

16 Diabetes

Disease characteristics

Diabetes (diabetes mellitus) is a common condition in which either not enough of the hormone insulin is made by the body, or the body cannot use the hormone properly. This disturbs the body's main energy processes and raises the blood glucose level. Diabetes is estimated to affect between 3% and 5% of Australians (DHAC & AIHW 1999). It can have a range of serious effects, especially on the heart and blood vessels, which can result in heart attack, stroke, blindness or gangrene leading to the need for amputation of the affected extremities.

There are several types of diabetes.

- Type 1 diabetes makes up about 10–15% of cases and is the most serious type. The body stops making insulin so daily insulin injections are needed for life. This type of diabetes most often starts in those aged under 40 years.
- Type 2 is the most common form and usually affects those aged 50 years and over. Some people with Type 2 can control their blood glucose levels with diet alone. But many also need to take tablets to help them produce more insulin and many will later need to go on to insulin injections.
- Gestational diabetes occurs during pregnancy in about 4–6% of females not previously diagnosed with diabetes. Gestational diabetes can be an indicator of greater risk of developing Type 2 diabetes later in life.

Type 1 diabetes is believed to be caused by particular biological interactions and exposure to environmental triggers. The risk of developing Type 2 diabetes increases with age, genetic predisposition and body fatness. Low birthweight is considered to be a good marker of the lifetime risk for Type 2 diabetes and physical activity is believed to play a protective role against it. The risk factors for gestational diabetes are similar to those for Type 2 diabetes (AIHW 2000a).

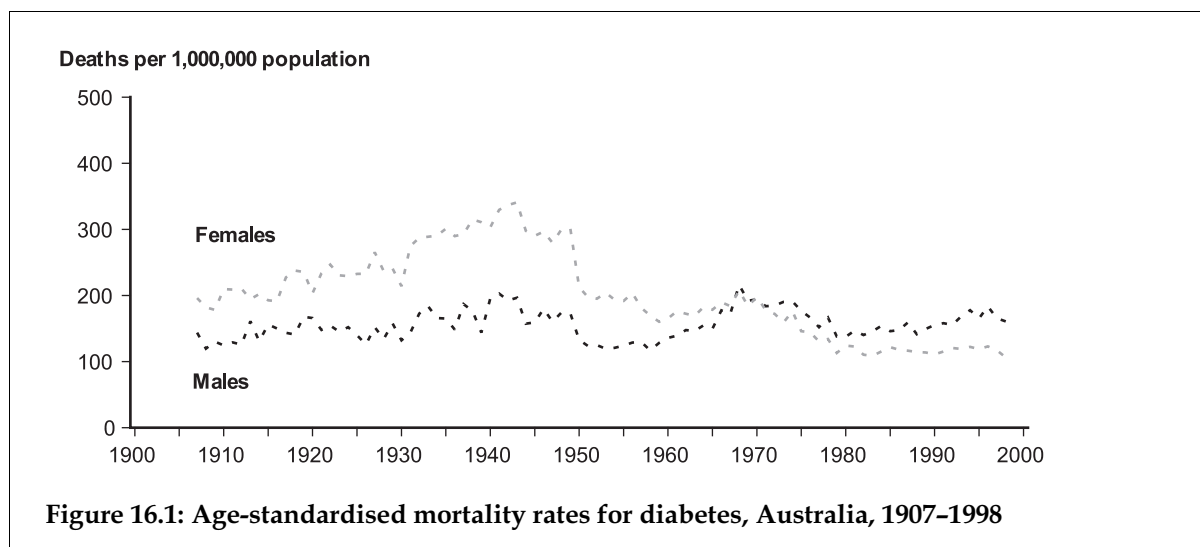
It is estimated that there are 15,000 PYLL each year before age 75 because of diabetes, making it a major cause of premature death in Australia.

Historic view

The diabetes mortality rates increased from 144 deaths per million population for males and 196 for females in 1907, to a peak of 203 for males (or 503 deaths) and 341 for females (or 984 deaths) in the early 1940s. The mortality rates remained high until about 1950, at which time insulin injection was introduced as an effective treatment for Type 1 diabetics. By the late 1950s, rates had decreased to 128 deaths per million population for males and 160 for females. Females continued to have higher diabetes mortality rates than men until 1968, when the rate peaked at 216 deaths per million population for males (or 856 deaths) and 208 for females (or 1,099 deaths).

After 1968, rates for females decreased more sharply than for males, falling to 109 deaths per million population for females and 140 for males in the early 1980s. Since the early 1980s diabetes mortality rates for males have increased and in 1998 the rate was 171 deaths per million population (or 1,515 deaths). Mortality rates for females have remained relatively

stable since the early 1980s and in 1998 there were 113 deaths per million population (or 1,412 deaths) (Figure 16.1).



Age–sex distribution

In 1998, 2% of all deaths were attributed to diabetes. Of the 2,927 deaths, 1,515 were of males and 1,412 were of females. In 1998 the mortality rates were 171 deaths per million population for males and 113 for females (Table 16.1). Generally death from diabetes occurs later in life.

- In 1998, about 88% of deaths occurred after age 60, and only 10 deaths occurred before the age of 25 years.
- In 1998, 85% of male deaths occurred from age 60 and 49% occurred from age 75.
- In 1998, 90% of female deaths occurred from age 60 and 64% occurred from age 75.

Twelve-year trends 1987–1998

Across the 1987–1998 period, the diabetes mortality rates increased significantly, by 3.7% per year for males and by 2.1% per year for females. There were significant increases in age-specific rates for males aged 55–59 years and 65–84 years (Table 16.1; Figure 16.2). There were no significant increases in age-specific rates for females.

Geographic differences in mortality

As discussed in Chapter 4, geographic differences are a complex interplay of many factors including socioeconomic status, occupational and environmental risk, migrant population, Aboriginal and Torres Strait Islander population, and proportion of the population living in rural and remote areas. Areas with a higher proportion of Aboriginal and Torres Strait Islander people will have higher mortality rates because of the higher mortality rates experienced by the Aboriginal and Torres Strait Islander population. Some of these factors are discussed separately below.

State and Territory comparison

The rates of diabetes deaths increased between the periods 1987–1991 and 1994–1998 for males and females overall (Table 16.2). The mortality rates for diabetes also showed some variation among the States and Territories. During the 1987–1991 period, compared with the national diabetes mortality rate:

- The mortality rate for males in Victoria was significantly higher.
- Mortality rates for males in New South Wales, Queensland and Western Australia were significantly lower.
- Mortality rates for females in Victoria and the Northern Territory were significantly higher.
- Mortality rates for females in New South Wales, Queensland and Western Australia were significantly lower.

During the 1994–1998 period:

- Mortality rates for males in Victoria, South Australia and the Northern Territory were significantly higher.
- Mortality rates for males in New South Wales and Queensland were significantly lower.
- Mortality rates for females in Victoria, South Australia and the Northern Territory were significantly higher.
- The mortality rate for females in New South Wales was significantly lower.

Geographic category (by metropolitan, rural and remote area)

During 1995–1997, mortality rates in remote regions were significantly higher than in metropolitan and rural areas, about 60% higher for males (275 deaths per million persons) and 180% higher for females (323).

The differences in mortality rates between rural and metropolitan areas were not as marked. There was no significant difference for males, but the difference for females (17%) was significantly higher (Table 16.3).

Country of birth

For the period 1992–1994, the world-standardised mortality rate for diabetes for Australian males born in Australia was 100 deaths per million population (Table 16.5).

- The mortality rate for Australian males born in New Zealand was significantly lower than for Australian males born in Australia.
- Mortality rates for Australian males born in Malta, Poland and Italy were significantly higher than for Australian males born in Australia.

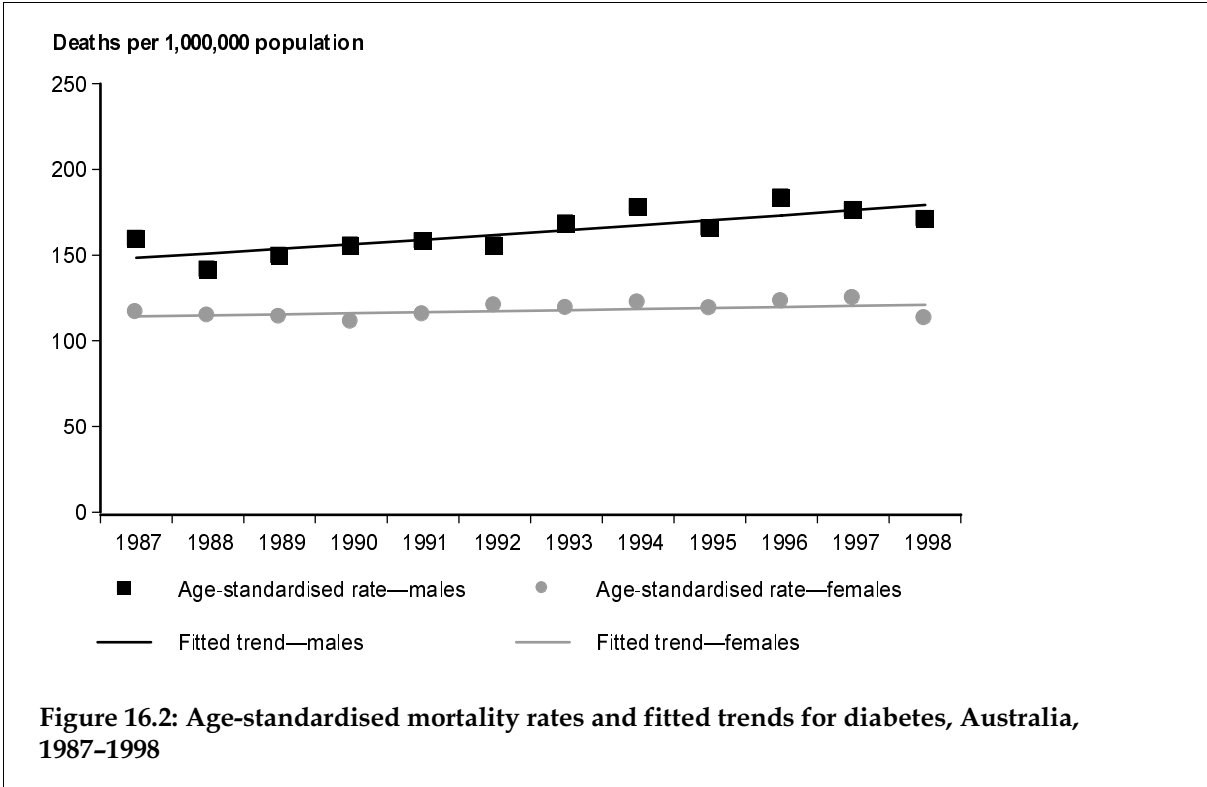
For the period 1992–1994, the world-standardised mortality rate for diabetes for Australian females born in Australia was 71 deaths per million population.

- Mortality rates for Australian females born in Canada, New Zealand, and the United Kingdom and Ireland were significantly lower than for Australian females born in Australia.
- Mortality rates for Australian females born in Malta, Italy, Poland and China were significantly higher than for Australian females born in Australia.

Socioeconomic status

For the period 1995–1997, there was an inverse relationship between diabetes mortality rates and socioeconomic status, with 16% of deaths occurring in the highest of the five SEIFA groups and 26% in the lowest SEIFA group (Table 16.4; Figure 16.3) (see Appendix D).

- The mortality rate in the lowest SEIFA group was significantly higher than in the highest SEIFA group, for males (49% higher, 209 deaths per million population compared to 140).
- The mortality rate for females was 98% higher (160 deaths per million population compared to 81).



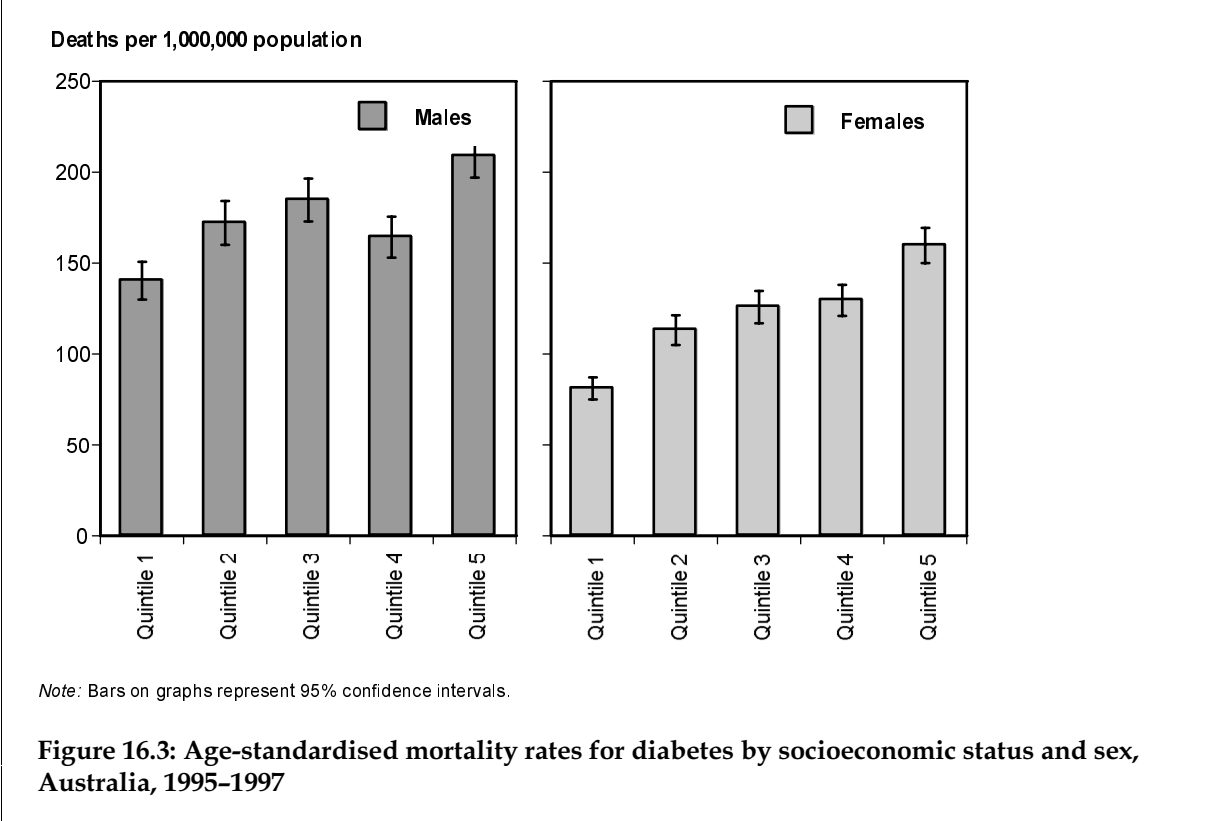


Table 16.1: Age-specific and age-standardised mortality rates for diabetes per million population, Australia, 1987–1998

Year	Age																Crude rate	ASMR Aust 1991		
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79			80-84	85+
Males																				
1987	0	0	0	0	3	3	14	17	32	31	86	129	267	502	789	1,344	2,217	3,227	123	159
1988	0	0	0	0	0	4	20	14	15	37	91	152	277	387	687	1,208	1,911	2,772	112	141
1989	2	0	3	1	1	4	12	14	27	23	79	148	266	459	806	1,242	1,998	2,876	120	149
1990	0	0	0	3	3	7	11	9	28	28	59	134	329	519	854	1,301	1,832	3,103	127	155
1991	0	2	2	0	0	7	6	12	24	53	74	161	281	456	731	1,321	2,002	3,709	129	158
1992	0	0	2	0	6	4	14	10	28	34	52	150	259	499	782	1,425	1,833	3,358	130	155
1993	0	0	0	5	5	4	21	15	35	45	79	201	304	506	878	1,310	2,060	3,535	145	168
1994	0	0	2	2	1	1	4	19	20	60	61	162	329	520	876	1,513	2,476	3,791	155	178
1995	0	0	0	0	0	4	8	14	20	54	69	177	334	543	889	1,233	2,271	3,206	149	165
1996	0	0	0	3	3	3	4	12	24	41	99	174	342	599	913	1,587	2,305	3,847	167	183
1997	0	0	0	2	3	7	9	23	34	49	94	179	289	597	901	1,434	2,343	3,342	165	176
1998	2	0	0	2	5	6	12	21	27	39	86	207	288	582	863	1,385	2,300	3,131	163	171
Females																				
1987	0	0	0	0	0	4	3	11	28	28	65	95	236	266	584	1,076	1,559	2,428	131	116
1988	3	0	0	1	2	3	8	8	18	14	50	132	200	304	572	981	1,627	2,435	131	115
1989	2	0	0	0	2	3	6	5	7	18	41	83	205	315	553	917	1,861	2,568	132	114
1990	0	0	2	0	6	4	4	6	8	17	52	123	148	330	514	961	1,572	2,594	129	111
1991	0	0	0	2	1	6	6	11	11	16	48	100	195	373	577	1,060	1,520	2,372	136	115
1992	3	0	0	0	1	3	3	10	14	17	40	117	214	371	588	1,069	1,624	2,638	145	120
1993	0	0	0	0	3	7	7	9	11	37	65	138	197	394	567	765	1,800	2,626	145	119
1994	2	0	2	2	1	1	7	9	23	30	55	75	216	403	618	948	1,573	2,886	152	122
1995	0	0	2	0	1	4	4	4	19	28	38	119	193	347	598	951	1,746	2,665	151	119
1996	0	2	2	0	1	1	6	8	18	34	58	137	177	324	602	972	1,835	2,832	160	123
1997	2	0	2	3	2	0	9	13	14	28	58	109	217	381	632	1,052	1,694	2,633	162	125
1998	0	0	2	5	2	3	6	9	26	26	73	104	193	284	606	933	1,436	2,523	150	113

Note: ASMR = age-standardised mortality rate.

Table 16.2: Number of deaths and age-standardised mortality rates for diabetes per million population, States and Territories, 1987–1991 and 1994–1998

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Males									
Deaths									
1987–1991	1,589	1,789	693	374	464	124	37	45	5,115
1994–1998	1,916	2,496	1,170	620	752	189	50	71	7,265
Deaths per million population									
1987–1991	136	210	123	121	162	134	139	224	153
1994–1998	132	242	160	163	209	169	116	353	175
Confidence intervals (95%)									
1987–1991	129–142	200–220	113–132	109–134	147–177	110–159	90–188	137–311	148–157
1994–1998	126–138	232–251	151–169	150–176	194–224	145–193	82–150	254–452	171–179
Females									
Deaths									
1987–1991	1,596	1,998	768	457	498	138	34	53	5,542
1994–1998	1,879	2,416	1,140	661	685	185	74	87	7,130
Deaths per million population									
1987–1991	91	157	101	100	126	104	84	349	114
1994–1998	89	156	117	125	138	115	120	454	120
Confidence intervals (95%)									
1987–1991	86–95	150–164	94–108	91–110	115–138	86–121	56–113	245–453	111–117
1994–1998	85–93	150–163	111–124	116–135	127–148	98–132	92–147	347–562	117–123

Table 16.3: Age-standardised mortality rates for diabetes per million population, by geographic area, 1995–1997

Geographic area	Males		Females	
	ASMR	95% confidence interval	ASMR	95% confidence interval
Metropolitan	168	162–174	113	109–117
Rural	183	173–193	132	125–139
Remote	275	230–320	323	274–373

Note: ASMR = age-standardised mortality rate.

Source: AIHW Mortality Database, based on *Statistical Local Area* resident population estimates compiled by the ABS.

Table 16.4: Age-standardised mortality rates for diabetes per million population, by socioeconomic status, 1995–1997

SEIFA quintile	Males		Females	
	ASMR	95% confidence interval	ASMR	95% confidence interval
1 High SES	140	130–151	81	75–88
2	172	160–184	113	105–121
3	185	173–197	126	117–134
4	164	153–176	130	121–138
5 Low SES	209	197–221	160	150–169

Notes

1. ASMR = age-standardised mortality rate; SES = socioeconomic status.

2. A description of the SEIFA Index of Relative Socioeconomic Disadvantage may be found in Appendix D.

Source: AIHW Mortality Database, based on *Statistical Local Area* resident population estimates compiled by the ABS.

Table 16.5: Age-standardised mortality rates per million population for diabetes, Australians by birthplace, 1992–1994

Males			Females		
Country of birth	ASMR (world)	95% CI	Country of birth	ASMR (world)	95% CI
Malta	281	199–363	Malta	277	196–358
Chile	187	0–449	Italy	148	128–168
Canada	169	52–285	Finland	147	3–291
Hungary	154	83–225	Poland	127	92–162
Poland	144	108–180	Hungary	122	67–176
Finland	142	2–282	China	121	82–159
Italy	141	120–162	Mauritius	96	2–190
Mauritius	118	2–234	Israel	96	0–228
Greece	107	75–138	Portugal	95	0–227
Australia	100	95–104	Greece	90	64–116
Germany	99	63–135	Netherlands	89	62–116
USA	97	22–171	Switzerland	87	0–187
Netherlands	91	56–127	Austria	86	31–141
Singapore	90	0–215	Japan	83	0–200
United Kingdom and Ireland	86	76–95	Germany	81	57–104
China	83	47–119	Korea	77	0–228
France	78	0–169	Australia	71	68–74
Austria	72	18–127	Singapore	57	0–135
Portugal	70	0–208	United Kingdom and Ireland	56	49–63
New Zealand	61	35–87	Hong Kong and Macau	50	0–120
Hong Kong and Macau	51	0–123	USA	48	0–96
Israel	—	—	New Zealand	26	12–40
Japan	—	—	Canada	21	0–52
Korea	—	—	Chile	—	—
Switzerland	—	—	France	—	—

Notes

1. ASMR = age-standardised mortality rate; CI = confidence interval.
2. Age-standardised mortality rates have been standardised to the World Standard Population.