



4.10 Overweight and obesity

Overweight and obesity—defined as abnormal or excessive fat accumulation—is a major public health issue in Australia. Australia’s measured obesity rate now ranks fifth among Organisation for Economic Co-Operation and Development (OECD) countries (OECD 2017). Over the past two decades, the proportion of Australians with a healthy body weight has decreased, and the proportion who are obese has increased. Of concern is the growing rate of severe obesity (body mass index, or BMI, of 35 kg/m² or above), which almost doubled between 1995 and 2014–15. This growing obesity trend has costly impacts for the individual and for the Australian economy and health care system.

Overweight and obesity result from a sustained energy imbalance in the body—when energy intake from eating and drinking is greater than energy used through physical activity (AIHW 2016a). It is influenced by a complex interplay of individual, environmental and societal factors.

A diet consistent with the Australian Dietary Guidelines is recommended to maintain a healthy weight (NHMRC 2013a). This is one that is relatively high in cereals (mostly wholegrains), vegetables and legumes/beans, fruit, some lean meats and poultry, fish, eggs, tofu, nuts and seeds, and milk, yoghurt and cheese—mostly reduced-fat—and a limited intake of energy-dense, nutrient-poor foods (that is, those containing saturated fat, added salt, added sugars and alcohol) (NHMRC 2013b). See Chapter 4.9 ‘Diet’ for more information on the dietary behaviours of Australians.

Energy is spent through bodily functions and physical activity, including sport, organised recreation, and incidental activity (NHMRC 2013a). In 2014–15, over half (52%) of Australian adults aged 18–64 were insufficiently active, including 15% who were inactive (ABS 2015). See Chapter 4.8 ‘Insufficient physical activity’ for more information on Australians’ physical activity.

The way that we live has changed. Australian adults now spend more time sitting or lying down (not just when sleeping). In 2014–15, Australians spent an average of 34 hours per week sitting at leisure, up from 31 hours per week in 2011–12 (ABS 2013a, 2016b).

As the waistlines of Australians continue to expand, it is important to examine both the extent of the problem, and the influence of factors such as the environment and society in which a person lives on their dietary and physical activity behaviours.

The most common and practical ways to measure overweight and obesity in population surveys are to calculate a person’s BMI or measure their waist circumference (Box 4.10.1).

Box 4.10.1: How is overweight and obesity measured at the population level?

BMI is calculated by dividing a person’s weight (in kilograms) by their height (in metres) squared.

$$\text{BMI} = \frac{\text{weight in kg}}{(\text{height in m})^2}$$

The information in this article uses the BMI classifications for adults defined by the World Health Organization (WHO). Obesity is split into three classes, according to severity, with more severe obesity associated with a higher risk of comorbidities (WHO 2000).





BMI (kg/m²)

Underweight: <18.50

Normal weight: 18.50–24.99

Overweight but not obese: 25.00–29.99

Class I obese: 30.00–34.99

Class II obese: 35.00–39.99

Class III obese: ≥40.00

Overweight

Obese

Waist circumference is another common measure of overweight and obesity. A waist circumference above 80 cm for women and 88 cm for men is associated with a higher risk of metabolic complications (WHO 2011). The following categories were developed by the WHO and are used in this article:

Waist circumference

Increased risk of metabolic complications

Men: 94 cm or more
Women: 80 cm or more


Substantially increased risk of metabolic complications

Men: 102 cm or more
Women: 88 cm or more

Differences in body composition may affect the appropriateness of BMI and waist circumference as population-level measures of overweight and obesity. Different BMI and waist circumference cut-off points might need to be considered for certain population groups such as older people; people with high muscle mass; and ethnic groups, including Aboriginal and Torres Strait Islander, Pacific Islander, South Asian, Chinese and Japanese populations (NHMRC 2013a).

For the information in this article, the same BMI and waist circumference measures were used for all adult population groups, based on measured—not self-reported—weight, height and waist circumference.

Measuring overweight and obesity among children and adolescents is complicated due to their growing bodies. At the population level, a series of age- and sex-specific BMI ranges developed by Cole et al. (2000) are recommended to monitor overweight and obesity in children. These ranges were used for information presented in this article and can be accessed on the Department of Health website (Department of Health 2009).

 To calculate your BMI and see how you compare with the rest of Australia see the online data visualisation tool at <www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/bmi-where-do-you-fit>.

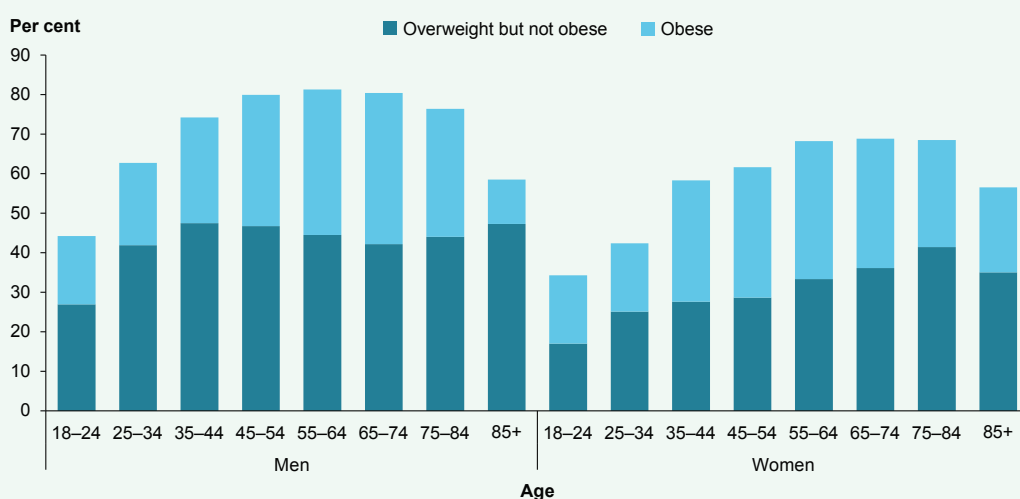
Who is overweight or obese?

Adults

Based on measured BMI, in 2014–15:

- almost two-thirds (63%) of Australians aged 18 and over were overweight or obese (36% overweight but not obese, and 28% obese) (ABS 2015)
- overall, men (71%) had higher rates of overweight and obesity than women (56%). A greater proportion of men (42%) than women (29%) were overweight but not obese, while a similar proportion of men (28%) and women (27%) were obese
- men were most likely to be overweight but not obese at age 35–44 (48%), and to be obese at age 65–74 (38%). Women were most likely to be overweight but not obese at age 75–84 (41%), and obese at age 55–64 (35%) (Figure 4.10.1).

Figure 4.10.1: Proportion of overweight and obese adults (based on measured BMI), by age and sex, 2014–15



Source: ABS 2015; Table S4.10.1.

Based on measured waist circumference (Box 4.10.1), in 2014–15:

- about one-quarter (24%) of men and one-fifth (21%) of women aged 18 and over had a waist circumference that indicated an increased risk of metabolic complications
- a greater proportion of women (45%) than men (35%) had a waist circumference that indicated a substantially increased risk of metabolic complications (ABS 2015).

Children

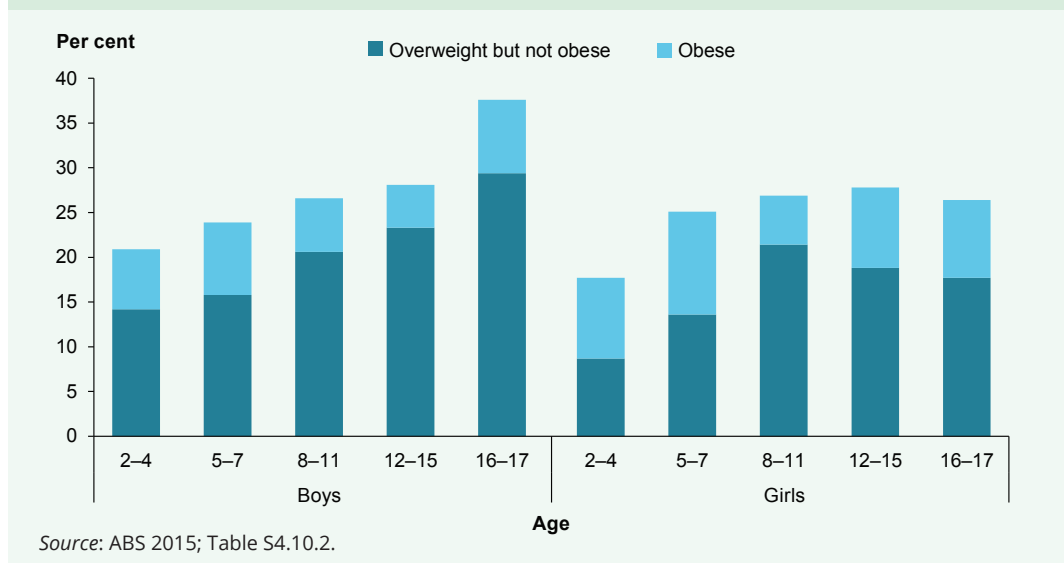
In 2014–15:

- one in 5 (20%) children aged 2–4 were overweight or obese—11% were overweight but not obese, and 8.7% were obese (ABS 2015)



- more than 1 in 4 (28%) children and young people aged 5–17 were overweight or obese—20% were overweight but not obese, and 7.4% were obese
- for both children and young people aged 2–4 and 5–17, similar proportions of boys and girls were obese
- boys were most likely to be overweight but not obese at age 16–17 (29%), while this was most likely for girls at age 8–11 (21%). The highest prevalence of obesity was at age 16–17 for boys (8.2%) and age 5–7 for girls (12%) (Figure 4.10.2).

Figure 4.10.2: Proportion of overweight and obese children and young people aged 2–17, by age and sex, 2014–15



Indigenous Australians

In 2012–13, after adjusting for differences in age structure, Indigenous people aged 18 and over were 1.2 times as likely to be overweight or obese as non-Indigenous people, and 1.6 times as likely to be obese (ABS 2014a). See Chapter 6.5 ‘Health behaviours of Indigenous Australians’ for more information on overweight and obesity among Indigenous Australians.

Socioeconomic areas

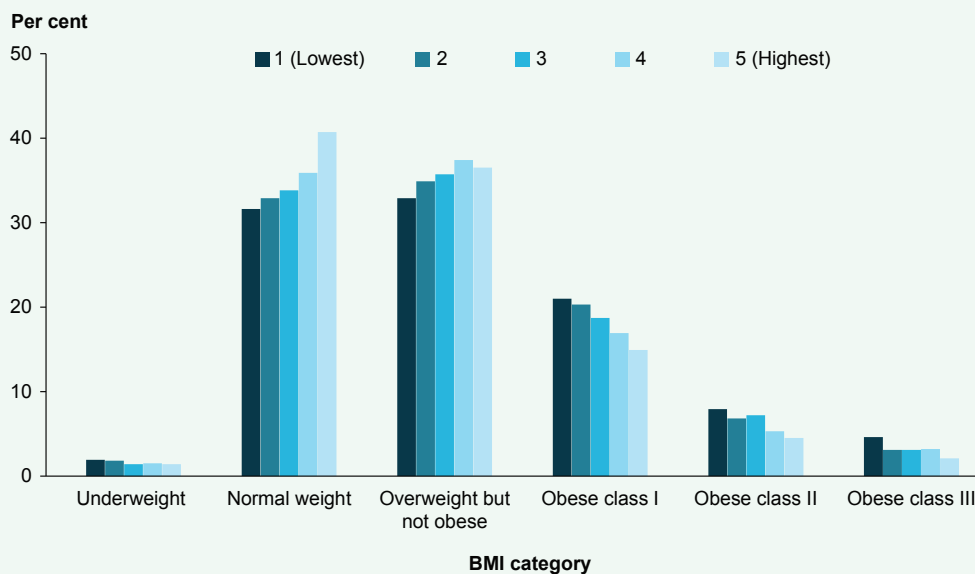
It is well established that social determinants affect a person’s health status. In Australia, there is evidence of a gradient in overweight and obesity prevalence across socioeconomic areas (see Glossary).

In 2014–15:

- adults in the lowest socioeconomic area (the lowest fifth) were more likely to be obese (34% for 3 obesity classes combined) than adults in the highest socioeconomic area (22% for 3 obesity classes combined). Adults in the highest socioeconomic area were most likely to have a normal body weight (41%) compared with all other socioeconomic area; adults in the lowest socioeconomic area were least likely (32%) (Figure 4.10.3)

- one-third (33%) of boys aged 2–17 in the lowest socioeconomic area were overweight or obese compared with 22% of boys in the highest socioeconomic area. Similarly, more than one-third (38%) of girls aged 2–17 in the lowest socioeconomic area were overweight or obese compared with 24% of girls in the highest socioeconomic area (ABS 2016b).

Figure 4.10.3: Proportion of adults in each BMI category, by socioeconomic area, 2014–15



Note: Socioeconomic areas 1–5 refer to area-based fifths derived using the ABS Index of Relative Socio-Economic Disadvantage (ABS 2013b).

Source: ABS 2016b; Table S4.10.3.

Geographical variation

One of the major factors associated with overweight and obesity is the area in which an individual lives. This includes their remoteness area and Primary Health Network (PHN) area.

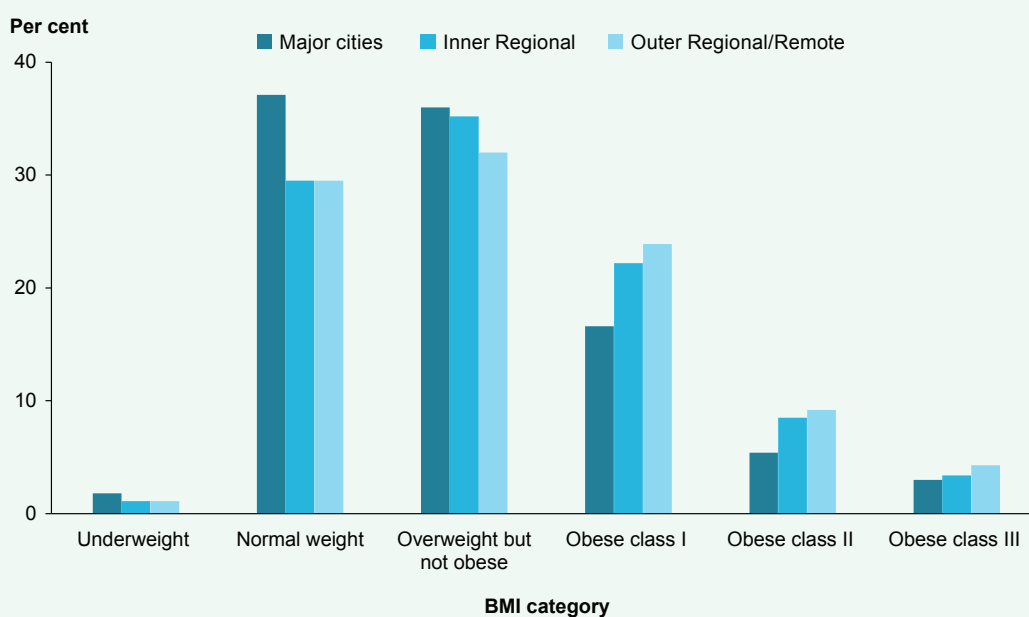
In 2014–15:

- adults living in *Major cities* were most likely to have a body weight in the normal weight range (37%), while adults living in *Inner regional* and *Outer regional/Remote* areas were most likely to have a body weight in the obese range (34% and 37%, respectively). There were a greater proportion of obese adults in *Inner regional* and *Outer regional/Remote* areas than in *Major cities*, with the proportion of adults with more severe obesity (Obese class II and III) increasing with increasing remoteness (Figure 4.10.4)
- among children, boys aged 2–17 living in *Outer regional/Remote* areas were 1.3 times as likely to be overweight or obese as boys living in *Major cities* (35% and 27%, respectively). For girls aged 2–17 living in *Outer regional/Remote* areas, the rate of overweight or obesity (36%) was 1.5 times as high as for girls living in *Major cities* (24%). Boys and girls in *Inner regional* areas were the least likely to be overweight or obese (21% and 23%, respectively) (ABS 2015)



- prevalence of overweight and obesity varied among PHNs, from 53% in Northern Sydney to 73% in Country South Australia. Prevalence was higher among regional PHNs (69%) than among metro PHNs (61%). For more information on variation among PHNs see *Healthy communities: overweight and obesity rates across Australia, 2014–15* (AIHW 2016b).

Figure 4.10.4: Proportion of adults in each BMI category, by remoteness area, 2014–15

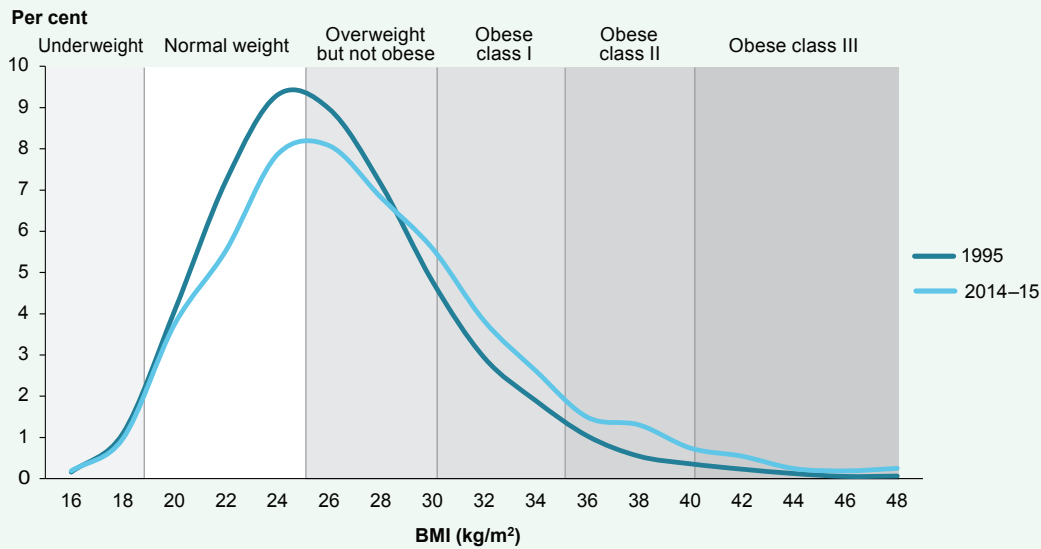


Source: ABS 2016b; Table S4.10.3.

The growing obesity trend

Over the past 20 years, the distribution of BMI has shifted among Australian adults. Fewer adults are now in the healthy weight range, and more in the obese range. Figure 4.10.5 shows the change in BMI among Australian adults between 1995 and 2014–15.

Figure 4.10.5: Distribution of BMI, people aged 18 and over, 1995 and 2014–15



Sources: ABS 2013c, 2016b; Table S4.10.4.

Adults in 2014–15 were significantly more likely to be obese than adults of the same age 20 years earlier for all but one age group. The largest relative difference was at age 18–21: in 2014–15, 15% of adults were obese at age 18–21, almost double the proportion who were obese at the same age in 1995 (7.2%) (AIHW 2017b).

Since 1995, the proportion of Australian adults with a BMI in the more severe obesity ranges (class II and class III obesity) has increased. This proportion almost doubled between 1995 and 2014–15, from 4.9% to 9.4% among Australian adults (Table 4.10.1).

Table 4.10.1: Age-standardised prevalence of more severe obesity (class II and class III obese), per cent (95% CI), people aged 18 and over, by sex, 1995 to 2014–15

Year	Men	Women	Persons
1995	3.4 (2.9–4.0)	6.3 (5.5–7.1)	4.9 (4.4–5.4)
2007–08	7.1 (6.1–8.1)	8.7 (7.7–9.7)	7.9 (7.2–8.6)
2011–12	7.9 (7.2–8.6)	11.0 (10.3–11.8)	9.5 (8.9–10.0)
2014–15	8.0 (7.1–8.9)	10.7 (9.8–11.6)	9.4 (8.7–10.0)

Notes

1. Class II and class III obesity refers to a measured BMI of 35.00 kg/m² or more.
2. The span presented in parentheses is the 95% confidence interval. We can be 95% confident that the true value lies within this interval.

Sources: ABS 2010, 2013c, 2014b, 2016b.



Why are our waistlines expanding?

Overweight and obesity is influenced by a range of determinants at the individual level, including biological and behavioural factors. As well, the contribution of social and environmental factors is becoming increasingly apparent. The interrelated nature of these factors contributes to the complexity of obesity. For example, individual behaviours such as eating habits can be influenced by social eating norms and by environmental factors such as accessibility to fresh and healthy food (CDC 2015).

Individual and behavioural factors

At the individual level, having a healthy diet and sufficient physical activity is central to maintaining the body's energy balance (NHMRC 2013a). A person's appetite, satiety, metabolism and body fat distribution can contribute to overweight and obesity; this might be influenced by genetics and epigenetic changes (NHMRC 2013a). Epigenetic changes are alterations in gene expression that can be brought about by a range of factors (for example, intrauterine growth restriction) and passed between generations. These changes can predispose individuals to obesity by influencing how energy balance is regulated (NHMRC 2013a).

As already noted, how Australians live has changed over the past 20 years. Positive changes in health behaviours include a relative drop in consumption of free sugars between 1995 and 2011–12 (ABS 2017). (Free sugars are those added to foods and drinks, and sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates.) Negative changes in health behaviours include an increased consumption of energy-dense, nutrient-poor foods; low consumption of fruit and vegetables; and a move towards less active transport and more sedentary leisure time activities. These behaviours have contributed to an increased obesity prevalence (Allender et al. 2012).

Obesogenic environment

The term 'obesogenic environment' has been used to describe an environment that promotes obesity among individuals and populations (Swinburn et al. 1999).

Change in food portion sizes

A study comparing portion sizes from the 1995 National Nutrition Survey and the 2011–12 National Nutrition and Physical Activity Survey found a significant increase (up to 66%) in energy per typical portion in common discretionary foods, including pizza, cake, sausages, cereal bars, processed meats, ice cream and wine (Zheng et al. 2017).

Built environment

Factors of the built environment (see Glossary) such as low walkability, a high density of convenience food outlets and the relatively cheap price and heavy promotion of energy-dense foods have been shown to contribute to greater energy intake, and less energy expenditure at a population level (Allender et al. 2012). Several studies have noted that access to green space is associated with reduced obesity—this might be due to more recreational walking, more physical activity and less sedentary time (Lachowycz & Jones 2011; WHO 2016).



As the boundaries of Australian cities continue to expand, individuals may have to travel further—with increased travel times—to reach destinations such as workplaces, retail zones, services, food outlets and open public spaces such as parks (Zapata-Diomedes & Veerman 2016). This may mean that active travel (such as walking to a destination) is replaced with less active forms of travel such as car trips (VicHealth 2016). A recent Australian study found that people living 20 km or further away from city centres had an increased waist circumference compared with people who lived less than 9 km from a city centre (Sugiyama et al. 2016).

Changing work lives

Australians are now spending more hours at work. The OECD ranks Australia 10th of 38 included member and partner countries for the proportion of its workers (13%) working 'very long hours' (50 hours or more per week as defined by the OECD) (OECD 2015). The workplace environment and its surrounds can have an adverse impact on the health of adults (AIHW 2012). Influencing factors include the proximity of food outlets, long working hours, access to food vending machines, event catering, and public transport access.

Occupation also plays a role, with predominantly office-type settings being associated with sedentary work (Parry & Straker 2013). This, in turn, has been linked to weight gain and to chronic conditions such as heart disease, diabetes and cancer (independent of the amount of time spent on physical activity) (Thorp et al. 2011; Wilmot et al. 2012).

For many families with all adults in paid employment, longer working hours leaves less time for food preparation, family recreation and physical activity (Australian National Preventative Health Agency 2014). Meal times are often fragmented: people may eat at different times and in different places (often outside the home) and rely heavily on snack and convenience foods. More than 58% of Australians' total food spending in 2014 was on discretionary food items, including potato chips, processed meats, soft drinks and chocolates (ABS 2016a).

School environment

Foods in school facilities such as canteens, cafeterias and vending machines can influence the choices and intake of students, with children and adolescents consuming up to two meals and snacks per day at school, 5 days a week (Espinel & King 2009). School policies may regulate the food available for purchase, however, and supportive play equipment and activity programs can encourage students to participate in physical activity (Escalante et al. 2013).

The majority of schools across Australia use a 'traffic light' scheme to classify foods sold in canteens—red foods are restricted, amber foods should not dominate and healthy green food should fill the menu (Hills et al. 2015). Strategies such as these support the healthy eating of Australian schoolchildren through increased availability and promotion of healthy food and drinks in schools (NSW Department of Education 2017). Such policies have proved influential: a previous canteen strategy in New South Wales that used the traffic light approach saw a rise in the proportion of schools offering no energy-dense, nutrient-poor (red) food items on their menu, from 7.0% in 2007 to 22% in 2010 (Hills et al. 2015).





Technology

In the home environment, Australian children and young people now spend about 20% of their waking lives in front of screens on weekdays, and 30% on weekends—including watching television, being on computers, and playing electronic games (Australian Institute of Family Studies 2015). Screen-based activities in young people and adults are strongly linked to obesity, with higher obesity rates associated with higher screen time (independent of physical activity) (Banks et al. 2011; Boone et al. 2007). Fewer hours of screen time in adolescence has also been shown to reduce the likelihood of obesity in adulthood (Boone et al. 2007).

Use of electronic devices such as smart phones and tablets during normal sleep time has been found to be associated with overweight and obesity among young people. Among a sample of 3,700 adolescents (in school grades 6, 8 and 10) in New South Wales, young people who usually used electronic devices during normal sleep time were 1.3 times as likely to be overweight or obese as adolescents who sometimes or never did (Mihirshahi et al. 2017).

Food advertising

The WHO found that the advertising of unhealthy food influences children's food preferences, purchase requests and consumption patterns (WHO 2010). The average Australian child will be exposed to 35 hours of food advertising on television over the course of a year, of which over half will be for unhealthy foods (King et al. 2013). The Australian food industry responded in 2009 with initiatives to limit the exposure of unhealthy food advertising to children, but a recent study showed there had been no subsequent change in this exposure in Australia from 2011 to 2015 (Watson et al. 2017).

Health burden of overweight and obesity

The health consequences of overweight and obesity are considerable. Burden of disease analyses have shown that, in 2011, 7.0% of the total burden of disease in Australia was due to overweight and obesity, with 63% of this due to fatal burden. Men (7.3%) had a greater burden of disease from overweight and obesity than women (6.6%) (AIHW 2017a). See Chapter 4.4 'Contribution of selected risk factors to burden of disease' for more information on burden of disease.

Being overweight or obese is also associated with higher mortality. A recent study of adults with a BMI above the 'normal weight' range (that is, a BMI of at least 25 kg/m²) showed the risk of death from all causes rose by 31% with each 5 kg/m² increase in BMI in Australian and New Zealand populations (di Angelantonio et al. 2016). An investigation into the effect of obesity on life expectancy found that, compared with people with a normal BMI, life expectancy was reduced by 2–4 years for people with class I obesity, and by 8–10 years for people with class III obesity (NHMRC 2013a; PSC 2009).

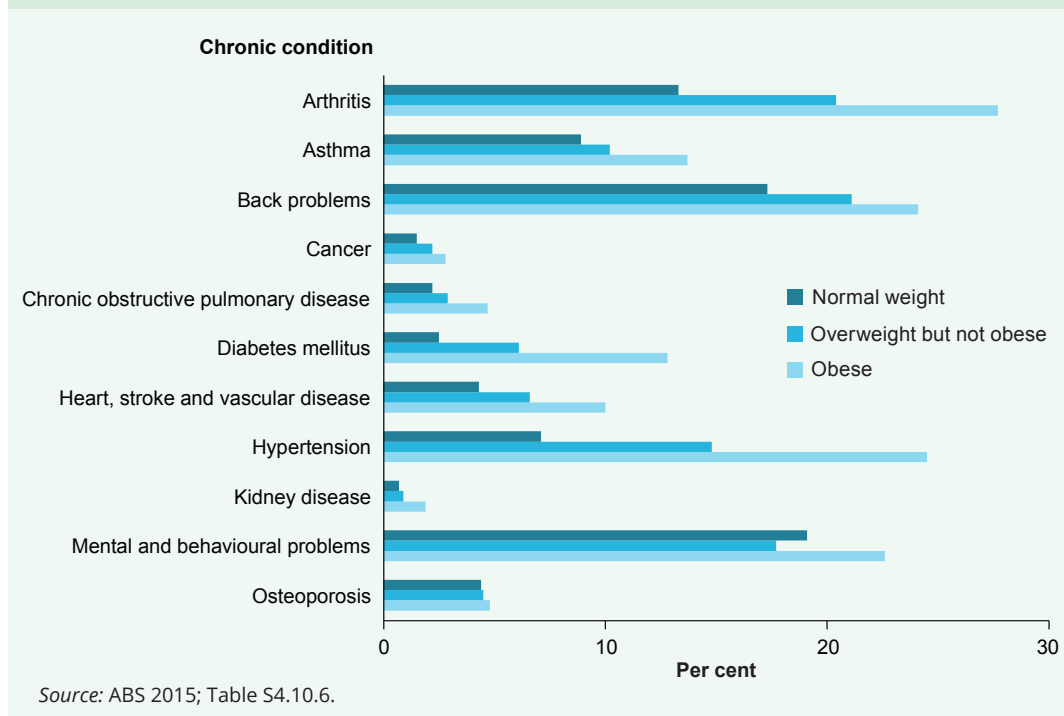


Chronic conditions among overweight and obese adults

Among adults, overweight and obesity increases the likelihood of developing many chronic conditions, including some cancers, some cardiovascular diseases, asthma, back pain and problems, chronic kidney disease, dementia, diabetes, gallbladder disease, gout, and osteoarthritis (AIHW 2017a).

In 2014–15, Australian adults who were overweight or obese reported higher rates of many chronic conditions than adults of normal weight (Figure 4.10.6). For several conditions, obese adults were more likely to report that they had a chronic condition than adults who were overweight but not obese, who in turn reported higher rates than adults of normal weight (ABS 2015).

Figure 4.10.6: Prevalence of selected chronic conditions in adults, by BMI category, 2014–15



Economic impact of overweight and obesity

Illnesses associated with overweight and obesity have a considerable impact on the Australian economy; PwC Australia estimated that obesity cost it \$8.6 billion in 2011–12 (in 2014–15 dollars). This included an estimated \$3.8 billion in direct costs and \$4.8 billion in indirect costs (for example, absenteeism and government subsidies), but did not account for further costs from reduced wellbeing and forgone earnings (PwC Australia 2015). The report estimated that, if no further action is taken to slow the rise in obesity, there will be \$87.7 billion in added costs due to obesity over a 10-year period (2015–16 to 2024–25).



In 2014–15, more than 124,600 procedures relating to weight-loss surgery were billed to Medicare—in public and private hospitals, and in non-hospital settings. In public hospitals, the estimated total cost of the 10 most common weight loss surgery procedures was \$30.4 million. The total cost for these Medicare-billed procedures in public and private hospitals, and non-hospital settings combined, was about \$62.8 million, with about \$25.7 million in benefits paid by Medicare, and about \$37.1 million paid in out-of-pocket costs by patients and/or health insurers (AIHW 2017c).

What is missing from the picture?

More regular and extensive monitoring of body weight and waist circumference and of the risk factors contributing to overweight and obesity (both behavioural and environmental) would contribute to a greater understanding of which obesity prevention strategies are working, and for whom and where.

Robust data on the contribution of genetic and epigenetic factors to overweight and obesity in Australia are currently limited. Data of this kind would help to better understand the genetic and molecular basis of obesity and shed light on the complex interplay of individual and environmental factors leading to this health risk factor.

Where do I go for more information?

More information on overweight and obesity is available at <www.aihw.gov.au/reports-statistics/behaviours-risk-factors/overweight-obesity/overview>.

The following reports are available for free download:

- *A picture of overweight and obesity in Australia 2017*
- *Overweight and obesity in Australia: a birth cohort analysis*
- *Healthy communities: overweight and obesity rates across Australia, 2014–15*
- *Impact of overweight and obesity as a risk factor for chronic conditions: Australian Burden of Disease Study series no.11*
- *Weight loss surgery in Australia 2014–15: Australian hospital statistics.*

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