Australian Government
Australian Institute of
Health and Welfare

Atrial fibrillation in Australia

Web report | Last updated: **18 Nov 2020** | Topic: Heart, stroke & vascular diseases

About

This report provides data on atrial fibrillation (AF) related hospitalisations, procedures and deaths in Australia, and identifies areas where additional data development activities will improve monitoring and surveillance.

In 2017–18, there were over 72,000 hospitalisations in Australia with AF and it was associated with 9.0% of deaths in 2018. Increases were observed over the recent decade in rates of AF hospitalisation and deaths, as well as the rates of procedures undertaken in hospitals for AF.

Cat. no: CDK 17

Findings from this report:

- In 2017-08, 0.7% of hospitalisations had a principal diagnosis of AF
- The age-standardised hospitalisation rate for AF (principal diagnosis) increased by 42% between 2000–01 and 2017–18
- AF (principal diagnosis) hospitalisation rate was 1.5 times as high for males as for females, in 2017-18
- The proportion of AF hospitalisations which had a cardiac ablation undertaken has increased steadily since 2004–05

What is atrial fibrillation?

Atrial fibrillation (AF) is a disturbance of the electrical system of the heart. It is the most common of a number of disorders referred to as 'arrhythmias' or 'dysrhythmias', in which the heart beats with an abnormal rhythm, and does not pump blood regularly or work as efficiently as it should (Verma & Wong 2019; NHFA 2016).

AF can vary in severity, from occasional episodes of electrical disturbance, to a chronic condition that can result in impairment of how the heart works, leading to poorer quality of life and a risk of stroke and/or heart failure.

Symptoms and causes

Often, people with AF do not know that they have it, and they do not experience any symptoms. Others may experience an irregular pulse, heart palpitations ('fluttering'), fatigue, weakness, discomfort, shortness of breath or dizziness.

The risk of developing AF is substantially higher in elderly individuals. Common causes of AF include long-term high blood pressure, coronary heart disease and valvular heart disease. Other risks for AF include obesity, having a thyroid condition, diabetes, chronic kidney disease, obstructive sleep apnoea, and smoking or consuming alcohol excessively. For some people, there is no apparent cause.

Stroke and heart failure risk

AF greatly increases the risk of stroke and strokes associated with AF are more severe, with a risk of death twice that of other stroke causes. An individual's risk may be even higher if their AF is associated with previous heart disease or with other chronic diseases (NHFA 2016). Primary care plays a key role in identifying AF, assessing the risk of stroke and commencing anticoagulant drug treatment when the benefits outweigh the risks.

Heart failure occurs more commonly than stroke in patients with AF (Odutayo et al. 2016). AF can lead to heart failure, and heart failure puts patients at greater risk for AF. AF and heart failure share risk factors, and patients who have both have more severe symptoms, and are at greater risk of mortality (Anter et al. 2009).

Treatment

Treatment for AF includes **medications** to control heart rate, and to thin the blood to prevent clotting and reduce the risk of having a stroke (AIHW 2017). Medication and lifestyle changes also help to manage common risk factors for cardiovascular disease (CVD).

People with prolonged or severe AF may undergo **cardioversion**. Electrical cardioversion is a hospital procedure which delivers a small electric shock to the heart to restore and maintain normal rhythm. Pharmacological cardioversion uses medicines to achieve the same purpose. After cardioversion, long-term medicines are often prescribed to help prevent AF from reoccurring.

Certain patients with AF benefit from **ablation**—this is a hospital procedure which inactivates small areas of tissue in the heart responsible for the abnormal electrical signals associated with AF.

Growing impact

The social, economic and public health impact of AF in Australia is growing. This can be attributed to a number of factors, including population ageing, changes in risk factor prevalence, better detection and improved CVD survival rates.

Clinical advances over recent decades have improved our understanding of the evolving impact of AF, leading to increased surveillance and improved diagnosis and treatment.

For more information on AF burden of disease and expenditure, see the Impact chapter.

References

AIHW (Australian Institute of Health and Welfare) 2017. Medicines for cardiovascular disease. Cat. no. CVD 80. Canberra: AIHW.

Anter E, Jessup M & Callans DJ 2009. Atrial fibrillation and heart failure—treatment considerations for a dual epidemic. Circulation 119:2516–25.

NHFA (National Heart Foundation of Australia) 2016. Atrial fibrillation: understanding abnormal heart rhythm. Canberra: NHFA.

Odutayo A, Wong CX, Hsiao AJ, Hopewell S, Altman DG & Emdin CA 2016. Atrial fibrillation and risks of cardiovascular disease, renal disease, and death: systematic review and meta-analysis. BMJ:354

Verma KP & Wong M 2019. Atrial fibrillation. Australian Journal of General Practice 48:694–9.

How many Australians have atrial fibrillation?

Currently, there are no national data sources that report on the total number of Australians who have AF.

Surveys and studies on sections of the Australian population suggest that AF affects approximately 2% of the general population—equivalent to more than 500,000 people in 2020.

The proportion affected increases with age. An estimated 5% of the Australian population aged 55 and over have AF.

Recent atrial fibrillation prevalence studies

- An estimated 2.2% of the general practice patient population in 2018-19 had a record of AF, compared to 1.8% reported for 2017-18 and 1.6% reported for 2016–17 (NPS MedicineWise 2020, 2019, 2018).
- In AusDiab, a longitudinal population-based study examining a number of chronic diseases including heart disease, 1.4% of participants aged 35 years and older had AF in 1999–2000. At follow-up 5 years later, new incident AF cases were identified at a rate of 2.0 per 1,000 person-years (Diouf et al. 2016).
- Rates of AF in international studies suggest that an estimated 5.4% of Australian adults aged 55 years and older had AF in 2014 (Ball et al. 2015).
- 2.5% of participants from 6 central Australian Aboriginal and Torres Strait Islander communities had AF in 2008–2009 (McGrady et al. 2012).

References

Ball J, Thompson DR, Ski CF, Carrington MJ, Gerber T & Stewart S 2015. Estimating the current and future prevalence of atrial fibrillation in the Australian adult population. Medical Journal of Australia 202:32–6.

Diouf I, Magliano DJ, Carrington MJ, Stewart S & Shaw JE 2016. Prevalence, incidence, risk factors and treatment of atrial fibrillation in Australia: The Australian Diabetes, Obesity and Lifestyle (AusDiab) longitudinal, population cohort study. International Journal of Cardiology 205:127–32.

McGrady M, Krum H, Carrington MJ, Stewart S, Zeitz C, Lee GA et al. 2012. Heart failure, ventricular dysfunction and risk factor prevalence in Australian Aboriginal peoples: the Heart of the Heart Study. Heart 98:1562–7.

NPS MedicineWise 2018. General practice insights report July 2016 – June 2017: a working paper. Sydney: NPS MedicineWise.

NPS MedicineWise 2019. General practice insights report July 2017 – June 2018. Sydney: NPS MedicineWise.

NPS MedicineWise 2020. General practice insights report July 2018 – June 2019. Sydney: NPS MedicineWise.

Hospital care for atrial fibrillation

Often, AF can be managed through the primary care that is provided by general practitioners, allied health services, community health services and community pharmacy. However, some patients with AF will need admission to hospital for investigation and management, and they may require surgical or therapeutic procedures during the admission. Other patients might be admitted to hospital for reasons other than AF, but their AF contributes to the care that they need in hospital—for example, people with AF who have a stroke.

Note that the hospitalisation data presented here are based on admitted patient episodes of care, which exclude non-admitted emergency department care, but can include multiple events experienced by the same individual. In 2018–19, over 27,400 patients were admitted to hospital following an emergency department presentation with AF as the principal diagnosis (AIHW 2020). Other patients who presented in emergency departments with AF would not have been admitted to hospital. Cardioversions performed in emergency departments are not captured in the data used for this report.

- Atrial fibrillation as prinicipal diagnosis (the diagnosis largely responsible for hospitalisation).
- Atrial fibrillation as prinicipal diagnosis or additional diagnosis.
- Hospital procedures for the treatment of atrial fibrillation.

References

AIHW (Australian Institute of Health and Welfare) 2020. Emergency department care 2018–19: Australian hospital statistics. Canberra: AIHW. Viewed 01 September 2020.

Hospital care for atrial fibrillation

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In 2017–18, there were over 72,000 hospitalisations in Australia with AF as a principal diagnosis (the diagnosis largely responsible for hospitalisation). This represents an age-standardised rate of 248 hospitalisations per 100,000 population.

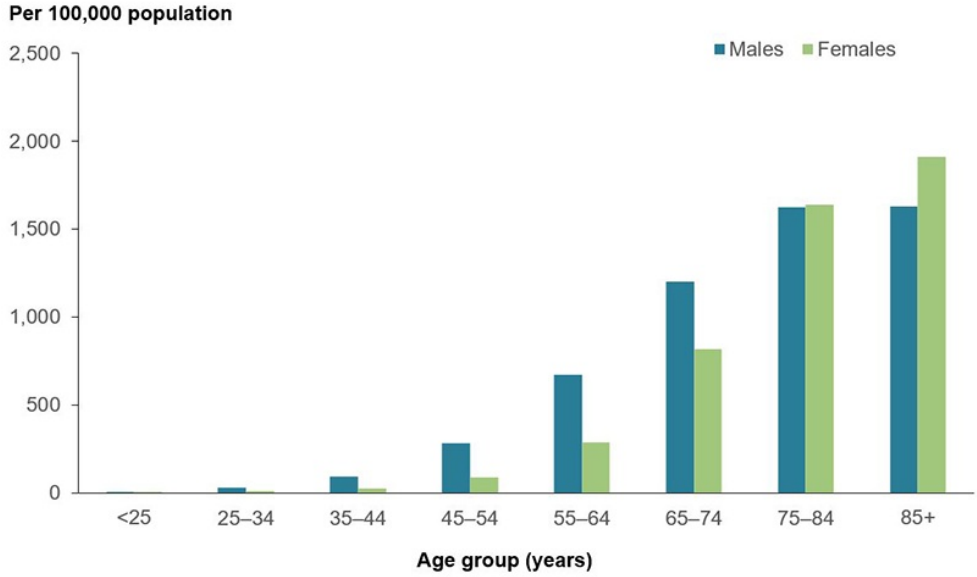
Hospitalisatons with AF as prinicipal diagnosis accounted for 0.7% of all hospitalisations, and 12% of all CVD hospitalisations in 2017–18. The average length of stay for hospitalisations with the principal diagnosis of AF was 2.4 bed-days, with 37% of AF hospitalisations discharged on the same day.

Age and sex

In 2017–18, AF hospitalisation rates as the principal diagnosis were:

- 1.5 times as high for males as for females (298 and 199 per 100,000 population)
- Higher among older age groups—the rate for persons aged 85 and over was almost 4 times as high as for the 55–64 year age group (1,804 and 477 per 100,000 population)
- Higher for males than females to age 65–74, similar at age 75–84, and higher for females than males at age 85 and over, reflecting the later onset of CVD and elevated risk of AF for older females (Figure 1).

Figure 1: Atrial fibrillation hospitalisation rates, principal diagnosis, by age and sex, 2017-18



Source: AIHW National Hospital Morbidity Database. (Data table 1)

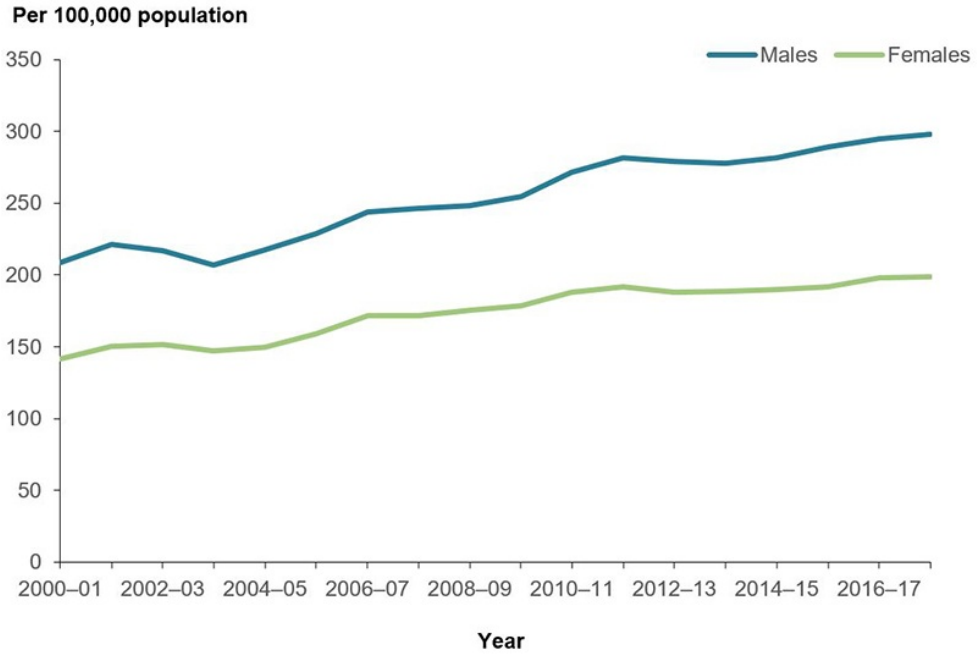
Trends

Between 2000–01 and 2017–18, the age-standardised rate of hospitalisations with a principal diagnosis of AF:

- increased by 42%, from 175 to 248 hospitalisations per 100,000 population
- rose from 209 to 298 per 100,000 population for males, and from 142 to 199 per 100,000 population for females (Figure 2).

There was also a relative increase in AF hospitalisations, from 0.5% of all hospitalisation and 8% of CVD hospitalisations in 2000–01, to 0.7% of all hospitalisations and 12% of CVD hospitalisations in 2017–18.

Figure 2: Atrial fibrillation hospitalisation rates, principal diagnosis, by sex, 2000-01 to 2017-18



Note: Age-standardised to the 2001 Australian population.
Source: AIHW National Hospital Morbidity Database. (Data table 3)

Given the rates of population ageing, hospitalisations for other CVDs and changes in rates of AF procedures, hospitalisations for AF rose at a greater rate than expected (Gallagher et al. 2019; Wong et al. 2012). The use of linked hospitalisations data in Western Australia has shown that the increase in that state was driven more by repeat hospitalisations for the same person, rather than new hospitalisations (Briffa et al. 2016; Weber et al. 2019).

Population groups

Aboriginal and Torres Strait Islander people

In 2017–18, there were 1,100 hospitalisations of Aboriginal and Torres Strait Islander people where AF was the principal diagnosis, at a rate of 139 hospitalisations per 100,000 population.

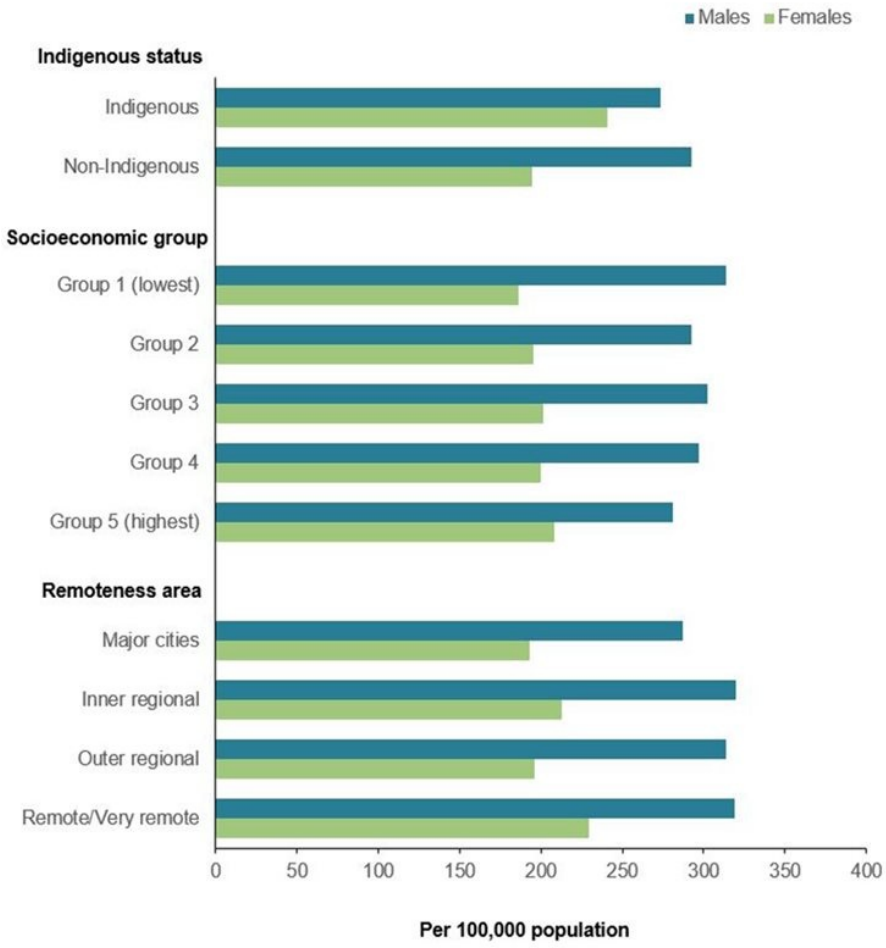
After adjusting for differences in the age structures between the populations, the rate of hospitalisations where AF was the principal diagnosis was similar for Indigenous and non-Indigenous males (273 and 292 per 100,000 population), but higher for Indigenous females compared with non-Indigenous females (241 and 195 per 100,000 population) (Figure 3).

Remoteness and socioeconomic position

In 2017–18, hospitalisation rates where AF was the principal diagnosis were:

- similar among socioeconomic groups (245 and 249 per 100,000 population in the lowest and highest socioeconomic groups), based on area of usual residence
- similar across remoteness areas (240 per 100,000 population in Major cities and 278 per 100,000 population in Remote and very remote areas) (Figure 3).

Figure 3: Atrial fibrillation hospitalisation rates, principal diagnosis, by sex and population group, 2017–18



Note: Age-standardised to the 2001 Australian population.
Source: AIHW National Hospital Morbidity Database. (Data table 5)

Primary Health Networks

A Primary Health Network (PHN) is an independent primary health care organisation established to commission health services to meet the identified and prioritised needs of people in their region, as well as work collaboratively within their regions to integrate health services at the local level to create a better experience for patients, encourage better use of health resources, and eliminate service duplication. In 2017–18, the age-standardised rate of hospitalisation for AF as a principal diagnosis varied across the 31 Australian PHN regions, ranging from 153 to 353 per 100,000 population (Data table 8).

The age-standardised rate was 2.3 times as high in the PHN region with the highest rate (Northern Territory) compared with the PHN region with the lowest rate (South Western Sydney).

For further analysis of geographic variations in AF hospitalisations by states/territories and by smaller local areas (Statistical Areas Level 3 (SA3s)), refer to ACSQHC (2017).

References

ACSQHC (Australian Commission on Safety and Quality in Health Care) 2017. The second Australian atlas of healthcare variation. Sydney: ACSQHC.

Briffa T, Hung J, Knuiman M, McQuillan B, Chew DP, Eikelboom J et al. 2016. Trends in incidence and prevalence of hospitalization for atrial fibrillation and associated mortality in Western Australia, 1995–2010. International Journal of Cardiology 208:19–25.

Gallagher C, Hendriks JML, Giles L, Karnon J, Pham C, Elliott AD et al. 2019. Increasing trends in hospitalisations due to atrial fibrillation in Australia from 1993 to 2013. Heart 105:1358–63.
Weber C, Hung J, Hickling S, Li I, McQuillan B & Briffa T 2019. Drivers of hospitalisation trends for non-valvular atrial fibrillation in Western Australia, 2000–2013. International Journal of Cardiology 276:273–7.

Wong CX, Brooks AG, Lau DH, Leong DP, Sun MT, Sullivan T et al. 2012. Factors associated with the epidemic of hospitalizations due to atrial fibrillation. American Journal of Cardiology 110:1496–9.

Hospital care for atrial fibrillation

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In hospitalisations where AF coexisted with a different principal diagnosis, and affected the care provided during hospitalisation, it was recorded as an additional diagnosis.

There were over 218,000 hospitalisations where AF was either the principal or additional diagnosis in 2017–18—an age-standardised rate of 729 hospitalisations per 100,000 population. Of these, one-third (33%) recorded AF as the principal diagnosis and two-thirds (66%) recorded AF as an additional diagnosis.

Hospitalisation of persons with AF as either the principal or additional diagnosis accounted for 1.9% of all hospitalisations in 2017–18.

Hospitalisations with AF as an additional diagnosis were more likely to involve a longer length of stay than admissions where AF was the principal diagnosis. The average length of stay for hospitalisations with either a principal or additional diagnosis of AF was 9.9 bed-days, with 6.2% of hospitalisations discharged on the same day.

Principal diagnoses where atrial fibrillation was an additional diagnosis

In 2017–18, the leading principal diagnoses where AF was an additional diagnosis included:

- other CVDs: heart failure, cerebral infarction (stroke), acute myocardial infarction (heart attack) and chronic ischaemic heart disease
- pneumonia
- sepsis
- chronic obstructive pulmonary disease (COPD)
- fracture of femur (Data table 10).

Population groups

Among population groups, when AF is considered as either a principal or an additional diagnosis, different patterns emerge compared to principal diagnosis alone. In 2017–18, AF hospitalisation rates (combined principal and additional diagnosis) were higher among Indigenous Australians, and increased with remoteness and socioeconomic disadvantage (Figures 4 and 5).

Aboriginal and Torres Strait Islander people

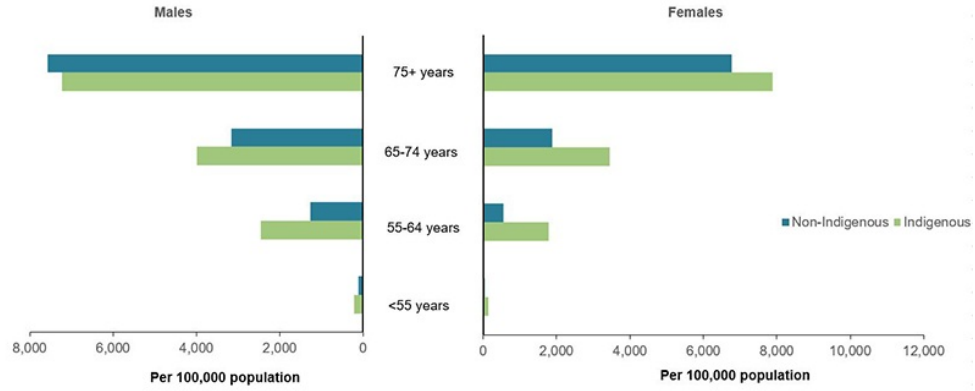
In 2017–18, there were 4,400 hospitalisations, where AF was the principal or additional diagnosis, for Aboriginal and Torres Strait Islander people. This represents a crude rate of 531 hospitalisations per 100,000 population

The hospitalisation rate, where AF was the principal or additional diagnosis, was:

- higher for Indigenous Australians than for non-Indigenous Australians across sex and age groups, with the exception of males aged 75 and over
- 2.0 times as high for Indigenous males aged 55–64 compared with non-Indigenous males aged 55–64 years (2,459 and 1,260 per 100,000 population)
- 3.3 times as high for Indigenous females aged 55–64 compared with non-Indigenous females aged 55–64 years (1,789 and 547 per 100,000 population) (Figure 4).

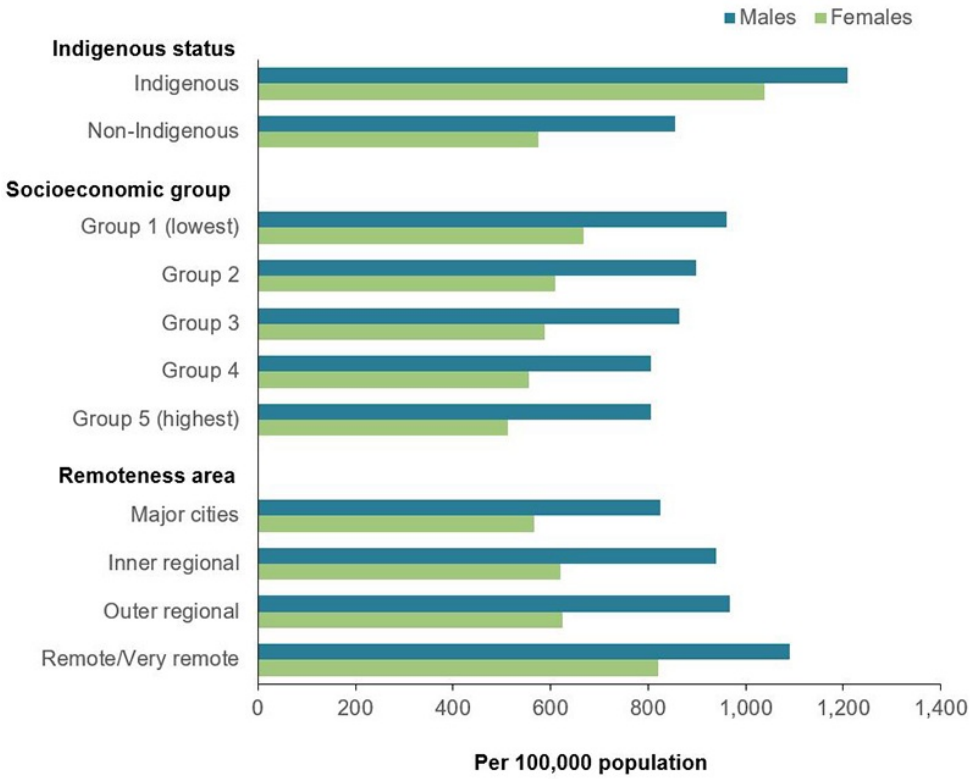
After adjusting for differences in the age structures between the population, the rate of hospitalisations, where AF was the principal or additional diagnosis, was 1.6 times as high for Indigenous Australians compared with non-Indigenous persons (1,123 and 710 per 100,000 population).

Figure 4: Atrial fibrillation hospitalisation rates, principal and additional diagnosis, by Indigenous status, age and sex, 2017–18



Source: AIHW National Hospital Morbidity Database. (Data table 7)

Figure 5: Atrial fibrillation hospitalisation rates, principal and additional diagnosis, by sex and population group, 2017–18



Note: Age-standardised to the 2001 Australian population.
Source: AIHW National Hospital Morbidity Database. (Data table 6)

Remoteness and socioeconomic position

In 2017–18, hospitalisation rates where AF was the principal or additional diagnosis were:

- 1.2 times as high in the lowest socioeconomic group compared with the highest socioeconomic group, based on area of usual residence (809 and 652 per 100,000 population)
- 1.4 times as high in Remote and very remote areas compared with Major cities (965 and 690 per 100,000 population) (Figure 5).

These patterns suggest that individual risk factors and social determinants, along with health service system factors such as recognition and diagnosis of AF, and access to elective investigation and management influence variation in hospitalisation rates among population groups (ACSQHC 2017; Katzenellenbogen et al. 2015).

A study using Western Australian data showed that Indigenous Australians with a first-time hospitalisation for AF were more likely to be younger and female than non-Indigenous Australians with a first-time hospitalisation for AF. Many of the CVD conditions associated with AF in the study had substantially higher incidence rates among Indigenous Australians, with differences in rates being much higher at younger ages and among women (Katzenellenbogen et al. 2015).

Primary Health Networks

The age-standardised rate of hospitalisation for AF as a principal or additional diagnosis was 2.6 times as high in the PHN region with the highest rate (Northern Territory, 1,293 per 100,000 population), compared with the PHN region with the lowest rate (Australian Capital Territory, 502 per 100,000 population) (Data table 9).

References

ACSQHC (Australian Commission on Safety and Quality in Health Care) 2017. The second Australian atlas of healthcare variation. Sydney: ACSQHC.

Katzenellenbogen JM, Teng THK, Lopez D, Hung J, Knuiman MW, Sanfilippo FM et al. 2015. Initial hospitalisation for atrial fibrillation in Aboriginal and non-Aboriginal populations in Western Australia. Heart 101:712–9.

Hospital care for atrial fibrillation

The hospital procedures in this report are a selection of procedures provided in hospital to admitted patients to treat AF (Data table 11).

Cardioversion

Electrical cardioversion is a therapeutic procedure which delivers a small electric shock to the heart to restore and maintain normal rhythm.

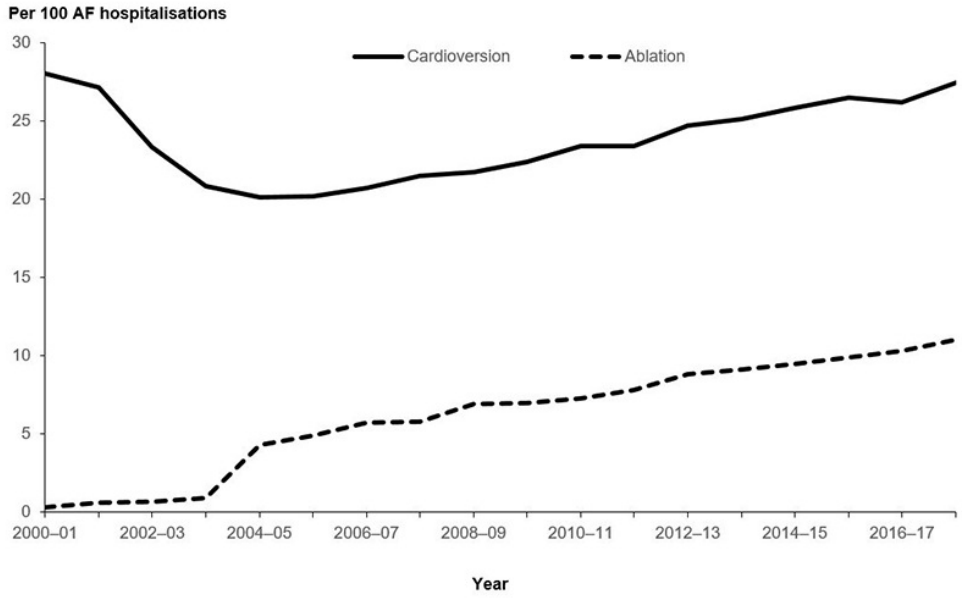
In 2017–18, there were 19,900 cardioversion procedures performed on persons with a principal diagnosis of AF, at a rate of 27 per 100 AF hospitalisations. The rate had declined during the early 2000s, but then rose to be similar to the rate in 2000–01 of 28 per 100 AF hospitalisations (Figure 6).

Cardiac ablation

Cardiac ablation is a therapeutic procedure where small areas of tissue in the heart responsible for AF are inactivated through application of heat or intense cold.

In 2017–18, there were 8,000 cardiac ablation procedures performed on persons with a principal diagnosis of AF, at a rate of 11 per 100 AF hospitalisations. This rate has increased from 0.3 per 100 AF hospitalisations in 2000–01 (Figure 6).

Figure 6: Rate of cardioversion and ablation procedures where principal diagnosis is atrial fibrillation, 2000–01 to 2017–18



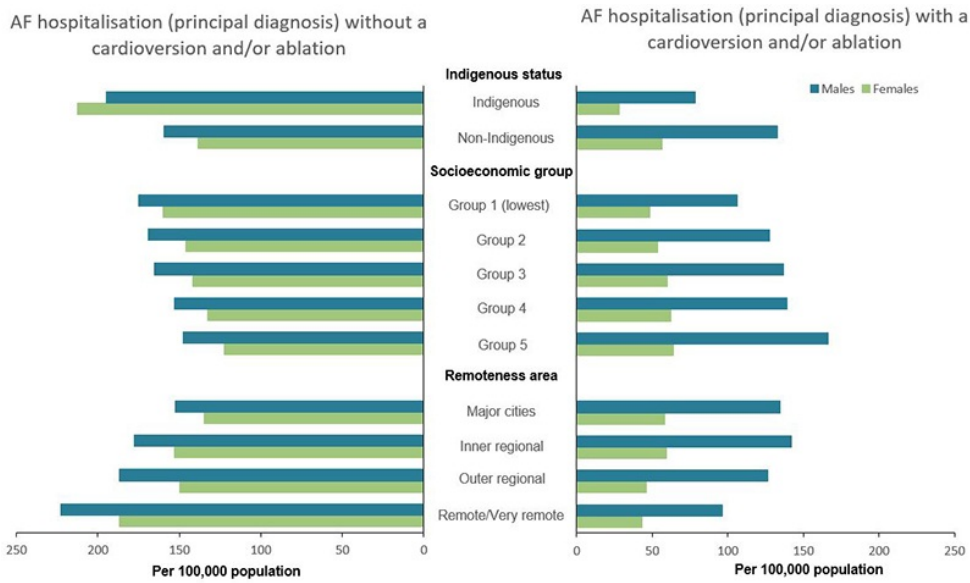
Note: Cardioversion includes Australian Classification of Health Interventions (ACHI) (10th edition) procedure code 13400-00. Cardiac ablation includes ACHI block number 601 plus procedure code 38212-01.
Source: AIHW National Hospital Morbidity Database. (Data table 12)

Population groups

Different population group patterns emerged among AF hospitalisations which included a cardioversion or ablation procedure compared with AF hospitalisations which did not (Figure 7).

In 2017–18, the proportion of AF hospitalisations that included either a cardioversion or an ablation procedure was higher for males compared with females. For males, the age-standardised rate of AF hospitalisations which included either a cardioversion or an ablation procedure was 135 per 100,000 population compared with 164 per 100,000 population for AF hospitalisations which did not. For females, the age-standardised rate of AF hospitalisations which included either a cardioversion or an ablation procedure was 57 per 100,000 population compared with 142 per 100,000 population for AF hospitalisations that did not.

Figure 7: Atrial fibrillation hospitalisation rates, principal diagnosis, with and without cardioversion or ablation procedure, by population group, 2017–18



Source: AIHW National Hospital Morbidity Database. (Data table 13)

In 2017–18, there were 254 hospitalisations of Aboriginal and Torres Strait Islander people where AF was a principal diagnosis and a cardioversion or ablation procedure was performed. This represented a rate of 31 per 100,000 population. There were 888 hospitalisations of Aboriginal and Torres Strait Islander people where AF was a principal diagnosis and no cardioversion or ablation procedure was performed. This represented a rate of 108 per 100,000 population (Data table 14).

The age-standardised rates of hospitalisation with a principal diagnosis of AF and with a cardioversion or ablation procedure were:

- 1.8 times as high in non-Indigenous Australians compared with Indigenous Australians (94 and 52 per 100,000 population)
- 1.4 times as high in Inner regional areas compared with Remote and very remote areas (100 and 72 per 100,000 population)
- 1.5 times as high in the least disadvantaged group compare with the most disadvantaged group, by area (113 and 77 per 100,000 population) (Figure 7).

The reverse patterns were seen for hospitalisations with a principal diagnosis of AF which did not include a cardioversion or ablation procedure. The age-standardised rates were:

- 1.4 times as high in Remote and very remote areas compared with Major cities (206 and 145 per 100,000 population)
- 1.2 times as high in the most disadvantaged group compared with the least disadvantaged group, by area (168 and 136 per 100,000 population)
- 1.4 times as high in Indigenous Australians compared with non-Indigenous Australians (207 and 150 per 100,000 population) (Figure 7).

Multiple factors underlie the differences in AF procedure rates among population groups. Geographical disparities in services and in clinical expertise are a barrier to accessing timely treatment for a number of cardiovascular conditions including AF, most notably affecting Indigenous Australians living in remote areas (AIHW 2019a).

High rates of cardioversion and ablation in males compared with females have been observed in European AF registry data (Schnabel 2017). In Australia, females also have lower CVD procedure rates than males for coronary angiography, percutaneous coronary intervention, coronary artery bypass graft, cardiac defibrillator implant and carotid endarterectomy (AIHW 2019b).

Clinical factors such as hospital admission practices, severity of AF, presence of comorbid conditions, and socioeconomic factors such as levels of private health insurance coverage, can also affect cardiac procedure rates among population groups (AIHW 2015).

References

AIHW (Australian Institute of Health and Welfare) 2015. Cardiovascular disease, diabetes and chronic kidney disease—Australian facts: Aboriginal and Torres Strait Islander people. Cat. no. CDK 5. Canberra: AIHW.

AIHW 2019a. Better Cardiac Care measures for Aboriginal and Torres Strait Islander people: fourth national report 2018–19. Cat. no. IHW 223. Canberra: AIHW.

AIHW 2019b. Cardiovascular disease in women. Cat. no. CDK 15. Canberra: AIHW.

Schnabel RB, Pecen L, Ojeda FM, Lucerna M, Rzayeva N, Blankenberg S et al. 2017. Gender differences in clinical presentation and 1-year outcomes in atrial fibrillation. Heart 103:1024–30.

Deaths from atrial fibrillation

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Most people with AF do not die from the condition, but from accompanying comorbidities and complications such as heart failure, myocardial infarction, stroke, chronic kidney disease, dementia or cancer. The complex causal interactions between AF and its comorbidities often leads to interdependence in disease development (Kornej et al. 2020).

AF is far more likely to be listed on a death certificate as an associated cause of death rather than the underlying cause of death, and so the most complete picture of the mortality burden of AF is obtained by examining deaths in which AF is listed as either an underlying or an associated cause of death.

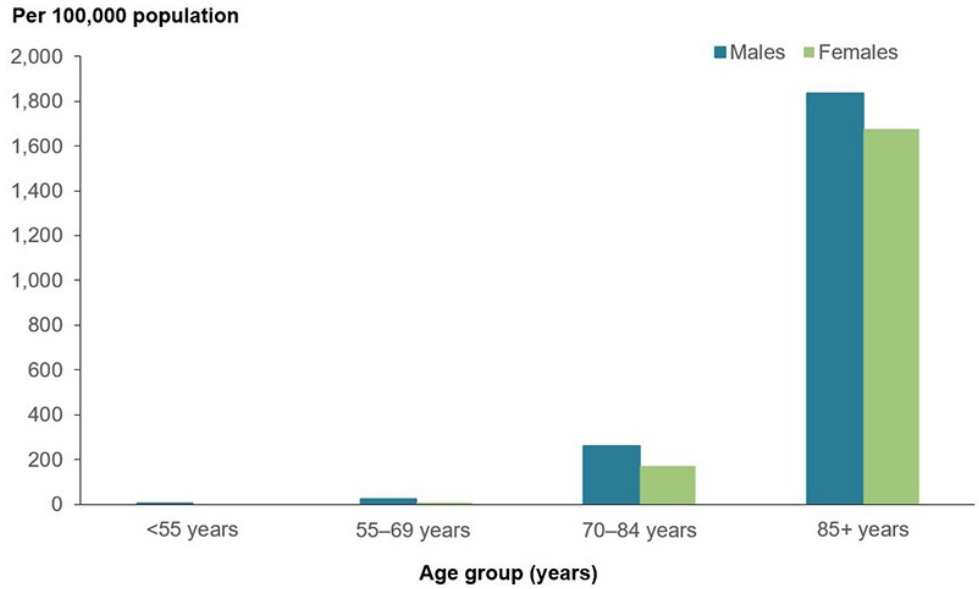
In 2018, AF was the underlying or associated cause of over 14,000 deaths in Australia—9.0% of total deaths.

Age and sex

In 2018, for deaths with an AF cause (underlying or associated):

- 62% of people were aged 85 and older
- just over half (52%) were female
- were 1.3 times as high for males as for females (49 and 37 per 100,000 population) when the rate was age standardised
- increased sharply with increasing age, from 17 per 100,000 population for persons aged 55–69 years, to 213 per 100,000 population for persons aged 70–84 years, to 1,736 per 100,000 population for persons aged 85 and over
- were higher, as a rate per population, for males than females in all age groups. The difference was largest in persons aged 55–69, with the male rate 2.4 times as high as the female rate (24 and 10 per 100,000 population). The relative difference decreased with increasing age (Figure 8).

Figure 8: Atrial fibrillation death rate, underlying and associated cause, by age and sex, 2018



Source: AIHW National Mortality Database. (Data table 15)

Population groups

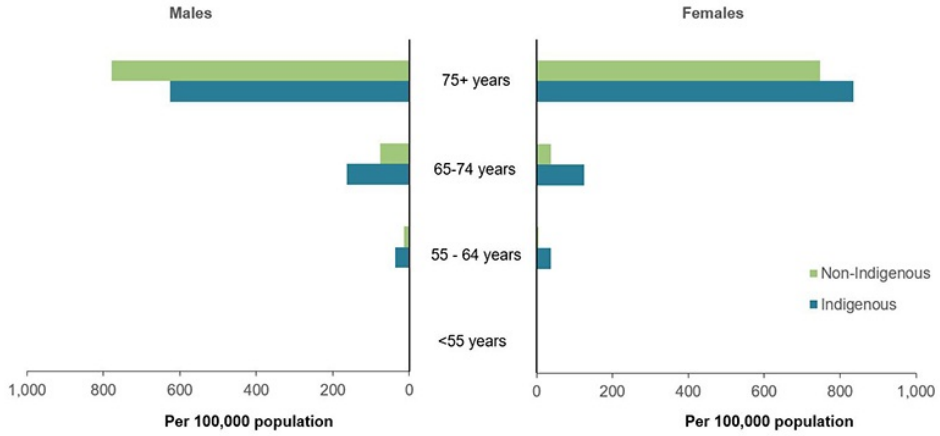
Aboriginal and Torres Strait Islander people

During the 3-year period 2016–2018, AF was a cause of death (underlying or associated) of 381 Aboriginal and Torres Strait Islander people in the 5 jurisdictions with adequate Indigenous identification. This represents a rate of 18 deaths per 100,000 population.

The death rate from AF was higher for Indigenous Australians than for non-Indigenous Australians across sex and age groups, with the exception of males aged 75 and over (Figure 9). The relative difference between Indigenous and non-Indigenous death rates was largest in younger age groups. Indigenous females aged 75 and over had a higher death rate from AF than Indigenous males, as well as both non-Indigenous males and females aged 75 and over (Figure 9). After adjusting for differences in the age structures between the populations, the rate of death among Indigenous Australians was 1.4 times as high as non-Indigenous Australians (63 and 44 per 100,000 population) (Figure 10).

Higher rates of fatal stroke among Indigenous Australians with AF have been associated with a higher prevalence of cardiovascular risk factors and vascular disease in younger age groups (Nedkoff et al. 2020).

Figure 9: Atrial fibrillation death rate, underlying and associated cause, by age, sex and Indigenous status, 2016–2018



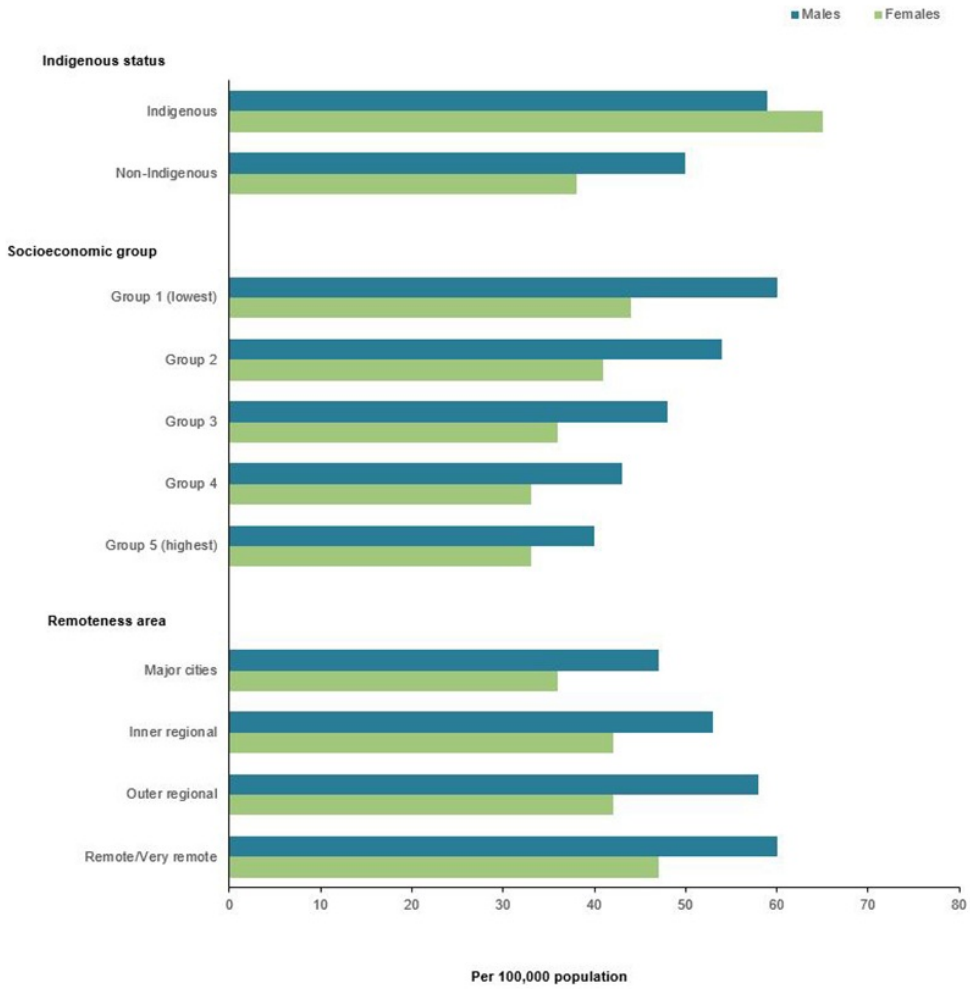
Source: AIHW National Mortality Database. (Data table 20)

Remoteness and socioeconomic position

During 2016–2018, AF death rates were:

- highest in Remote and very remote areas (53 per 100,000 population), followed by Outer regional areas, Inner regional areas and Major cities (50, 47 and 41 per 100,000 population, respectively)
- 1.4 times as high in the lowest socioeconomic group compared with the highest socioeconomic group (51 and 36 per 100,000 population) (Figure 10).

Figure 10: Atrial fibrillation deaths rate, underlying and associated cause, by population group, 2016–2018



Note: Age-standardised to the 2001 Australian population.
Source: AIHW National Mortality Database. (Data table 16)

Primary Health Networks

In 2018, the rates for death with an AF cause varied across 31 PHN regions, ranging from 20 to 66 deaths per 100,000 population (Data table 17).

The rate was 3.3 times as high in the PHN region with the highest rate (Western Queensland) compared with the PHN region with the lowest rate (Perth North).

Trends

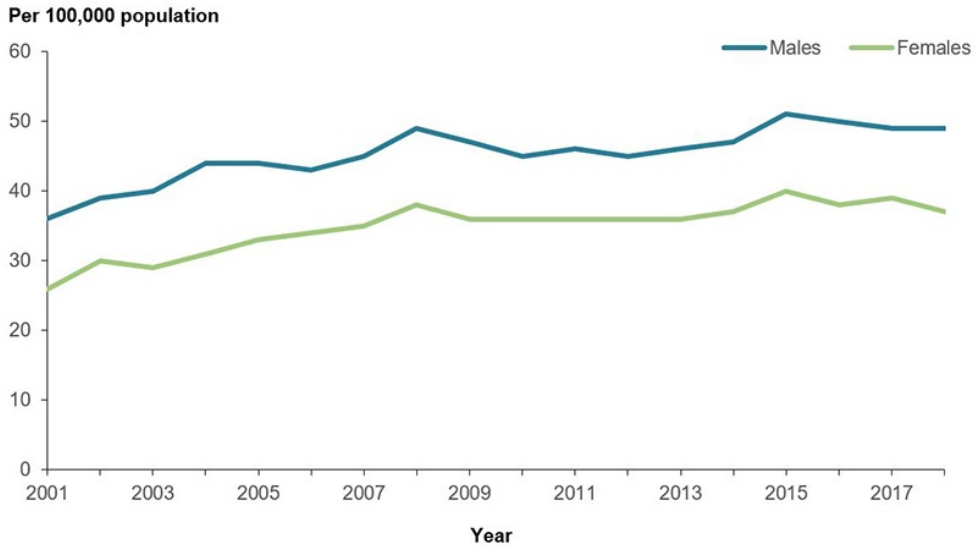
Between 2001 and 2015, there was a 50% relative increase in the age-standardised rate of deaths with an AF cause (underlying or associated) —from 30 per 100,000 population in 2001 to 45 per 100,000 population in 2015.

The trend then stabilised in the following 3 years to 2018.

The age-standardised death rate for males rose from 36 to 49 per 100,000 population between 2001 and 2018, and the female rate from 26 to 37 per 100,000 population (Figure 11).

AF was listed as an underlying or associated cause in 4.6% of all deaths in 2001, increasing to 9.0% of death in 2018.

Figure 11: Atrial fibrillation deaths rate, underlying and associated cause, by sex, 2001 to 2018



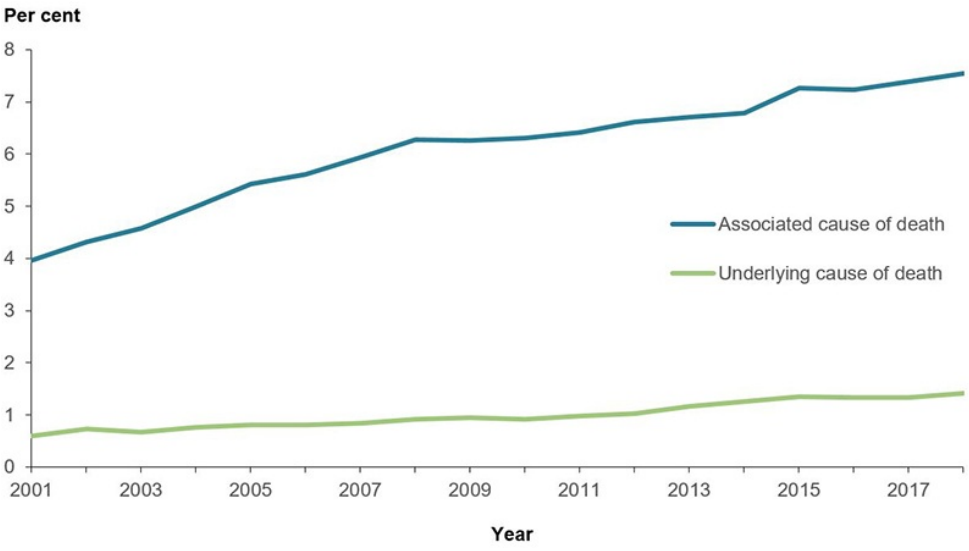
Note: Age-standardised to the 2001 Australian population.
Source: AIHW National Mortality Database. (Data table 19)

Atrial fibrillation as underlying cause of death

In 2018, AF was listed as the underlying cause of 2,235 deaths in Australia. The listed underlying cause of death is the condition, disease or injury that initiated the sequence of events leading directly to death; that is, the primary or main cause. For each death, only a single underlying cause is selected from all the conditions reported on a death certificate.

Between 2001 and 2018, the proportion of deaths in Australia with the underlying cause of AF increased 2.3-fold from 0.6% to 1.4% of all deaths (Figure 12).

Figure 12: Atrial fibrillation deaths as percent of total deaths, underlying cause and associated cause, 2001-2018



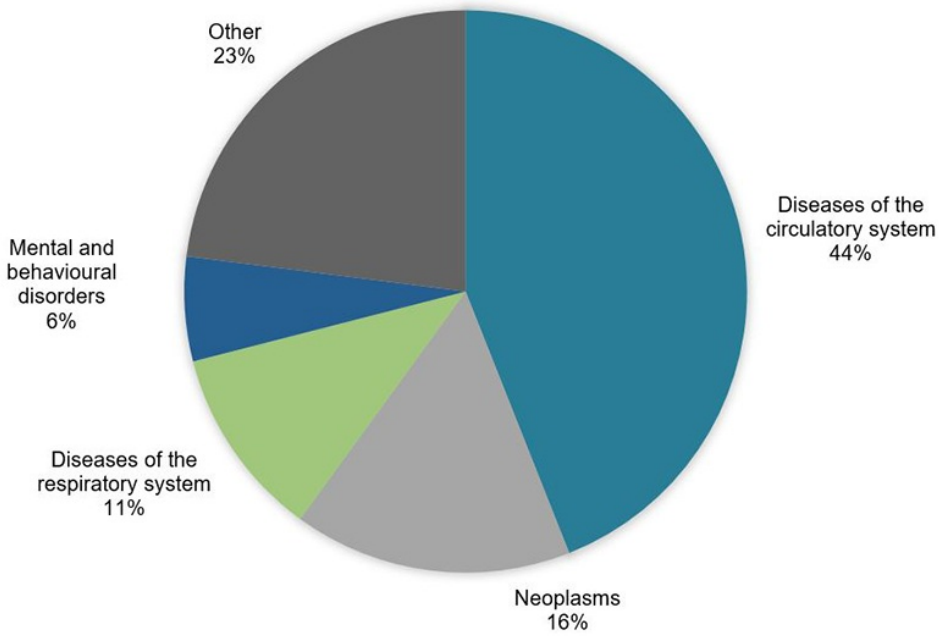
Source: AIHW National Mortality Database. (Data table 19)

Atrial fibrillation as associated cause of death

In 2018, AF was listed as an associated cause of 11,960 deaths in Australia—7.6% of all deaths. Between 2001 and 2018, the proportion of deaths in Australia with an associated cause of AF almost doubled, from 4.0% to 7.6% of all deaths (Figure 12).

Almost half (44%) of the deaths listing AF as an associated cause in 2018 had a disease of the circulatory system listed as the underlying cause (Figure 13).

Figure 13: Underlying causes of death when atrial fibrillation is an associated cause of death, 2018



Source: AIHW National Mortality Database.

At the specific disease level, the leading underlying causes of death where AF was listed as an associated cause included:

- chronic ischaemic heart disease (13.2%)
- acute myocardial infarction (heart attack) (6.7%)
- chronic obstructive pulmonary disease (COPD) (5.1%)
- stroke, not specified as haemorrhage or infarction (4.5%),
- unspecified dementia (4.4%). (Data table 18)

References

Kornej J, Borschel CS, Benjamin EJ & Schnabel RB 2020. Epidemiology of atrial fibrillation in the 21st century: novel methods and new insights. Circulation Research 127:4–20.

Nedkoff L, Kelty EA, Hung J, Thompson SC & Katzenellenbogen JM 2020. Differences in stroke risk and cardiovascular mortality for Aboriginal and other Australian patients with atrial fibrillation. Medical Journal of Australia 212:215–21.

Stroke and atrial fibrillation

AF greatly increases the risk of stroke, and this risk varies with the presence of risk factors and modifiers. Avoidance of stroke is 1 of the 3 patient management focal points of the 'Atrial fibrillation Better Care (ABC) holistic pathway: ('A' Anticoagulation/Avoid stroke; 'B' Better symptom management; 'C' Cardiovascular and Comorbidity optimization (Hindricks et al. 2020).

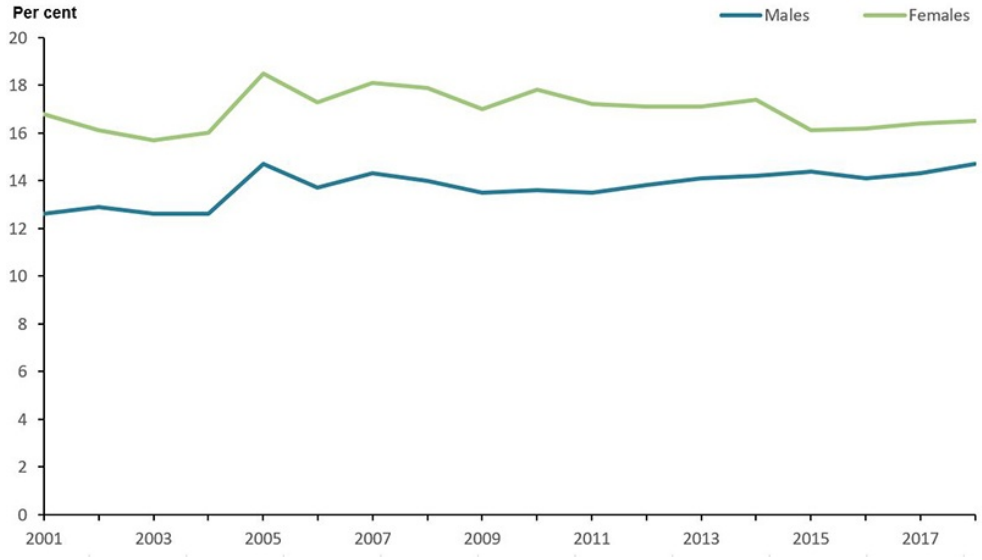
Stroke hospitalisation with atrial fibrillation as an additional diagnosis

In 2017–18, there were 39,053 acute hospitalisations with the principal diagnosis of stroke, and of these 6,059 (15.5%) had AF listed as an additional diagnosis. For female stroke hospitalisations, 16.5% had AF listed as an additional diagnosis and for males, 14.7%.

Between 2000–01 and 2017–18, the age-standardised rate of hospitalisation with a principal diagnosis of stroke was stable, from 169 per 100,000 population in 2000–01 to 133 per 100,000 population in 2017–18. The age-standardised rate of hospitalisation for stroke with an additional diagnosis for AF follow a similar trend, from 25 per 100,000 population in 2000–01 to 20 per 100,000 population in 2017–18 (Data table 21).

The percentage of hospitalisations for stroke in which AF was an additional diagnosis has remained relatively steady between 2000–01 and 2017–18 (Figure 14).

Figure 14: Percentage of hospitalisations for stroke, principal diagnosis, which had an additional diagnosis of AF, by sex, 2000-01 to 2017-18



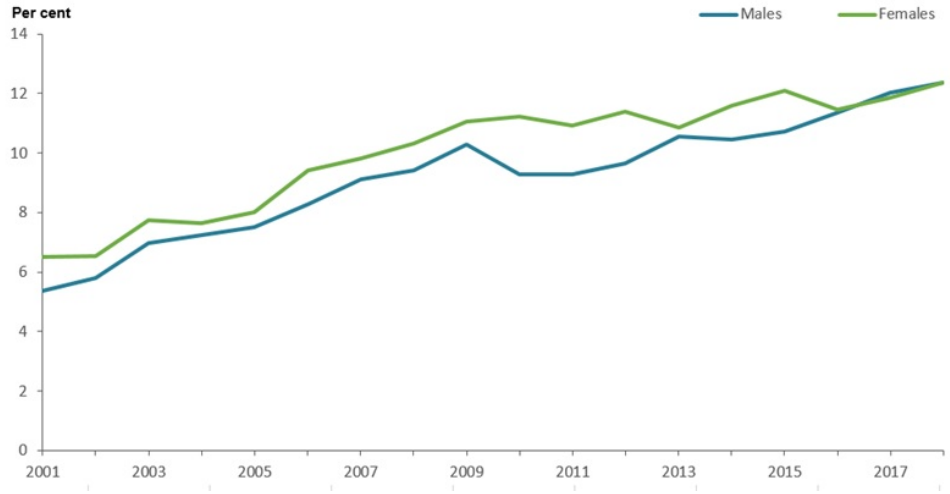
Source: AIHW National Hospital Morbidity Database. (Data table 21)

Stroke deaths with atrial fibrillation as an associated cause

In 2018, stroke was the underlying cause of 8,420 deaths—1,041 (12%) of these had AF listed as an associated cause. While more females died of stroke in 2018, (4,940 compared with 3,480 for males) the proportion of the deaths in which AF was listed as an associated cause was similar for males and females (both 12%).

Between 2001 and 2018, the age-standardised rate of stroke deaths decreased from 45 to 26 per 100,000 population. The age-standardised rate of stroke death with AF listed as an associated caused remained stable between 2001 and 2018, from 2.7 to 3.1 per 100,000 (Data table 22). The proportion of stroke death in which AF was listed as an associated cause increased over this period from 6% to 12% (Figure 15).

Figure 15: Percentage of stroke deaths, underlying cause, which had an associated cause of AF, by sex, 2000-01 to 2017-18



Source: AIHW National Mortality Database. (Data table 22)

References

Hindricks G, Potpara T, Dagres N, Arbelo E, Bax J, Blomström-Lundqvist C et al. 2020. ESC Guidelines for the diagnosis and management of atrial fibrillation developed in collaboration with the European Association of Cardio-Thoracic Surgery (EACTS): The Task Force for the diagnosis and management of atrial fibrillation of the European Society of Cardiology (ESC) Developed with the special contribution of the European Heart Rhythm Association (EHRA) of the ESC, European Heart Journal

Impact

Burden of disease

Burden of disease is a measure of the years of healthy life lost from living with, or dying from disease and injury. The measure used is the 'disability adjusted life year' (DALY). This measure combines health loss from living with illness and injury (non-fatal burden, or YLD) and dying prematurely (fatal burden, or YLL) to estimate total health loss (total burden, or DALY). 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.

The contribution of AF to the burden of disease has increased in recent decades:

- 3.7% of the CVD burden, and 0.65% of the total burden in 2003
- 5.6% of the CVD burden, and 0.85% of the total burden in 2011
- 6.9% of the CVD burden, and 0.94% of the total burden in 2015.

The contribution of AF to the total burden of disease increases with age—1.0% for age 65–69 years, increasing to 2.5% for age 85 and over in 2015.

Most of the contribution in 2015 was non-fatal (63%).

Between 2003 and 2015, there was a two-thirds increase in DALY burden associated with AF. The contribution of the following three 'drivers of change over time' has been estimated to be:

- 25% increase due to population growth
- 18% increase due to population ageing
- 22% due to the change in amount of atrial fibrillation (AIHW 2020).

Expenditure

An estimated $881 million was spent on the diagnosis and treatment of AF in 2015–16, equivalent to 8.4% of recurrent expenditure on CVD and 0.8% of recurrent expenditure on all health conditions (AIHW 2019b).

Close to two-thirds of expenditure on AF (67%) was for persons aged 65 years and over.

By area, over two thirds of allocated expenditure (69% or $609 million) was spent on hospital services. These included public hospital admitted patients ($329 million), private hospital services ($199 million), public hospital outpatients ($31 million) and public hospital emergency departments ($49 million).

Another 17% ($146 million) was spent on prescription pharmaceuticals dispensed through the Pharmaceutical Benefits Scheme.

The remaining 14% ($127 million) related to non-hospital medical services (primary care), comprising general practitioner services ($64 million), specialist services ($43 million), medical imaging ($3 million), pathology ($17 million) and allied health and other services ($1 million).

References

AIHW (Australian Institute of Health and Welfare) 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.

AIHW 2019b. Disease expenditure in Australia. Cat. no. HWE 76. Canberra: AIHW.

AIHW 2020. Australian Burden of Disease Study 2015: Interactive data on disease burden. Cat. no. BOD 24. Canberra: AIHW.

Atrial fibrillation data development areas

In Australia, the prevalence of non-hospitalised AF in the general population is largely unknown, and is not captured within currently available population health survey data.

There are a number of data development areas that will lead to a more comprehensive understanding of AF in Australia. These areas include the collection and reporting of AF across primary care, especially general practice and other settings, and the use of linked health services data.

Primary care data

Data on the management of AF in the general practice setting provides important information about people with AF diagnosed and managed in all settings including solely in the primary care setting. Ongoing and more detailed reporting, along with linkage to hospital, death and other administrative data will expand the capacity of primary care data sources to contribute to AF monitoring. Research projects are currently underway in this area.

General practice data can also provide a fuller picture of the associated comorbidities of patients with AF and their overall management.

Linked health services data

Analysis of linked hospitals data can provide important information about AF hospitalisation trends that cannot be determined from unlinked data, including the identification of repeat or first time hospitalisation.

Analysis of AF in linked hospitals data has occurred in Western Australia and this has improved understanding of hospitalisations at a person level (Briffa et al. 2016; Weber et al. 2019).

The National Integrated Health Services Information (NIHSI) Analysis Asset (AA) (NIHSI-AA), a national linked data analysis resource combining data from multiple AIHW-held health information sources, provides a future opportunity to explore AF hospitalisation trends for additional state and territory jurisdictions.

References

Briffa T, Hung J, Knuiman M, McQuillan B, Chew DP, Eikelboom J et al. 2016. Trends in incidence and prevalence of hospitalization for atrial fibrillation and associated mortality in Western Australia, 1995–2010. International Journal of Cardiology 208:19–25.

Weber C, Hung J, Hickling S, Li I, McQuillan B & Briffa T 2019. Drivers of hospitalisation trends for non-valvular atrial fibrillation in Western Australia, 2000–2013. International Journal of Cardiology 276:273–7.

Data sources, classifications and methods

This section outlines the data source, classifications and methods for analysing the data presented in the Atrial Fibrillation in Australia web report.

On this page

Data sources

The **National Hospital Morbidity Database (NHMD)** is a collection of episode-level records from the Admitted Patient Care National Minimum Data Set. It contains information on episodes of care for admitted patients in hospital, and includes demographic, diagnostic, outcomes, interventions and procedural information.

The scope of the NHMD is episodes of care for admitted patients in all public and private acute and psychiatric hospitals, free-standing day hospital facilities, and alcohol and drug treatment centres in Australia.

The counting unit in the NHMD is the 'separation', described as 'hospitalisations' in this report. 'Separation' is the term used to refer to the episode of admitted patient care, which can be a total hospital stay (from admission to discharge, transfer or death) or a portion of a hospital stay beginning or ending in a change of type of care (for example, from acute care to rehabilitation).

The hospital separations data do not include episodes of non-admitted patient care provided in outpatient clinics or emergency departments. Patients in these settings may be admitted subsequently, with the care provided to them as admitted patients being included in the NHMD. The following care types were excluded from analysis: 7.3 (newborn—unqualified days only), 9 (organ procurement—posthumous) and 10 (hospital boarder). Separations from Western Australia which were coded as being an 'Inter-hospital contracted patient to private sector hospital' were excluded based on advice from WA to avoid double counting of these separations.

This report includes analysis of hospitalisations in which AF was coded as a principal diagnosis and additional diagnosis.

- A principal diagnosis is recorded at separation and determined to be chiefly responsible for the patient's episode of care in hospital.
- An additional diagnosis is a condition or complaint either coexisting with the principal diagnosis or arising during the episode of admitted patient care. An additional diagnosis is reported if the condition affects patient management.

Analysis of procedures is included in this report.

- A procedure is a clinical intervention that is surgical in nature, carries a procedural risk, carries an anaesthetic risk, requires specialised training and/or requires special facilities or equipment available only in an acute-care setting.

The **National Mortality Database (NMD)** contains Cause of Death Unit Record File data provided to the AIHW by the Registries of Births, Deaths and Marriages and the National Coronial Information System (managed by the Victorian Department of Justice) and include cause of death coded by the Australian Bureau of Statistics (ABS). The data are maintained by the AIHW in the NMD.

Deaths registered in 2015 and earlier are based on the final version of cause of death data; deaths registered in 2016 are based on a revised version; and deaths registered in 2017 and 2018 are based on a preliminary version. Revised and preliminary versions are subject to further revision by the ABS.

Mortality data by Indigenous status are reported for 5 jurisdictions combined: New South Wales, Queensland, Western Australia, South Australia and the Northern Territory. The AIHW considers the quality of Indigenous identification in mortality data for these 5 jurisdictions to be adequate from 1998.

The analysis using the NMD includes deaths with AF listed as the underlying cause and listed as an associated cause:

- **Underlying cause of death** is the condition, disease or injury that initiated the sequence of events leading directly to death; that is, the primary or main cause. For each death, only a single underlying cause is selected from all the conditions reported on a death certificate.
- **Associated causes of death** are all causes listed on the death certificate, other than the underlying cause of death. They include the immediate cause, any intervening causes, and conditions that contributed to the death but were not related to the disease or condition causing the death.

Classifications

AF was classified in the NHMD using the International statistical classification of diseases and related health problems 10th Revision, Australian Modification (ICD-10-AM, 10th edition, ACCD 2019a) using code I48, and in the NMD as ICD-10 code I48.

Stroke was classified in the NHMD as (ICD-10-AM, 10th edition) codes I60–I64, and in the NMD as ICD-10 codes I60–I64.

The Australian Classification of Health Interventions (ACHI) procedure codes used in analysis of hospitalisations with the principal diagnosis of AF are presented in Table 1.

Table 1: Atrial fibrillation procedure codes used in analysis (ACHI 10th edition, ACCD 2019b)

	ACHI procedure code (block number)	**Description**
Cardioversion	13400-00 (Block:1890)	Defibrillation Electric countershock of heart Restoration of cardiac rhythm by electrical stimulation
Cardiac ablation	Block: 601	Destruction procedures on atrium
Cardiac ablation ***(in ACHI 4th and 5th editions only)***	38212-01 (Block: 665)	Cardiac electrophysiological study with radiofrequency ablation

Methods

Procedure rates

The procedure rate presented in this report is the number of hospitalisations in which AF was the principal diagnosis and the procedure of interest was undertaken, expressed as a rate per 100 hospitalisations in which AF was the principal diagnosis. Procedures or groupings of procedures were counted once only, regardless of whether the same procedure or grouping of procedures was conducted more than once in a hospitalisation.

Age-specific rates

Age-specific rates are calculated by dividing the number of cases occurring in a specified age group by the corresponding population in the same age group, expressed as a rate (for example, number per 100,000 population).

Age-standardised rates

Age-standardisation is a method of removing the influence of age when comparing populations with different age structures—either different populations at one time or the same population at different times. Direct age-standardisation was used in this report. The Australian estimated resident population as at 30 June 2001 has been used as the standard population.

Rate ratio

A rate ratio provides a measure of the relative difference in rates between 2 populations. A rate ratio of 1 indicates no difference in the rates between the populations; less than 1 indicates that the rate for population A (for example, females) is lower than that for population B (for example, males); and greater than 1 indicates that the rate for population A is higher than that for population B.

Analysing trends

This report presents trend data on AF hospitalisation, including procedures, and on death rates using data from the AIHW NHMD (for 2000–01 to 2017–18) and the NMD (from 2001 through to 2018). Age-standardised rates for hospitalisation and death rates, and the percentages of all death and all hospitalisations are presented for this time period. The percentage of change is calculated as the difference between the values of the first and last time periods, divided by the value in the first time period.

Remoteness

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. The 6 remoteness areas are 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.

Further information on the ASGS is available on the ABS website.

Socioeconomic areas

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. 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 the analyses in this report, the population is divided into 5 socioeconomic groups, with roughly equal populations (each around 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, most disadvantaged), while the last group includes the 20% of the population living in areas with the lowest levels of relative disadvantage (referred to as Group 5, least disadvantaged).

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

Aboriginal and Torres Strait Islander persons

In this report, comparisons are made between Aboriginal and Torres Strait Islander persons and people who do not identify as Indigenous.

People with 'not-stated' Indigenous status are excluded from any analysis by Indigenous status.

References

ACCD (Australian Consortium for Classification Development) 2019a. International statistical classification of diseases and related health problems, 10th Revision, Australian Modification (ICD-10-AM), 10th edition. Tabular list of diseases, and alphabetic index of diseases. Adelaide: Independent Hospital Pricing Authority.

ACCD 2019b. The Australian Classification of Health Interventions (ACHI), 10th edition. Tabular list of interventions, and alphabetic index of interventions. Adelaide: Independent Hospital Pricing Authority.

Data