

Trends in deaths

**Analysis of Australian data 1987–1998
with updates to 2000**

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**Analysis of Australian data 1987–1998
with updates to 2000**

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and
Paul Jelfs**

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Australian Institute of Health and Welfare
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Preface

This report examines the changing pattern of Australian mortality. It reflects a greater effort by the Australian Institute of Health and Welfare to examine the impact of mortality in population groups and geographic locations, and to examine long-term mortality trends.

The report undertakes a detailed examination of the period 1987 to 1998 and highlights recent changes to 2000. It includes analysis of long-term mortality trends over the past century, and analysis by State and Territory, Indigenous status, socioeconomic status, geographic area and country of birth for 16 feature disease groups and all causes combined. In addition, a companion set of data on deaths from 174 diseases is available on the AIHW web site (www.aihw.gov.au).

Commentary is provided to put the statistics into context and to serve as a guide to further analysis. The report is aimed at a broad audience, but provides enough technical information to be useful for those studying and working in the areas of public health and health policy.

While mortality rates are declining for Australians in general, the decreases have not been shared equally by all Australians. Mortality rates for Indigenous males and females are still significantly higher than for other Australians. Mortality rates are also significantly higher for Australians living in non-metropolitan areas (influenced by Indigenous rates in these areas) and for those with lower socioeconomic status. There have also been worrying increases in the rates of lung cancer among females.

I commend this report to you and trust that it will provide a comprehensive view of mortality in Australia as we start the new century.

Richard Madden
Director

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Abbreviations

ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
AHTAC	Australian Health Technology Advisory Committee
AIHW	Australian Institute of Health and Welfare
ASGC	Australian Standard Geographic Classification
ASMR	Age-standardised mortality rate
CI	Confidence interval
COPD	Chronic obstructive pulmonary disease
HALE	Healthy life expectancy
ICD	International Classification of Diseases
NSW	New South Wales
NT	Northern Territory
OECD	Organisation for Economic Co-operation and Development
PYLL	Person years of life lost
Qld	Queensland
RRMA	Rural, Remote and Metropolitan Areas Classification
SA	South Australia
SEIFA	Socioeconomic Indexes for Areas
SES	Socioeconomic status
SIDS	Sudden infant death syndrome
SLA	Statistical Local Area
SMR	Standardised mortality ratio
TAS	Tasmania
USA	United States of America
UK	United Kingdom
Vic	Victoria
WA	Western Australia
WHO	World Health Organization

Summary information for leading causes of death, males, 2000

Conditions	Deaths		Mortality rate ^(a)	Yearly % change		Median age	Top 10
	Number	% of total		1987–1998	1997–2000		
All causes of death	66,817	100.0	7,127	-2.3	-3.4	74	
All circulatory diseases	23,756	35.5	2,555	-3.8	-6.4	78	
Ischaemic heart disease	14,052	21.0	1,502	-2.6	-7.0	76	1
Cerebrovascular diseases	4,913	7.4	535	-0.9	-4.0	80	2
Diseases of the arteries, arterioles and capillaries	1,321	2.0	143	-4.0	-4.0	78	9
All malignant cancers	20,153	30.2	2,116	-0.8	-1.8	72	
Lung cancer	4,587	6.9	480	-1.9	-2.4	71	3
Prostate cancer	2,663	4.0	288	2.3	-1.1	78	5
Colorectal cancer	2,533	3.8	265	0.4	-2.2	72	6
Other							
Chronic obstructive pulmonary disease	3,281	4.9	355	-1.7	-6.1	77	4
Suicide	1,860	2.8	194	0.5	-6.4	39	7
Diabetes	1,594	2.4	169	3.7	-1.7	75	8
Influenza and pneumonia	1,312	2.0	145	-2.3	6.7	79	
Land transport accidents	1,374	2.0	147	^(b) -6.1	-1.0	32	10
Renal failure	803	1.2	88	2.4	-2.3	82	

(a) Mortality rates use Australian 1991 Standard Population and are expressed per 1,000,000 population.

(b) The 1987–1998 trend is calculated using ICD-9 codes E810–819 (motor vehicle traffic accident).

Summary information for leading causes of death, females, 2000

Conditions	Deaths		Mortality rate ^(a)	Yearly % change		Median age	Top 10
	Number	% of total		1987–1998	1997–2000		
All causes of death	61,474	100.0	4,507	-1.9	-3.0	81	
All circulatory diseases	25,931	42.2	1,726	-3.6	-5.5	84	
Ischaemic heart disease	12,469	20.3	840	-1.9	-6.7	84	1
Cerebrovascular diseases	7,387	12.0	483	-1.0	-3.8	85	2
Diseases of the arteries, arterioles and capillaries	1,296	2.1	86	-4.2	-5.0	85	9
All malignant cancers	15,475	25.2	1,280	-0.4	-2.0	74	
Female breast cancer	2,511	4.1	215	0.0	-4.1	67	3
Lung cancer	2,291	3.7	196	1.4	1.3	72	4
Colorectal cancer	2,179	3.5	175	-0.2	-3.0	76	5
Other							
Chronic obstructive pulmonary disease	2,015	3.3	156	2.6	-5.7	78	6
Diabetes	1,412	2.3	107	2.1	-4.1	79	7
Influenza and pneumonia	1,625	2.6	101	-1.7	2.7	82	8
Renal failure	913	1.5	60	2.5	0.4	84	10
Suicide	503	0.8	52	-0.1	-6.0	40	
Land transport accidents	532	0.9	55	^(b) -5.8	-2.5	37	

(a) Mortality rates use Australian 1991 Standard Population and are expressed per 1,000,000 population.

(b) The 1987–1998 trend is calculated using ICD-9 codes E810–819 (motor vehicle traffic accident).

Summary of findings

This publication presents profiles for 16 causes of death— ischaemic heart disease, cerebrovascular disease, lung cancer, prostate cancer, breast cancer, colorectal cancer, chronic obstructive pulmonary disease, asthma, suicide, motor vehicle traffic accidents, homicide, diabetes, mental disorders, dementia, and smoking- and alcohol-related disease— as well as all deaths. Each disease profile discusses age and sex trends in mortality rates for the period 1987–1998; comparisons of mortality rates for the Indigenous population, metropolitan, rural and remote populations, and the States and Territories; and comparisons of mortality rates by socioeconomic status and country of birth.

Life expectancy, premature loss of life and general mortality patterns are also discussed, and an overview is given of the major causes of death by age and sex.

You will also find age and sex trends for 174 diseases on the mortality portal of the AIHW web site at <http://www.aihw.gov.au>.

Hundreds of statistical measurements have been made in the analyses for this report. However, rather than present every one of them, we have presented those that show statistical significance. To limit repetitive description of these statistics, the term ‘significantly’ has been used to describe measurements that are statistically significantly different.

Mortality

Overall

Over the 20th century, the male age-standardised mortality rate declined by 63%, from 19,503 deaths per million population in 1907 to 7,127 in 2000. The female age-standardised mortality rate declined by 72% over the same period, from 16,133 to 4,507 deaths per million population.

Twelve-year trends 1987–1998

During the period 1987–1998 the mortality rate fell by 22.5% for males (from 10,054 deaths per million population), and by 19.4% for females (from 5,837 deaths per million population). Mortality rates for males aged 0 to 4 years fell by 27%, while for females the rates fell by 19%.

The mortality rate decreased for all five-year age groups except males aged 35–39 and males aged 30–34 (where there was a small but statistically significant increase). The rates decreased for females aged 10–14, 30–34 and 35–39 (where decreases were not as pronounced).

Life expectancy

Life expectancy at birth increased by about 20 years over the 20th century, from 55.2 and 58.8 years for males and females respectively in 1901 to 76.6 and 82.1 years in 2000 (Figure 2.1; Table 2.1).

For the analysis period 1987–1998, the gains were 2.9 years for males and 2.2 years for females.

Healthy life expectancy in Australia was compared in this report with 20 countries that either had health systems comparable with Australia's or had large migrant populations residing in Australia. Among these countries, healthy life expectancy was ranked sixth highest for Australian-born males, and third highest for Australian-born females (Figure 2.2; Table 2.2).

Major causes of death

In 1998, the top 10 causes of death in descending order were:

- Ischaemic heart disease (heart attack)
- Cerebrovascular disease (stroke)
- Lung cancer
- Chronic obstructive pulmonary disease
- Bowel cancer
- Diabetes
- Suicide
- Breast cancer
- Prostate cancer
- Pneumonia.

Together these accounted for 56% of all deaths (see Table: Summary information for leading causes of death, pages x-xi).

Ischaemic heart disease and cerebrovascular disease were the two leading causes of death for males and females, ischaemic heart disease having been the most common cause of death for the last 60 years. Lung cancer and chronic obstructive pulmonary disease were the third and fourth most common causes of death for males. For females, breast cancer was the third most common, followed by colorectal cancer.

Causes of death can be compared as single causes (e.g. lung cancer and ischaemic heart disease), or as group causes (e.g. all cancers and cardiovascular disease). The ranking of a cause of death is thus determined by how the causes were grouped. This publication generally uses single causes of death and only uses group causes when it is desirable to aggregate deaths as a single disease entity for epidemiological or management purposes.

Premature loss of life

In health statistics, premature loss of life is a concept used as a summary measure, allowing comparisons of premature loss of life between different causes of death. Person years of life lost (PYLL), used in this report, is one of a set of measures of premature loss of life based on mortality data (see Appendix D). The global burden of disease work undertaken at the World Health Organization has extended the concept of life lost due to premature mortality to include equivalent years of 'healthy' life lost in states of less than full health, 'disability', and measured by disability-adjusted life years (DALY). This work has been continued at the Australian Institute of Health and Welfare in the publication *The Burden of Disease and Injury in Australia* (1999), by Colin Mathers, Theo Vos and Chris Stevenson.

There were more than one million PYLL to the Australian population during 1987 because of premature death (defined as death before the age of 75 years). This amount reduced to about 940,000 PYLL during 1998.

Suicide was the largest single contributor to PYLL for males (12.2%) while breast cancer was the main contributor for females (9.0%). However, the mortality from conditions attributed to tobacco smoking was responsible for an estimated 118,000 PYLL in 1998 – a preventable 13% of all premature loss of life (14.5% for males, 10.2% for females).

Major causes of death by age and sex in 1998

For infants (less than 1 year old), conditions emerging from the perinatal period (e.g. maternal complications of pregnancy, and complications of placenta, cord and membranes) were the largest cause of death for both males and females. These include deaths due to conditions that have their origin in the perinatal period, from 22 completed weeks of pregnancy to 28 days following birth, even though death may occur later (AIHW 1999c).

For those aged 0 to 24, injury was the main cause of death for both males and females.

For males aged 25 to 44, injury was the main cause of death, considerably greater than other causes for males. For females, breast and cervical cancer were the main causes by age 35.

For males aged 45 to 64, the main causes of death were colorectal and lung cancer, while for females, breast and colorectal cancer were the most common.

For both males and females aged 65 to 84, cardiovascular disease, largely ischaemic heart disease, overtook cancer as the principal cause of death.

For both males and females 85 years and older, the principal cause of death was cardiovascular disease, followed by cancer and respiratory disease.

Indigenous status

In 1995–1997, the number of Aboriginal and Torres Strait Islander deaths was three times higher than the expected number when based on the rates for the Australian population as a whole. Data was analysed from the Northern Territory, Western Australia and South Australia where identification of Indigenous status was considered of a good enough standard for the analysis period 1995–1997.

Trends in Aboriginal and Torres Strait Islander deaths were not analysed due to the generally poor quality of Indigenous identification in mortality and population data in earlier years.

Geographic comparisons

There were significant differences in mortality rates between metropolitan and non-metropolitan areas in Australia. Those living in rural areas had significantly higher mortality rates than those living in metropolitan areas. Rates were highest for residents of remote regions.

These differences were influenced by many factors, including the proportion of the Indigenous population, the socioeconomic status of the population, level of public health infrastructure, availability of health services and environmental risks.

Socioeconomic status

Mortality rates by cause of death were generally inversely related to socioeconomic status, with rates lowest for high socioeconomic status populations, and highest for low socioeconomic populations. Breast cancer was one of the causes of death that was contrary to this relationship.

Country of birth

Mortality rates for Australian residents showed significant differences in respect of country of birth. However, the findings should be treated with caution because of the relatively small numbers for many countries, particularly the findings for individual disease groups. Australian males and females born in Korea, Hong Kong and Macau had significantly lower mortality rates, indicative of an overall pattern of lower mortality rates for those born in Asian countries. Mortality rates were highest among Australian males and females born in Israel, and in males born in Finland, Poland and the United States of America.

Summary of disease profiles

1. Ischaemic heart disease (heart attack) was the leading cause of death in Australia, claiming 22% of all deaths in 1998. During 1998 the mortality rates were 1,730 and 942 deaths per million population for males and females respectively. Of the 28,103 deaths, 15,173 were males and 12,930 were females. This accounts for 96,000 PYLL each year (ranked first overall for persons, but second behind suicide for males, and second behind breast cancer for females, on this measure).
2. Cerebrovascular disease (stroke) was the second largest underlying cause of death, responsible for 10% of all deaths in 1998, with rates of 593 and 535 deaths per million population for males and females respectively. Of the 12,612 deaths that occurred during 1998, 5,065 were males and 7,547 were females. It accounts for about 29,000 PYLL (ranked ninth).
3. Lung cancer was the leading cause of cancer death for males in Australia and the third for females, with rates of 532 male deaths per million population and 186 female deaths in 1998. Of the 6,874 deaths, 4,821 were males and 2,053 were females. It accounts for about 45,000 PYLL each year (ranked fifth).
4. Bowel cancer was the second most common cause of cancer deaths and responsible for 4% of all deaths, with rates of 288 and 196 per million population for males and females respectively in 1998. Of the 4,916 deaths in 1998, 2,605 were males and 2,311 were females. It accounts for about 33,000 PYLL each year (ranked seventh).
5. Prostate cancer is a major cause of death in older males, with 83% of prostate cancer deaths occurring in males aged 70 years and older, and 44% in males aged 80 years and older. During 1998, there were 2,556 deaths from prostate cancer (296 deaths per million population).
6. Breast cancer deaths were associated with about 30,000 PYLL, making breast cancer the highest contributor to premature death for females in Australia. During 1998 there were 2,568 deaths (232 deaths per million population) from breast cancer.
7. Chronic obstructive pulmonary disease contributed 4% of all deaths. During 1998 the mortality rates were 402 and 171 deaths per million population for males and females respectively. Of the 5,575 deaths during 1998, 3,500 were males and 2,075 were females.

It is estimated that 16,000 PYLL before the age of 75 years each year makes this a major cause of premature death for males and females.

8. Mental disorders contributed to 2.5% of all deaths in 1998 with rates of 214 and 145 deaths per million population for males and females respectively. Of the 3,903 deaths during 1998, 1,855 were males and 1,720 were females. It is estimated that in 1998 there were about 33,000 PYLL for males (ranked sixth on this measure) and about 9,000 PYLL for females (ranked tenth).
9. Mortality rates due to dementia and related disorders were 171 and 182 deaths per million population for males and females respectively during 1996 (see explanation in Chapter 18). There were 3,873 deaths during 1996 – 1,294 males and 2,579 females.
10. Two per cent of all deaths in 1998 were attributed to diabetes. During that year the diabetes mortality rate was 171 deaths per million population for males and 113 per million for females. Of the 2,927 deaths, 1,515 were males and 1,412 were females. There were an estimated 15,000 PYLL each year because of diabetes before age 75. The death rates for the Indigenous population were considerably higher than the rates for the general population for the period 1995–1997.
11. Mortality rates from asthma in 1998 were similar for both males and females (32 and 36 deaths per million population). In that year, one out of every two hundred deaths were due to asthma. Of the 699 deaths, 284 were males and 415 were females.
12. Suicide accounted for 2% of all deaths in 1998, and the mortality rate for males (231 deaths per million population) was about four times higher than for females (56). Of the 2,682 deaths, 2,150 were males and 532 were females. There were an estimated 92,000 PYLL due to suicide each year making it first in rank for males and fourth for females on this measure.
13. Deaths from motor vehicle accidents accounted for 1.3% of all deaths in 1998. Of these 1,731 deaths, 1,224 were males and 507 were females. In 1998, motor vehicle mortality rates were 134 deaths per million population for males and 53 deaths per million population for females. Age-specific rates were significantly greater between ages 15–34 years and for 70 years and over, although the effect of age was less pronounced for females than males. There were an estimated 64,000 PYLL due to motor vehicle traffic accidents in 1998, making it third in rank for males and fifth for females on this measure.
14. Homicide accounted for about 0.2% of all deaths in 1998. The mortality rates were 21 and 11 deaths per million population in 1998. Of these 298 deaths, 197 were males and 101 were females.
15. Tobacco smoking was responsible for an estimated 17,800 deaths in 1998 (accounting for 14% of all deaths). Males represented 12,849 (72%) of the smoking-related deaths and this accounted for 19% of all male deaths. The mortality rate for males (1,437 per million) was three times higher than the rate for females (428). Deaths due to smoking represented about 13% of PYLL in 1998, making it the largest preventable cause of death. These estimates refer only to active smoking of cigarettes, not to passive smoking.
16. Excessive alcohol consumption was responsible for an estimated 2,344 male deaths and 1,193 female in 1998. Deaths due to alcohol-related disease represented about 3.5% of all deaths, and about 7% of PYLL.

Part I

An overview of mortality in Australia

Chapter 1 Introduction

Chapter 2 Life expectancy and premature loss of life

Chapter 3 Major causes of death in 1998 by age and sex

