



Australian Government

Australian Institute of
Health and Welfare

Incidence of Type 1 diabetes in Australians under 40 years

*A snapshot of National Diabetes
Register data for 2000–2002*

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 2000–2002 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 2,515 new cases of Type 1 diabetes in children aged 0–14 years registered on the NDR during 2000–2002. There were another 2,170 cases in people aged 15–39 years.
- In registrants aged 0–14 at their first insulin use the rate increased significantly between 2000 and 2002—19.2 new cases per 100,000 population in 2000 compared to 22.7 in 2002. The opposite pattern was seen in registrants aged 15–39 years, with the age-adjusted rate decreasing from 10.8 new cases per 100,000 population in 2000 to 9.2 in 2002.
- 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 13.0 new cases per 100,000 population for males compared to 7.6 for females.

Bulletin 38

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Purpose

This short bulletin presents the latest available national data on new cases of Type 1 diabetes in Australia. The data are from the National Diabetes Register (NDR) which is based at the Australian Institute of Health and Welfare (see the Appendix for more detail about the NDR).

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 worldwide (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 those aged 0–14 at their first insulin use 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 in children 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 2,515 people aged 0–14 years with Type 1 diabetes began using insulin over the 3-year period from 2000 to 2002.
- This equates to an average age-adjusted annual rate of 21.1 new cases per 100,000 population each year, 21.3 for males and 20.8 for females.
- Over the three years 2000–2002 the age-adjusted rate of new cases of Type 1 diabetes among those aged 0–14 at their first insulin use increased from 19.2 per 100,000 population in 2000, to 21.3 in 2001 and 22.7 in 2002. While the annual increases from 2000 to 2001 and 2001 to 2002 are not statistically significant, the overall increase from 2000 to 2002 is.
- In males aged 0–14 years at their first insulin use, the rate increased from 19.4 per 100,000 population in 2000 to 22.5 in 2002. Females showed a similar increase, rising from 18.9 per 100,000 population in 2000 to 23.0 in 2002. No significant differences were found between boys and girls which 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).

- The rate of new cases of Type 1 diabetes increased with increasing age in the 0–14 years age group. During 2000–2002 the average annual rate was lowest in the 0–4 years age group at 13.9 per 100,000 and highest in the 10–14 age group at 26.9, with the 5–9 age group sitting in between at 22.0. For both sexes in all years the rate was lowest in the youngest age group (0–4 years) and highest in the older age group (10–14 years).
- All three age groups showed the same pattern over the three years with an increase in the rate per 100,000 population. For example, the rate among those aged 0–4 increased from 12.2 in 2000, to 14.1 in 2001 and 15.4 in 2002.

Table 1: New cases of Type 1 diabetes among those aged 0–14 at their first insulin use: sex and age, by year of first insulin use, 2000–2002

Age at first insulin use	Males		Females		Persons		
	Number	Age-specific rate ^(a)	Number	Age-specific rate ^(a)	Number	Age-specific rate ^(a)	
2000	0–4	83	12.7	73	11.7	156	12.2
	5–9	140	20.2	140	21.3	280	20.7
	10–14	172	25.1	152	23.3	324	24.2
	Total 0–14	395	19.4	365	18.9	760	19.2
	0–14 ASR^(b) (95% CI)	..	19.4 (17.5–21.4)	..	18.9 (17.0–20.8)	..	19.2 (17.8–20.5)
2001	0–4	106	16.1	74	12.0	181	14.1
	5–9	140	20.2	155	23.6	295	21.8
	10–14	204	29.4	169	25.6	373	27.6
	Total 0–14	450	22.0	399	20.5	849	21.3
	0–14 ASR^(b) (95% CI)	..	22.0 (20.0–24.0)	..	20.5 (18.5–22.6)	..	21.3 (19.9–22.7)
2002	0–4	109	16.7	87	14.0	196	15.4
	5–9	155	22.4	160	24.4	315	23.4
	10–14	195	27.9	200	30.0	395	28.9
	Total 0–14	459	22.5	447	23.0	906	22.7
	0–14 ASR^(b) (95% CI)	..	22.4 (20.4–24.5)	..	23.0 (20.8–25.1)	..	22.7 (21.2–24.2)
2000–2002 (average)	0–4	99	15.2	78	12.6	178	13.9
	5–9	145	20.9	152	23.1	297	22.0
	10–14	190	27.5	174	26.3	364	26.9
	Total 0–14	435	21.3	404	20.8	838	21.1
	0–14 ASR^(b) (95% CI)	..	21.3 (19.3–23.3)	..	20.8 (18.8–22.8)	..	21.1 (19.6–22.5)

.. not applicable

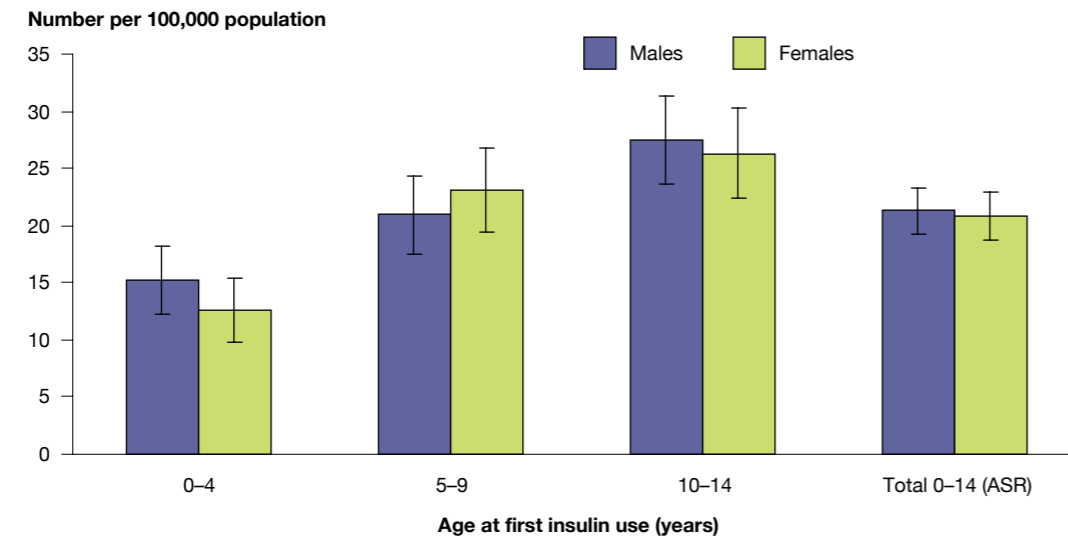
(a) Number per 100,000 population.

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

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

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Figure 1: New cases of Type 1 diabetes among those aged 0–14 at their first insulin use: 2000–2002 average annual incidence rate



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

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

Table 2

- Over 2000–2002 the average annual rate of new cases of Type 1 diabetes among those aged 0–14 was similar across states and territories, with the exception of the Northern Territory. 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.
- The rate of new cases of Type 1 diabetes among those aged 0–14 was higher in 2002 than in 2000 for each of the states and territories, with the exception of the Northern Territory. However, these increases were not statistically significant.

Table 2: New cases of Type 1 diabetes among those aged 0–14 at their first insulin use: states and territories^(a), 2000, 2001, 2002

Year	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia ^(b)
Number									
2000	251	180	157	71	72	15	9	5	760
2001	272	206	176	85	62	28	15	5	849
2002	289	229	167	98	74	30	14	4	906
2000–2002 (average)	271	205	167	85	69	24	13	5	838
Number per 100,000 population aged 0–14 years (95% CI)^(c)									
2000	18.9 (16.5–21.2)	18.8 (16.1–21.6)	20.6 (17.4–23.8)	17.7 (13.6–21.8)	24.4 (18.8–30.0)	14.9 (7.4–22.5)	13.7 (4.8–22.7)	10.0 (1.2–18.8)	19.2 (17.8–20.5)
2001	20.3 (17.9–22.7)	21.4 (18.5–24.4)	22.8 (19.4–26.2)	21.1 (16.6–25.6)	21.1 (15.9–26.4)	28.2 (17.8–38.7)	22.9 (11.3–34.5)	10.3 (1.3–19.3)	21.3 (19.9–22.7)
2002	21.6 (19.1–24.1)	23.8 (20.7–26.9)	21.4 (18.1–24.6)	24.4 (19.6–29.2)	25.4 (19.6–31.2)	30.6 (19.7–41.6)	21.4 (10.2–32.6)	7.9 (0.1–15.7)	22.7 (21.2–24.2)
2000–2002 (average)	20.3 (17.8–22.7)	21.4 (18.4–24.3)	21.6 (18.3–24.8)	21.1 (16.6–25.5)	23.6 (18.1–29.2)	24.6 (14.8–34.3)	19.4 (8.7–30.0)	9.4 (0.9–17.9)	21.1 (19.6–22.5)

(a) State/territory of current residence.

(b) Components may not add to totals due to missing data.

(c) 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 4,685 people aged 0–39 years with Type 1 diabetes began using insulin over the 3-year period from 2000 to 2002—an average of 1,562 new cases each year.
- This equates to an average age-adjusted annual rate of 14.2 new cases per 100,000 population each year—16.0 for males and 12.4 for females. This gender difference was statistically significant, and is a result of significantly higher rates of new cases in males aged 15–39 years compared with females of the same age: an average age-adjusted annual rate of 13.0 per 100,000 population for males and 7.6 for females. This male excess in the older age group is consistent with the findings of various other studies (including Kyvik et al. 2004; Weets et al. 2002; and Gale & Gillespie 2001).
- Over the three years 2000–2002, the age-adjusted rate of new cases of Type 1 diabetes among those aged 0–39 on the NDR was fairly stable (13.9 per 100,000 population in 2000; 14.7 in 2001; and 14.1 in 2002). A similar pattern was observed for both males and females.
- The rate of new cases of Type 1 diabetes in those aged 0–39 at their first insulin use decreased with increasing age. During 2000–2002 the average annual rate was highest in the 0–14 age group at 21.1 per 100,000 and lowest in the 25–39 age group at 9.2, with the 15–24 age group sitting in between at 12.2. 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).
- The three age groups showed a different pattern across the 3 years. Among those aged 0–14 at their first insulin use the rate increased each year from 2000 to 2002, as described earlier. In contrast the 15–39 year age group showed the opposite pattern, decreasing each year with the drop from 10.8 in 2000 to 9.2 in 2002 being statistically significant.
- Over 2000–2002 the average annual rate of new cases of Type 1 diabetes among those aged 0–39 ranged from 7.3 per 100,000 population in the Northern Territory to 17.9 in Tasmania, followed by 16.1 in Western Australia. However, care should be taken when looking at rates for the smaller states and territories as small numbers are involved. When compared with the other states, the lower rate reported in the Northern Territory over 2000–2002 is statistically significant. However, this is possibly due to lower ascertainment in remote areas of the Northern Territory where diabetes products may be obtained from remote areas pharmacy services which are not part of the National Diabetes Services Scheme (NDSS). This means that the NDSS and thus the NDR do not receive data from these people. Diabetes Australia is currently running a project to evaluate the impact of this on the NDSS.

Table 3: New cases of Type 1 diabetes among those aged 0–39 at their first insulin use: sex and age, by year of first insulin use, 2000–2002

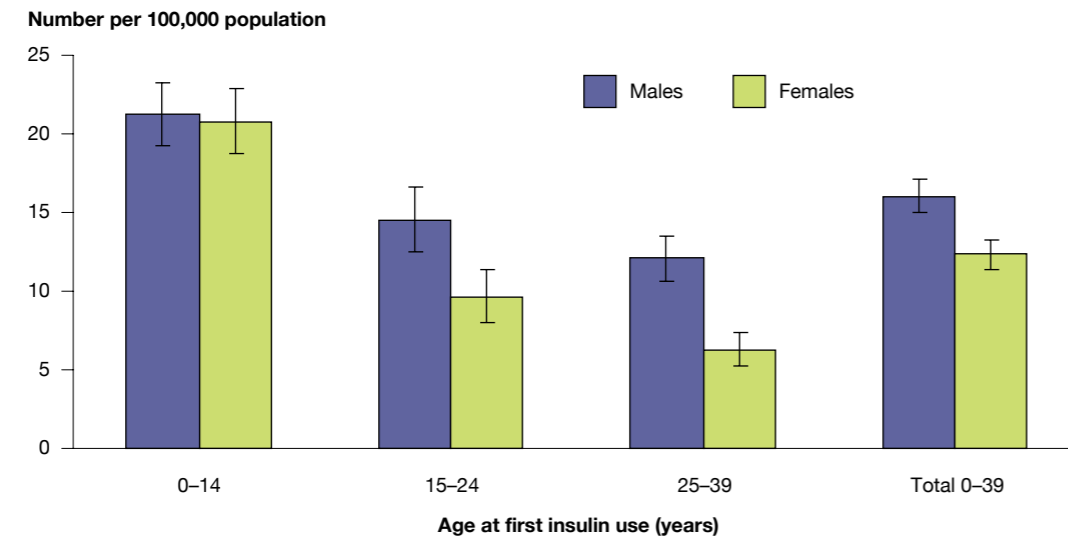
Age at first insulin use	Males		Females		Persons		
	Number	Age-standardised rate per 100,000 population ^(a) (95% CI)	Number	Age-standardised rate per 100,000 population ^(a) (95% CI)	Number	Age-standardised rate per 100,000 population ^(a) (95% CI)	
2000	0–14	395	19.4 (17.5–21.4)	365	18.9 (17.0–20.8)	760	19.2 (17.8–20.5)
	15–24	188	14.1 (12.1–16.1)	119	9.3 (7.6–10.9)	307	11.7 (10.4–13.0)
	25–39	291	13.3 (11.8–14.9)	159	7.2 (6.1–8.4)	450	10.3 (9.3–11.2)
	Total 15–39	479	13.6 (12.4–14.9)	278	8.0 (7.1–9.0)	757	10.8 (10.1–11.6)
	Total 0–39	874	15.7 (14.7–16.8)	643	12.0 (11.0–12.9)	1,517	13.9 (13.2–14.6)
2001	0–14	450	22.0 (20.0–24.0)	399	20.5 (18.5–22.6)	849	21.3 (19.9–22.7)
	15–24	202	14.9 (12.9–17.0)	139	10.7 (8.9–12.4)	341	12.8 (11.5–14.2)
	25–39	276	12.7 (11.2–14.2)	147	6.7 (5.6–7.8)	423	9.7 (8.8–10.6)
	Total 15–39	478	13.6 (12.3–14.8)	286	8.2 (7.2–9.1)	764	10.9 (10.1–11.7)
	Total 0–39	928	16.6 (15.6–17.7)	685	12.7 (11.7–13.6)	1,613	14.7 (13.9–15.4)
2002	0–14	459	22.4 (20.4–24.5)	447	23.0 (20.8–25.1)	906	22.7 (21.2–24.2)
	15–24	200	14.6 (12.6–16.6)	119	9.1 (7.4–10.7)	319	11.9 (10.6–13.2)
	25–39	221	10.2 (8.8–11.5)	109	5.0 (4.1–5.9)	330	7.6 (6.8–8.4)
	Total 15–39	421	11.8 (10.7–13.0)	228	6.5 (5.7–7.4)	649	9.2 (8.5–9.9)
	Total 0–39	880	15.7 (14.6–16.7)	675	12.5 (11.5–13.4)	1,555	14.1 (13.4–14.8)
2000–2002 (average)	0–14	435	21.3 (19.3–23.3)	404	20.8 (18.8–22.8)	838	21.1 (19.6–22.5)
	15–24	197	14.5 (12.5–16.6)	126	9.7 (8.0–11.4)	322	12.2 (10.8–13.5)
	25–39	263	12.1 (10.6–13.6)	138	6.3 (5.3–7.4)	401	9.2 (8.3–10.1)
	Total 15–39	459	13.0 (11.8–14.2)	264	7.6 (6.7–8.5)	723	10.3 (9.6–11.1)
	Total 0–39	894	16.0 (15.0–17.1)	668	12.4 (11.4–13.3)	1,562	14.2 (13.5–14.9)

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

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

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Figure 2: New cases of Type 1 diabetes among those aged 0–39 at their first insulin use: 2000–2002 average annual incidence rate



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

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

Forthcoming publications

Publications planned to follow this bulletin are: another short bulletin presenting a snapshot of 2004 data from the National Diabetes Register; a discussion paper investigating the impact of the change in the NDSS registration form occurring in 2003; and subsequently a major statistical profile report covering NDR 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), 2000, 2001, 2002

Year of first insulin use	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia ^(b)
Number									
2000	503	338	309	165	124	45	23	10	1,517
2001	490	378	349	185	116	50	35	10	1,613
2002	501	383	290	185	117	45	23	10	1,555
2000–2002 (average)	498	366	316	178	119	47	27	10	1,562
Number per 100,000 population aged 0–39 years (95% CI)^(c)									
2000	13.7 (12.5–14.9)	12.6 (11.2–13.9)	14.8 (13.2–16.5)	15.0 (12.7–17.3)	15.1 (12.5–17.8)	17.3 (12.2–22.4)	11.8 (7.0–16.6)	7.3 (2.7–11.8)	13.9 (13.2–14.6)
2001	13.2 (12.1–14.4)	14.0 (12.6–15.4)	16.6 (14.9–18.4)	16.7 (14.3–19.1)	14.2 (11.6–16.8)	19.1 (13.8–24.4)	18.2 (12.2–24.3)	7.3 (2.8–11.9)	14.7 (13.9–15.4)
2002	13.5 (12.4–14.7)	14.2 (12.8–15.7)	13.6 (12.0–15.1)	16.7 (14.3–19.2)	14.5 (11.9–17.1)	17.2 (12.1–22.2)	12.1 (7.2–17.1)	7.5 (2.8–12.1)	14.1 (13.4–14.8)
2000–2002 (average)	13.5 (12.3–14.7)	13.6 (12.2–15.0)	15.0 (13.4–16.7)	16.1 (13.8–18.5)	14.6 (12.0–17.3)	17.9 (12.7–23.0)	14.0 (8.7–19.4)	7.3 (2.8–11.9)	14.2 (13.5–14.9)

(a) State/territory of current residence.

(b) Components may not add to totals due to missing data.

(c) 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 from 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.

Abbreviations

ASR	age-standardised rate
CI	confidence interval
NDR	National Diabetes Register
NDSS	National Diabetes Services Scheme

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Australian Institute of Health and Welfare

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Penny Allbon

Any enquiries about or comments on this publication should be directed to:

Cardiovascular Disease and Diabetes Unit

Australian Institute of Health and Welfare

GPO Box 570

Canberra ACT 2601

Phone: 02 6244 1000

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