

2.2 Atrial fibrillation hospitalisations 35 years and over

Context

This data item examines hospitalisations for atrial fibrillation in people aged 35 years and over based on their place of residence.

Atrial fibrillation is one type of abnormal heart rhythm, also referred to as an arrhythmia.¹ Atrial fibrillation begins in the upper heart chambers and causes them to quiver (fibrillate) instead of beating normally, meaning that the heart does not pump blood around the body as efficiently as it should. Blood clots can form, blocking the blood supply to vital organs.¹ Some people with atrial fibrillation experience symptoms such as fatigue and dizziness, but others may be unaware that they have this condition and are at risk of adverse outcomes without treatment.

Atrial fibrillation has been estimated to affect 6% of Australian men and 5% of Australian women aged 55 years and over.² Risk factors for atrial fibrillation include older age, long-term high blood pressure, overweight and obesity, obstructive sleep apnoea, coronary heart disease, valvular heart disease, diabetes, chronic kidney disease, exposure to stimulants such as alcohol, and family history.^{3,4}

Many patients have both heart failure and atrial fibrillation; risk factors for the two conditions are similar, and each condition can cause or worsen the other.⁴ For people with atrial fibrillation, coexisting heart failure increases the risk of hospitalisation for cardiovascular and other causes, and the risk of mortality.^{4,5}

Atrial fibrillation increases the risk of stroke, especially for older people and those with other comorbidities.^{1,4} For example, among people aged 80–89 years, atrial fibrillation increases the risk of stroke by 4.5 times.³ Treatment for atrial fibrillation may include medications to control the heart's rate, blood thinning (anticoagulant) medication to prevent the formation of blood clots and reduce stroke risk, and medication and lifestyle changes to manage the risk factors.^{1,3,6}

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For people with serious or prolonged episodes of atrial fibrillation, electrical or pharmacological cardioversion may be used to return the heart to a normal rhythm.^{1,3} To maintain normal rhythm after cardioversion, either long-term medications or, sometimes, surgery may be used. Selected patients with atrial fibrillation can benefit from catheter ablation, a procedure that delivers an electric current to the site of arrhythmias to restore and maintain normal rhythm.⁷

Between 1993 and 2007, the rate of hospitalisation for atrial fibrillation in Australia increased by 155%.⁸ Similar rises have been reported in other high-income countries.⁹ The ageing population may explain part of this rise. Other likely contributors include increases in overweight and obesity, increases in cardiovascular risk factors, and the increased survival rates for people with coronary artery disease and heart failure.^{2,10}

About the data

Data are sourced from the National Hospital Morbidity Database, and include both public and private hospitals. Rates are based on the number of hospitalisations for atrial fibrillation as a principal diagnosis per 100,000 people aged 35 years and over in 2014–15. These rates include paroxysmal, chronic and persistent atrial fibrillation.

People admitted to hospital with atrial fibrillation are sometimes transferred to other hospitals – for example, for care that cannot be provided in the hospital of initial admission. Transfers from other hospitals are excluded from the rates presented here. However, repeat admissions (other than interhospital transfers) within the year for one person are counted as separate admissions.

The analysis and maps are based on the residential address of the patient and not the location of the hospital. Rates are age and sex standardised to allow comparison between populations with different age and sex structures. Data quality issues – for example, the recognition of Aboriginal and Torres Strait Islander status in datasets – could influence the variation seen.

What do the data show?

Magnitude of variation

In 2014–15, there were 58,608 hospitalisations for atrial fibrillation as a principal diagnosis, representing 430 hospitalisations per 100,000 people aged 35 years and over (the Australian rate).

The number of hospitalisations for atrial fibrillation as a principal diagnosis across 322[†] local areas (Statistical Area 3 – SA3) ranged from 192 to 740 per 100,000 people aged 35 years and over. The rate was **3.9 times as high** in the area with the highest rate compared to the area with the lowest rate. The number of hospitalisations varied across states and territories, from 362 per 100,000 people aged 35 years and over in Tasmania to 537 in the Northern Territory (Figures 2.10–2.13).

After the highest and lowest 10% of results were excluded and 259 SA3s remained, the number of hospitalisations per 100,000 people aged 35 years and over was 1.7 times as high in the area with the highest rate compared to the area with the lowest rate.

Rates by SA3 for two additional years, 2012–13 and 2013–14, are available online at www.safetyandquality.gov.au/atlas.

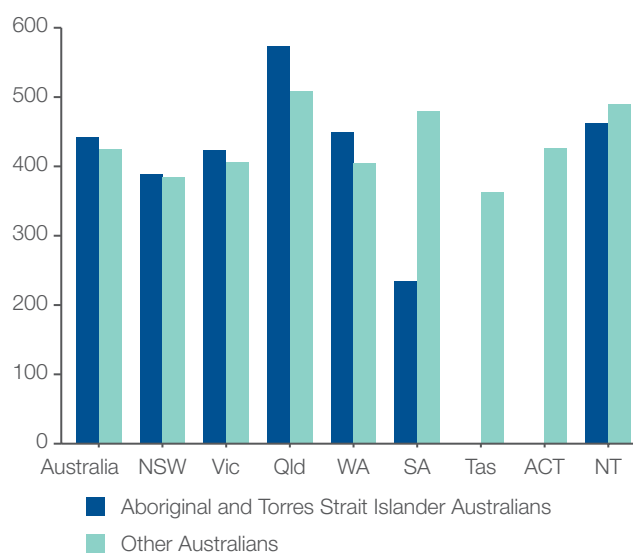
Analysis for remoteness and socioeconomic status

Rates decreased with socioeconomic disadvantage across major cities and regional areas. However, in remote areas, rates increased with socioeconomic disadvantage (Figure 2.14).

Analysis by Aboriginal and Torres Strait Islander status

The rate was similar for both Aboriginal and Torres Strait Islander Australians (442 per 100,000 people) and other Australians (425 per 100,000 people) (Figure 2.8).

Figure 2.8: Number of hospitalisations for atrial fibrillation (principal diagnosis) per 100,000 people aged 35 years and over, age and sex standardised, by state and territory and Indigenous status, 2014–15



The data for Figure 2.8 are available at www.safetyandquality.gov.au/atlas.

[†] There are 333 SA3s. For this item, data were suppressed for 11 SA3s due to a small number of hospitalisations and/or population in an area.

Notes:

Some of the published SA3 rates were considered more volatile than others. These rates are excluded from the calculation of the difference between the highest and lowest SA3 rates in Australia.

Rates are age and sex standardised to the Australian population in 2001.

Rates are based on the number of hospitalisations in public and private hospitals (numerator) and people in the geographic area (denominator).

Analysis is based on the patient's area of usual residence, not the place of hospitalisation.

Data for Tas and ACT (Aboriginal and Torres Strait Islander Australians) have been suppressed.

Data by Indigenous status should be interpreted with caution as hospitalisations for Aboriginal and Torres Strait Islander patients are under-enumerated and there is variation in the under-enumeration among states and territories.

For further detail about the methods used, please refer to the Technical Supplement.

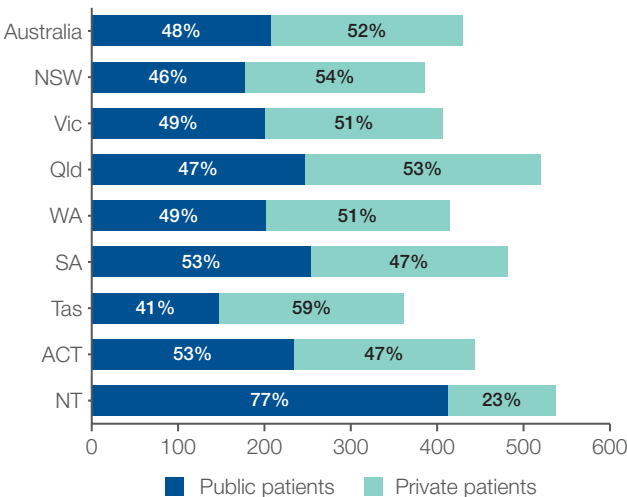
Sources: AIHW analysis of National Hospital Morbidity Database 2014–15 and ABS Estimated Resident Population 30 June 2014.

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Analysis by patient funding status

Overall, 52% of hospitalisations for atrial fibrillation as a principal diagnosis were for privately funded patients. This proportion varied from 23% in the Northern Territory to 59% in Tasmania (Figure 2.9).

Figure 2.9: Number of hospitalisations for atrial fibrillation (principal diagnosis) per 100,000 people aged 35 years and over, age and sex standardised, by state and territory and patient funding status, 2014–15



The data for Figure 2.9 are available at www.safetyandquality.gov.au/atlas.

Additional analysis

Atrial fibrillation hospitalisations, principal or additional diagnosis

The data item relates only to people admitted to hospital with atrial fibrillation as a principal diagnosis. However, more people are admitted with atrial fibrillation as an additional diagnosis. In 2014–15, there were 180,548 hospitalisations for atrial fibrillation as either a principal or additional diagnosis, representing 1,292 hospitalisations per 100,000 people aged 35 years and over (the Australian rate).

The number of hospitalisations with atrial fibrillation as either a principal or additional diagnosis across 324[^] local areas (SA3s) ranged from 898 to 2,169 per 100,000 people aged 35 years and over. The rate was **2.4 times as high** in the area with the highest rate compared to the area with the lowest rate. The number of hospitalisations varied across states and territories, from 1,129 per 100,000 people aged 35 years and over in Western Australia, to 1,999 in the Northern Territory.

For admissions where atrial fibrillation was either a principal or additional diagnosis, minimal variation was seen within metropolitan and regional areas according to socioeconomic disadvantage. A relatively higher rate was observed in remote areas at most socioeconomic disadvantage.

The rate of atrial fibrillation as either a principal or additional diagnosis was 1.4 times as high for Aboriginal and Torres Strait Islander Australians as for other Australians.

There are no data visualisations for atrial fibrillation as a principal or additional diagnosis; however rates by SA3 for 2014–15 are available online at www.safetyandquality.gov.au/atlas.

[^] There are 333 SA3s. For this item, data were suppressed for nine SA3s due to a small number of hospitalisations and/or population in an area.

Notes:

Rates are age and sex standardised to the Australian population in 2001.
Rates are based on the number of hospitalisations in public and private hospitals (numerator) and people in the geographic area (denominator).
Analysis is based on the patient's area of usual residence, not the place of hospitalisation.
Hospitalisations for public patients do not incur a charge to the patient or to a third party payer, for example a private health insurance fund.
Hospitalisations for private patients do incur a charge to the patient and/or a third party payer.
For further detail about the methods used, please refer to the Technical Supplement.

Sources: AIHW analysis of National Hospital Morbidity Database 2014–15 and ABS Estimated Resident Population 30 June 2014.

Interpretation

Potential reasons for the variation include differences in:

- The prevalence of risk factors such as coronary artery disease, diabetes, hypertension, heart failure and obesity
- Health literacy and the ability to self-manage cardiovascular conditions
- Rates of diagnosis of atrial fibrillation
- Access to effective, culturally appropriate primary care and cardiac care for Aboriginal and Torres Strait Islander Australians
- Use of therapies and lifestyle interventions to manage or prevent arrhythmias
- The availability and use of pathways and guidelines for managing atrial fibrillation in the community
- Admission practices, both in emergency departments and in primary care¹¹
- Levels of private health insurance and access to private hospitals
- Access to cardioelectrophysiologists, specialist physicians, and services that provide specialist management of heart rhythm disorders.

The Victorian Heart Health: Improved Services and Better Outcomes for Victorians policy, released in 2014–15, may have had an effect on subsequent atrial fibrillation hospitalisations in Victoria.

Expansion of the Northern Territory Integrated Cardiac Network Service in 2013–14 may have resulted in a plateauing of hospitalisation rates for atrial fibrillation in 2014–15.

This analysis shows lower rates of hospitalisation for atrial fibrillation as a principal diagnosis among people in areas of socioeconomic disadvantage in major cities and regional communities. Further investigation should involve exploring patterns of elective and emergency hospitalisations, and any variation in management of this condition.

The patterns seen in this analysis may reflect lower rates of recognition and diagnosis of atrial fibrillation among people living in socioeconomically disadvantaged areas, and lower access to private hospitals for elective investigation and management.

Addressing variation

An increased focus on primary prevention through reducing cardiovascular risk factors, including obesity and hypertension, is important for reducing overall rates of atrial fibrillation. Improving symptom control and management of comorbid conditions – particularly heart failure – should be targeted to improve quality of life and reduce hospitalisations among people with atrial fibrillation.⁵

Greater access to primary care and specialist cardiac clinics for patients with atrial fibrillation could provide patients with more advice and support to improve medication adherence and management of risk factors.¹² People in rural and remote areas face a number of barriers to accessing cardiac services, such as the cost of travel.¹² Initiatives are needed to increase access to cardiac specialist services in rural and remote locations.

Selected patients with atrial fibrillation can be managed in the emergency department rather than through hospitalisation, without increasing the rate of short-term readmission.¹¹

Ways to improve access to specialised advice for people living in rural and remote communities include expansion of telehealth facilities and outreach cardiology clinic services.

Between 10% and 30% of people with atrial fibrillation are undiagnosed, and are therefore not receiving therapy to prevent stroke.¹³ On average, Aboriginal and Torres Strait Islander Australians develop atrial fibrillation almost 20 years younger than do non-Indigenous Australians.¹⁴ A trial of opportunistic screening for atrial fibrillation among Aboriginal and Torres Strait Islander Australians in the Northern Territory is currently under way.¹⁴

Atrial fibrillation hospitalisations 35 years and over

A key issue in management of atrial fibrillation is preventing the serious consequences of blood clots that can form as a result of irregular heartbeats. Greater use of anticoagulant medication in appropriate patients would reduce the burden of death and disability caused by stroke in people with atrial fibrillation. Approximately one-third of people who had an ischaemic stroke had previously known or newly diagnosed atrial fibrillation in a Swedish study.¹⁵ Anticoagulant medication reduces the risk of stroke by approximately two-thirds, but only 40–60% of patients who are appropriate candidates receive anticoagulant therapy. In addition, some patients who are at moderate to high risk of stroke receive antiplatelet therapy (for example, aspirin) rather than more effective anticoagulant therapy.

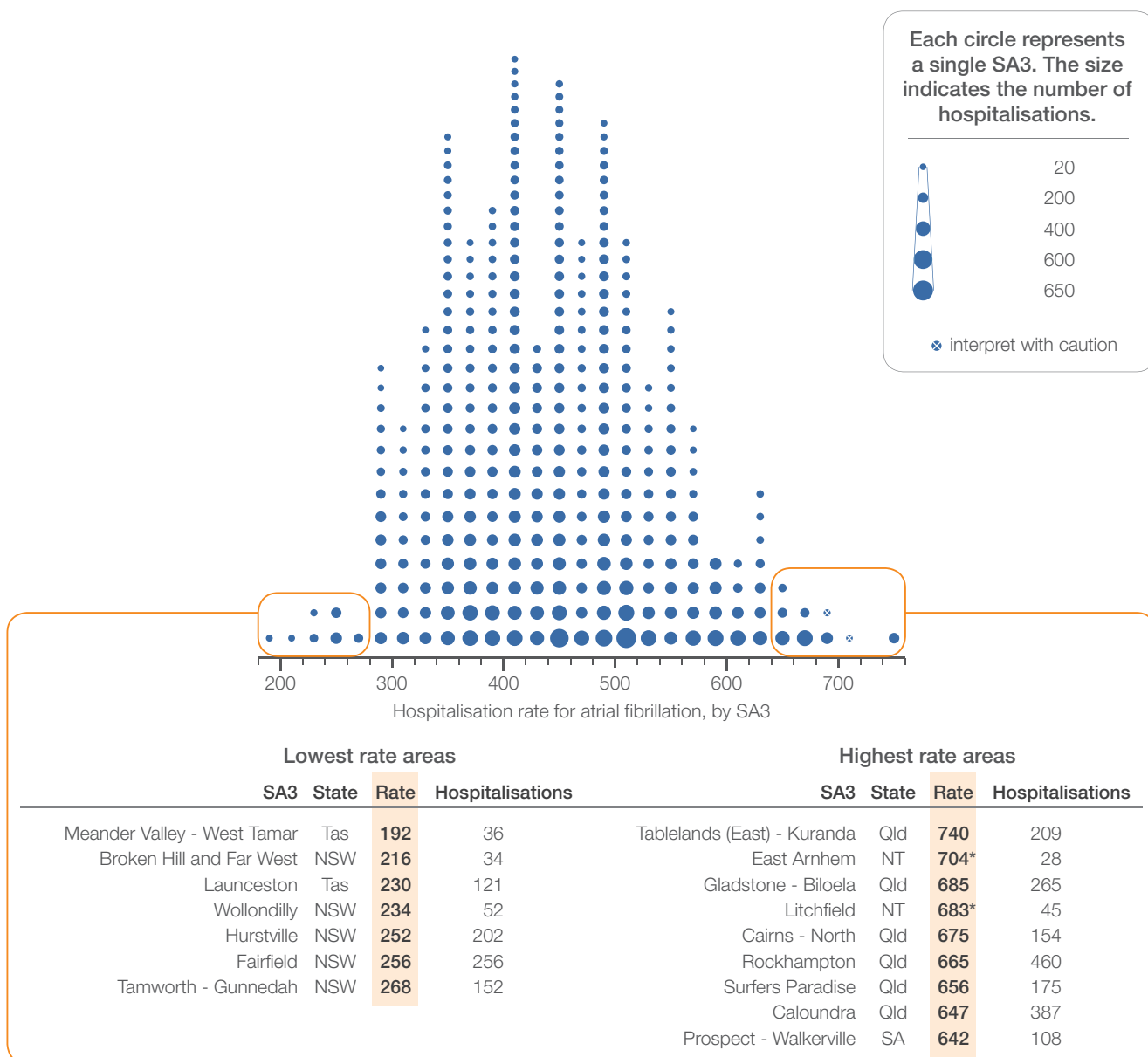
There are barriers to the use of anticoagulants. For example, use of warfarin requires frequent monitoring, and all anticoagulants are associated with a risk of bleeding, although this is generally outweighed by the benefit of anticoagulant therapy in reducing overall stroke incidence.¹³ Finding ways to improve risk assessment and remove or reduce prescribing barriers so that anticoagulants are used, where clinically appropriate, could lead to significant health gains.¹³

Warfarin has been the mainstay of anticoagulant therapy for many years. From 2011, novel oral anticoagulants, also known as non-vitamin K oral anticoagulants, added to the options available for stroke prevention in people with atrial fibrillation in Australia. In the year after novel oral anticoagulants were listed on the Pharmaceutical Benefits Scheme, the overall rate of anticoagulant therapy increased, while the rate of warfarin use decreased.¹⁶ Both types of anticoagulant therapy require careful patient selection and routine clinical monitoring to minimise the risks of clots and bleeding.¹⁷

Future analyses of variation should focus on geographic differences in use of therapies for atrial fibrillation. Examination of the prevalence and management of risk factors such as diabetes, hypertension and obesity could reveal further drivers of variation. The extent to which atrial fibrillation is a factor in hospitalisation for stroke should also be explored. Use of linked datasets for future analyses would help throw light on variations in use of effective primary and secondary prevention.

A clinical care standard on risk assessment and management of atrial fibrillation would be valuable, particularly for general practitioners in regional and remote areas, where access to specialist care is limited.

Figure 2.10: Number of hospitalisations for atrial fibrillation (principal diagnosis) per 100,000 people aged 35 years and over, age and sex standardised, by Statistical Area Level 3 (SA3), 2014–15



Notes:

Rates are age and sex standardised to the Australian population in 2001.

Rates are based on the number of hospitalisations in public and private hospitals (numerator) and people in the geographic area (denominator).

Analysis is based on the patient's area of usual residence, not the place of hospitalisation.

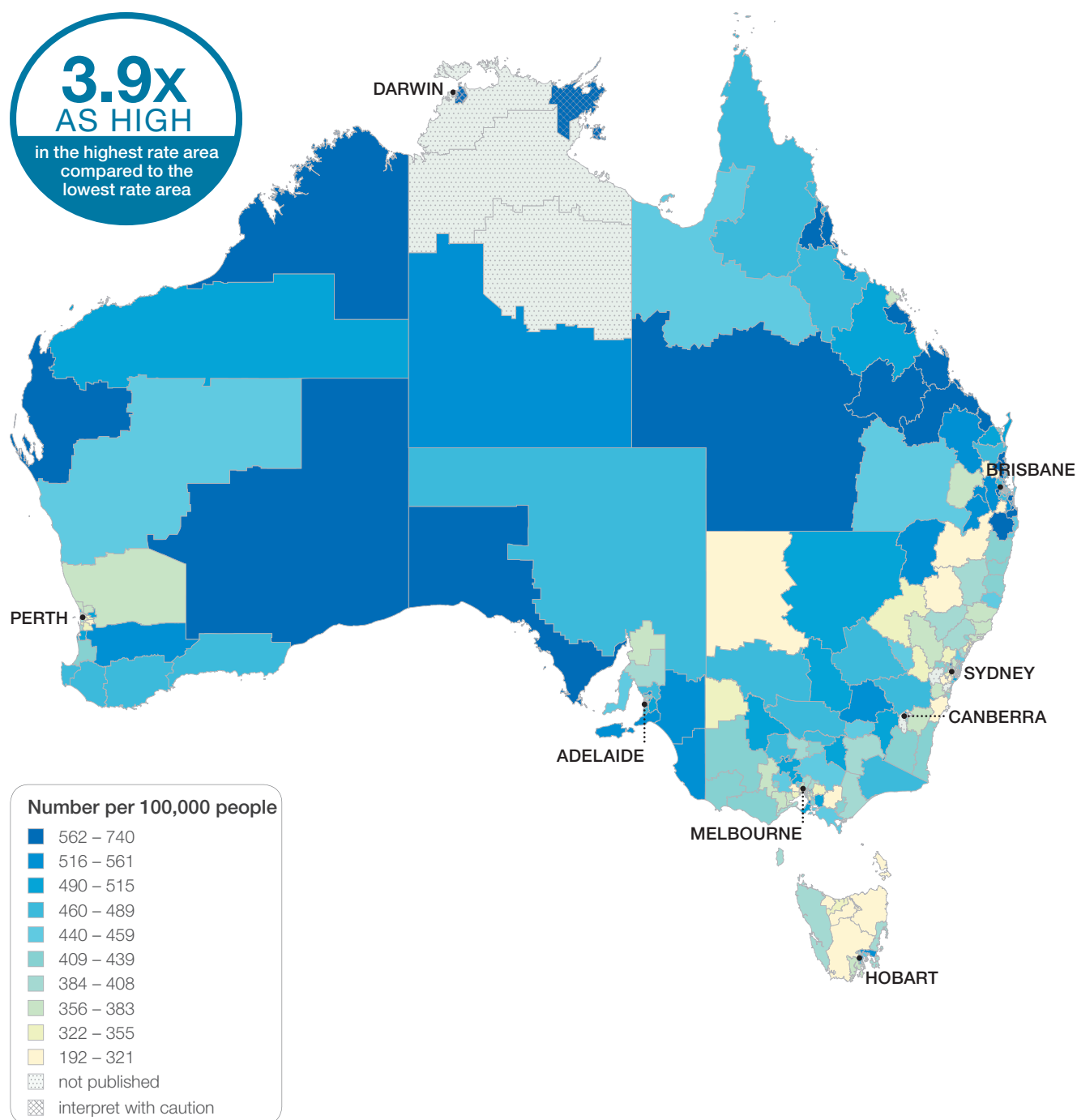
Crosses and asterisks indicate rates that are considered more volatile than other published rates and should be interpreted with caution. These rates are excluded from the calculation of the difference between the highest and lowest SA3 rates in Australia.

For further detail about the methods used, please refer to the Technical Supplement.

Sources: AIHW analysis of National Hospital Morbidity Database 2014–15 and ABS Estimated Resident Population 30 June 2014.

Atrial fibrillation hospitalisations 35 years and over

Figure 2.11: Number of hospitalisations for atrial fibrillation (principal diagnosis) per 100,000 people aged 35 years and over, age and sex standardised, by Statistical Area Level 3 (SA3), 2014–15: Australia map



Notes:

Rates are age and sex standardised to the Australian population in 2001.

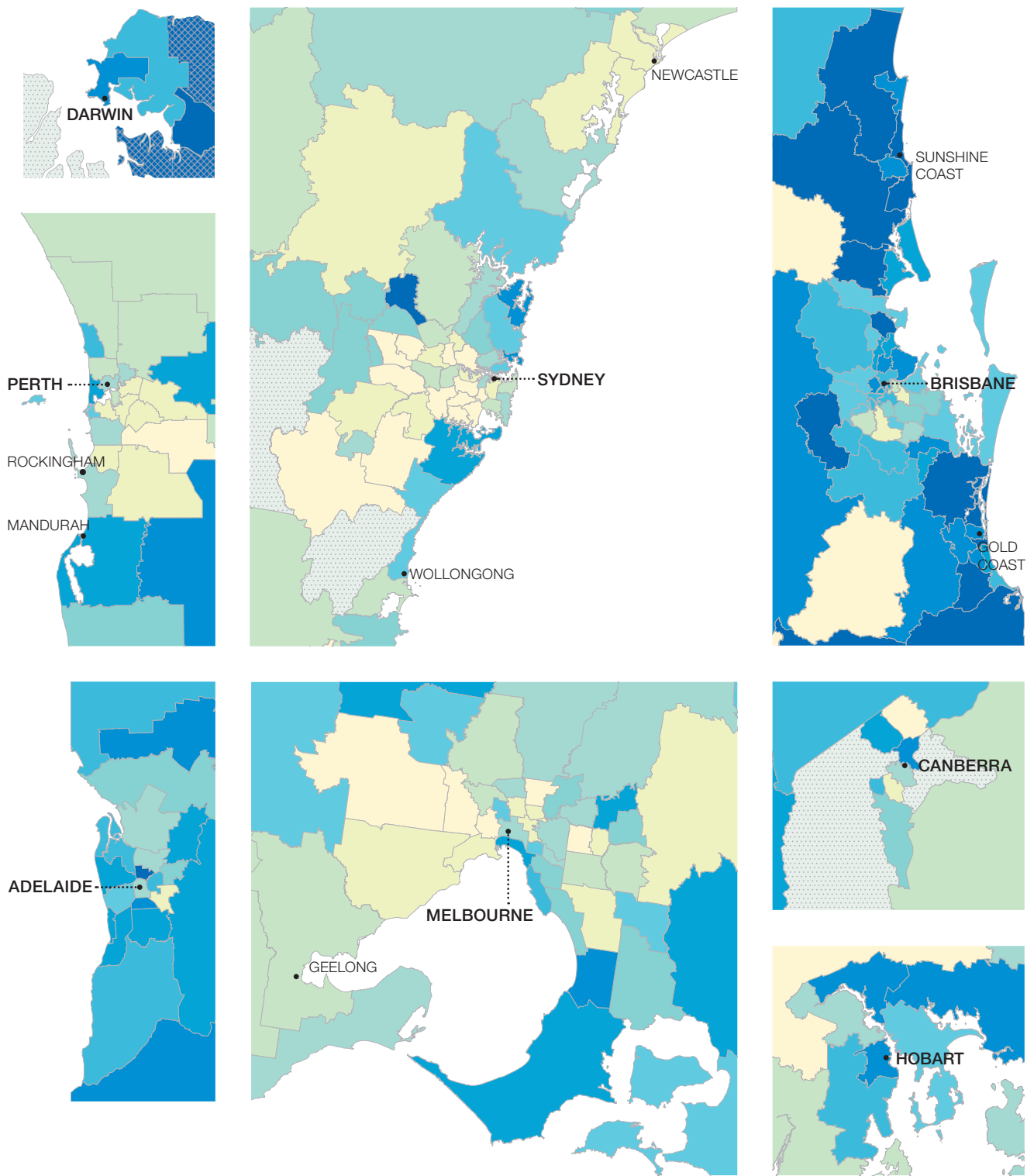
Rates are based on the number of hospitalisations in public and private hospitals (numerator) and people in the geographic area (denominator). Analysis is based on the patient's area of usual residence, not the place of hospitalisation.

Hatching indicates a rate that is considered more volatile than other published rates and should be interpreted with caution.

For further detail about the methods used, please refer to the Technical Supplement.

Sources: AIHW analysis of National Hospital Morbidity Database 2014–15 and ABS Estimated Resident Population 30 June 2014.

Figure 2.12: Number of hospitalisations for atrial fibrillation (principal diagnosis) per 100,000 people aged 35 years and over, age and sex standardised, by Statistical Area Level 3 (SA3), 2014–15: capital city area maps



Notes:

Rates are age and sex standardised to the Australian population in 2001.

Rates are based on the number of hospitalisations in public and private hospitals (numerator) and people in the geographic area (denominator).

Analysis is based on the patient's area of usual residence, not the place of hospitalisation.

Hatching indicates a rate that is considered more volatile than other published rates and should be interpreted with caution.

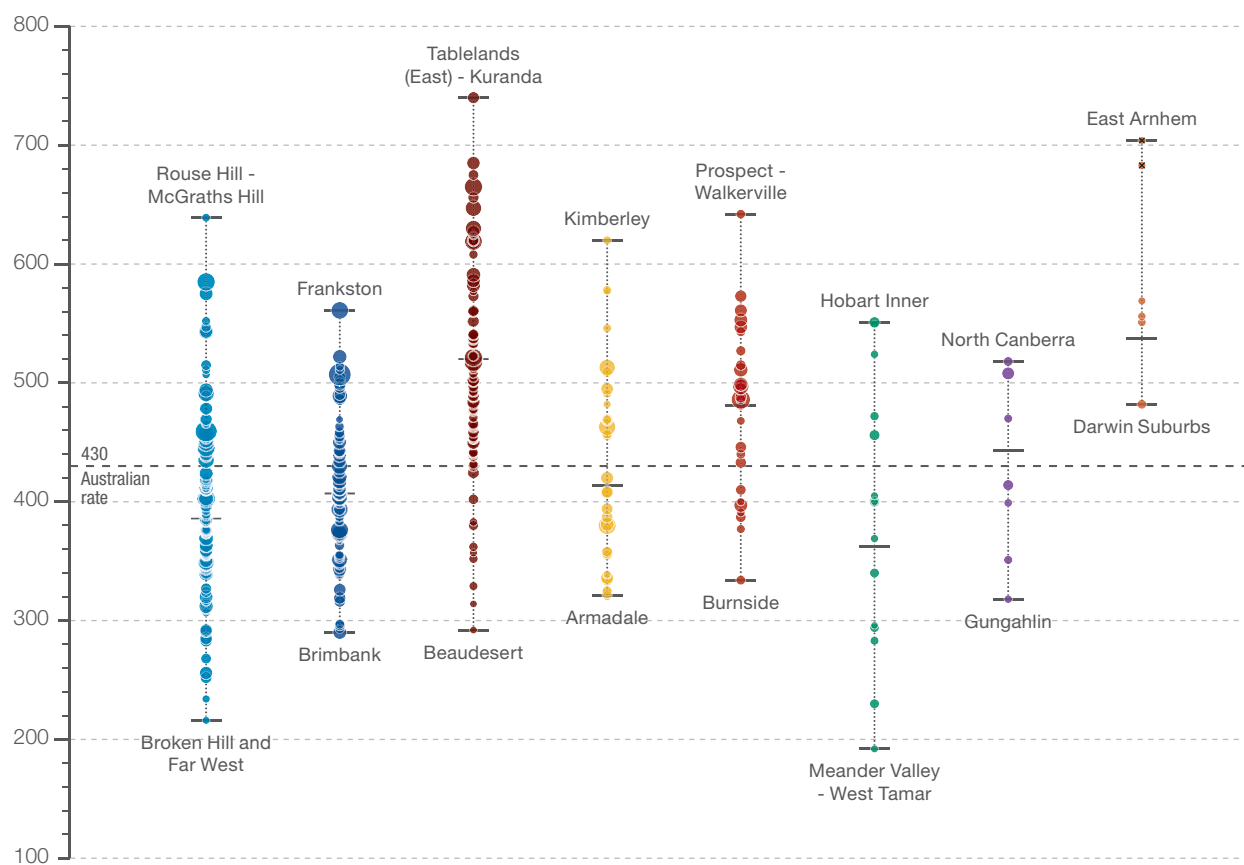
For further detail about the methods used, please refer to the Technical Supplement.

Sources: AIHW analysis of National Hospital Morbidity Database 2014–15 and ABS Estimated Resident Population 30 June 2014.

Atrial fibrillation hospitalisations 35 years and over

Figure 2.13: Number of hospitalisations for atrial fibrillation (principal diagnosis) per 100,000 people aged 35 years and over, age and sex standardised, by Statistical Area Level 3 (SA3), state and territory, 2014–15

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
Highest rate	639	561	740	620	642	551	518	704*
State/territory	386	407	520	414	481	362	443	537
Lowest rate	216	290	292	321	334	192	318	482
No. hospitalisations	17,523	13,887	13,613	5,574	5,319	1,278	813	437



Each circle represents a single SA3. The size indicates the number of hospitalisations.

✱ interpret with caution

20 200 400 600 650

Notes:

Rates are age and sex standardised to the Australian population in 2001.

Rates are based on the number of hospitalisations in public and private hospitals (numerator) and people in the geographic area (denominator).

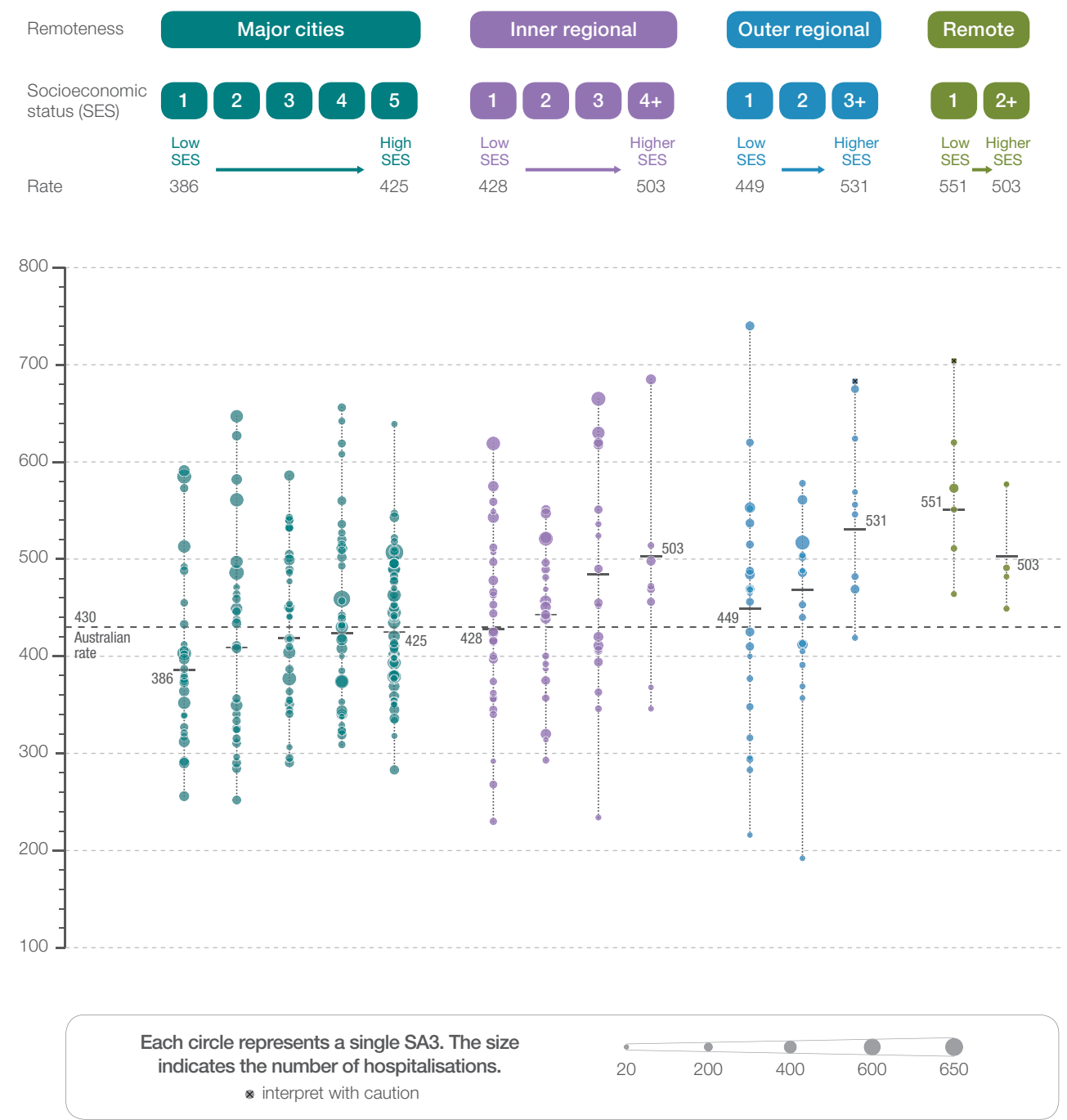
Analysis is based on the patient's area of usual residence, not the place of hospitalisation.

Crosses and asterisks indicate rates that are considered more volatile than other published rates and should be interpreted with caution. These rates are excluded from the calculation of the difference between the highest and lowest SA3 rates in Australia.

For further detail about the methods used, please refer to the Technical Supplement.

Sources: AIHW analysis of National Hospital Morbidity Database 2014–15 and ABS Estimated Resident Population 30 June 2014.

Figure 2.14: Number of hospitalisations for atrial fibrillation (principal diagnosis) per 100,000 people aged 35 years and over, age and sex standardised, by Statistical Area Level 3 (SA3), remoteness and socioeconomic status, 2014–15



Notes:
Rates are age and sex standardised to the Australian population in 2001.
Rates are based on the number of hospitalisations in public and private hospitals (numerator) and people in the geographic area (denominator).
Analysis is based on the patient's area of usual residence, not the place of hospitalisation.
Crosses indicate rates that are considered more volatile than other published rates and should be interpreted with caution.
For further detail about the methods used, please refer to the Technical Supplement.

Sources: AIHW analysis of National Hospital Morbidity Database 2014–15 and ABS Estimated Resident Population 30 June 2014.

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Resources

- Department of Health, Western Australia. Quick reference guide: atrial fibrillation information for the health practitioner. Perth: Department of Health; 2014.
- NSW Therapeutic Advisory Group Inc. National QUM indicators for Australian hospitals. Set 1: Antithrombotic therapy, data collection tools. Sydney: NSW TAG; 2014.
- National Institute for Health and Care Excellence. Atrial fibrillation: management. London: NICE; 2014. (clinical guideline).
- Management of atrial fibrillation: European Society of Cardiology Clinical Practice Guidelines.⁴
- 2014 American College of Cardiology/American Heart Association/Heart Rhythm Society *Guideline for the Management of Patients with Atrial Fibrillation*, executive summary.
- NPS MedicineWise. Good anticoagulant practice. Sydney: NPS MedicineWise; 2013.
- New oral anticoagulants: a practical guide on prescription, laboratory testing and peri-procedural/bleeding management, 2014.²¹
- Atrial fibrillation – Understanding abnormal heart rhythm, patient information, Heart Foundation of Australia.

Australian initiatives

The information in this chapter will complement work already under way to address the rate of hospitalisation for atrial fibrillation in Australia.

This work includes:

- Medicare Benefits Schedule (MBS) items for chronic disease management – an Australian Government initiative that helps general practitioners to manage the health care of people with chronic conditions; it makes MBS rebates available for those requiring multidisciplinary, team-based care from a general practitioner and at least two other healthcare providers
- The Better Cardiac Care for Aboriginal and Torres Strait Islander People project, Australian Health Ministers' Advisory Council
- Essential Service Standards for Equitable National Cardiovascular Care for Aboriginal and Torres Strait Islander People
- The National Strategic Framework for Chronic Conditions, which addresses primary, secondary and tertiary prevention of chronic conditions; it is anticipated that the framework will be publicly available in 2017.

Many state and territory initiatives are also in place, including:

- Design, service and infrastructure plan for Victoria's cardiac system, Victorian Government
- South Australian data collections
- State and territory cardiac networks.

References

1. National Heart Foundation of Australia. Atrial fibrillation: arrhythmia. Melbourne: Heart Foundation; 2008. Available from: <https://www.heartfoundation.org.au/your-heart/heart-conditions/atrial-fibrillation-arrhythmia>
2. Ball J, Thompson DR, Ski CF, Carrington MJ, Gerber T, Stewart S. Estimating the current and future prevalence of atrial fibrillation in the Australian adult population. *Med J Aust* 2015;202:32–5.
3. PriceWaterhouseCoopers. The economic costs of atrial fibrillation in Australia. PriceWaterhouseCoopers; 2010.
4. Kirchhof P, Benussi S, Kotecha D, Ahlsson A, Atar D, Casadei B, et al. 2016 ESC guidelines for the management of atrial fibrillation developed in collaboration with EACTS. *Europace* 2016;18:1609–78.
5. Steinberg BA, Kim S, Fonarow GC, Thomas L, Ansell J, Kowey PR, et al. Drivers of hospitalization for patients with atrial fibrillation: results from the Outcomes Registry for Better Informed Treatment of Atrial Fibrillation (ORBIT-AF). *Am Heart J* 2014;167:735–42.
6. National Center for Chronic Disease Prevention and Health Promotion, Division for Heart Disease and Stroke Prevention. Atrial fibrillation. Atlanta: Centers for Disease Prevention and Control; 2015.
7. Kalman JM, Sanders P, Brieger D, Aggarwal A, Zwar NA, Tatoulis J, et al. National Heart Foundation of Australia consensus statement on catheter ablation as a therapy for atrial fibrillation. *Med J Aust* 2013;198:27–8.
8. Wong CX, Brooks AG, Leong DP, Roberts-Thomson KC, Sanders P. The increasing burden of atrial fibrillation compared with heart failure and myocardial infarction: a 15-year study of all hospitalizations in Australia. *Arch Intern Med* 2012;172:739–41.
9. Ball J, Carrington MJ, McMurray JJ, Stewart S. Atrial fibrillation: profile and burden of an evolving epidemic in the 21st century. *Int J Cardiol* 2013;167:1807–24.
10. Deo R, Varosy PD. Invited commentary – Global arrhythmia burden: the public health implications of the rise in atrial fibrillation comment on 'The increasing burden of atrial fibrillation compared with heart failure and myocardial infarction'. *Arch Intern Med* 2012;172:741–2.
11. Ptasek LM, White B, Lubitz SA, Carnicelli AP, Heist EK, Ellinor PT, et al. Effect of a multidisciplinary approach for the management of patients with atrial fibrillation in the emergency department on hospital admission rate and length of stay. *Am J Cardiol* 2016;118:64–71.
12. National Rural Health Alliance and National Heart Foundation of Australia. Cardiovascular disease in rural Australia. Fact sheet. Melbourne: NRHA and NHFA; 2015.
13. Australian Government Department of Health and Ageing. Review of anticoagulation therapies in atrial fibrillation. Canberra: Department of Health and Ageing; 2012.
14. Gwynne K, Flaskas Y, O'Brien C, Jeffries TL, McCowen D, Finlayson H, et al. Opportunistic screening to detect atrial fibrillation in Aboriginal adults in Australia. *BMJ Open* 2016;6:e013576.
15. Friberg L, Rosenqvist M, Lindgren A, Terent A, Norrving B, Asplund K. High prevalence of atrial fibrillation among patients with ischemic stroke. *Stroke* 2014;45:2599–2605.
16. Pratt NL, Ramsay EN, Caughey GE, Shakib S, Roughead EE. Uptake of novel oral anticoagulants in Australia. *Med J Aust* 2016;204:104.
17. NPS MedicineWise. Good anticoagulant practice. Sydney: NPS MedicineWise; 2013.
18. Department of Health, Western Australia. Quick reference guide: atrial fibrillation information for the health practitioner. Perth: Department of Health; 2014.
19. NSW Therapeutic Advisory Group Inc. National QUM indicators for Australian hospitals. Sydney: NSW TAG; 2014.
20. National Institute for Health and Care Excellence. Atrial fibrillation: management. London: NICE; 2014. (Clinical guideline)
21. Tran H, Joseph J, Young L, McRae S, Curnow J, Nandurkar H, et al. New oral anticoagulants: a practical guide on prescription, laboratory testing and peri-procedural/bleeding management. *Australasian Society of Thrombosis and Haemostasis. Intern Med J* 2014;44:525–36.

