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Incidence of Type 1 diabetes in Australians under 40 years

A snapshot of National Diabetes Register data for 2004

Highlights

Diabetes is one of the leading threats to the health of Australians and it is well documented that the rate of new cases of diabetes is on the increase. This short bulletin presents the latest available national data on new cases of Type 1 diabetes in Australia. The data come from the National Diabetes Register (NDR) held at the AIHW.

- There were 982 new cases of Type 1 diabetes in children aged 0–14 years registered on the NDR during 2004. There were another 877 cases in people aged 15–39 years.
- This equates to an age-standardised annual incidence rate of 24.6 new cases of Type 1 diabetes per 100,000 population for 0–14 year olds in 2004, and 12.3 for 15–39 year olds.
- The rate of new cases among 0–4 year olds was significantly lower than the rates for 5–9 year olds and 10–14 year olds for both sexes.
- No significant gender differences were found among registrants with Type 1 diabetes aged 0–14 years. However, among registrants aged 15–39 years there was a significantly higher rate among males—an average age-adjusted annual rate of 15.9 new cases per 100,000 population for males compared to 8.7 for females.

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Purpose

This short bulletin has been prepared to present the latest available national data on Type 1 diabetes in Australia, which are 2004 data from the National Diabetes Register (NDR). The NDR is maintained at the Australian Institute of Health and Welfare (see the Appendix for more detail about the NDR).

This bulletin follows a recently released bulletin covering data from the NDR for 2000–2002. At present there is a gap in the series due to a change to the process for NDR registration occurring in 2003. The impact of this change on ascertainment will be examined in a separate report. Until this is examined it is not possible to present trend information and as such this bulletin only contains data for 2004; the data in this bulletin should not be compared to earlier NDR publications.

Background

Diabetes is one of the leading threats to the health of Australians—it is a chronic condition which places sufferers at increased risk of complications such as heart disease, stroke, kidney failure, blindness and amputation. It is well documented that the rate of diabetes is increasing both in Australia and world wide (King et al. 1998; Dunstan et al. 2001; IDF 2003). There are several types of diabetes and it is the increase in Type 2 diabetes that is the main contributor to the alarming increase in diabetes prevalence. However, recently there have been reports that Type 1 diabetes is also on the increase (Taplin et al. 2005; Haynes et al. 2004; Craig et al. 2000).

NDR registrants with Type 1 diabetes, aged 0–14 years at their first insulin use

NDR records for 0–14 year olds are received from two data sources: the National Diabetes Services Scheme (NDSS) database, administered by Diabetes Australia, and the Australasian Paediatric Endocrine Group (APEG) state and territory databases. As a result, coverage of new cases (incident cases) of insulin-treated diabetes under 15 years of age is considered to be high thus producing reliable estimates of Type 1 diabetes incidence.

Table 1; Figure 1

- Of people registered on the NDR, a total of 982 people aged 0–14 years with Type 1 diabetes began using insulin in 2004.
- This equates to an age-standardised annual incidence rate of 24.6 new cases of Type 1 diabetes per 100,000 population for 0–14 year olds in 2004.
- While the age-standardised incidence rate in males aged 0–14 years (25.1 per 100,000 population) was slightly higher than that for females of the same age (24.0 per 100,000 population), the difference was not statistically significant. This is consistent with the findings of a Western Australian study by Haynes et al. (2004) but in contrast to a New South Wales study by Taplin et al. (2005).
- In 2004, the rate of new cases of Type 1 diabetes increased with increasing age in the 0–14 years age group. The incidence rate was lowest in the 0–4 years age group at 15.1 per 100,000 and highest in the 10–14 years age group at 31.7, with the 5–9 years age group sitting in between at 26.5. This pattern was observed for both males and females, with the rate of new cases among 0–4 year olds being significantly lower than the rates for 5–9 year olds and 10–14 year olds for both sexes.

Table 2

- In 2004, the rate of new cases of Type 1 diabetes among 0–14 year olds was similar across New South Wales, Victoria, Queensland and Western Australia (at around 23–24 new cases per 100,000 population). The Northern Territory had the lowest average annual rate of new cases at 20.7 new cases per 100,000 population, while Tasmania, the Australian Capital Territory and South Australia had the highest rates (30.5, 30.1 and 28.9 per 100,000 population, respectively). However, none of these differences were statistically significant. Care should be taken when looking at rates for the smaller states and territories as small numbers are involved.

Table 1: New cases of Type 1 diabetes among those aged 0–14 at their first insulin use, by age and sex, 2004

Age at first insulin use (years)	Males		Females		Persons	
	Number	Age-specific rate ^(a)	Number	Age-specific rate ^(a)	Number	Age-specific rate ^(a)
0–4	105	16.2	85	13.8	190	15.1
5–9	176	25.8	176	27.2	352	26.5
10–14	234	32.9	206	30.5	440	31.7
Total 0–14	515	25.2	467	24.1	982	24.7
0–14 ASR^(b) (95% CI)	..	25.1 (22.9–27.3)	..	24.0 (21.8–26.2)	..	24.6 (23.0–26.1)

.. Not applicable

(a) Number per 100,000 population.

(b) Age-standardised to the 2001 Australian population.

Source: National Diabetes Register (data extracted March 2006).

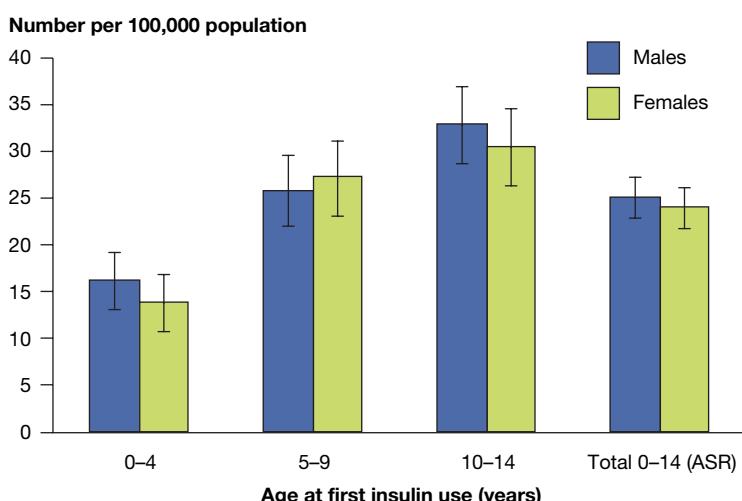
Table 2: New cases of Type 1 diabetes among those aged 0–14 at their first insulin use, states and territories^(a), 2004

State	Number	Number per 100,000 population aged 0–14 years ^(b) (95% CI)
NSW	323	24.3 (21.7–27.0)
Vic	225	23.4 (20.3–26.4)
Qld	198	24.7 (21.2–28.1)
WA	94	23.3 (18.6–28.1)
SA	83	28.9 (22.7–35.2)
Tas	30	30.5 (19.6–41.5)
ACT	19	30.1 (16.6–43.6)
NT	10	20.7 (7.9–33.5)
Australia	982	24.6 (23.0–26.1)

(a) State/territory of current residence.

(b) Age-standardised to the 2001 Australian population.

Source: National Diabetes Register (data extracted March 2006).

Figure 1: New cases of Type 1 diabetes among those aged 0–14 at their first insulin use, 2004

Note: The total rate for 0–14 years is age-standardised to the 2001 Australian population.

Source: National Diabetes Register (data extracted March 2006).

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NDR registrants with Type 1 diabetes, aged 0–39 years at their first insulin use

Tables 3 and 4; Figure 2

- Of people registered on the NDR, a total of 1,859 people aged 0–39 years with Type 1 diabetes began using insulin in 2004.
- This equates to an age-standardised annual incidence rate of 16.8 new cases of Type 1 diabetes per 100,000 population for 0–39 year olds in 2004.
- The age-standardised incidence rate in males aged 0–39 years (19.3 per 100,000 population) was higher than that for females of the same age (14.2 per 100,000 population); this difference was statistically significant. This is a result of significantly higher rates of new cases in males aged 15–39 years compared with females of the same age. The age-adjusted annual rate was 15.9 per 100,000 population for males and 8.7 for females. A male excess in this age group is consistent with the findings of various other studies (including Kyvik et al. 2004; Weets et al. 2002; and Gale & Gillespie 2001).
- In 2004, the rate of new cases of Type 1 diabetes in registrants aged 15 years and over was lower than that for those aged under 15 years. The average annual rate was highest in the 0–14 age group at 24.6 per 100,000 and lowest in the 25–39 age group at 11.1, with the

Table 3: New cases of Type 1 diabetes among those aged 0–39 at their first insulin use, by age and sex, 2004

Age at first insulin use (years)	Males		Females		Persons	
	Number	Age-standardised rate per 100,000 population ^(a) (95% CI)	Number	Age-standardised rate per 100,000 population ^(a) (95% CI)	Number	Age-standardised rate per 100,000 population ^(a) (95% CI)
0–14	515	25.1 (22.9–27.3)	467	24.0 (21.8–26.2)	982	24.6 (23.0–26.1)
15–24	249	17.6 (15.4–19.8)	148	11.0 (9.2–12.8)	397	14.4 (13.0–15.8)
25–39	322	14.9 (13.3–16.5)	158	7.3 (6.1–8.4)	480	11.1 (10.1–12.1)
Total 15–39	571	15.9 (14.6–17.2)	306	8.7 (7.7–9.7)	877	12.3 (11.5–13.2)
Total 0–39	1,086	19.3 (18.1–20.4)	773	14.2 (13.2–15.2)	1,859	16.8 (16.0–17.5)

(a) Age-standardised to the 2001 Australian population.

Source: National Diabetes Register (data extracted March 2006).

15–24 age group sitting in between at 14.4. For both sexes in all years the rate was highest in the youngest age group (0–14 years) and lowest in the older age group (25–39 years).

- In 2004 the average annual rate of new cases of Type 1 diabetes among 0–39 year olds ranged from a low of around 15 per 100,000 population for the Northern Territory (15.0), the Australian Capital Territory (15.6) and New South Wales (15.7) to a high of around 20 for South Australia (19.9). These differences were not statistically significant and care should be taken when looking at rates for the smaller states and territories as small numbers are involved.

Forthcoming publications

Publications planned to follow this bulletin are a paper investigating the impact of changed registration arrangements in 2003 on the NDR's ascertainment, as well as a major statistical profile report covering data for 2000–2005.

Table 4: New cases of Type 1 diabetes among those aged 0–39 at their first insulin use, states and territories^(a), 2004

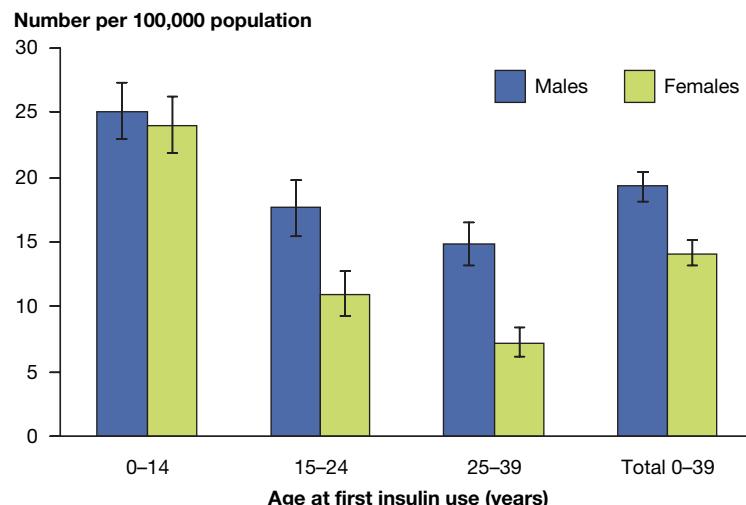
State	Number	Number per 100,000 population aged 0–39 years (95% CI) ^(b)
NSW	579	15.7 (14.4–17.0)
VIC	449	16.5 (15.0–18.1)
Qld	390	17.7 (16.0–19.5)
WA	190	17.1 (14.7–19.5)
SA	158	19.9 (16.8–23.0)
Tas	44	17.0 (12.0–22.1)
ACT	29	15.6 (9.9–21.4)
NT	20	15.0 (8.4–21.6)
Australia	1,859	16.8 (16.0–17.5)

(a) State/territory of current residence.

(b) Age-standardised to the 2001 Australian population.

Source: National Diabetes Register (data extracted March 2006).

Figure 2: New cases of Type 1 diabetes among those aged 0–39 at their first insulin use, 2004



Note: All rates are age-standardised to the 2001 Australian population.

Source: National Diabetes Register (data extracted March 2006).

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Appendix

Data sources

National Diabetes Register

The National Diabetes Register (NDR) is a database, housed at the Australian Institute of Health and Welfare, that collects information about people who use insulin as part of their treatment of diabetes. It includes people who began to use insulin on or after 1 January 1999. Data for the register are obtained from two data sources: the National Diabetes Services Scheme, administered by Diabetes Australia, and the Australasian Paediatric Endocrine Group (APEG) state-based registers. APEG registers collect information about children with diabetes aged less than 15 years.

For more information about the NDR please see the two statistical profile reports that have been published on the 1999–2001 NDR data (AIHW 2001; AIHW 2003).

Statistical methods

Age-specific rates

Age-specific rates were calculated by dividing the number of cases occurring in each specified age group by the mid-year estimated resident population for that age group, expressed as a rate per 100,000 population.

Age-standardised rates

Age standardisation is used to remove the influence of age to facilitate comparisons between populations with different age structures. There are two different methods commonly used to adjust for age—direct and indirect age standardisation. In this publication direct age standardisation was used, which is the most common method. This is done by applying the age-specific rates to a standard population. In this analysis the 2001 Australian population was used as the standard population.

Step 1: Calculate the age-specific rate for each age group in the population of interest.

Step 2: Calculate the expected number of cases in each age group by multiplying the age-specific rate by the corresponding standard population for each age group.

Step 3: Add together the expected number of cases in each age group and divide the total by the total standard population. This is the age-standardised rate.

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Abbreviations

APEG	Australasian Paediatric Endocrine Group
ASR	age-standardised rate
CI	confidence interval
NDR	National Diabetes Register
NDSS	National Diabetes Services Scheme

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