleep</td>
</tr>
<tr>
<td></td>
<td>Asthma Guh</td>
</tr>
<tr>
<td>Musculoskeletal</td>
<td>Osteoarthritis</td>
</tr>
<tr>
<td></td>
<td>Spinal disc disorders</td>
</tr>
<tr>
<td></td>
<td>Lower back pain</td>
</tr>
<tr>
<td></td>
<td>Disorders of soft-tissue structures such as tendons, fascia and cartilage.</td>
</tr>
<tr>
<td></td>
<td>Wearing et al 2006</td>
</tr>
<tr>
<td></td>
<td>Mobility disability (particularly in older adults)</td>
</tr>
<tr>
<td></td>
<td>Impaired immune function</td>
</tr>
<tr>
<td>Reproductive Health</td>
<td>Menstrual</td>
</tr>
<tr>
<td></td>
<td>Miscarriage and poor pregnancy outcome</td>
</tr>
<tr>
<td></td>
<td>Infertility/subfertility</td>
</tr>
<tr>
<td></td>
<td>Breast cancer (postmenopausal women)</td>
</tr>
<tr>
<td></td>
<td>Endometrial cancer</td>
</tr>
<tr>
<td></td>
<td>Ovarian cancer</td>
</tr>
<tr>
<td>Mental Health</td>
<td>Depression</td>
</tr>
<tr>
<td></td>
<td>Anxiety disorder</td>
</tr>
<tr>
<td></td>
<td>Reduced health-related quality of life</td>
</tr>
</tbody>
</table>

## 2.3 The Economic Cost of Obesity

In its August 2008 report, commissioned by Diabetes Australia, The growing Cost of Obesity in 2008: three years on, Access Economics estimated the financial cost of obesity at $8.283 billion. This figure comprised:

- Productivity costs ($3.6 billion) 44%
- Health System costs ($2.0 billion) 24%
- Carer Costs ($1.9 billion) 23%
- Deadweight Loss from transfers (taxation revenue forgone, welfare and other government payments) – ($727 million) 9% and other indirect costs ($76 million) 1%.

In addition, there were costs of lost wellbeing (due to disability or shorter life span) valued at $49.9 billion resulting in an estimated total cost of obesity of all States and Territories of $58.2 billion. The economic costs of obesity were highest in NSW, at $19.0 billion, comprised of $2.7 billion financial costs (14%) and $16.3 billion in net lost wellbeing costs (86%). The division of the financial
costs were borne as follows:

- Federal Government (34.3%) representing $2.8 billion per annum;
- The individual (29.4%);
- Family and friends (19.2%);
- Society (11.8%);
- State Governments (5.1%); and
- Employers (less than 0.1%).

If the cost of lost wellbeing is included, the individual's share rises to 90%.

There have been earlier attempts to estimate the cost of obesity in Australia including: a 1989-90 estimate by the AIHW and the Centre for Health Program Evaluation (CHPE), which estimated the direct costs of obesity at $464 million and indirect costs at $272 million. Similarly, an unpublished study from 1995-96, estimated the cost of obesity at between $0.68-1.24 billion. Comparisons are difficult due to different measurement assumptions. However, when comparing direct health costs there has been a dramatic increase as the AIHW/CHPE estimate of direct costs was $464 million as against Access Economics estimate of $2.0 billion.

*Australia's Food & Nutrition 2012*, reported that a poor diet costs Australia $5 billion each year, with direct health-care costs of $3 billion. When overweight and obesity are included, this figure increases to $11.6 billion per year.

An OECD report predicts there will be a significant rise in the future health-care costs for OECD countries, as there is a time lag between the onset of obesity and linked chronic health problems. A recent study in the United Kingdom predicted that costs linked to overweight and obesity could increase by as much as 70% from 2007 to 2015, with further increases continuing to 2025.

The 19th-century writer John Ruskin was the first to acknowledge that certain exchanges had economic value but were at the same time detrimental to human well-being. He referred to such exchanges as "illth." Picking up on this theme and playing devil's advocate as it were, Garry Egger and Boyd Swinburn point out that, whilst the obesity epidemic may burden the taxpayer, economically it is a 'blessing' as the extra consumption contributing to obesity adds to the economy, as well as to the health 'industries' and other associated industries in treating obesity. For example, a recent US study reported that the health costs for an obese individual are $1400 per year more than for a healthy weight individual. This adds an extra $47 billion to the US economy representing approximately 10% of all health spending. A similar trend exists in Australia where a review of weight loss surgery between 1998-99 and 2007-08 shows it has increased from 535 procedures to 17,000, with 61% of the procedures occurring in private hospitals.
3. CLASSIFYING OVERWEIGHT AND OBESITY

The National Health and Medical Research Council (NHMRC) is Australia's leading expert body promoting the development and maintenance of public and individual health standards. The NHMRC considers that, while it may be easy to recognise that a person is overweight "proper diagnosis requires that clinically significant risk levels of the problem be identified and this often necessitates some form of quantification." While the NHMRC emphasises "there are no perfect measures of overweight or obesity," it is the case that clinical measures have been developed.

The WHO believes such measures are "valuable" as they allow:

- meaningful comparisons of weight status within and between populations;
- the identification of individuals and groups at increased risk or morbidity and mortality;
- the identification of priorities for intervention at individual and community levels;
- a firm basis for evaluating interventions.

3.1 Clinical Measures

It is only possible to accurately measure fat as a proportion of total body mass when one is deceased. In living humans, a range of measures have been developed:

A: Anthropometric Measures are a set of non-invasive, quantitative techniques for determining an individual's body fat composition by measuring, recording, and analyzing specific dimensions of the body, such as height and weight, skin-fold thickness and bodily circumference at the waist, hip, and chest.

B: Body Composition Measures involve the use of technology in determining the relative proportions of protein, fat, water and mineral components in the body. Methods for calculating body composition include: magnetic resonance imaging, computerised tomography scanning, dual X-ray absorptiometry, infra-red spectroscopy and bioelectric-impedence analysis.

Measures relying on technology present obstacles in that they often are expensive, require rare equipment, and their reliability is questionable in less than fully standardised conditions. For these reasons, in clinical practice, anthropometric measures are relied on.

3.2 Body Mass Index (BMI)

BMI is the main measure used in international obesity guidelines and is relied on by WHO as a population measure for obesity. BMI is defined as a person's weight in kilograms divided by the square of their height in metres.
The weight classification relied on by the WHO:\textsuperscript{45}

<table>
<thead>
<tr>
<th>Classification</th>
<th>BMI (Kg/m(^2))</th>
<th>Risk of Co-Morbidities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt; 18.5</td>
<td>Low (but possible increased risk of other clinical problems)</td>
</tr>
<tr>
<td>Normal range</td>
<td>≥ 18.5 -24.9</td>
<td>Average</td>
</tr>
<tr>
<td>Overweight</td>
<td>≥ 25.0</td>
<td></td>
</tr>
<tr>
<td>Pre-obese</td>
<td>25.0-29.9</td>
<td>Increased</td>
</tr>
<tr>
<td>Obese I</td>
<td>30.0-34.9</td>
<td>Moderate</td>
</tr>
<tr>
<td>Obese II</td>
<td>35.0-39.9</td>
<td>Severe</td>
</tr>
<tr>
<td>Obese III</td>
<td>≥ 40.0</td>
<td>Very Severe</td>
</tr>
</tbody>
</table>

The above classification is "based primarily on the association between BMI and mortality"\textsuperscript{46} for adult people of European descent.

**The Development of the BMI and its Limitations:** The BMI, originally developed for use by epidemiologists studying the health of populations, was adopted by doctors who wanted a quick way to measure body fat in individual patients.\textsuperscript{47} In 1985 the United States National Institute of Health (NIH) started defining obesity according to BMI. However, the BMI was intended to be used only for population studies and not for individual diagnosis, as it ignores variables such as a patient's age, ethnicity and gender.\textsuperscript{48} The NHMRC acknowledges the BMI has "several limitations"\textsuperscript{49} including:

a) The index is insensitive to the distribution between muscle and adipose tissue (fat), for the formula depends only upon weight and height. This is a problem in older patients, where BMI will increase without any corresponding increase in weight because of "their differential loss of lean mass and decreased height and overestimated in [patients] with a muscular build,"\textsuperscript{50} such as professional athletes.

b) The index does not indicate the distribution of fat. The NHMRC states "individuals with the same BMI can have different levels of visceral [abdominal] fat mass."\textsuperscript{51} This is an issue as men generally have twice the amount of abdominal fat than pre-menopausal women.\textsuperscript{52} In addition, the amount of abdominal fat independent of total body fat has consistently been shown to increase the risk of cardiovascular disease, type II diabetes and cancer.\textsuperscript{53} However, the latter has limited predictive correlation above a BMI of 35 (Obese II).\textsuperscript{54}

c) The index does not show "the same degree of fatness across populations."\textsuperscript{55} This is in part due to body proportion variations among different ethnic groups: "Among Asians and Indians morbidity and mortality occur at a lower BMI and it is proposed that the BMI cut-offs for overweight and obesity in these populations be lowered to ≥23 and ≥ 25 respectively. In contrast, African- Americans and Polynesians tend to have a lower body fat percentage than people of European descent at
the same BMI."\(^{56}\)

This is of significance to Australia given our multi-ethnic population base. In addition, owing to a lack of data the 2003 NHMRC Guidelines make no recommendation as to the best measure for Aboriginal and Torres Strait Islander people.\(^{57}\) It is likely that different BMI cut-offs would be required for "Aboriginal and Torres Strait Islander."\(^{58}\)

The NHMRC is currently reviewing the 2003 Australian Dietary Guidelines. The 2012 Draft Guidelines (NHMRC 2012 Draft Guidelines) released in December 2011\(^{59}\) acknowledge the limitations of the BMI but continue to recommend its continued use to classify overweight or obese individuals.\(^{60}\) The Draft Guidelines continue to rely on the WHO BMI classification in the above Table\(^{61}\) and also recommend the "use of the [the] waist circumference in addition to BMI to refine assessment."\(^{62}\) This is because waist circumference enhances type II diabetes prediction beyond that predicted by BMI alone in women but not in men.\(^{63}\)

The WHO concludes that BMI provides "the most useful, albeit crude, population-level measure of obesity."\(^{64}\) Similarly, the 2003 NHMRC Guidelines recommend that BMI results be interpreted "with caution when this is the only measure of body fatness in a person."\(^{65}\)

### 3.3 Combining Clinical Measures

According to both the 2003 NHMRC Guidelines and the 2012 Draft Guidelines the deficiencies in the BMI and waist circumference measures can be "moderated if both measures are used in the risk assessment."\(^{66}\) Hence, the NHMRC recommends "if patients wish to be measured, a combination of BMI and waist circumference or weight and waist circumference should be used."\(^{67}\)

**Combining Waist Measurement and BMI to assess obesity and the risk of type II diabetes and cardiovascular disease- NHMRC Draft Guideline.\(^{68}\)**

<table>
<thead>
<tr>
<th>Classification</th>
<th>BMI(Kg/m²)</th>
<th>Men: 94-102</th>
<th>Women: 80-88</th>
<th>102+</th>
<th>88+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overweight</td>
<td>25-29.9</td>
<td>Increased</td>
<td>High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obese I</td>
<td>30-34.9</td>
<td>High</td>
<td>Very High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obese II</td>
<td>35-39.9</td>
<td>Very High</td>
<td>Very High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obese III</td>
<td>≥ 40</td>
<td>Extremely High</td>
<td>Extremely High</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 3.4 Classifying Obesity in Childhood

There are no definitions for obesity and overweight for children under two years of age.\(^{69}\) The 2003 NHMRC Guidelines consider that "BMI should be used as the standard measure of overweight and obesity for 2 to 18 year old[s] in Australia."\(^{70}\) The limitations of the BMI also apply to children.\(^{71}\)
One recommendation of the Draft NHMRC Guidelines 2012 states (in part):

- BMI should be used as the standard measure of overweight and obesity for 2 to 18 year olds in Australia.

- BMI-for-age percentile charts should be used in clinical practice and in non-health care settings. A BMI above the 85th percentile is indicative of overweight and a BMI above the 95th percentile is indicative of obesity. It should be noted that this definition of overweight and obesity is arbitrary and that a more appropriate definition is needed but not yet available. The Centers for Disease Control and Prevention BMI percentile charts are recommended for use until local BMI growth charts are developed. There is a need for Australia to develop such charts for clinical practice very soon.

A further recommendation is that:

Waist circumference appears to be the best clinical determinant of truncal obesity, and hence metabolic risk, in children and adolescents and can be used for longitudinal assessment in management.

Acknowledged is the:

need to develop local BMI growth charts for use in Australia. Separate BMI growth charts may need to be considered in Aboriginal and Torres Strait Islander people.
4. PREVALENCE OF OBESITY

4.1 International overview

There are three key international reports that provide the most current comparison of the rates of overweight and obesity globally:

1. The World Health Organisation’s, World Health Statistics 2012\(^{73}\) (WHO 2012);
2. The Organisation for Economic Co-Operation and Development (OECD)'s Sixth Edition of Health at a Glance 2011:OECD Indicators (OECD 2011);\(^{74}\) and

All of these reports appear to measure obesity based on BMI and the WHO classification. However, there is a need to be cautious when assessing international comparisons, as different collection methods and reporting may be used. For example, in OECD 2011 Australian data is based on measured height and weight derived from medical examinations, whereas other OECD countries’ data is based on self-reported health surveys, which are considered to be less accurate.\(^{76}\) This could account for the variation in the data reported in WHO 2012 and OECD 2011 below.

According to WHO 2012, worldwide 2.8 million people die each year as a result of being overweight or obese.\(^{77}\) In 2008, it was estimated that half a billion men and women over the age of 20 were obese, with women more likely to be obese than men. Worldwide the prevalence of obesity has almost doubled between 1980 and 2008.\(^{78}\)

<table>
<thead>
<tr>
<th>Percentage of each gender who were obese</th>
<th>Gender</th>
<th>1980</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>5%</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>8%</td>
<td>14%</td>
<td></td>
</tr>
</tbody>
</table>

The prevalence of overweight and obese individuals was highest in the WHO region of the Americas (62% of both sexes overweight and 26% obese) and lowest in the WHO South East Asia Region (14% of both sexes overweight and 3% obese).\(^{81}\)

<table>
<thead>
<tr>
<th>WHO Region</th>
<th>Adults aged ≥20 years who are obese (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
</tr>
<tr>
<td>African Region</td>
<td>5.3</td>
</tr>
<tr>
<td>Region of the Americas</td>
<td>23.5</td>
</tr>
<tr>
<td>South-East Asia Region</td>
<td>1.7</td>
</tr>
<tr>
<td>European Region</td>
<td>20.4</td>
</tr>
<tr>
<td>Eastern Mediterranean Region</td>
<td>13.0</td>
</tr>
<tr>
<td>Western Pacific Region</td>
<td>5.1</td>
</tr>
</tbody>
</table>
A more detailed comparison of Australia, New Zealand, the United Kingdom and the United States is set out below.

The prevalence of obese individuals in Australia, New Zealand, the United Kingdom and the United States of America.

<table>
<thead>
<tr>
<th>Country</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>25.2</td>
<td>24.9</td>
</tr>
<tr>
<td>New Zealand</td>
<td>26.2</td>
<td>27.7</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>24.4</td>
<td>25.2</td>
</tr>
<tr>
<td>United States of America</td>
<td>30.2</td>
<td>33.2</td>
</tr>
</tbody>
</table>

The OECD reports, OECD 2011 and OECD Working Papers No.45, reinforce the "alarming rise" in obesity rates. For more than half of the OECD countries (19 of the 34 OECD countries) 50.3% of the population are said to be overweight or obese. In those OECD countries where height and weight were measured, such as Australia, the average proportion of the adult population who are overweight rose to 55.8%. Across the OECD membership, 17% of the adult population are obese. Obesity rates among adults are highest in the United States (rising from 15% in 1980 to 34% in 2008) and lowest in Japan and South Korea (4%) although obesity is on the rise in both the latter countries.

Increasing obesity rates among the adult population in OECD countries, 1990, 2000 and 2009 (or nearest years)

Amongst OECD countries obesity rates are higher for women than for men. Further, "internationally a complex relationship exists between socio-economic conditions and obesity." In low-income countries obesity is more prevalent amongst those who are better-off, while the reverse applies in modern industrialised societies like Australia where the rates of obesity decrease with increasing socio-economic status and education.
4.2  Australia Compared to the World

4.2.1  Adults

Australia’s obesity prevalence is comparable to Canada, the United Kingdom and Ireland (20-24%), and reflects the same level for the United States in the early 1990s.\textsuperscript{93}

BMI Distributions have been increasing over time in all countries. However, of greatest concern is the conclusion of the *OECD Working Papers No.45* study that the shift is more marked in Australia, the United Kingdom and the United States.\textsuperscript{94} The shift in Australia is depicted in the chart below.

**Shows age and gender standardised distribution of BMI in Australia for the years 1989, 1995 and 2005.**

A recent Australian Institute of Health and Welfare (AIHW) report, *Australia’s Health 2012*, compared Australia’s adult obesity prevalence to 13 other member countries of the OECD where BMI was calculated using only measured data. It found that Australia had the second highest rate of obesity for males and the highest for females.
Prevalence of obesity among adults, selected OECD countries 2009 (or nearest year)\textsuperscript{95}

![Bar chart showing prevalence of obesity among adults in selected OECD countries]

- United States
- New Zealand
- Australia
- Canada
- Mexico
- Luxembourg
- Ireland
- United Kingdom
- Chile
- Finland
- Czech Republic
- Slovak Republic
- Japan
- Republic of Korea

\textit{Note:} Countries are only included where BMI is calculated using measured data.

\textit{Source:} OECD 2011.

The \textit{OECD Working Papers No. 45} report, which undertook modelling to project overweight and obesity rates for 2014 and 2019, concluded that for several countries, including Australia, “a substantial further increase in obesity rate is projected.”\textsuperscript{96}

\section*{4.2.2 Children}

The figure below shows the prevalence of overweight (including obesity) in OECD countries among school-aged children aged 5-17 years.\textsuperscript{97} Australian girls had the 12\textsuperscript{th} highest rate of overweight/obesity (24%) and Australian boys were ranked 17\textsuperscript{th} in terms of prevalence of overweight/obesity (22%). The prevalence for girls exceeded the average OECD prevalence rate of 21.4% and for boys was only 0.9% below the OECD average prevalence.
Prevalence of overweight (including obesity) in OECD countries among school-aged children aged 5-17 years

4.3 Prevalence of obesity in Australia

At a national level the most recent analysis on obesity is found in two AIHW reports, Australia’s Health 2012 and Australia’s Food and Nutrition 2012. But note that these reports rely on the most ‘recent’ national statistics taken from the 2007-08 National Health Survey (NHS 2007-08) conducted by the Australian Bureau of Statistics (ABS).

In respect of children aged 5-17 years old, the NHS 2007-08 also provides the most recent national data, with the 2007 Australian National Children’s Nutrition and Physical Activity Survey (the Children’s Survey 2007) also providing the most recent data for children aged 2-16 years.

As of March 2011, the ABS commenced the first Australian Health Survey (AHS) 2011-13, the biggest health survey ever conducted in Australia, from which limited first results have just been released. The ABS states:

The AHS builds on previous health surveys allowing comparisons of health information over time such as obesity, smoking, health conditions and how we manage our health.
The ABS National Health Survey: The ABS conducted a National Health Survey (NHS) from August 2007 to June 2008, with approximately 20,800 participants from 15,792 private dwellings. Although the sample size was relatively small, participants came from all States and Territories, including both urban and rural areas (except very remote areas) and across all age groups. Information was obtained for one adult and one child in each participating household.

In 2007-08, based on measured body mass index (BMI), 25% of Australian adults and 8% of children (aged 5-17) were obese, equating to approximately 3 million people. A further 37% of adults were overweight, with the highest rate of overweight/obesity in the 65-74 year age group, at (75%). Adult males (68%) were more likely to be overweight or obese than adult females (55%). For children, 17% were classified as overweight with proportions being similar for both boys and girls. However, this is not the case for obesity, with a higher proportion of boys being obese (10%) than girls (6%).

The first results of the AHS, report that 28.3% of Australian adults and 7.6% of children (aged 5-17) were obese. This represents a 3.3% increase in the prevalence of obesity for adults and a marginal decrease for children. A further 35% of adults were overweight (a decrease of 2%), with the highest rate of overweight/obesity in the 65-74 year age group, at (74.7%).

Adult males (70.3%) continued to be more likely to be overweight or obese than adult females (56.2%), with both rates increasing since the NHS. For children, 17.7% were classified as overweight, a 0.7% increase. However the AHS considered that there had been no significant change in the proportion of children who were overweight or obese. In contrast to the NHS, the proportion of girls who were overweight or obese was higher than that of boys (27.1% compared to 23.6%).

The 2007 Australian National Children's Nutrition and Physical Activity Survey: The Children's Survey 2007 was commissioned by the Commonwealth Department of Health and Ageing (DoHA), the Department of Agriculture, Fisheries and Forestry and the Australian Food and Grocery Council to assess:

- Food and nutrient intake;
- Physical activity participation; and
- To measure weight, height and waist circumference in a sample of children aged 2-16 years randomly selected across Australia.

Data was collected on two occasions from 4,487 participants or their caregivers from February to August 2007.

Similar to the findings of the NHS 2007-08, 17% of children were overweight and 6% were obese, 2% lower than the comparable finding in the NHS 2007-08. The proportion with excess weight was similar in boys and girls, both peaking in the 9-13 years age group. While there are no agreed cut-offs for waist girth in children, it has been suggested by the NHMRC that abdominal
fatness is excessive in children when the ratio of waist girth to height exceeds 50%. Based on this measure, one child in six had a waist girth greater than the recommended ratio.

Table 8: Australian children aged 2-16 by BMI category, 2007 (percent)

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Underweight</th>
<th>Normal</th>
<th>Overweight</th>
<th>Obese</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2–3</td>
<td>5</td>
<td>74</td>
<td>17</td>
<td>4</td>
</tr>
<tr>
<td>4–8</td>
<td>4</td>
<td>78</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td>9–13</td>
<td>6</td>
<td>69</td>
<td>18</td>
<td>7</td>
</tr>
<tr>
<td>14–16</td>
<td>5</td>
<td>71</td>
<td>19</td>
<td>6</td>
</tr>
<tr>
<td>Girls</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2–3</td>
<td>4</td>
<td>78</td>
<td>14</td>
<td>4</td>
</tr>
<tr>
<td>4–8</td>
<td>4</td>
<td>75</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>9–13</td>
<td>5</td>
<td>65</td>
<td>23</td>
<td>7</td>
</tr>
<tr>
<td>14–16</td>
<td>5</td>
<td>72</td>
<td>16</td>
<td>7</td>
</tr>
<tr>
<td>Children</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2–16</td>
<td>5</td>
<td>72</td>
<td>17</td>
<td>6</td>
</tr>
</tbody>
</table>

(a) Population weights applied.
Source: 2007 Children's Survey (CSIRO & University of South Australia 2008).

4.4 Obesity Trends in Australia

4.4.1 Adults

The Australian Diabetes, Obesity and Lifestyle Study 2000 (AusDiab) analysed data (confined to capital city participants who were aged 25-64 years of age) obtained from the 1980 and 1989 National Heart Foundation Risk Factor Prevalence Studies and the ABS National Nutrition Survey of 1995.

The figures below show that, for the period 1980-2000, the prevalence of obesity amongst males increased by 10% (more than doubling) and for females by 12% (almost tripling).

Changes in prevalence of Obesity (BMI ≥ 30 kg/m²) in Australia 1980-2000 by age group
4.4.2 Children

A similar trend exists for children, with obesity beginning to increase in the 1970s. A 2003 NSW report concluded for the period 1985-1995, the level of combined overweight/obesity in children more than doubled, whilst the level of obesity tripled in all age groups and for both sexes. Similarly, a 2010 Productivity Commission working paper reported a clear trend of overweight and obesity increasing amongst boys and girls aged 7-15 years between 1985 and 2007.

This trend was confirmed in the AIHW's reports, Australia's Health 2010 and the more recent Australia's Food & Nutrition 2012. The last report suggested that the proportion of overweight children continued to increase since 1995 but not as rapidly. It also indicated that it is uncertain whether childhood overweight and obesity rates have stabilised or are continuing to rise. The report said that further monitoring is required to answer this question. It would seem that detailed data collection over a period is needed in order to identify national trends in children.

4.5 Variation within the Australian Population

Although obesity is widely distributed amongst the Australian population, it is not evenly distributed. The greatest prevalence occurs in the following population sub-groups:

- Aboriginal and Torres Strait Islanders peoples;
- Those in the most disadvantaged socioeconomic groups;
- Those living in rural and remote areas as opposed to urban areas; and
- People born overseas.
4.5.1 Aboriginal and Torres Strait Islander peoples
For Aboriginal and Torres Strait Islander people high body mass is the second highest contributor to disease burden (11.4%) after tobacco use (12.1%). The 2004-05 National Aboriginal Torres Strait Islander Health Survey (NATSIHS 2004-05) found (29%) of Indigenous Australians aged 18 years and over were overweight and (31%) were obese.

Further, after adjusting for differences in age structure, Indigenous adults were almost twice as likely to be obese (34% compared to 18%) but less likely to be overweight than non-Indigenous adults (31% compared to 36%). These findings reflect those of a 1994 survey, which found 25% of Indigenous men were obese compared to only 18.5% for non-Indigenous men.

However, amongst Indigenous women 60% were overweight compared to 49% for non-Indigenous women. Further, the rate of obesity amongst Indigenous women was 10% higher.

One concerning finding was that the differences between the Indigenous and non-indigenous population were most pronounced in the younger age groups.

Further, a variation has been found between Torres Strait Islander and Aboriginal populations, with a higher proportion of Torres Strait Islander people in the overweight or obese categories than in the Aboriginal population (61% versus 56%).

There is currently no data on the prevalence of overweight and obesity among Aboriginal and Torres Strait Islander children. However, there is limited self-reported data available for 15-24 year olds from the NATSIHS 2004-05 showing that Indigenous young people were more likely to be overweight or obese than non-Indigenous young people (37% vs 27%) and twice as likely to be obese (15% vs 6% respectively).

The change from a nutrient-dense traditional diet to a Western-style diet (higher in saturated fat and refined sugars) is said to be part of the reason why obesity and diet-related diseases, such as type II diabetes, have become more prevalent among Indigenous people.

4.5.2 Socioeconomic Status
There is a strong correlation between a low socio economic status and a low level of education and a higher level of obesity with the correlation strongest in women. However, data from the NHS 2007-08 suggests that for Indigenous adults there was little difference between the proportion of overweight/obese persons in the lowest socio-economic quintile (61%) and those in the highest quintile (60%).

Household Income: Data from the NHS 2007-08 shows that adults living in areas with the highest levels of disadvantage (AHD) had a higher prevalence of
overweight/obesity (65.3%), while those living in areas of least disadvantage (ALD) had the lowest prevalence (56.1%). This trend was also reflected amongst young people aged 12-24 years, with those in AHDs more likely to be overweight or obese than those in ALDs (44% and 25% respectively). In fact, amongst young people obesity rates were three times higher in AHDs than those in ALDs (22% and 6% respectively). One reason for this may be that energy-dense foods composed of refined grains, added sugars or fats may present the lowest cost option to consumers as compared to diets based on fresh vegetables, fruit, lean meats and fish. Accordingly, people in lower-income households may be more inclined to consume energy dense foods as they are generally cheaper options resulting in higher rates of weight and obesity.

Data from the NHS 2007-08 shows that adults in households in the most disadvantaged quintile were less likely to consume the recommended daily intake of fruit and vegetables than those in the most advantaged quintile households (4.9% vs 6.8% respectively).

Further, participants in the most disadvantaged quintile were more likely to be sedentary or exercise at lower levels (78.6%) compared with (64.1%) of adults in households in the most advantaged quintile. In fact, over half of the adults in the most disadvantaged quintile did no exercise at all in the week prior to the NHS, compared with a quarter of adults in households in the most advantaged quintile.

One Melbourne study comparing residents of socio-economically varied neighbourhoods found people living in advantaged neighbourhoods had a greater number of supermarkets as well as fruit and vegetable stores within 2 km of their home. They also had a higher density of fruit and vegetable stores per 10,000 residents and travelled the least distance to their nearest supermarket and or fruit and vegetable store. Further, these residents had access to a greater range of fruit and vegetables and tended to spend more on these foods.

**Education:** The prevalence of obesity also seems to vary according to level of education attainment. ABS research shows that adults who had only completed year 11 or lower were more likely to be overweight or obese (69%) than those who had completed year 12 or equivalent (54%). Similarly, adults who had no formal qualification (63%) or "only" a qualification such as a certificate I-IV (66%) were more likely to be overweight or obese than adults with a degree, diploma or higher qualification (55%).

Again the trend appears to be different amongst Indigenous adults, in which case those whose highest year of school completed was Year 12 were more likely to be overweight or obese than those whose highest year school completed was year 9 or below (64% compared to 57%).
Employment: In contrast to the previous categories, ABS research suggests that employed adults were more likely to be overweight or obese (both 60%) than those unemployed (44%). But note that more than a third of those unemployed were aged 18-24 years and the prevalence of overweight/obesity increases with age.\textsuperscript{136}

In contrast, Indigenous adults who were employed were only slightly more likely to be overweight/obese (61%) than those who were unemployed (59%) or not in the labour force (60%).

Employed people who worked full time were more likely to be overweight or obese (63%) than those who worked part-time (51%). This may suggest that longer working hours affect people's weight by increasing sitting times (depending on occupation)\textsuperscript{147} as well as reducing the time available for activities such as exercise and preparation of healthy meals.\textsuperscript{148}

4.5.3 Remoteness

The obesity rate amongst Australians across both sexes was significantly higher in regional and remote parts of Australia (31%) than in major cities (23%).\textsuperscript{149}

<table>
<thead>
<tr>
<th>Sex</th>
<th>Level of Remoteness- Proportion (%) of each gender overweight or obese</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Outer regional areas</td>
</tr>
<tr>
<td>Women</td>
<td>50</td>
</tr>
<tr>
<td>Men</td>
<td>69</td>
</tr>
</tbody>
</table>

This may be explained by a variety of factors, including a higher proportion of adults in outer regional and remote parts of Australia doing no exercise (43%) compared with those who live in major cities (36%).\textsuperscript{151}

It is also the case that healthier food options are not as easily available or more costly in some regional areas, sometimes\textsuperscript{152} 30-50% higher\textsuperscript{153} than in metropolitan areas due to transport and overhead costs. In fact, remote stores on average sell half the fruit and one-quarter of the vegetable intake per capita of that of the overall Australian community.\textsuperscript{154}

The higher food costs apply mainly to independent supermarkets and generally not to major supermarket chains such as Coles or Woolworths who are able to spread costs across stores.\textsuperscript{155} Queensland Health believes that strategies are required to help address the few supermarkets in remote areas and therefore the lack of price competition.\textsuperscript{156}

The NATSIHS 2004-05 Report found that the level of remoteness did not impact on the proportion of Aboriginal and Torres Strait Islander Australians who were overweight or obese.\textsuperscript{157}
4.5.4 People Born Overseas

Recent immigrants to Australia in the period 1996-2006 on average had slightly lower age-standardised rates of obesity (11%) compared to the pre-existing adult obesity rate (18%).\textsuperscript{158} However, for migrants the prevalence of obesity varies according to country of origin. For example, adults born in Southern and Eastern Europe, and the Oceania region (excluding Australia) were more likely to be overweight or obese (65% and 63% respectively) whereas adults born in South East Asia were least likely to be overweight or obese (31%).\textsuperscript{159}

Further, children of Pacific Islander or Middle Eastern/Arabic background are most likely to be obese. This ethnic effect is independent of socio-economic status.\textsuperscript{160}
5. NEW SOUTH WALES PREVALENCE AND TRENDS

5.1 Adults

The *NSW Adult Population Health Survey* results for 2011 reveal that there has been a significant increase in the proportion of adults who are overweight or obese (41.5% in 1997 compared to 52.6% in 2011) with the prevalence being higher among males than females.\(^{161}\)

| Overweight or Obesity by Sex, Persons Aged 16 Years and Over, NSW\(^{162}\) |
|-----------------|---|---|---|
| Gender          | 1997 | 2011 | Increase   |
| Female          | 33.9 | 45.4 | 11.5       |
| Male            | 49.1%| 59.8 | 10.7       |

Specifically in relation to obesity, the tables below show the percentage of male and female persons by age group that were obese in 1997 and 2011. It is of concern that there has been a significant increase in the proportion of persons aged 16 years and over who are obese, 8.45% across both genders and all age groups. The greatest increase for males was in the 35-44 age group (an increase of 14.2%) and for females in the 65-74 age group (an increase of 12%).\(^{163}\)

| Obesity (Percentage %) by Age, Male Persons Aged 16 Years and Over, NSW.\(^{164}\) |
|-----------------|---|---|---|
| Age Group       | 1997 | 2011 | Increase   |
| 16-24           | 4.4 | 9.3 | 4.9       |
| 25-34           | 10.9 | 14.6 | 3.7       |
| 35-44           | 11.0 | 25.2 | 14.2      |
| 45-54           | 16.5 | 22.4 | 5.9       |
| 55-64           | 15.1 | 27.7 | 12.6      |
| 65-74           | 14.9 | 24.3 | 9.4       |
| 75+             | 5.0 | 10.7 | 5.7       |
| All ages        | 11.3 | 19.7 | 8.4       |

| Obesity (Percentage %) by Age, Female Persons Aged 16 Years and Over, NSW.\(^{165}\) |
|-----------------|---|---|---|
| Age Group       | 1997 | 2011 | Increase   |
| 16-24           | 3.1 | 7.4 | 4.3       |
| 25-34           | 10.0 | 15.2 | 5.2       |
| 35-44           | 11.0 | 20.5 | 9.5       |
| 45-54           | 15.0 | 21.0 | 6         |
| 55-64           | 18.8 | 29.8 | 11        |
| 65-74           | 16.5 | 28.5 | 12        |
| 75+             | 7.7 | 18.8 | 11.1      |
| All ages        | 11.3 | 19.8 | 8.5       |

5.2 Demographic Distribution

The national trend is reflected at a State level with the prevalence of overweight and obesity higher among:\(^{166}\)

- Aboriginal communities (60% of Aboriginal adults were classified as either overweight (30.2%) or obese (29.9%)).\(^{167}\)
- The socio-economically disadvantaged;
Those living in regional and remote areas (68.5% compared to 49.9% in major cities); and

A significantly higher proportion of adults born in New Zealand (59.5%), Greece (64.8%) Italy (70.6%) and Lebanon (72.4%) were overweight or obese compared with the overall NSW adult population.\textsuperscript{168}

5.3 Children

The NSW Child Population Health Survey for 2009-2010 reported that 18.5% of children were overweight and 10.1% were obese.\textsuperscript{169}

In NSW, a Schools Physical Activity and Nutrition Survey (SPANS) for children between 5 and 17 years of age was undertaken in 2004 and 2010.\textsuperscript{170} An analysis of the trends between the 2004 and 2010 survey results show that combined overweight/obesity remained stable at 22.8%.\textsuperscript{171}

Between 2004 and 2010, the prevalence of overweight/obesity decreased slightly amongst boys from 25.1% to 24.0%; for girls it increased from 20.5% to 21.5%.\textsuperscript{172}

The 2010 SPANS Report makes an optimistic observation:

\begin{quote}
The trends between 2004 and 2010 are in contrast to earlier trends that had showed consistent increases in combined overweight and obesity since 1985.\textsuperscript{173}
\end{quote}

As with adults, the prevalence of overweight and obesity is higher amongst lower socioeconomic groups.\textsuperscript{174}
6. **FACTORS CONTRIBUTING TO OVERWEIGHT AND OBESITY**

Australia's Food & Nutrition 2012 states:

A person's health and well-being is influenced by a complex interplay of societal, environmental, socio-economic, biological and lifestyle factors.\(^{175}\)

There are three key factors that influence the development of overweight and obesity: biology, environment and life style behaviours.\(^{176}\) Each of these factors has a sub-set of risk factors. There are different types of risk factors: modifiable risk factors (these can be categorised as behavioural or biomedical) and non-modifiable risk factors.

### Risk factors for chronic diseases such as obesity\(^{177}\)

<table>
<thead>
<tr>
<th>Behavioural</th>
<th>Biomedical</th>
<th>Broad Influences</th>
<th>Norn-modifiable risk factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tobacco smoking</td>
<td>Excess weight</td>
<td>Socio--environmental factors</td>
<td>Age</td>
</tr>
<tr>
<td>Risky alcohol consumption</td>
<td>High blood pressure</td>
<td>Psychological factors</td>
<td>Gender</td>
</tr>
<tr>
<td>Physical inactivity</td>
<td>High blood cholesterol</td>
<td>Early life factors</td>
<td>Indigenous status</td>
</tr>
<tr>
<td>Poor diet</td>
<td>Other</td>
<td>Political factors</td>
<td>Ethnic background</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td>Family history</td>
</tr>
</tbody>
</table>

Three risk factors are considered in this section of the paper, namely: those associated with:

- Biology
- The environment, and
- Life style

#### 6.1 Risk Factor - Biology

The NHMRC acknowledges that genetics and epigenetic changes (changes in gene expression caused by mechanisms other than changes in the DNA sequence)\(^{178}\) may in part explain why some individuals have an increased risk of developing overweight and obesity than others.\(^{179}\)

**Genetics:** A strong predictor of a child’s weight is the weight status of his or her parents as confirmed by studies of adopted children and monozygotic twins. This is not to say that the family environment is not important in terms of impact on child's risk of developing overweight and obesity. Genetic obesity is thought to be due to inheritance of a "large number of genetic variations leading to a series of small but important disruptions to the way the body regulates energy balance."\(^{180}\)

**Epigenetic Changes:**\(^{181}\) Epigenetic changes are thought to predispose individuals to obesity by influencing the regulation of energy balance. The following factors have been shown to increase the level of obesity later in life:

- In Utero and Early Life Experience
Low Birth Weight Infants
High Birth Weight Infants
Accelerated Weight Gain or Rapid Early Growth

Breastfeeding exclusively for six months has been shown to reduce the level of obesity later in childhood. It is not clear whether this relationship is correlative or causative.\textsuperscript{182}

6.2 Risk Factor - Environment

Research indicates that "Environments that support or discourage health behaviours critically influence health".\textsuperscript{183} The modern Australian environment has been described as "obesogenic"\textsuperscript{184} in the way it encourages a sedentary lifestyle resulting in individuals having "a chronic positive energy imbalance."\textsuperscript{185} It is only recently that the role of the physical environment as a key factor in driving obesity has been acknowledged.\textsuperscript{186}

There are five key urban characteristics comprising both the natural and built environment that influence physical activity and may therefore impact on obesity:\textsuperscript{187}

- Transport infrastructure, foot paths and cycle ways;
- Facilities for physical activities, which may include outdoor sports facilities, playgrounds and natural green spaces such as bushland and parks.\textsuperscript{188}
- Street connectivity and design, which reflects the ease of travel between households, shops and places of employment.\textsuperscript{189}
- Mixed land uses (residential, commercial, industrial and agricultural) as well as community and recreation facilities are often associated with shorter travel distances.\textsuperscript{190}
- Residential density, a higher residential density may mean that there are more people to use a range of activities and institutions within a smaller area, often leading to shorter walking distances (as opposed to use of a car) to such destinations.\textsuperscript{191}

**Green Space:** Some research indicates that access to "green space" increases the likelihood of the public undertaking physical activity. There are a number of variables that may influence the use of "green space" besides personal factors such as motivation, include: the space's attractiveness, distance, size, quality and ease of access.\textsuperscript{192}

**Travel Behaviour:** Different modes of travel have been shown to have consequences for health with car use contributing to a sedentary lifestyle. Australia has one of the highest rates of car ownership in the World and \( \frac{3}{4} \) of all trips to work are undertaken by car.\textsuperscript{193}

In the 12 months ending 31 October 2010 there were an estimated 16.0 million vehicles registered in Australia; with passenger vehicles comprising 76.9\% of all registered vehicles.\textsuperscript{194} According to the 2006 Census, the majority (83\%) of
employed Australians who travelled to work using one method of transport used a car. Overall 8% of Australians used public transport (bus, tram, ferry, and train), while only 6% used non-motorised transport (that is, walked or cycled only).\textsuperscript{195}

A similar trend existed in New South Wales with 77% of those employed travelling to work by car; 15% using public transport and 6.4% using non-motorised transport.\textsuperscript{196}

A recent study in New South Wales reported that those who drove to work were significantly more likely than non-car commuters to be overweight or obese (51% vs 43%) and were significantly less likely to achieve recommended levels of physical activity. Further, the association with overweight and obesity increased with frequency of driving among respondents. Amongst respondents driving more than 10 times a week, 47% were overweight or obese, compared with 41% among those driving 6 to 10 times and 30% among those driving less than six times a week.\textsuperscript{197}

Another study conducted in New South Wales reported that men who cycle to work were significantly less likely to be overweight and obese (39.8%) compared with those driving to work (60.8%). Further, men who used public transport to work were also significantly less likely to be overweight and obese (44.6%). However, these inverse relationships were not found for women.\textsuperscript{198}

Several studies report that changes in walking and cycling infrastructure can result in reduced car use and increase use of non-motorised transport.\textsuperscript{199}

**Walkability:** "Walkability"\textsuperscript{200} refers to "how conducive an area is to walking for leisure, exercise or transport."\textsuperscript{201} The NHS 2007–08 reported that only 37.4% of Australian adults exercised sufficiently.\textsuperscript{202} In respect to walking specifically, 57% of Australians aged 15 years or older walked for transport and only 43% walked for fitness, recreation or sport. Walking for transport was most common among young adults (15–24 years). Walking for fitness, recreation or sport was less common increased across the age groups until 65–74 years, after which both forms of walking declined.\textsuperscript{203}

The importance of walking in the management of obesity has been suggested by American and Australian studies which indicate "an inverse relationship between neighbourhood 'walkability' and obesity."\textsuperscript{204}

**Policies to encourage walking:** The National Heart Foundation created a walkability survey in 2008-09\textsuperscript{205} to help identify the aspects of the local environment that encourage or dissuade people from walking with the aim of providing feedback to local councils.

In Victoria, Deakin University in conjunction with the City of Greater Geelong developed the Clause 56 Walkability Toolkit, which is "designed to assist developers, subdivision designers and planning officers determine the "walkability" of a location, internally and within the context of [the] surrounding street network[s] and amenity."\textsuperscript{206} The toolkit outlines steps to identify the
walking area (the ‘walking catchment’), determine if key destinations (shops, schools, public transport) are within walking distance and to assess the quality of the walking experience.  

The website, [http://www.walkscore.com/score/sydney](http://www.walkscore.com/score/sydney) is a large-scale public access "walkability" index site. It allows prospective home buyers and the general public to calculate the ‘walk score™’ of a particular address in Australia, New Zealand, Canada and the United States. Each walk score™ is calculated between 0 (low "walkability," high car dependence) and 100 (high "walkability," low car dependence) based solely on the distance to amenities.

### 6.3 Risk factors - Life Style Behaviours

The following life-style choices are modifiable risk factors for obesity:

1. Dietary behaviours;
2. Level of physical activity;
3. Smoker status; and
4. Alcohol consumption

This Briefing Paper focuses on dietary behaviours and physical activity levels at both a national and State level.

#### 6.3.1 Dietary Behaviours

The NHMRC produced the current [Australian Dietary Guidelines](#) (the Dietary Guidelines) in April 2003. The Dietary Guidelines are used by health professionals, policymakers, educators, food manufacturers, food retailers and researchers to assist Australians to eat a healthy diet. They aim to:

- Promote health and wellbeing; reduce the risk of diet-related conditions, such as high cholesterol, high blood pressure and obesity; and reduce the risk of chronic diseases such as type II diabetes, cardiovascular disease and some types of cancers.

In addition, the Commonwealth Department of Health and Ageing (DoHA) produces the [Australian Guide to Healthy Eating](#), which is designed to "help average Australians and their clinicians work out the foods they should eat each day based on age, gender and activity level."

The Guide provides detailed recommendations as to the number of servings of each food group, including size of servings. Further, these recommendations are specified for: children and teenagers, men and women across all age groups and for women when pregnant and breast feeding.

Both the Dietary Guidelines and the Guide are in the process of being reviewed by the NHMRC's Dietary Guidelines Working Group.
The NHMRC recently conducted a public consultation on the draft guidelines released in December 2011. It is anticipated that the redrafted Australian Dietary Guidelines will be released in early 2013. Other resources are also expected to be released at the same time, including: the revised Australian Guide to Healthy Eating and the revised Infant Feeding Guidelines.

The NHMRC states that one of the reasons we need Dietary Guidelines is that:

Unfortunately, diet-related chronic diseases are currently a major cause of death and disability among Australians.

Further, the NHMRC states that:

Many of the health problems due to poor diet in Australia stem from excessive intake of foods that are high in energy, fat, added sugar and/or salt but relatively low in nutrients. These include fried and fatty take-away foods, baked products like pastries, cakes and biscuits, savoury snacks like chips, and sugar-sweetened drinks. If these foods are consumed regularly they can increase the risk of excessive weight gain and other diet-related conditions and diseases.

Many diet-related health problems in Australia are also associated with inadequate intake of nutrient-dense foods, including vegetables, legumes/beans, fruit and wholegrain cereals.

The NHMRC states that evidence supports that Australians need to eat more:

- vegetables and legumes/beans
- fruits
- wholegrain cereals
- low fat milk, yoghurt, cheese
- fish, seafood, poultry, eggs, legumes and beans (including soy), and nuts and seeds.
- red meat (young females only)

And to eat less:

- starchy vegetables (e.g. potatoes)
- refined cereals
- high and medium fat dairy foods
- red meats (adult males only)
- food and drinks high in saturated fat, added sugar, salt, or alcohol (e.g. fried foods, most take-away foods from quick service restaurants, cakes and biscuits, chocolate and confectionery, sweetened drinks).

**Current National Data for Food and Nutrient Intake:** The most current detailed national data for Australian adults' food and nutrient in-take was conducted 16 years ago in the 1995 *National Nutrition Survey* and five years ago for children aged 2-16 in the 2007 *Australian National Children's Nutrition and Physical Activity Survey*. The data is therefore "rather dated."
The NHS 2007-08 provides the latest national data on selected dietary behaviours (the intake of fruit and vegetables). It warned that the data should be interpreted with care, as survey respondents had difficulty in estimating quantities consumed.

Percentage (%) of persons aged 15 years and over who met the recommended daily intake of fruit and vegetables.

<table>
<thead>
<tr>
<th></th>
<th>Fruit</th>
<th>Vegetables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>56%</td>
<td>10%</td>
</tr>
<tr>
<td>Male</td>
<td>46%</td>
<td>7%</td>
</tr>
</tbody>
</table>

According to the NHS 2007-08 only (51%) of the Australian population aged 15 years and over consumed the recommended two or more serves of fruit per day; while only 1 in 11 (9%) consumed the recommended five or more serves of vegetables. The just released first results of the AHS 2011-13 indicate a further decrease with (48.3%) of Australians consuming the recommended two or more serves of fruit per day; while only (8.3%) consumed the recommended five or more serves of vegetables.

For both the NHS 2007-08 and the AHS 2011-13 females aged 15 years and over consumed more fruit and vegetables overall than their male counterparts. Those aged ≥ 65 years and older were more likely to consume the recommended daily intake of fruit and vegetables (still only 10%) compared with (4%) for people aged 18 to 34 years. The latter figure decreased further to (3%) in the AHS 2011-13.

Persons aged 16 and over who do not usually consume the recommended servers of fruit and/or vegetables, 2007-08

In 2003 the inadequate consumption of fruit and vegetables was estimated to be responsible for 2.1% of the total burden of disease in Australia.
**Children - NHS 2007-08 Results:** Based on the NHS 2007-08, the table below outlines the percentage of children who met the recommended daily intake of fruit and vegetables according to DoHA’s *Australian Guide to Healthy Eating*.

**Percentage (%) of children for the following sub-age groups: 5-7 years, 8-11 years, 12-15 years and 16-17 years who met the recommended daily intake of fruit and vegetables.*

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Percentage (%) of children who met the recommended daily intake of:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fruit</td>
</tr>
<tr>
<td>Aged 5-7 years</td>
<td>98%</td>
</tr>
<tr>
<td></td>
<td>Recommended intake of one serve of fruit and two serves of vegetables.</td>
</tr>
<tr>
<td>Aged 8-11 years</td>
<td>99%</td>
</tr>
<tr>
<td></td>
<td>Recommended intake of one serve of fruit and three serves of vegetables.</td>
</tr>
<tr>
<td>Aged 12-15 years</td>
<td>23%</td>
</tr>
<tr>
<td></td>
<td>Recommended intake of three serves of fruit and four serves of vegetables.</td>
</tr>
<tr>
<td>Aged 16-17 years</td>
<td>18%</td>
</tr>
<tr>
<td></td>
<td>Recommended intake of three serves of fruit and four serves of vegetables.</td>
</tr>
</tbody>
</table>

**Children - The 2007 Australian National Children’s Nutrition and Physical Activity Survey:** Similar findings were recorded in the 2007 *Australian National Children's Nutrition and Physical Activity Survey*, with older children less likely than younger children to meet the recommended serves of fruit and vegetables.*

**Fruit**

51%-68% of children aged 2-13 met the fruit serve (excluding fruit juice); only 1% of children aged 14-16 years met the recommended daily intake.* Fruit consumption increases when fruit juice is included, but that in itself can be seen as problematic.* As shown in the table below, the proportion of children meeting the recommended intake declines with the increasing age of the child.

**Vegetables**

When potatoes are included, 14-22% of children aged 2-13 met the vegetables serve, a figure that falls to 5% of children aged 14-16 years. When potatoes are excluded, these figures fall to 2-5% of children aged 2-13 and 0% children aged 14-16.*

<table>
<thead>
<tr>
<th>Dietary Guideline</th>
<th>Parameter</th>
<th>2-3</th>
<th>4-8</th>
<th>9-13</th>
<th>14-16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruits</td>
<td>≥ 1-3 serves /day excluding juice</td>
<td>68</td>
<td>61</td>
<td>51</td>
<td>1</td>
</tr>
<tr>
<td>Fruits</td>
<td>≥ 1-3 serves /day including juice</td>
<td>90</td>
<td>93</td>
<td>90</td>
<td>24</td>
</tr>
<tr>
<td>Vegetables</td>
<td>≥2-4 serves /day excluding potato</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Vegetables</td>
<td>≥2-4 serves /day including potato</td>
<td>14</td>
<td>22</td>
<td>14</td>
<td>5</td>
</tr>
</tbody>
</table>

**Current NSW Dietary Data:** In 2010, 56.4% of adults consumed the recommended two serves of fruit per day. However, only 9.5% of adults consumed the recommended five serves of vegetables per day. The 2011 NSW ‘Adult’ Population Health Survey (persons aged 16 years and over) below shows that this consumption has further decreased, with 52% of adults consuming the recommended serves of fruit per day and only 8.6% of adults consuming the recommended serves of vegetables per day.

**Recommended fruit and vegetable consumption by age and sex, persons aged 16 years and over, NSW 2011.**
The 2010 SPANS Report found that 95.9% of primary school aged children and 42.1% of high school aged children met fruit consumption recommendations. However, only 43.6% of primary school aged children and 20.1% of high school aged children met recommendations for vegetable consumption.\textsuperscript{237}

\textit{The AIHW Report - Australia’s Food & Nutrition 2012}: This AIHW report highlights the following additional dietary factors that may have contributed to the obesity trend in Australia:

- There has been a strong trend towards the consumption of convenience foods (packaged foods that can be prepared quickly and easily).\textsuperscript{238} In fact, in 2009-10, Australian households spent on average $237 per week on food and beverages with food prepared outside the home (both meals out and fast food) being the largest expenditure item averaging $63 (27%) per week, an increase from $42 (24%) in 2003 (not adjusting for inflation). This was followed by alcoholic beverages at $32 (14%). Households only spent $30 (13%) per week on meat, fish and seafood collectively.\textsuperscript{239}

\textit{Average weekly expenditure on food, by selected food items, gross household income quintile, 2009-10}\textsuperscript{240}

- There has been an increase in the number of dual-income families as more women have entered the workforce providing families with more money but less time to spend on preparing food. Both factors have resulted in more meals and snacks being eaten outside the home. To place this in perspective, in 2007 there were an estimated 17,000 fast food outlets which sold more than 1.64 billion meals and takeaways per year.\textsuperscript{241}
The excess consumption of sugar- The *Australian Dietary Guidelines* indicate that only 15-20% of energy from sugar is compatible with a healthy diet. However, *Australia's Food and Nutrition 2012* reports that the majority of children had energy intakes from sugar far greater than 20%.

Figure 13: Proportion of children exceeding the recommended sugar intake (more than 20% of total energy derived from sugars), aged 2-16, 2007.

The *Australian Guide to Healthy Eating* classifies "extra foods" as "foods which we can occasionally include for variety. They are generally higher in fat and/or sugar, kilojoules, salt etc." Examples include: sweet biscuits, cakes, jam/honey, pizza, meat pies, potatoes crisps, margarine/butter, confectionery, soft drinks, fruit drinks, cordials and alcohol.

In respect of adults, sugar, sweet biscuits and sugar-sweetened soft-drinks are the most consumed "extra food", following margarine. The top three "extra foods" consumed by children that contribute the most to energy intake are:

<table>
<thead>
<tr>
<th>Extra Food</th>
<th>Proportion consuming (%)</th>
<th>Mean Intake (grams/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar-sweetened soft drinks</td>
<td>35.4</td>
<td>180.7</td>
</tr>
<tr>
<td>Cordials</td>
<td>35.4</td>
<td>119.3</td>
</tr>
<tr>
<td>Sweet biscuits</td>
<td>31.1</td>
<td>31.1</td>
</tr>
</tbody>
</table>

For David Gillespie, writing in *Sweet Poison, Why Sugar Makes Us Fat*, the key to understanding the modern diet is the increased consumption of sugar. He argues that while our body uses glucose (a sugar) biochemically as its primary fuel (food is broken down to this simple sugar) we have not evolved to cope with the volume or versions of sugar in our modern western diet. Gillespie says that Australia's sugar consumption has been increasing, in particular through soft-drink consumption. In 2003 Australians consumed an average of 110 litres of soft drinks per person, an increase from 87.4 litres in the late
1980s. In 2003, a NSW average teenager (12-18 years old) consumed 300-600 ml of soft drink each day, which is more than their daily intake of milk. While there has been an increase in the consumption of fruit over time, this has largely been due to increased juice consumption against a background of falling whole fruit and vegetable consumption. The problem with juicing is that it converts fruit and vegetables:

- containing significant fibre mass, flavoured with fructose, to one containing little other than fructose, water-oh, and some vitamin C.

Gillespie states that:

- Australians were consuming about 22.5 kg of fructose by the turn of the 21st century... an awful lot more than the less than zero kilos of added fructose we were eating 130 years before.

**6.3.2 Level of Physical Activity**

One of the key causes of overweight and obesity is an energy in-balance between calories consumed and calories expended over time. Physical activity increases the body's normal energy expenditure (internal bodily functions) and may influence this equation. A sustained energy imbalance leads to excessive consumption being stored as body fat and hence contributing to an individual's overweight or obese status.

Physical activity is defined as "any bodily movement produced by muscles [which] results in energy expenditure." Physical activity includes incidental movement (for example, hanging out washing), work-related activity (for example, lifting) and exercise which is "planned, structured and repetitive."

Physical activity has clinically been shown to be beneficial for the musculoskeletal system, psychological health, the maintenance of healthy body weight and to prevent chronic diseases, as well as beneficial in managing such diseases. Physical activity is said to be the "best buy in public health because of its manifold benefits." Of concern is the evidence that Australians are not sufficiently active and that physical activity is in fact declining.

After tobacco smoking, physical inactivity is the second largest contributor to the burden of disease and injury in Australia (6.6%) and has been estimated to have a direct health care cost of almost $1.5 billion in 2006-07.

**National Physical Activity Guidelines (NPAG):** DoHA produces the National Physical Activity Guidelines for adults (the NPAG) which outline the minimum levels of physical activity required to gain health benefits and ways to incorporate incidental physical activity into everyday life. In addition, DoHA makes physical activity recommendations for the following ages:

- Physical Activity Recommendations for 0-5 year olds
- Physical Activity Recommendations for 5-12 year olds
Physical Activity Recommendations for 12-18 year olds
Physical Activity Recommendations for Older Australians

The NPAG recommends "at least 30 minutes of moderate intensity physical activity on most, preferably all days." The 30 minutes does not have to be continuous but can consist of sessions of 10-15 minutes. Moderate intensity is defined as causing "a slight but noticeable increase in one's breathing and heart rate." Examples include brisk walking, mowing the lawn, digging in the garden or medium paced swimming or cycling.

Guideline Four recommends vigorous exercise "for those who are able and wish to achieve greater health and fitness benefits." The NPAG advises that regular vigorous activity may provide superior health and fitness benefits compared to moderate intense activity, such as "extra protection against heart disease." Vigorous activity includes football, netball, aerobics, circuit training, jogging, speed walking, fast cycling. To achieve optimum results the activity should be undertaken for 30 minutes three to four days a week.

The Current Picture of Physical Activity Undertaken by Australians: The NHS 2007-08 provides the latest data about physical activity for adults and children aged 5-17 years old. The survey included questions about exercising for sport, recreation and fitness, as well as walking for transport. The Children's Survey 2007 provides data for slightly younger children aged 2-16 years. The physical activity module used in the NHS 2007-08 is being repeated in the Australian Bureau of Statistics, AHS 2011-2013.

Physical Activity—Adults: The NHS 2007-08 specifically showed the following for obese adults compared to 'normal weight' and 'overweight' adults as defined by the NHMRC BMI guidelines:

Obese adults were less likely to:

- exercise at high or moderate levels of fitness, recreation or sport;
- exercise three or more days; and
- meet the recommended guidelines of exercise.

Obese adults were more likely to:

- be sedentary or exercise at low levels for fitness, recreational sport;
- exercise two or less days; and
- do no exercise.

In 2007–08, the proportion of adults who exercised sufficiently (both in terms of time and number of sessions in the one week survey period) to obtain benefits to their health was only 37.4 %.
The results suggest that 8% of adults exercised for sufficient time, but not for five or more sessions. Conversely, 10% of adults had a sufficient number of sessions but did not exercise for a sufficient amount of time. Males were more likely to exercise at sufficient levels than females (39% vs 36%).

ABS research suggests that participation in sport and physical recreation for people aged 15 years and over has been decreasing, from 10.5 million (66%) in 2005-06 to 11.1 million (64%) in 2009-10, with the decline being driven by a fall in female participation, from 66% to 63%. However, the rate of people participating in aerobics, fitness or gym activities increased slightly from 13% to 14%.

Results from the NHS 2007-08 shows that more than 96% of adults spent between 1 and 11 hours sitting during leisure time per day, with the average Australian spending between three and six hours each day’s sitting during leisure time.

Further, a recent survey showed that for Australians, 77% of time spent at work was sedentary. This is concerning given recent research has shown that the amount of time spent sitting during a day can affect a person’s health, regardless of how much moderate or vigorous activity they do. The research highlights that movement is needed throughout the day and not just as result of planned exercise.
Hours usually spent sitting during leisure time, by sex and physical activity level in the week before the interview, people aged 15 and over, 2007-08.

Australian’s living outside major metropolitan areas and those living in socio-economically disadvantaged areas were less likely to undertake sufficient physical activity.²⁸⁰

Insufficient time or sessions of physical activity, by selected variables, people aged 15 and over, 2007-08²⁸¹
Physical Activity—Children: The AIHW’s Australia’s Health 2010 acknowledges that children’s physical activity tends to be less structured than that of adults:

For example, children may participate in organised sports or activities, at school or through clubs, or may just be physically active through unstructured activities such as playing with friends, in or out of school.\textsuperscript{282}

The Children’s Survey 2007 collected information about physical activity levels of children (9-16 years).\textsuperscript{283}

The report concluded that by most methods of analysis the majority of children aged 9-16 years met the guidelines for moderate to vigorous physical activity everyday (MVPA). On any given day, there was a 69\% chance that a child would obtain at least 60 minutes of MVPA. Boys were more likely than girls to meet the guidelines. However, there was a drop-off with age, which was more marked in girls.\textsuperscript{286}

The National Physical Activity Guidelines recommend that 5-18-year-olds accumulate no more than two hours of screen time a day for entertainment. The Children’s Survey 2007 calculated the total amount of out-of-school hours of screen time for children aged 9-16 years. As with physical activity, four criteria were used to assess observance of the guidelines.\textsuperscript{287}

The Children’s Survey 2007 concluded that “the levels of observance of screen time guidelines were low.”\textsuperscript{289} On any given day, there was only 33\% chance that any given child would obtain no more than two hours of screen time. In fact on average children aged 9-16 years engaged in 223 minutes of screen time each day.\textsuperscript{290} Girls met the guidelines more often than boys and younger children more often than older children.\textsuperscript{291}
A 2012 University of Sydney study of nearly 1200 children in their first year of school (mean age 5.3 years) showed that detrimental weight-related behaviours were already established in the home environment prior to children beginning at school. The study reported that 18.7% of children in the study were overweight or obese. Compared to non-overweight participants, overweight/obese boys were 1.73 times more likely to exceed recommended TV time and 2.07 times more likely to eat dinner three or more times/week in front of the TV. Overweight/obese girls were twice as likely to have a TV in their bedroom, 1.65 times more likely to be rewarded with sweets for good behaviour and were 1.65 times more likely to be inactive. The authors of the study considered that the prevalence of the behaviours was high for such young children and suggested the need to intervene during the pre-school years to minimise early exposure and potential adoption of these behaviours. The study concluded that:

Social marketing strategies that communicate to parents the benefits for changing obesogenic household practices to reduce screen time and adopt healthier dietary behaviours during preschool years have the potential to assist children to start school in optimum health.

**The Current Picture of Physical Activity undertaken in NSW:** According to NSW Health, in 2011, 54% of adults undertook adequate levels of physical activity each week. More men (59.6%) than women (48.5%) reported adequate levels of physical activity.

**Adequate physical activity by age and sex, persons aged 16 years and over, NSW, 2011.**

These proportions have declined slightly when compared with the 1998 NSW Health Survey, which reported that (65%) of all males and (57%) of females
undertook a minimum of 150 minutes of accumulated physical activity throughout a week.\textsuperscript{297}

In respect of children, the 2010 SPANS Report indicated that less than half (46.4\%) of Years K, 2 and 4 students spent 60 minutes or more per day in physical activity.\textsuperscript{298} Boys (50.5\%) were more likely to do so than girls (42.2\%); from 2004 to 2010, there was a significant decline in physical activity among students in Years 6, 8 and 10, with the exception of Year 10 girls. This is a reversal of the gains observed between 1997 and 2000.\textsuperscript{299}

In 2012, the Auditor-General released a report entitled "Physical activity in government primary schools, Department of Education and Communities." The Department of Education and Communities (DEC) "Curriculum Planning, Assessment and Reporting Policy" requires schools to provide two hours of "planned" physical activity each week. According to the report, DEC does not monitor physical activity in schools leaving this to school principals.\textsuperscript{300} The audit found that:

- "around 30 per cent of government primary schools do not provide two hours of planned physical activity each week
- even those schools that provide two hours of planned physical activity are not likely to provide two hours of moderate to vigorous physical activity each week, as planned time usually includes travel to venues, setting up equipment, waiting for a turn etc. DEC’s minimum requirement for planned physical activity does not stipulate a minimum amount that should be ‘moderate to vigorous’, unlike some other States
- the quality of physical activity instruction varies between schools and teachers, with many primary students not able to master the fundamental movement skills required to participate in a full range of physical activities."\textsuperscript{301}

The Auditor-General made eight recommendations,\textsuperscript{302} all of which were accepted by DEC.\textsuperscript{303}
7. GOVERNMENT RESPONSES

7.1 The Commonwealth Government's Response to Obesity

Federally, the following departments, bodies and agencies have responsibilities that impact on the management of obesity in Australia:

- The Department of Health and Ageing (DoHA) develops and evaluates national policy, resources and initiatives in the areas of nutrition, healthy eating and the promotion of physical activity and healthy weight.\(^{304}\)

- The National Health and Medical Research Council (NHMRC) is Australia's leading expert body promoting the development and maintenance of public and individual health standards. It is an independent statutory body\(^ {305}\) responsible to the Commonwealth Minister for Health and Aging.\(^ {306}\) The NHMRC co-ordinates the development of the Australian Dietary Guidelines (discussed in an earlier section of this paper) and nutrient reference values.\(^ {307}\) It is said that:

  [The] Dietary Guidelines are a key statement to support Australia's policy goals and directions for supporting better nutritional outcomes for the population...based on the best available evidence and a systematic review of the literature.\(^ {308}\)

In 2010 DoHA commissioned the NHMRC to review the 2003 Clinical Practice Guidelines for the Management of Overweight and Obesity in Adults, Children and Adolescents. The updated draft clinical practice guidelines (Management of Overweight and Obesity in Adults, Children and Adolescents, Clinical Practice Guidelines for Primary Care Health Professionals) were released for public consultation on 12 March 2012, with submissions closing 4 May 2012.\(^ {309}\) The draft guidelines are "designed for use primarily at the level of the individual" but "acknowledge that individual choices are shaped by the wider environmental and social context."\(^ {310}\) The draft guidelines are based on similar guidelines from Scotland\(^ {312}\) and a systematic literature review.\(^ {313}\)

Another federal government agency in this field is Food Standards Australia New Zealand (FSANZ). This is an independent statutory agency,\(^ {314}\) part of the Australian Government's Health and Ageing portfolio. FSANZ develops food standards to cover the food industry in Australia and New Zealand.

The standards regulate:

- The use of ingredients, processing aids, colourings, additives, vitamins and minerals.
- The composition of some foods e.g. dairy, meat and beverages as well as standards developed by new technologies such as genetically modified foods.

FSANZ are also responsible for labelling for both packaged and unpackaged food, including specific mandatory warnings or advisory labels.
7.2 National Policies and Programs Influencing Obesity

The *Australia's Food & Nutrition 2012* report acknowledges obesity is a common risk factor for the development of chronic diseases including cardiovascular disease, type II diabetes and some cancers. Accordingly, at a national level it has been acknowledged that policies that prevent or reduce obesity have the potential to improve the health and well-being of Australians, as well as reduce health-care costs. Therefore a large number of current national health policies are focusing on obesity prevention and reduction.

Set out below is an outline of the key Commonwealth Government policies and programs over the last 20 years (1992-2012):

**Key Australian Government policies and programs over the last 20 years (1992 – 2012)**

<table>
<thead>
<tr>
<th>Date</th>
<th>Policy / Program</th>
<th>Key Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>Dietary Guidelines for Australians</td>
<td>Advice on healthy food choices to contribute to a healthy lifestyle and reduce the risk of diet-related diseases.</td>
</tr>
<tr>
<td></td>
<td>Australia's Food and Nutrition Policy</td>
<td>Improve knowledge and skills; food and nutrition objectives in policy; people with special needs, monitoring and surveillance</td>
</tr>
<tr>
<td>1994</td>
<td>The Core Food Groups: the Scientific Basis for Developing Nutrition Education Tools</td>
<td>A consistent basis for the development of a range of nutrition education tools.</td>
</tr>
<tr>
<td>1996</td>
<td>National Public Health Partnership – Strategic and Integrated Response to Public Health Priorities</td>
<td>Priority areas – healthy weight, child public health, information development and workforce development and planning.</td>
</tr>
<tr>
<td>1997</td>
<td>Australia's Weight: A Strategic Plan for the Prevention of Overweight and Obesity</td>
<td>Aim – to prevent further weight gain and reduce adult overweight and obesity; and ensure healthy growth of children.</td>
</tr>
<tr>
<td>1998</td>
<td>The <em>Australian Guide to Healthy Eating</em></td>
<td>Practical resource to help Australians develop the skills and knowledge needed to choose a healthy diet.</td>
</tr>
<tr>
<td>1999</td>
<td>Dietary Guidelines for Older Australians</td>
<td>Practical advice about nutritious eating for older Australians to promote and maintain a healthy lifestyle.</td>
</tr>
<tr>
<td></td>
<td>National Aboriginal and Torres Strait Islander Nutrition Strategy and Action Plan</td>
<td>Food supply, food security, economic status, nutrition and social issues, Indigenous nutrition workforce and information systems.</td>
</tr>
<tr>
<td>2003</td>
<td>Dietary Guidelines for Adults, Children and Adolescents (incorporating the infant Feeding Guidelines for Health Workers)</td>
<td>Food and diet recommendations to promote health and reduce diet-related conditions and chronic disease risk. Focus on food groups and lifestyle patterns, rather than specific nutrients.</td>
</tr>
<tr>
<td>2005</td>
<td>National Chronic Disease Strategy (NHPAC 2005)</td>
<td>Priority areas included asthma, cancer, diabetes, heart, stroke and vascular disease, and arthritis and osteoporosis.</td>
</tr>
<tr>
<td>2006</td>
<td>Nutrient Reference Values for Australia and New Zealand, incorporating Recommended Dietary Intakes (NHMRC &amp; NZMoH 2006)</td>
<td>Recommendations for an adequate nutritional intake for healthy people to prevent chronic diseases.</td>
</tr>
</tbody>
</table>
The most recent policy development by the Commonwealth Government is the national nutrition policy "to provide a long-term overarching framework to guide programs and policies aimed at reducing the burden of nutrition-related disease and educating and encouraging consumers to choose a healthy diet."\(^3{16}\)

### 7.3 Preventative Health Focus

In 1996, the Commonwealth Government, in response to the World Health Organisation's global strategy, *Health for All by the Year 2000*, established the National Health Priority Areas initiative (NHPAs).\(^3{17}\) The aim was to focus both public attention and health policy on areas considered "to contribute significantly to the burden of disease in Australia and for which there is potential for health gain."\(^3{18}\) The initial 1996 set of NHPAs included cardiovascular health, cancer control, injury prevention and control and mental health. Diabetes mellitus was added in 1997, followed by asthma in 1999, arthritis and musculoskeletal conditions in 2002 and obesity was only added in 2008.\(^3{19}\)

In the same year the Commonwealth Government strengthened its focus on preventative health through the National Partnership Agreement on Preventative Health (NPAPH), "in an attempt to improve the health of Australians and reduce pressure on the health system."\(^3{20}\) The Agreement commits all Australian government to address the rising prevalence of lifestyle-related chronic diseases, including obesity, by implementing programs and activities that promote healthy behaviours in the daily lives of Australians.\(^3{21}\)
7.4 An Inter-Governmental Response to Obesity: The National Partnership Agreement on Preventative Health (NPAPH)

**Background:** The Council of Australian Governments (COAG) is the peak inter-governmental forum in Australia. The health ministers from all jurisdictions collectively make up the Standing Council on Health of COAG, which has overall responsibility for Australia's health system, including "the development, implementation and evaluation of national policies, programs and priorities in relation to population health, chronic disease and child health and well-being."

The Council is supported by the Australian Health Ministers Advisory Council (AHMAC), a committee of the heads of all government health authorities; its role is to advise the health ministers on policy, resources and financial issues.

**The National Partnership Agreement on Preventative Health (NPAPH):** On 29 November 2008, COAG announced the NPAPH under the Intergovernmental Agreement on Federal Financial Relations. The NPAPH provided $872.1 million for health prevention initially over six years from 2009-10. This was the largest investment ever made by the Commonwealth Government in health prevention. The NPAPH was extended on 28 June 2012 for a further three years to June 2018.

The NPAPH aims:

> To address the rising prevalence of lifestyle related chronic disease by laying the foundations for healthy behaviours in the daily lives of Australians through settings such as communities, early childhood education and care environments, schools and workplaces, supported by national social marketing campaigns.

The NPAPH consists of 11 initiatives all of which, with the exception of 'Social Marketing Tobacco', 'directly' impact on the management of overweight and obesity.

The implementation of the NPAPH sits both with DoHA and the States and Territories. The evaluation of the NPAPH is conducted by the Australian National Preventive Health Agency (ANPHA).

DoHA is responsible for the following initiatives: Healthy Communities, Industry Partnership, Social marketing campaigns – MeasureUp, Eating Disorder Collaboration. In addition, DoHA implements:

> soft infrastructure to support the NPAPH which includes a number of aspects: establishment of the Australian National Preventive Health Agency (discussed below), workforce audit and strategy, expansion of the health survey and developing soft infrastructure to support the Healthy Workers Initiative.

The States and Territories are responsible for implementing the following initiatives: Healthy Children and Healthy Workers (discussed in detail below under 'NSW Government Response to Obesity'). The States and Territories are also responsible for implementing local activities that support social marketing...
campaigns and for developing the infrastructure to support the collection of health, nutrition and physical activity data.\textsuperscript{328}

The NPAPPH includes the following performance benchmarks for obesity that have been agreed to by the Commonwealth, the States and Territories:

**Children**

- The "proportion of children at unhealthy weight is to be held at less than five per cent from baseline by 2016; [The] proportion of children at healthy weight returned to baseline level by 2018."\textsuperscript{329}
- "Increase [the] mean number of daily serves of fruits and vegetables consumed by children by at least 0.2 serves for fruits and 0.5 serves for vegetables from a base by 2016."\textsuperscript{330} This is to be further increased to "0.6 for fruits and 1.5 for vegetables by 2018."\textsuperscript{331}
- "Increase [the] proportion of children participating in at least 60 minutes of moderate physical activity each day from a baseline by 5 per cent by 2016 [and] by 15 per cent by 2018."\textsuperscript{332}

**Adults**

- The "proportion of adults at unhealthy weight held at less than five percent from baseline by 2016; proportion of adults at healthy weight returned to baseline by 2018."\textsuperscript{333}
- "Increase [the] mean number of daily serves of fruits and vegetables consumed by adults by at least 0.2 for fruits and 0.5 for vegetables from a baseline by 2016; 0.6 for fruit and 1.5 for vegetables by 2018."\textsuperscript{334}
- "Increase [the] proportion of adults participating in at least 30 minutes of moderate physical activity on five or more days of the week [by] five per cent from [a] baseline for each state by 2016; 15 per cent by 2018."\textsuperscript{335}

For the purpose of measuring the performance of NSW against these benchmarks, the baseline will be as at June 2009 for both healthy children and healthy adults. The performance of NSW will be assessed at two time points: June 2016 and December 2017 (projected to June 2018).\textsuperscript{336}

**The Australian National Preventative Health Agency (ANPHA):** As part of the NPAPPH, the ANPHA was formally established on 1 January 2011.\textsuperscript{337} Its creation was originally agreed to by COAG as part of the NPAPPH in 2008 and was also recommended by the National Health and Hospitals Reform Commission’s Report and in the final report of the National Preventative Health Taskforce.\textsuperscript{338, 339}

The ANPHA's role is to "support the development of evidence and data on the state of preventive health in Australia and the effectiveness of preventative health interventions."\textsuperscript{340} The Agency has a five-year Strategic Plan 2011-2015 and an aligned Operational Plan for 2012-2013, which has six broad strategic goals.\textsuperscript{341} Specifically, in relation to reducing obesity, "Key Result Area (KRA) 2.2 Reduce Obesity" of the Operational Plan outlines the Agencies actions for 2012-13 and associated performance targets.\textsuperscript{342}
Key Result Area (KRA) 2.2 Reduce Obesity of the Operational Plan 2012-13 of ANPHA:

<table>
<thead>
<tr>
<th>KRA 2.2 Reduce Obesity</th>
<th>Actions for 2012-13</th>
<th>Performance targets (Target Dates)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support, extend and improve policies and programs that aim to reduce the prevalence of overweight and obesity, through research, analysis and advice.</td>
<td>• Strengthen <em>Measure Up Campaign</em> coordination.</td>
<td>• Expanded <em>National Measure Up Campaign Reference Group</em> operations - Sep 2012.</td>
</tr>
<tr>
<td></td>
<td>• Continue ongoing roll-out of the <em>Measure Up Campaign</em> and planning of future campaign developments.</td>
<td>• Implement <em>Measure Up Campaign</em> phase Spring 2012 – Mar 2013.</td>
</tr>
<tr>
<td></td>
<td>• Implement a coordinated approach to progressing the national agenda to address obesity through social marketing.</td>
<td>• Implement <em>Measure Up Campaign</em> phase Autumn 2013 – June 2013.</td>
</tr>
<tr>
<td></td>
<td>• Report on implementing recommendations of the National Seminar on Unhealthy Food and Beverage Advertising to Children.</td>
<td>• National Obesity Prevention Social Marketing Strategy - Dec 2012.</td>
</tr>
<tr>
<td></td>
<td>• Develop a monitoring framework to measure children’s exposure to the marketing of 'unhealthy' food and beverages (subject to funding).</td>
<td>• National Seminar on Unhealthy Food and Beverage Advertising to Children Report presented to Standing Council on Health (SCoH) - Dec 2012.</td>
</tr>
<tr>
<td></td>
<td>• Review national obesity research gaps and priorities</td>
<td>• A monitoring framework for future data collection developed and considered by SCoH – June 2013.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <em>National Obesity Prevention Research Priorities</em> - Dec 2012.</td>
</tr>
</tbody>
</table>

The table above makes reference to the "Measure Up" campaign.\(^{343}\) This campaign aimed to provide Australians (target 25-50 year olds and 45-60 year olds) with the tools and knowledge to make healthy lifestyle choices to reduce the risk factors for chronic disease. This program has been extended into a second phase known as "Swap It, Don't Stop It" campaign until July 2013. This second phase of the campaign focuses on encouraging small everyday lifestyle
changes to improve health.

Outlined below is some of the additional work ANPHA has undertaken or is currently undertaking in regards to obesity prevention:

- Late last year ANPHA held a Symposium on Social Marketing in Obesity
- Currently ANPHA is developing a national approach to social marketing for obesity
- Unhealthy food marketing to children - ANPHA and the South Australian Department of Health undertook a national seminar on food advertising and marketing to children.
- ANPHA is developing a National Preventative Health Research Strategy and obesity will be included in this strategy
- Earlier this year ANPHA awarded $3.75 million for research in the areas of obesity, smoking and harmful use of alcohol.
- ANPHA is responsible for evaluating the NPAPH. 'Phase One' of the National Evaluation was expected to be completed by August 2012.

**Historical Background to the National Partnership Agreement on Preventative Health (NPAPH):** In April 2008 the Minister for Health and Ageing, Nicola Roxon, announced the formation of the National Preventative Health Taskforce (NPHT) for a three year period to advise the Government on interventions that would address the prevention of obesity, tobacco and harmful consumption of alcohol that are collectively placing an escalating burden on the Australian health system.

To start debate, the Minister for Health and Ageing and the NPHT released on 10 October 2008, "Australia: The Healthiest Country by 2020, A Discussion Paper." Public submissions were called for and closed on 2 January 2009. The paper outlined the scale of the obesity problem and the following potential reforms:

The Taskforce believes that in order to halt and reverse the rise in overweight and obesity the major actions are:

- **Reshape industry supply and consumer demand towards healthier products** by increasing availability and access to healthier food and activity choices and through the development of comprehensive national food policy (eg. modelled on the UK’s *Food Matters*).

- **Protect children and others from inappropriate marketing** of unhealthy foods and beverages, and improve public education and information.

- **Embed physical activity and healthy eating in everyday life** through school, community and workplace programs. At the same time these are reinforced by individuals and families choosing to become more active and to eat healthier foods.
- **Reshape urban environments towards healthy options** through consistent town planning and building design that encourage greater levels of physical activity and through appropriate infrastructure investments (for example, for walking, cycling, food supply, sport and recreation).

- **Strengthen skill and support primary health care and the public health workforce** to support people in making healthy choices, especially through the delivery of community education and advice about nutrition, physical activity and the management of overweight and obesity.

- **Close the gap for disadvantaged communities** through the development of targeted approaches to overweight and obesity for disadvantaged groups, particularly Indigenous and low-income Australians, pregnant women and young children.

- **Build the evidence base**, monitor and evaluate the effectiveness of actions.\(^{352}\)

The NPHT prepared a detailed technical report, "Technical Report 1, Obesity in Australia: a need for urgent action, including addendum for October 2008 to June 2009," which outlined the impact of obesity in Australia, prevention options and potential initiatives.

On 30 June 2009, the NPHT released the National Preventative Health Strategy, officially launched by the then Minister for Health and Ageing, Nicola Roxon, on 1 September 2009. The Strategy comprised three parts: an overview; a roadmap for action; and technical papers focused on three key areas including obesity (referred to above), tobacco and alcohol. These three risk factors are the priority areas for the ANPHA.\(^{353}\)

It can also be noted that in May 2009, the Standing Committee on Health and Ageing released a report, Weighing it Up, Obesity in Australia. The Report was intended to complement the National Preventative Health Taskforce process by making "general recommendations on what governments, industry, individuals and the broader community can do to reverse our growing waistline."\(^{354}\) The Committee held 13 public hearings, visited hospitals, schools as well as heard from Federal, State and Local Government officials as to "campaigns, policies and activities that seek to prevent and manage the obesity epidemic in children youth and adults."\(^{355}\) The Report made twenty recommendations covering government, industry and community programs and partnerships.\(^{356}\)

On 11 May 2010, the Commonwealth Minister for Health and Ageing released Taking Preventative Action, the Government’s detailed response to the report of the National Preventative Health Taskforce. The Government supported or said it had taken action in 28 "Key Action Areas" (the Taskforce put forward 35 "Key Action Areas"); and 63 sub-recommendations were addressed (136 recommendations were made) and of the remaining sub-recommendations, five were addressed using a different approach and the remaining 49 were left for consideration by the Government.\(^{357}\)
In respect of obesity, the Government outlined a detailed response to the following ten broad "Key Action Areas":

- **Key action area 1**: Drive environmental changes throughout the community that increase levels of physical activity and reduce sedentary behaviour
- **Key action area 2**: Drive change within the food supply to increase the availability and demand for healthier food products, and decrease the availability and demand for unhealthy food products
- **Key action area 3**: Embed physical activity and healthy eating in everyday life
- **Key action area 4**: Encourage people to improve their levels of physical activity and healthy eating through comprehensive and effective social marketing
- **Key action area 5**: Reduce exposure of children and others to marketing, advertising, promotion and sponsorship of energy-dense nutrient-poor foods and beverages
- **Key action area 6**: Strengthen, up-skill and support the primary healthcare and public health workforce to support people in making healthy choices
- **Key action area 7**: Address maternal and child health, enhancing early life and growth patterns
- **Key action area 8**: Support low-income communities to improve their levels of physical activity and healthy eating
- **Key action area 9**: Reduce the obesity prevalence and burden in Indigenous communities
- **Key action area 10**: Build the evidence base, monitor and evaluate effectiveness of actions.\(^{358}\)

The Government acknowledged what had been recognised by the NPHT, namely:

> in proposing measures to tackle obesity, the evidence for intervention was more variable than in other public health issues such as tobacco control.\(^{359}\)

Accordingly, when regulatory interventions are undertaken, they must be staged, which allows both time for the approaches to work and for their effectiveness to be assessed.\(^{360}\) In other words, there is a strong emphasis on "learning by doing."\(^{361}\)

### 7.5 New South Wales Government’s Response to Obesity under the National Partnership Agreement

As noted, in November 2008 the NPAPPH, which consists of 11 initiatives, was signed by the Commonwealth, State and Territory Governments. Under the Agreement, the NSW Government has agreed to deliver at this stage the following three "Initiatives":\(^{362}\)
The Healthy Children Initiative; The Healthy Worker Initiative; and The Social Marketing Initiative.

**The Healthy Children Initiative ("HCI"):** This initiative will provide from July 2011 to 2017-18 up to $325.9 million to State and Territory Governments to deliver programs for children from birth to 16 years of age to increase levels of physical activity and improve the intake of fruit and vegetables in settings such as child care centres, pre-schools and schools.\(^{363}\)

NSW will receive $78.6 million in funding to deliver this initiative. The following three programs to execute it have been approved by NSW Health:\(^{364}\)

1. **The Children’s Healthy Eating and Physical Activity Program** seeks to enhance the capacity of settings within the community to adopt a variety of programs that promote physical activity and healthy eating. It is intended to achieve broad organisational change that supports the implementation of a range of health-promoting programs and practices on an ongoing basis. The program includes existing state-wide programs targeting early childhood and primary settings as well as new programs for supported playgroup, high school and sporting settings.

2. **The Targeted Family Eating and Physical Activity Program** targets children who are overweight or obese and their families. It delivers a behavioural treatment regarding healthy eating, physical activity and small screen recreation. The program is targeted at areas where the prevalence of overweight and obesity is high and where there is greater social disadvantage.

3. **The Population Health Education Program** will deliver evidence-based messages on health related behaviours to young people. The campaign will use a range of appropriate channels and mechanisms most likely to resonate with and impact on the health related behaviours of young people in NSW.\(^{365}\)

Part of the aim of the Children’s Healthy Eating and Physical Activity Program is to support teachers in early childhood services and primary schools to improve their knowledge of childhood healthy eating and physical activity. By the end of 2011, 53% of early childhood services across NSW, and nearly 1,000 government and independent schools, had participated in this program.\(^{366}\) By the end of 2011, nearly 1300 children and their families had taken part in the Targeted Family Healthy Eating and Physical Activity Program and over the next four years NSW Health plans to deliver the program to 7,000 children, their siblings and parents.\(^{367}\)

NSW Health states in respect of the Targeted Family Healthy Eating and Physical Activity Program:

> Initial program results are promising and include reductions in Body Mass Index, waist circumference and time spent in sedentary behaviour and an increase in the number of hours spent in physical activity each week. Children taking part in this program have also reported an increase in self-esteem.\(^{368}\)
The Healthy Worker Initiative ("HWI"): This initiative will provide State and Territories with up to $289.1 million from 1 July 2011 to June 2018 to support "workplace health programs that focus on decreasing rates of overweight and obesity, increasing levels of physical activity and intake of fruit and vegetables, smoking cessation and reducing harmful levels of alcohol consumption." The Commonwealth is allocating $5.2 million to:

develop 'soft infrastructure' to support the implementation of State and Territory activities at both a local and national level.  

NSW will receive $70.9 million in funding for this initiative, with the primary targets being adults aged 35-55 years in paid employment. So far, the Get Healthy Information and Coaching Service® (Get Healthy Service) is the key program implemented by NSW Health. This service provides adults with free, evidence-based information and coaching via telephone on healthy eating, physical activity and weight loss.

Since the launch of the Get Healthy Service in February 2009 to June 2012, there have been approximately 6,500 requests for information kits and 12,200 requests for coaching. As of August 2012, approximately 4,100 people are currently enrolled or have graduated from the six month health coaching program. According to NSW Health:

Participants who have completed 6 months of coaching continue to demonstrate significant improvements in self-reported weight, waist circumference, BMI, healthy eating and physical activity behaviours.

NSW Health plans for the program in 2012-13 to target at risk communities, as defined by the Department. In addition, it is planned under this program that an Aboriginal Strategy and a module specifically designed to prevent type II diabetes will be introduced. Under the HWI, NSW Health plans to introduce additional specific programs to prevent type II diabetes across NSW, as well as strategies to facilitate the promotion of healthy eating and physical activity in the workplace.

The Social Marketing Initiative: This initiative represents $120 million from 2009–10 to 2012–2013. The Australian National Preventive Health Agency (ANPHA) manages and coordinates the initiative ($41 million), whilst the States and Territories are given a total of $18 million to deliver programs at a local level that reinforce and extend the national campaign messages. In relation to obesity, there is a further $59.0 million allocated to the Measure Up campaign. NSW is also receiving $1.9 million each year for three years 2010-11 until 2012-13 and is using the funding to promote the Get Healthy Service.

The Current Status of the NPAPH between NSW and the Commonwealth: Under the NPAPH, NSW is required to submit "Implementation Plans" for each "Initiative" for approval by the Commonwealth Minister for Health. Recently, the NPAPH has been varied in terms of extending the period of funding for the Healthy Children Initiative and Healthy Worker Initiative. Accordingly, NSW is
required to submit modified "Implementation Plans" for approval by the end of 2012.\textsuperscript{378} It is said that the "NSW Ministry of Health is currently working with key stakeholders on these Plans."\textsuperscript{379}

### 7.6 Independent NSW Government Initiatives

In 2002, the NSW Government in recognition of the dramatic increase in the number of overweight and obese children in the decade 1985-1995 convened the \textit{Childhood Obesity Summit}.\textsuperscript{380} Nine working groups\textsuperscript{381} presented the then Minister for Health, Craig Knowles, with 145 resolutions.\textsuperscript{382} The Government released "\textit{NSW Childhood Obesity Summit, Government Response 2003},"\textsuperscript{383} which addressed each resolution. In addition the Government released an action plan, "\textit{Prevention of Obesity in Children and Young People, NSW Government Action Plan 2003-2007}.”\textsuperscript{384} This plan focused on seven priority areas, namely:

1. Healthier schools;
2. An active community;
3. Supporting parents;
4. Healthy child and out-of-school care;
5. Community understanding;
6. Increasing knowledge; and
7. Governments, industry and community working together.

In 2006, the then Premier announced a ban of soft drinks from school canteens to work in harmony with the 2004 Healthy School Canteens Strategy.\textsuperscript{385} In 2003, a NSW average teenager (12-18 years old) consumed 300-600 ml of soft drink each day, which was more than their daily intake of milk.\textsuperscript{386}

In November 2006, as part of the State Plan "\textit{A New Direction for NSW}"\textsuperscript{387} a target was set to "stop the growth in childhood obesity by holding childhood obesity at the 2004 level of 25% by 2010. The plan was then to reduce levels to 22% by 2016."\textsuperscript{388} The Plan committed the Government to the principle of "prevention and early intervention into future policy development and programme design."\textsuperscript{389} There is no official NSW Government report confirming that the target set for 2010 was met. However, a comparison of the 2004 Schools Physical Activity and Nutrition Survey (SPANS) Report to the 2010 SPANS Report reveals that the overall prevalence of combined overweight and obesity fell from 25% in 2004 for students aged 7-16\textsuperscript{390} to 22.4% in 2010 for students aged 5-16, which is below the target set.\textsuperscript{391}

In 2009, the NSW Government released the "\textit{NSW Government Plan for Preventing Overweight and Obesity in Children, Young People and their Families 2009 – 2011}.” It presented a range of policies and initiatives to stop the growth in childhood obesity.\textsuperscript{392} The Plan promoted:

healthy food and physical activity choices and seeks to encourage behaviour change at both an individual and community level by addressing five key priority areas of community information; healthy food; active lifestyles; sport and recreation infrastructure; and prevention and early intervention services.\textsuperscript{393}
In addition, six key behaviours were targeted within the Plan:

1. Reduced intake of energy dense and nutrient poor foods;
2. Increased intake of vegetables and fruit;
3. Reduced intake of sugar sweetened beverages;
4. Reduced time in sedentary, particularly the small screen related behaviours;
5. Increased moderate to vigorous physical activity; and
6. Increased walking and incidental exercise.\textsuperscript{394}

Both of the above plans - "Prevention of Obesity in Children and Young People, NSW Government Action Plan 2003-2007" and "NSW Government Plan for Preventing Overweight and Obesity in Children, Young People and their Families 2009 – 2011" - were inter-agency both in terms of implementation and monitoring.\textsuperscript{395} They were led by the Obesity Senior Officer's Group (with NSW Health as Secretariat) and historically reported to the CEOs of the agencies that fell within Human Services and Justice.\textsuperscript{396}

NSW became the first Australian jurisdiction to introduce mandatory nutrition information labelling for certain prescribed food businesses, when the Parliament passed the Food Amendment Act 2010.\textsuperscript{397} which amended the Food Act 2003 and the Food Regulation 2010. As a result, from 1 February 2012 any food business that sells standard food items at 20 or more locations in New South Wales or at 50 or more locations in Australia is required to display the nutritional information of their standard food items.\textsuperscript{398}

The legislation was introduced in light of the then Government's conclusion that "we are dealing with an overweight and obesity epidemic"\textsuperscript{399} that was costing NSW an estimated $19 billion per annum. Noted too, was the fact that 4.5 million Australians eat at a fast-food outlets each day without knowing the nutritional value of the food they are consuming.\textsuperscript{400} Accordingly, it was determined that the:

food regulatory system can help to address these chronic health problems by giving consumers the information they need to make healthy food choices.

Further, it was said that the Government wanted to avoid "uncoordinated industry efforts",\textsuperscript{401} as exemplified in the United Kingdom, which appeared to confuse consumers.\textsuperscript{402}

As required by s.106R of the Food Act 2003, NSW Health in partnership with the NSW Food Authority will undertake an evaluation of the legislation with a report expected to be tabled in Parliament by 1 February 2013. This review will also consider whether the legislation should be extended to include the display of additional nutritional information relating to fat and salt.\textsuperscript{403}

Variations on the NSW model have been followed in other jurisdictions, as follows:

- The ACT passed the Food (Nutritional Information) Amendment Act
On 23 February 2012, South Australia passed the Food Variation Regulations 2012 under the Food Act 2001. The effect will be that multiple site food businesses that sell standardised food items from 20 or more locations in South Australia or 50 or more locations nationally will be required to display kilojoule information at the point of sale. The legislation includes a 12 month transition period, with businesses having up until 23 February 2013 to comply.

Unlike in NSW and the ACT, supermarkets are currently exempt from the regulations. The South Australian Government intends to review this position in two years.

The former Victorian Premier, John Brumby, announced in 2010 a similar mandatory scheme applying to food service businesses with 50 or more outlets in Victoria or 200 or more outlets across Australia. At present this is still under consideration.

Similarly, Queensland and Tasmania have also announced plans to introduce a labelling scheme.

The NSW Premier, Barry O’Farrell, released on 6 September 2011, "NSW 2021: A Plan to Make NSW Number One," a ten-year strategic plan for NSW ("NSW 2021"). The NSW 2021 Plan has 32 goals of which goal 11 is to "keep people healthy and out of hospital." In working towards achieving this broad goal, the Plan aims to strengthen preventative health by:

- Establishing an Office of Preventative Health responsible for state-wide coordination of key preventative health programs and reporting on the achievements of the Preventative Health Fighting Fund
- Establishing a Ministerial Advisory Committee on Preventative Health to provide advice about strategies to keep people healthy and out of hospital.

The NSW Government opened the NSW Office of Preventative Health on 29 June 2012 with Professor Chris Rissell of the University of Sydney’s School of Public Health as its inaugural Director. The Office has a state-wide health promotion focus and is responsible for "overseeing the NSW Government’s $120 million Preventative Health Fighting Fund." It will coordinate initiatives to reduce lifestyle-related risk factors which lead to chronic disease, including state-wide programs that address overweight and obesity.

The Minister for Health, Jillian Skinner, said in June 2012:
The NSW Government is firmly committed to keeping people healthy and out of hospital and, most importantly, to improving their quality of life. It's about making sure that people are living healthy lives.\textsuperscript{419}

Delivering on their NSW 2021 Plan, in June 2012 the NSW Government established a Ministerial Advisory Committee on Preventative Health under s 20(6) of the \textit{Health Administration Act} 1982 (NSW). The Committee has been established for a period of up to two years with terms of appointment expiring 1 June 2014.\textsuperscript{420} The Committee is primarily responsible for:

- Providing expert advice to the Minister for Health and Minister for Medical Research on evidence-based, effective and feasible strategies to maintain and enhance individual and population health.
- Promoting discussion and resolution with influential sectors beyond health in the pursuit of primary prevention.
- Proposing prevention for patients with serious and continuing illness that will enhance their life quality and reduce crises that necessitate hospital care.\textsuperscript{421}

The Advisory Committee is chaired by Professor Stephen Leeder AO, Director, Menzies Centre for Health Policy, School of Public Health, University of Sydney. Other members are clinicians from varied backgrounds, including population health, chronic disease management, general practice, nursing, allied health and Aboriginal health.\textsuperscript{422}

The NSW 2021 Plan also included the following "Key Initiatives":

- Implementing the NSW Healthy Children’s Initiative under the National Partnership Agreement on Preventative Health. As stated above, an Implementation Plan has been agreed upon with the Commonwealth Government.
- Developing a new cross-government plan to address overweight and obesity in NSW. The plan will include a focus on adult, as well as child overweight and obesity.\textsuperscript{423}

The NSW 2021 plan includes the performance benchmarks for obesity set under the NPAPH and the following specific targets for overweight and obesity:

- Reduce overweight and obesity rates of children and young people (5-16 years) to 21\% by 2015; and
- Stabilise overweight and obesity rates in adults by 2015, and then reduce by 5\% by 2020.\textsuperscript{424}

According to NSW Health:

These targets will require a coordinated investment and the large-scale delivery of evidence-based programs – to both adults and children - across NSW. This will be progressed through the Healthy Children and Healthy Worker Initiatives of the National Partnership Agreement on Preventative Health and through yet to be determined initiatives under the NSW Strategy for the Prevention of Overweight & Obesity 2012-2016. \textsuperscript{425}
NSW Health has stated it is in the process of developing the *NSW Strategy for the Prevention of Overweight and Obesity 2012-2016*.426

8 CONCLUSION

Obesity is a major public health issue, as complex as it is important. As with smoking, policies designed to tackle obesity can raise questions about individual choice and the social costs and benefits associated with government policies and interventions in this area. What is clear is that obesity can have serious health consequences and that it is a growing problem in Australia, as it is in most advanced industrial societies. There are some hopeful signs, most notably in the levelling off of obesity rates among children, in NSW and Australia. However, considerable challenges posed by the high prevalence of overweight and obesity remain, as acknowledged by recent developments in public health policy. Of particular concern is that the prevalence of obesity is not evenly distributed in society, with lower socio-economic groups experiencing higher rates than those who are more well off. The challenge is for public policy to address the obesity issue in all its complexity, in its many biological, environmental and social manifestations.

2 Body Mass Index was calculated using only measured data.
7 Note 1 at 424.
8 Note 1 at 424.
9 Note 1 at 424.
10 Note 1 at 425.
11 Note 1 at 425.
12 National Health and Medical Research Council (NHMRC), *Management of Overweight and Obesity in Adults, Adolescents and Children, Clinical Practice Guidelines for Primary Care Health Professionals, Public Consultation Draft* (Canberra, 29 March 2012) at vii.
14 Note 12 at 16-17.
15 Note 12 at 16-17.
17 Note 16 at iv.
18 Note 16 at iv.
19 Note 16 at 23.
20 Note 16 at iv.
21 Note 16 at iv.

23 Note 22 at 29.

24 Note 22 at 30.


26 Note 3 at 54.

27 J, Ruskin, "Unto This Last", first published in December 1860 in the monthly journal *Cornhill Magazine* in four articles (In the hyperlink reference above at 47) in G, Egger, Planet Obesity *How We’re Eating Ourselves And The Planet To Death*, (Crows Nest, NSW, Allen & Unwin, 2010) at 44.

28 G, Egger, Planet Obesity *How We’re Eating Ourselves And The Planet To Death*, (Crows Nest, NSW, Allen & Unwin, 2010) at 43.


30 National Health and Medical Research Council (NHMRC), *Clinical Practice Guidelines for the Management of Overweight and Obesity in Adults*, Endorsed 18th September 2003 (Canberra, Updated 19th March 2004) at 43.

31 Note 30 at 44.


33 Note 32 at 7.

34 Note 30 at 43.


36 Note 30 at 43.

37 See [http://www.topendsports.com/testing/tests/magnetic-resonance-imaging.htm](http://www.topendsports.com/testing/tests/magnetic-resonance-imaging.htm) for a description of the procedure and the advantages and disadvantages of this method.

38 See [http://www.topendsports.com/testing/tests/computed-tomography.htm](http://www.topendsports.com/testing/tests/computed-tomography.htm) for a description of the procedure and the advantages and disadvantages of this method.

39 See [http://www.topendsports.com/testing/tests/DEXA.htm](http://www.topendsports.com/testing/tests/DEXA.htm) for a description of the procedure and the advantages and disadvantages of this method.

40 See [http://www.topendsports.com/testing/tests/near-infrared-interactance.htm](http://www.topendsports.com/testing/tests/near-infrared-interactance.htm) for a description of the procedure and the advantages and disadvantages of this method.

41 See [http://www.topendsports.com/testing/tests/BI.htm](http://www.topendsports.com/testing/tests/BI.htm) for a description of the procedure and the advantages and disadvantages of this method.

42 Note 30 at 43.

43 Note 12 at 10.


45 Note 32 at 9.

46 Note 32 at 8.


48 Note 47 at 2.

49 Note 30 at 44.

50 Note 30 at 44.

51 Note 30 at 45.

52 Note 30 at 45.

53 Note 30 at 46.

54 Note 30 at 46.

55 Note 30 at 46.

56 Note 32 at 8.

57 Note 30 at 45.

58 Note 30 at 45.

59 Between December 2011 and 29 February 2012.
BMI may be insensitive to children who are particularly tall or short for their age, who are muscular and there are racial differences. 


The WHO Region of the Americas includes the following countries: Antigua & Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Kitts & Nevis, Saint Lucia, Saint Vincent & Grenadines, Suriname, Trinidad & Tobago, United States of America, Uruguay and Venezuela.

The WHO South East Asia Region includes the following countries: Bangladesh, Bhutan, Democratic People’s Republic of Korea, India, Indonesia, Nepal, Maldives, Myanmar, Sri Lanka, Thailand and Timor-Leste.
Research Organisation (CSIRO), Preventative Health National Research Flagship and the University of South Australia (Canberra: DoHA, 2007).

E-mail advice confirming the most recent Commonwealth reports and statistical analysis on the issue of obesity from Debbie Vanderdonk, Australian Institute of Health & Welfare, 23 July 2012.

Note 6.

Note 6.

Note 100.

Note 100 at 8.

In the self-reporting cohort the highest rate of overweight/obesity was in the lower 55-64 year age group at (67%), 8% lower than the measured group. However, measured BMI index is considered more reliable as the survey shows both male and female adults generally underestimated their weight with (63%) of males and (48%) of females classifying themselves as overweight or obese. However, when these same adults were measured the prevalence increased to (68%) of males and (55%) of females respectively.

Note 100 at 8.

Note 100 at 8.

Note 6.

Note 100 at 8.

Note 6.

Note 101 at x.

Note 101 at 35 and 116.

Note 3 at 53

Note 101 at 36.

Note 101 at 35 and Note 25 at 185.

The Australian Diabetes, Obesity and Lifestyle Study (AusDiab), *Diabetes & Associated Disorders in Australia-2000-The Accelerating Epidemic*, (Melbourne, the International Diabetes Institute, 2001).

Note 118 at 16.

Note 118 at 16.

Standardised to the 1991 Australian population-Note 118 at 16 and 17 and Note 13 at 19.

Note 74 at xiii.

Note 13 at 19 and Note 25 at 188.


Note 74 at 9.

Note 124 at 116 and Note 25 at 188.

Note 25 at 188.

Australian Bureau of Statistics, *Overweight and Obesity in Adults in Australia; A Snapshot, ABS cat no. 4842.0.55.001(Canberra, 27/05/11 released at 11.30 am) at 10-14 and Note 12 at xi*

Australian Institute of Health and Welfare, *Aboriginal and Torres Strait Islander Health Performance Framework 2010: Detailed Analyses* cat. no. IHW 53 (Canberra, AIHW, October 2011) at 1510.

Note 12 at 2.

Note 13 at 22.

Note 12 at 3.

Note 12 at 2.

Australian Institute of Health and Welfare, *Young Australians: their health and wellbeing 2011* cat. no. PHE 140 (Canberra, AIHW, 2011) at 63.

Note 25 at 9.

Note 13 at 20.

Note 100.

Note 134 at 63.

Note 128 at 11.

Note 25 at 9.

Note 13 at 20.

Note 100.

Note 134 at 63.

Note 128 at 11.

An index quintile was compiled from various characteristics including income, educational
Obesity was highest for those who worked as machinery operators and drivers (74%). These roles generally involve long hours of sitting, which may undo the benefits of any regular physical activity. In contrast people that worked as sales workers (most likely to be standing and walking in their roles) were the least likely to be overweight or obese (53%)

Note 128 at 3.

There is often a lack of sporting facilities (eg heated pools and commercial gyms) as well as walking paths that support physical activity. Further, there may be the perception that 'rural work' provides sufficient physical activity and therefore physical activity is not needed during leisure hours- National Health and Medical Research Council (NHMRC)- Note 12 at 39

Note 25 at 97.

161 Information provided by NSW Health to the author in a written statement, 1 August 2012.

162 Based on aggregate data across the years 2006 to 2009.

163 Information provided by NSW Health to the author in a written statement, 1 August 2012.


165 Information provided by NSW Health to the author in a written statement, 1 August 2012.


167 Note 28.
179 Note 12 at 5.
180 Note 12 at 5.
181 Note 12 at 5.
183 Note 5 at 5.
185 Note 5 at 5 and 16.
186 Note 5 at 17.
187 Note 5 at 5.
189 Note 188 at 37.
190 Note 5 at 9.
191 Note 188 at 37.
192 Note 188 at 45.
193 Note 13 at ix.
194 Australian Bureau of Statistics, 9208.0 - Survey of Motor Vehicle Use, Australia, 12 months ended (Canberra, 31 October 2010 Latest ISSUE Released at 11:30 AM (CANBERRA TIME) 23/08/2011.)
195 Note 188 at 42.
196 Australian Bureau of Statistics, 2068.0 – NSW Detailed (Place of Work-Study Area)-N S W Method Of Travel To Work By Occupation (a) (Released at 11:30 AM (CANBERRA TIME) 29/02/2008.)
199 Note 5 at 21.
201 Note 188 at 37.
202 Note 124 at 93.
203 Note 188 at 37.
204 Note 188 at 37.
205 >accessed 17 July 2012.
207 >accessed 17 July 2012.
209 accessed 17 July 2012.
211 Note 209.
212 Note 209.
213 Between December 2011 and 29 February 2012.
214 Information provided to the author by Emma Breen, Acting Assistant Director for Dietary Guidelines, the Australian Government, National Health and Medical Research Council, 31 October 2012.
The survey included 13,858 people aged two and over and used a 24-hour food recall method to provide a representative indication of food consumption. A second 24 hour recall was collected on a subset of respondents and nutrient intakes from the first day were adjusted to estimate “usual intake” by including information from the second 24-hour record.


Information provided by NSW Health to the author in a written statement, 1 August 2012.


Note 124 at 92


Note 262 at 2.

Note 262 at 2.

Note 262 at 2.

Note 262 at 2.

Note: The AIHW's *Australia Health 2010* (Note 124) warns that the NHS 2007-08 (Note 100) "data cannot be used to measure compliance with the national guidelines. However, by using the number of days on which exercise was undertaken over a 1-week period as a proxy for the number of sessions, [this] data enables activity levels to be calculated." at 92.

Note 101

E-mail advice confirming the most recent Commonwealth reports and statistical analysis on the issue of obesity from Debbie Vanderdonk, Australian Institute of Health & Welfare, 23 July 2012.

Note 128 at 4.

Note 128 at 16.

Note 124 at 93.


Note 124 at 93.

Australian Bureau of Statistics, *Participation in Sport and Physical Recreation, Australia*, ABS cat no. 4177.0 (Canberra, 21/12/10 released at 11.30 am) and Note 24 at 204.

Note 3 at 207.

Note 273 at 29.

Note 124 at 94.

Note 273 at 29.

Note 124 at 96.

This allowed for different activities to be recorded for small blocks of time, over four 24-hour periods (2 days prior to the face to face interview and two days prior to the telephone interview). From this data, time spent on moderate to vigorous physical activity and time spent on screen-based activities (for example, watching television or DVDs, or using a computer) was assessed against the national recommendations p.6 survey – Note 124 at 96.

All Days Method - a child meets the guidelines if he or she accumulates at least 60 minutes of moderate to vigorous physical activity (MVPA) on each of the four-days sampled.

Most Days Method - a child meets the guidelines if he or she accumulates at least 60 minutes of MVPA on most (i.e three or four) of the four-days sampled.

Four-day Average Method - a child meets the guidelines if he or she accumulates at least 60 minutes of MVPA per day when averaged across the four days sampled.

Child x Day Method - The probability that are randomly chosen child on a randomly chosen day will accumulate at least 60 minutes of MVPA on that day.

Note 101 at 28.

Note 101 at 27.

Note 101 at 31: All Days Method - a child meets the guidelines if he or she accumulates no more than two hours of screen time on each of the four days sampled.

Most Days Method - a child meets the guidelines if he or she accumulates no more than two hours of screen time on most (i.e. three or four) of the four days sampled.

Four-day Average Method - a child meets the guidelines if he or she accumulates no more than two hours of screen time when averaged across the four days sampled.

Child x Day Method - the probability that are randomly chosen child on a randomly chosen day will accumulate no more than two hours of screen time on that day.

Note 101 at 31.
Note 101 at 31.
Note 124 at 97.
Note 101 at 31.
Note 292 at 3.
Note 292 at 4.
Note 292 at 3.
Note 292 at 4.
Note 13 at 36.
Note 101 at 17
Note 234.
The Audit Office of New South Wales, "Physical activity in government primary schools, Department of Education and Communities," (Sydney, 13 June 2012) at 3.
Note 300 at 3.
Note 300 at 4.
Note 300 at 5-6.
Note 25 at 42.
The National Health and Medical Research Council was first constituted in September 1936. The current legislative basis of the Council is the National Health and Medical Research Council Act 1992 (NHMRC Act). The NHMRC also has responsibilities under the Prohibition of Human Cloning for Reproduction and the Regulation of Human Embryo Research Amendment Act 2006 which came into operation on 12 June 2007. Obligations of NHMRC under the Prohibition of Human Cloning for Reproduction Act 2002 and the Research Involving Human Embryos Act 2002 include the development and implementation of a program for reviewing and enhancing relevant guidelines, and the provision of administrative improvements in the licensing process.
Note 25 at 42.
Note 25 at 55.
Note 12 at vii
Note 12 at vii
http://www.sign.ac.uk/guidelines/fulltext/115/index.html
Established by the Food Standards Australia New Zealand Act 1991.
Note 25 at 49.
Note 25 at 52.
Note 25 at 50.
Note 25 at 51.
Note 25 at 51.
Note 323.

Information provided to the author by Anna Davies of ANPHA, 12 September 2012.

Note 323.

Information provided to the author by Debbie Hurlbut, Acting director, National partnership Section, Healthy Living and Chronic Disease Program Branch/Population Health Division, Department of health and Ageing, 10 October 2012.

Note 327.


Note 329.

Information provided by NSW Health to the author in a written statement, 21 September 2012.

Following the commencement of the Australian National Preventive Health Agency Act 2010 on 1 January 2011. The Revised Explanatory Memorandum, circulated by authority of the Minister for Health and Aging, the Hon Roxon, MP, explains the aims and operations of the Act.


Note 452 at 7.


Information about this can be found in the report of proceedings from the Symposium on Social marketing In Obesity and the ANPHA First Year Highlights report - Information provided to the author by Anna Davies of ANPHA, 12 September 2012.


Note 350 at 14.

Note 350 at 11.


Note 354 at viii.
Note 354 at at x-xvii.


Note 357 at 34.

Note 357 at 34.

Note 357 at 34.

Note 336.


Note 336.

Note 336.

Note 234.

Note 234.

Note 234.

Note 234.

Note 343.

Note 336.

Note 336.

Note 336.

Note 336.

Note 336.


Early childhood; family and community; school education; health; sport, recreation and fitness; local government; commercial food industry; media and transport & planning.


Note 382.


Hansard transcript, Speakers; Mr Bryce Gaudry & Mr Morris Iemma, 24 May 2006.

Note 13 at 32.

NSW Government, State Plan "A New Direction for NSW", (Sydney, November 2006).

Note 387 at 47.


Note 170 at 4.


Note 392.


Information provided by NSW Health to the author in a written statement, 27 September 2012.

Note 394.
Passed Parliament 23 November 2010 and assented 29 November 2010 -
http://bulletin.prod.parlment.nswbills.nsf/d2117e6bba4ab3ebca256e68000a0ae2/65f4de57ad54
9f6ca2577d600188881OpenDocument
398 Requirements relating to display of nutritional information for food, Division 4 ss106K-106 R
of the Food Act 2003 (NSW) and Requirements for display of nutritional information, Part 2B,
clause 16 P-16 W of the Food Regulation 2010 (NSW).
399 “Agreement in Principle” speech of Steve Whan, Member for Monaro, Minister for Primary
Industries, Emergency Services and Rural Affairs, Legislative Assembly, Wednesday 10
November 2010.
400 Note 398.
401 Note 398.
402 Note 398.
403 Note 234 and Information provided by NSW Health to the author in an email dated 17
September 2012.
405 Section 109 Food (Nutritional Information) Amendment Act 2011
406 Section 108 Food (Nutritional Information) Amendment Act 2011
407 Section 110 Food (Nutritional Information) Amendment Act 2011
408 Food Variation Regulations 2012 (SA),
012_7.aspx
409 South Australia Health,
http://www.sahealth.sa.gov.au/wps/wcm/connect/Public+Content/SA+Health+Internet/Health+se
rvices/Public+health/Display+of+kilojoule+information+in+chain+food+outlets > viewed 19
September 2012.
410 Information provided by Pauline Ireland to the Author, Assistant Director, Food Safety and
Regulation, Department of Health Victoria, 21 September 2012.
411 Note 234.
412 Media Release, “NSW 2021: A Plan to Make NSW Number One”, 6 September 2011,
b20
and Note 413.
414 NSW 2021, A Plan to NSW Number One,
415 Media release "Office of Preventative Health Fulfills Election Promise", The Hon Jillian
Skinner MP, Minister for Health and Medical Research, 29 June 2012.
416 Note 416.
417 Note 234.
418 Note 416.
419 Note 336.
420 Note 336.
421 Note 336.
422 Note 336.
Members
• Professor Ronald Penny AO, Emeritus Professor of Medicine, University of New South
Wales.
• Professor Kerryn Phelps AM, Adjunct Professor, School of Public Health, Sydney
University and Conjoint Professor in the School of Public Health and Community
Medicine, University of New South Wales.
• Professor John Dwyer AO, Emeritus Professor of Medicine, the University of New South
Wales.
• Mr Craig Bosworth, General Manager, Strategy and Stakeholder Relations, National Health Call Centre Network.
• Ms Sandra Bailey, Chief Executive Officer, NSW Aboriginal Health & Medical Research Council.
• Ms Kerry Stevenson, Divisional Manager Primary, Community and Allied Health, Central Coast Local Health District

423 Note 415.
424 Note 415.
425 Note 234.
426 Note 224 and Note 336.