Australian Government
Australian Institute of Health and Welfare

Epilepsy in Australia

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About

Epilepsy is one of the most common and disabling chronic neurological conditions. It is characterised by recurrent seizures, which are caused by a temporary disruption of the electrical activity in the brain. This web report provides an overview of epilepsy in Australia, including statistics on disease prevalence, burden, treatment access, hospitalisations and deaths.

Cat. no: NEU 1

- Fact sheet
- Data

Findings from this report:

- The National Health Survey 2017–18 estimates 0.6% of Australians have been diagnosed with epilepsy
- There were 31,400 hospitalisations associated with epilepsy in 2018–19
- There were over 20,600 emergency department presentations associated with epilepsy in 2018–19
- In 2019, epilepsy contributed to about 1,100 deaths

Summary

Epilepsy is a chronic neurological disorder in which seizures are caused by a disruption of the electrical activity in the brain. An epilepsy diagnosis does not refer to a singular condition, but rather represents a diverse range of disorders involving many seizure types (Epilepsy Australia 2021). It is one of the most common and disabling neurological conditions. The prevalence of epilepsy is predicted to increase over the coming years as people more frequently survive traumatic causes of the condition, such as stroke and injury (WHO 2019).

This web report provides an overview of epilepsy in Australia, including disease prevalence, burden, treatment access, hospitalisations and deaths as well as sociodemographic breakdowns.

Prevalence

In 2017–18, epilepsy was estimated to affect 0.6% of Australians, or 151,000 people, equally affecting both males and females (ABS 2018). In the same year, it was estimated that 1.2% of Aboriginal and Torres Strait Islander people had epilepsy, or 9,000 people. Indigenous Australians were twice as likely to have epilepsy as non-Indigenous Australians (1.2% and 0.6% respectively), with Indigenous males and females similarly likely to self-report epilepsy (1.3% and 1.0% respectively).

Epilepsy burden and expenditure

Burden of disease analysis measures fatal and non-fatal impacts of epilepsy. In 2018, epilepsy was ranked the 30th cause for disease burden in Australia. The burden of disease for epilepsy was highest among 15–19 year olds for disability-adjusted life years (DALY) (3,565 DALY), 5–9 year olds for years lived with disability (YLD) (3,042 YLD) and 35–39 year olds for years of life lost (YLL) (926 YLL).

Around $134 billion of recurrent health system expenditure in 2018–19 could be attributed to specific disease groups. Epilepsy expenditure accounted for around $333 million of this expenditure, or 0.2%.

Treatment

In 2019–20, around 388,000 people were dispensed (at least one) antiepileptic medication, with an average of 8 prescriptions dispensed per person.

For a sub-set of people whose seizures cannot be controlled by medication, surgical options may be investigated. In 2018–19, there were 317 epilepsy-related procedures provided in hospital to patients with a principal and/or additional diagnosis of epilepsy.

Hospitalisations

There were 31,400 hospitalisations associated with epilepsy in 2018–19. Epilepsy was recorded as the principal diagnosis for 66% of these hospitalisations, while the remainder (34%) had epilepsy recorded as an additional diagnosis.

Hospitalisations with a principal diagnosis of epilepsy were most common among the youngest age group (132 hospitalisations per 100,000 people for males and 125 for females aged 0–4 years), while hospitalisations with a principal and/or an additional diagnosis of epilepsy were most common in the oldest age group (221 and 175 hospitalisations per 100,000 population for males and females aged 85 and over, respectively).

Rates of hospitalisations related to epilepsy were highest in *Remote* and *Very remote* areas when compared with other geographic areas (150 and 160 hospitalisations per 100,000 people respectively) and increased with increasing socioeconomic disadvantage.

Hospitalisations among Indigenous Australians were 3.5 times as high as the rate among non-Indigenous Australians (390 and 113 hospitalisations per 100,000 people, respectively).

These hospitalisations data are based on admitted patient episodes of care, and may include multiple hospitalisation events experienced by the same individual.

There were over 20,600 emergency department presentations associated with epilepsy in 2018–19, with males more likely to present to the emergency department than females (92.4 and 72.4 presentations per 100,000 population, respectively).

Deaths

In 2019, epilepsy contributed to about 1,100 deaths, or 0.7% of all deaths that occurred in that year. It was more likely to be an associated cause of death (78% of all epilepsy deaths) than the underlying cause of death, meaning that it was not the main cause of death.

‘All cause’ death rates for epilepsy (those where epilepsy is the underlying or the associated cause of death) have declined over the last few decades, from 4.6 deaths per 100,000 in 1997 to 3.7 per 100,000 in 2019. Over this time, males have continually had higher death rates (around 1.5 times as high) than females.

In 2019, all cause death rates due to epilepsy increased with increasing age, remoteness and disadvantage, and were over three times as high among Indigenous Australians as non-Indigenous Australians (12.1 and 3.5 deaths per 100,000, respectively). The gap in death rates between Indigenous and non-Indigenous Australians was similar for females and males.

What is epilepsy?

Epilepsy is a chronic neurological disorder in which seizures are caused by a disruption of the electrical activity in the brain. It is one of the most common and disabling neurological conditions (Epilepsy Action Australia 2020), yet the causes are still not well understood (Stafstrom & Carmant 2015). Epilepsy involves many different types of seizures including changes to sensation, awareness, behaviour or movement. Not all seizures involve convulsions (Epilepsy Action Australia 2020).

While the underlying cause of epilepsy is known for around half of all people with the condition, the cause is never identified for many sufferers. Known causes include injury and stroke, prolonged oxygen deprivation, brain infections and tumours, neurodegenerative conditions (such as dementia) and congenital abnormalities. People with or without epilepsy can also suffer from pseudoseizures. Superficially these appear to be seizures, but are a result of psychological causes.

Box 1: Classifying epilepsy

In 2017, the International League Against Epilepsy (ILAE) revised its classification of seizures. The new basic seizure classification is based on 3 key features: where seizures begin in the brain, the level of awareness during a seizure, and other features of seizures such as movement (Epilepsy Foundation 2016; Deloitte Access Economics 2020).

Where seizures begin

Seizures that start in an area on one side of the brain are known as *focal seizures*, and seizures that involve both sides of the brain are known as *generalised seizures*.

A seizure that starts on one side of the brain and spreads to both is known as a *focal to bilateral seizure*.

A seizure of *unknown onset* can be given the appropriate name later on once an origin has been established.

The level of awareness during a seizure

The description of awareness applies primarily to focal seizures, as generalised seizures are presumed to affect awareness.

Focal aware applies if the person having the seizure is aware, even if they are not responsive.

Focal impaired awareness applies if awareness was affected at any point during the seizure.

It is not always possible to know whether awareness was affected, so the awareness term may not always be used.

Other symptoms

The terms *motor* and *non-motor* are used to distinguish seizures that do and do not involve movement such as twitching or muscle stiffening. These terms are applicable to both focal onset and generalised onset seizures.

Epilepsy can be treatable with pharmaceuticals and 70% of people with epilepsy can become seizure free with medication (WHO 2019). Medication is not wholly effective or suitable for controlling seizures in the remaining 30%. Whether seizures are successfully controlled by medication or not, an epilepsy diagnosis requires lifelong management, and can impact work, education and health as a result. Additionally, roughly half of the people with epilepsy have coexisting physical or psychiatric conditions (WHO 2019). Comorbidity in epilepsy is associated with poorer health outcomes, increased health care needs, decreased quality of life and greater social exclusion.

References

Deloitte Access Economics 2020. The economic burden of epilepsy in Australia, 2019-20.

Epilepsy Foundation 2016. 2017 Revised Classification of Seizures. Viewed 8 Jan 2021, 2017 Revised Classification of Seizures | Epilepsy Foundation.

Epilepsy Action Australia 2020. Epilepsy: The Facts. Viewed 8 Jan 2021, About Epilepsy | Epilepsy Action Australia.

Stafstrom CE, Carmant L 2015. Seizures and epilepsy: an overview for neuroscientists. Cold Spring Harbor Perspectives in Medicine 5(6). doi:10.1101/cshperspect.a022426.

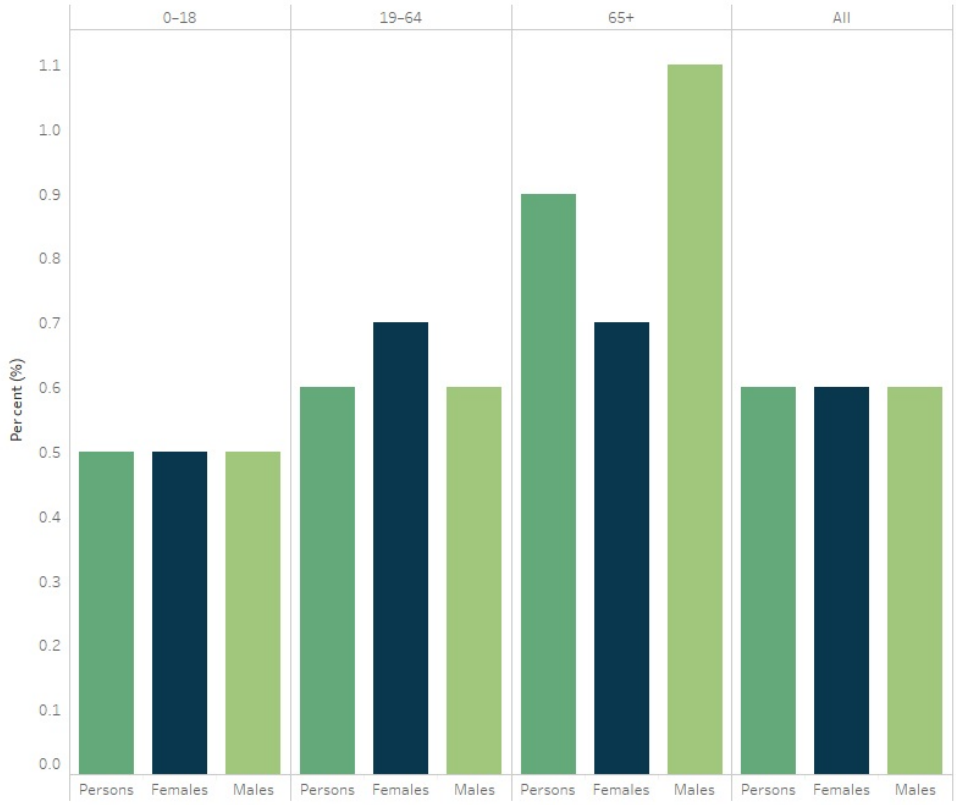
World Health Organisation 2019. Epilepsy: a public health imperative. Geneva: World Health Organization.

How many Australians have epilepsy?

It is estimated that in 2017–18, 0.6% (95% CI: 0.5–0.7) of Australians, or 151,000 people, had epilepsy, with the same prevalence observed in both males and females. These age-standardised rates were estimated from self-reported diagnosis of epilepsy data within the Australian Bureau of Statistics (ABS) 2017–18 National Health Survey (ABS 2018a; 2018b). Epilepsy was most prevalent in the 65+ age group, with 0.9% of people in this age group self-reporting a diagnosis of epilepsy (Figure 2.1). As these estimates were calculated from self-reported data they potentially underestimate the prevalence of epilepsy in Australia.

Figure 2.1: Prevalence of self-reported epilepsy in Australia, by age and sex, 2017–18

This is a bar chart that displays the prevalence of epilepsy by age and sex. It shows the overall prevalence was the same for both males and females (0.6%). There is a slight increase in prevalence for both males and females as age increases.



Prevalence of epilepsy, by age and sex, 2017-18
Note:
1. Based on self-reported data.
Source: AIHW analysis of ABS 2018b.
http://www.aihw.gov.au/

Aboriginal and Torres Strait Islander people

In 2018–19, it is estimated that 1.2% (95% CI: 0.8–1.6) of Indigenous Australians, or 9,000 people, had epilepsy. Indigenous Australians were twice as likely to report having epilepsy as non-Indigenous Australians (1.2% and 0.6% respectively) based on age-standardised data from the ABS 2018–19 National Aboriginal and Torres Strait Islander Health Survey (ABS 2019).

The prevalence of epilepsy in male and female Indigenous Australians was similar (1.3% and 1.0% respectively). Due to the high margins of error, breakdowns of epilepsy prevalence by age groups could not be reported for Indigenous Australians with epilepsy.

References

ABS 2018a. National Health Survey: First results, 2017–18. ABS cat. no. 4364.0.55.001. Canberra: ABS.

ABS 2018b. Microdata: AIHW analysis of National Health Survey, 2017–18. ABS cat. no. 4324.0.55.001. Findings based on Detailed Microdata analysis. Canberra: ABS.

ABS 2018c. National Health Survey: Users' Guide, 2017–18. ABS cat. No. 4363.0. Canberra: ABS.

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

Epilepsy burden and expenditure

Burden of epilepsy

People living with epilepsy may experience poor health or die prematurely as a result of their condition. Both the fatal (dying prematurely) and non-fatal impact (living with poor health or disability) of epilepsy can be measured by burden of disease analysis. Burden of disease analysis combines the years of healthy life lost due to living with ill health (YLD) with the years of life lost due to dying prematurely (YLL). Fatal and non-fatal burden combined are referred to as total burden, and are reported using the disability-adjusted life years (DALY) measure (AIHW 2020). The Australian Burden of Disease Study 2018 measured the burden of over 200 diseases and injuries in Australia, including epilepsy.

Box 2: Australian Burden of Disease Study 2018

The Australian Burden of Disease Study (ABDS) 2018 provides Australian-specific burden of disease estimates for the total population for 2018, 2015, 2011 and 2003, as well as estimates of the disease burden attributable to specific risk factors. The study utilised and adapted methods developed as part of the previous ABDS 2015 and 2011 (AIHW 2019; AIHW 2016). The ABDS uses Australian data sources and adapts the methods from global studies to produce estimates that are relevant to the Australian context.

The fatal burden estimates for epilepsy were derived from the AIHW National Mortality Database and are considered to be of high quality. National non-fatal burden estimates for epilepsy were based on self-reported prevalence data from the National Health Survey (NHS) 2017–18. Age–sex specific distributions (including by state/territory) were calculated using counts of hospital separations from the AIHW National Hospital Morbidity Database which were adjusted to account for readmissions using linked hospitalisation and deaths data from the NIHSI AA v0.5. The severity distribution for epilepsy was based on a study conducted in the United Kingdom by Moran and others (2004). Prevalence estimates by severity were then mapped to health states and disability weights to calculate YLD. For more information on the YLD calculation for epilepsy, refer to the Australian Burden of Disease Study: methods and supplementary material 2018 web report.

In 2018, epilepsy was ranked the 30th cause for disease burden in Australia. The total burden of disease for epilepsy was highest among 15–19 year olds (3,600 DALY). Non-fatal burden was highest among 5–9 year olds (3,000 YLD) and fatal burden was highest in the 35–39 year age group (930 YLL) (Figure 3.1).

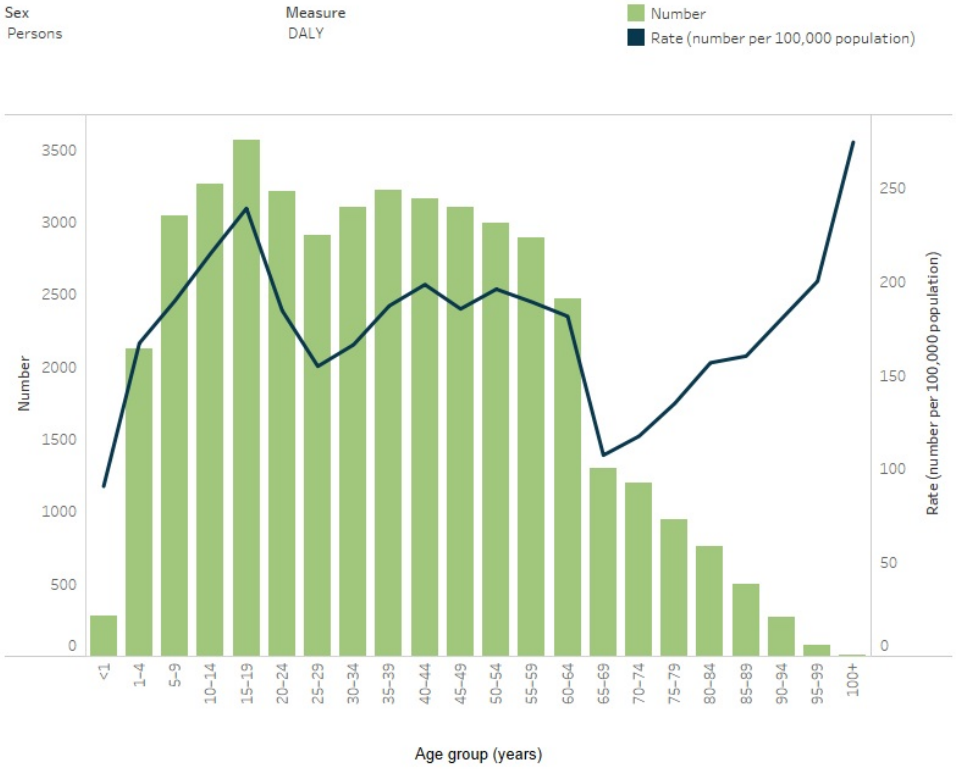
Figure 3.1 includes estimates for:

- disability-adjusted life years (DALY) due to epilepsy
- years lived with disability (YLD) due to epilepsy
- years of life lost (YLL) due to epilepsy
- deaths due to epilepsy.

More information on how burden of disease is calculated is available on the Burden of disease webpages.

Figure 3.1: Burden of disease due to epilepsy, by measure, sex and age group 2018

This is a bar chart that displays the numbers and rates of the three measures of burden of disease due to epilepsy (DALY – total burden, YLD – non-fatal burden and YLL – fatal burden) by sex and age group. The non-fatal burden for persons shows a decline in the number of years lived with disability from age 5-9 onwards. The number of years lost due to fatal burden decreases with age from 55-59 years for persons. The total burden (DALY) decreases with age for persons from the age group 35-39.



Title: Burden of disease due to epilepsy by sex and age group 2018
Note:
1. Diseases displaying a rate of 0.0 per 100,000 population refer to a rate <0.05 per 100,000 population.
DALY = total burden
YLD = non-fatal burden
YLL = fatal burden
Source: AIHW 2021a
http://www.aihw.gov.au/

Expenditure on epilepsy

Disease expenditure in Australia provides a broad picture of how health system resources are allocated directly to particular disease groups and conditions, and is a reference point for planners and researchers interested in costs and patterns for particular diseases. Around $134 billion of recurrent expenditure in 2018–19 could be attributed to specific disease groups. Expenditure directly attributable to epilepsy accounted for around $333 million of this expenditure, or 0.2%.

A number of different health system resources were utilised for epilepsy management across Australia in 2018–19. In terms of expenditure, the most utilised resource was public hospital admitted patient services, followed by use of the pharmaceutical benefits scheme and public hospital outpatient services.

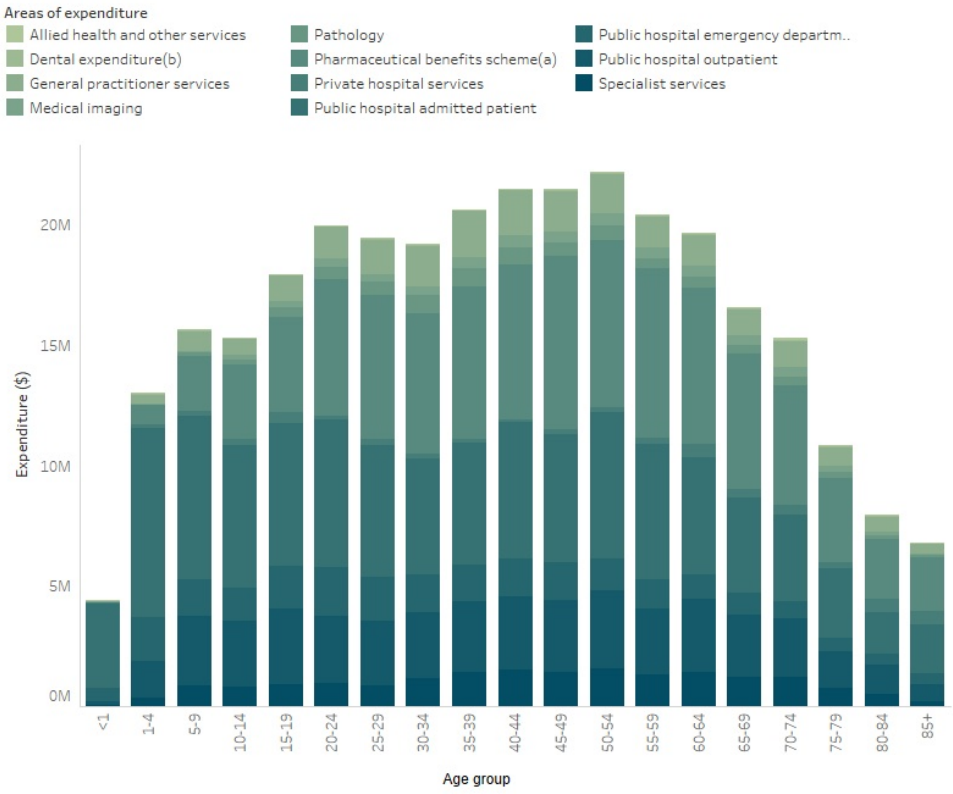
Total epilepsy expenditure increased with age, peaking at over $22 million in the 50–54 year old age group. However, from the 55–59 year old age group, epilepsy expenditure declined with age.

Total epilepsy expenditure was higher for males in the majority of age groups compared with females (Figure 3.2).

More information on how disease expenditure is calculated for health services is available on the Health and welfare expenditure webpages. This includes costs that are not included in this estimate such as provision of aged care services of people with epilepsy.
This is a bar chart that displays health system expenditure directly for epilepsy by 5-year age groups. It can also be filtered by sex and area of expenditure. Across all areas of expenditure, males aged 50-54 years had the highest expenditure directly for epilepsy while females aged 40-44 years old had the highest expenditure.

Sex
Persons

Areas of expenditure
All



Epilepsy expenditure, by area of expenditure, sex and age 2018-19
Source: AIHW 2021b.

References

AIHW 2021a. Australian Burden of Disease Study: impact and causes of illness and death in Australia 2018. Australian Burden of Disease Study series no. 23. Cat. no. BOD 29. Canberra: AIHW.

AIHW 2021b. Disease expenditure in Australia 2018–19. Cat. no. HWE 81. Canberra: AIHW.

Treatment and management of epilepsy

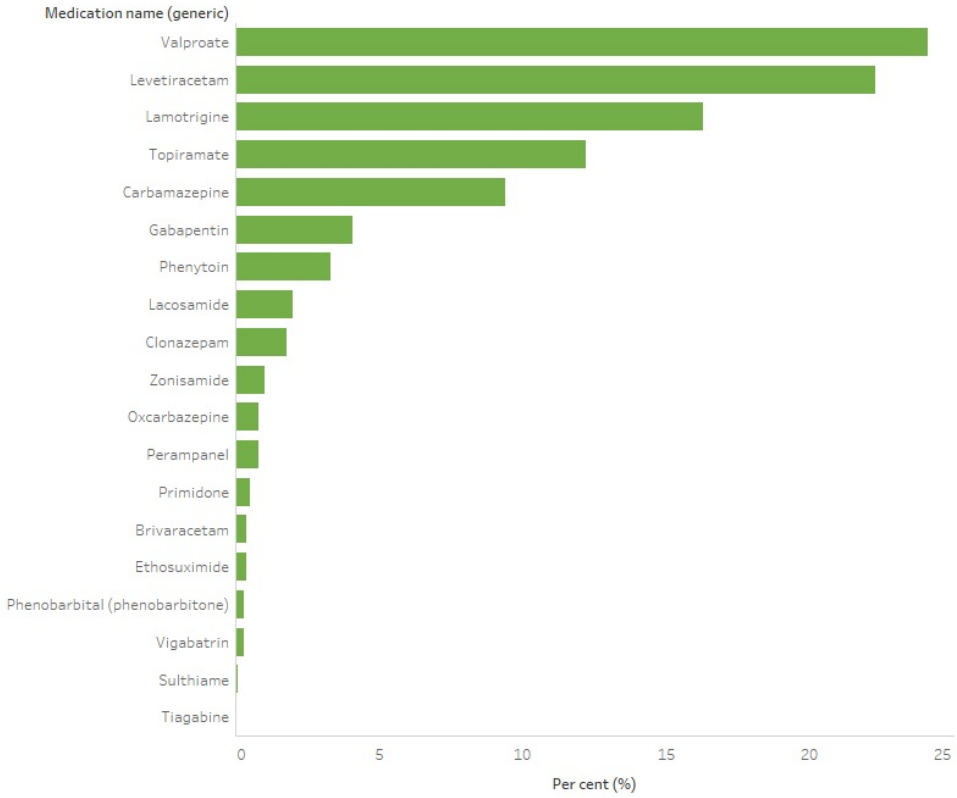
Pharmaceuticals

Around two-thirds of people with epilepsy in Australia can control their seizures with anti-epileptic drugs (Perucca et al. 2018). Anti-epileptic drugs generally work by inhibiting neural activity, and the medication prescribed is based on the characteristics of each person (for example, the type of seizures, age, sex and side effects). Due to the wide range of mechanisms by which anti-epileptic drugs work on brain activity, many are also used for other purposes and so the data presented below may not relate solely to the treatment of epilepsy. For example, carbamazepine, a common first line treatment for epilepsy, is also used as a treatment for nerve pain in trigeminal and glossopharyngeal neuralgia (TGA, 2019). Others are prescribed as mood stabilisers (e.g. sodium valproate) and as tranquilisers (e.g. diazepam).

In 2019-20, there were many antiepileptic drugs available for prescription under the Pharmaceutical Benefits Scheme (PBS) in Australia (Table 4.1). People may be prescribed one drug only, or may be prescribed additional supplementary drugs to help control seizures more effectively. These medications may be from a single medication type, or from multiple different therapeutic groups.

Figure 4.1: Antiepileptic prescriptions dispensed in 2019-20

This is a horizontal bar chart that displays antiepileptic medication prescriptions dispensed under the Pharmaceutical Benefit Scheme, by number of scripts and by percentage of total antiepileptic medication prescriptions in 2019–20.



Number of antiepileptic medications dispensed in 2019-20, by generic medication name
Note: PBS data includes prescriptions funded under the Repatriation Pharmaceutical Benefits Scheme.
Source: AIHW analysis of PBS data maintained by the Australian Government Department of Health.
http://www.aihw.gov.au/

In 2019–20 there were 3.1 million prescriptions dispensed for antiepileptic medications. *Valproate* was the most commonly dispensed antiepileptic medication (24% of all antiepileptic prescriptions filled), followed by *Levetiracetam* (22%) (Figure 4.1). Around 388,000 people were dispensed at least one antiepileptic medication during 2019–20, with an average of 8 prescriptions dispensed per person.

In May 2021, cannabidiol was made available through the PBS for patients with severe myoclonic epilepsy in infancy (SMEI), also known as Dravet Syndrome. Cannabidiol can only be prescribed in the first instance by a treating neurologist, and must only be prescribed as an adjunctive therapy once the condition has proven to be poorly controlled by at least two epilepsy medications. The data presented here do not cover the period of availability of cannabidiol, but the use of this recently listed product can be explored in future.

Surgical

For seizures that cannot be controlled through medications, surgical options can be investigated. Surgery can reduce the amount of seizures for some people with epilepsy and can stop seizures for others, and may involve extensive rehabilitation depending on the nature of the surgery. There are only certain types of epilepsy that are suitable for surgery, and eligibility for surgery is based on medical investigations. Epilepsy procedure codes using the Australian Classification of Health Interventions (ACHI) are listed in Table 4.2.

Table 4.2: ICD-10AM ACHI codes for procedures relating to treating epilepsy

Primary surgical treatments for intractable epilepsy

ACHI code	Description
40700	Corpus callosotomy
40701	Vagus nerve stimulation, stimulator placement
40702	Vagus nerve stimulation, stimulator repositioning or removal
40703	Corticectomy, topectomy or partial lobotomy
40704	Vagus nerve stimulation, placement of lead
40705	Vagus nerve stimulation, repositioning or removal of lead
40706	Hemispherectomy
40707	Vagus nerve stimulation, electrical analysis and programming of device
40708	Vagus nerve stimulation, replacement of battery in stimulator
40709	Intracranial electrode placement by burr hole
40712	Intracranial electrode placement by craniotomy

Secondary surgical treatments for intractable epilepsy (primary purpose pain relief)

ACHI code	Description
39131	Adjustment of epidural electrodes
39134	Insertion of subcutaneously implanted neurostimulator
39136	Removal of epidural electrodes
39137	Replacement of epidural electrodes
39138	Adjustment of other peripheral nerve electrodes

Source: ICD-10AM 11th Edition and MBS Online

In 2018–19, there were 317 epilepsy-related primary procedures provided in hospital to patients with a principal and/or additional diagnosis of epilepsy.

In 2018–19, 135 epilepsy-related secondary procedures were provided in hospital to patients with a principal and/or additional diagnosis of epilepsy. The main purpose of these secondary procedures is pain relief, but they are also used as surgical treatments for epilepsy.

Management

Aside from pharmaceuticals and surgery treatment options, medical and allied healthcare professionals may also provide support to those living with epilepsy. There are many healthcare professionals who specialise in epilepsy, and can provide management support to affected people. These include:

- Neurologists: Neurology is a branch of medicine focussed on disorders of the nervous system. A neurologist can treat a number of disorders that affect the brain, spinal cord and nerves, including epilepsy.
- Epileptologists (a type of neurologist): An epileptologist may become involved if epilepsy diagnosis, treatment and/or seizures are complex.

Other healthcare and allied health professionals can also provide support in epilepsy management. These may include:

- Nurses
- Social Workers
- Speech and language therapists
- Occupational therapists
- Psychiatrists
- Neuropsychiatrists

- Psychologists
- Radiologists
- Physiotherapists (Epilepsy Foundation 2019).

Seizure type, severity and response to medication vary between people living with epilepsy. As such, epilepsy management plans also vary. These plans may include any of the above professionals, or may include additional sources of management support.

References

Epilepsy Foundation 2019. Epilepsy Specialists. Viewed 30 June 2021, Epilepsy Specialists | Epilepsy Foundation.

Perucca P, Scheffer IE & Kiley M 2018. The management of epilepsy in children and adults. Medical Journal of Australia, 208(5), 226-233.

TGA (Therapeutic Goods Administration) 2019. Carbamazepine. Viewed 11 August 2021.

Hospitalisations for epilepsy

Box 3: Diagnosis definitions

Principal diagnosis: the diagnosis that is considered to be chiefly responsible for the hospitalisation.

Additional diagnosis: a coexisting condition to the principal diagnosis or a condition arising during hospitalisation that affects patient management or care.

Epilepsy hospitalisations

There were about 31,400 hospitalisations associated with epilepsy in 2018–19. Two-thirds (66%) had epilepsy recorded as the principal diagnosis and 34% had epilepsy recorded as an additional diagnosis. Hospitalisations associated with epilepsy accounted for 0.3% of all hospitalisations in Australia in 2018–19.

The hospitalisations data presented here are based on admitted patient episodes of care, and may include multiple hospitalisation events experienced by the same individual.

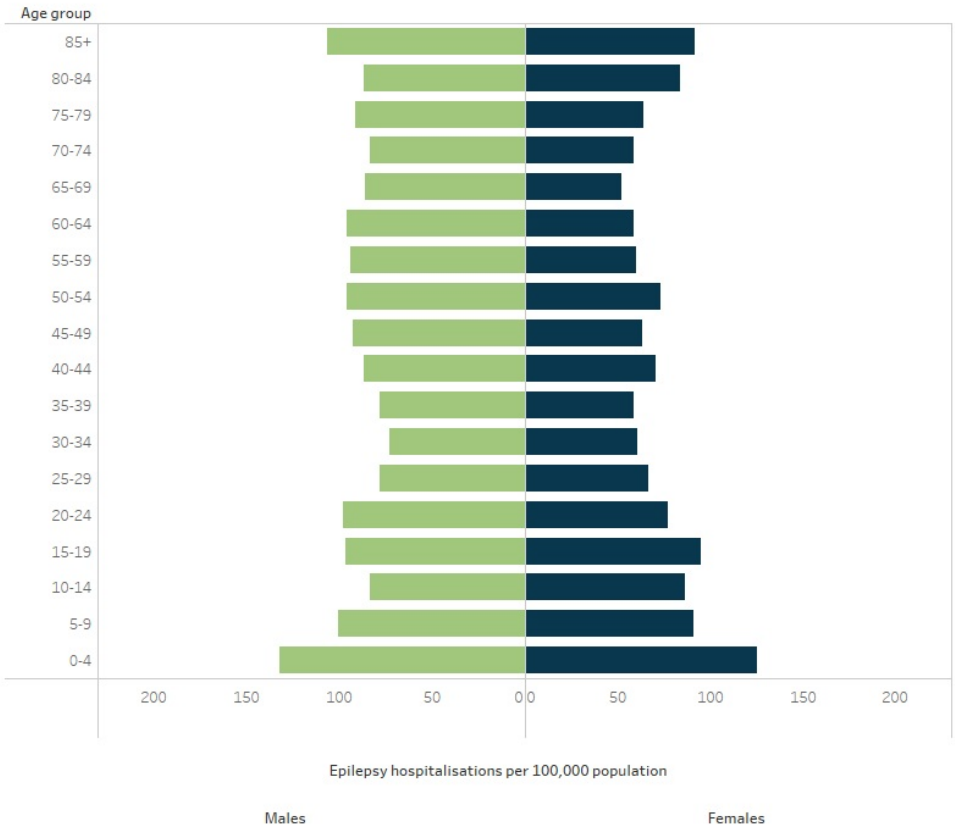
Age and sex

In 2018–19, epilepsy hospitalisation rates (where epilepsy was the principal diagnosis) were:

- higher in males than females across all age groups, but particularly between the ages of 20 and 79
- highest among people aged 0–4 years (132 and 125 hospitalisations per 100,000 population for males and females, respectively) (Figure 5.1a).

Figure 5.1a: Rate of epilepsy hospitalisations (principal diagnosis), by age group and sex, 2018–19

This is a butterfly chart with age group on the y axis and the rate of hospitalisations where epilepsy was the principal diagnosis (number per 100,000 population) for males (left) and females (right) on the x axis. It shows the highest rate of hospitalisations, where epilepsy was a principal diagnosis occurred in the 0-4 age group for both males and females. Rates were higher for males than they were for females, in every age group.



Epilepsy hospitalisations (principal diagnosis), by age group and sex, 2018–19
Note: Records with missing age and sex information and intersex records were excluded from this analysis.
Source: AIHW analysis of the National Hospital Morbidity Database...

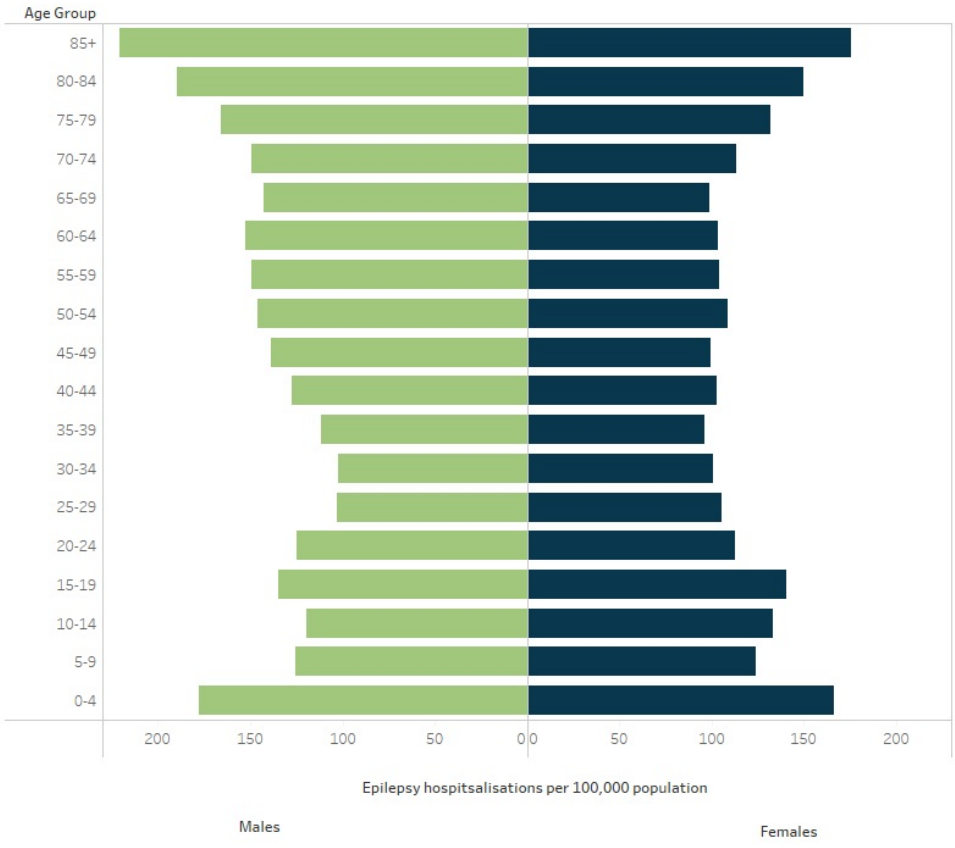
Rates of hospitalisations with epilepsy (hospitalisations where epilepsy is a principal and/or additional diagnosis) (Figure 5.1b) showed a different age pattern than hospitalisations due to epilepsy (hospitalisations where epilepsy is the principal diagnosis only – as presented above). Rates of hospitalisations with epilepsy were highest in the 85+ age group (175 hospitalisations per 100,000 population for females and 221 per 100,000 population for males) (Figure 5.1b). The differences between the two age breakdowns (Figure 5.1a & Figure 5.1b) indicate that hospitalisations where epilepsy is an additional diagnosis (a coexisting condition to the principal diagnosis or a condition arising during hospitalisation that affects patient management) made up a relatively larger proportion of hospitalisations in the 85+ age group for both men and women.

In 2018–19, epilepsy hospitalisation rates (where epilepsy was the principal and/or additional diagnosis) were:

- higher for males than females from age 35–39 and over
- highest among people aged 85+ (221 and 175 hospitalisations per 100,000 population for males and females, respectively) (Figure 5.1b).

Figure 5.1b: Rate of epilepsy hospitalisations (principal and/or additional diagnosis), by age group and sex, 2018-19

This is a butterfly chart with age group on the y axis and the rate of hospitalisations where epilepsy was a principal and/or additional diagnosis (number per 100,000 population) for males (left) and females (right) on the x axis. It shows the highest rate of hospitalisations where epilepsy was a principal and/or an additional diagnosis, occurred in age group 85+ for both males and females.



Epilepsy hospitalisations (additional diagnosis), by age group and sex, 2018–19
Note: Records with missing age and sex information and intersex records were excluded from this analysis.
Source: AIHW analysis of the National Hospital Morbidity Database...

Variation between population groups

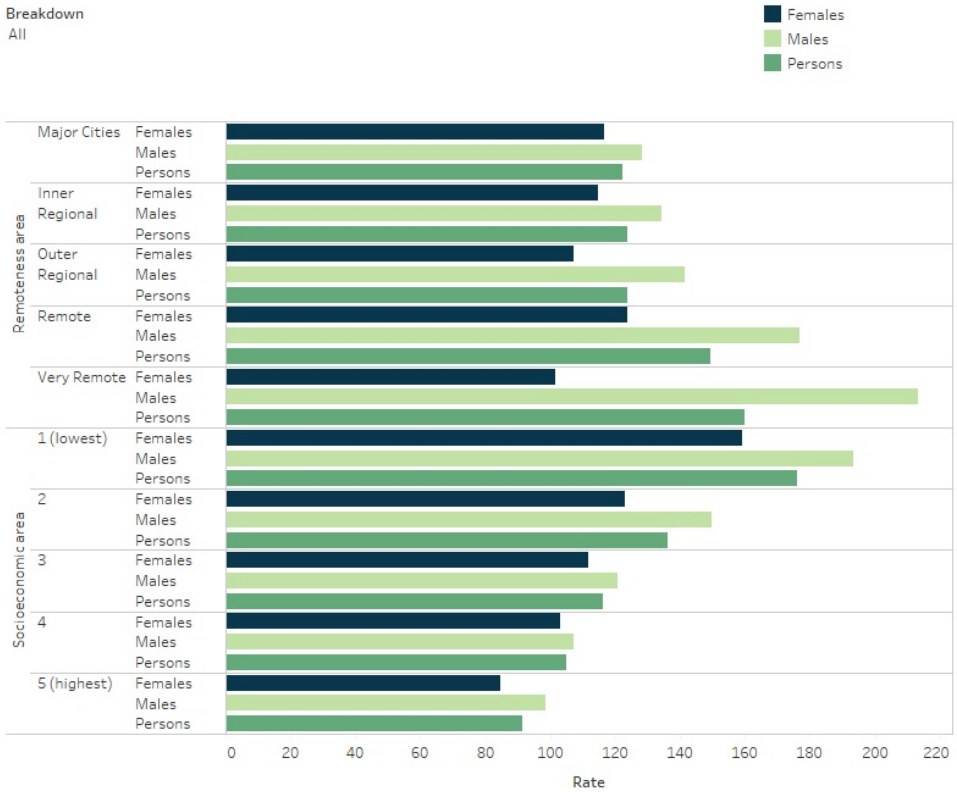
In 2018–19, rates of hospitalisations with epilepsy (where epilepsy was the principal and/or additional diagnosis) varied by remoteness and increased with socioeconomic disadvantage. Rates were:

- overall 1.3 times as high in *Very remote* areas compared with *Major cities*. However, for women, rates were higher in *Major cities* compared with *Very remote* areas (117 and 101 hospitalisations per 100,000 population, respectively). For men, rates were 1.7 times as high in *Very remote* areas compared with *Major cities* (213 and 128 hospitalisations per 100,000 population, respectively)
- 1.8 times as high among those living in the lowest socioeconomic areas compared with those living in the highest socioeconomic areas. This difference was smaller for females than males. For women, rates were more than 1.5 times as high among those living in the lowest socioeconomic areas as those living in the highest socioeconomic areas (159 and 85 hospitalisations per 100,000, respectively). For men, rates were 1.9 times as high among those living in the lowest socioeconomic areas as those living in the highest socioeconomic areas (193 and 99 per 100,000, respectively) (Figure 5.2).

Figure 5.2: Rates of epilepsy hospitalisations (principal and/or additional diagnosis), by remoteness and socioeconomic area, 2018-19

This is a horizontal bar chart that displays the rate of epilepsy hospitalisations on the x-axis, and the socioeconomic area, or remoteness category on the y-axis. It is also disaggregated by sex. Rates of epilepsy hospitalisations, where epilepsy was a principal and/or additional diagnosis varied by remoteness area, and increased with socioeconomic area disadvantage. Males and females have different patterns in

their rates of hospitalisation for epilepsy by remoteness and socioeconomic areas.



Epilepsy hospitalisations (principal and/or additional diagnosis), by remoteness and socioeconomic areas, 2018–19
Notes:
1. Age-standardised to the 2001 Australian Standard Population.
2. Hospitalisation rates have been calculated using population estimates for Australia, which includes other Territories.
Source: AIHW analysis of the National Hospital Morbidity Database.
http://www.aihw.gov.au/

Aboriginal and Torres Strait Islander people

In 2018–19, there were around 3,000 hospitalisations where epilepsy was the principal and/or additional diagnosis among Indigenous Australians.

After adjusting for differences in the age structure of the populations, the hospitalisation rate among Indigenous Australians was:

- over three times the rate of non-Indigenous Australians (390 and 113 hospitalisations per 100,000 population, respectively)
- higher among males than females (490 and 297 hospitalisations per 100,000 population, respectively).

Emergency department presentations

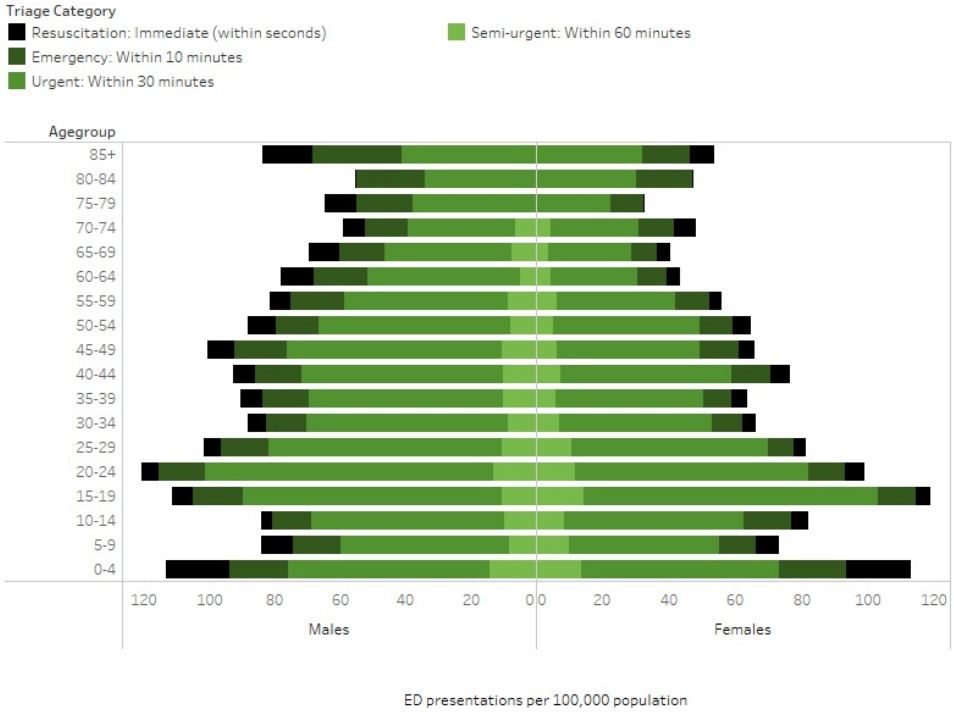
In 2018–19 there were over 20,700 emergency department (ED) presentations with a principal diagnosis of epilepsy (Figure 5.3), with 54% of these ED presentations going on to be admitted to a hospital. The rates of ED presentations were:

- higher in males than females (92.4 and 72.4 presentations per 100,000 population respectively)
- higher in younger groups, with the highest being males aged 20–24 and females aged 15–19 (122 and 120 presentations per 100,000 population respectively).

The majority of ED presentations were triaged as urgent (seen within 30 minutes) across both the male and female populations. A small proportion of ED presentations required resuscitation (Figure 5.3).

Figure 5.3: Rates of epilepsy emergency department presentations (principal diagnosis), by age group, sex and triage category, 2018-19

This is a butterfly chart with age group on the y axis and the rate of ED presentations for epilepsy, broken down by triage category, for males (left) and females (right) on the x axis. It shows that male 20-24 year olds and female 15-19 year olds had the highest rates of ED presentations for epilepsy followed by 0-4 year olds.



Epilepsy emergency department presentations per 100,000 population (principal diagnosis), by age group, sex and triage category, 2018-19

Notes:

1.Emergency department presentation rates have been calculated using population estimates for Australia, which include other territories.

2. Non urgent: Within 120 minutes is not published to prevent disclosure.

Source: AIHW analysis of the Non-Admitted Patient Emergency Department Care Database.

http://www.aihw.gov.au/

Deaths due to epilepsy

Epilepsy contributed to about 1,100 deaths in 2019 (0.7% of all deaths) according to the AIHW National Mortality Database. Epilepsy was the underlying cause of death in around 235 deaths (22% of all epilepsy deaths). It was an associated cause in a further 850 deaths (78% of all epilepsy deaths). While epilepsy as the underlying cause of death is well captured in mortality data, deaths among people with epilepsy (that is, where it is recorded as an associated cause of death) may not be fully captured. All of the epilepsy death statistics below are based on deaths where epilepsy is an underlying or associated cause of death.

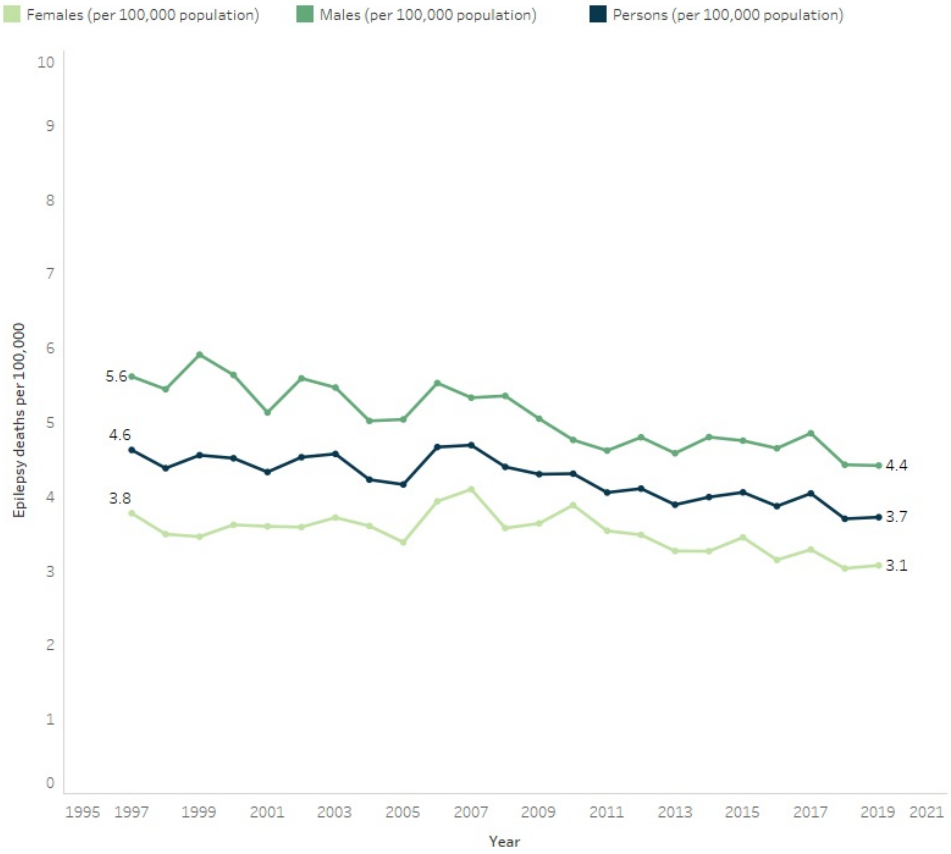
Trends

Age-standardised epilepsy death rates have declined over the last 2 to 3 decades (Figure 6.1), both where epilepsy is the underlying cause of death and where it is the underlying or associated cause of death. Between 1997 and 2019:

- Epilepsy death rates decreased from 4.6 deaths per 100,000 to 3.7 per 100,000.
- Males consistently had a higher rate of epilepsy deaths than females (5.6 per 100,000 compared with 3.8 per 100,000 in 1997; 4.4 per 100,000 compared with 3.1 per 100,000 in 2019, respectively) (Figure 6.1).

Figure 6.1: Trends in epilepsy death rates (underlying or associated cause), by sex, 1997–2019

This is a line graph that shows epilepsy deaths per 100,000 population by year on separate lines for males, females and persons. For males, females and persons the death rate has reduced over the period 1997 to 2019. The death rate for males reduced from 5.6 to 4.4, for females from 4.6 to 3.7 and for persons from 3.8 to 3.1 deaths per 100,000 population, where epilepsy was an underlying or associated cause.



Trends in epilepsy deaths per 100,000 population (underlying or associated case), by sex, 1997–2019
Note: Age-standardised to the 2001 Australian Standard Population.
Source: AIHW analysis of the National Mortality Database.
http://www.aihw.gov.au/

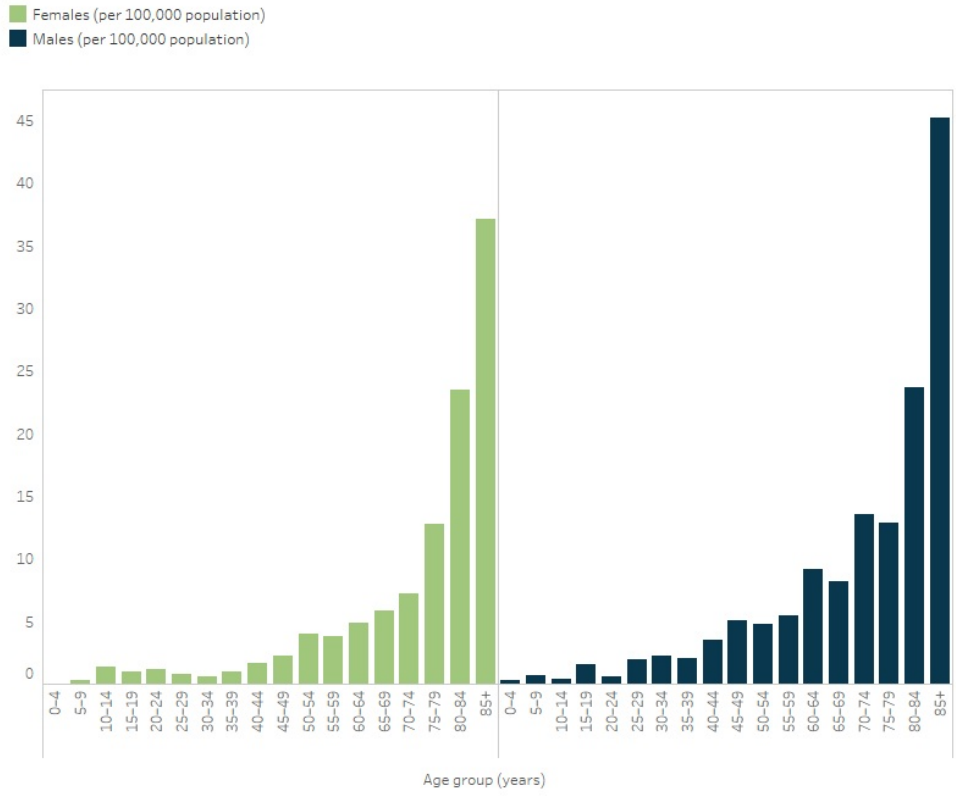
Age and sex

In 2019, age-specific epilepsy death rates (underlying or associated cause):

- increased with age from the mid-30s, with rates 1.7 times as high for those in the 85 and over age group (45.2 and 37.1 deaths per 100,000 for males and females, respectively) compared with those in the 75–84 year age group (23.7 and 23.5 deaths per 100,000 for males and females, respectively)
- were generally higher for males than females across the age groups (Figure 6.2).

Figure 6.2: Epilepsy death rates (underlying or associated cause), by age group and sex, 2019

This is a bar chart that displays epilepsy deaths per 100,000 population by age group and sex. It shows epilepsy deaths rates increase with age from the mid-30s and are highest for both males and females in the 85+ age groups.



Epilepsy deaths per 100,000 population (underlying or associated cause), by age group and sex, 2019
Source: AIHW analysis of the National Mortality Database.
http://www.aihw.gov.au/

Variations between population groups

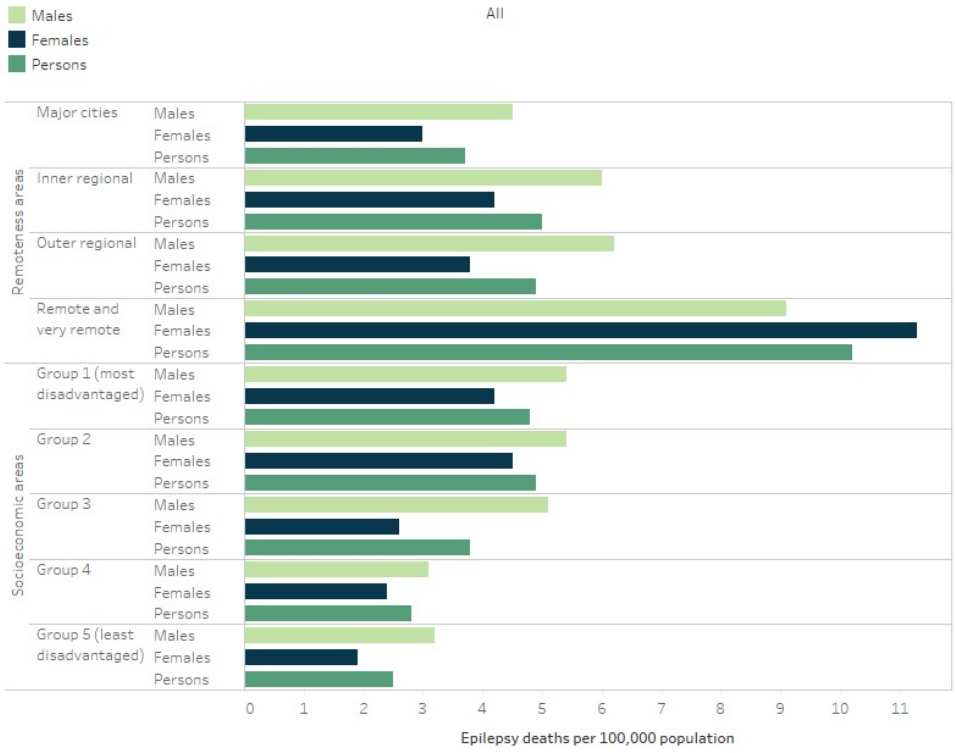
Epilepsy death rates (underlying or associated cause) generally increased with increasing socioeconomic disadvantage and for people residing in *Remote and very remote* areas (Figure 6.3).

The epilepsy death rates in 2019 were:

- almost twice as high among those living in the lowest socioeconomic areas compared with those living in the highest socioeconomic areas (4.8 and 2.5 deaths per 100,000, respectively). The difference was larger for females than males – 2.2 times as high among people living in the lowest socioeconomic areas as those living in the highest socioeconomic areas for females (4.2 and 1.9 deaths per 100,000, respectively) and 1.7 times as high for males (5.4 and 3.2 deaths per 100,000, respectively)
- 2.8 times as high in *Remote and very remote* areas compared with *Major cities* (10.2 and 3.7 deaths per 100,000, respectively). The difference was larger for females than males – 3.8 times as high in *Remote and very remote* areas than in *Major cities* for females (11.3 and 3.0 deaths per 100,000, respectively) and twice as high for males (9.1 and 4.5 deaths per 100,000).

Figure 6.3: Epilepsy death rates (underlying or associated cause), by remoteness and socioeconomic area, 2019

This is a horizontal bar chart that displays epilepsy deaths per 100,000 population by remoteness area, socioeconomic area and sex. It shows that death rates were highest in remote and very remote areas and lowest in major cities. It also shows that epilepsy death rates were highest in the most disadvantaged areas and lowest in the least disadvantaged areas.



Epilepsy deaths per 100,000 population (underlying or associated cause), by remoteness and socioeconomic areas, 2019
Notes:
1. Age-standardised to the 2001 Australian Standard Population.
2. Remoteness is classified according to the Australian Statistical Geography Standard 2016 Remoteness Areas structure based on Statistical Area Level 2 (SA2) of usual residence.
3. Socioeconomic areas are classified according to population-based quintiles using the Index of Relative Socio-Economic Disadvantage (IRSD) based on Statistical Area Level 2 (SA2) of usual residence.
Source: AIHW analysis of the National Mortality Database.
http://www.aihw.gov.au/

Aboriginal and Torres Strait Islander people

In 2019, there were 57 deaths of Indigenous Australians where epilepsy was recorded as either the underlying or associated cause. The death rate (underlying or associated cause) was higher for Indigenous males than it was for females (13.1 and 10.5 deaths per 100,000, respectively). Due to data quality issues, these data include people residing in New South Wales, Queensland, Western Australia, South Australia and the Northern Territory only.

After adjusting for differences in the age structure of the populations, the rate of deaths of people with epilepsy was over three times as high among Indigenous Australians as non-Indigenous Australians (12.1 and 3.5 deaths per 100,000, respectively).

The gap in death rates between Indigenous and non-Indigenous Australians was similar for females and males.

References

AIHW (Australian Institute of Health and Welfare) 2016. Australian Burden of Disease Study 2011: methods and supplementary material. Cat. no. BOD 6. Canberra: AIHW.

AIHW 2019. Australian Burden of Disease Study: methods and supplementary material 2015. Cat. no. BOD 23. Canberra: AIHW.

Moran NF, Poole K, Bell G, Solomon J, Kendall S, McCarthy M et al. 2004. Epilepsy in the United Kingdom: seizure frequency and severity, anti-epileptic drug utilization and impact on life in 1652 people with epilepsy. Seizure 13(6):425-33, doi:10.1016/j.seizure.2003.10.002.

Data

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