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## A rising epidemic: obesity in Australian children and adolescents

### Introduction

Rates of obesity are rising alarmingly in many parts of the world, and this trend is not restricted to adults. Child and adolescent obesity is a significant health problem. In Australia, the prevalence of obesity in children and adolescents has jumped markedly in all age groups and for both boys and girls over the past few decades (Booth et al. 2003; Magarey et al. 2001).

Obesity in children and adolescents is a major concern, not only because of health and social problems in the short-term, but also because there is a high risk it may continue into adulthood and affect long-term health.

This data briefing examines escalating levels of obesity among Australian children and adolescents over the period 1985 to 1995 using measured body mass index (BMI) data (Box 1). More recent regional data, as well as the causes, consequences and public health implications of obesity in children and adolescents, are also discussed.

### Prevalence and trends

#### National data

National measured time trend data on the prevalence of obesity in Australian children and adolescents are not readily available. The most recent national data come from the 1985 Australian Health and Fitness Survey (AHFS) and the 1995 National Nutrition Survey (NNS). Published results from these surveys, using the International Obesity Task Force (IOTF) definitions of child obesity (Box 1), showed the following (Figure 1):

- In 1995, an estimated 4.7% of boys and 5.5% of girls aged 7-15 years were obese and a further 15.3% of boys and 16.0% of girls were overweight but not obese (Magarey et al. 2001).

**Box 1: How is obesity measured?**

Obesity is most commonly measured using the body mass index (BMI). BMI is a weight-to-height ratio, and is considered to be a reasonable reflection of body fat for most people. BMI is calculated by dividing body weight in kilograms by the square of height in metres (kg/m<sup>2</sup>).

The International Obesity Task Force (IOTF) has developed standard age- and sex-specific BMI cut-off points for child overweight and obesity. For example, for 10 year-olds overweight is defined as a BMI of 19.84 or more for boys and 19.86 for girls, with obesity defined as a BMI of 24.00 or more for boys and 24.11 or more for girls (<http://www.health.gov.au/pubhlth/strateg/hlthwt/obesity.htm>).

In clinical settings it is recommended that calculated BMI for children and adolescents be compared with a suitable growth reference such as the United States Centers for Disease Control and Prevention BMI for-age chart (<http://www.cdc.gov/nchs/about/major/nhanes/growthcharts/background.htm>).

Sources: Cole et al. 2000; WHO 2000.

- In the ten year period from 1985 to 1995 the prevalence of obesity among 7–15 year-olds tripled (Magarey et al. 2001).

Additional analysis of the 1995 NNS (also using the IOTF definitions of child obesity) shows that 4.6% of 2–17 year-olds were obese and a further 15.3% were overweight but not obese in 1995. The prevalence of obesity was highest among boys aged 15–17 years (6.1%) and girls aged 5–9 years (7.1%) (Figure 2). Overall, one in five (19.9%) Australian children were overweight (this includes those who are obese), with prevalence rates highest among boys aged 15–17 years (24.1%) and girls aged 2–4 years (22.7%).

**Regional data**

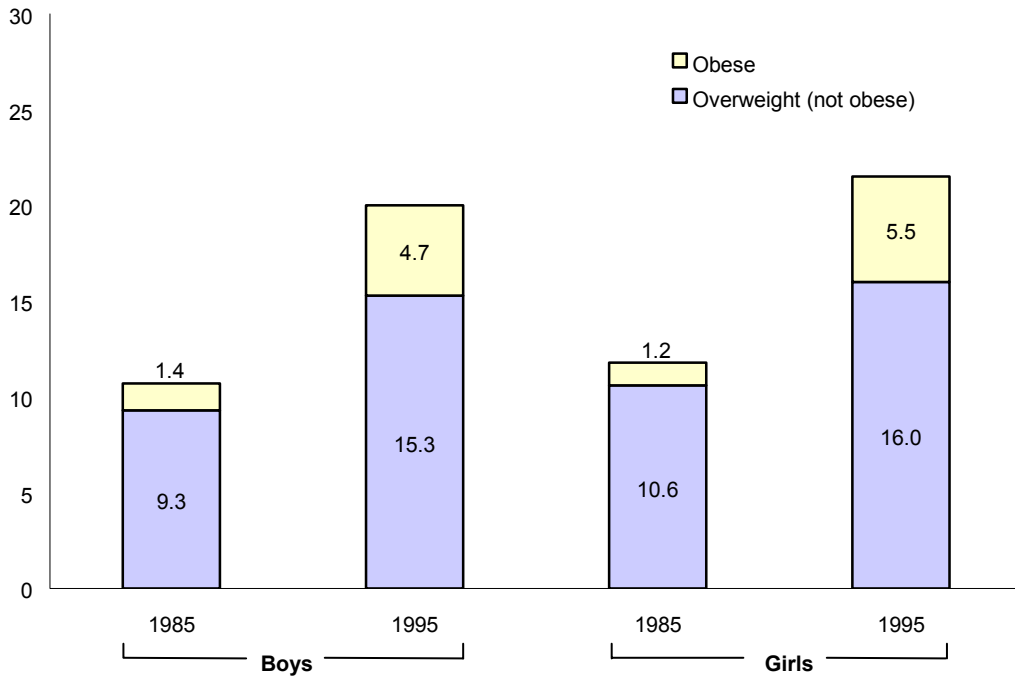
More recent data from regional studies of school students indicate that rates of obesity among young Australians are not only rising, they are accelerating.

- In the 2003 Sentinel Site for Obesity Prevention in Victoria study, 7.9% of children aged 7–11 years were obese, and 26.7% were overweight (Swinburn & Bell cited in Catford & Caterson 2003).
- In a survey of NSW primary school children aged 7–11 years in 2000, the prevalence of obesity was 9.9% in boys and 7.1% in girls (Goodman et al. 2002). The prevalence of overweight was as high as 26.2% in boys and 28.4% in girls.
- Analysis of BMI data collected in state surveys between 1967 and 1997 by Booth et al. (2003) showed from the mid-1980's to the mid-1990's the prevalence of obesity tripled and that of overweight doubled among 7–15 year olds, compared with a much smaller rate of increase over the preceding 16 years.

There are also signs that obesity may be developing at a much younger age than in the past. Research from South Australia's Child and Youth Help showed that the percentage of obese preschoolers (children aged four years) rose from 3.5% for girls and 3.2% for boys in 1995 to 5.8% for girls and 4.1% for boys in 2002 (Vaska & Volkmer 2004).

New data on obesity in children is currently being collected as part of the NSW Schools Physical Activity and Nutrition Survey (SPANS 2004). These data should be available by the end of 2004.

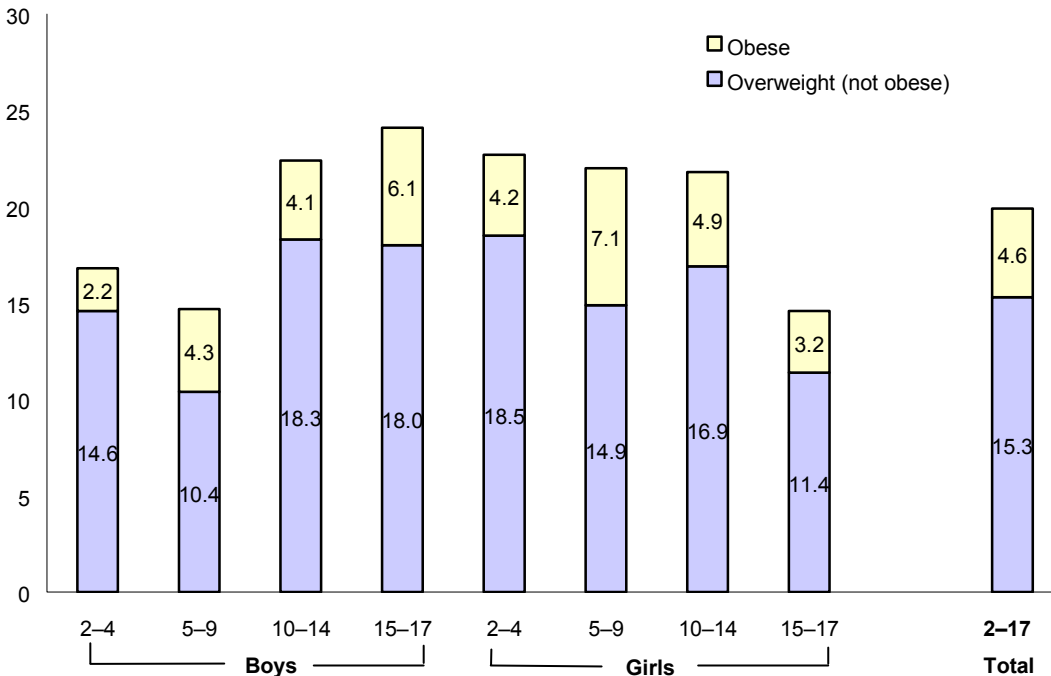
Per cent



Source: Magarey et al. 2001.

**Figure 1: Prevalence of overweight and obesity among boys and girls aged 7-15 years, 1985 and 1995**

Per cent



Source: AIHW analysis of ABS 1995 National Nutritional Survey.

**Figure 2: Prevalence of overweight and obesity among boys and girls aged 2-17 years, 1995, by age group**

## Who is most at risk?

There is limited information to determine whether obesity is distributed differentially across the population of Australian children and adolescents. However, there is some evidence of higher prevalence of overweight among children from European and Middle-Eastern cultural backgrounds compared with children from English-speaking or Asian backgrounds (Booth et al. 2001). There is also growing evidence, both nationally and internationally, that children from families with lower socioeconomic status (SES) are more likely to be overweight (Power & Parsons 2000; Booth et al. 2001; Tennant et al. 2003).

Data on the prevalence of obesity among Aboriginal and Torres Strait Islander children and adolescents are also scant. The only measured national data come from the 1994 National Aboriginal and Torres Strait Islander Survey (NATSIS), although these estimates are not directly comparable with the data presented above as overweight prevalence was determined using weight-for-age and -sex percentile curves. This survey found that around 13% of Aboriginal and Torres Strait Islander boys and 19% of girls aged 7–15 years were overweight (ABS 1998).

## How do Australian children compare with children from other countries?

International epidemiological studies generally show a consistent trend of increasing obesity prevalence among children and adolescents – particularly over the past two decades (WHO 2000; Department of Health 2003; NCHS 2004). Unfortunately, there are limited international data that are comparable with Australia in terms of the survey years and age ranges included. In addition, countries also use different definitions of child and adolescent obesity.

International comparisons based on data using the IOTF references show that the prevalence of obesity among children and adolescents varies considerably across countries (Table 1). However, as these data were collected for different years, using different age groups it is difficult to make direct comparisons.

**Table 1: International comparisons of obesity among children, 1992–2002**

Country	Year	Age range (years)	Proportion obese (per cent)		
			Boys	Girls	Boys & girls
New Zealand	2002	5–14	9.0	10.7	n.a.
England	2002	2–15	5.5	7.2	n.a.
Australia	1995	2–17	4.2	5.1	4.6
USA	1994	6–18	n.a.	n.a.	7.8
Scotland	1994	4–11	2.1	3.2	n.a.
England	1994	4–11	1.7	2.6	n.a.
Russia	1992	6–18	n.a.	n.a.	4.2

n.a. Not available

Sources: AIHW analysis of the ABS 1995 NNS; Chinn & Rona (2001); Department of Health (2003); Ministry of Health (2003); Wang & Wang (2002).

## Causes of obesity

Obesity is a condition of excess body fat. In general, body fat accumulates when the energy intake from food and drink is greater than the energy expended through physical activity over an extended period of time. While excess body fat can have a genetic or medical basis, these factors cannot explain the rapid increase in population prevalence of obesity.

In broad terms, escalating rates of obesity can be attributed to both a rise in energy intake and a decline in physical and incidental activity (Catford & Caterson 2003 ; WHO 2000). For example, mean energy intake increased by 15% among boys and 12% among girls aged 10–15 years between 1985 and 1995 (Cook et al. 2001). At the same time, physical activity levels of Australians have declined over the last few decades, as in most industrialised countries. Unfortunately, there are no trend survey data for children and adolescents, although it is generally acknowledged that younger Australians are less physically active than in the past.

The main factors implicated in rising levels of obesity among children and adolescents are:

- **Increasing energy intake** – Ready availability of energy-dense foods and drinks, larger serving sizes, reduced time for cooking, and meals eaten away from the home have contributed to diets becoming increasingly high in fat and energy.
- **Increasingly sedentary lifestyles** – Many activities now widely undertaken by children involve very little physical activity. Data from the 2000 Children’s participation in cultural and leisure activities survey showed that the most popular leisure activities reported by children aged 5–14 years were watching TV and videos (96.9%) and playing electronic or computer games (68.9%) (ABS 2001). Unfortunately, these passive forms of entertainment are likely to be displacing traditional recreational activities such as bike riding and backyard sports.
- **Decreased walking, cycling and transport-related physical activity** – Children are being driven to places (such as school) that they may once have walked to because of increasing use of cars, and perceptions that roads and local neighbourhoods are unsafe.
- **Changes in family structures and dynamics** – Changes in family work patterns mean that parents are busier and have less play-time with children.

## Health and psychosocial consequences

The most common consequences of childhood and adolescent obesity are psychological and social problems associated with the negative stigma of being ‘obese’. Bullying and teasing directed towards obese children and adolescents can contribute to poor body image and low self-esteem, and may have a major effect on future psychological and social wellbeing (WHO 2000; Royal College of Physicians of London 2004).

Increasing body fatness is also accompanied by changes in body function (Royal College of Physicians of London 2004). These changes predispose obese children and adolescents to a wide range of physical health problems – both during their early life and during adulthood (WHO 2000; Royal College of Physicians of London 2004).

Physical problems associated with being obese in childhood and adolescence can be divided into:

## Short- and medium-term consequences

- Type 2 diabetes (especially in those who are obese in late adolescence), with its potential to lead to later coronary heart disease, stroke, infection, limb amputation, kidney failure and blindness.
- Early development of risk factors for coronary heart disease, including raised blood pressure, cholesterol and blood sugar levels, and hardening of the arteries.
- Respiratory problems such as asthma and sleep apnoea.
- Orthopaedic problems.
- Gastrointestinal, endocrine and liver problems.

## Long-term consequences

The major long-term consequence of childhood obesity is its continuation into adulthood. Research suggests that obesity is more likely to continue into adulthood when it develops in late childhood or adolescence and when the obesity is severe (WHO 2000).

Childhood obesity that persists into adult life not only increases the adult risk of obesity-related conditions but also their occurrence at an earlier age (Royal College of Physicians of London 2004). These conditions include:

- Type 2 diabetes, coronary heart disease, raised blood pressure, alterations in blood lipids (fats), gallbladder and liver disease and certain forms of cancer.
- Respiratory problems such as sleep apnoea.
- Osteoarthritis and gout.
- Reproductive problems.

## Public health implications

Almost a quarter of children and adolescents in Australia are overweight. Of these, about one in four are obese – a proportion that is increasing each year. If this trend continues, it will place enormous pressure on services for the care of people with obesity-related diseases when these children become adults. Devising a strategy to counteract rising obesity is a complex challenge that needs to be addressed at both a societal and individual level (Dixon et al. 2003).

In late 2003, the National Obesity Taskforce (established one year earlier) outlined a national action plan to tackle the problem of obesity in *Healthy Weight 2008* (National Obesity Taskforce 2003). This strategy focuses on children and young people, as well as the families that support them, in order to reduce obesity in the broader adult population in the future. Among the goals of *Healthy Weight 2008* are to increase the proportion of children, young people and families who are physically active and have a healthy diet, and to address the broader social and environmental determinants of poor nutrition and sedentary lifestyles. If the *Healthy Weight 2008* goals are to be achieved, ongoing nationally-representative data are needed – not only to monitor the magnitude of the problem but also to signal emerging trends and assess the effectiveness of interventions.

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