



Incidence of insulin-treated diabetes in Australia

Web report | Last updated: 09 Dec 2020 | Topic: [Diabetes](#) |

Citation

AIHW

Australian Institute of Health and Welfare 2020. Incidence of insulin-treated diabetes in Australia. Cat. no. CDK 11. Canberra: AIHW. Viewed 31 August 2021, <https://www.aihw.gov.au/reports/diabetes/incidence-of-insulin-treated-diabetes>

Latest edition

Last updated 13/07/2021 v24.0

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About

The *Incidence of insulin-treated diabetes in Australia* web report presents the latest available data on new cases of type 1 diabetes and insulin-treated type 2 diabetes. It is part of the ongoing national reporting using the National (insulin-treated) Diabetes Register (NDR). The NDR is a linked data set, which includes data from the:

- National Diabetes Services Scheme (NDSS)
- Australasian Paediatric Endocrine Group (APEG)
- National Death Index.

The data are presented by age, sex, trends, population groups and geographic areas.

Cat. no: CDK 11

- [Fact sheet](#)
- [Data](#)

Findings from this report:

- In 2019, about 30,800 people began using insulin to treat their diabetes in Australia
 - Over 16,600 people started insulin to manage their type 2 diabetes—4,100 cases per 100,000 people with type 2 diabetes
 - Just over 3,100 people were diagnosed with type 1 diabetes—13 cases per 100,000 population
 - Around 1,800 (57%) people diagnosed with type 1 diabetes were aged under 25
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Last updated 31/08/2021 v2.0

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Incidence of insulin-treated diabetes in Australia

Diabetes is a chronic condition marked by high levels of glucose (sugar) in the blood. This is caused by the body being unable to produce insulin (a hormone made by the pancreas to control blood glucose levels) or to use insulin effectively, or both.

An estimated 1 in 20 (4.9% or 1.2 million) Australians had diabetes in 2017-18, based on self-reported data (ABS 2019).

All people with type 1 diabetes, and some with type 2, gestational or other forms of diabetes will require insulin replacement therapy to manage their condition.

The [fact sheet](#) and [supplementary data tables](#) presents the latest available data on new cases of insulin-treated diabetes, with a focus on type 1 diabetes and insulin-treated type 2 diabetes, in Australia. Data are from the 2019 National (insulin-treated) Diabetes Register (NDR).

References

ABS (Australian Bureau of Statistics) 2019. Microdata: National Health Survey, 2017-18. ABS cat. no. 4324.0.55.001. Findings based on detailed microdata file analysis. Canberra: ABS.

Last updated 24/08/2021 v18.0

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Data sources

National (insulin-treated) Diabetes Register

The National (insulin-treated) Diabetes Register (NDR) collects information about people who began using insulin as part of their treatment for diabetes since 1999.

The register includes most people diagnosed with type 1 diabetes since this time, as well as those with type 2 diabetes, gestational diabetes, and other less common forms of diabetes who use insulin to manage their condition.

The Australian Institute of Health and Welfare (AIHW) maintains the NDR, which is derived from 2 primary data sources:

- **The National Diabetes Services Scheme (NDSS)**

Established in 1987, the NDSS is an initiative of the Australian Government, administered with the assistance of Diabetes Australia. People with a diagnosis of diabetes by a health professional can register with the scheme. Once registered, they can access diabetes self-management information, services, and subsidised products—such as pens and needles to administer insulin, blood glucose test strips, insulin pump consumables, and continuous glucose monitoring products.

- **Australasian Paediatric Endocrine Group (APEG) state-based registers**

The APEG is a professional body that represents health professionals involved in managing and researching disorders of the endocrine system, including diabetes in children and adolescents. The APEG maintains clinic-based state and territory diabetes registers of children.

The capture of insulin-treated diabetes on the NDR depends on the coverage of these 2 primary data sources.

For more information see the [NDR data quality statement](#).

Last updated 16/11/2020 v5.0

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Methods and classifications

Comparison with previous reports

The methods to create the National (insulin-treated) Diabetes Register (NDR) have changed in recent years. These include:

- the way data are processed
- how eligibility for the NDR is determined
- changes to the method used to calculate the incidence of insulin-treated type 2 diabetes.

The derivation of the register applied these new methods retrospectively across all years. Because of these changes, results presented in this report and based on the NDR 2019 cannot be compared with earlier publications, or with results based on earlier NDR data.

Diabetes type on the NDR

A health practitioner classifies diabetes type at the time of NDSS registration. But misclassification can occur, as the symptoms of type 1 and type 2 diabetes can be similar, particularly in young adults.

Further, changes in the classification of diabetes type in the NDSS data in 2002-2003 might have resulted in people with insulin-treated type 2 diabetes being misclassified as having type 1 diabetes.

So, as part of processing information from the primary data sources to create the NDR, the reported diabetes type is checked against a set of criteria, and revised where necessary.

This algorithm (a method of calculation) assesses and reclassifies diabetes type for some registrants on the NDSS. The reclassified diabetes type has been used to calculate estimates by diabetes type for the NDR 2019.

The algorithm is based on age at diagnosis and the period between diagnosis and first insulin use, because of the correlation with diabetes type. The algorithm has been periodically updated in consultation with the AIHW Diabetes Expert Advisory Group. But with or without the algorithm, there will always be some level of misclassification.

More information on the algorithm is available [on request](#).

Incidence

Incidence is the number of new cases (of an illness or event) occurring in a population during a given period. Incidence can be described as either a whole number or rate relative to the total number of people at risk.

Incidence should not be confused with prevalence, which refers to the total number or proportion of cases (of an illness or event) in a population at a given point in time.

In this report incidence of insulin-treated diabetes is described over the calendar year—that is, the number of new cases from 1 January to 31 December in the year being reported.

Incidence rates

Throughout this report, incidence rates are calculated and presented based on the number of cases per 100,000 population.

For example, the incidence rate of:

- type 1 diabetes among males is calculated as a rate per 100,000 males in the Australian population
- insulin use among people with type 2 diabetes is calculated as a rate per 100,000 NDR registrants with type 2 diabetes not previously using insulin.

The denominator population used to calculate the incidence rates for insulin-treated type 2 diabetes has changed in recent years. As a result, the incidence rates presented in this web report cannot be compared with earlier publications or results based on earlier NDR data.

For more information see [Type 2 diabetes population](#).

Estimated resident populations

Population data were used to derive incidence rates of type 1 diabetes. Population data are sourced from the Australian Bureau of Statistics (ABS), and updated when revised or new estimates become available.

All population estimates that the ABS currently produces are based on area of usual residence. These estimated resident populations are derived from the ABS Census of Population and Housing, and adjusted for deaths, births and net migration.

The estimated resident populations used in this report are based on the population estimates for 30 June 2019.

The Aboriginal and Torres Strait Islander population is calculated from the Census. Because of the smaller Indigenous population, it is difficult to measure population changes accurately between Census years using the same methods as for the Australian population. As a result, the ABS has developed experimental estimates and projections based on the 2016 Census.

All calculations of rates for Aboriginal and Torres Strait Islander people use the Series B projected Indigenous populations for 2019.

Type 2 diabetes population

All registrants with type 2 diabetes with no record of insulin use were used as the denominator population to derive the incidence rates of insulin-treated type 2 diabetes.

The NDR derived data from the NDSS and APEG was used to identify the population with diagnosed type 2 diabetes. As most people with type 2 diabetes registered with APEG are also registered with the NDSS, the combined NDSS and APEG data are referred to in the web report as NDSS data.

The population data included all people with type 2 diabetes who were diagnosed between 2000 and 2019 and were still alive on 31 December of each year of analysis.

The coverage of the Australian population with type 2 diabetes registered with the NDSS is unknown, as not all people with type 2 diabetes need insulin treatment or register with the NDSS. The NDSS might underestimate people with type 2 diabetes who manage their diabetes primarily through diet, exercise, and medication.

The population for each year of the analysis was derived based on the diagnosis date of the registrants recorded on the NDSS and APEG. Although NDSS data are available from 1987, many people who registered with the NDSS in the early years of operation have a missing diagnosis date. Where diagnosis date was missing, registration date was used as a proxy to derive the population.

Due to concerns with the Aboriginal and Torres Strait Islander population derived from the NDSS, incidence data for insulin-treated type 2 diabetes by Indigenous status have been excluded from this report.

The NDSS might underestimate the number of Indigenous registrants because:

- identifying as being Aboriginal or Torres Strait Islander is voluntary
- people might access diabetes-related products through other programs
- the coding of Indigenous status on the NDSS has changed.

For more information, see [Indigenous status](#).

Age-specific rates

Age-specific rates provide information on incidence in an age group relative to the total number of people at risk in the same age group.

All age-specific rates in this report are presented as new cases per 100,000 population.

Rates were not reported if the number of new cases of insulin-treated diabetes was less than 5.

Age-standardised rates

Age-standardisation is a method used to eliminate the effect of differences in population age structures when comparing populations with different age structures, and where age affects the variable being compared.

All incidence rates presented in this report are age-standardised to the 2001 Australian population, and presented as age-standardised new cases per 100,000 population.

Age-standardised rates were not reported if the number of new cases of insulin-treated diabetes was less than 20. Age groups were combined where there were less than 30 cases in any age group to calculate age-standardised rates.

Geography

Remoteness area

Comparisons of regions in this report use the ABS Australian Statistical Geography Standard (ASGS) 2016 Remoteness Structure, which groups Australian regions into 6 remoteness areas: *Major cities*, *Inner regional*, *Outer regional*, *Remote*, *Very remote* and *Migratory*.

These areas are defined using the Accessibility/Remoteness Index for Australia (ARIA), which is a measure of the remoteness of a location from the services that large towns or cities provide. Accessibility is based on distance to a metropolitan centre.

A higher ARIA score denotes a more remote location. The category *Major cities* includes Australia's capital cities, except for Hobart and Darwin, which are classified as *Inner regional*. *Remote* and *Very remote* areas have been combined in this publication, and *Migratory* is excluded.

Further information on the ASGS is available on the [ABS website](#).

The coverage of the NDSS might be lower in *Remote and very remote* areas or across states and territories with large remote communities. This might influence estimates on the number of people with insulin-treated diabetes in these areas on the NDR.

The lower coverage might in part be due to the distribution of NDSS access points, which help deliver support services and products to people with diabetes in all states and territories. These access points are more limited in rural Australia, and unavailable in some remote communities, where other programs are sometimes available.

Primary Health Network

Primary Health Network (PHN) organisations connect health services across a specific geographic area (a PHN area). The Australian Government Department of Health defines the [boundaries](#).

There are 31 PHN areas that cover the whole of Australia. PHNs replaced the previous 61 Medicare Locals on 1 July 2015. The boundaries align with Local Hospital Network (LHN) boundaries (or equivalent), and take into account population size, LHN alignment, state and territory borders, patient flow, stakeholder input and administrative efficiencies. Not all PHNs directly align with the ABS ASGS structure.

Statistical area level 2 (SA2) data was combined up to the PHN area levels, using concordance files sourced from ABS for the analysis of type 1 diabetes.

PHN correspondence files are sourced from the ABS for the analysis of insulin-treated type 2 diabetes. For this update, statistical information is presented using the [2017 boundaries](#) of the 31 PHNs.

Table 1.1 shows the number of PHNs by state and territory. Three jurisdictions (Tasmania, the Northern Territory, and the Australian Capital Territory) are single PHNs. Their size, particularly in jurisdictions with large Indigenous populations (such as the Northern Territory and Western Australia), might mask important inter-area variation.

Incidence rates for PHNs with less than 20 new cases of insulin-treated diabetes in the reference period were not reported. In 2019, this affected the Northern Territory and Western Queensland PHNs.

Table 1.1: Number of PHNs, by state and territory

State/territory	Number of PHNs
New South Wales	10
Victoria	6
Queensland	7
Western Australia	3
South Australia	2
Tasmania	1
Australian Capital Territory	1
Northern Territory	1
Total	31

Socioeconomic area

Socioeconomic classifications in this report are based on the ABS Index of Relative Socio-economic Disadvantage (IRSD). Geographic areas are assigned a score based on social and economic characteristics of that area, such as income, educational attainment, public sector housing, unemployment, and jobs in low skill occupations.

A low score means an area has, on average, more low-income families, people with less training, and higher unemployment, and might be considered disadvantaged relative to other areas with higher scores.

High scores reflect a relative lack of disadvantage, rather than advantage, and the IRSD relates to the average disadvantage of all people living in a geographical area. It cannot be presumed to apply to all individuals living in the area.

For this report, the population is divided into 5 socioeconomic groups, with roughly equal populations (each about 20% of the total), based on the level of disadvantage of the statistical local area of their usual residence.

The first group includes the 20% of the population living in areas with the highest levels of relative disadvantage (referred to as Group 1, lowest).

The last group includes the 20% of the population living in areas with the lowest levels of relative disadvantage (referred to as Group 5, highest).

The IRSD values used in this report are based on the 2016 Census. Further information is available on the [ABS website](#).

Indigenous status

The NDR might underestimate the number of Aboriginal and Torres Strait Islander registrants with insulin-treated diabetes. Reasons are as follows:

- Indigenous status can only be reported for people who registered on the NDSS after 2005, due to changes in the way this variable is coded. Before 2005, data entry of Indigenous status coded all ‘unknown’ or ‘not stated’ responses to the Indigenous status question as ‘non-Indigenous’. In 2005, an extra value was added to indicate ‘inadequate/not stated’ where Indigenous status was not known. As a result, Indigenous status cannot be determined for 98% of people registered on the NDSS before 2005.
- Identifying as being of Indigenous origin on both data sources of the NDR (NDSS and APEG) is voluntary.
- Other programs that give Indigenous Australians access to diabetes-related products might result in lower registration rates for the NDSS, and subsequently the NDR, among Aboriginal and Torres Strait Islander people. For example, programs such as Aboriginal Medical Services and the National Aboriginal Community Controlled Health Organisation—provide Indigenous Australians access to free and subsidised products that people with insulin-treated diabetes need. In addition, NDSS access points are not always available in remote areas.

These factors might lead to an underestimation of the incidence of type 1 diabetes among Aboriginal and Torres Strait Islander people.

Last updated 9/11/2020 v3.0

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Notes

9 Dec 2020 - The Incidence of insulin-treated diabetes web report was updated with data from the National (insulin-treated) Diabetes Register. This is an update to the *Incidence of insulin-treated diabetes in Australia* web report released in March 2020.

25 Mar 2020 - The Incidence of insulin-treated diabetes web report was updated with data from the National (insulin-treated) Diabetes Register.

Data quality statement

The National (insulin-treated) Diabetes Register (NDR)

Last updated 8/12/2020 v8.0

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Data

Data tables: [Incidence of insulin-treated diabetes in Australia](#)

Download Data tables: [Incidence of insulin-treated diabetes in Australia](#). Format: [XLSX 92Kb](#) [XLSX 92Kb](#)

Last updated 4/02/2020 v1.0

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Archived content

The archived web report and fact sheet provides previously available data for the incidence of insulin-treated diabetes in Australia from the 2018 National (insulin-treated) Diabetes Register.

[Web report: Incidence of insulin-treated diabetes in Australia](#)

[Download Web report: Incidence of insulin-treated diabetes in Australia. Format: PDF 529Kb PDF 529Kb](#)

[Fact sheet: Incidence of insulin-treated diabetes in Australia, 2018](#)

[Download Fact sheet: Incidence of insulin-treated diabetes in Australia, 2018. Format: PDF 276Kb PDF 276Kb](#)

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Related material

Resources

[Fact sheet: Incidence of insulin-treated diabetes in Australia, 2019](#)

The fact sheet presents the latest available data on new cases of insulin-treated diabetes, with a focus on type 1 diabetes and insulin-treated type 2 diabetes, in Australia. Data are from the 2019 National (insulin-treated) Diabetes Register (NDR).

[Download Fact sheet: Incidence of insulin-treated diabetes in Australia, 2019. Format: PDF 273Kb PDF 273Kb](#)

[Presentation: Incidence of insulin-treated diabetes in Australia figures](#)

The PowerPoint includes figures presenting the latest available data on new cases of type 1 diabetes and insulin-treated type 2 diabetes, in Australia. Data are from the 2019 National (insulin-treated) Diabetes Register (NDR).

[Download Presentation: Incidence of insulin-treated diabetes in Australia figures. Format: PPT 930Kb PPT 930Kb](#)

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- [Cardiovascular disease](#) | 15 Jul 2020
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- [Incidence of gestational diabetes in Australia](#) | 04 Sep 2019

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- [Chronic disease](#)
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