

### Patterns of mortality from stroke in Queensland

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#### Summary

Stroke is a common cause of death. It is the third leading cause of death for men, after coronary heart disease and lung cancer and is the second leading cause of death for women after coronary heart disease. About 900 men and 1300 women die from stroke in Queensland each year.

Contrary to popular belief, strokes do not only affect the elderly. Although about half of all strokes occur in people older than 75 years, young people are occasionally affected by stroke, sometimes at the peak of their working lives.

Mortality rates from stroke in Queensland are similar to the Australian average.

Mortality rates from stroke continue to decrease in both Queensland and Australia. For the 10-year period, 1991 to 2000, mortality rates for stroke declined by 3.4% per year in males and 3.1% per year in females. This rate of decrease is smaller than that for coronary heart disease, but greater than that for all causes of death combined.

Experts have attributed the declines in mortality rates from stroke to preventive measures including better control of hypertension, cessation of cigarette smoking, increased levels of physical activity and warfarin anticoagulation in patients with atrial fibrillation.

Mortality rates from stroke in Queensland and Australia are higher than those in France, the United States, Canada and Hong Kong. For example, 26% of deaths from stroke in Queensland could be prevented if this state had mortality rates similar to those in France. Although international comparisons of mortality may be influenced by differences in coding practices between countries, these international benchmarks, along with the decreases in mortality over time, show that there is further potential for reducing mortality from stroke in Queensland.

Advances in acute stroke management have occurred in recent years, including the use of aspirin, increased access to stroke units and, for selected patients, thrombolysis with tissue plasminogen activator. However, the most effective means of reducing the burden of stroke is prevention.

Hypertension is the single most important risk factor for stroke and the identification and treatment of hypertension with medication (including isolated systolic hypertension in the elderly) is particularly important. Lifestyle changes to help lower blood pressure include eating less salt and limiting alcohol consumption. Other risk factors for stroke include atrial fibrillation, smoking, physical inactivity, obesity and high blood cholesterol, previous stroke, and transient ischaemic attacks (TIA).

Death rates from stroke do not vary according to Queensland Health administrative zones. They also do not vary by geographic remoteness. This is in contrast to coronary heart disease for which mortality rates in remote areas are 25% higher than the state average (see Information Circular 55).

Death rates from stroke in economically disadvantaged areas of Queensland are 12% higher than the state average. In affluent areas they are 10% lower than the state average. This is similar to the pattern seen for coronary heart disease.

As is the case for coronary heart disease, Indigenous people in Queensland have mortality rates from stroke that are more than two times the state average.

The epidemiology of stroke and coronary heart disease is similar; there is overlap in some of the risk factors and the two diseases tend to occur together. However, there are differences; stroke patients are at least 10 years older, there is less of a male excess in middle age and hypertension is a much more important risk factor and high blood cholesterol is a less important risk factor.

#### Aims

This Information Circular provides Queensland-specific information on mortality from stroke. The aims of the Circular are to:

- Benchmark rates of stroke in Queensland with those of the other Australian states and territories, and internationally.
- Examine trends in mortality from stroke in Queensland.
- Compare rates of stroke for all of Queensland with those of special populations, namely: Indigenous people, rural and remote populations, and economically disadvantaged groups.

The Circular does not consider incidence (new cases) of stroke. Little is known about trends in the incidence of stroke or its non-fatal component because it can only be measured accurately through stroke registers. These are expensive to maintain and usually do not cover entire populations. Consequently, there is little population-based data on the incidence of stroke in Queensland, the rest of Australia or overseas.

Hospitalisation data offer a possibly useful proxy for monitoring incidence of stroke. However, not all persons suffering from stroke are admitted to hospital—especially if the stroke is mild or the person is already residing in a nursing home. Further, the proportion of strokes admitted to hospital can change over time, making trends difficult to interpret. Developmental work on using hospitalisation data to monitor the incidence of stroke is continuing.

### What is stroke?

A stroke is a clinically defined syndrome of rapidly developing damage to the brain, which can impair a range of functions including movement and communication. It occurs when an artery supplying blood to the brain suddenly becomes blocked (ischaemic stroke), or bleeds (haemorrhagic stroke).

About 90% of strokes are ischaemic, due mainly to a process called atherosclerosis, which clogs the arteries, thereby reducing blood flow. (In a similar way, atherosclerosis of the arteries that supply the heart leads to heart attack, i.e., coronary heart disease). Another cause of ischaemic stroke is clots that travel from the heart as a result of atrial fibrillation. About 10% of strokes are haemorrhagic, caused by bleeding within the brain or on its surface.

### Stroke is a leading cause-of-death

Stroke causes about 880 deaths per year among men and 1280 deaths among women in Queensland. It is the third leading cause of death for men and is the second leading cause of death for women (Table 1).

**Table 1. Leading causes of death, Queensland, 2000**

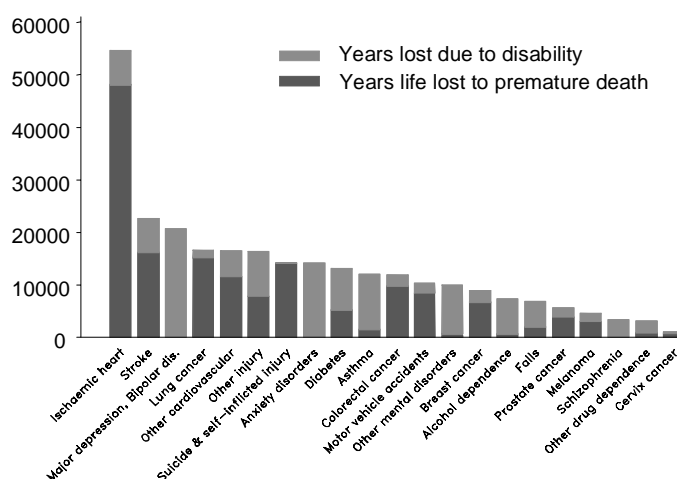
Males			Females		
Cause of death	No of deaths	Per cent	Cause of death	No of deaths	Per cent
Ischaemic heart disease	2538	21.5	Ischaemic heart disease	2386	23.3
Lung cancer	872	7.4	Stroke	1280	12.5
Stroke	861	7.3	Breast cancer	393	3.8
COPD <sup>1</sup>	630	5.3	Bowel cancer	361	3.5
Prostate cancer	506	4.3	Lung cancer	356	3.5
Bowel cancer	461	3.9	COPD <sup>1</sup>	304	3.0
Suicide	405	3.4	Pneumonia	245	2.4
Diabetes	306	2.6	Diabetes	242	2.4
Transport accidents	256	2.2	Dementia	173	1.7
Pneumonia	211	1.8	Suicide	120	1.2
Melanoma of the skin	143	1.2	Ovarian cancer	118	1.2
Dementia	94	0.8	Transport accidents	82	0.8
			Melanoma of the skin	65	0.6
<b>All causes</b>	<b>11778</b>	<b>100.0</b>	<b>All causes</b>	<b>10247</b>	<b>100.0</b>

Source: Death Registration Data Set, Health Information Centre, Queensland Health  
 1. Chronic obstructive pulmonary disease, that is, chronic bronchitis and emphysema

### Combining information on death and disability

The leading causes of death provide one perspective of the burden of disease in a population. Another perspective is obtained by combining information on deaths, disability, impairment, and illness using a measure called the Disability-Adjusted Life Year or DALY. One DALY is a lost year of healthy life and is calculated as a combination of years of life lost to premature death and *healthy* years of life lost due to disability or illness. Figure 1 shows the leading causes of disease burden in Queensland, based on the DALY. Coronary heart disease and stroke still rank one and two respectively when disability is taken into account.

**Figure 1. DALYs for leading diseases, Queensland, 1996-1998**

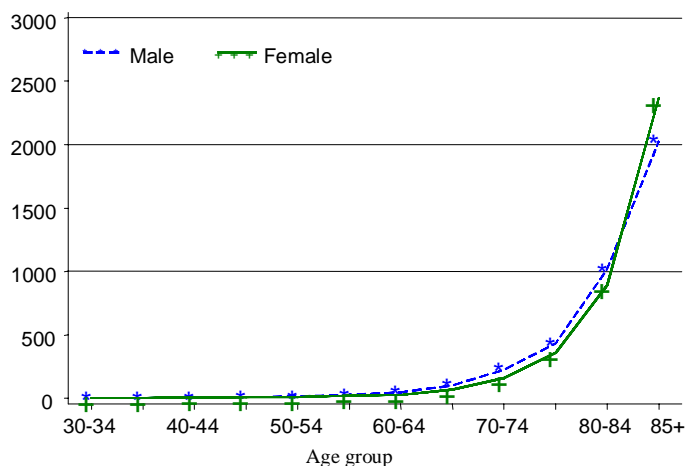


Source: Health Information Centre, Queensland Health

## Age-specific mortality rates

About 50% of people who die from stroke are older than 75 years, but 5% occur in people younger than 45 years. Age-specific mortality rates are similar for males and females (Figure 2).

**Figure 2. Age-specific mortality rates for stroke, 1996-2000**



Source: Death Registration Data Set, Health Information Centre, Queensland Health

## Trends in mortality

The risk of Queenslanders (and other Australians) dying from stroke has decreased progressively since the early 1950s. This is in contrast to coronary heart disease, for which the rates did not start decreasing until the late 1960s.

Mortality rates from stroke continue to decrease in Queensland and Australia, although the rate of decline may have slowed since the 1970s. For the 10-year period, 1989 to 1998, mortality rates for stroke declined by 3.4% per year in males and 3.1% per year in females. This rate of decline is smaller than that for coronary heart disease, but greater than that for all causes of death combined (Table 2).

**Table 2. Annual percentage change in age-standardised mortality rates, Queensland, 1991 to 2000**

	Annual percentage change	
	Males	Females
Coronary heart disease	-4.3	-3.8
Stroke	-3.4	-3.1
All cardiovascular disease	-4.0	-3.5
All-cause mortality	-2.1	-1.8

Experts have attributed the declines in death rates from stroke to preventive measures including better control of hypertension, cessation of cigarette smoking, increased levels of physical activity and warfarin anticoagulation in patients with atrial fibrillation.

## Interstate comparisons

Queensland's death rates are about the same as the national average and the downward trend for Queensland is about the same as that for all of Australia (Table 3 and Figures 3 & 4).

**Table 3: State variations in mortality from stroke.**

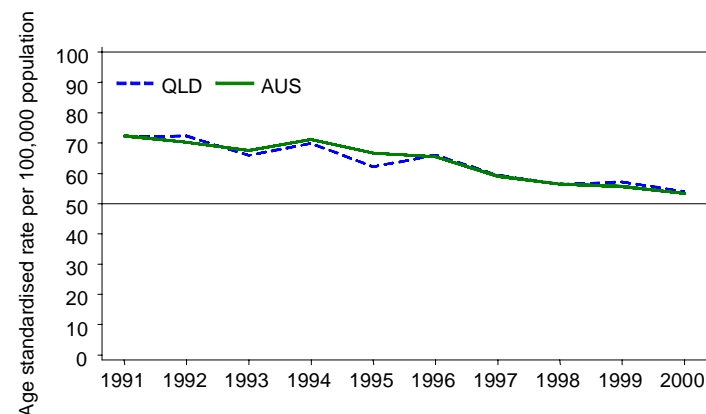
	Males		Females	
	Average rate <sup>1</sup> 1998 to 2000	APC <sup>2</sup> 1991 to 2000	Average rate <sup>1</sup> 1998 to 2000	APC <sup>2</sup> 1991 to 2000
NSW	59.6	-3.5	53.0	-3.7
Vic	49.5	-3.5	45.9	-3.5
Qld	55.7	-3.4	51.0	-3.1
WA	52.1	-3.5	45.9	-3.2
SA	53.2	-4.5	48.0	-4.0
Tas	64.6	-2.2	51.4	-3.4
Australia	55.1	-3.5	49.8	-3.4

1. Rate per 100,000 population, directly age standardised to the 1991 Australian Standard Population

2. Annual percentage change

Source: Death Registration Data Set, Health Information Centre, Queensland Health

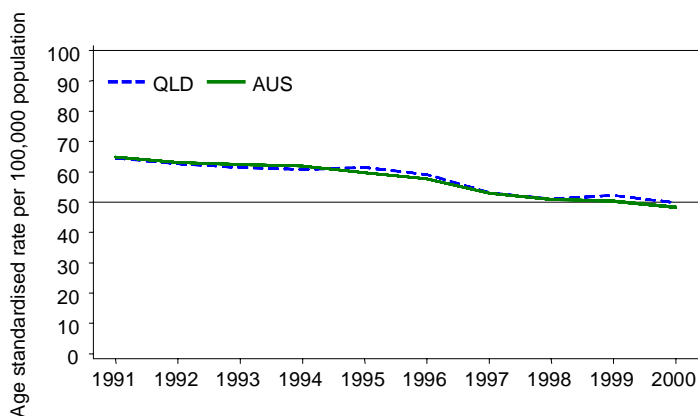
**Figure 3. Trends in directly age standardised mortality rates<sup>1</sup> for stroke, males, Queensland and Australia, 1991 to 2000**



Source: Death Registration Data Set, Health Information Centre, Queensland Health

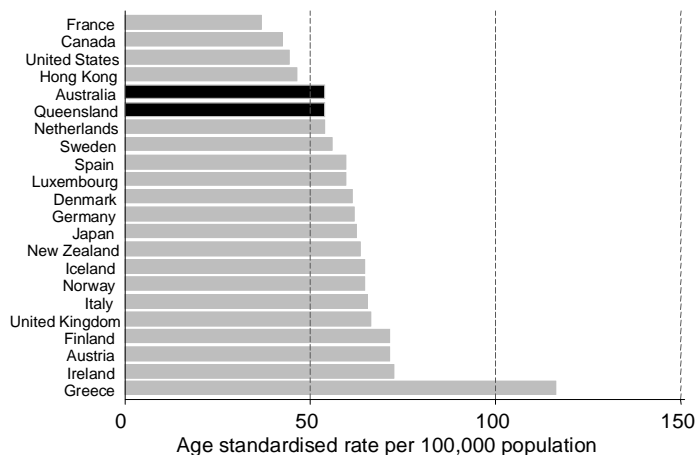
<sup>1</sup>Directly age standardised to the 1991 Australian Standard Population.

**Figure 4. Trends in directly age standardised mortality rates for stroke, females, Queensland and Australia, 1991 to 2000**



Source: Death Registration Data Set, Health Information Centre, Queensland Health  
 \*Directly age standardised to the 1991 Australian Standard Population.

**Figure 6. International comparison of directly age standardised mortality rates<sup>1</sup> for stroke, females, various years (1996 to 1998)**

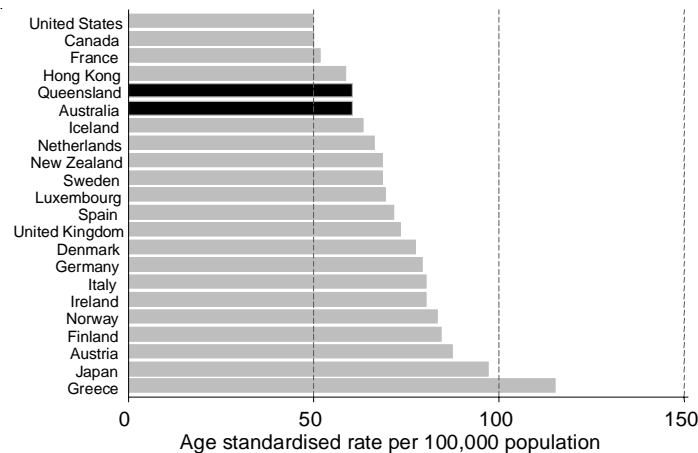


Source: World Health Organisation, health statistical data collections  
 \*Directly age standardised to the 1991 Australian Standard Population.

**International comparisons**

Information from other countries provides useful benchmarks that show there is potential for further lowering of the death rates for stroke in Queensland and Australia (Figures 5 & 6).

**Figure 5. International comparison of directly age standardised mortality rates<sup>1</sup> for stroke, males, various years (1996 to 1998)**

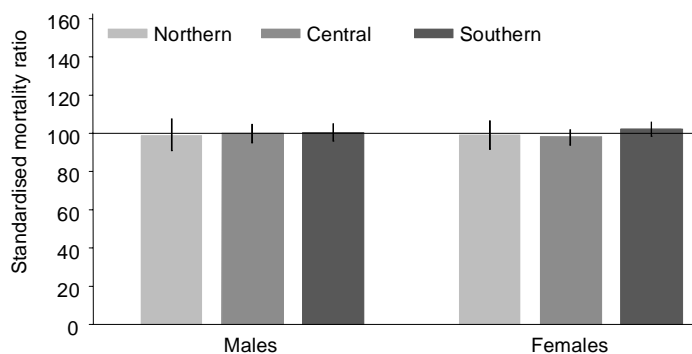


Source: World Health Organisation, health statistical data collections  
 \*Directly age standardised to the 1991 Australian Standard Population.

**Variation across Queensland Health Zones**

There are no differences in mortality rates from stroke across the three Health Zones in Queensland (Figure 7).

**Figure 7. Age standardised mortality ratios<sup>1</sup> for stroke by Zone, by sex, 1996-2000**

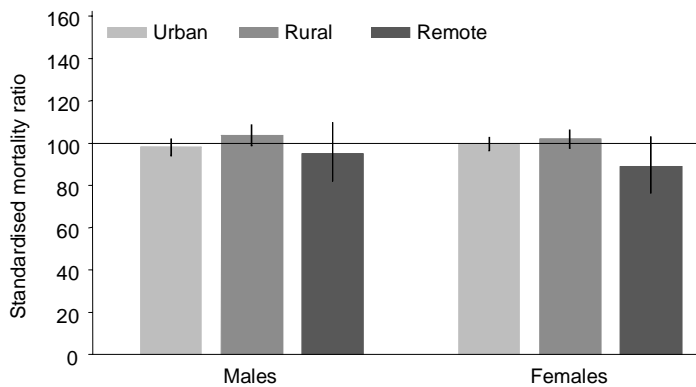


Source: Death Registration Data Set, Health Information Centre, Queensland Health  
 \*Indirectly age standardised to the Queensland population.

**Variation by geographic remoteness**

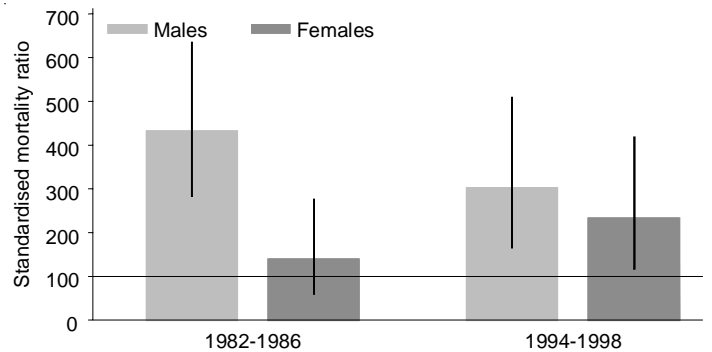
In Queensland, as in the other states, there are no differences in stroke mortality by geographic remoteness. [Australian Institute of Health & Welfare, Heart Foundation of Australia. Heart, Stroke and Vascular Disease, Australian Facts. Canberra AIHW 1999] (Figure 8).

**Figure 8. Age standardised mortality ratios<sup>1</sup> for stroke by geographic remoteness, by sex, 1996-2000**



Source: Death Registration Data Set, Health Information Centre, Queensland Health  
<sup>1</sup>Indirectly age standardised to the Queensland population.

**Figure 10. Age standardised mortality ratios for stroke for rural & remote Indigenous communities in Queensland, 1982-196 & 1994-1998**

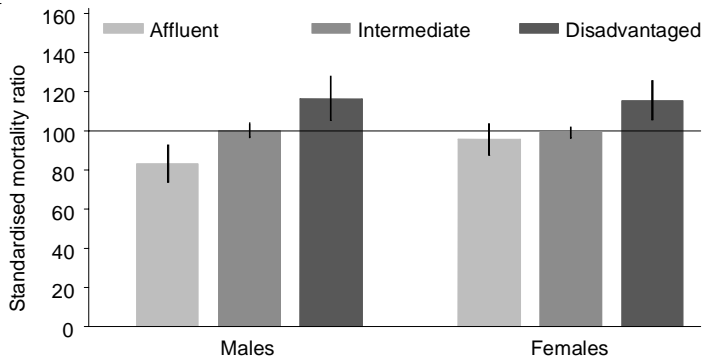


Source: Death Registration Data Set, Health Information Centre, Queensland Health  
<sup>1</sup> Indirectly age standardised to the Queensland population.

### Variation by economic disadvantage

Mortality rates from stroke in economically disadvantaged areas are 12% higher than the state average. In affluent areas they are 10% lower than the state average (Figure 9).

**Figure 9. Age standardised mortality ratios<sup>1</sup> for stroke by economic disadvantage, by sex, 1996-2000**



Source: Death Registration Data Set, Health Information Centre, Queensland Health  
<sup>1</sup> Indirectly age standardised to the Queensland population.

### Variation by Indigenous status

Indigenous people have mortality rates for stroke that are between two and three times higher than that for the rest of the population (Figure 10).