



Diabetes

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Citation

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The Australian Institute of Health and Welfare (AIHW) has developed core monitoring information on the prevalence, incidence, hospitalisation and deaths from diabetes (including type 1 diabetes, type 2 diabetes, and gestational diabetes) in Australia that is updated on a regular basis on the AIHW website to ensure that the most up-to-date information and trends are easily accessible and available.

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Findings from this report:

- [Type 2 diabetes and type 1 diabetes accounted for 2.2% and 0.3% of Australia's disease burden respectively in 2015](#)
- [Diabetes contributed to 11% of Australian deaths in 2018 \(16,700 deaths\) \(underlying or associated cause\)](#)
- [Diabetes death and hospitalisation rates in Remote and very remote areas were two-times the rate in Major cities](#)
- [An estimated 1.2 million Australians \(4.9% of the total population\) had diabetes in 2017-18, based on self-reported data](#)

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What is diabetes?

Diabetes is a chronic condition marked by high levels of glucose in the blood. It is caused either by the inability of the body to produce insulin (a hormone made by the pancreas to control blood glucose levels) or by the body not being able to use insulin effectively, or both. The main types of diabetes are explained in Box 1.

Box 1: Types of diabetes

Type 1 diabetes

Type 1 diabetes is a lifelong autoimmune disease that usually has onset in childhood or early adolescence. The exact cause is unknown but it is believed to be the result of an interaction of genetic and environmental factors. A person with type 1 diabetes requires daily insulin replacement to survive, except in cases where a pancreatic transplant occurs.

Type 2 diabetes

The most common form of diabetes, generally having a later onset than type 1 diabetes, people with type 2 diabetes produce insulin, but do not produce enough, and/or cannot use it effectively. It involves a genetic component, but is largely preventable and is often associated with lifestyle factors including physical inactivity, poor diet, being overweight or obese, and tobacco smoking. Type 2 diabetes can be managed with changes to diet and exercise, oral glucose-lowering medications, non-insulin injectable glucose-lowering medications, insulin injections, or a combination of these methods.

Gestational diabetes

Gestational diabetes is characterised by glucose intolerance of varying severity that develops or is first recognised during pregnancy, mostly in the second or third trimester. It usually resolves after the baby is born, but can recur in later pregnancies and significantly increases the risk of developing type 2 diabetes in later life, both for the mother and the baby. Gestational diabetes can be often managed with changes to diet and exercise, while some cases require treatment with medication.

Other types of diabetes

Other types of diabetes are relatively uncommon, and are most typically related to certain conditions or syndromes that result in defects in insulin secretion, insulin action, or both. For some people with other types of diabetes, adequate glycaemic control can be achieved through diet and exercise or use of other medications. Some however, may also require insulin to manage their blood glucose.

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How many Australians have diabetes?

All diabetes

An estimated 1.2 million Australians (4.9% of the total population) had diabetes in 2017-18, based on self-reported data from the Australian Bureau of Statistics (ABS) 2017-18 National Health Survey. This estimate includes people with type 1 diabetes, type 2 diabetes, and type unknown, but excludes gestational diabetes.

Information based on self-reported data only is likely to underestimate the prevalence of diabetes as it does not include people with undiagnosed diabetes. The ABS 2011-12 Australian Health Survey, which included both measured and self-reported data showed that for every 4 adults with diagnosed diabetes, there was 1 who was undiagnosed.

Trends

The age-standardised prevalence rate of self-reported diabetes increased from 3.3% in 2001 to 4.4% in 2017-18. There was little change in the prevalence rate from 2014-15 to 2017-18 (Figure 1).

Figure 1: Prevalence of self-reported diabetes, by sex, 2001 to 2017-18

The chart shows a gradual increase in the prevalence of self-reported diabetes between 2001 and 2014-15 from just over 3% for both males and females to just over 5% for males and 4% for females. Among both males and females, the prevalence of self-reported diabetes remained fairly steady between 2014-15 and 2017-18.

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Age and sex

In 2017-18, the prevalence of diabetes (based on self-reported data):

- was higher for males (5.0%) than females (3.8%)
- increased steadily up to the 75 and over age group, with rates among those aged 65-74 more than 3 times as high as for those aged 45-54 (15.5% and 4.5%, respectively) and 1.5 times as high as those aged 55-64 (10.2%) (Figure 2).

Figure 2: Prevalence of self-reported diabetes, by age group and sex, 2017-18

The chart shows the increasing prevalence of diabetes in 2017-18 by age group from 1.0% for males and 0.9% for females in the 0-44 age group to 21% and 17% for males and females, respectively in the 75+ age group. The prevalence of diabetes was higher for males than females in all age groups from 45 years and over.

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Variations between population groups

In 2017-18, the prevalence of diabetes (based on self-reported data) was similar across remoteness areas, but varied by socioeconomic disadvantage (Figure 3). Proportions were:

- similar between *Major cities* (4.3%), *Inner regional* (3.9%) and *Outer regional and remote areas* (5.3%).
- around twice as high among those living in the lowest socioeconomic areas (6.7% and 5.8% for males and females, respectively) as in the highest socioeconomic areas (4.1% and 2.2% for males and females, respectively) (Figure 3).

Figure 3: Prevalence of self-reported diabetes, by sex, remoteness and socioeconomic areas, 2017-18

The chart shows slight variations in the prevalence of diabetes in 2017-18, for both males and females by level of remoteness with 4.3% in *Major cities*, 3.9% in *Inner regional areas* and 5.3% in *Outer regional and remote areas*. The prevalence of diabetes increased with the level of socioeconomic disadvantage for both males and females from 3.2% in the least disadvantaged areas up to 6.3% in the most disadvantaged areas.

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Aboriginal and Torres Strait Islander people

Around 7.9% of Indigenous Australians (64,100 people) had diabetes according to self-reported data from the ABS 2018-19 National Aboriginal and Torres Strait Islander Health Survey (ABS 2019b). This is similar to the 7.7% reported in the 2012-13 Australian Aboriginal and Torres Strait Islander Health Survey (ABS 2014).

After controlling for differences in the age structures between the populations, based on self-reported and measured results, Indigenous Australians were almost 3 times as likely to have diabetes as their non-Indigenous counterparts (12.6% compared with 4.3%).

References

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ABS 2014. Australian Aboriginal and Torres Strait Islander Health Survey: First results, Australia, 2012-13. ABS cat. no. 4727.0.55.001. Canberra: ABS.

ABS 2016. Microdata: National Health Survey, 2014-15. ABS cat. no. 4324.0.55.001. Findings based on Detailed Microdata File analysis. Canberra: ABS.

ABS 2019a. Microdata: National Health Survey, 2017-18. ABS cat. no. 4324.0.55.001. Findings based on Detailed Microdata File analysis. Canberra: ABS.

ABS 2019b. National Aboriginal and Torres Strait Islander Health Survey, 2018-19. ABS cat. no. 4715.0. Canberra: ABS.

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How many Australians have diabetes?

Type 1 diabetes

According to the National (insulin-treated) Diabetes Register (NDR), there were 2,800 new cases (incidence) of type 1 diabetes in Australia in 2018, equating to 12 cases per 100,000 population.

Trends

There were around 47,800 new cases of type 1 diabetes diagnosed between 2000 and 2018—an average of 7 new cases per day.

Incidence rates of type 1 diabetes remained relatively stable between 2000 and 2018, fluctuating between 11 and 13 new cases per 100,000 population. During this period, the incidence rate for 0-14 year olds was, on average, 1.4 times as high as for those aged 15-24, and 3.6 times as high as for those aged 25 and over (Figure 1).

Figure 1: Trends in incidence of type 1 diabetes, by age group and sex, 2000 to 2018

The chart shows the relatively stable trend in the incidence of type 1 diabetes between 2000 and 2018, for all age groups. Incidence rates were highest in the 0-14 age group with between 22 and 27 new cases per 100,000 population per year. The incidence rate dropped in the 15-24 age group to between 15 and 18 new cases per 100,000 and in the 25+ age group to between 6 and 9 new cases per 100,000 per year.

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Age and sex

In 2018:

- The incidence rate of type 1 diabetes was higher in males than females (14 and 10 per 100,000 population, respectively).
- Almost 3 in 5 (60%) new cases of type 1 diabetes were among children and young people aged under 25.
- The peak age group of diagnosis was 10-14 (36 and 32 per 100,000 for males and females, respectively) —more than 5 times the rate at ages 35-39 (10 and 4 per 100,000 for males and females, respectively) and more than 10 times the rate for those aged 75 and over (5 and 1 per 100,000 for males and females, respectively) (Figure 2).

Figure 2: Incidence in type 1 diabetes, by age group at diagnosis and sex, 2018

The chart shows the incidence of type 1 diabetes peaked in the 10-14 age group with 36 and 32 new cases per 100,000 population for males and females, respectively, in 2018. The incidence rate was higher for males than females in all age groups except 5-9 and 65-69 years.

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Variations between population groups

According to the NDR, the incidence of type 1 diabetes in 2018 was similar both by level of remoteness and level of socioeconomic disadvantage. The numbers ranged from:

- 11 per 100,000 population in *Major cities*, 14 per 100,000 population living in *Inner regional* and *Outer regional areas* to 9 per 100,000 population in *Remote and very remote areas*.
- 11 per 100,000 population living in the highest socioeconomic areas to 12 per 100,000 population living in the lowest socioeconomic areas (Figure 3).

Figure 3: Incidence in type 1 diabetes, by remoteness and socioeconomic areas, 2018

The chart shows the incidence of type 1 diabetes in 2018 was slightly higher among those living in *Inner regional* and *Outer regional areas* with 14 new cases per 100,000 population. The incidence rate was lowest among those living in *Remote and very remote areas* with 9 new cases per 100,000 population. Incidence rates were similar across all socioeconomic areas.

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Aboriginal and Torres Strait Islander people

According to the NDR, in 2018, there were 129 new cases of type 1 diabetes among Aboriginal and Torres Strait Islander people, equating to 16 cases per 100,000 population.

After adjusting for differences in the age structures between the populations, the incidence rate of type 1 diabetes was similar among Indigenous Australians and non-Indigenous Australians (12 and 11 cases per 100,000, respectively).

Prevalence of type 1 diabetes among children and young adults

There are currently no national data on the total number of cases (*prevalence*) of type 1 diabetes at all ages, but there are estimates for children and young adults. According to the NDR, around 20,700 children and young adults aged 0-24 had type 1 diabetes in 2018. This equates to 261 per 100,000 population, with a slightly higher rate among males compared with females (266 and 256 per 100,000 population, respectively).

In 2018, more than two-thirds (67%) of children and young adults with type 1 diabetes were aged 15-24 years (Figure 4). Overall, prevalence rates for type 1 diabetes among children and young adults have remained steady since 2013 (between 261 and 264 per 100,000 population).

Figure 4: Prevalence of type 1 diabetes among children and young adults, by age group and sex, 2018

The chart shows the prevalence of type 1 diabetes among children and young adults aged 0-24 in 2018. Prevalence rates increased with age and peaked in the 20-24 age group for males and females with 464 per 100,000 males and 421 per 100,000 females, respectively.

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In 2018, the prevalence of type 1 diabetes among children and young adults varied between population groups.

Prevalence rates:

- were higher in *Inner regional* and *Outer regional* areas (169 and 149 per 100,000 population, respectively) compared with *Major cities* and *Remote and very remote* areas (134 and 86 per 100,000, respectively).
- fluctuated across socioeconomic areas, and slightly higher overall among the lowest compared with the highest socioeconomic areas (263 and 235 per 100,000, respectively) (Figure 5).

Among Aboriginal and Torres Strait Islander children and young adults aged 0-24, there were 208 cases of type 1 diabetes per 100,000 population in 2018. After adjusting for differences in the age structure of the populations, Indigenous children and young adults were less likely to have type 1 diabetes as their non-Indigenous counterparts (197 and 232 per 100,000, respectively).

Figure 5: Prevalence of type 1 diabetes, children and young adults aged 0-24, by remoteness and socioeconomic areas, 2018

The chart shows the prevalence of type 1 diabetes among children and young adults aged 0-24 by remoteness and socioeconomic area in 2018. Prevalence of type 1 diabetes was similar across all socioeconomic areas (ranging from 235 per 100,000 population in the least disadvantaged to 263 per 100,000 in the most disadvantaged). Prevalence rates were higher in *Inner regional* and *Outer regional* areas (169 and 149 per 100,000 compared with 134 per 100,000 in *Major cities* and 86 per 100,000 population in *Remote and very remote* areas).

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How many Australians have diabetes?

Type 2 diabetes

Almost 1 million Australian adults (5.3% of those aged 18 and over) had type 2 diabetes in 2017-18, according to self-reported data from the Australian Bureau of Statistics (ABS) 2017-18 National Health Survey. Proportions were:

- slightly higher for men than women (6.1% and 4.6%, respectively). Age-specific rates for men were higher than women from age 45 onwards (Figure 1).
- relatively similar across *Major cities* (4.8%), *Inner regional* (4.2%) and *Outer regional and remote areas* (6.0%).
- around twice as high among those living in the lowest socioeconomic areas (7.0%) compared with the highest socioeconomic areas (3.3%) (Figure 2).

Information based on self-reported data only is likely to underestimate the prevalence of type 2 diabetes as many cases remain unreported, due to survey participants either not knowing or accurately reporting their diabetes status. For further information about self-reported data limitations, refer to [self-reported](#) in the glossary.

Figure 1: Prevalence of self-reported type 2 diabetes, among persons aged 18 and over, 2017-18

The bar chart shows the prevalence of type 2 diabetes increased rapidly from the 18-44 to 75+ from around 1% for both sexes to 19% for men and 15% for women. The rates in the 75+ age group were 5 times that of the 45-54 age group. The prevalence of type 2 diabetes increased more rapidly for men than women from the 45-54 age group. Prevalence for men was 1.6 and 1.3 times higher for men than women in the 65-74 and 75+ age groups, respectively.

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Figure 2: Prevalence of self-reported type 2 diabetes, among persons aged 18 and over, by sex, remoteness and socioeconomic areas, 2017-18

The chart shows the prevalence of type 2 diabetes among persons aged 18 and over was similar by remoteness area with 4.5% in *Major cities*, 4.2% in *Inner regional* areas and 6.0% in *Outer regional and remote areas*. Prevalence among men in these areas was 1.2-1.3 times as high as women. The prevalence of type 2 diabetes increased by level of socioeconomic disadvantage with those living in the lowest socioeconomic areas 1.6 times as likely to have type 2 diabetes as those living in the highest socioeconomic areas (7.4% and 4.5%, respectively). Prevalence was 1.2 to 2.0 times higher among men than women in all socioeconomic areas.

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Information on insulin use among people with type 2 diabetes is available from the National (insulin-treated) Diabetes Register (NDR). Around 17,000 people with type 2 diabetes began insulin treatment in 2018, equating to around 4,200 cases per 100,000 registrants with type 2 diabetes not previously using insulin. According to the NDR:

- incidence rates for insulin-treated type 2 diabetes were 1.7 times as high for females as males (5,400 and 3,200 per 100,000, respectively).
- almost all cases of insulin-treated type 2 diabetes (91%) occurred among those aged 40 and over.

Note: Incidence rates of insulin-treated type 2 diabetes for Indigenous registrants have been excluded from this report, as the NDR may underestimate the number of Aboriginal and Torres Strait Islander registrants with diabetes. For more information see the 'Methods and classifications' section of the Australian Institute of Health and Welfare's [Incidence of insulin-treated diabetes in Australia](#) report.

Reference

ABS 2019a. Microdata: National Health Survey, 2017-18. ABS cat. no. 4324.0.55.001. Findings based on Detailed Microdata File analysis. Canberra: ABS.

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How many Australians have diabetes?

Gestational diabetes

According to the National Hospital Morbidity Database, in 2017-18, around 1 in 6 females, aged 15-49 who gave birth in hospital, were diagnosed with gestational diabetes (16.1% or 43,100 women) (Figure 1).

The incidence rate for gestational diabetes increased with age, peaking at 31% for females aged 45-49 (Figure 2).

Between 2000-01 and 2017-18, the rate of females diagnosed with gestational diabetes in Australia tripled, from 5.2% to 16.1% (Figure 1). However, new diagnostic guidelines are likely to have had an impact on the number diagnosed with gestational diabetes in recent years, so caution should be taken when comparing rates over time.

Figure 1: Incidence of gestational diabetes, 2000-01 to 2017-18

The chart shows the incidence of gestational diabetes among females aged 15-49 in Australia from 2000-01 to 2017-18. Rates remained steady (between 5% and 6%) until 2012-13. The rate more than tripled between 2011-12 and 2017-18 to around 16%. Caution should be taken when comparing rates over time however, as this period saw the introduction of new diagnostic criteria, which, in addition to increasing risk factors in the population, is likely to have influenced the numbers of females being diagnosed.

Points in the chart indicate the timing of relevant events leading up to the changing diagnostic criteria. These include the publication of the HAPO Study in 2008, the development of new IADPSG guidelines in 2010, the establishment of the NGDR in 2011, the endorsement of the IADPSG guidelines by WHO in 2013 and ADIPS in 2014.

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Figure 2: Incidence of gestational diabetes, by age group, 2017-18

This figure shows the incidence of gestational diabetes by age group in 2017-18. Incidence rates increased steadily from 7 females per 100,000 in the 15-19 age group to 31 females per 100,000 women in the 45-49 age group.

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Variations between population groups

In 2017-18, the incidence of gestational diabetes was:

- similar by remoteness area.
- increased with the level of socioeconomic disadvantage. Females living in the lowest socioeconomic areas were 1.6 times as likely to be diagnosed with gestational diabetes as those living in the highest socioeconomic areas (21% and 13%, respectively) (Figure 3).

Figure 3: Incidence of gestational diabetes, by remoteness and socioeconomic area, 2017-18

This figure shows the incidence of gestational diabetes by remoteness area and socioeconomic area in 2017-18. Rates were similar by remoteness area yet increased with the level of disadvantage from around 13% in the least disadvantaged areas up to 21% in the most disadvantaged areas.

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Aboriginal and Torres Strait Islander females

In 2017-18, there were just over 1,700 new cases of gestational diabetes among Aboriginal and Torres Strait Islander females, equating to 13% of Indigenous females aged 15-49 who gave birth in an Australian hospital.

After adjusting for differences in the age structure of the populations, the incidence rate among Aboriginal and Torres Strait Islander females was similar to the rate among non-Indigenous females (17% and 16%, respectively).



Impact

Burden of disease

Burden of disease analysis assesses the health impact on a population of different diseases, conditions, injuries and risk factors. [The Australian Burden of Disease Study 2015](#) (AIHW 2019a) used information from a range of sources to quantify the fatal and non-fatal effects of these diseases.

Type 2 diabetes was the 12th largest contributor to Australia's disease burden in 2015, accounting for 2.2% of total burden of disease. The burden from type 2 diabetes increased slightly from 1.8% in 2003 to 2.2% in 2011, and remained unchanged between 2011 and 2015. Type 1 diabetes contributed to 0.3% of Australia's disease burden in 2015—unchanged from both 2003 and 2011.

In 2015, 4.7% of the total burden of disease was attributed to high blood plasma glucose levels (which includes diabetes and pre-diabetes).

Expenditure

In 2015-16, an estimated 2.3% (\$2.7 billion) of total disease expenditure in the Australian health system was attributed to diabetes (AIHW 2019b). Further information is available from the [Disease expenditure in Australia](#) report.

References

AIHW 2019a. [Australian Burden of Disease Study: impact and causes of illness and death in Australia 2015](#). Australian Burden of Disease series no. 19. Cat. no. BOD 22. Canberra: AIHW. Viewed 24 March 2020.

AIHW 2019b. [Disease expenditure in Australia](#). Cat. no. HWE 76. Canberra: AIHW. Viewed 24 March 2020.

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Hospital care for diabetes

All diabetes hospitalisations

There were about 1.2 million hospitalisations associated with diabetes in 2017-18, with 5% recorded as the principal diagnosis (the diagnosis largely responsible for hospitalisation) and 95% recorded as an additional diagnosis (a coexisting condition with the principal diagnosis or a condition arising during hospitalisation that affects patient management), according to the Australian Institute of Health and Welfare [National Hospital Morbidity Database](#). This represents 11% of all hospitalisations in Australia.

Note that hospitalisation data presented here are based on admitted patient episodes of care, including multiple events experienced by the same individual.

In 2017-18 there were around:

- 53,900 hospitalisations with diabetes as the [principal diagnosis](#). Of these hospitalisations, 29% were due to type 1 diabetes, 64% were due to type 2 diabetes, 5% were due to gestational diabetes and 1% were due to diabetes 'other or unspecified'.
- 1,149,000 hospitalisations with diabetes as an [additional diagnosis](#). Of these hospitalisations, 4% were due to type 1 diabetes, 90% were due to type 2 diabetes, 5% were due to gestational diabetes and 1% were due to diabetes 'other or unspecified' (Figure 1).

Figure 1: Hospitalisations by diabetes diagnosis type, 2017-18

The chart shows the majority of hospitalisations with diabetes as the principal diagnosis in 2017-18 were for type 2 diabetes (64%) followed by type 1 diabetes (29%), gestational diabetes (5%) and other or unspecified diabetes (1%). 90% of hospitalisations with diabetes as an additional diagnosis type were for type 2 diabetes. Type 1 diabetes and gestational diabetes represented 4% and 5% of these hospitalisations, respectively, with other or unspecified representing 1%.

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Hospital care for diabetes

Type 1 diabetes

Type 1 diabetes

There were around 63,700 hospitalisations where type 1 diabetes was recorded as the principal and/or additional diagnosis in 2017-18, with 15,700 as the principal diagnosis and 48,000 as an additional diagnosis.

Age and sex

In 2017-18, type 1 diabetes hospitalisation rates (as the principal diagnosis) were:

- similar among males and females overall (63 and 67 per 100,000 population, respectively).
- highest among young people aged 10-19 (96 and 118 per 100,000 for males and females, respectively) (Figure 2a).

Figure 2a: Type 1 diabetes hospitalisations (principal diagnosis), by age group and sex, 2017-18

The bar chart shows hospitalisations with type 1 diabetes as the principal diagnosis peaked in the 10-19 age group with 96 and 118 hospitalisations for males and females, respectively, per 100,000 population. Hospitalisation rates were 1.2 and 1.4 times higher for females than males in the 10-19 and 20-29 age group. Rates were similar or slightly higher for males in all other age groups.

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Overall, hospitalisation rates for type 1 diabetes showed a different age pattern when recorded as an additional diagnosis rather than the principal diagnosis—overall rates increased to age group 70-79 and then declined (Figure 2b).

Figure 2b: Type 1 diabetes hospitalisations (additional diagnosis), by age group and sex, 2017-18

The bar chart shows hospitalisations with type 1 diabetes as the additional diagnosis increased with age and peaked in the 70-79 age group (400 per 100,000 males and 326 per 100,000 females, respectively).

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Variations between population groups

In 2017-18, type 1 diabetes hospitalisation rates (as the principal and/or additional diagnosis) varied by remoteness and increased with socioeconomic disadvantage. Rates were:

- higher in *Inner regional* and *Outer regional* areas (329 and 272 per 100,000 population, respectively) compared with *Major cities* and *Remote and very remote* areas (230 and 198 per 100,000, respectively).
- 1.6 times as high among those living in the lowest socioeconomic areas as those living in the highest socioeconomic areas—313 and 193 per 100,000, respectively. This difference was similar for males and females (Figure 3).

Figure 3: Type 1 diabetes hospitalisations (principal and/or additional diagnosis), by remoteness and socioeconomic area, 2017-18

The bar chart shows type 1 diabetes hospitalisations (principal and/or additional diagnosis) in 2017-18 were slightly higher in Inner regional and Outer regional areas compared with Major cities and Remote and very remote areas, for both males and females. The chart also shows type 1 diabetes hospitalisations increased with the level of socioeconomic disadvantage in 2017-18. Similar for males and females, the rate per 100,000 population increased from 193 for the least disadvantaged areas up to 313 for the most disadvantaged areas.

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Aboriginal and Torres Strait Islander people

In 2017-18, there were around 3,100 hospitalisations for type 1 diabetes (as the principal and/or additional diagnosis) among Aboriginal and Torres Strait Islander people, a rate of 374 per 100,000 population.

After adjusting for differences in the age structure of the populations:

- the rate among Indigenous Australians was 1.9 times the rate for non-Indigenous Australians.
- the difference between Indigenous and non-Indigenous Australians was greater for males than females—2.2 times as high for males and 1.6 times as high for females.

Hospital care for diabetes

Type 2 diabetes

There were around 1.1 million hospitalisations with type 2 diabetes recorded as the principal and/or additional diagnosis in 2017-18, with 35,000 (3% of type 2 diabetes hospitalisations) as the principal diagnosis and 1,032,000 (97% of type 2 diabetes hospitalisations) as an additional diagnosis.

Age and sex

In 2017-18, type 2 hospitalisation rates (as the principal and/or additional diagnosis):

- were 1.4 times as high for males as females (4,300 and 3,100 per 100,000 population, respectively). Age-specific rates were higher among males than females from age 45 onwards.
- increased with age, with the majority (87%) of type 2 diabetes hospitalisations occurring in those aged 55 and over. Type 2 diabetes hospitalisation rates were highest among those aged 85 and over (31,400 and 19,900 per 100,000 for males and females, respectively) (Figure 4).

Figure 4: Type 2 diabetes hospitalisations (principal and/or additional diagnosis), by age group and sex, 2017-18

The bar chart shows the increasing rate of type 2 diabetes hospitalisations (principal and/or additional diagnosis) by age, peaking in the 75-84 and 85+ age groups for males and females with around 30,000 hospitalisations per 100,000 population for males and 20,000 hospitalisations per 100,000 for females. The type 2 diabetes hospitalisation rate was more than 1.5 times higher for males than females in each of the age groups from 65-74 and over.

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Variations between population groups

In 2017-18, type 2 diabetes hospitalisation rates (as the principal and/or additional diagnosis) increased with remoteness and socioeconomic disadvantage. Rates were:

- 2.5 times as high in *Remote and very remote* areas compared with *Major cities*. This gap was much larger for females than males—3.5 times as high for females (10,300 and 2,900 per 100,000 population, respectively) and 1.8 times as high for males (7,600 and 4,200 per 100,000, respectively).
- twice as high among those living in the lowest socioeconomic areas compared with those living in the highest socioeconomic areas. This difference was higher for females than males—more than 2.4 times as high for females (4,500 and 1,900 per 100,000, respectively) and 1.8 times as high for males (5,700 and 3,100 per 100,000, respectively) (Figure 5).

Figure 5: Type 2 diabetes hospitalisations (principal and/or additional diagnosis), by remoteness and socioeconomic areas, 2017-18

The bar chart shows type 2 diabetes hospitalisations (principal and/or additional diagnosis) in 2017-18 were notably higher in *Remote and very remote* areas, particularly for females with a hospitalisation rate of 10,262 per 100,000 population being around 3.5 times that of other areas. The rate for males was 7,571 per 100,000 population (1.8 times higher than for males living in other areas). The chart also shows the type 2 diabetes hospitalisation rate increased with the level of socioeconomic disadvantage in 2017-18. The rate per 100,000 population increased from 3,082 to 5,676 for males and 1,943 to 4,543 for females in the least to most disadvantaged areas, respectively.

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Aboriginal and Torres Strait Islander people

In 2017-18, there were around 70,000 hospitalisations for type 2 diabetes (as the principal and/or additional diagnosis) among Aboriginal and Torres Strait Islander people, a rate of 8,500 per 100,000 population.

After adjusting for differences in the age structure of the populations:

- the rate of type 2 diabetes hospitalisations among Indigenous Australians was 4.3 times the rate for non-Indigenous Australians.
- the difference in rates between Indigenous Australians and non-Indigenous Australians was greater for females than males—5.6 times as high for females and 3.2 times as high for males.



Hospital care for diabetes

Hospitalisations for gestational diabetes

For this web report, national estimates for gestational diabetes incidence are based on the number of hospitalisations of females aged 15-49 with a birth event and coexisting diagnosis of gestational diabetes. Total gestational diabetes hospitalisations however, may include multiple episodes of care and in other locations to where a birth event occurs.

In 2017-18, there were around 53,700 hospitalisations with gestational diabetes recorded as the principal and/or additional diagnosis. Most of these were recorded as an additional diagnosis (51,300 or 96% of gestational diabetes hospitalisations).

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Hospital care for diabetes

Hospital procedures for diabetes complications

There are no diabetes-specific hospital procedures. However, lower-limb amputation is often associated with diabetes.

Lower-limb amputation

For people with diabetes, high blood glucose levels can damage the nerves (peripheral neuropathy) and result in poor circulation (peripheral vascular disease) in the lower limbs, potentially causing ischaemia (reduced blood supply to tissues), gangrene and impaired wound healing. These complications may lead to foot ulcers and infections, and in the most severe cases, amputations of the affected toes, foot and lower leg. Diabetes is the leading cause of non-traumatic lower-limb amputation.

In 2017-18, there were just under 6,000 lower-limb amputations provided in hospital to patients with a principal and/or additional diagnosis of diabetes. Lower-limb amputations were more common among males and those aged 65 and over (with 76% and 58% of such amputations, respectively).

Note that hospitalisation data presented here provides counts on the total number of in-hospital episodes for amputations, but cannot determine the number of individuals undergoing amputation, the number of repeat amputations, nor establish the link between the amputation and diabetes.

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Deaths from diabetes

Diabetes contributed to about 16,700 deaths in 2018 (10.5% of all deaths) according to the AIHW [National Mortality Database](#). Diabetes was the underlying cause of death in around 4,700 deaths (28% of diabetes deaths). It was an associated cause of death in a further 12,000 deaths (72% of diabetes deaths).

Diabetes is far more likely to be listed as an [associated](#) cause of death rather than the [underlying](#) cause of death. This is because it is often not diabetes itself that leads directly to death, but one of its complications that will be listed as the underlying cause of death on the death certificate. When diabetes was examined as an associated cause of death, the conditions most commonly listed as the underlying cause of death were cancer, coronary heart disease and stroke.

Where diabetes was listed as the underlying and/or associated cause of death:

- 5% were due to type 1 diabetes (800 deaths)
- 56% were due to type 2 diabetes (9,500 deaths)
- 39% were due to other or unspecified diabetes (6,400 deaths).

Note: Examining only the underlying cause of death can underestimate the impact of diabetes on mortality (Harding et al. 2014). Further, deaths from diabetes are known to be under-reported in national mortality statistics, as diabetes is often omitted from death certificates as a cause of death (McEwen et al. 2011; Whittall 1990).

Trends

Diabetes death rates have remained relatively stable over the last 2 to 3 decades, both where diabetes is the underlying cause of death and where it is the underlying or associated cause of death. On average:

- diabetes was the underlying cause of death in around 3,300 deaths per year between 1985 and 2018, equating to death rates of 17-22 deaths per 100,000 population for males and 12-15 per 100,000 population for females.
- diabetes was the underlying or associated cause of death in around 13,300 deaths per year between 1997 and 2018, equating to death rates of 67-78 per 100,000 population for males and 41-49 per 100,000 population for females (Figure 1).

Figure 1: Trends in diabetes deaths (underlying or associated cause), by sex, 1997-2018

The chart shows that diabetes death rates (underlying or associated cause) have remained relatively stable from 1997 to 2018 for both males and females (67–78 per 100,000 males and 41–49 per 100,000 females).

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Age and sex

In 2018, diabetes death rates (as the underlying or associated cause):

- were 1.7 times as high for males as females (68 and 41 per 100,000 population, respectively). Age-specific rates for males were higher than females across all age groups.
- increased with age, with rates 2.8 times as high in those aged 85 and over (1,400 and 1,100 per 100,000 for males and females) compared with those 75-84 years (570 and 334 per 100,000 for males and females, respectively) (Figure 2).

Figure 2: Diabetes deaths (underlying or associated cause), by age group and sex, 2018

The chart shows that diabetes death rates (underlying or associated cause) increased with age and peaked in the 85 and over age group (1,436 and 1,092 per 100,000 for males and females). Diabetes death rates for males were 1.3 to 1.7 times higher than females across all age groups.

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Variations between population groups

Diabetes death rates (as the underlying or associated cause) increased with [remoteness](#) and [socioeconomic disadvantage](#):

The proportions in 2018 were:

- twice as high in *Remote and very remote* areas compared with *Major cities* (103 and 49 per 100,000 population, respectively). The difference was higher for females than males—2.7 times as high in *Remote and very remote* areas than in *Major cities* for females (104 and 38 per 100,000, respectively) and 1.6 times as high for males (101 and 64 per 100,000, respectively) (Figure 3).
- more than twice as high among those living in the lowest socioeconomic areas compared with those living in the highest socioeconomic areas (77 and 33 per 100,000, respectively). This gap was similar for males and females (Figure 3).

Figure 3: Diabetes deaths (underlying or associated cause), by remoteness and socioeconomic areas, 2018

The bar chart shows diabetes deaths (underlying or associated cause) by remoteness and socioeconomic area in 2018. Diabetes death rates was higher in *Remote and very remote* areas compared with *Major cities* for females (104 compared with 38 per 100,000 females) and males (101 compared with 64 per 100,000 males). Diabetes death rates were higher in the lowest socioeconomic areas compared with the highest socioeconomic areas for females (59 and 24 per 100,000 females, respectively) and males (97 and 45 per 100,000 males, respectively).

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Aboriginal and Torres Strait Islander people

Among Aboriginal and Torres Strait Islander people in 2018, there were 86 deaths per 100,000 population from diabetes (as the underlying or associated cause). The death rate was similar among Indigenous males and females (84 and 87 per 100,000, respectively). These data include people residing in New South Wales, Queensland, Western Australia, South Australia and the Northern Territory only.

After adjusting for differences in the age structure of the populations, the rate was 4 times as high among Indigenous Australians as non-Indigenous Australians (210 and 52 per 100,000 population, respectively).

The gap in the death rates between Indigenous and non-Indigenous Australians was higher among females than males– 5 times as high for females (200 and 38 per 100,000, respectively) and 3 times as high for males (217 and 68 per 100,000, respectively).

Reference

Harding JL, Shaw JE, Peeters A, Guiver T, Davidson S, Magliano DJ 2014. Mortality trends among people with type 1 and type 2 diabetes in Australia: 1997-2010. *Diabetes Care* 37.

McEwen L, Karter A, Curb J, Marrero D, Crosson J & Herman W 2011. Temporal trends in recording of diabetes on death certificates: results from Translating Research into Action for Diabetes (TRIAD). *Diabetes Care* 34: 1529-33.

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Related material

For more information on how deaths are registered, coded and updated, see [about deaths data](#).

Latest related reports

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Data

Data tables: [Diabetes 2020](#)

Download Data tables: [Diabetes 2020](#). Format: [XLS 613Kb](#) [XLS 613Kb](#)

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