This evidence brief forms part of the Australian National Preventive Health Agency’s evidence brief series which aims to disseminate information and inform dialogue relating to high priority preventive health issues.

This evidence brief was prepared by The Boden Institute of Obesity, Nutrition, Exercise & Eating Disorders and the Menzies Centre for Health Policy, University of Sydney for the Australian National Preventive Health Agency.

This brief is written in plain English to appeal to a wide audience. A more detailed technical paper supports the evidence presented in this brief and is available upon request from ANPHA@anpha.gov.au
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SUMMARY

• Adults who are obese are more likely to die at least 2-4 years younger than those at a healthy weight.

• Obesity increases the risk of a number of debilitating and chronic conditions including high blood pressure, type 2 diabetes, coronary heart disease, stroke, joint problems, at least eight types of cancer, arthritis, back pain, respiratory difficulties, skin problems and sleep apnoea.

• The prevalence of obesity is rising, particularly in adults.

• There are indications rates may have plateaued in children however, rates continue to be high and are a serious problem.

• The rates of overweight and obesity have increased dramatically in the last 30 years. This has been due to changes in the social and physical environments which have led to increased access to and the consumption of cheap high kilojoule foods and reduced to daily physical activity levels due to more sedentary occupations and modes of travel.

• Australia’s obesity problem is similar to that of other developed nations.

• Men have an overall higher rate of being above a healthy weight but men and women have similar rates of obesity.

• The prevalence of being above a healthy weight is similar among states and territories, although there is some variation in recent trends across Australia.

• The differences in the prevalence of being above a healthy weight in both men and women is influenced by a range of social and economic factors such as level of education, financial stress, rurality, availability of fresh food and the availability of green space, these effects seem both greater and more complex in women.

• There is a socioeconomic gradient in body weight with those with lower incomes being more likely to be above a healthy weight.

• Aboriginal and Torres Strait Islander people are more likely to be obese with the rate of obesity being 1.7 times higher in women and 1.4 times higher in men than in non indigenous people.

• In general, people born overseas have lower rates of obesity than those born in Australia but gain weight after coming to Australia. Patterns in the rates of overweight and obesity in children under the age of 15 years, as in adults varies with gender and age group and with ethnic, socioeconomic and indigenous status. Low physical activity, high sedentary behaviour and unhealthy diets contribute to this variation.

• Children who are obese are more likely to continue being obese throughout their lifetime.

• Strategies to address obesity need to consider social and cultural factors as well as individual factors that contribute to obesity.
INTRODUCTION

Obesity is a global health problem and the prevalence of obesity is increasing in the Australian population. The obesity epidemic in Australia is occurring primarily because of a social and physical environment where the physical activity requirements of daily living are decreasing and where energy-dense foods and drinks are relatively cheap and freely available.

Addressing any epidemic requires the capacity to regularly monitor population trends and characteristics. Identifying groups where prevalence is not increasing or where previous increases have plateaued or even declined may help understand ways to prevent obesity. Where monitoring identifies groups with higher rates of increase then this may indicate the need for additional targeted intervention. In addition, monitoring is important to the evaluation of the overall impact of public health interventions.

The focus of this brief is to bring together the results of the most recent surveys in Australia that have monitored population and subgroup trends in obesity and to examine potential explanations for observed trends.

Data Sources

This brief builds on a previous technical report written for the Commonwealth Government.1 National data for this current brief were largely drawn from the Australian Bureau of Statistics. Department of Health websites for each state and territory were searched for state based data. For international comparison, country-specific data were obtained from the Organisation for Economic Co-operation and Development (OECD) website. The source of additional data is listed in Appendix A.

The most reliable source of information are from surveys that involve people being weighed and having their height measured. This is expensive to compile on a national level and is not carried out regularly. Other data derive from self-reports in which people are asked how tall they are and how much they weigh. Self-reported data are less reliable (many people underestimate their weight and overestimate their height), but is less expensive and more widely available. Self-reported data, if compiled carefully, can be very useful in assessing trends.

Unless stated otherwise, data included in this report are based on measured height and weight.

Terminology

The most common and useful measure of weight in the health sector is the body mass index, or BMI. It is calculated as weight in kilograms divided by the square of height in metres.

A healthy weight is defined as a BMI between 18.5 and 25 kg/m². This is based on the finding that people with a BMI above 25 kg/m² or below 18.5 kg/m² are more likely to die prematurely of a health-related issue than those with a BMI between 18.5 and 25 kg/m².

In this report, weight status terms used for adults are listed in Table 1. The situation for children aged 2–18 years is more complex as BMI cut-off points used to define overweight and obesity vary with age and gender.2
TABLE 1: TERMINOLOGY USED IN THIS REPORT

<table>
<thead>
<tr>
<th>TERMINOLOGY</th>
<th>DEFINITION</th>
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<tbody>
<tr>
<td>Healthy weight</td>
<td>BMI between 18.5 and 25 kg/m²</td>
</tr>
<tr>
<td>Above a healthy weight</td>
<td>BMI of 25 kg/m² and over</td>
</tr>
<tr>
<td>Overweight</td>
<td>BMI of more than 25 and less than 30 kg/m²</td>
</tr>
<tr>
<td>Obese</td>
<td>BMI of 30 kg/m² and over</td>
</tr>
<tr>
<td>Unhealthy diet</td>
<td>Diet not consistent with the Australian Dietary Guidelines³</td>
</tr>
<tr>
<td>Abdominal obesity</td>
<td>Waist circumference of 94 cm and above for men and 80 cm and above for women</td>
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Why weight matters?

Adults who are obese are more likely to die younger than those who are not. Life expectancy is reduced by 2-4 years for those with BMI between 30 and 35 kg/m², and by 8-10 years for those with BMI between 40 and 45 kg/m² compared with BMI 22.5-25 kg/m².⁴ Obese adults are more likely to develop high blood pressure, type 2 diabetes, coronary heart disease, stroke, joint problems, and at least eight different types of cancer.⁶ They are also more likely to have all the indicators on blood tests that suggest chronic diseases, if not already apparent, will soon develop.⁷

Obese adults are also prone to develop a range of debilitating conditions which can affect their quality of life, such as arthritis, back pain, respiratory difficulties, skin problems and sleep apnoea, and risk social exclusion.⁶

Childhood obesity can have lasting health, social and economic effects. Obese children are more likely than others to be obese in adult life.⁶ Obese adolescents are also more likely to have low self-esteem, low confidence and to be discriminated against, which may explain the lower academic achievements reported in this group.⁹

Obesity is also often associated with psychosocial problems such as low self-esteem and depressive symptoms, many of which appear to result from the negative cultural bias and prejudice against obese people.¹⁰

Obesity is a significant national issue with Australia’s rate of being above a healthy weight one of the highest in developed nations.¹¹ Based on health services utilisation and health related expenditure data from individuals, the economic cost of being above a healthy weight in 2005 for adults alone, was estimated at $21 billion in direct healthcare and direct non-healthcare costs, plus an additional $35.6 billion in government subsidies.¹¹ An analysis undertaken by KPMG estimated the total direct and indirect costs of obesity in 2008-09 to be $37.7 billion or 3.1% of Gross Domestic Product (GDP).¹² The direct financial cost was $7.7 billion of which $1.3 billion related to direct health care costs of obesity-related medical conditions. A further $6.4 billion or 0.5% of GDP in cost related to productivity losses.
OBESITY IN ADULTS

International weight trends

Throughout the world, obesity is becoming more common in adults. Obesity is increasing in reasonably similar fashion throughout the western world, with some nations having started the increase earlier than others\(^1\) (Figure 1).

**FIGURE 1:** PREVALENCE OF OBESITY FOR ADULTS AGED ≥ 15 YEARS IN 5 OECD COUNTRIES

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Data source: OECD Health data 2013
National weight trends

THE AVERAGE AUSTRALIAN ADULT IS NOW ABOVE A HEALTHY WEIGHT

The average Australian adult is now above a healthy weight. In the latest national survey, 63% of adults were above a healthy weight (35% overweight, 28% obese).14

Obesity is becoming more common. In 2011-12, 1 in 4 adults were obese compared with 1 in 5 adults in 1995. This increase occurred across all ages and both genders, although at different rates (see weight and gender).

The proportion of the adult population with a BMI of 35 kg/m² and over increased substantially from 1 in 20 adults in 1995 to 1 in 10 adults in 2011-12 (Figure 2).

FIGURE 2: PROPORTION OF ADULTS AT VARIOUS BMI SCORES, 1995 AND 2011-12

Data source: Australia health Survey 2011-12
Weight and gender

Between the 1995 and 2011-12 surveys, the average weight for men increased by 3.6kg while the equivalent gain for women was 4.0kg. A larger proportion of men than women are above a healthy weight (70% vs. 56%; Figure 3). While the proportion of obese men and women is similar, more men are overweight than women, suggesting that women are more likely than men to progress to becoming obese.

A number of explanations have been suggested but not proven for the difference in weight patterns between women and men. Women tend to eat slightly healthier diets and drink less alcohol, although also tend to exercise less. Genetic differences may play a part. The impact of pregnancy and childbirth is mooted as a factor, but the relationship is complex and not linear. Further research is required to explore these possible reasons.

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Weight and age

The proportion of men who are above a healthy weight increases each year until the age of about 50, when it plateaus and then, at age 75, declines (Figure 4).

The critical period of weight gain in men appears to be the 5-10 year period after leaving school, when many men leave the structure offered by school (with scheduled sport and physical activity, and a diet that may be monitored by parents) to a workplace or further study with less structure and less external monitoring.

The proportion of women who are above a healthy weight increases gradually with age, to a plateau at around the age of 60. While there is no sudden rise at any age, the rate of increase in obesity appears to be greatest between the ages of 25 and 54 years during which time pregnancy and menopause onset may both have an impact (Figure 4).

FIGURE 4: PROPORTION OF THE ADULT POPULATION ABOVE A HEALTHY WEIGHT, BY AGE AND GENDER

Data source: ABS Australian Health Survey data 2011-12.
Weight variations across Australia

The proportion of adults across Australia who are above a healthy weight is fairly similar in different states and territories (Figure 5). This ranges in men from 68% in Victoria to 73% in Queensland, and in women from 54% in Victoria and New South Wales to 61% in South Australia.

There are differences in trends between the 2007-08 and 2011-12 National Health Surveys, with South Australia showing the greatest increase between the two surveys and Victoria and New South Wales registering little change (Figure 5). The reasons for this are not clear.

**FIGURE 5:** PREVALENCE OF ADULTS BEING ABOVE A HEALTHY WEIGHT BY STATE AND TERRITORY, 2007-08 AND 2011-12

Weight and the urban/rural divide

IN GENERAL, PEOPLE WHO LIVE OUTSIDE MAJOR CITIES ARE MORE LIKELY TO BE ABOVE A HEALTHY WEIGHT

In general, people who live outside major cities are more likely to be above a healthy weight (Figure 6). Much of this difference is due to the higher concentration of people of a lower socioeconomic status and of Aboriginal and Torres Strait Islander ethnicity, as well as a lower concentration of migrants, who as a group weigh less than Australian-born people.

Other possible explanations include more health risk behaviours (such as inadequate exercise and poor diet), more expensive fresh food (mainly in remote areas), and possibly less ready access to large supermarkets or grocery stores, which is associated with healthier eating. The 2010 Healthy Food Access Basket Survey which estimated the cost of a basket of healthy food in different parts of Queensland reported a 26% higher cost in very remote areas compared with major cities.

FIGURE 6: TREND IN PREVALENCE OF ADULTS BEING ABOVE A HEALTHY WEIGHT, BY REMOTENESS, 2007-08 TO 2011-1.

Weight and socioeconomic status

The lower the socioeconomic status the higher the likelihood of being above a healthy weight. At a national level, 66% of people in the most disadvantaged fifth of the population are above a healthy weight, compared with 59% of those in the least disadvantaged fifth of the population (Figure 7).

Comparing prevalence of obesity amongst the 61 Medicare Local catchments highlights differences in obesity rates between people of different socioeconomic status.22 For example, compare the prevalence of obesity in the adult population in 2011-12 covered by the Loddon-Mallee-Murray Medicare Local, a poorer, rural area centred on

FIGURE 7: PREVALENCE OF BEING ABOVE A HEALTHY WEIGHT BY SOCIOECONOMIC DISADVANTAGE INDEX, 2007-08 TO 2011-12

Data Source: National Health Surveys 2007-08, 2011-12
Bendigo, Victoria, with that of the North Shore and Beaches Medicare Local, a wealthier, urban area centred on Frenchs Forest in Sydney. Bendigo has a SEIFA index of 984 (below the national average of 1000) and Frenchs Forest has a SEIFA index of 1140, which is among the highest 10% in the nation. The prevalence of obesity is 41% in the Loddon-Mallee-Murray and 14% in North Shore and Beaches.\(^2\) As these data are not age-weighted, caution is required in interpreting the data, but the differences are stark.

In the latest national survey there is a distinct difference between men and women in socioeconomic gradient for being above a healthy weight, with there being no gradient for men and a strong gradient in women. The prevalence in women in the least disadvantaged areas was 48% compared with 64% in the most disadvantaged areas (Figure 8). These data underline the importance of focusing efforts to reduce obesity in people of lower socioeconomic status.

**FIGURE 8:** SOCIAL GRADIENT IN BEING ABOVE A HEALTHY WEIGHT, BY GENDER

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Data source: Australian Health Survey 2011-12

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\(^1\) SEIFA is the Socio-Economic Index For Areas, produced by the Australian Bureau of Statistics, which ranks areas in Australia according to relative socio-economic advantage and disadvantage, based on information from the five-yearly Census.
Weight and Aboriginal and Torres Strait Islander people

Aboriginal and Torres Strait Islander people are just as likely as other Australians to be above a healthy weight, according to the 2012-13 Australian Aboriginal and Torres Strait Islander Health Survey. However, an Aboriginal and Torres Strait Islander person who is above a healthy weight is more likely to fall into the obese, rather than overweight, category. This is especially true for women with an Aboriginal and Torres Strait Islander woman being 1.7 times more likely to be obese than a non-indigenous Australian woman of the same age, and an Aboriginal and Torres Strait Islander man is 1.4 times more likely to be obese than a non-indigenous Australian man of the same age.

AN ABORIGINAL AND TORRES STRAIT ISLANDER WOMAN IS 1.7 TIMES MORE LIKELY TO BE OBESE THAN A NON-INDIGENOUS AUSTRALIAN WOMAN OF THE SAME AGE

The likelihood of Aboriginal and Torres Strait Islander adults living in remote areas being above a healthy weight was slightly less than that of Aboriginal and Torres Strait Islander adults living in non-remote areas (61% vs. 67%).

It is not possible to report trends, as the 2012-13 Australian Aboriginal and Torres Strait Islander Health Survey did not use the same methods to collect data as the 2004-05 National Aboriginal and Torres Strait Islander Health Survey. However there are indications that the gap between Aboriginal and Torres Strait Islander and other Australians has widened with respect to obesity. The 2004-05 National Aboriginal and Torres Strait Islander Health Survey found that Aboriginal and Torres Strait Islander Australians were 1.2 times more likely to be overweight or obese than other Australians. In 2012-13 Aboriginal and Torres Strait Islander males were 1.4 times more likely and females 1.7 times more likely to be obese.
**Weight and cultural background**

The situation for culturally and linguistically diverse groups is complex due to differences in the way data are collected in different surveys, as well as the difficulty in teasing out factors which impact on weight in such a heterogeneous group of people.

Adults who speak English at home are more likely to be above a healthy weight than those who speak a language other than English. That is true for both people born overseas and those born in Australia (Figure 9).

**FIGURE 9:** PREVALENCE OF OBESITY AMONG ADULTS BY COUNTRY OF BIRTH AND MAIN LANGUAGE SPOKEN AT HOME

Data source: Australia Health Survey 2011-12
In general, adults born in the Pacific Islands or southern and eastern Europe are more likely to be above a healthy weight than those born in Australia, and people born in north-east Asia and south-east Asia are much less likely.

However, there is a need for caution in interpreting these results, as the age profiles of different migrant groups may vary. Still, the most compelling case for concentrated action is to focus attention on reducing obesity among people of Southern and Eastern Europe, Oceania (which includes the Pacific Islands) and North Africa and the Middle East background where rates of obesity are high among adults. Of particular note, are rates for those of Pacific Islander descent, where rates of diabetes are also increasing markedly.24

The longer migrants and subsequently, their family members live in Australia, the more their pattern of health risk becomes similar to that of the rest of the national population. A similar pattern as for breast cancer and other health conditions appears to exist in migrants in regard to weight, with 63% of adults who migrated to Australia before 1996 being above a healthy weight compared with 44% of those who arrived between 1996 and 2008, albeit often from different countries of origin and with different age profiles.25,26 Those most at risk of rapid weight gain among migrants are those from Africa and Asia.27
Childhood obesity

There has been a rapid rise in childhood obesity throughout the world. However, the rapid rise is slowing appreciably, and may have plateaued in China, England, France, Netherlands, Sweden, Switzerland and the USA. It appears to be stabilising at different levels in different nations. However, it remains high in all these nations and is a significant public health issue.28

In the latest National Health Survey, 25% of children aged 5–18 (18% overweight, 7% obese) were above a healthy weight. In children aged 5-17, the proportion who were above a healthy weight increased between 1995 and 2007-08 (21% and 25% respectively) and then remained stable to 2011-12 (26%). Combined national and state-based data from 1901 to 2003 suggest the increase started in the 1970s.29

The belief that the rise in childhood obesity has plateaued is supported by data from the NSW School Physical Activity and Nutrition Surveys (NSW SPANS) and the ACT Year 6 Physical Activity and Nutrition Surveys.30,31 Furthermore, data from two Victorian studies suggest a decrease in prevalence.32,33

In general, a larger proportion of boys than girls are above a healthy weight at most ages. But within that, both the national data and the NSW SPANS data show that the prevalence of obesity has risen recently in younger boys and fallen in older boys. There is no consistent pattern in girls.

BOYS ARE MORE LIKELY THAN GIRLS TO BE ABOVE A HEALTHY WEIGHT
Around 30% of children in the more socially disadvantaged groups were above a healthy weight compared with around 20% in those with higher socioeconomic advantage.\textsuperscript{30}

NSW SPANS data suggest prevalence of being above a health weight was higher for children from the most socioeconomically disadvantaged group compared with their most socioeconomically advantaged counterparts. Around 30% of children in the more socially disadvantaged groups were above a healthy weight compared with around 20% in those with higher socioeconomic advantage.\textsuperscript{30}

While there was no overall difference between children from rural and urban areas of New South Wales, higher proportions of boys from Years 2, 4 and 6 and girls from Kindergarten and Year 2 in rural areas were above a healthy weight compared with their urban counterparts.\textsuperscript{30} In addition differences related to cultural background were also noted. Children who speak mainly Middle Eastern languages at home are more likely to be above a healthy weight than children of the same age who speak mainly English at home.\textsuperscript{30}
Waist circumference as a measure of obesity

As well as BMI, waist circumference is used as a measure of obesity. Caucasian men and women with waist circumference greater than or equal to 94 cm and 80 cm, respectively, are considered to be at increased risk of developing chronic disease.

In the National Health Survey 2007-08, 5 in 9 men and 5 in 8 women had waist circumference measures that placed them in the increased risk of developing chronic disease category. In the 2011-12 survey these figures had remained the same for men (5 in 9) but had increased to 2 in 3 women. Across age groups, the prevalence of abdominal obesity ranged from 26% in men aged 18-24 years to 82% in those aged 65-74 years. For women, the prevalence for the same age groups were 43% to 84%. The prevalence in those aged 75 years or older was lower at 70% in men and similar in women (82%).

Although BMI is commonly used in reporting obesity prevalence, there is a case for also reporting waist circumference defined obesity. This is because the direction and rate of change in these two measures of obesity is not necessarily the same. A recent Australian study reported that participants aged 65 years or older had an average weight loss of 2.4 kg over 12 years but the entire study population, including those aged 65 years or older, had an average increase in waist circumference over that period, suggesting a decrease in muscle mass and an increase in fat mass in older people.34
Why is obesity increasing?

At the simplest level, obesity is caused by an imbalance between the amount of energy taken in through food and drink, and the amount of energy used by activities of daily life. The unused energy is stored in the body as fat.

While it is known that the risk of obesity is influenced by genetics, diet and physical activity, there is growing interest in what is termed the obesogenic environment. The way our social, and physical environment is changing tends to encourage obesity-promoting behaviours and discourage appropriate eating and physical activity behaviours. Urban design and the built environment can discourage physical activity and active travel, and influence the ease of access to unhealthy food. Changes to the food supply have led to the ready availability of cheap, high kilojoule processed foods that are aggressively marketed. The portion size of snack foods, sweetened drinks and takeaway foods has increased and their relative cost has decreased, while the relative cost of fresh produce has increased. Changes to occupational structures and work environments have led to the replacement of physically active workplaces with desk-bound and sedentary occupations. In addition, longer working hours leave less time for food preparation and family recreation and physical activity.

Recent research has strengthened previous theories about the importance of a number of factors which can increase the risk of being above a healthy weight, including:

- stress, including financial stress
- lack of access to green space
- access to unhealthy food and lack of access to healthy food
- access to health care concerning obesity
- poor sleep

The specific mechanisms are uncertain but involve considerations of physical and mental well-being, the means and time to follow a healthy diet, the means and time for physical activity and the potential health benefits of restoration through sleep.
An authoritative review on what is driving the global obesity epidemic summarized that:

- Changes in the global food system, including reductions in the time-cost of food, seem to be the major drivers of the rise of the global obesity epidemic during the past 3–4 decades, although substantial differences in national and local environments (especially sociocultural, economic, and transport environments) produce the wide variation in obesity prevalence recorded across populations.

- In the first half of the 20th century, increased mechanisation and motorisation were accompanied by corresponding decreases in food energy supply (indicative of consumption), thereby keeping obesity prevalence low. In many high income countries, an energy balance flipping point seems to have occurred in the 1960s and 1970s, with an increasing food energy supply now pushing up energy intake and population weight. While genetic influences are important, for most people it is their exposure to an environment where low cost energy-dense food is readily available that triggers and drives the obesity. Obesity is the result of people responding normally to the obesogenic environments they find themselves in.
What we need to understand better

There are many unanswered or only partially answered questions about what is driving the obesity epidemic in Australia. The main concern arising from the examination of the prevalence, distribution and trends in obesity is the continual increase in the proportion of adults who are above a healthy weight.

We need to better understand why some groups of people are at particular risk of becoming obese, such as women, especially those of lower socioeconomic status, migrants, and Aboriginal and Torres Strait Islander people; why the prevalence of obesity is stabilising in children but not adults; and how to intervene in particular groups or at particular life stages, such as in young men in the decade after leaving school.

Specific questions that need to be addressed in future surveys on obesity include:

• What is the spatial distribution of the variable prevalence of obesity in Australia

• Which factors beyond diet and physical activity warrant routine monitoring in better understanding the distribution of determinants of obesity?

• Should future national surveys include measurement of waist and hip circumference given these measures may be more relevant for some age and ethnic groups?

• Are there disparities in the plateauing of the weight and in particular is this occurring across all ethnic and socioeconomic groups?
CONCLUSION

Overall more Australians are becoming above a healthy weight and obese. There is an increasing pattern of social disparities especially in obesity. There is some evidence that the increase may be less in children but the social disparities remain. Being obese has major implications for the health of Australians and increasing health care costs.

BEING OBSESE HAS MAJOR IMPLICATIONS FOR THE HEALTH OF AUSTRALIANS AND INCREASING HEALTH CARE COSTS
REFERENCES


47. Astell-Burt T, Feng X, Kolt GS. Greener neighborhoods, slimmer people? Evidence from 246 920 Australians International Journal of Obesity advance online publication 4 June 2013; doi: 10.1038/ijo.2013.64


GLOSSARY OF ADDITIONAL SOURCES OF DATA

Australian Health Survey (also known as National Health Survey) 2011-12

Australian Aboriginal and Torres Strait Islander Health Survey 2012-13

NSW School Physical Activity and Nutrition Surveys 2010

NSW Population Health Survey 2010

Victorian Population Health Survey 2010

Queensland Self Reported Health Status 2011-12

OECD Health data 2013
promoting a healthy australia