

Introduction

Cardiovascular disease is one of five National Health Priority Areas (the others are injury, mental health, cancer and diabetes) agreed to at a meeting of Australian Health Ministers in July 1996. Cardiovascular disease comprises all diseases of the circulatory system, including heart disease, stroke and vascular diseases. Its inclusion as a priority area is continued recognition of the massive impact cardiovascular disease has in Australia in terms of burden of illness and economic costs and in terms of the need for coordinated activity to reduce these effects. This report is produced from the national monitoring system established to monitor this disease and its impact. Previous mortality surveillance reports in the Cardiovascular Disease Series are listed in the *Related publications* section at the end of this report.

The National Cardiovascular Monitoring System

The system comprises the National Centre for Monitoring Cardiovascular Disease, an Advisory Committee, and a number of collaborative projects with other centres.

The National Centre is located within the Australian Institute of Health and Welfare and commenced operation in January 1996. It monitors trends and inequalities in mortality, morbidity and risk factors, monitors progress towards national goals and targets, promotes standards and develops data systems. The function of the Advisory Committee is to advise on the development and implementation of the monitoring system, and guide and review the Centre's work program. The committee includes representatives from Commonwealth, State and Territory Health Departments, the National Heart Foundation, medical colleges, and academics with expertise in the fields of cardiovascular disease, data collection and analysis.

The inclusion of collaborative projects with other centres recognises that, for the national monitoring system to be fully effective, it is important that it incorporates the expertise that exists in key agencies and centres of excellence.

The components of the national system relate to primary prevention, risk factors, disease incidence, pre-hospital and emergency care, medical and surgical hospital care, rehabilitation, follow-up care, disease prevalence and functional status, palliative care and death.

Mortality surveillance

This report addresses one of the important functions of the National Centre: to monitor and report on trends and differentials in cardiovascular mortality. The report provides a detailed statistical profile of death from cardiovascular disease and its major components, for Australia, for each State and Territory, for the Indigenous (Aboriginal and Torres Strait Islander peoples) and non-Indigenous populations, and for urban, rural and remote areas.

Classification of cause of death

The mortality classification is based upon the International Classification of Diseases, Ninth Revision (ICD-9) (World Health Organization 1977). Where more than one condition is mentioned on the medical certificate of cause of death, one 'underlying cause' is selected from those shown. ICD-9 contains detailed rules for this selection. The following classification of causes of death has been used in this report:

Cause of death	ICD-9 code*
Cardiovascular disease (diseases of the circulatory system):	390–459
Rheumatic heart disease	390–398
Hypertensive disease	401–405
Ischaemic heart disease (coronary heart disease):	410–414
Acute myocardial infarction (heart attack)	410
Other ischaemic (coronary) heart disease	411–414
Heart failure	428
Cerebrovascular disease (stroke)	430–438
Atherosclerosis	440
Peripheral vascular disease	441–444
Other cardiovascular disease (other diseases of the circulatory system)	415–417, 420–427, 429, 446–459
All causes	001–999

*The ICD-9 coding system was first used in Australia in 1979.

Mortality profiles

Mortality profiles are provided for each cardiovascular disease, where numbers permit.

A full mortality profile for a particular cause of death consists of:

- number of deaths by year, age group and sex;
- age-specific death rates by year, age group and sex;
- crude and age-standardised death rates by year and sex, for all ages and the age group 25–74;
- annual rates of change (with indicators of statistical significance); and
- differences between the most recent death rate and that expected based on projections for that year (with indicators of statistical significance).

The methods used for estimating death rates, annual rates of change, and tests of statistical significance are described in *Appendix A*.

Full mortality profiles and a graph depicting the age-standardised death rates (all ages) and their underlying trend are included for all cardiovascular disease groups at national level, and for the more common disease groups at State and Territory; Indigenous and non-Indigenous; and urban, rural and remote levels. Mortality profiles for the less common causes of death are available on the Australian Institute of Health and Welfare World Wide Web site at <http://www.aihw.gov.au>. Users without Internet access may request the tables on disk.

Full mortality profiles are given when there are at least 16 deaths in any age-specific group, in any year 1985–1996, for either males or females¹. When this criterion is not satisfied the total number of deaths is given by year and sex, in place of a full mortality profile.

Data sources, terms and concepts are explained more fully in the following sections.

Death registration data

Registration of deaths in Australia is the responsibility of the State and Territory Registrars of Births, Deaths and Marriages. Information on the cause of death is supplied by the medical practitioner certifying the death or by a coroner. Other information about the deceased is supplied by a relative or other person acquainted with the deceased, or by an official of the institution where the death occurred. The information is provided by the Registrars to the Australian Bureau of Statistics for coding of cause of death and compilation into aggregate statistics. The data in this publication are provided to the Australian Institute of Health and Welfare by the State and Territory Registrars after processing by the Australian Bureau of Statistics.

Scope and coverage

National, State and Territory

Registration of deaths is a legal requirement in Australia and is virtually complete. All deaths which occur in Australia are within the scope of the collection, with the exception of deaths of foreign diplomatic personnel.

In the interest of timeliness, the mortality statistics in this publication relate to the year of registration of death. Usually about 5–6% of all deaths (and deaths from cardiovascular disease) which occur in one year are not registered until the following year or later. For national and State and Territory statistics this effect is minimal as the proportion of deaths not registered in the year of occurrence is fairly constant from year to year.

1. Although such a decision includes an element of subjectivity, the relative standard error on a count of 16 deaths is 25% (assuming a Poisson distribution for the number of deaths), which is a reasonable compromise between the need for precision and the desire to report in as much detail as possible.

This report covers the period from 1985–1996 for national and State and Territory data, the latest year for which data are available. In 1984 there were abnormal delays in the registration process in New South Wales which had the effect of displacing approximately 2,000 death registrations from 1984–1985. In 1985, these represent about 1.7% of all deaths in Australia and 4.5% of deaths in New South Wales. The effect on estimates of trend for that State is negligible. In 1988 legislation revisions in the Northern Territory meant that some deaths were registered in that year which may not have been registered until 1989 under the former legislation. The effect is negligible for Australia but contributed to the relatively higher cardiovascular death rate for females in the Northern Territory in 1988.

Age-standardised death rates in the Northern Territory and the Australian Capital Territory show greater variation from year to year than the States due to their smaller population base. For reliability the death rates for the Northern Territory and the Australian Capital Territory are averaged over three years (1994–1996) in the *Overview of current trends* section of this report. For the States, death rates are presented for the most recent year, 1996.

Indigenous population

At present there is considerable variation in the quality of data on Indigenous deaths from State to State. Only mortality data for Western Australia, South Australia, the Northern Territory and the Australian Capital Territory are considered to be of sufficient quality for publication, with registration of Indigenous deaths estimated to be over 90% complete in these States and Territories. Due to the small number of deaths and the short period that death data has been collected in the Australian Capital Territory, data from Western Australia, South Australia and the Northern Territory form the basis of Indigenous analysis in this report. For comparability the non-Indigenous section of this report also includes data from only Western Australia, South Australia and the Northern Territory.

Among the Indigenous population the proportion of deaths not registered in the year of occurrence varies by year and State and Territory and is generally in the vicinity of 10–20%, and is sometimes even higher (Anderson et. al 1996). An analysis of Indigenous mortality by year of registration could therefore be misleading, and year of occurrence of death has been used instead. An adjustment was made for deaths that occurred in 1996 that were not registered in that year. The adjustment was based on the proportion of deaths occurring in 1995 but registered in 1996. The additional deaths were spread across age groups and causes of death in proportion to the number actually recorded. For comparability, the non-Indigenous mortality profiles were also based on year of occurrence with an adjustment factor for the most recent year. For the Indigenous population, mortality trends have been examined for the period 1991–1996. Between 1991 and 1996 there was a large increase in the number of Indigenous people counted in the Population Census, to an extent greater than can be explained by natural increase. The number of Indigenous people identified in the 1996 Census was about 17% higher than previously published projections for 1996 based on the 1991 Census. In this report, Indigenous population estimates for 1992–1996 are based on the 1996 Census.

Urban, rural and remote areas

Urban, rural and remote zones are identified in this report using the Rural, Remote and Metropolitan Areas (RRMA) classification (DPIE & DSHS 1994). The RRMA classification assigns each Statistical Local Area (SLA) into one of seven categories which can be re-grouped into three larger zones or areas: urban (metropolitan), rural and remote. The classification takes into account population numbers and an index of remoteness. The three zones or areas are defined as follows:

- Urban zone
 - Capital cities
 - Other metropolitan centres (urban centre population \geq 100,000)
- Rural zone (index of remoteness $<$ 10.5)
 - Large rural centres (urban centre population 25,000–99,000)
 - Small rural centres (urban centre population 10,000–24,999)
 - Other rural areas (urban centre population $<$ 10,000)

- Remote zone (index of remoteness > 10.5)
 - Remote centres (urban centre population \geq 5,000)
 - Other remote areas (urban centre population < 5,000).

SLA boundaries may be re-drawn between censuses, and at each census, area classifications and their population counts are updated.

This report examines mortality trends for the three larger areas (urban, rural and remote), as numbers of deaths can become too small for accurate trend estimation in the seven-category classification. Year of registration of death has been used in examining the urban, rural and remote statistics in this publication. The analysis is for the period 1986–1996 as population estimates at RRMA level are not available prior to 1986.

Age groups

In this report results are given for males and females separately, and for the ten age groups <25, 25–34, 35–44, 45–54, 55–59, 60–64, 65–69, 70–74, 75–84, and 85+. Results are also given for the age group 25–74. This age range aligns with National Health Priority Area indicators for cardiovascular mortality. However for the Indigenous population a slightly different age grouping has been used (25–64 and age groups: <25, 25–34, 35–44, 45–54, 55–64, 65–74, 75+), reflecting the lower life expectancy of the Indigenous population (15–20 years younger than their Australian counterparts).

Data quality

The Australian Bureau of Statistics uses a variety of quality control measures to ensure mortality data are as reliable as possible. When a medical certificate of cause of death does not give sufficient information to enable accurate coding of the underlying cause of death, and the deceased was aged less than 75, the Australian Bureau of Statistics writes to the certifying doctor (or medical superintendent when death occurred in a hospital) seeking additional information. When the deceased was aged 75 or over, queries are made only where an operation has been performed but the condition requiring surgery was not stated. Responses are returned via the Registrar of Births, Deaths and Marriages, who supplies the original information. Other quality control measures include check-coding of cause of death, detailed computer editing of data, and checks on the statistical output, at the individual record and aggregate levels.

Since 1993, the Queensland office of the Australian Bureau of Statistics has been responsible for processing all of Australia's cause of death data to ensure greater consistency in coding and improved data quality. Before this, cause of death processing was carried out in each of the Australian Bureau of Statistics offices. As of 1 January 1997 the Australian Bureau of Statistics has introduced a new automatic coding software, which identifies multiple causes of deaths within Australia.

It has been demonstrated that coding of death for acute myocardial infarction (ICD-9 410) and ischaemic heart disease (ICD-9 410–414) is quite accurate in Australia (Boyle & Dobson 1995).