

13. Diabetes

Diabetes mellitus is a group of diseases characterised by high levels of blood glucose resulting from defects in insulin secretion, insulin action, or both. Insulin is a hormone produced by the pancreas that helps the body to use glucose. In 2000, diabetes was the sixth leading cause of death among Australians (ABS 2001b). Over the course of the disease, diabetes can be associated with serious complications, including heart disease, stroke, blindness and neurological problems, and with premature death. Persons with diabetes, however, can take measures to reduce the likelihood of such occurrences.

Although there are two types of diabetes, it is usually Type 1 (juvenile onset or insulin dependent diabetes) which affects children. Type 1 diabetes occurs when the pancreas is unable to produce insulin. It is believed to result from an auto-immune destruction of the pancreatic cells producing insulin, leading to insulin deficiency. Susceptibility to Type 1 diabetes is thought to be determined by an interaction between genetic factors and environmental triggers (Atkinson & MacLaren 1994). Type 2 diabetes (late onset, non-insulin dependent diabetes) is of less relevance to children. Type 2 diabetes occurs when the pancreas does not produce enough insulin (insulin insufficiency) or when the body cannot use the produced insulin (insulin resistance). Risk factors for Type 2 diabetes include older age, obesity, family history of diabetes, physical inactivity and ethnicity.

There are no national estimates of the prevalence of diabetes based on clinical evidence such as measured blood glucose level. While the Australian Diabetes, Obesity and Lifestyle Study (AusDiab) conducted between 1999 and 2000 attempted to fill this gap, participation in the survey was restricted to adults. Data are available, however, on the prevalence of diabetes (Type 1) in children from the 1995 ABS National Health Survey. The estimated prevalence of Type 1 diabetes based on the survey was around 0.1% (ABS 1997).

Data on the incidence of Type 1 diabetes are also patchy. Regional studies indicate that the incidence is between 12 and 15 per 100,000 children aged 0–14 years (McCarthy et al. 1996). The incidence of Type 1 diabetes in Australian children is on the rise. Data from the New South Wales Register show that between 1992 and 1996 the incidence increased at a rate of 3% per year (17.1 per 100,000 in 1992 compared with 21.6 in 1996; in Handelsman & Jackson 1999).

While it is estimated that up to 98% of diabetes in children is Type 1 (Handelsman & Jackson 1999), Type 2 diabetes, which is usually only seen in adults, is being increasingly reported in children in the USA, UK and other countries (Ehtisham et al. 2001; Fagot-Campagna 2001). The emergence of Type 2 in children has been linked to lifestyle factors such as little exercise and to obesity in children from certain ethnic groups (American Diabetes Association 2000). Although the incidence and prevalence of Type 2 diabetes in Australian children are not known, they can be expected to increase over the next decade.

Information for this chapter is derived from three sources: the National Diabetes Register; the AIHW National Hospital Morbidity Database; and the AIHW Mortality Database.

Incidence of diabetes

The indicator for the incidence of Type 1 diabetes is the total number of children aged 0–14 years who are recorded on the National Diabetes Register as receiving insulin in a given year as a rate per 100,000 children. Data on incidence are derived from this register, which is held at the AIHW. The register records the characteristics of people who began to use insulin from January 1999 (AIHW 2001c). Data for the register are gathered from two sources: the National Diabetes Services Scheme, which collects information about people who are insulin treated in all age groups and the Australian Paediatrics Endocrine Group, which collects information on people under 15 years of age with Type 1 diabetes.

Of the 13,347 people on the register between January 1999 and December 2000, 1,333 (10%) were children aged 0–14 years. Incidence rates of insulin-treated diabetes in children aged 0–14 years in Australia in 2000 are shown in Table 13.1.

Table 13.1: Incidence of diabetes (predominantly Type 1) among children aged 0–14 years, 2000

Age (years)	Males		Females	
	Number	Rate per 100,000 children	Number	Rate per 100,000 children
0–4	84	13.0	75	12.2
5–9	138	20.2	133	20.5
10–14	165	24.3	148	22.9
0–14	387	19.2	356	18.6

Source: AIHW 2001c.

- In 2000, the incidence of diabetes among children aged 0–14 years was 19.2 per 100,000 boys and 18.6 per 100,000 girls. This is similar to incidence rates of Type 1 diabetes reported in regional studies.
- Rates increased with age, with children aged 10–14 years having the highest rates (24.3 for boys, 22.9 for girls).

Children in metropolitan, rural and remote areas

Table 13.2: Incidence of diabetes among children aged 0–14 years in metropolitan, rural and remote areas, 2000

	Metropolitan	Rural	Remote
Number	498	231	14
Rate per 100,000 children	18.4	21.0	9.4

Source: AIHW 2001c.

- In 2000, the incidence of diabetes among children aged 0–14 years was highest among those in rural areas (21.0 per 100,000 children), followed by those in metropolitan areas (18.4). Rates in remote areas were half those in rural or metropolitan areas (9.4).
- Aboriginal and Torres Strait Islander children made up 1% (15) of all children on the register.

According to the National Diabetes Register, the low numbers and rates of Type 1 diabetes in Indigenous children and in children living in remote areas are unlikely to reflect actual differences in prevalence between these groups. Instead, they are more likely to reflect the extent to which Indigenous communities use services other than the National Diabetes Services Scheme. For example, these communities have access to services and products free of charge through health service centres and Aboriginal community councils. Similarly, people living in remote areas are able to access free treatment products through selected pharmacies (AIHW 2001c).

Hospitalisations

The indicator for diabetes hospitalisations is the number of hospitalisations of children aged 0–14 years for diabetes in a given year as a rate per 100,000 children.

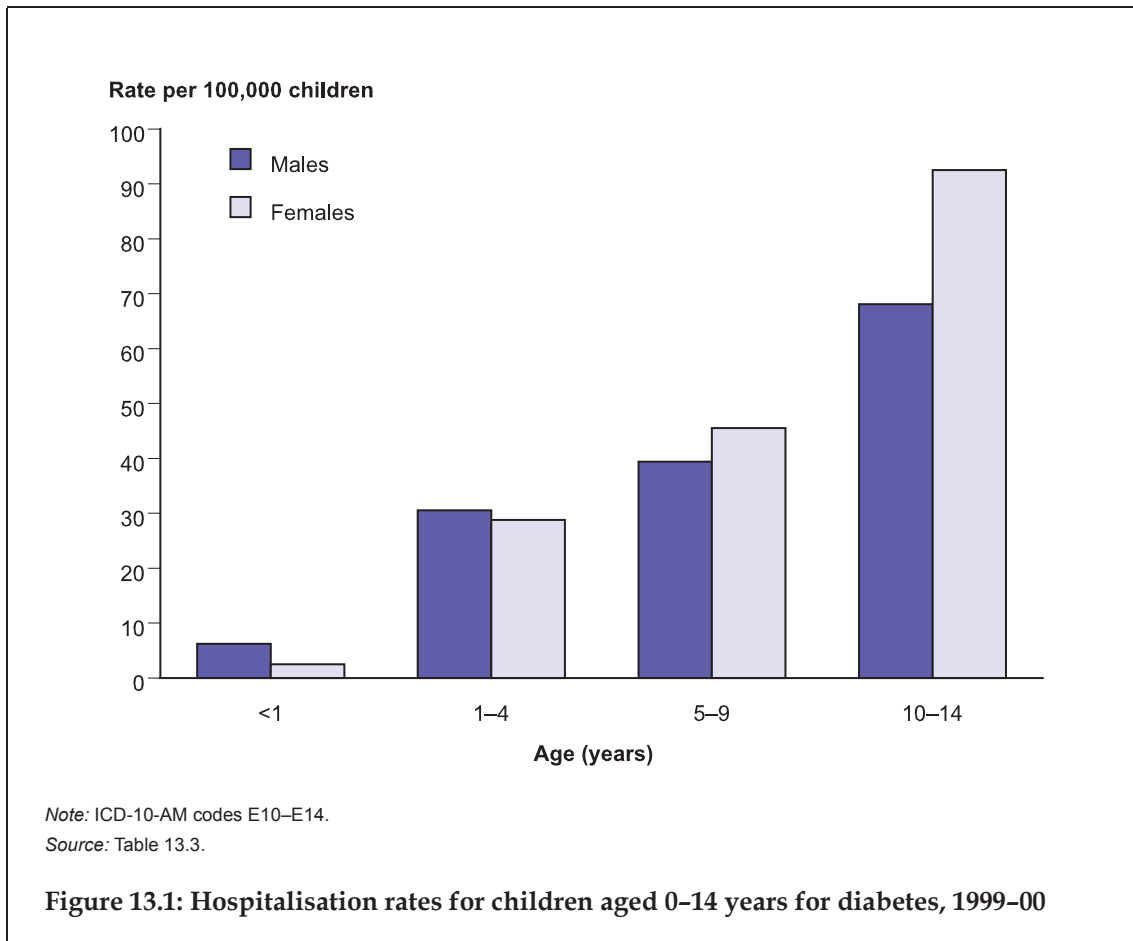
Table 13.3: Hospitalisation rates for children aged 0–14 years for diabetes, 1993–94 to 1999–00 (per 100,000 children)

	Age (years)	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
Males	<1	6.8	0.0	5.3	4.6	5.4	3.1	6.2
	1–4	25.2	23.8	27.9	31.1	27.1	28.2	30.5
	5–9	28.5	35.9	41.1	42.3	40.5	37.4	39.4
	10–14	58.3	69.5	71.2	69.4	67.7	74.9	68.1
	0–14	35.9	41.2	45.0	45.6	43.4	44.9	44.2
Females	<1	3.2	8.8	6.4	2.4	7.3	0.8	2.5
	1–4	25.5	24.1	24.2	28.6	26.7	25.5	28.8
	5–9	39.5	43.0	45.0	42.7	45.3	43.0	45.5
	10–14	91.9	94.2	86.5	86.6	89.0	80.6	92.5
	0–14	50.5	52.4	50.4	50.6	52.1	47.8	53.5
Persons	0–14	43.0	46.7	47.6	48.0	47.7	46.3	48.7

Note: ICD-9-CM code 250 (1993–94 to 1997–98) and ICD-10-AM codes E10–E14 (1998–99 to 1999–00).

Source: AIHW National Hospital Morbidity Database.

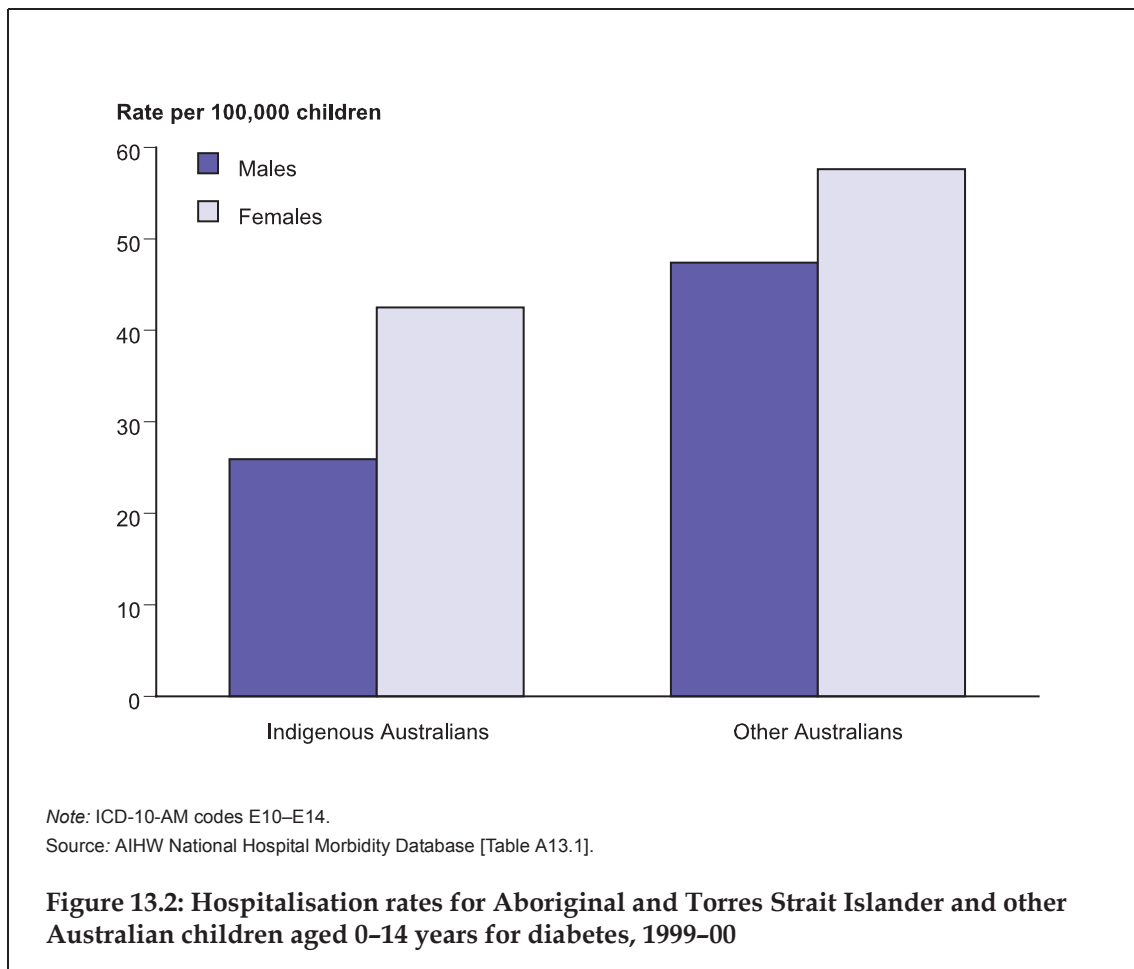
- There was a 13% increase in the overall hospitalisation rate for children aged 0–14 years for diabetes over the period 1993–94 to 1999–00, from 43.0 to 48.7 per 100,000 children.
- The hospitalisation rates for girls were higher than those for boys.
- Most of the increase in overall rates was due to the rise in the hospitalisation rate for boys. The rate for boys increased by 23%, compared with a 6% increase for girls over the same period.



- In 1999-00, there were 1,935 hospitalisations of children aged 0-14 years for diabetes. The hospitalisation rate was highest in the 10-14 years age group. The rate increased from 4.4 per 100,000 infants to 80.0 per 100,000 children aged 10-14 years. This is to be expected, as diabetes is a chronic disease and the prevalence becomes progressively higher in older age groups.
- The hospitalisation rate was higher for girls than for boys among children aged 5 years or older. For children aged less than 5 years, it was slightly higher for boys than for girls.

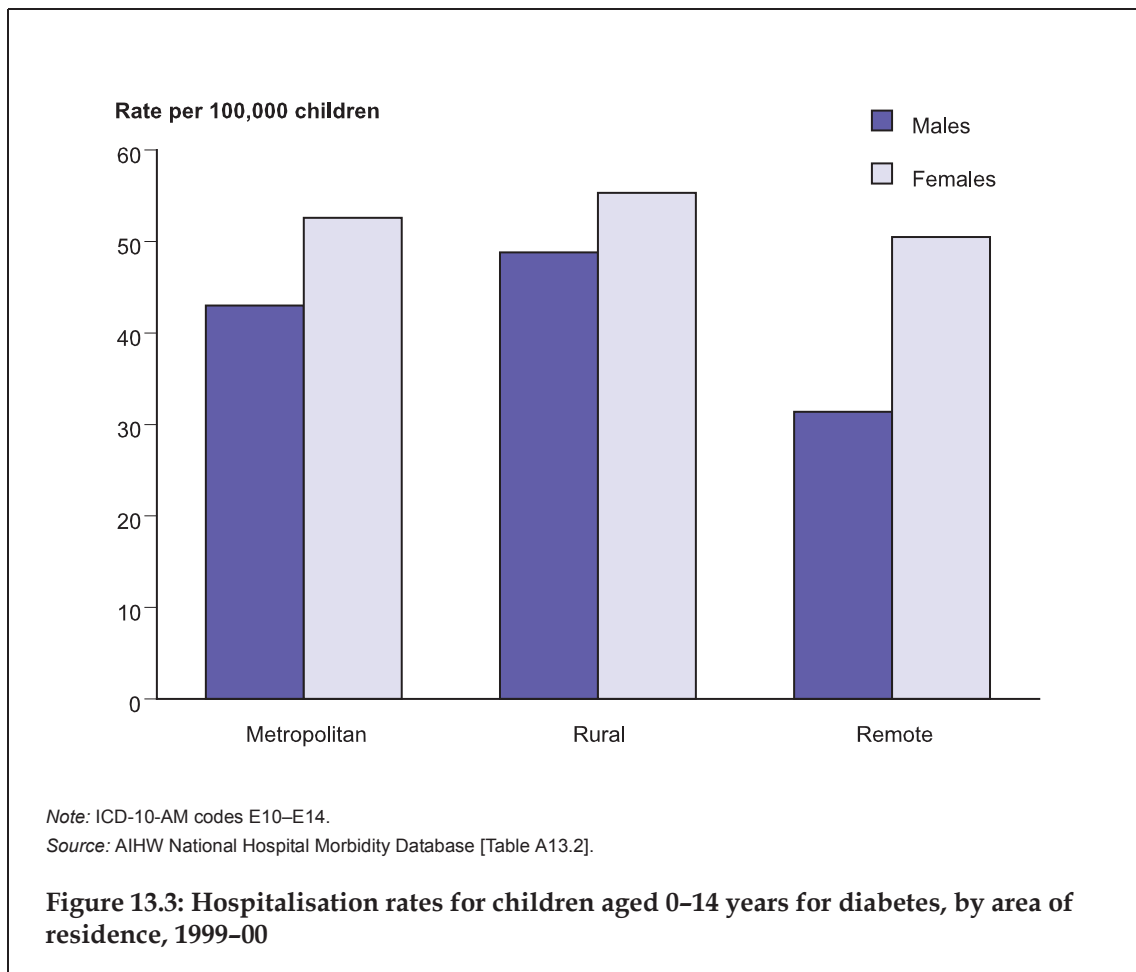
The impact of diabetes on the health system can be examined in terms of the length of time children spent in hospital. In 1999-00, there were 7,575 hospital bed days for which diabetes was the principal diagnosis, with an average length of stay in hospital of 3.9 days. Diabetes was also responsible for an additional 1,075 bed days where it was not the principal diagnosis but where it had to be managed during hospitalisations for other conditions.

Aboriginal and Torres Strait Islander children



- In 1999–00, there were 49 hospitalisations of Aboriginal and Torres Strait Islander children aged 0–14 years for diabetes. Most of these cases were of girls (30, or 61%); 63% of all hospitalisations (31) were of children aged 10–14 years.
- The hospitalisation rate was lower for Aboriginal and Torres Strait Islander children than for other Australian children (34.0 compared with 52.4 per 100,000 children).
- Similar to the national pattern, the rate for Aboriginal and Torres Strait Islander girls was higher than for boys (42.5 compared with 25.9).

Children in metropolitan, rural and remote areas



- The hospitalisation rate for diabetes was highest for children aged 0–14 years living in rural areas: 52.0 per 100,000 children, compared with 47.7 for children living in metropolitan areas and 40.7 for those living in remote areas. Both boys and girls living in rural areas had higher hospitalisation rates than boys and girls living in other areas.
- The greatest differences in rates were between girls and boys in remote areas, where girls were hospitalised at a rate 1.6 times that of boys. The rate was 50.5 per 100,000 girls, compared with 31.4 per 100,000 boys.
- Similar to the national pattern, rates in all areas were highest for children aged 10–14 years.

Deaths

Over the period 1991 to 2000, 16 children aged 0–14 years died from diabetes (11 girls and 5 boys). The low death rate from diabetes may be a reflection of improved management of the disease through medication.

Burden of disease attributable to diabetes

In 1996, Type 1 diabetes was estimated to account for 0.9% of the total burden of disease in children aged 0-14 years (2,158 DALYs) (AIHW: Mathers et al. 1999). The total disease burden was slightly higher in girls (51% of the total) than in boys (49%). The diabetes disability burden accounted for 97% of the total burden of disease (2,097 YLD), and the diabetes mortality burden for 3% (61 YLL).

