

HEART, STROKE *and* VASCULAR *diseases*

AUSTRALIAN FACTS



HEART, STROKE *and* **VASCULAR** *diseases*

AUSTRALIAN FACTS

NATIONAL CENTRE FOR
MONITORING CARDIOVASCULAR DISEASE

MAY 1999

Australian Institute of Health and Welfare
and
Heart Foundation of Australia

AIHW Cat. No. CVD 7

Heart, stroke and vascular diseases

© Australian Institute of Health and Welfare 1999

This work is copyright. Apart from any use as permitted under the *Copyright Act 1968*, no part may be reproduced without prior permission from the Australian Institute of Health and Welfare. Requests and enquiries concerning reproduction and rights should be directed to the Head, Communication and Public Affairs, Australian Institute of Health and Welfare, GPO Box 570, Canberra ACT 2601.

A complete list of the Institute's publications is available from the Publications Unit, Australian Institute of Health and Welfare, GPO Box 570, Canberra ACT 2601, or via the Institute's web site at <http://www.aihw.gov.au>.

ISSN 1323-9236

ISBN 0 642 39578 0

SUGGESTED CITATION

Australian Institute of Health and Welfare (AIHW) 1999. Heart, stroke and vascular diseases, Australian facts. AIHW Cat. No. CVD 7. Canberra: AIHW and the Heart Foundation of Australia (Cardiovascular Disease Series No. 10).

CONTRIBUTORS

This publication has been prepared by staff of the National Centre for Monitoring Cardiovascular Disease at the Australian Institute of Health and Welfare.

Project Leader

Sushma Mathur Senior Project Officer

Writing and Editorial Team

Tim Armstrong Senior Project Officer

Stan Bennett Head, National Centre

Joanne Davies Project Officer

Trent Harlow Project Officer

Paul Magnus Medical Adviser, Health Division

Sushma Mathur Senior Project Officer

Susana Senes-Ferrari Senior Project Officer

FEEDBACK

The Institute welcomes feedback from users on any aspect of this publication. Comments, suggestions or requests for further information may be directed to:

Trent Harlow

Tel: 02 6244 1018

Fax: 02 6244 1166

Funded and published by the Australian Institute of Health and Welfare and the Heart Foundation of Australia.

Printed by National Capital Printing

CONTENTS

Preface	v
Acknowledgments	vii
Highlights	ix
Introduction	1
Cardiovascular disease and its components	
Cardiovascular disease	5
Coronary heart disease	9
Stroke	13
Heart failure	17
Peripheral vascular disease	19
Rheumatic fever and rheumatic heart disease	21
Risk factors	
Risk factors	25
Physical inactivity	27
Tobacco smoking	29
Nutrition	31
High blood pressure	33
High blood cholesterol	35
Overweight and obesity	37
Diabetes	39
Health care costs	
Health care costs of cardiovascular conditions	41
Treatment and care	
Drug treatment	43
Cardiovascular procedures	47
Comparisons	
International comparisons	51
Methods and data sources	53
Statistical tables	57

Heart, stroke and vascular diseases

PREFACE

Despite successes in the fight against heart, stroke and vascular diseases in Australia in recent decades, these diseases continue to have a considerable impact on the health of Australians and on the health care system. This has been recognised by Australian Health Ministers who made cardiovascular health one of five National Health Priority Areas. This focus has intensified the demand for up-to-date information on cardiovascular disease and its impact on the Australian population.

Heart, Stroke and Vascular Diseases, Australian Facts is the first of a biennial series which will provide an overview of the latest information on cardiovascular disease and its major components.

The report brings together information on a range of areas including risk factors, disease prevalence and incidence, treatment, management and health care costs.

Data on high-risk population groups such as the Indigenous population and people who are at a socioeconomic disadvantage are included, as are data on people living in rural and remote areas of Australia.

The report will be relevant to policy makers, health professionals and researchers, and will be particularly useful to the broader community and interest groups as a compendium of data on cardiovascular disease. Data are presented in a 'user-friendly' manner, and key sources of data and further information have been provided.

The report was prepared by the National Centre for Monitoring Cardiovascular Disease at the Australian Institute of Health and Welfare, with funding support from the Heart Foundation of Australia. It represents an important collaboration between Australia's national agency for health and welfare statistics and information, and Australia's lead agency in the continuing fight against cardiovascular disease.

The report replaces the popular series of *Heart & Stroke Facts* produced by the Heart Foundation of Australia up to 1996.

The report is available on the AIHW web site. Future editions of the report will provide updated data and new information.

Dr Richard Madden

Director
Australian Institute of Health and Welfare

Professor Andrew Tonkin

Director, Health, Medical & Scientific Affairs
Heart Foundation of Australia

Heart, stroke and vascular diseases

ACKNOWLEDGMENTS

The following people made valuable contributions to this report and their input is greatly appreciated:

Philip Barter	Royal Adelaide Hospital, The University of Adelaide
Adrian Bauman	University of New South Wales
Kuldeep Bhatia	Australian Institute of Health and Welfare
Ingrid Coles-Rutishauser	Deakin University
Joan Cunningham	Australian Bureau of Statistics
Michael de Looper	Australian Institute of Health and Welfare
Annette Dobson	University of Newcastle
Pat Field	Heart Foundation of Australia
Graeme Hankey	Department of Neurology, Royal Perth Hospital
Nigel Harding	Australian Institute of Health and Welfare
Indra Gajanyake	Australian Institute of Health and Welfare
Garry Jennings	Cardiovascular Medicine Department, The Alfred Hospital
Barbara Jones	Royal Australian College General Practitioners
Peter McManus	Department of Health and Aged Care
Colin Mathers	Australian Institute of Health and Welfare
Amanda Nobbs	Australian Institute of Health and Welfare
Lyn Roberts	Heart Foundation of Australia
Franca Smarrelli	National Stroke Foundation
Jenny Thomas	Department of Health and Aged Care
Andrew Tonkin	Heart Foundation of Australia
Tarun Weeramanthri	[Northern] Territory Health Services
Louis Young	Department of Health and Aged Care

Heart, stroke and vascular diseases

HIGHLIGHTS

- Cardiovascular disease refers to heart, stroke and vascular diseases. Much progress has been made in the fight against cardiovascular disease in Australia. Death rates have fallen dramatically, some risk factors have improved, and there have been major advances in treatment and care.
- Death rates from coronary heart disease peaked in 1968 and have fallen since by over 60%. The fall in death rates was initially due to lower heart attack rates but, more recently, improved survival after a heart attack has played an important part as well.
- Death rates from stroke were fairly steady during the 1950s and 1960s and have since fallen by about 68%. A decline in attack rates is likely to have been the main reason for the fall in national stroke death rates.
- Nevertheless, cardiovascular disease continues to place a heavy burden on Australians in terms of illness, disability and death, and its health care costs exceed those of any other disease. These issues are expected to become more acute over the next decades with the growing number of elderly Australians, among whom cardiovascular disease is most common.
- About 2.8 million Australians, 16% of the population, had cardiovascular conditions in 1995.
- For a 40-year-old, the risk of having coronary heart disease at some time in their future life is 1 in 2 for men and 1 in 3 for women.
- For a 45-year-old, the risk of having a stroke before age 85 is 1 in 4 for men and 1 in 5 for women.
- Cardiovascular disease is ahead of cancers and other groups of causes of death in Australia in 1997, accounting for 52,641 deaths, 41% of all deaths.
- Coronary heart disease is the largest single cause of death in Australia, claiming 29,051 lives in 1997. Every day, around 80 Australians die from coronary heart disease.
- Stroke is Australia's second greatest single killer after coronary heart disease, claiming 12,133 lives in 1997. It is the leading cause of long-term disability in adults.
- People in lower socioeconomic groups are more likely to die from cardiovascular disease than those in higher socioeconomic groups.
- Indigenous Australians die from cardiovascular disease at twice the rate of other Australians. The difference is even greater among those aged 25–64, where Indigenous death rates were 7 and 9 times those of other Australian men and women respectively in 1995–97.
- Prevalence of rheumatic heart disease among Indigenous Australians is one of the highest in the world.
- Indigenous Australians are more likely to smoke tobacco, not participate in leisure-time physical activity, be obese and have diabetes than other Australians. These are all risk factors for cardiovascular disease.
- Much of the death, disability and illness caused by cardiovascular disease is preventable.
- In 1995, over 10 million adult Australians (about 80% of the adult population) had at least one of the following cardiovascular risk factors: tobacco smoking, physical inactivity, high blood pressure, or overweight. Four in 5 men and 3 in 4 women had at least one of these risk factors.
- In a 1995 survey, over 4.5 million adult Australians (over one-third of the adult population) reported doing no leisure-time physical activity in the 2 weeks prior to interview. People who do not participate in regular physical activity are almost twice as likely to die from coronary heart disease as those who participate.
- Almost 3.2 million adult Australians (around 24% of the adult population) in 1995 were at risk of developing cardiovascular disease and cancers from smoking tobacco products.
- Around 2.2 million adult Australians (17% of the adult population) had high blood pressure and/or were on treatment for the condition in 1995. High blood pressure increases the risk of cardiovascular disease by 2 to 4 times.

Heart, stroke and vascular diseases

- Around 7.4 million adult Australians (56% of the adult population) were overweight in 1995. Almost 2.5 million (19% of the adult population) of those were obese. On average, men in 1995 weighed 3.6 kg more than their counterparts in 1980, and women 4.8 kg more. People who are overweight or obese have a higher risk of coronary heart disease, stroke, heart failure and type 2 diabetes.
- Over 350,000 Australians (2% of the population) in 1995 reported having type 1 or type 2 diabetes. People with diabetes are at an increased risk of developing coronary heart disease, stroke and peripheral vascular disease.
- Cardiovascular disease is the most costly disease for the health system in Australia. In 1993–94, it accounted for \$3.7 billion, 12% of total direct health system costs.
- Cardiovascular diseases consuming most health system resources were coronary heart disease (\$894 million), high blood pressure (\$831 million) and stroke (\$630 million).
- In 1996–97, there were 421,516 hospitalisations for cardiovascular conditions (8% of all hospitalisations).
- Although men and women aged over 64 represent only 12% of the total population, they account for almost 60% of hospitalisations for cardiovascular conditions.
- The average length of stay in hospital for cardiovascular conditions fell from 7.6 days in 1993–94 to 5.9 days in 1996–97.
- During 1994 there were 19,409 heart surgery procedures. By far the most common heart operation was coronary artery bypass grafting (CABG) at 14,941 procedures.
- There were 11,348 coronary angioplasty procedures performed in 1995. Data indicates that stents were deployed in one-third of these patients.
- A total of 11,878 computerised tomography (CT) brain scans and 4,478 carotid endarterectomies were performed for stroke during 1996–97.
- 40.6 million drug prescriptions for cardiovascular drugs were dispensed in the community in 1997. This represents one-fifth of all prescriptions.
- The cost of cardiovascular drugs amounted to \$1,105 million, 34% of all costs for prescription drugs listed in the Pharmaceutical Benefits Scheme in 1997.
- Australian death rates from coronary heart disease rank towards the middle of the 17 countries compared (ranked tenth lowest for males and females). Coronary heart disease death rates tend to be low in Asian and Mediterranean countries and highest in the Russian Federation.
- Stroke death rates in Australia are among the lowest of the 17 countries compared (ranked fifth lowest for males and females). The Australian stroke death rates for males were still one-third higher than those recorded in the United States. Females in France and Switzerland have the lowest death rates for stroke. Australian females have 1.4 times their rate.

INTRODUCTION

BACKGROUND

Much progress has been made in recent years in improving the cardiovascular health of Australians. Death rates have fallen dramatically, some risk factors have improved, and there have been major advances in treatment and care.

Nevertheless, cardiovascular disease¹ continues to place a heavy burden on Australians in terms of illness, disability and death, and its health care costs exceed those of any other disease. The invasive treatment of heart disease uses a high level of health resources. The heavy burden of disability due to stroke is of particular concern. These issues are expected to become more acute over the next decades with the growing number of elderly Australians, among whom cardiovascular disease is most common.

Certain groups have higher mortality from cardiovascular disease, especially Indigenous Australians and people who are at a socioeconomic disadvantage. Those who live in rural and remote areas of Australia have special needs, and cardiovascular mortality also varies between the States and Territories.

Much of the death, disability and illness caused by cardiovascular disease is preventable. Many Australians remain at higher risk of the disease through smoking cigarettes, being physically inactive, eating a diet high in saturated fats and being overweight. Levels of blood pressure and blood cholesterol among many Australians are higher than recommended. Cardiovascular risk is markedly increased in individuals with more than one risk factor.

Risk factors themselves are strongly influenced by wider circumstances. The importance of factors such as people's economic resources, education, living conditions, working conditions, social support and access to health care and social services is now recognised.

NATIONAL ACTION TO COMBAT THE DISEASE

Because of the widespread nature of cardiovascular disease and its potential for prevention, Australian Health Ministers made cardiovascular health one of five National Health Priority Areas (NHPAs). The first report on cardiovascular health is expected to be released later in 1999. The NHPA initiative involves various levels of government and draws heavily on advice from non-government sources. The main aim is to reduce the incidence and impact of heart, stroke and vascular diseases in Australia. Strategies are in place or being developed to improve the risk factor profile of Australians, and the treatment, management and rehabilitation of those with existing cardiovascular disease. The Commonwealth Government also funds the Australian Institute of Health and Welfare to operate a national system to monitor the disease and its risk factors, treatment and care.

PURPOSE AND STRUCTURE OF THIS REPORT

This report was produced by the National Centre for Monitoring Cardiovascular Disease at the Institute with funding support from the Heart Foundation of Australia. The report aims to provide the community, health professionals and policy makers with a concise summary of the latest data and trends in heart, stroke and vascular diseases in Australia. As such, there are many medical details it does not cover and it is not designed to be a source of personal medical advice.

The report includes fact sheets on cardiovascular disease and its major components, and on each major risk factor. This format allows the sheets to be used individually or as a coherent set, but it means that there is some repetition between sheets.

There are also fact sheets on health care costs, drug treatment, procedures and international comparisons. Population groups at greater risk of cardiovascular disease are given a special focus where data are available. Each fact sheet concludes with information for the reader who wishes to investigate further.

Methods and data sources and statistical tables are included at the back of the report.

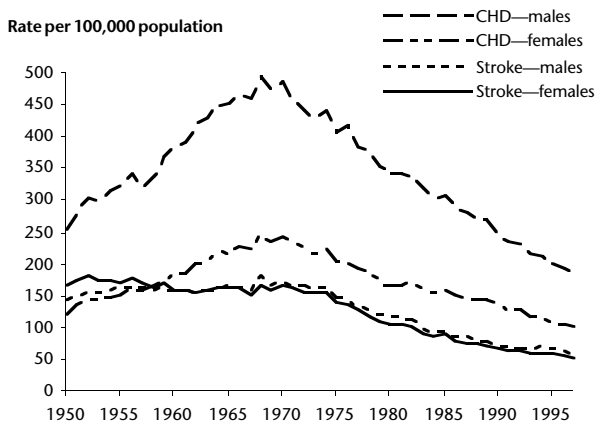
1. The term 'cardiovascular disease' is used in this report to refer to heart, stroke and vascular diseases.

HISTORICAL PERSPECTIVE

Before looking at the fact sheets which contain the latest information, it is useful to take a longer-term view.

Death rates from coronary heart disease peaked in 1968 and have fallen since by over 60% among males and females. Death rates from stroke were fairly steady during the 1950s and 1960s and have fallen by about 68% since 1968. These declines are substantial, especially when compared with declines of around 20% in mortality from non-cardiovascular diseases.

The declines observed nationally have also occurred in special populations such as Indigenous Australians, people in lower socioeconomic groups and people living in rural and remote areas.



Notes

1. CHD = coronary heart disease.
2. Age-standardised to the 1991 Australian population.

Source: AIHW National Mortality Database.

Death rates for coronary heart disease and stroke, 1950–97

REASONS FOR THE DECLINE

There is evidence that the fall in death rates for coronary heart disease was initially due to lower heart attack rates but, more recently, improved survival after a heart attack has played an important part as well.

For stroke, a decline in attack rates is likely to have been the main reason for the fall in national death rates.

CHANGES IN RISK FACTORS AND MEDICAL CARE

The declines in heart attack and stroke rates suggest that levels of risk factors in the population have improved, perhaps resulting from changes in lifestyle. Consistent with this, levels of blood pressure, tobacco smoking and saturated fat in the diet have declined. However, there has been little change in participation in physical activity during leisure-time, and the proportion of Australians who are overweight and obese has risen sharply. There are no recent data on the levels of blood cholesterol.

Improved survival rates after heart attack suggests more effective acute medical interventions as well as better long-term care in such patients (especially from beta blocker drugs). Drugs such as ACE inhibitors, thrombolytics, aspirin and other antiplatelet agents have increased in usage and are known to reduce the risk of death if given during or soon after a heart attack.

The increase in prescribing of drugs for lowering blood pressure and a dramatic increase in the use of cholesterol lowering drugs will have reduced the risk of heart attacks. The steady rise in coronary artery bypass surgery and the introduction of coronary angioplasty from the 1980s would be expected to have reduced death rates.

For stroke, it is likely that the increased use of drugs for lowering blood pressure, antiplatelet agents and anticoagulant therapy have contributed to the decline in death rates.

In summary, the evidence suggests that the declines in death rates for coronary heart disease and stroke have been influenced by changes in some risk factors and in medical intervention such as counselling, drug use, emergency care, medical and surgical treatment and follow-up care.

Where data are available, these factors are considered in more detail in the fact sheets that form the main body of this report.

CURRENT SITUATION

The latest national information on deaths and risk factor prevalence are shown below. These diseases and risk factors are defined in the fact sheets that follow.

Number of deaths in Australia, all ages, 1997

Disease	Males	Females
Coronary heart disease	15,565	13,486
Stroke	4,879	7,254
Other cardiovascular diseases	2,185	2,295
Peripheral vascular disease	1,253	928
Heart failure	1,041	1,662
High blood pressure ^(a)	448	687
Rheumatic fever and rheumatic heart disease	125	223
<i>All cardiovascular disease</i>	<i>25,717</i>	<i>26,924</i>
All causes of death	67,752	61,598

(a) High blood pressure relates to ICD-9 codes 401–405.

Source: AIHW National Mortality Database.

Number of Australians with a risk factor, 18 years and over, 1995

Risk factor	Men	Women
Overweight	4,169,700	3,182,300
High blood cholesterol ^(a)	2,479,700	2,029,400
Physical inactivity	2,260,800	2,399,500
Smoking	1,797,700	1,382,900
High blood pressure ^(b)	1,112,600	1,079,900
Diabetes type 2	163,000	151,000

(a) Most recent data are from 1989 and only includes those aged 20–69. High blood cholesterol is defined as 5.5 mmol/L.

(b) High blood pressure includes all persons with high blood pressure and those receiving treatment for high blood pressure.

Sources: AIHW analysis of the 1995 National Health Survey, 1995 National Nutrition Survey and 1989 Risk Factor Prevalence Survey.

FURTHER INFORMATION

Dr Stan Bennett

E-mail: stan.bennett@aihw.gov.au

Phone: 02 6244 1141

Detailed data

Refer to the **Statistical tables** section.

Main data sources

National Mortality Database (Australian Institute of Health and Welfare).

1995 National Health Survey (Australian Bureau of Statistics).

1995 National Nutrition Survey (Australian Bureau of Statistics and Commonwealth Department of Health and Aged Care).

References/further reading

Australian Institute of Health and Welfare (AIHW) 1998. Australia's health 1998: the sixth biennial health report of the Australian Institute of Health and Welfare. AIHW Cat. No. AUS 10. Canberra: AIHW.

Bennett SA & Magnus P 1994. Trends in cardiovascular risk factors in Australia. *Medical Journal of Australia* 161:519–27.

D'Espaignet ET 1993. Trends in Australian mortality: diseases of the circulatory system 1950–1991. Canberra: AIHW.

Department of Health and Aged Care and Australian Institute of Health and Welfare (in press). National Health Priority Areas report on cardiovascular health 1999. Canberra: DHAC and AIHW.

Jamrozik K, Broadhurst RJ, Lai N, Hankey GJ, Burvill PW & Anderson CS (in press). Trends in the incidence, severity and outcome of stroke in Perth, Western Australia. Nedlands: University of Western Australia and Royal Perth Hospital.

Heart, stroke and vascular diseases

CARDIOVASCULAR DISEASE

Cardiovascular disease is Australia's greatest health problem. It kills more people than any other disease (almost 53,000 deaths in 1997) and creates enormous costs for the health care system. It places a heavy burden on individuals and the community due to resulting disabilities. However, over the last decade there have been substantial falls in death rates, improvements in some risk factor levels and major advances in treatment and care.

WHAT IS CARDIOVASCULAR DISEASE?

In this report, cardiovascular disease refers to all diseases involving the heart and blood vessels. It includes International Classification of Diseases (ICD-9) codes 390–459.

In Australia, the types of cardiovascular diseases that pose the biggest cardiovascular problems are coronary heart disease, stroke, peripheral vascular disease and heart failure. Rheumatic fever and rheumatic heart disease are also significant conditions, due to their high levels among Indigenous Australians.

The main underlying problem in cardiovascular disease is atherosclerosis, a process that clogs blood-supply vessels with deposits of fat, cholesterol and other substances. It is most serious when it affects the blood supply to the heart, causing angina or heart attack, or to the brain, which can lead to a stroke.

DID YOU *know?*

- No other group of diseases in Australia costs the health care system more than cardiovascular diseases. In 1993–94, it accounted for \$3.7 billion or 12% of total direct health system costs.
- People born in Australia are more likely to die from cardiovascular disease than Australian residents who were born overseas.
- Australians are 34% more likely to die from cardiovascular diseases than from cancers.

RISK FACTORS FOR CARDIOVASCULAR DISEASE

The major preventable risk factors for cardiovascular disease are tobacco smoking, high blood pressure, high blood cholesterol, overweight, insufficient physical activity, high alcohol use and type 2 diabetes. For stroke, atrial fibrillation is a further risk factor. Risk is higher for males than for females and strongly increases with age for both males and females.

HOW MANY AUSTRALIANS HAVE CARDIOVASCULAR CONDITIONS?

In 1995, an estimated 2.8 million Australians, or 16% of the population, had cardiovascular conditions.¹ High blood pressure was the most common condition for both males and females.

Sex and age

There was no significant difference in the proportion of males and females reporting cardiovascular conditions in 1995—16% for females and 14.5% for males.

The prevalence of cardiovascular conditions increases dramatically with age. For example, over 60% of people aged 75 and over had a cardiovascular condition in 1995 compared with less than 9% of those aged under 35.

Indigenous Australians²

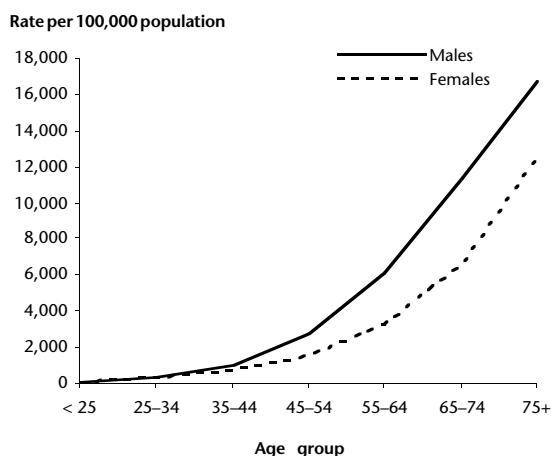
Indigenous Australians are more likely to have cardiovascular conditions than other Australians across almost all age groups. For example, in the 25–44 age group, 23% of Indigenous Australians reported cardiovascular conditions compared with 16% among other Australians.

1. This includes diseases of the circulatory system (ICD-9 codes 390–459) and circulatory-system-related congenital anomalies (ICD-9 codes 745–747).

2. Excludes Indigenous Australians living in remote areas.

HOSPITALISATION

In 1996–97, there were 421,516 hospitalisations for cardiovascular conditions (8% of all hospitalisations). Of these, 37% were attributed to coronary heart disease, 12% to stroke, 10% to heart failure, 3% to peripheral vascular disease and 0.4% to rheumatic fever and rheumatic heart disease.



Source: AIHW National Hospital Morbidity Database.

Hospital use for cardiovascular conditions, 1996–97

Sex and age

Males are more likely to be hospitalised for cardiovascular conditions than females, across all age groups.

Hospital use for cardiovascular conditions increases with age. Although men and women aged 65 and over represent only 12% of the total population, they account for almost 60% of hospitalisations for cardiovascular conditions.

Length of stay in hospital

There has been a decline in the average length of stay in hospital for cardiovascular conditions from 7.6 days in 1993–94 to 5.9 days in 1996–97. Those hospitalised for stroke tended to stay the longest (on average 10.5 days), followed by peripheral vascular disease (8.7 days), heart failure (8.6 days), rheumatic fever and rheumatic heart disease (7.4 days), and coronary heart disease (5 days). The average length of stay for non-cardiovascular conditions was 4 days.

Although men are more likely than women to be hospitalised for cardiovascular conditions, women tended to stay in hospital longer (on average 6.3 days compared with 5.6 days). Length of stay in hospital increases with age, with those aged 85 and over staying in hospital for 10 days on average.

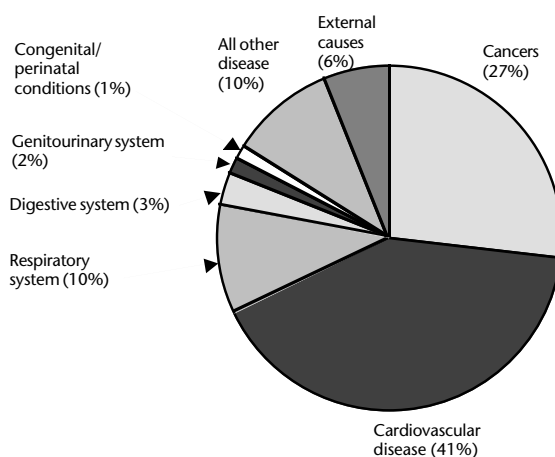
DEATHS

Cardiovascular disease was the leading cause of death among Australians in 1997, accounting for 52,641 deaths, 41% of all deaths.

Coronary heart disease was the major cardiovascular cause of death accounting for 55% of all such deaths, followed by stroke (23%), heart failure (5%), peripheral vascular disease (4%) and rheumatic fever and rheumatic heart disease (0.7%).

Trends

Over the period 1986–97, death rates from cardiovascular disease have been declining at a rate of 3.7% per year for males and 3.5% per year for females, a faster rate than for all causes overall. This decline is partly due to improved survival following cardiovascular events, and partly due to falls in the rate at which people get the disease due to improvements and better management of the associated risk factors.



Source: ABS 1999a.

Proportion of deaths by major disease categories, 1997

Sex and age

Males are more likely to die from cardiovascular disease than females across almost all age groups, with males aged under 75 experiencing death rates 2 to 3 times those of females in 1997. Among the elderly (75 and over age group), more women die from cardiovascular disease than men, with the age-specific death rates among elderly women approaching those of elderly men. This can be explained by the much greater number of women than men who live into old age.

Although cardiovascular disease is a common cause of death among middle-aged Australians, it kills an even greater proportion of older people. Among those aged 75 and over, cardiovascular disease accounts for 50% of all deaths.

Socioeconomic groups

People from lower socioeconomic groups are more likely to die from cardiovascular disease than are those from higher socioeconomic groups. In 1991, people aged 25–64 living in the lowest socioeconomic group died from cardiovascular disease at around twice the rate of those living in the highest socioeconomic group. This difference in death rates has existed since at least the 1970s.

Indigenous Australians¹

Indigenous Australians died from cardiovascular disease at twice the rate of other Australians in 1995–97. The difference is even greater among those aged 25–64 where Indigenous death rates were 7 and 9 times those of other Australian men and women respectively.

Urban, rural and remote areas

Cardiovascular disease death rates were higher in rural areas compared with urban areas in Australia in 1995–97. Rates were not significantly different in remote areas.

States and Territories

Death rates for cardiovascular disease varied between the States and Territories from 20% above the national average to 10% below the national average in 1995–97. Death rates were highest in the Northern Territory and Tasmania, and lowest in Western Australia.

State and Territory prevalence rates of smoking, overweight and physical inactivity parallel the cardiovascular disease death levels, suggesting that variation in death rates can be partly explained by differences in the prevalence of risk factors.

FURTHER INFORMATION

Sushma Mathur

E-mail: sushma.mathur@aihw.gov.au
Phone: 02 6244 1171

Detailed data

Refer to the **Statistical tables** section.

Main data sources

1995 National Health Survey (Australian Bureau of Statistics).

National Hospital Morbidity Database (Australian Institute of Health and Welfare).

National Mortality Database (Australian Institute of Health and Welfare).

References/further reading

Australian Bureau of Statistics (ABS) 1997. 1995 National Health Survey: Cardiovascular and related conditions, Australia. ABS Cat. No. 4372.0. Canberra: AGPS.

Australian Bureau of Statistics (ABS) 1999a. Deaths Australia 1997. ABS Cat. No. 3302.0. Canberra: AGPS.

Australian Bureau of Statistics (ABS) 1999b. 1995 National Health Survey: Aboriginal and Torres Strait Islander results. ABS Cat. No. 4806.0. Canberra: AGPS.

Australian Institute of Health and Welfare (AIHW) 1998. Australia's health 1998: the sixth biennial health report of the Australian Institute of Health and Welfare. AIHW Cat. No. AUS 10. Canberra: AIHW.

Department of Health and Aged Care and Australian Institute of Health and Welfare (in press). National Health Priority Areas report on cardiovascular health 1999. Canberra: DHAC and AIHW.

Mathur S & Gajanyake I 1998. Surveillance of cardiovascular mortality in Australia 1985–96. Cardiovascular Disease Series No. 6. AIHW Cat. No. CVD 3. Canberra: AIHW.

1. Includes data from Western Australia, South Australia and the Northern Territory only.

Heart, stroke and vascular diseases

CORONARY HEART DISEASE

Coronary heart disease is the largest single cause of death in Australia, claiming over 29,000 lives in 1997. It kills over three times more people than lung and breast cancer combined, the third most common cause of death in Australia, and a far greater number than other leading causes of death. However, death rates from coronary heart disease have fallen substantially, by over 60% since the late 1960s.

WHAT IS CORONARY HEART DISEASE?

Coronary heart disease (ischaemic heart disease), ICD-9 codes 410–414, is the most common cause of sudden death in Australia. It comprises mainly heart attack and angina. A heart attack occurs when a vessel supplying blood to the heart muscle suddenly becomes blocked by a blood clot. This is a medical emergency and the blockage will lead to death of some heart muscle unless the clot can be quickly dissolved by drugs given in hospital. Angina is a temporary chest pain or discomfort caused by a reduced blood supply to the heart muscle.

Among Australians having a heart attack, over 4 in 10 will be dead within a year and over half of all heart attack deaths will occur before the person reaches hospital. About 25% of those who have a heart attack die within an hour of their first-ever symptoms. In individuals with known coronary heart disease having a second heart attack, the risk of sudden death may increase by 4 to 5 times.

RISK FACTORS FOR CORONARY HEART DISEASE

The major preventable risk factors for coronary heart disease are tobacco smoking, high blood cholesterol, high blood pressure, insufficient physical activity and overweight. Dietary factors and diabetes have also been associated with a higher risk of coronary heart disease. Men and older Australians are at greater risk of developing coronary heart disease.

HOW MANY AUSTRALIANS HAVE CORONARY HEART DISEASE?

No national data are available on the number of Australians who have coronary heart disease. However, the Universities of Newcastle and Western Australia and the Queensland

Department of Health have developed a method to estimate the rate of heart attacks among people aged 35–69.

In 1995–96 there were an estimated 19,910 coronary heart disease events (mainly heart attacks) in Australia among people aged 35–69. Non-fatal heart attacks represented almost two-thirds of all such cases (12,955 cases).

Sex and age

Non-fatal heart attacks were three times more common among men than women in the 35–69 age group. Rates of heart attacks increase dramatically with age.

Trends

Trends in rates of heart attacks among men and women aged 35–64 have been monitored in Newcastle and Perth, as part of the World Health Organization's multinational Monitoring of Trends and Determinants in Cardiovascular Disease (MONICA) project. Rates of non-fatal heart attacks have fallen significantly between 2.5% and 3.7% per year during the period 1984–93.

Rates of first heart attacks (both fatal and non-fatal) among middle-aged Australians have been falling for at least the last decade.

DID YOU *know*?

- For a 40-year-old, the risk of having coronary heart disease at some time in their future life is 1 in 2 for men and 1 in 3 for women.
- Every day, around 80 Australians die from coronary heart disease.
- Coronary heart disease is the most costly cardiovascular disease for the health care system, accounting for 24% of total cardiovascular disease costs. In 1993–94, coronary heart disease amounted to \$894 million in direct health system costs.
- Australians in 1997 are two-thirds as likely to die from coronary heart disease as their counterparts a decade earlier.

DEATHS

Coronary heart disease (mainly heart attacks) was the leading cardiovascular cause of death, accounting for 29,051 deaths (23% of all deaths) in Australia in 1997.

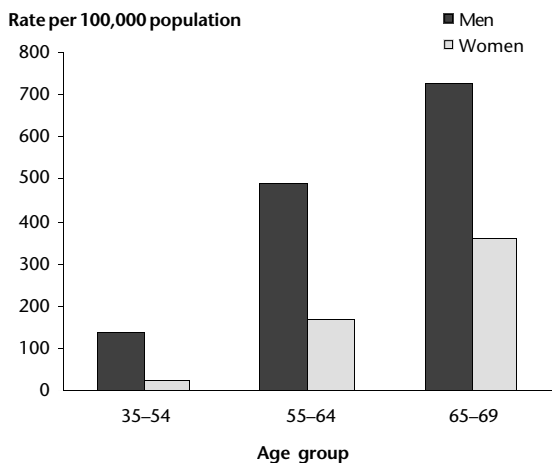
Trends

Coronary heart disease death rates have continued the decline that began in the 1960s and are falling at a rate of 4% per year among males and 3.8% per year among females for the period 1986–97.

Sex and age

Overall, males were almost twice as likely to die from coronary heart disease as females in 1997, with males aged under 70 having death rates 3 to 5 times those of females. However, in the 85 and over age group, twice as many women died from coronary heart disease than did men. This can be explained by the much greater number of women than men who live into old age.

Coronary heart disease is the leading cause of premature death among males, and for females is second only to breast cancer. Deaths under the age of 70 are considered premature because life expectancy is now 75 for males and 81 for females.



Source: AIHW 1998.

Non-fatal heart attacks, 1993–96

HOSPITALISATION

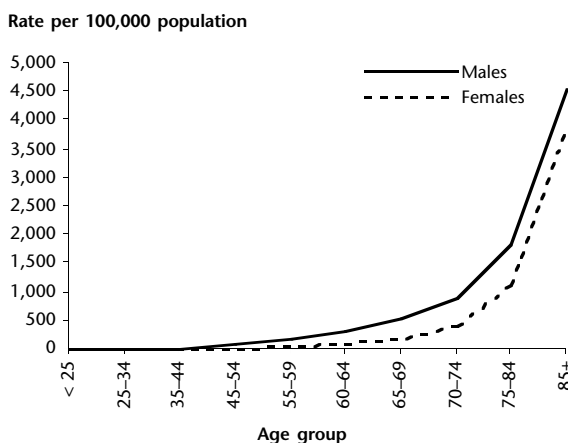
In 1996–97, there were 155,975 hospitalisations for coronary heart disease (3% of all hospitalisations). Coronary heart disease accounted for 37% of all hospitalisations for cardiovascular conditions. Around half of all hospitalisations for coronary heart disease were for diagnostic and surgical procedures in 1996–97.

Sex and age

Males were at least twice as likely to be hospitalised for coronary heart disease than females. Hospital use for coronary heart disease increases rapidly with age, with 58% of such cases being aged 65 and over in 1996–97.

Length of stay in hospital

The average length of stay in hospital for coronary heart disease was 5 days in 1996–97, a decline from 1993–94 when the average length of stay was 5.9 days. Those hospitalised for coronary heart disease tend to stay for a shorter period than those hospitalised for other major cardiovascular conditions, diabetes and most cancers.



Source: AIHW National Mortality Database.

Death rates from coronary heart disease, 1997

Socioeconomic groups

In 1991, people aged 25–64 from the lowest socioeconomic group were at least twice as likely to die from coronary heart disease as those from the highest socioeconomic group. This pattern has been observed for at least the last 30 years.

Indigenous Australians¹

Indigenous Australians died from coronary heart disease at around 1.7 times the rate of other Australians in 1995–97. The difference is even greater among adults aged 25–64 where Indigenous death rates were 6 and 7 times those of other Australian men and women respectively.

Urban, rural and remote areas

For males, coronary heart disease death rates were higher in rural areas compared with urban areas in Australia in 1995–97. For females, there was no significant differences in coronary heart disease death rates across urban, rural and remote areas.

States and Territories

Death rates from coronary heart disease were highest in Tasmania and Queensland in 1995–97, but for the remaining States and Territories there were no significant differences in coronary heart disease death rates.

FURTHER INFORMATION

Sushma Mathur

E-mail: sushma.mathur@aihw.gov.au

Phone: 02 6244 1171

Detailed data

Refer to the **Statistical tables** section.

Main data sources

National Hospital Morbidity Database (Australian Institute of Health and Welfare).

National Mortality Database (Australian Institute of Health and Welfare).

References/further reading

Australian Institute of Health and Welfare (AIHW) 1998. Australia's health 1998: the sixth biennial health report of the Australian Institute of Health and Welfare. AIHW Cat. No. AUS 10. Canberra: AIHW.

Beaglehole R, Stewart AW, Jackson R, Dobson AJ, McElduff P, D'Este K, et al. 1997. Declining rates of coronary heart disease in New Zealand and Australia, 1983–1993. *American Journal of Epidemiology* 145(8):707–13.

Bennett SA 1996. Socioeconomic trends in death from coronary heart disease and stroke among Australian men, 1979–1993. *International Journal of Epidemiology* 25:266–75.

Hanes DS, Weir MR & Sowers JR 1996. Gender considerations in hypertension pathophysiology and treatment. *American Journal of Medicine* 101(3A):105–21S.

Lloyd-Jones DM, Larson MG, Beiser A & Levy D 1999. Lifetime risk of developing coronary heart disease. *The Lancet* 353:89–92.

Mathur S & Gajanayake I 1998. Surveillance of cardiovascular mortality in Australia 1985–96. *Cardiovascular Disease Series No. 6*. AIHW Cat. No. CVD 3. Canberra: AIHW.

1. Includes data from Western Australia, South Australia and Northern Territory only.

Heart, stroke and vascular diseases

STROKE

Stroke is Australia's second greatest single killer after coronary heart disease, claiming over 12,000 lives in 1997. It is the leading cause of long-term disability in adults and it places great demands on family members and caregivers. Death rates from stroke have been falling since the late 1960s. Given the rapid ageing of the Australian population, however, and a slowing down of the decline in stroke death rates in recent years, the number of people dying from stroke and those surviving with a permanent disability is likely to increase in the future.

WHAT IS STROKE?

The term 'stroke' refers to cerebrovascular disease, ICD-9 codes 430–438. Stroke occurs when an artery supplying blood to a part of the brain suddenly becomes blocked, which occurs in 85% of the cases, or bleeds (15% of cases). This can damage part of the brain, which in turn impairs a range of functions including movement of body parts and communication.

About one-third of those who have had a stroke will die within 12 months. A further one-third are permanently disabled, with some degree of paralysis of one side of the body, difficulty in communicating, or a range of other problems that may affect their quality of life and their ability to function in society.

DID YOU *know*?

- For a 45-year-old, the risk of having a stroke before age 85 is 1 in 4 for men and 1 in 5 for women.
- Stroke is the cause of nearly 25% of all chronic disability in Australia.
- About 25% of all people who have a stroke die within the first month of their stroke.
- People who have a stroke are on average at least 10 years older than those who have heart attacks.
- Australians born in Europe are more likely to have a stroke than their Australian-born counterparts.

RISK FACTORS FOR STROKE

Risk factors for stroke include high blood pressure, tobacco smoking, heavy alcohol consumption, high blood cholesterol, overweight, and insufficient physical activity. Transient ischaemic attack (TIA), atrial fibrillation, diabetes and history of heart attacks are also associated with an increased risk of stroke.

HOW MANY AUSTRALIANS HAVE A STROKE?

Each year, around 40,000 Australians have a stroke, with 70% of these first-ever strokes. The 1995 National Health Survey estimated that 116,500 Australians, or 0.6% of the population, have had a stroke at some time in their lives. In the 1990 Perth Community Stroke Study it was estimated that 1.2% of the population in Perth have had a stroke. This equates to approximately 220,000 people in Australia.

Sex and age

More women are affected by stroke than men, due to the larger number of elderly women. However, the proportion of men with stroke is 30% higher than for women.

Stroke is more common among older Australians, with around 50% of all strokes occurring in those aged 75 years and over.

DISABILITY DUE TO STROKE

The 1993 Survey of Disability, Ageing and Carers found that, among Australians with a disability, an estimated 31,700 had stroke as the main cause of their disability. Paralysis and physical activity restrictions affected 1 in 3 stroke sufferers, and almost 2 in 3 needed assistance with mobility.

Sex and age

Females with a disability were more likely than males with a disability to have had a stroke. The prevalence of stroke among those with a disability increases markedly with age, with 80% of those with a stroke aged 65 years and over.

DEATHS

Stroke was the second most common cause of death among Australians in 1997, accounting for 12,133 deaths or 9% of deaths from all causes. Australian stroke death rates were among the lowest of the 17 countries for which data were compared.

Trends

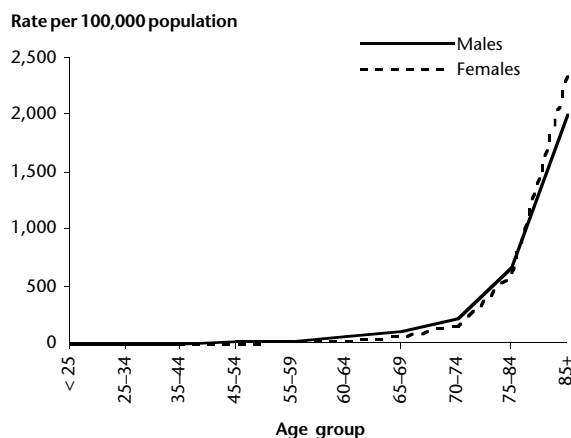
Between 1986 and 1997, death rates from stroke have been declining at a rate of 3.2% per year among males and 3.5% per year among females.

Sex and age

Males are slightly more likely to die from stroke than females across almost all age groups. Males aged 45–74 had death rates 1.5 times those of females in 1997. The difference in stroke death rates between males and females is not as marked as for coronary heart disease.

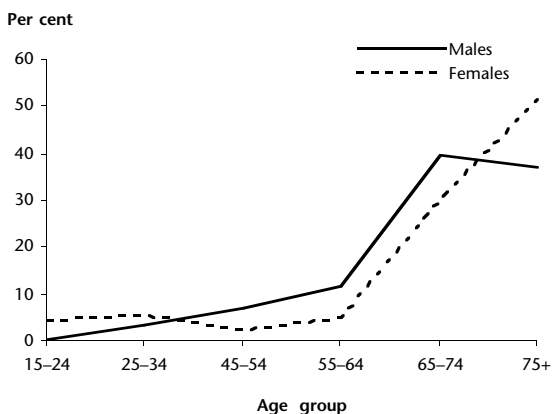
Although the age-specific death rates from stroke are generally higher among males than females (the exception being the 85 and over age group), the actual number of deaths is greater for females. This apparent inconsistency can be explained by the much greater number of women than men who live into old age, where death rates from stroke are considerably higher.

Stroke death rates increase dramatically with age, with 87% of all deaths from stroke occurring among those aged 70 and over.



Source: AIHW National Mortality Database.

Death rates from stroke, 1997



Source: AIHW analysis of the 1993 Survey of Disability, Ageing and Carers.

People whose disability is caused by stroke, 1993

HOSPITALISATION

In 1996–97, there were 51,854 hospitalisations for stroke (1% of all hospitalisations). Stroke accounted for 12% of all hospitalisations for cardiovascular conditions.

Sex and age

Males were 31% more likely to be hospitalised for stroke than females. Hospital use for stroke increases rapidly among older Australians, with over three-quarters of such cases being aged 65 and over in 1996–97.

Length of stay in hospital

The average length of stay in hospital for stroke was 10.5 days in 1996–97, a decline from 1993–94 when the average length of stay was 15.6 days. The length of stay in hospital for stroke was twice as long as that for other cardiovascular conditions (10.5 days compared with 5.3 days) in 1996–97. Length of stay in hospital was generally higher for females than for males (11.5 days compared with 9.6 days).

Socioeconomic groups

In 1991, people aged 25–64 from the lowest socioeconomic group were twice as likely to die from stroke as those in the highest socioeconomic group.

Indigenous Australians¹

Indigenous males and females died from stroke at 3 and 1.7 times the rate of other Australians respectively in 1995–97. The difference is even greater among adults aged 25–64 where Indigenous death rates were 8 times those of other Australians.

Urban, rural and remote areas

There were no significant differences in stroke death rates across urban, rural and remote areas of Australia in 1995–97.

States and Territories

There were no significant differences in stroke death rates across the States and Territories in 1995–97.

FURTHER INFORMATION

Sushma Mathur

E-mail: sushma.mathur@aihw.gov.au

Phone: 02 6244 1171

Detailed data

Refer to the **Statistical tables** section.

Main data sources

1993 Survey of Disability, Ageing and Carers (Australian Bureau of Statistics).

National Hospital Morbidity Database (Australian Institute of Health and Welfare).

National Mortality Database (Australian Institute of Health and Welfare).

References/further reading

Bennett SA 1996. Socioeconomic trends in death from coronary heart disease and stroke among Australian men, 1979–1993. *International Journal Epidemiology* 25:266–75.

Mathur S & Gajanayake I 1998. Surveillance of cardiovascular mortality in Australia 1985–96. *Cardiovascular Disease Series No. 6. AIHW Cat. No. CVD 3*. Canberra: AIHW.

National Health and Medical Research Council (NHMRC) 1997. *Clinical practice guidelines: prevention of stroke—the role of anticoagulants, antiplatelet agents and carotid endarterectomy*. Canberra: AGPS.

National Stroke Foundation 1997. *National stroke strategy*. Canberra: AGPS.

1. Includes data from Western Australia, South Australia and Northern Territory only.

Heart, stroke and vascular diseases

HEART FAILURE

Heart failure is common among middle-aged and elderly Australians and people who have had a heart attack. The prevalence of this condition is likely to increase considerably as the population ages. Heart failure accounts for almost 3,000 deaths each year. The cost of heart failure treatment exceeds that of all types of cancers combined.

WHAT IS HEART FAILURE?

Heart failure, ICD-9 code 428, occurs when the heart is unable to pump blood adequately to the rest of the body. There are many causes of heart failure, notably heart attack, high blood pressure or a damaged heart valve. Heart failure that causes swelling of the ankles and lung congestion is called congestive heart failure. Symptoms commonly seen in people with heart failure are fatigue and breathlessness.

The most common medical treatment for heart failure are diuretics and ACE (angiotensin converting enzyme) inhibitors.

RISK FACTORS FOR HEART FAILURE

The most important predisposing factors for heart failure are coronary heart disease and high blood pressure. High blood cholesterol, diabetes, tobacco smoking, overweight and insufficient physical activity have also been associated with an increased risk of heart failure.

HOW MANY AUSTRALIANS HAVE HEART FAILURE?

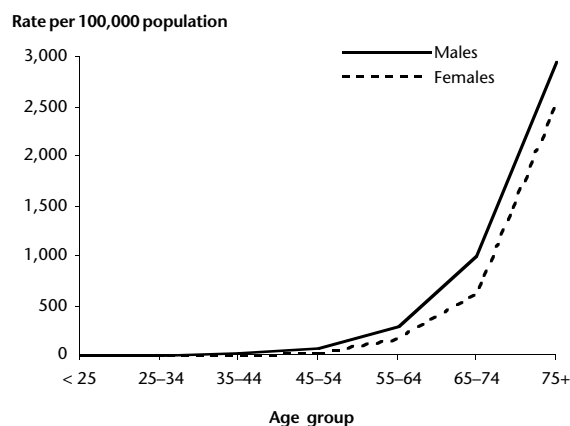
No national data are available on the number of Australians who have heart failure.

DID YOU *know?*

- Heart failure accounts for one of the largest number of patient days in hospital among cardiovascular conditions and ranks fifth highest for hospital patient days overall in 1996–97.
- Direct health care costs for heart failure amounted to \$411 million in 1993–94 (11% of cardiovascular disease costs), the fourth highest among cardiovascular conditions after coronary heart disease, high blood pressure and stroke.

HOSPITALISATION

In 1996–97, there were 40,970 hospitalisations for heart failure (0.8% of all hospitalisations). Heart failure accounted for 10% of all hospitalisations for cardiovascular conditions.



Source: AIHW National Hospital Morbidity Database.

Hospital use for heart failure, 1996–97

Sex and age

Males are more likely to be hospitalised for heart failure than females. Hospital use for heart failure tends to increase with age, with those aged 70 and over accounting for over three-quarters of all hospitalisations for heart failure.

Length of stay in hospital

There has been a decline in the average length of stay in hospital for heart failure, from 10.6 days in 1993–94 to 8.6 days in 1996–97. Although males are more likely to be hospitalised for heart failure than females, females tended to have a longer average length of stay in hospital (9.1 days compared with 8.1 days).

DEATHS

Heart failure is the third largest cause of cardiovascular deaths in Australia. It accounted for 2,703 deaths or 2.1% of deaths from all causes in 1997.

Trends

Death rates from heart failure have been declining at a rate of 3.8% per year for males and 3.7% per year for females between 1986 and 1997.

Sex and age

In 1997, more females died from heart failure than males, but death rates among males aged under 85 were higher than for females. This apparent inconsistency can be explained by the much greater number of women than men who live to be over 85, where death rates from heart failure are considerably higher.

Deaths from heart failure occur predominantly among older Australians, with 94% of such deaths occurring among those aged 70 and over.

Socioeconomic groups

The number of heart failure deaths in the low and high socioeconomic groups is too small to draw any reliable conclusions.

Indigenous Australians¹

Among Indigenous Australians there are relatively few deaths attributable to heart failure. This may be a reflection of the younger age structure of Indigenous Australians compared with the overall Australian population. Between 1992 and 1997, 33 Indigenous males and 36 Indigenous females died from heart failure over the five years. In 1995–97 there were no significant differences in heart failure death rates between Indigenous and other Australians.

Urban, rural and remote areas

Heart failure death rates were higher in rural areas compared with urban areas in 1995–97. Rates in remote areas were not significantly different.

Heart failure death rates, 1995–97

	Males	Females
	Rate per 100,000 population	
Urban areas	12.7	11.5
Rural areas	15.6	13.9
Remote areas	17.5	13.6
Australia	13.7	12.2

Note: Age-standardised to the 1991 Australian population.

Source: AIHW National Mortality Database.

States and Territories²

In 1995–97, heart failure death rates were generally lower in Queensland and Western Australia, and for the remaining States and Territories there were no significant differences in heart failure death rates.

FURTHER INFORMATION

Sushma Mathur

E-mail: sushma.mathur@aihw.gov.au

Phone: 02 6244 1171

Detailed data

Refer to the **Statistical tables** section.

Main data sources

National Hospital Morbidity Database (Australian Institute of Health and Welfare).

National Mortality Database (Australian Institute of Health and Welfare).

References/further reading

Department of Health and Aged Care & Australian Institute of Health and Welfare (in press). National Health Priority Areas report on cardiovascular health 1999. Canberra: DHAC and AIHW.

DiBianco R 1993. Therapeutic review—a practical approach to the management of heart failure. *Australian Family Physician* 22(5): 764–88.

Mathur S & Gajanayake I 1998. Surveillance of cardiovascular mortality in Australia 1985–96. *Cardiovascular Disease Series No. 6*. AIHW Cat. No. CVD 3. Canberra: AIHW.

Waters A-M, Armstrong T & Senes-Ferrari S 1998. Medical care of cardiovascular disease in Australia. *Cardiovascular Disease Series No. 7*. AIHW Cat. No. CVD 4. Canberra: AIHW.

1. Includes data from Western Australia, South Australia and the Northern Territory only.

2. The Northern Territory has been excluded from this analysis due to the small number of deaths occurring there.

PERIPHERAL VASCULAR DISEASE

Peripheral vascular disease occurs mainly among older people, and is likely to increase significantly as the population ages. Peripheral vascular disease directly claimed over 2,000 lives in Australia in 1997.

WHAT IS PERIPHERAL VASCULAR DISEASE?

Peripheral vascular disease, ICD-9 codes 441–444, occurs due to a reduced arterial blood supply to the legs. This ranges from asymptomatic disease, through pain on walking, to pain at rest and limb-threatening reduced blood supply that can lead to amputation. The major cause of death in people with peripheral vascular disease is coronary heart disease.

RISK FACTORS FOR PERIPHERAL VASCULAR DISEASE

The major preventable risk factors for peripheral vascular disease include diabetes, tobacco smoking, high blood pressure and high blood cholesterol.

HOW MANY AUSTRALIANS HAVE PERIPHERAL VASCULAR DISEASE?

No national data are available on the number of Australians who have peripheral vascular disease.

HOSPITALISATION

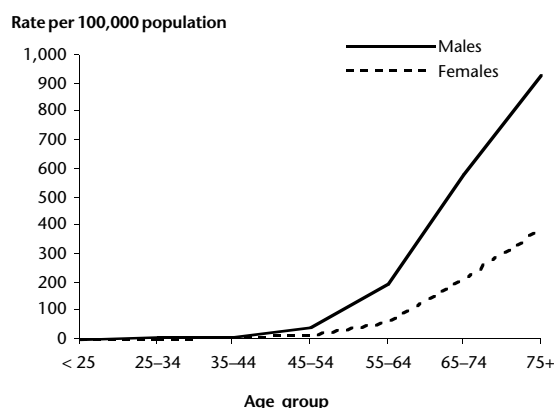
In 1996–97, there were 13,802 hospitalisations for peripheral vascular disease (0.3% of all hospitalisations). Peripheral vascular disease accounted for 3% of all hospitalisations for cardiovascular conditions.

Sex and age

Males are 2.5 times as likely to be hospitalised for peripheral vascular disease than females. Hospital use for peripheral vascular disease tends to increase with age, with those aged 65 and over accounting for over three-quarters of all hospitalisations for peripheral vascular disease.

DID YOU *know?*

- Direct health care costs for peripheral vascular disease amounted to \$179.5 million in 1993–94, 5% of all cardiovascular disease costs.
- There were 635 amputations for peripheral vascular disease in 1996–97.



Source: AIHW National Hospital Morbidity Database.

Hospital use for peripheral vascular disease, 1996–97

Length of stay in hospital

The average length of stay in hospital for peripheral vascular disease was 8.7 days in 1996–97, a decline from 1993–94 where the average length of stay was 10.4 days. Males tended to have a slightly longer average length of stay than females, 8.8 days compared with 8.5 days. This pattern differs from cardiovascular disease overall, where females generally had a longer length of stay in hospital.

DEATHS

Peripheral vascular disease accounted for 2,181 deaths or 1.7% of deaths from all causes in 1997.

Trends

Deaths from peripheral vascular disease have been declining at a rate of 2.5% per year for males and 0.9% per year for females between 1986–97. Death rates from this disease have been falling at a slower rate than for the other major causes of cardiovascular disease.

Sex and age

In 1997, males were twice as likely to die from peripheral vascular disease than females. Peripheral vascular disease increases dramatically with age, with 83% of deaths occurring among those aged 70 and over.

Socioeconomic groups

People from lower socioeconomic groups are more likely to die from peripheral vascular disease than are those from higher socioeconomic groups.

Indigenous Australians¹

Among Indigenous Australians there are relatively few deaths attributable to peripheral vascular disease. This may be a reflection of the younger age structure of Indigenous Australians compared with the overall Australian population. Between 1992 and 1997, 11 Indigenous males and 8 Indigenous females died from peripheral vascular disease over the five years. In 1995–97, there were no significant differences in peripheral vascular disease death rates between Indigenous and other Australians.

Urban, rural and remote areas

There were no significant differences in peripheral vascular disease death rates across urban, rural and remote areas of Australia in 1995–97.

Peripheral vascular disease death rates, 1995–97

	Males	Females
	Rate per 100,000 population	
Urban areas	14.6	6.8
Rural areas	16.2	7.5
Remote areas	12.7	6.6
Australia	15.0	7.0

Note: Age-standardised to the 1991 Australian population.

Source: AIHW National Mortality Database.

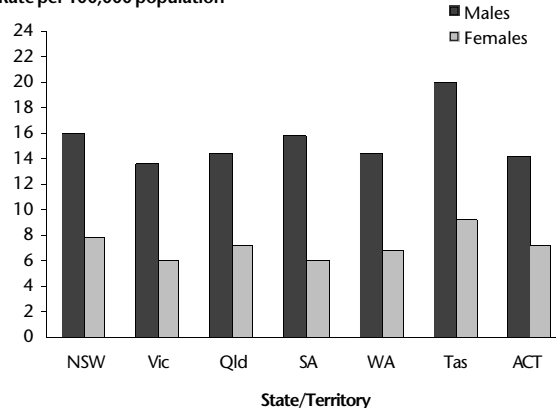
States and Territories²

There were no significant differences in peripheral vascular disease death rates across the States and Territories in 1995–97.

1. Includes data from Western Australia, South Australia and the Northern Territory only.

2. The Northern Territory has been excluded from this analysis due to the small number of deaths occurring there.

Rate per 100,000 population



Note: Age-standardised to the 1991 Australian population.

Source: AIHW National Mortality Database.

Death rates from peripheral vascular disease, 1995–97

FURTHER INFORMATION

Sushma Mathur

E-mail: sushma.mathur@aihw.gov.au

Phone: 02 6244 1171

Detailed data

Refer to the **Statistical tables** section.

Main data sources

National Hospital Morbidity Database (Australian Institute of Health and Welfare).

National Mortality Database (Australian Institute of Health and Welfare).

References/further reading

Mathur S & Gajanayake I 1998. Surveillance of cardiovascular mortality in Australia 1985–96. Cardiovascular Disease Series No. 6. AIHW Cat. No. CVD 3. Canberra: AIHW.

Waters A-M, Armstrong T & Senes-Ferrari S 1998. Medical care of cardiovascular disease in Australia. Cardiovascular Disease Series No. 7. AIHW Cat. No. CVD 4. Canberra: AIHW.

RHEUMATIC FEVER AND RHEUMATIC HEART DISEASE

Rheumatic fever and rheumatic heart disease account for less than 400 deaths each year. Although this disease is rare among the Australian population overall, rates among Indigenous Australians living in remote areas are very high. The incidence of acute rheumatic fever among Indigenous children in 1996 exceeds that of poor areas of urban Australia 50 years ago. Since the 1950s, acute rheumatic fever and rheumatic heart disease have largely become diseases of economically disadvantaged people.

WHAT ARE RHEUMATIC FEVER AND RHEUMATIC HEART DISEASE?

Rheumatic fever, ICD-9 codes 390–392, is caused by Group A Streptococcus bacteria which enter the bloodstream from infected sores or tonsils. It occurs mainly in children and young adults and may affect the heart valves, heart muscle and its lining, the joints and the brain. Recurrences of rheumatic fever can be almost prevented by strict follow-up and monthly injections of penicillin.

Rheumatic heart disease, ICD-9 codes 393–398, is the damage done to the heart muscle and heart valves by an attack of acute rheumatic fever.

RISK FACTORS FOR RHEUMATIC FEVER AND RHEUMATIC HEART DISEASE

Poverty and overcrowding, poor sanitary conditions, lack of education and limited access to medical care for adequate diagnosis and treatment are recognised as contributing factors to this disease in Australia.

DID YOU *know?*

- Prevalence of rheumatic heart disease among Indigenous Australians is one of the highest in the world.
- Rheumatic heart disease remains the leading cause of heart disease among children and young adults in many developing countries.
- The World Health Organization estimates that 12 million people worldwide are affected by rheumatic fever and rheumatic heart disease, with 400,000 deaths annually.

DISEASE RATES IN THE TOP END OF THE NORTHERN TERRITORY

A register of people with known or suspected rheumatic fever and rheumatic heart disease has been established in the Top End of the Northern Territory. This section draws on data from this register.

Acute rheumatic fever

Trends

Acute rheumatic fever among Indigenous children in the Top End has declined over the last decade. Between 1994 and 1998 the rate of Indigenous children aged 5–14 with acute rheumatic fever was 193 per 100,000 population, compared with 254 per 100,000 population in 1988–93.

Acute rheumatic fever among Indigenous Australians in the Top End of the Northern Territory, 1988–98

Years	5-14 years		All ages	
	Rate ^(a)	No.	Rate ^(a)	No.
1988–93	254	91	—	—
1994	204	18	84.3	27
1995	148	13	78.0	25
1996	238	21	105.0	38
1997	159	14	69.0	25
1998	216	19	80.2	29
1994–98	193	85	83.4	144

(a) Rate per 100,000 population.

Source: Rheumatic Heart Disease Register.

Current rates

In 1998, Indigenous children aged 5–14 accounted for two-thirds of all cases of acute rheumatic fever among Indigenous Australians in the Top End of Australia's Northern Territory (19 cases). There were 216 cases for every 100,000 Indigenous children aged 5–14. In contrast, the rate among other Australian children was 12.8 per 100,000 (2 cases).

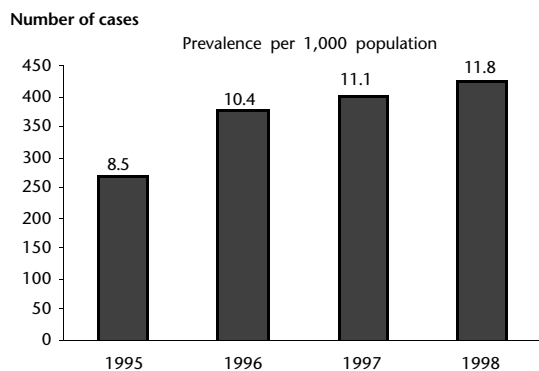
Rheumatic heart disease

Trends

The prevalence of rheumatic heart disease is increasing in the Top End of the Northern Territory. In 1998, there were 11.8 cases per 1,000 Indigenous people, compared with 8.5 per 1,000 in 1995. This increase could be due to an improvement in the reporting and awareness of the condition and its symptoms rather than a rise in the number of cases.

Current rates

In 1998, there were 451 people with rheumatic heart disease, of whom 95% were Indigenous Australians (426 cases). Rheumatic heart disease occurred in 34 children aged 5–14 (8% of all cases), of whom all were Indigenous Australians. The prevalence of rheumatic heart disease among Indigenous Australians was 11.8 per 1,000. In contrast, among other Australians the rate was 0.24 per 1,000.



Source: Rheumatic Heart Disease Register.

Rheumatic heart disease among Indigenous Australians, Top End of the Northern Territory, 1995–98

HOSPITALISATION

In 1996–97, there were 1,864 hospitalisations for rheumatic fever and rheumatic heart disease (0.03% of all hospitalisations) in Australia. Rheumatic fever and rheumatic heart disease accounted for 0.4% of all hospitalisations for cardiovascular conditions.

Although Indigenous Australians represent less than 2% of the population, they account for 14% of hospitalisations for rheumatic fever and rheumatic heart disease.

Sex and age

Females are more likely to be hospitalised for rheumatic heart disease than males, and for rheumatic fever there is little difference between males and females.

Hospital use for rheumatic heart disease increases with age up to age 80, with almost 60% of such cases aged 55–79. Rheumatic fever is more common among the younger age groups. Of the hospitalisations for rheumatic fever, 54% occur among those aged 5–19.

Length of stay in hospital

The average length of stay in hospital for rheumatic fever and rheumatic heart disease in 1996–97 was 7.4 days, a marginal decline from 1993–94 when the average length of stay was 7.9 days. Females tended to stay in hospital longer than males for this condition, on average 7.6 days compared with 7.1 days.

DEATHS

Rheumatic fever and rheumatic heart disease accounted for 348 deaths in Australia or 0.3% of deaths from all causes in 1997.

Trends

Death rates from rheumatic fever and rheumatic heart disease have been declining at a rate of 3.9% per year for males and 4.1% per year for females between 1986 and 1997. These death rates have been falling faster than for many of the other cardiovascular diseases. The rapid decline in death rates from this disease suggests improvement in living conditions and better access to medical care among disadvantaged Australians.

Sex and age

There were no significant differences in rheumatic fever and rheumatic heart disease death rates between males and females in 1997. Two in three of these deaths occurred among those aged 70 and over.

Socioeconomic groups

The number of deaths from rheumatic fever and rheumatic heart disease in the low and high socioeconomic groups is too small to draw any reliable conclusions.

Indigenous Australians¹

Indigenous Australians are far more likely to die from rheumatic fever and rheumatic heart disease than other Australians. In 1995–97, Indigenous males were 19 times and Indigenous females 13 times as likely to die from rheumatic fever and rheumatic heart disease as other Australians.

Urban, rural and remote areas

Among females, death rates from rheumatic fever and rheumatic heart disease were higher in remote areas compared with urban and rural areas in 1995–97. For males, there were no significant differences in rheumatic fever and rheumatic heart disease death rates across urban, rural and remote areas of Australia.

States and Territories

Most deaths from rheumatic fever and rheumatic heart disease occurred in New South Wales, Victoria and Queensland. The remaining States and Territories accounted for 25% of all such deaths in 1995–97. There were no significant differences in rheumatic fever and rheumatic heart disease death rates across the States and Territories.

FURTHER INFORMATION

Sushma Mathur

E-mail: sushma.mathur@aihw.gov.au

Phone: 02 6244 1171

Detailed data

Refer to the **Statistical tables** section.

Main data sources

National Hospital Morbidity Database (Australian Institute of Health and Welfare).

National Mortality Database (Australian Institute of Health and Welfare).

Rheumatic Heart Disease Register (Australian Institute of Health and Welfare and Department of Health and Aged Care).

References/further reading

Carapetis J, Wolff DR & Currie BJ 1996. Acute rheumatic fever and rheumatic heart disease in the Top End of Australia's Northern Territory. *Medical Journal of Australia* 164:146–49.

Department of Health and Aged Care & Australian Institute of Health and Welfare (in press). National Health Priority Areas report on cardiovascular health 1999. Canberra: DHAC & AIHW.

World Health Organization (WHO) 1995. Strategy for controlling rheumatic fever/rheumatic heart disease, with emphasis on primary prevention: Memorandum from a Joint WHO/ISFC meeting. *Bulletin of the World Health Organization* 73(5):583–87.

1. Includes data from Western Australia, South Australia and the Northern Territory only.

Heart, stroke and vascular diseases

RISK FACTORS

Risk factors are characteristics or exposures that are associated with a greater risk of ill-health. For cardiovascular disease they include heredity and behavioural and physiological factors. Cardiovascular disease and its risk factors are strongly influenced by the circumstances in which people live and work.

Interaction between risk factors can lead to greater risks of cardiovascular disease in people who have more than one risk factor.

WHAT ARE THE RISK FACTORS FOR CARDIOVASCULAR DISEASE?

Increasing age and male sex are risk factors for heart, stroke and vascular disease. That is, the risk for both males and females increases sharply with age. However, at any age the risk for males is greater than for females.

Risk factor	Coronary heart disease	Stroke
Demographic and hereditary factors		
Age	♥	♥
Sex	♥	—
Family history	♥	♥
Behavioural risk factors		
Physical inactivity	♥	♥
Tobacco smoking	♥	♥
Nutrition	♥	♥
Physiological risk factors		
High blood pressure	♥	♥
High blood cholesterol	♥	♥
Overweight	♥	♥
Diabetes	♥	♥
Non-valvular atrial fibrillation	—	♥

♥ substantial evidence of association between the risk factor and the disease.
 — no known association.

Behavioural risk factors can influence physiological risk factors (e.g. poor diet and physical inactivity promote overweight, high blood pressure and high blood cholesterol). Behavioural and physiological risk factors can be modified, unlike heredity, sex and age.

Risk for a cardiovascular disease rises steadily with increasing risk factor values. People below the threshold level will still be at risk to some degree. This risk will be higher in people with more than one risk factor present.

HOW MANY AUSTRALIANS HAVE A MODIFIABLE CARDIOVASCULAR DISEASE RISK FACTOR?

In 1995, over 10 million adult Australians (about 80% of the adult population) had at least one of the following risk factors: tobacco smoking, insufficient physical activity, high blood pressure, or overweight. This information is from the 1995 National Health and National Nutrition surveys. These surveys did not measure blood cholesterol and hence this risk factor is not included here.

Trends

Between 1980 and 1989 there was a decrease in the proportion of men and women with two or more major risk factors.

Over the past decade it appears that there have been reductions in the proportion of Australians who smoke or have high blood pressure, the proportion of people undertaking physical activity has remained relatively static, but the proportion of Australians who are overweight or obese has risen at an alarming rate.

DID YOU *know*?

- People's social and economic circumstances influence their health and length of life.
- Men who smoke are 2.9 times more likely to have a heart attack than men who do not; men who smoke and have high blood pressure are 4.5 times more likely to have a heart attack than men who do not have either risk factor.
- 4 in 5 men and 3 in 4 women have at least one modifiable risk factor.

Heart, stroke and vascular diseases

Sex and age

In 1995, 84% of men and 74% of women had at least one major modifiable risk factor (i.e. tobacco smoking, high blood pressure, overweight, physical inactivity). Around 12% of men and 9% of women had 3 or more of these risk factors.

Prevalence of risk factors was low among younger Australians and generally increased with age, peaking around 'middle-age', after which it remained relatively stable. Over 90% of men aged 45–79 years and over 80% of women aged 55 years and over had at least one major modifiable risk factor.

Socioeconomic groups

In 1995, 81% of women in the lowest socioeconomic group had a cardiovascular disease risk factor (i.e. tobacco smoking, high blood pressure, overweight, physical inactivity) compared with 68% in the highest group. Around 11% of women in the lowest socioeconomic group had 3 or more risk factors, compared with 5% of women in the highest group.

Men in the lowest socioeconomic group were over twice as likely to have 3 or more risk factors than were men in the highest group (13% and 6% respectively). However, for one or more risk factors, there was no significant difference between men in the lowest socioeconomic group (86%) and those in the highest group (81%).

Indigenous Australians

There are no age-standardised national data to directly compare multiple risk factor prevalence rates in Indigenous and other Australians. For individual risk factors, however, Indigenous Australians are more likely to smoke tobacco, not participate in leisure-time physical activity and be obese than other Australians. In 1995, 8% of Indigenous Australians drank alcohol at harmful levels compared with 3% of other Australians.

Urban, rural and remote areas

In 1995, there were no significant differences between prevalence of at least one risk factor (i.e. tobacco smoking, high blood pressure, overweight, physical inactivity) among people living in urban, rural or remote areas.

Although not significantly different from each other, almost 88% of men in remote areas of Australia had at least one risk factor, compared with 85% of men in rural and 83% of men in urban areas. Similarly, 77% of women in remote areas had at least one risk factor compared with 73% in rural and urban areas.

States and Territories

In 1995, there were no significant differences in the prevalence of at least one risk factor (tobacco smoking, high blood pressure, overweight, physical inactivity) between the States and Territories. The highest rate was in Tasmania (83%) and the lowest was in the Northern Territory (73%).

FURTHER INFORMATION

Dr Tim Armstrong

E-mail: tim.armstrong@aihw.gov.au

Phone: 02 6244 1129

Detailed data

Refer to the **Statistical tables** section.

Main data sources

1995 National Health Survey (Australian Bureau of Statistics).

1995 National Nutrition Survey (Australian Bureau of Statistics and Commonwealth Department of Health and Aged Care).

References/further reading

Australian Bureau of Statistics (ABS) 1999. 1995 National Health Survey: Aboriginal and Torres Strait Islander results. ABS Cat. No. 4806.0. Canberra: ABS.

Australian Institute of Health and Welfare (AIHW) 1998. Australia's health 1998: the sixth biennial health report of the Australian Institute of Health and Welfare. AIHW Cat. No. AUS 10. Canberra: AIHW.

Bennett SA & Magnus P 1994. Trends in cardiovascular disease risk factors in Australia. Results from the National Heart Foundation's Risk Factor Prevalence Study, 1980–1989. *Medical Journal of Australia* 161:519–27.

Waters A-M & Bennett S 1995. Risk factors for cardiovascular disease: a summary of Australian data. *Cardiovascular Disease Series* No. 1. Canberra: AIHW.

World Health Organization (WHO) 1998. *The solid facts: social determinants of health*. Copenhagen: Centre for Urban Health. Geneva: WHO.

PHYSICAL INACTIVITY

Physical activity reduces the risk of coronary heart disease. People who do not participate in regular physical activity are almost twice as likely to die from coronary heart disease as those who participate. Insufficient physical activity is recognised as being as important as high blood pressure and high blood cholesterol in contributing to Australia’s level of cardiovascular disease.

Evidence suggests that physical activity may also play a protective role against stroke. Leisure-time physical activity and vigorous work-related physical activity have been shown to lower the incidence of stroke.

Insufficient physical activity is likely to be associated with other risk factors for cardiovascular disease such as overweight, high blood pressure and high blood cholesterol. There is also evidence that people who increase their level of physical activity will reduce their levels of these risk factors.

WHAT IS PHYSICAL ACTIVITY?

The US Surgeon General’s Report on Physical Activity and Health recommends that at least 30 minutes of physical activity at a moderate intensity be carried out on most if not all days of the week to obtain a health benefit. Moderate physical activities include brisk walking, swimming, jogging, digging in the garden, and cycling.

DID YOU *know?*

- Physical inactivity is also a risk factor for some cancers, type 2 diabetes, injury, osteoporosis, and mental health problems.
- At least thirty minutes of moderate physical activity on most days of the week will benefit health.
- Up to a third of new cases of diabetes could be prevented by physical activity.

Physical activity can be measured in different ways, so results from different surveys provide different estimates of the proportions of physically active Australians. The information presented here is derived from the Australian Bureau of Statistics National Health Survey, and is but one of several approaches. The measure enables trend information to be reported and reflects some components of physical activity, but does not reflect incidental or occupational physical activity. For the purposes of this report, people reporting no leisure-time physical activity for recreation or exercise in the two weeks before the interview are considered at risk.

HOW MANY AUSTRALIANS ARE PHYSICALLY INACTIVE?

In 1995, over 4.5 million adult Australians (or over one-third of the adult population) reported doing no leisure-time physical activity in the two weeks before the interview.

Trends

There was little change in physical activity patterns during the 1980s and little change since. The proportion of people doing no physical activity during their leisure-time decreased only slightly between 1989–90 and 1995 from 36% to 34%. This fall was mainly due to an increase in physical activity among people aged 35–54 years.

Walking for physical activity increased in popularity during the 1990s with 45% of men and 53% of women walking for recreation or exercise in 1995 compared with 41% and 49% respectively in 1989–90.

Proportion not engaged in physical activity

Sex	1989–90	1995
	Per cent	
Men	35.6	33.5
Women	36.0	33.8

Notes

1. Age-standardised to the 1991 Australian population.
2. Includes persons aged 18 years and older.

Source: AIHW analysis of the 1989–90 and 1995 National Health Surveys.

Sex and age

In 1995, rates of physical activity were highest among younger adults and generally decreased with age.

The proportions of people undertaking walking, moderate or vigorous physical activity for an average of 30 minutes at least 5 times per week were similar for men (18%) and women (17%). The highest rates occurred among people aged 65–69 years. An increase in physical activity by people aged 50–70 years may be due to increased leisure-time that typically occurs with reduced work and family responsibilities.

This pattern supports other evidence that 'lack of time' is a major barrier to leisure-time physical activity.

Socioeconomic groups

In 1995, men and women in the lowest socioeconomic group were more likely to be physically inactive, 37% and 39% respectively, than those in the highest group, 27% and 29% respectively.

Indigenous Australians¹

Indigenous Australian adults are more likely than other Australian adults to report no physical activity in their leisure-time. In 1995, 40% of Indigenous Australians reported no leisure-time physical activity, compared with 34% of other Australians. Indigenous women of all ages were more likely than their other Australian counterparts to be physically inactive in their leisure-time. For men, however, this was true only for 18–44-year-olds.

Urban, rural and remote areas

In 1995, rates of physical inactivity during leisure-time were higher among people living in remote areas of Australia (37%) than for people living in urban (34%) or rural (32%) areas.

States and Territories

Rates of physical inactivity were highest in the Northern Territory (40%), and lowest in the Australian Capital Territory (25%) and Western Australia (29%).

FURTHER INFORMATION

Dr Tim Armstrong

E-mail: tim.armstrong@aihw.gov.au

Phone: 02 6244 1129

Detailed data

Refer to the **Statistical tables** section.

Main data sources

1989–90, 1995 National Health Surveys (Australian Bureau of Statistics).

References/further reading

Armstrong TP 1998. Monitoring trends in prevalence of physical activity in Australia (1989/90–1995). *Medicine and Science in Sports and Exercise* 30:S202.

Australian Bureau of Statistics (ABS) 1999. 1995 National Health Survey: Aboriginal and Torres Strait Islander results. ABS Cat. No. 4806.0. Canberra: ABS.

Australian Institute of Health and Welfare (AIHW) 1998. Australia's health 1998: the sixth biennial health report of the Australian Institute of Health and Welfare. AIHW Cat. No. AUS 10. Canberra: AIHW.

Bauman A 1999. Physical activity levels of Australians: results of the Active Australia baseline survey—November 1997. Canberra: Australian Sports Commission.

Bennett SA & Magnus P 1994. Trends in cardiovascular disease risk factors in Australia. Results from the National Heart Foundation's Risk Factor Prevalence Study, 1980–1989. *Medical Journal of Australia* 161:519–27.

Berlin J & Colditz GA 1990. A meta-analysis of physical activity in the prevention of coronary heart disease. *American Journal of Epidemiology* 132:612–28.

United States Department of Health and Human Services 1996. The Surgeon General's report on physical activity and health. Washington: US Government Printing Office.

1. Excludes Indigenous Australians living in remote areas.

TOBACCO SMOKING

Tobacco smoking increases the risk of coronary heart disease, stroke and peripheral vascular disease as well as a range of cancers and other diseases and conditions.

WHAT IS TOBACCO SMOKING?

Smoking here refers to the daily smoking of tobacco products, including packet cigarettes, roll-your-own cigarettes, pipes and cigars.

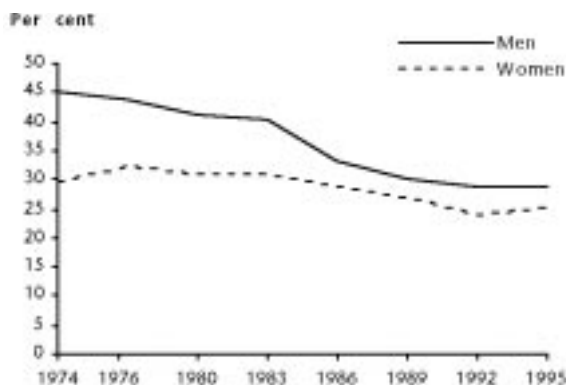
HOW MANY AUSTRALIANS CURRENTLY SMOKE?

In 1995, almost 3.2 million adult Australians (around 24% of the adult population) were at risk of developing heart disease and other chronic conditions from smoking tobacco products.

Trends

Adult smoking rates have been declining since the 1960s and this trend has continued into the 1990s. National surveys by the Anti-Cancer Council of Victoria show that the rate of decline of current smokers has slowed in more recent years.

Smoking among 15-year-old school students has stayed relatively constant over the past 10 years.



Note: Age-standardised to the 1986 Australian population.

Sources: Hill 1988; Hill et al. 1991; Hill et al. 1995; Hill et al. 1998.

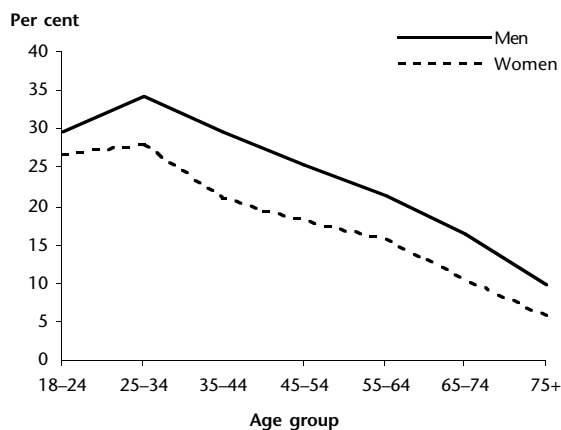
People smoking 1974-95

Sex and age

In 1995, about 27% of men and 20% of women aged 18 years and over smoked. Men and women aged 25-29 years had the highest proportion of smokers at around 33%. After 30 years of age, the rate of smoking declined with increasing age to be lowest among men and women aged 80 years and over.

In 1995, the proportion of ex-smokers in Australia was 32% for men and 23% for women. The proportion of people reporting to have never smoked was 40% for men and 57% for women.

In 1996, 24% of 15-year-old school boys and 29% of 15-year-old school girls smoked tobacco.



Source: AIHW analysis of the 1995 National Health Survey.

Smoking rate, 1995

Socioeconomic groups

Smoking is more common among people in the lowest socioeconomic group than those in higher socioeconomic groups. In 1995, around 19% of men and 15% of women in the highest socioeconomic group smoked, compared with 36% of men and 28% of women in the lowest socioeconomic group.

In 1995, unemployed men (46%) and women (33%) were much more likely to be smokers than employed men (27%) or women (21%).

Indigenous Australians¹

In 1995, adult Indigenous Australians were at least twice as likely to smoke as other Australian adults (51% compared with 23%). A higher proportion of Indigenous adults smoked than other Australians at every age. Smoking was more common among Indigenous men (56%) than women (46%).

Urban, rural and remote areas

There was no significant difference between rates of smoking among people living in rural (26%) and remote (24%) areas compared with urban Australians (24%). Fifty per cent of urban Australians have never smoked, compared with 46% of those in rural and 47% of those in remote areas.

States and Territories

In 1995, the highest rates of smoking occurred in the Northern Territory (32%). Lowest rates were found in the Australian Capital Territory (22%).

DID YOU *know?*

- One in four men and one in five women are at a greater risk of heart attack, stroke and peripheral vascular disease due to tobacco smoking.
- The rate of decline in current smoking has slowed in more recent years.
- Around 70,000 Australian teenagers start smoking each year.
- The estimated health system cost of smoking-related cardiovascular disease in 1989–90 was \$350 million.

FURTHER INFORMATION

Dr Tim Armstrong

E-mail: tim.armstrong@aihw.gov.au

Phone: 02 6244 1129

Detailed data

Refer to the **Statistical tables** section.

Main data sources

1995 National Health Survey (Australian Bureau of Statistics).

Anti-Cancer Council of Victoria surveys.

References/further reading

Australian Bureau of Statistics (ABS) 1999. 1995 National Health Survey: Aboriginal and Torres Strait Islander results. ABS Cat. No. 4806.0. Canberra: ABS.

Australian Institute of Health and Welfare (AIHW) 1998. Australia's health 1998: the sixth biennial health report of the Australian Institute of Health and Welfare. AIHW Cat. No. AUS 10. Canberra: AIHW.

Australian Institute of Health and Welfare (AIHW) 1996. Tobacco use and its health impact in Australia. AIHW Cat. No. CVD 1. Canberra: AIHW.

Cunningham J 1997. Cigarette smoking among Indigenous Australians. ABS Cat. No. 4701.0. Canberra: ABS.

Hill D 1988. Australian patterns of tobacco smoking in 1986. Medical Journal of Australia 149:6–10.

Hill DJ, White V & Gray N 1991. Australian patterns of tobacco smoking in 1989. Medical Journal of Australia 154:797–801.

Hill DJ, White VM & Scollo MM 1998. Smoking behaviours of Australian adults in 1995: trends and concerns. Medical Journal of Australia 168:209–13.

Hill DJ, White V & Segan S 1995. Prevalence of cigarette smoking among Australian secondary school students in 1993. Australian Journal of Public Health 19:445–49.

Waters A-M & Bennett S 1995. Risk factors for cardiovascular disease: a summary of Australian data. Cardiovascular Disease Series No. 1. Canberra: AIHW.

1. Excludes Indigenous Australians living in remote areas.

NUTRITION

The effect of nutrition on the risk of coronary heart disease, stroke and peripheral vascular disease results from the combined effects of individual dietary factors. Cardiovascular disease cannot be attributed to any one dietary component alone. Nutrition affects several physiological conditions and other risk factors (e.g. blood pressure, blood cholesterol levels, antioxidant levels, overweight, diabetes).

DIETARY RISK FACTORS FOR CARDIOVASCULAR DISEASE

Total intake of fat

High intakes of fat, especially saturated fats, are associated with elevated blood cholesterol levels, overweight and increased death from cardiovascular disease in populations where levels of physical activity are low. Total fat (e.g. saturated, monounsaturated, polyunsaturated) accounts for about 33% of the total energy intake of Australian adults. Although total dietary fat intake has reduced from around 37% in the 1980s, the current level is still above the National Health and Medical Research Council's recommended level of 30%.

Intake of saturated fatty acids

Among Australian adults, the contribution of saturated fat as a proportion of total energy intake has declined over the past decade. However, saturated fat still accounts for around 13% of total energy intake, higher than the recommended maximum level of 10%. Consumption of saturated fat is slightly higher among younger Australians than among older Australians. The major sources of saturated fatty acids in the adult diet are cheese, butter and margarine, pastries, milk and meat.

DID YOU know?

- In 1995, only 37% of 19–24-year-old Australians reported eating fruit.
- Adults in rural and remote areas of Australia are more likely to consume fats and oils than those in urban areas.
- Heavy alcohol consumption increases risk of heart attack and stroke.

Contribution of saturated fat as a proportion of total energy intake

Sex	1983	1995
	Per cent	
Men	15.9	12.7
Women	16.3	12.8

Notes

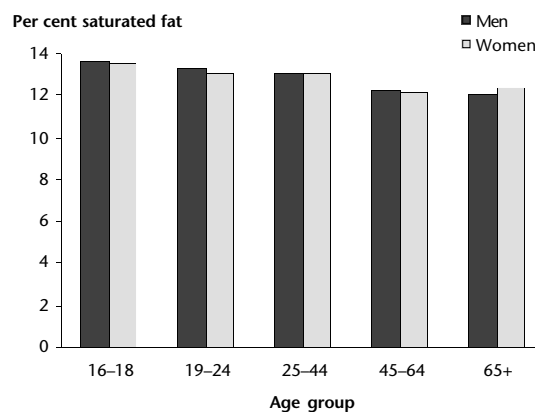
1. Age-standardised to the 1991 Australian population. 1983 estimates are for State capital cities only.

2. Includes persons aged 25–64.

Sources: 1983 National Dietary Survey of Adults; AIHW analysis of data from the 1995 National Nutrition Survey.

Intake of trans fatty acids

High intake of *trans* fatty acids increases blood cholesterol levels and risk of coronary heart disease. The major sources of *trans* fatty acids are fat spreads (e.g. some but not all margarines), meat and meat products. Currently there are no national data to assess *trans* fatty acid intake among Australians.



Source: ABS & DHFS 1997.

Saturated fat as a proportion of total energy intake, 1995

Intake of dietary cholesterol

The major sources of dietary cholesterol are eggs and meat. In 1995 the mean daily intake of dietary cholesterol among Australian men was 358 mg, and among women, 240 mg. There are no Australian recommendations for dietary cholesterol intake, however, recommendations for the United States are that less than 300 mg of dietary cholesterol be consumed each day.

High consumption of alcohol

High intake of alcohol (and particularly binge drinking) is associated with higher blood pressure and death from stroke. Evidence shows that each increment of 10 g of alcohol consumed per day increases systolic blood pressure by an average of 1–2 mmHg and diastolic blood pressure by 1 mmHg.

Abstinence from alcohol

Many studies indicate that abstinence from alcohol increases risk of heart attack and death from coronary heart disease. Although moderate alcohol consumption is associated with a reduced risk of coronary heart disease, it is associated with an increase in overall risk of illness and death. The cardiovascular health benefit of low to moderate alcohol consumption (1–2 drinks per day) relates mainly to men over 40 years of age and post-menopausal women.

In 1995, 45% of Australian adults reported that they do not drink alcohol.

High consumption of salt

High salt consumption in some people is associated with an increase in blood pressure and possibly risk of cardiovascular illness and death. No national data exist to assess levels of salt consumption among Australians. However, in one study conducted in Hobart, only 6% of men and 36% of women were below the recommended maximum intake of 100 mmol/day.

FURTHER INFORMATION

Dr Tim Armstrong

E-mail: tim.armstrong@aihw.gov.au

Phone: 02 6244 1129

Detailed data

Refer to the **Statistical tables** section.

Main data sources

1983 National Dietary Survey of Adults (Commonwealth Department of Health and National Heart Foundation).

1995 National Health Survey (Australian Bureau of Statistics).

1995 National Nutrition Survey (Australian Bureau of Statistics and Commonwealth Department of Health and Aged Care).

References/further reading

Ashwell M (ed.) 1997. Diet and heart disease: a round table of factors. British Nutrition Foundation. London: Chapman and Hall.

Australian Bureau of Statistics (ABS) & Commonwealth Department of Health and Family Services 1997. 1995 National Nutrition Survey: selected highlights. ABS Cat. No. 4802.0. Canberra: ABS.

Australian Bureau of Statistics (ABS) and Commonwealth Department of Health and Aged Care 1998. 1995 National Nutrition Survey: nutrient intakes and physical measurements. ABS Cat. No. 4805.0. Canberra: ABS.

Australian Institute of Health and Welfare (AIHW) 1998. Australia's health 1998: the sixth biennial health report of the Australian Institute of Health and Welfare. AIHW Cat. No. AUS 10. Canberra: AIHW.

Beard TC, Woodward DR, Ball PJ, et al. 1997. The Hobart salt study 1995: few meet national sodium intake target. Medical Journal of Australia 166:404–7.

Lester IH 1994. Australia's food and nutrition. Canberra: AGPS.

Smith A, Kellett E & Schmerlaib Y 1998. The Australian guide to healthy eating: background information for nutrition educators. Canberra: Commonwealth Department of Health and Family Services.

HIGH BLOOD PRESSURE

High blood pressure is a major risk factor for coronary heart disease, stroke, heart failure and peripheral vascular disease. The risk of disease increases as the level of blood pressure increases. When high blood pressure is controlled by medication, the risk of cardiovascular disease is reduced, but not to the levels of unaffected people.

Research has shown that high blood pressure is associated with other cardiovascular risk factors, including high cholesterol levels, physical inactivity, overweight and diabetes. Dietary salt intake and mental stress are also factors that may influence blood pressure.

WHAT IS HIGH BLOOD PRESSURE?

Blood pressure represents the forces exerted by blood on the walls of the arteries and is written as systolic/diastolic (e.g. 120/80 mmHg, stated as '120 over 80').

In people with arteries 'hardened' by deposits of fatty material and minerals, or with great resistance to blood flow resulting from kidney malfunction or stress, systolic blood pressure may increase from 120 to around 300 mmHg and diastolic pressure may exceed 120 mmHg.

For the purposes of this report, high blood pressure is defined as:

- systolic blood pressure greater than or equal to 160 mmHg and/or
- diastolic blood pressure greater than or equal to 95 mmHg and/or,
- receiving treatment for high blood pressure.

DID YOU *know?*

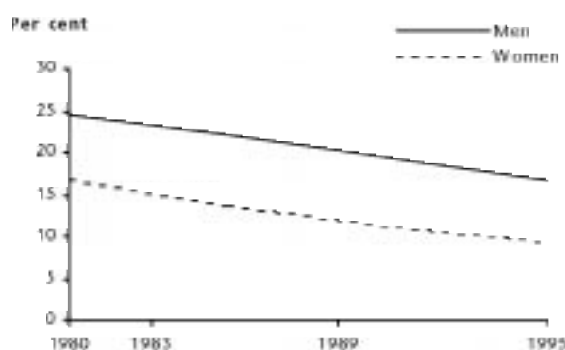
- High blood pressure can increase the risk of cardiovascular disease by 2 to 4 times.
- Both systolic and diastolic blood pressures are predictors of cardiovascular disease, although systolic blood pressure is a stronger predictor of death due to coronary heart disease.

HOW MANY AUSTRALIANS HAVE HIGH BLOOD PRESSURE?

In 1995, around 2.2 million adult Australians (17% of the adult population) had high blood pressure.

Trends

There have been significant declines in the proportion of people with high blood pressure and/or receiving treatment since the 1980s.



Notes

1. Age-standardised to the 1991 Australian population.
2. Includes persons aged 25-64.

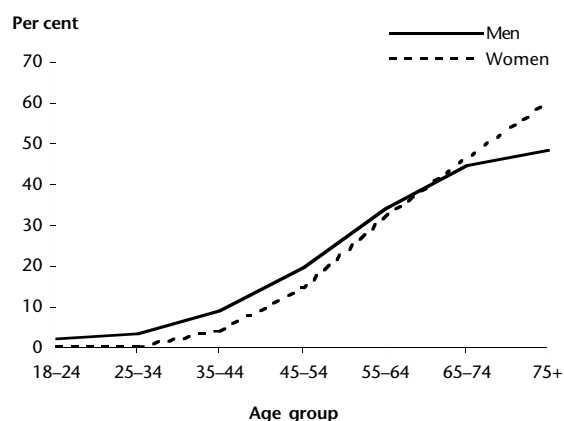
Sources: AIHW analysis of the Risk Factor Prevalence Study and 1995 National Nutrition Survey.

Rates of high blood pressure, 1980–95

There has also been a significant decline in average blood pressure levels during the same period. This decline occurred equally among those not on medication for high blood pressure as among those on treatment.

Sex and age

In 1995, 17% of men and 15% of women aged 18 years and over had high blood pressure. The proportion of men and women with high blood pressure increases with age. Among people aged 65–69 years, about 41% had high blood pressure.



Source: AIHW analysis of the 1995 National Nutrition Survey.

People with high blood pressure, 1995

Socioeconomic groups

In 1995, there was a difference in the prevalence of high blood pressure among women in the lowest socioeconomic group (18%) and those in the highest group (13%). However, there was no significant difference in the prevalence of high blood pressure among men in the lowest socioeconomic group (18%) and those in the highest group (16%).

Data from 1989 showed that high blood pressure was more common among people with low levels of education, and among single men living alone compared with men with partners and/or dependent children.

Indigenous Australians

There are no measured national data to assess the rates of high blood pressure among Indigenous Australians. Data from the Kimberley region suggest that high blood pressure is 2 to 3 times more common among Indigenous people than among other Australians. Among the same group of Indigenous people, drinking alcohol, obesity and high blood cholesterol levels were associated with high blood pressure.

Urban, rural and remote areas

In 1995 there were no significant differences in the prevalence of high blood pressure between urban, rural and remote areas. Around 15% of urban and rural women had high blood pressure and/or were on treatment for it, compared with 16% of women living in remote areas. For men, estimated rates were 17% in urban areas and 18%–19% in rural and remote regions.

States and Territories

In 1995 there were no significant differences in the prevalence of high blood pressure between the States and Territories. Highest rates were in Tasmania and South Australia (18%), and the lowest were in the Northern Territory (13%).

FURTHER INFORMATION

Dr Tim Armstrong

E-mail: tim.armstrong@aihw.gov.au

Phone: 02 6244 1129

Detailed data

Refer to the **Statistical tables** section.

Main data sources

1995 National Nutrition Survey (Australian Bureau of Statistics and Commonwealth Department of Health and Aged Care).

References/further reading

Australian Institute of Health and Welfare (AIHW) 1998. Australia's health 1998: the sixth biennial health report of the Australian Institute of Health and Welfare. AIHW Cat. No. AUS 10. Canberra: AIHW.

Bennett SA & Magnus P 1994. Trends in cardiovascular disease risk factors in Australia. Results from the National Heart Foundation's Risk Factor Prevalence Study, 1980–1989. *Medical Journal of Australia* 161:519–27.

Mathers C 1994. Health differentials among adult Australians aged 25–64 years. *Health Monitoring Series No. 1*. Canberra: AGPS.

Smith RM, Spargo RM, Hunter EM, et al. 1992. Prevalence of hypertension in Kimberley Aborigines and its relationship to ischaemic heart disease. An age stratified random survey. *Medical Journal of Australia* 156:557–62.

Waters A-M & Bennett S 1995. Risk factors for cardiovascular disease: a summary of Australian data. *Cardiovascular Disease Series No. 1*. Canberra: AIHW.

WHO MONICA Project 1988. Geographical variation in the major risk factors of coronary heart disease in men and women aged 35–64 years. *World Health Statistics Quarterly* 41:115–38.

HIGH BLOOD CHOLESTEROL

High blood cholesterol is a major risk factor for coronary heart disease and stroke. It is the main cause of the process by which the blood vessels that supply the heart and other parts of the body become clogged. Risk of heart disease increases steadily from a low base with increasing blood cholesterol levels.

Saturated fat in the diet is the main factor that raises blood cholesterol levels. Cholesterol in foods can also raise blood cholesterol levels, but less than saturated fat does. Heredity affects blood cholesterol and a few people have high cholesterol levels regardless of their saturated fat and cholesterol dietary intake.

A recent Australian study has shown that the cholesterol lowering drug treatment pravastatin reduces death and illness from cardiovascular disease compared with placebo treatment.

WHAT IS HIGH BLOOD CHOLESTEROL?

Total blood cholesterol levels above 5.5 mmol/L are an indication of a greatly increased risk of developing coronary heart disease. Levels above 6.5 mmol/L are considered to indicate extremely high risk.

HOW MANY AUSTRALIANS HAVE HIGH BLOOD CHOLESTEROL?

The last national survey to assess blood cholesterol levels in Australia was conducted in 1989 by the National Heart Foundation. At that time it was estimated that over 4.5 million Australian adults (aged 20–69 years) had higher than desirable cholesterol levels. There are no national data since this survey.

DID YOU *know?*

- For children, high blood cholesterol is defined as a level of 4.5 mmol/L or greater.
- People with high blood cholesterol feel perfectly well and will usually have no warning signs that they are at risk of heart disease.
- Highly effective drugs to lower high blood cholesterol are now available.
- Dispensing pharmacy drugs to lower blood cholesterol increased over the period 1990–97 from 1.2 million to 6.1 million prescriptions.

Trends

There were no clear changes in the levels of blood cholesterol during the 1980s and there are no later data on trends during the 1990s. The proportion of people with elevated blood cholesterol levels did not decline during that period.

Average blood cholesterol levels, 1980–89

Sex	1980	1983		1989
		mmol/L		
Men	5.72	5.67	5.66	5.66
Women	5.68	5.63	5.55	5.55

Notes

1. Estimates adjusted for age.

2. Includes persons aged 25–64.

Source: Bennett & Magnus 1994.

Sex and age

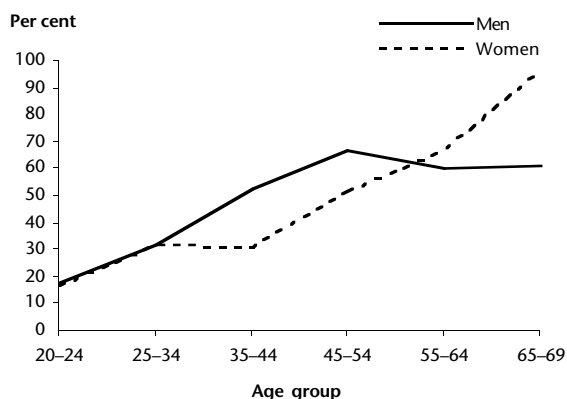
In 1989, over 47% of men and 39% of women aged 20–69 years had blood cholesterol levels above 5.5 mmol/L.

In men there was a rapid increase in the prevalence of elevated total cholesterol after age 34. In women, the increase occurred a decade later, after age 44, and the level exceeded that of men after the age of 55.

In terms of those at very high risk of cardiovascular disease, over 15% of men and women (aged 20–69) had blood cholesterol levels of 6.5 mmol/L or more.

Socioeconomic groups

There are no strong associations between cholesterol levels and socioeconomic status. However, analysis of data from 1989 showed that high blood cholesterol (≥ 6.5 mmol/L) was more common among unemployed women (25–64 years) than among women in full-time employment. Among men aged 25–64 years, those living alone or previously married had around 1.5 times higher rate for elevated blood cholesterol (≥ 6.5 mmol/L) than those with partners or dependents.



Note: Blood cholesterol levels ≥ 5.5 mmol/L.

Source: RFPSMC 1990.

People with high blood cholesterol, 1989

Indigenous Australians

There are no national data on blood cholesterol levels among Indigenous Australians. A New South Wales survey on cardiovascular risk factors showed that a greater proportion of Indigenous women in Wilcannia had cholesterol levels above 6.5 mmol/L compared with other Australian women. However, other studies have shown no difference in cholesterol levels between Indigenous and other Australians.

Urban, rural and remote areas

There are no national data on blood cholesterol levels across urban, rural and remote areas of Australia.

States and Territories

Data are available only for 1989 for the capital cities of each State and Territory. Hobart had the highest proportion of adults (aged 20–69) with cholesterol levels above 5.5 mmol/L (60% of men and 53% of women) compared with other Australian capitals. The lowest prevalence of high cholesterol for men was in Melbourne (42%) and for women in Darwin (36%).

FURTHER INFORMATION

Dr Tim Armstrong

E-mail: tim.armstrong@aihw.gov.au

Phone: 02 6244 1129

Detailed data

Refer to the **Statistical tables** section.

Main data sources

1980, 1983, 1989 Risk Factor Prevalence Surveys (National Heart Foundation).

References/further reading

Bennett SA & Magnus P 1994. Trends in cardiovascular risk factors in Australia: results from the National Heart Foundation's Risk Factor Prevalence Study, 1980–1989. *Medical Journal of Australia* 161:519–27.

Boyle CA & Dobson AJ 1992. Cardiovascular disease risk factors in New South Wales: a summary of available data in 1991. Newcastle: Department of Statistics, University of Newcastle.

Grundt SM 1997. Cholesterol and coronary heart disease: the 21st century. *Archives of Internal Medicine* 157:1177–84.

Guest CS, O'Dea K & Larkins RG 1994. Blood pressure, lipids and other risk factors for cardiovascular disease in Aborigines and persons of European descent of southeastern Australia. *Australian Journal of Public Health* 18:79–86.

Mathers C 1994. Health differentials among adult Australians aged 25–64 years. *Health Monitoring Series No. 1*. Canberra: AIHW.

Risk Factor Prevalence Study Management Committee (RFPSMC) 1990. Risk Factor Prevalence Study. Survey No. 3 1989. Canberra: National Heart Foundation of Australia and Australian Institute of Health.

The LIPID Study Group 1998. Prevention of cardiovascular events and death with pravastatin in patients with coronary heart disease and a broad range of initial cholesterol levels. *New England Journal of Medicine* 339:1349–57.

Waters A-M & Bennett S 1995. Risk factors for cardiovascular disease: a summary of Australian data. *Cardiovascular Disease Series No. 1*. Canberra: AIHW.

OVERWEIGHT AND OBESITY

People who are overweight or obese have a higher risk of ill-health including coronary heart disease, stroke, heart failure, and type 2 diabetes. Overweight and obesity is also associated with high blood pressure and high blood cholesterol. Life expectancy is reduced by obesity, mainly through the effects of increased body fat on related conditions.

Evidence that reducing weight reduces the risk of ill health and death from cardiovascular disease is inconclusive. However, among those who are overweight, weight loss reduces the incidence and severity of high blood pressure, high blood cholesterol and diabetes.

WHAT IS OVERWEIGHT AND OBESITY?

To assess the numbers of people who are overweight or obese in the population, the body mass index (BMI) is used. BMI is calculated by weight (kg) divided by height squared (m). A BMI of 25 or greater indicates overweight, and 30 or greater indicates obesity.

HOW MANY AUSTRALIANS ARE OVERWEIGHT?

In 1995, around 7.4 million adult Australians (around 56% of the adult population) were overweight (BMI \geq 25). Almost 2.5 million (or 19% of the adult population) of those were obese (BMI \geq 30).

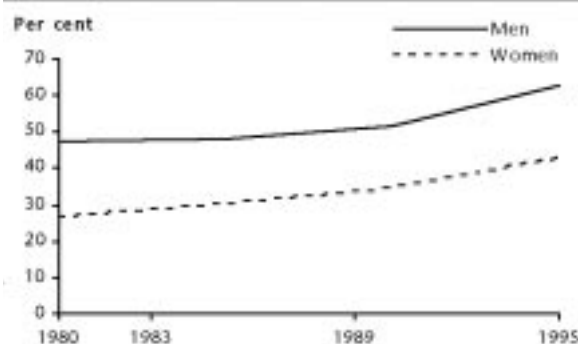
DID YOU *know?*

- Overweight and obesity are also related to other health conditions such as some cancers, type 2 diabetes, gallstones, sleep apnoea, osteoarthritis and reproductive problems among women.
- On average, women in 1995 weighed 4.8 kg more than their counterparts in 1980, and men 3.6 kg more.
- Obese children tend to become obese adults.
- State surveys suggest that the proportion of overweight children is also increasing.

Trends

There have been significant increases in the proportions of overweight and obese Australians over the last 15 years. Trend data (from Australian capital cities only) indicate that the proportion of overweight women aged between 25 and 64 years has increased from 27% in 1980 to 43% in 1995.

The proportion of overweight men in that age group increased from 48% to 63% over the same period. The proportion of obese men in that age group has increased dramatically from 8% in 1980 to 18% in 1995 and the proportion of obese women has increased from 7% to 16%.



Notes

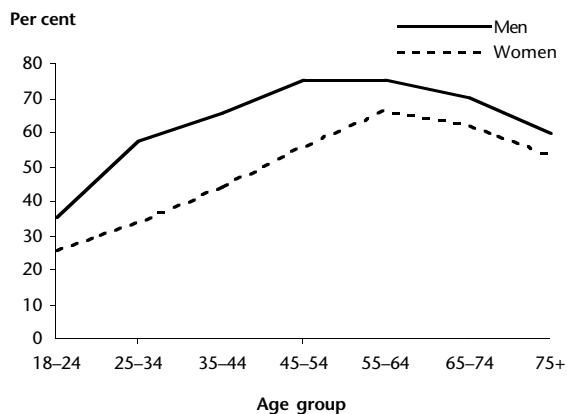
1. Age-standardised to the 1991 Australian population.
2. Includes persons aged 25–64.

Sources: AIHW analysis of the 1980, 1983, 1989 Risk Factor Prevalence Survey and 1995 National Nutrition Survey.

Rate of overweight people, 1980–95

Sex and age

In 1995, men were more likely to be overweight than were women. Around 64% of men and 49% of women aged 18 years and over were overweight. The proportion of overweight people increased with age and peaked at 50–54 years for men (79%) and 55–64 years for women (68%). Around 18% of adult Australians were obese.



Source: AIHW analysis of the 1995 National Nutrition Survey.

Overweight people, 1995

Socioeconomic groups

Being overweight or obese is more common among women in lower socioeconomic groups. In 1995, around 53% of women in the lowest socioeconomic group were overweight, compared with 44% of women in the highest socioeconomic group.

In 1995 there was no significant difference among the rate of overweight men in the highest and lowest socioeconomic groups (around 61%).

Indigenous Australians

From data collected in 1994 (Indigenous Australians) and 1995 (all Australians) there was little difference between the age-adjusted proportion of overweight Indigenous Australian men (62%) and all Australian men (63%). However, almost 25% of those Indigenous men were obese, a rate somewhat higher than that for all Australian men (18%).

Almost 60% of Indigenous women were overweight, a rate much higher than seen among all Australian women (49%). Rates of obesity among Indigenous women were also much higher than among all Australian women (30% compared with 18%).

Urban, rural and remote areas

In 1995 the majority (53%) of women living in remote areas were overweight. In comparison, around 47% of women living in urban and rural areas were overweight. For men, there was no significant difference, with 65% of men in remote and rural areas being overweight compared with 63% in urban areas.

States and Territories

In 1995, there were no significant differences between the proportions of overweight and obese people in the States and Territories. The rate of overweight ranged from 61% in Tasmania to 49% in the Northern Territory.

FURTHER INFORMATION

Dr Tim Armstrong

E-mail: tim.armstrong@aihw.gov.au

Phone: 02 6244 1129

Detailed data

Refer to the **Statistical tables** section.

Main data sources

1994 National Aboriginal and Torres Strait Islander Survey (Australian Bureau of Statistics).

1995 National Nutrition Survey (Australian Bureau of Statistics and Commonwealth Department Health and Aged Care).

1980–1989 Risk Factor Prevalence Study (National Heart Foundation).

References/further reading

Australian Bureau of Statistics (ABS) 1999. 1995 National Health Survey: Aboriginal and Torres Strait Islander results. ABS Cat. No. 4806.0. Canberra: ABS.

Cunningham J & Mackerras D 1998. Overweight and obesity, Indigenous Australians. ABS Cat. No. 4702.0. Canberra: ABS.

National Health and Medical Research Council (NHMRC) 1997. Acting on Australia's weight: a strategic plan for the prevention of overweight and obesity. Canberra: NHMRC.

National Heart Lung Blood Institute (NHLBI) 1998. Obesity education initiative expert panel 1998. Clinical guidelines on the identification, evaluation, and treatment of overweight and obesity in adults: the evidence report. Bethesda: NHLBI.

Waters A-M & Bennett S 1995. Risk factors for cardiovascular disease: a summary of Australian data. Cardiovascular Disease Series No. 1. Canberra: AIHW.

DIABETES

People with diabetes are at an increased risk of developing coronary heart disease, stroke and peripheral vascular disease.

WHAT IS DIABETES?

Diabetes is a condition in which the body makes too little of the hormone insulin or cannot use it properly. This disturbs the body's main energy processes. The two most common types of diabetes are type 1 (also known as insulin-dependent diabetes mellitus, or IDDM) and type 2 (also known as non-insulin-dependent diabetes mellitus, or NIDDM).

Type 1 diabetes occurs when the body does not produce any insulin, which helps the body use sugar, glucose and other carbohydrates. It generally occurs in people under the age of 40 years. People with type 1 diabetes must take daily insulin and follow a careful diet to stay healthy.

Type 2 diabetes, which accounts for about 85–90% of all diabetes, is a disorder resulting from the body's inability to make enough, or to properly use, insulin. Type 2 diabetes is usually associated with obesity and other cardiovascular risk factors.

HOW MANY AUSTRALIANS HAVE DIABETES?

There are no national estimates of the prevalence of diabetes based on blood glucose testing. In 1995, over 350,000 Australians (2% of the population) reported having type 1 or type 2 diabetes. Self-reported diabetes underestimates the true prevalence of the condition. Studies suggest that there is one undiagnosed person for each known case of type 2 diabetes.

DID YOU know?

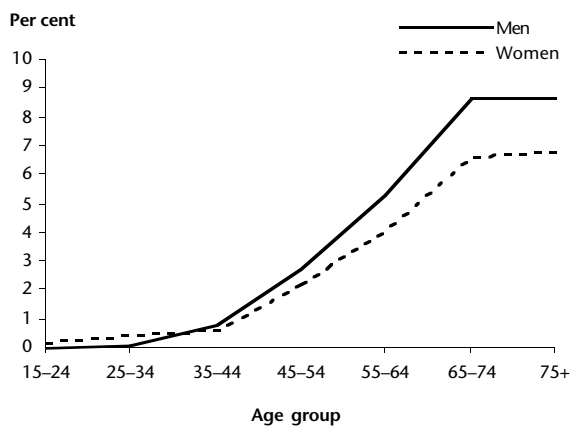
- Diabetes causes:
 - Blindness
 - High blood pressure
 - Limb amputation
 - Impotency in men
 - Kidney complications
 - Heart disease and stroke—risk of these conditions are 2–5 times higher among diabetics than non-diabetic individuals.
- Diabetes may develop during pregnancy.

Trends

There are no national data to assess time trends in the prevalence of diabetes.

Sex and age

Type 2 diabetes rates increase with age, with a greater increase after 40 years of age. In 1995, from self-reported data, prevalence increased from 0.1% among people aged less than 15 years to 8% among those aged 75 years or older. The increase in prevalence after 40 years of age was greater among males than females.



Source: AIHW analysis of the 1995 National Health Survey.

People with type 2 diabetes, 1995

Socioeconomic groups

In 1995, Australians in the lowest socioeconomic group had higher rates of type 2 diabetes than people in higher socioeconomic groups. Women in the lowest socioeconomic group (2.5%) were 2.5 times as likely to report diabetes than those in the highest group (1.0%). Men in the lowest socioeconomic group had a rate of type 2 diabetes of 2.3%, compared with 1.5% for men in the highest group.

Self-reported type 2 diabetes is also associated with employment. In 1995, unemployed men and those not in the labour force reported rates of type 2 diabetes that were 2–3 times that of employed men. The differences were more marked for women, with unemployed women reporting over 13 times the rate of type 2 diabetes (8%) than did employed women (0.6%).

Indigenous Australians

Indigenous Australians have one of the highest rates of type 2 diabetes in the world. In 1995, self-reported diabetes was 7–8 times higher among Indigenous Australians than other Australians among those aged 25–55 years. The rates were more than twice as high among those aged 55 years or more.¹ However, other evidence suggests that the overall prevalence of diabetes among Indigenous adults could be as high as 10–30% (i.e. 2–4 times that of other Australians). It is not clear why diabetes is so common among Indigenous Australians, however, it is thought to have a genetic basis coupled with the rapid change from a traditional way of life to a more 'westernised' lifestyle. This lifestyle is marked by decreased physical activity and a high-fat, low-fibre diet that promotes obesity, high blood cholesterol and high blood pressure.

Urban, rural and remote areas

In 1995, there were no significant differences between the reported rates of type 2 diabetes among people from urban, rural or remote areas of Australia.

States and Territories

In 1995, there were no significant differences in reported type 2 diabetes across the States and Territories.

Non-English-speaking backgrounds

Certain migrant groups have a high prevalence of diabetes. In particular, diabetes is very common among Micronesians, Polynesians and Melanesian Islanders, migrant Asian Indians and Chinese, and people from Southern Europe.

FURTHER INFORMATION

Dr Tim Armstrong

E-mail: tim.armstrong@aihw.gov.au

Phone: 02 6244 1129

Detailed data

Refer to the **Statistical tables** section.

Main data sources

1995 National Health Survey (Australian Bureau of Statistics).

References/further reading

Australian Bureau of Statistics (ABS) 1999. 1995 National Health Survey: Aboriginal and Torres Strait Islander results. ABS Cat. No. 4806.0. Canberra: ABS.

Australian Institute of Health and Welfare (AIHW) 1998. Australia's health 1998: the sixth biennial health report of the Australian Institute of Health and Welfare. AIHW Cat. No. AUS 10. Canberra: AIHW.

Colagiuri S, Colagiuri R & Ward J 1998. National Diabetes Strategy Implementation Plan. Canberra: Diabetes Australia.

King H, Rewers M, Zimmet P, et al. 1993. WHO Adhoc Reporting Group—global estimates for prevalence of diabetes mellitus and impaired glucose tolerance in adults. *Diabetes Care* 16:157–77.

McCarty DJ, Zimmet P, Dalton A, et al. 1996. The rise and rise of diabetes in Australia, 1996: a review of statistics, trends and costs. Canberra: International Diabetes Institute.

Nathan DM, Meigs J & Singer DE 1997. The epidemiology of cardiovascular disease in type 2 diabetes mellitus: how sweet it is...or is it? *The Lancet* 350(Suppl 1):4–9.

Zimmet PZ & Albertini KGMM 1997. The changing face of macrovascular disease in non-insulin-dependent diabetes mellitus: an epidemic in progress. *The Lancet* 350 (Suppl 1):1–4.

Zimmet P, McCarty D & De Couten M 1997. The global epidemiology of non-insulin-dependent diabetes mellitus and the metabolic syndrome. *Journal of Diabetes and Its Complications* 11:60–68.

1. Excludes Indigenous Australians living in remote areas.

HEALTH CARE COSTS OF CARDIOVASCULAR CONDITIONS

Direct health care costs of cardiovascular disease rank equal first with diseases of the digestive system as the most expensive disease group in Australia.

Following is an overview of the direct health care costs associated with cardiovascular disease in Australia for the period 1993–94. Indirect costs, such as lost production due to sickness and premature death, are not included. As such, the figures presented here do not estimate the full economic impact of cardiovascular disease in Australia.

COST OF CARDIOVASCULAR DISEASE

The total direct cost of cardiovascular disease in Australia during 1993–94 was \$3,719 million. This represented 12% of total health costs and made it the most expensive disease group. The cost of digestive system diseases was equally expensive (\$3,715 million). Costs related to musculoskeletal conditions ranked next (\$3,002 million). These were followed by injury, mental disorders and respiratory conditions (each around \$2,600 million).

DID YOU *know?*

- The average treatment cost for a heart attack in 1993–94 was around \$5,000.
- The average lifetime health care cost of stroke is around \$26,000 per sufferer in 1993–94.
- During 1993–94, public and private hospital costs due to cardiovascular diseases totalled \$1.5 billion. For the same period, over \$700 million was spent on drugs for the treatment and prevention of cardiovascular diseases.

Sex

Overall, there is no difference between males and females for the total costs of cardiovascular disease. During 1993–94, costs were around \$1,850 million for each sex. Costs do vary between males and females for individual cardiovascular conditions.

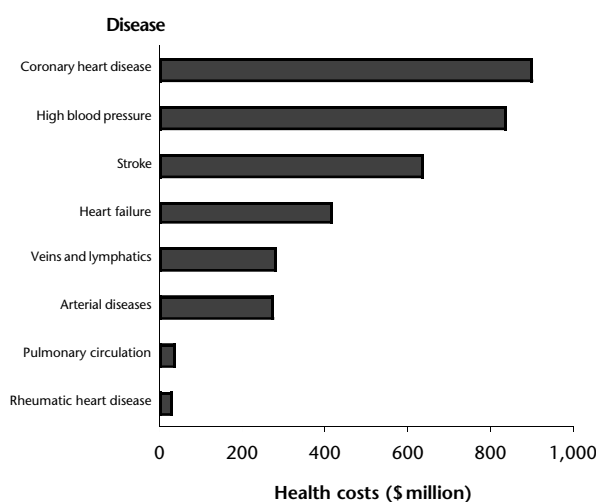
Total costs of coronary heart disease were higher for males (\$560 million) than for females (under \$340 million). The opposite was true for high blood pressure, stroke and heart failure. Females accounted for high blood pressure costs of \$500 million compared with males at \$335 million. Stroke costs for females were nearly \$350 million compared with males at \$280 million. Costs of heart failure for females were nearly \$250 million compared with males at \$170 million.

Age

Costs related to cardiovascular disease rise steeply with age from 40 years onwards. During 1993–94, total costs of cardiovascular disease were about \$900 million for females over 75 years. For males over 70 years, the total costs of cardiovascular disease were around \$600 million.

CORONARY HEART DISEASE

The most expensive of all cardiovascular diseases was coronary heart disease. At \$894 million this was 24% of total cardiovascular disease costs. The majority of costs were related to hospital inpatients. Public hospital costs were over \$410 million. Private hospital costs were nearly \$150 million. The next most expensive health service was the cost of prescription drugs at nearly \$100 million.



Source: Mathers & Penm 1999.

Health care costs for cardiovascular diseases, 1993–94

Heart, stroke and vascular diseases

HIGH BLOOD PRESSURE

More is spent on research relating to high blood pressure than on any individual cardiovascular disease. At an estimated \$22 million, these research costs were double the next closest, costs for coronary heart disease research, and over three times more than the costs of stroke research.

HEART FAILURE

The total health system cost of heart failure were \$411 million (11% of cardiovascular disease costs). The majority of these were hospital inpatient costs (\$140 million) and nursing home costs (\$135 million). Public hospital care costs around \$120 million and private hospital costs were just over \$20 million.

STROKE

Total health system costs for stroke were \$630 million (17% of cardiovascular disease costs). The majority of costs were hospital inpatient costs (\$269 million). Nursing home services provided the other major area of expenditure, representing almost half of all stroke health service costs at \$265 million.

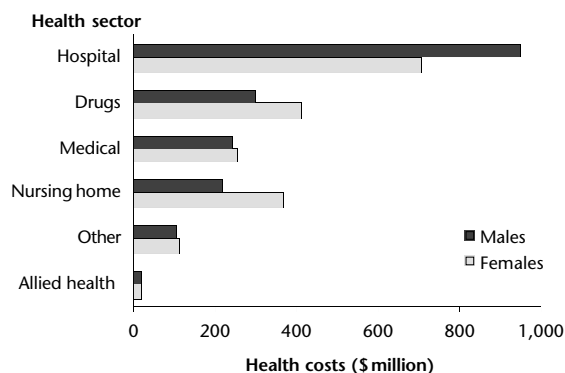
DIABETES

Like high blood cholesterol, diabetes significantly increases the risk of cardiovascular disease. Cardiovascular complications caused by diabetes cost \$223 million during 1993–94. The complications caused by diabetes include stroke (\$75 million), coronary heart disease (\$68 million), heart failure (\$37 million), high blood pressure (\$32 million) and peripheral vascular disease and atherosclerosis (\$10 million).

COSTS BY HEALTH SERVICE

In 1993–94, hospitals and nursing homes were responsible for the majority of health service costs for cardiovascular disease (\$2,240 million). The next most expensive service was the cost of drugs. Prescription and non-prescription drugs were less than one-third the cost of hospitals and nursing homes (\$715 million). Medical services ranked third most expensive (\$500 million).

These include consultations with general practitioners and specialists as well as pathology tests, screening and other diagnostic services. The least expensive services included administration, research and prevention programs and allied health practitioners (totalling \$258 million).



Notes

1. Excluding high blood cholesterol costs.
2. Other includes administration, research and prevention program costs.

Source: Mathers & Penm 1999.

Health care costs of cardiovascular diseases by health sector, 1993–94

FURTHER INFORMATION

Trent Harlow

Email: trent.harlow@aihw.gov.au

Phone: 02 6244 1018

Detailed data

Refer to the **Statistical tables** section.

Main data sources

Mathers C & Penm R 1999. Health system costs of cardiovascular diseases and diabetes in Australia 1993–94. AIHW Cat. No. HWE 11. Canberra: AIHW.

References/further reading

Australian Institute of Health and Welfare (AIHW) 1998. Australia's health 1998: the sixth biennial health report of the Australian Institute of Health and Welfare. AIHW Cat. No. AUS 10. HWE 11. Canberra: AIHW.

Mathers C & Penm R 1999. Health system costs of cardiovascular diseases and diabetes in Australia 1993–94. AIHW Cat. No. HWE11. Canberra: AIHW.

DRUG TREATMENT

There is a wide range of effective drugs to treat people with cardiovascular disease. They have improved people's quality of life and lowered death rates. A brief overview of the use of prescription medicines in Australia is presented here. The data shown refer to use in the community only; medicines given in hospital are not included.

Drug use is measured in defined daily dose per 1,000 population per day (DDD/1,000/day). This is based on the assumed average dose per day of a drug used for its main indication in adults. The DDD enables valid comparisons between drugs independent of differences in price, preparation and quantity per prescription.

BLOOD PRESSURE LOWERING DRUGS

Although drugs in this class are grouped as 'blood pressure lowering', they also have other important and useful effects and are given to treat various conditions, not just high blood pressure. As the indication for which the drug is prescribed is not recorded, it is not possible to determine drug use for specific conditions or purposes. It would be incorrect to think that these data show the use of drugs to lower blood pressure.

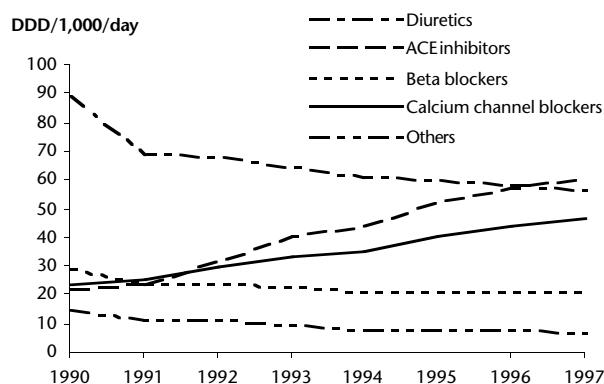
DID YOU *know?*

- 40.6 million drug prescriptions for cardiovascular drugs were dispensed in 1997. This represents a fifth of all prescriptions.
- Frusemide, a diuretic, was the second most widely used drug in Australia in 1997. Enalapril, simvastatin, amlodipine and felodipine were also among the top ten.
- Simvastatin, a cholesterol lowering drug, was the top drug by cost to the government, amounting to \$185 million in 1997. Also ranked in the top ten were enalapril, amlodipine, captopril and pravastatin.
- About 1.6 million Australians were on treatment for high blood pressure in 1995.

Diuretics

Diuretics are effective in reducing blood pressure. This reduces the occurrence of strokes and heart disease. Diuretics are also helpful for people with heart failure.

Though diuretics are still very popular, their prescription is falling in favour of more modern drugs such as ACE inhibitors and calcium channel blockers. Frusemide was the most commonly dispensed diuretic in 1997 (22.7 DDD/1,000/day).



Note: DDD = defined daily dose.

Source: DHFS 1998.

Community use of blood pressure lowering drugs, 1990–97

Beta blockers

Beta blockers are used to treat patients with high blood pressure and have other important uses. In people with angina or history of heart attack, beta blockers can reduce pain and deaths, and prevent further heart attacks. Through their lowering of blood pressure, these drugs prevent strokes and heart attacks. Usage levels have remained unchanged in the 1990s. Atenolol was the most widely prescribed beta blocker in 1997 (9.7 DDD/1,000/day).

Calcium channel blockers

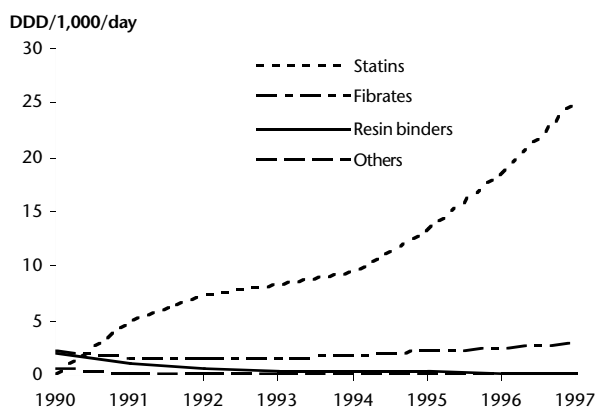
Calcium channel blockers are effective in reducing blood pressure and angina. So far, only one drug in this class (verapamil) has been shown to prevent further heart attacks and deaths in people with a previous heart attack. The use of calcium channel blockers has risen steadily in recent years. Amlodipine and felodipine were the most commonly dispensed calcium channel blockers in 1997 (14.8 and 11.7 DDD/1,000/day, respectively).

Angiotensin converting enzyme (ACE) inhibitors

ACE inhibitors are used widely to treat people with high blood pressure or heart failure. These drugs limit the progressive enlargement of the heart after a heart attack and relieve heart failure symptoms. If given early during a heart attack, they can reduce deaths. They have become increasingly popular in the 1990s. Enalapril (22.0 DDD/1,000/day) is the most used ACE inhibitor, followed by captopril (9.9 DDD/1,000/day) and lisinopril (9.4 DDD/1,000/day).

LIPID LOWERING DRUGS

Lipid lowering drugs are effective in preventing heart attacks and reducing coronary heart disease deaths. Statins, resin binders, nicotinic acid, fibrates and probucol all reduce blood LDL (low density lipoprotein) cholesterol to varying degrees, statins being the most effective agents. Fibrates, nicotinic acid and fish oil lower blood triglycerides. The use of statins has increased dramatically since 1994 when their value was established conclusively. Simvastatin is the most widely prescribed lipid lowering agent (20.5 DDD/1,000/day), followed by pravastatin and fluvastatin (3.3 and 1.4 DDD/1,000/day, respectively).



Note: DDD = defined daily dose.

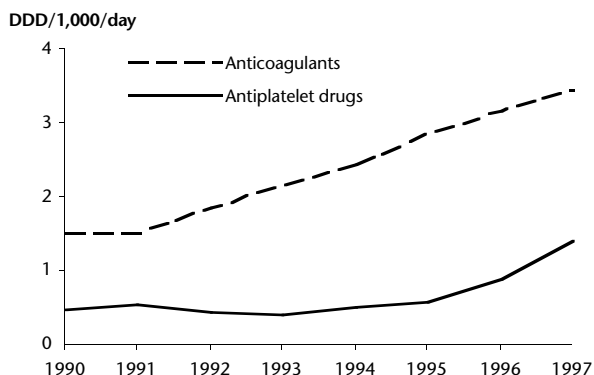
Source: DHFS 1998.

Community use of lipid lowering drugs, 1990-1997

ANTITHROMBOTIC DRUGS

Thrombolytic drugs

Thrombolytic drugs dissolve blood clots. These drugs are given only in hospital, under close supervision. They are useful in patients suffering a heart attack, where a clot blocks blood supply to part of the heart. They are also effective in people having a stroke caused by a clot impeding blood flow to part of the brain (ischaemic stroke). Thrombolytics are used less in peripheral vascular disease. For best results, the drugs must be given early in the heart attack or stroke. Among 35-64-year-olds, an estimated 42% of people suffering a heart attack were treated with thrombolytics in 1991 to 1993, a 5% increase per year since 1985. As these drugs are given only in hospital, it is not valid to talk about their community use.



Note: DDD = defined daily dose.

Source: DHFS 1998.

Community use of drugs to prevent or dissolve blood clots, 1990-97

Aspirin and other antiplatelet agents

Antiplatelet drugs interfere with the formation of blood clots that are made of platelets. Among these drugs are aspirin, ticlopidine and abciximab. If given during a heart attack, aspirin reduces the risk of death. Used long-term, it also reduces deaths and heart attacks among people with coronary heart disease. Given early during an ischaemic stroke (see page 44), aspirin reduces later similar strokes as well as deaths and disability. Antiplatelet agents used long-term in ischaemic stroke patients also prevent further strokes. The use of antiplatelet drugs, particularly aspirin, has risen in the past few years (aspirin 1.3 DDD/1,000/day in 1997, excluding that obtained over the counter, that is, without prescription).

Anticoagulants

These drugs prevent the formation of clots that could block blood vessels by interfering with the clotting process. Anticoagulants are given to certain patients with stroke, peripheral vascular disease or heart disease to lower their risk of subsequent disease. Warfarin and heparin are in this class of drugs. Their use has increased markedly in the 1990s (warfarin 3.3 DDD/1,000/day in 1997).

OTHER DRUGS

Nitrates

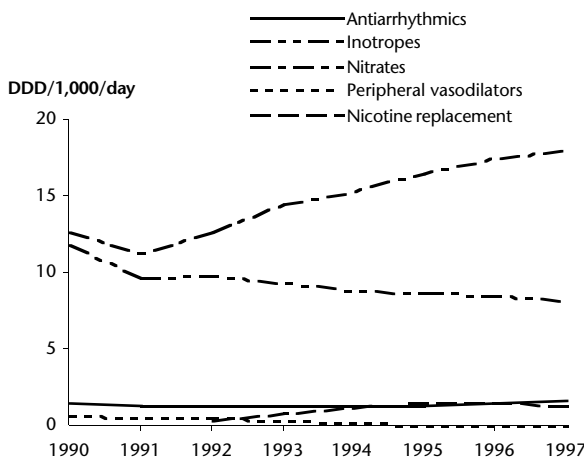
Nitrates relieve and prevent angina symptoms by dilating blood vessels. They are among the most commonly prescribed cardiovascular drugs. Their use has risen over the past 6 years (all nitrates 17.9 DDD/1,000/day in 1997).

Inotropes

Inotropes increase the force of contraction of the heart muscle. These drugs are useful in people with heart failure. There has been a slow decline in the prescription of these drugs since 1990 (all inotropes 8.1 DDD/1,000/day in 1997).

Antiarrhythmics

Antiarrhythmic drugs are given to restore the normal heart rhythm or prevent serious (life-threatening) abnormal heart rhythms (arrhythmias). Amiodarone is the most commonly dispensed drug in this class. The level of use of these drugs in the community has remained fairly constant during the 1990s (amiodarone 1.0 DDD/1,000/day in 1997).



Note: DDD = defined daily dose.

Source: DHFS 1998.

Community use of other drugs for cardiovascular disease, 1990-97

Antismoking agents

Nicotine, in the form of skin patches or chewing gum, is used as replacement therapy to help people give up smoking. Stopping tobacco smoking lowers the occurrence of coronary heart disease, stroke and peripheral vascular disease, and reduces progression of disease. The use of nicotine replacement therapy increased since 1992 but has stabilised in the past 3 years.

DRUG COSTS

The costs of cardiovascular drugs amounted to \$1,105 million, that is, 34% of all prescription drug costs in 1997. Government and patient costs are available only for drugs listed in the Pharmaceutical Benefits Scheme, so these figures underestimate the total cost of cardiovascular drugs.

The following table shows the cost of prescription drugs used in the community in Australia during 1997.

Heart, stroke and vascular diseases

Prescription drugs used in the community in Australia, 1997

Drug	No. scripts (000) ^(a)	\$ (millions) ^(b)
Blood pressure lowering drugs		
ACE inhibitors	9,961.5	330.0
Calcium channel blockers	8,553.2	221.3
Beta blockers	5,111.2	55.2
Diuretics	3,482.2	39.7
Other	1,145.7	19.9
<i>Total blood pressure lowering drugs</i>	<i>28,253.8</i>	<i>666.2</i>
Lipid lowering drugs		
Statins	5,421.6	274.1
Fibrates	627.4	28.6
Resin binders	66.2	3.5
Other	32.9	0.7
<i>Total lipid lowering drugs</i>	<i>6,148.1</i>	<i>306.9</i>
Other drugs		
Nitrates	2,752.4	63.4
Nicotine (antismoking agent)	575.9	21.7
Antiarrhythmics	416.0	18.5
Inotropes	788.2	6.4
Peripheral vasodilators	9.0	0.1
<i>Total other drugs</i>	<i>4,541.4</i>	<i>110.1</i>
Antithrombotic drugs		
Anticoagulants	1,488.7	14.7
Antiplatelets	167.2	7.0 ^(c)
<i>Total antithrombotic drugs</i>	<i>1,655.8</i>	<i>21.8</i>
Total cardiovascular drugs	40,599.1	1,104.9

(a) Includes drugs subsidised under the Pharmaceutical Benefits and Repatriation Pharmaceutical Benefits Schemes and non-subsidised drugs.

(b) Includes government and patient costs for drugs listed in the Pharmaceutical Benefits Scheme only.

(c) This figure is likely to grossly underestimate the actual cost as over-the-counter aspirin is not included.

Source: DHFS 1998.

FURTHER INFORMATION

Susana Senes-Ferrari

E-mail: susana.senes-ferrari@aihw.gov.au

Phone: 02 6244 1052

Main data sources

Pharmaceutical Benefits Scheme and Repatriation Pharmaceutical Benefits Scheme (Health Insurance Commission).

Pharmacy Guild Survey.

References/further reading

1998 MIMS Annual. Twenty-second edition. MIMS Australia, June 1998.

Australian medicines handbook 1998. First edition. Adelaide: Australian Medicines Handbook Pty Ltd.

Commonwealth Department of Health and Family Services (DHFS) 1998. Australian statistics on medicines 1997. Canberra: AGPS.

Waters A-M, Armstrong T & Senes-Ferrari S 1998. Medical care of cardiovascular disease in Australia. Cardiovascular Disease Series No. 7. AIHW Cat. No. CVD 4. Canberra: AIHW.

CARDIOVASCULAR PROCEDURES

Cardiovascular disease is a major cause of illness and death in Australia. The most common forms of heart disease affecting Australians are coronary heart disease, acquired valve disease, conduction defects, congestive heart failure and congenital heart defects. Stroke and vascular disease also cause significant long-term suffering and disability. Medical services offer a range of procedures to diagnose and treat cardiovascular disease. A brief overview of their use in Australia is presented here.

PROCEDURES FOR HEART DISEASE

Coronary angiography

Coronary angiography gives a picture of the heart's arteries. It is used to diagnose coronary heart disease and is essential before either coronary artery bypass surgery or coronary angioplasty. In 1996–97, there were 68,335 coronary angiograms.

Coronary artery bypass grafts

Coronary artery bypass grafting (CABG) entails using blood vessel grafts to bypass blockages in the coronary arteries and restore adequate blood supply to the heart muscle. Usually the graft material comes from a vein in the patient's leg or a chest artery, or both. CABG is not a cure for coronary artery disease, and there is a risk of recurrent disease.

DID YOU *know?*

- During 1994 there were 19,409 heart surgery procedures performed in 37 units around Australia. The national rate of operations was 1,088 per million population, with a mortality rate of 2.8%.
- By far the most common heart operation was coronary artery bypass grafting (CABG).
- Most people undergoing procedures for heart, stroke and vascular diseases are over 54 years old.
- Hospital care of heart, stroke and vascular diseases cost \$1,657 million in 1993–94. In addition, medical and allied health professional services amounted to \$543 million.

Reoperations are uncommon within the first 5 years but become more frequent later. Although coronary angioplasty (see below) has replaced some CABG procedures, the techniques are complementary and the rate of CABG is still increasing.

There were 14,941 coronary bypass graft operations in 1994, with a mortality rate of 2.5%. Eight per cent of coronary artery bypass graft procedures were reoperations.

The national average rate for coronary artery bypass graft surgery was 837 per million population in 1994. The rate varied markedly across States, ranging from 707 per million population in Tasmania to 1,010 per million population in South Australia.

Coronary angioplasty

As with coronary artery bypass grafting, coronary angioplasty is used to restore adequate blood flow to blocked coronary arteries. It involves inserting a catheter with a balloon into a major artery via the skin. The catheter is threaded through the circulation back towards the heart and into the coronary arteries to the area of the vessel blockage. The balloon is then inflated against the plaque to create a wider passage for blood flow.

Coronary angioplasty avoids the major trauma of coronary artery bypass graft surgery because it does not require the opening of the patient's chest. However, the technique can be used to treat only certain types of coronary artery obstruction.

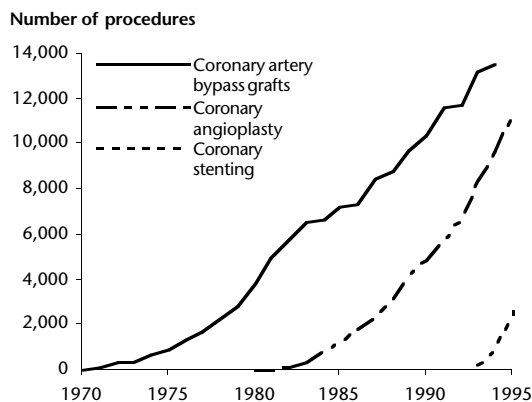
During 1995 there were 11,348 coronary angioplasty procedures performed in 39 units throughout Australia. This was a 17% increase in procedure numbers over the previous year. Twenty-one per cent of the procedures were repeats.

The average national rate in 1995 was 629 per million population. This varies widely across States, from 403 per million population in Queensland to 875 per million population in Western Australia.

Coronary stenting

Although initial coronary angioplasty success rates are high, there is a risk of early acute closure of the coronary artery and a high rate of reblockage. This led to the development of other catheter-based techniques. The most successful of these newer techniques is stenting and hence its use is increasing rapidly. Coronary stenting involves expanding metal mesh tubes within the artery to form a supporting structure which holds the artery open.

Stents were inserted in 30% of coronary angioplasty patients in 1995. This represents a 175% increase over their use in the previous year.



Sources: National Cardiac Surgery and Coronary Angioplasty Registers.

Trends in coronary revascularisation procedures, 1970–95

Heart transplants

There were 94 heart transplants and 4 combined heart-lung transplants done in 1997. The main reasons for heart transplant are coronary heart disease and cardiomyopathy.

Operations for congenital defects

Congenital conditions include abnormalities of the heart or heart valves, defects of the great vessels, such as the aorta and pulmonary artery, or combinations of defects. Most children with congenital defects are treated with surgery, usually in infancy or early childhood.

There were 1,520 operations for congenital heart defects in 1994. Septal defects (defects in the wall which separates the left and right chambers of the heart) were the main reasons for congenital heart surgery.

Surgery for heart valve defects

Valve surgery involves repairing or replacing the mitral, aortic, tricuspid or pulmonary valves. Valve disease may be age-related, a result of disease such as rheumatic fever, or congenital. Most valve procedures in Australia consist of replacing the damaged valve with a mechanical device, a pig device or a human graft. Reconstruction of the damaged valve by stitching techniques is less common. Simpler valve procedures can be undertaken with catheter-based techniques.

Heart valve defects accounted for 3,686 procedures in 1994. Surgery was most frequent for the aortic and mitral valves. Fifty-nine procedures were reoperations for mechanical valve failures and 130 procedures were reoperations for tissue valve failures.

Electrophysiological treatments

Electrophysiology surgery involves carefully removing or destroying sections of heart muscle tissue responsible for abnormal heart rhythms (arrhythmias) which can be serious or even life-threatening. There were 75 such operations in 1994.

Implantable cardiac defibrillators

Implantable cardiac defibrillators are effective in preventing sudden cardiac death in people at high risk of the life-threatening arrhythmia known as fibrillation. In 1996–97, there were 340 such devices implanted in Australia.

PROCEDURES FOR STROKE

CT brain scan

Computerised tomographic (CT) scan of the brain is used in acute stroke to distinguish between the major stroke types (blocked blood supply to the brain; bleeding within the brain or on its surface). This guides treatment. The test is also done to confirm a clinical diagnosis of stroke which may be difficult to make. During 1996–97 a total of 11,878 CT brain scans were performed for a stroke diagnosis.

Carotid endarterectomy

Carotid endarterectomy entails surgically removing plaque from the carotid arteries in the neck which supply blood to the brain. This reduces the risk of blockages in these arteries, which could lead to a stroke. Only about 10% of stroke patients are suitable candidates for this procedure. In 1996–97 there were 4,478 carotid endarterectomies in Australia.

Magnetic resonance imaging scan and ultrasound of carotid arteries

Magnetic resonance imaging (MRI) of the brain and ultrasound of the carotid arteries are non-invasive investigations done to help diagnose stroke or assess the risk of stroke. There are no national figures on the number of these procedures performed for stroke.

PROCEDURES FOR PERIPHERAL VASCULAR DISEASE

Amputation for peripheral vascular disease

In severe cases of peripheral vascular disease the reduced blood supply to the lower limbs results in an amputation. There were 635 amputations for peripheral vascular disease in 1996–97. People aged 65 and over accounted for 80% of them.

Surgery for abdominal aortic aneurysm

Abdominal aortic aneurysm is an abnormal widening of the aorta (the main artery leading from the heart) below the level of the renal arteries. They are life-threatening if they rupture so surgery is performed in severe cases. In 1996–97 there were 2,210 such operations in Australia. People aged 65 years and over, accounted for 80% of these procedures.

FURTHER INFORMATION

Susana Senes-Ferrari

E-mail: susana.senes-ferrari@aihw.gov.au

Phone: 02 6244 1052

Main data sources

National Hospital Morbidity Database (Australian Institute of Health and Welfare).

National Cardiac Surgery Register (Australian Institute of Health and Welfare and Heart Foundation of Australia).

National Coronary Angioplasty Register (Australian Institute of Health and Welfare and Heart Foundation of Australia).

References/further reading

Australian Institute of Health and Welfare (AIHW) 1998. Australian hospital statistics 1996–97. Health Services Series No. 11. AIHW Cat. No. HSE 5. Canberra: AIHW.

Senes-Ferrari S 1999. Coronary angioplasty in Australia 1995. Cardiovascular Disease Series No. 8. AIHW Cat. No. CVD 5. Canberra: AIHW.

Senes-Ferrari S 1999. Cardiac surgery in Australia 1994. Cardiovascular Disease Series No. 9. AIHW Cat. No. CVD 6. Canberra: AIHW.

Waters A-M, Armstrong T & Senes-Ferrari S 1998. Medical care of cardiovascular disease in Australia. Cardiovascular Disease Series No. 7. AIHW Cat. No. CVD 4. Canberra: AIHW.

Heart, stroke and vascular diseases

INTERNATIONAL COMPARISONS

Cardiovascular disease is not just a health problem experienced in Australia. It is a major health and economic burden throughout the world, especially in developed countries. The following comparisons are presented using the latest available data for selected countries, ranging from 1989–95.

CARDIOVASCULAR DISEASE

Cardiovascular disease includes coronary heart disease, stroke and other forms of heart and vascular disease. The Russian Federation shows the highest death rates from cardiovascular disease of the 17 countries compared. Their death rate is over three times that of Australia for both males and females. Males in Hong Kong have the lowest death rate for cardiovascular disease, the Russian Federation rate being about six times greater. For females, the lowest death rates are found in France, Hong Kong and Japan. All of these countries have rates less than a quarter of those in the Russian Federation.

Australia and cardiovascular disease

Australian death rates are ranked towards the middle of the 17 countries compared (ranked equal 7th lowest with Italy). The Australian death rate for males is 1.7 times that for Hong Kong males. For Australian females the death rate is 1.5 times that of French females.

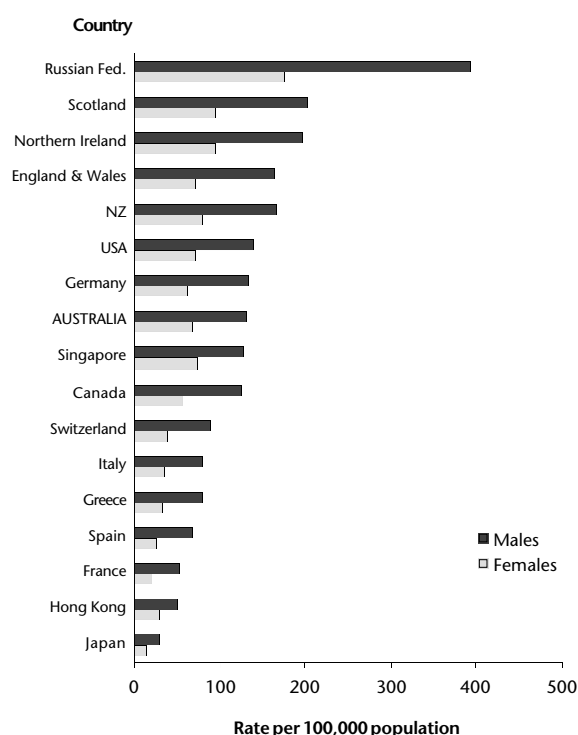
Trends

During the period 1950–92, death rates for cardiovascular disease have declined in all countries compared here. Rates in Australia have halved in this time. Canada (for males and females) along with Switzerland and France (for females) are the only countries to exceed Australia’s death rate decline.

CORONARY HEART DISEASE

Coronary heart disease is the major cardiovascular cause of death in Australia. It is caused by blockages in the coronary arteries that supply blood to the heart muscle. Australian death rates from coronary heart disease rank towards the middle of those countries compared (ranked 10th lowest for males and females). Coronary heart disease death rates tend to be lower in Asian and Mediterranean countries. There has been significant miscoding of coronary heart disease deaths in numerous countries, including Spain, Italy, Japan and France.

However, even after recoding, these countries are still found to have low death rates. The highest death rates are recorded in the Russian Federation. Their death rates are twice those of the next highest country, Scotland.



Note: Latest available data ranging from 1992–94.

Source: AIHW 1998a.

Death rates from coronary heart disease for selected countries, 1992–94

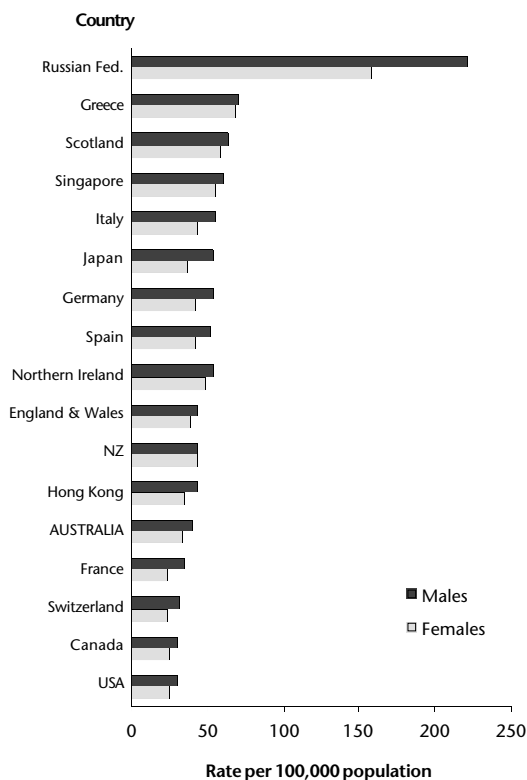
Trends

In recent decades, death rates for coronary heart disease have declined in most of the countries compared. In particular, the United States, Switzerland, Canada, Japan, Italy (for females) and Spain (for females) have all seen their death rates halved. Australian death rates have also halved in this time. Exceptions to this trend include Norway and France. Although their death rates are presently lower than they were during 1960–84, they are still higher than their early 1950s rates.

STROKE

Stroke death rates in Australia are among the lowest of those countries compared here (ranked fifth lowest for males and females).

The Australian stroke death rates for males were still one-third higher than those recorded in the United States. Females in France and Switzerland have the lowest death rates for stroke, and Australian females have 1.4 times their rate. Unlike for coronary heart disease, Greece and Japan have one of the highest death rates for stroke.



Note: Latest available data ranging from 1992–94.

Sources: AIHW 1998a.

Death rates from stroke for selected countries, 1992–94

Trends

Between 1970 and 1992, declines in stroke death rates have been rapid for all countries compared. Almost all countries have seen declines in stroke death rates of greater than 30%, except for Greece where the rate of decline was less than 10%. Australian stroke death rates have declined more than 60% during 1970–92.

RISK FACTORS

Variation in cardiovascular disease death rates for different countries may be attributed to different diets and lifestyles. From available data, Australia appears to have similar risk factor patterns to other Western countries including the United States, Canada, Britain and New Zealand.

Smoking

The proportion of adults who regularly smoke in Australia (24% in 1995) appears to be quite low compared with many other countries. Greece, Japan and Spain had the highest proportion of adult smokers (34%–37%). Smoking rates among adults in the United States was 26% in 1992.

High blood pressure

Australian adults appear to be ranked around the middle of the countries compared here for the number of people with high blood pressure (17% in 1995).

High blood cholesterol

The proportion of Australian adults with high blood cholesterol (43% in 1989) compares similarly with the rates seen in the United States and Canada.

Overweight

The proportion of Australian adults who are overweight (56% in 1995) appears to be greater than many other countries. This rate is similar to that seen in the United States.

FURTHER INFORMATION

Trent Harlow

E-mail: trent.harlow@aihw.gov.au

Phone: 02 6244 1018

References/further reading

Australian Institute of Health and Welfare (AIHW) 1998a. Australia's health 1998: the sixth biennial health report of the Australian Institute of Health and Welfare. AIHW Cat. No. AUS 10. Canberra: AIHW.

Australian Institute of Health and Welfare (AIHW) 1998b. International health—how Australia compares. AIHW Cat. No. PHE 8. Canberra: AIHW.

Fiegel KM, Carroll MD, Kuczmarski RJ, Johnson CL 1998. Overweight and obesity in the United States: prevalence and trends, 1960–1994. *International Journal of Obesity* 22:39–47.

Waters A-M & Bennett S 1995. Risk factors for cardiovascular disease: a summary of Australian data. *Cardiovascular Disease Series No. 1*. Canberra: AIHW.

World Health Organization MONICA Project 1998. Geographical variation in the major risk factors of coronary heart disease in men and women aged 35–64 years. *World Health Statistics Quarterly* 41: 115–38.

METHODS AND DATA SOURCES

RATES

Age-standardised rates have been used to remove the influence of age when comparing populations with different age structures. The 1991 Australian population has been used as the standard population in all Australian comparisons. The world standard population has been used for international comparisons.

Age and sex-specific rates have been used to compare age and sex groups.

Crude rates have been used when age-standardisation is not appropriate or not possible.

CLASSIFICATIONS

Cause of death and hospital diagnosis

The classification of cause of death is based upon the International Classification of Diseases, Ninth Revision (ICD-9). The following classification has been used in this report.

Disease	ICD-9 code
Rheumatic fever and rheumatic heart disease	390–398
Coronary heart disease	410–414
Heart failure	428
Stroke	430–438
Peripheral vascular disease	441–444
Cardiovascular disease	390–459

Hospital diagnosis has been classified using the ICD-9 CM (clinical modification), based on the same codes.

Urban, rural and remote areas

Urban, rural and remote areas are identified in this report using the Rural, Remote and Metropolitan Areas (RRMA) classification, developed in 1994 by the Department of Primary Industries and Energy and the then Department of Human Services and Health.

The RRMA classification assigns each Statistical Local Area in Australia into one of seven categories—2 metropolitan, 3 rural and 2 remote zones. These can be regrouped into three larger zones: urban (metropolitan), rural and remote. The classification is based primarily on population numbers and an index of remoteness.

This report examines data for the three larger areas (urban, rural and remote), as cell sizes are too small for accurate estimation in a more detailed classification.

Socioeconomic groups

The Australian Bureau of Statistics has constructed a number of socioeconomic indexes designed to classify areas on the basis of social and economic information collected in the Census of Population and Housing. The indexes are compiled at small geographical areas such as collection districts and then aggregated to larger geographic areas such as postcodes or statistical local areas (SLAs).

In this report the index of relative socioeconomic disadvantage has been used, which is based on income, educational attainment and employment status. Individual records were classified into quintiles of socioeconomic disadvantage according to the value of this index for the SLA of usual residence.

Indigenous Australians

Indigenous Australians refers to people who identify themselves as being of Aboriginal and/or Torres Strait Islander origin. Data quality issues exist in the identification of Indigenous Australians across population surveys and administrative data collections. In the 1996 Census, the number of people who identified themselves as Indigenous Australians was about a third higher than the number who did so in 1991, a difference much larger than can be explained by natural increase.

Heart, stroke and vascular diseases

Deficiencies in health data for Indigenous Australians occur in both the National Mortality Database and the National Health Survey. Only mortality data for South Australia, Western Australia, the Northern Territory and the Australian Capital Territory are considered to have more than 90% coverage of Indigenous Australian deaths. Data for the Australian Capital Territory has not been included in this report due to the small number of deaths and the short period of time that death data has been collected there. No data is available from the National Health Survey on Indigenous Australians living in remote areas, due to concerns about data quality.

MAIN DATA SOURCES

1983 National Dietary Survey of Adults, was conducted as a component of the second Risk Factor Prevalence Survey, by the Commonwealth Department of Health in collaboration with the National Heart Foundation (now the Heart Foundation of Australia). The survey was designed to obtain national information on dietary intake to determine the food composition and nutrient intake of Australians aged 25–64. The survey collected information from a sample of 5,950 people living in the six capital cities of Australia.

1993 Disability, Ageing and Carers Survey, conducted by the Australian Bureau of Statistics, collects national information on the disability and handicap levels of Australians, their current and future care needs and the role of carers. It can be used with previous national disability surveys to monitor trends over time. The survey collected information from a sample of about 46,800 people, over a 4 month period from February to April 1993.

1995 National Health Survey, conducted by the Australian Bureau of Statistics, was designed to obtain national information on the health status of Australians, their use of health services and facilities, and health-related aspects of their lifestyle. It can be used with previous health surveys to monitor trends in health over time. The survey collected information from a sample of 57,600 people, over a 12-month period from January 1995 to January 1996.

1995 National Nutrition Survey, a joint project between the Australian Bureau of Statistics and the Commonwealth Department of Health and Aged Care, is the largest and most comprehensive Australian survey of food and nutrient intake, dietary habits and body measurements. The survey collected information from a sub-sample of respondents from the 1995 National Health Survey, approximately 13,800 people from urban and rural areas of Australia. The National Nutrition Survey was conducted over a 12-month period from January 1995 to January 1996.

Drug Utilization Sub-Committee Database, held at the Commonwealth Department of Health and Aged Care, monitors the community (i.e. non-public hospital) use of prescription medicines in Australia. This database combines information on prescriptions subsidised by the Pharmaceutical Benefits Scheme and the Repatriation Pharmaceutical Benefits Scheme with an estimate, from the Pharmacy Guild Survey, of those prescriptions that are not subsidised (i.e. private prescriptions and PBS prescriptions priced under the general patient copayment). The Pharmacy Guild Survey collects dispensing information each month from a random sample of about 250 pharmacies throughout Australia. Information on drugs prescribed in public hospitals and on highly specialised drugs available for outpatients through public hospital pharmacies under section 100 of the National Health Act are not included in this database.

National Cardiac Surgery Register, held at the Australian Institute of Health and Welfare, contains information on the number of a range of heart surgery procedures and associated deaths. The data are supplied annually to the Australian Institute of Health and Welfare by cardiac surgery units around Australia.

National Coronary Angioplasty Register, held at the Australian Institute of Health and Welfare, contains information on coronary angioplasty procedures, indications, associated complications, lesion location, success rates and adjunctive techniques such as stenting. The data are supplied annually to the Australian Institute of Health and Welfare by cardiac catheterisation units around Australia.

National Hospital Morbidity Database, held at the Australian Institute of Health and Welfare, contains demographic, diagnostic, procedural and duration of stay information on episodes of care for patients admitted to hospital. The data items are supplied to the Australian Institute of Health and Welfare by the State and Territory health authorities. The database provides information on the number of hospitalisations for a particular condition or procedure. It is not possible to count patients individually.

National Mortality Database, held at the Australian Institute of Health and Welfare, contains information on the cause of death supplied by the medical practitioner certifying the death or by a coroner. Registration of deaths is the responsibility of the State and Territory Registrars of Births, Deaths and Marriages. Registrars provide the information to the Australian Bureau of Statistics for coding of cause of death and compilation into aggregate statistics. As of 1 January 1997 the Australian Bureau of Statistics has introduced new automatic coding software, which identifies multiple causes of deaths within Australia. In this report, death data relates only to the principal cause of death.

Risk Factor Prevalence Study, a series of surveys conducted by the Heart Foundation of Australia (formerly National Heart Foundation) in 1980, 1983 and 1989, was designed to obtain national information on biomedical and behavioural risk factors in Australia and to monitor trends over time. While the data are somewhat dated, it remains an important source of national data for biomedical risk factors. The study collected information from a sample of around 22,000 adults living in capital cities of Australia (Canberra and Darwin were not included in the 1980 and 1983 Study), between May/June and December of the survey year.

Heart, stroke and vascular diseases

STATISTICAL **TABLES**

Table 1: Death rates for cardiovascular diseases and all causes of death by age, 1997

Disease	Sex	Age group										All ages ^(a)
		< 25	25-34	35-44	45-54	55-59	60-64	65-69	70-74	75-84	85+	
Rate per 100,000 population												
Coronary heart disease	Male	0.1*	3.0	19.6	69.8	160.1	303.6	521.5	877.7	1,836.4	4,538.4	183.1
	Female	0.0	1.1*	3.6	14.3	45.0	100.0	187.1	410.0	1,133.0	3,867.6	101.4
Heart failure	Male	**	**	**	1.1*	2.8*	6.7	15.5	28.8	141.4	675.1	13.1
	Female	0.0	0.0	**	0.4*	1.7*	5.8	8.0	19.8	107.2	716.9	11.3
Peripheral vascular disease	Male	**	**	0.6*	2.0	6.9	17.8	38.9	78.6	171.6	400.1	15.0
	Female	0.0	**	0.3*	0.8*	2.4*	8.0	17.1	27.4	82.4	245.5	7.1
Rheumatic fever and rheumatic heart disease	Male	**	0.4*	0.4*	0.7*	2.1*	2.5*	3.9*	4.6*	14.1	26.6	1.5
	Female	**	0.3*	0.5*	1.0*	3.1*	3.6*	5.1	8.8	19.8	26.2	1.9
Stroke	Male	0.4*	1.9	4.1	14.1	26.1	56.3	114.4	230.2	664.0	2,000.4	59.0
	Female	0.3*	1.9	3.5	9.4	19.5	29.5	74.8	162.6	592.6	2,343.2	53.0
<i>All cardiovascular disease</i>	<i>Male</i>	<i>2.0</i>	<i>9.6</i>	<i>29.7</i>	<i>102.7</i>	<i>231.7</i>	<i>439.0</i>	<i>765.2</i>	<i>1,351.2</i>	<i>3,130.8</i>	<i>8,665.7</i>	<i>305.5</i>
	<i>Female</i>	<i>1.0</i>	<i>5.3</i>	<i>11.0</i>	<i>31.4</i>	<i>86.5</i>	<i>168.1</i>	<i>336.3</i>	<i>715.8</i>	<i>2,196.0</i>	<i>8,205.9</i>	<i>200.2</i>
All causes of death	Male	77.5	131.3	168.3	342.5	703.3	1,271.2	2,103.2	3,492.8	7,058.3	17,398.6	790.1
	Female	43.2	52.2	90.6	215.0	431.9	684.6	1,134.4	1,917.1	4,480.9	14,463.0	494.5

* Rates should be interpreted with caution as the relative standard errors are between 25% and 50%.

** Rates are not presented as relative standard errors are greater than 50%.

(a) Age-standardised to the 1991 Australian population.

Source: AIHW National Mortality Database.

Table 2: Hospital rates for cardiovascular diseases by age, 1996–97

Disease	Sex	Age group									All ages ^(a)
		< 4	5–14	15–24	25–34	35–44	45–54	55–64	65–74	75+	
Rate per 100,000 population											
Coronary heart disease	Male	0.6*	**	2.4	44.7	383.5	1,480.9	3,326.6	5,279.8	5,493.8	1,115.3
	Female	**	0.5*	0.8*	12.7	87.3	417.4	1,254.1	2,542.6	3,652.5	503.2
Heart failure	Male	9.6	0.4*	2.9	7.0	20.5	72.9	300.8	996.2	2,957.0	241.1
	Female	8.4	1.0*	1.7	4.2	9.6	33.9	164.9	611.3	2,529.9	167.0
Peripheral vascular disease	Male	1.2*	0.3*	2.9	7.8	10.2	39.8	192.8	581.3	932.0	105.1
	Female	**	0.9*	1.9	3.6	9.1	21.1	63.6	210.0	391.1	41.4
Rheumatic fever and rheumatic heart disease	Male	0.9*	4.7	4.7	2.5	4.8	5.8	16.1	26.0	32.4	7.9
	Female	1.0*	4.3	4.0	5.4	7.7	12.7	30.4	41.3	33.8	11.8
Stroke	Male	7.4	3.2	9.0	20.5	51.0	165.4	505.7	1,437.1	3,111.6	312.4
	Female	4.9	3.8	9.2	20.0	47.2	117.4	305.9	876.7	2,434.2	214.2
All cardiovascular disease	Male	84.6	47.1	161.0	438.1	1,090.4	2,849.7	6,222.8	11,460.7	16,857.1	2,651.9
	Female	59.7	36.2	137.5	426.4	826.7	1,624.5	3,368.0	6,727.6	12,598.2	1,692.9

* Rates should be interpreted with caution as the relative standard errors are between 25% and 50%.

** Rates are not presented as relative standard errors are greater than 50%.

(a) Age-standardised to the 1991 Australian population.

Source: AIHW National Hospital Morbidity database.

Table 3: Cardiovascular disease risk factors by age, 1995

Risk factor	Sex	Age group							
		18–24	25–34	35–44	45–54	55–64	65–74	75+ ^(a)	
		Per cent							
Diabetes type 2	Male	0.0 ^(b)	0.1*	0.8	2.7	5.3*	8.7	8.7*	1.9 ^(c)
	Female	0.2 ^{(b)*}	0.4*	0.6	2.2	4.1	6.6*	6.8	1.5 ^(c)
High blood cholesterol ^(d)	Male	18.1 ^(e)	32.4	52.7	66.7	60.5	61.7 ^(f)	—	46.6 ^(g)
	Female	17.2 ^(e)	32.2	30.9	52.3	66.7	97.0 ^(f)	—	38.6 ^(g)
High blood pressure ^(h)	Male	2.5*	3.7	9.6	20.2	34.3*	45.3*	49.0*	17.3
	Female	0.6	0.9*	4.3	15.1*	32.2*	46.8	60.8*	15.0
Overweight	Male	35.6	58.1	66.0	75.6	75.6	70.5	60.1	63.1
	Female	25.9	33.9	44.4	56.4	66.5	62.1	53.1	47.8
Physical inactivity	Male	24.1	30.7	35.9	38.6	38.4	35.7	45.5	33.5
	Female	27.4	30.0	34.2	34.7	36.9	43.6	54.1	33.8
Smoking	Male	29.7	34.4	29.7	25.6	21.6*	16.4	10.0	27.1
	Female	26.8	**	21.3	18.2	16.0	10.6	6.1	20.3

* Rates should be interpreted with caution as the relative standard errors are between 25% and 50%.

** Rates are not presented as relative standard errors are greater than 50%.

(a) Age-standardised to the 1991 Australian population.

(b) Data available only for 15–24-year-olds.

(c) Also includes data from people less than 18 years.

(d) Most recent data are from 1989. High blood cholesterol is defined as ≥ 5.5 mmol/L.

(e) Data available only for 20–24-year-olds.

(f) Data available only for 65–69-year-olds.

(g) Data available only for 20–69-year-olds.

(h) High blood pressure includes all persons with high blood pressure and those receiving treatment for high blood pressure.

Sources: AIHW analysis of the 1995 National Health Survey (Australian Bureau of Statistics); Risk Factor Prevalence Study Management Committee 1990. Risk Factor Prevalence Study. Survey No. 3 1989. Canberra: National Heart Foundation of Australia and Australian Institute of Health.

Table 4: Death rates for cardiovascular diseases by States and Territories, 1995–97

Disease	Sex	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
		Rate per 100,000 population							
Coronary heart disease	Male	197.5	185.9	201.0	183.8	192.9	209.1	175.4	167.8
	Female	110.1	100.1	112.0	95.3	101.6	108.1	84.9	99.8
Heart failure	Male	14.8	15.1	9.7	10.3	14.2	17.9	20.9*	22.0*
	Female	13.1	13.5	9.2	9.8	10.6	17.5	15.8	20.3*
Peripheral vascular disease	Male	16.0	13.6	14.4	14.4	15.8	20.0	14.3*	19.3*
	Female	7.8	6.0	7.2	6.9	6.0	9.3	7.3	4.3
Rheumatic fever and rheumatic heart disease	Male	1.4	1.5	1.5	1.4*	1.5*	**	**	8.5*
	Female	1.9	2.2	1.9	2.4	1.7	2.7*	**	8.8*
Stroke	Male	67.6	59.4	61.6	60.7	65.6	69.5	64.4	86.7
	Female	60.2	52.0	57.7	53.2	56.8	61.4	56.6	70.8
All cardiovascular disease	Male	334.1	310.5	316.1	300.2	325.2	360.0	305.6	358.8
	Female	219.6	200.5	211.7	188.1	204.4	233.6	191.8	245.5
All causes of death	Male	820.4	803.2	796.1	792.4	797.0	883.8	720.6	1,119.2
	Female	505.0	497.2	494.3	481.8	486.9	558.8	477.4	775.6

* Rates should be interpreted with caution as the relative standard errors are between 25% and 50%.

** Rates are not presented as relative standard errors are greater than 50%.

Note: Age-standardised to the 1991 Australian population.

Source: AIHW National Mortality Database.

Table 5: Annual rates of change in cardiovascular disease death rates by States and Territories, 1986–97

Disease	Sex	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Per cent										
Coronary heart disease	Male	-4.3	-3.9	-3.7	-4.2	-4.2	-3.8	-2.6	-1.4	-4.0
	Female	-4.0	-3.6	-3.3	-4.0	-4.0	-4.1	-3.4	-3.5	-3.8
Heart failure	Male	-4.0	-3.3	-6.4	-3.8	-1.7	-2.7	6.0	—	-3.8
	Female	-3.8	-3.4	-5.2	-3.1	-2.7	-2.1	-4.3	—	-3.7
Peripheral vascular disease	Male	-2.1	-3.4	-2.8	-3.0	-1.0	-0.9	—	—	-2.5
	Female	-0.8	-0.8	-0.5*	-0.9	-2.3	0.7*	—	—	-0.9
Rheumatic fever and rheumatic heart disease	Male	-5.3	-4.4	-1.2*	—	-2.5	—	—	—	-3.9
	Female	-4.7	-4.1	-2.7	—	-3.9	—	—	—	-4.1
Stroke	Male	-3.9	-3.0	-3.1	-2.6	-2.7	-1.7	-3.0	4.0	-3.2
	Female	-3.9	-3.8	-3.1	-2.4	-2.6	-3.7	-1.6	6.0	-3.5
All cardiovascular disease	Male	-3.9	-3.5	-3.6	-3.7	-3.6	-2.9	-2.7	-0.1	-3.7
	Female	-3.7	-3.6	-3.1	-3.4	-3.3	-3.6	-3.0	-1.1	-3.5
All causes of death	Male	-2.3	-2.1	-2.1	-1.9	-1.9	-1.5	-2.3	-1.5	-2.1
	Female	-2.0	-1.8	-1.6	-1.3	-1.4	-1.7	-2.1	-0.6	-1.8

* Annual rates of change are statistically significant at 5% level. All other rates of change are significant at the 1% level.

Note: In some States and Territories the number of deaths is very small and for these no rates of change have been presented.

Source: AIHW National Mortality Database.

Table 6: Cardiovascular disease risk factors by States and Territories, 1995^(a)

Risk factor	Sex	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Per cent	
Diabetes type 2 ^(b)	Male	1.7	2.1	1.6	1.7	2.0	2.6	1.5	0.8		
	Female	1.4	1.5	1.2	1.9	2.0	1.4	1.7	3.1		
High blood pressure ^(c)	Male	17.0	16.7	19.1	15.4	18.0	18.1	16.1*	15.4		
	Female	14.5	14.9	14.7	15.7	16.9	18.4	14.6*	**		
Overweight	Male	62.6	64.7	61.6	60.8	64.6	66.6	62.5*	52.0		
	Female	46.9	49.7	44.4	47.2	49.7	54.2	51.5	46.5*		
Physical inactivity	Male	34.3	34.2	33.7	29.5	34.0	33.6	22.8	42.7		
	Female	36.7	31.9	34.2	28.0	34.1	35.5	27.4	35.1		
Smoking	Male	27.0	26.5	28.8	26.5*	26.5	26.9	23.6	33.6		
	Female	20.4	20.5	22.1	19.3	20.6	25.1	19.9	29.0*		

* Rates should be interpreted with caution as the relative standard errors are between 25% and 50%.

** Rates are not presented as relative standard errors are greater than 50%.

(a) Includes persons aged 18 years and over.

(b) Also includes data from people aged less than 18 years.

(c) High blood pressure includes all persons with high blood pressure and those receiving treatment for high blood pressure.

Note: Age-standardised to the 1991 Australian population.

Sources: AIHW analysis of the 1995 National Health Survey (Australian Bureau of Statistics); AIHW analysis of the 1995 National Nutrition Survey (Australian Bureau of Statistics and Commonwealth Department of Health and Aged Care).

Table 7: Death rates for cardiovascular diseases by urban, rural, remote areas^(a), 1995–97

Disease	Sex	Rate per 100,000 population		
		Urban	Rural	Remote
Coronary heart disease	Male	188.0	205.0	205.0
	Female	103.8	109.1	110.2
Heart failure	Male	12.7	15.6	17.5
	Female	11.5	13.9	13.6
Peripheral vascular disease	Male	14.6	16.2	12.7
	Female	6.8	7.5	6.6*
Rheumatic fever and rheumatic heart disease	Male	1.4	1.5	4.2*
	Female	2.0	1.9	7.0*
Stroke	Male	63.2	64.8	59.9
	Female	56.7	56.7	55.6
<i>All cardiovascular disease</i>	Male	313.4	338.3	335.4
	Female	206.2	216.2	224.4
All causes of death	Male	790.9	842.1	928.2
	Female	492.5	511.0	605.2

* Rates should be interpreted with caution as the relative standard errors are between 25% and 50%.

(a) Refers to 1994 Rural, Remote and Metropolitan (RRMA) classification.

Note: Age-standardised to the 1991 Australian population.

Source: AIHW National Mortality Database.

Table 8: Annual rates of change in cardiovascular disease death rates by urban, rural, remote areas^(a), 1986–97

Disease	Sex	Urban	Rural	Remote
		Per cent		
Coronary heart disease	Male	-4.3	-3.6	-3.3
	Female	-3.9	-3.4	-3.7
Heart failure	Male	-3.9	-3.7	-4.7
	Female	-3.6	-4.1	-5.8
Peripheral vascular disease	Male	-2.7	-1.9	-3.5
	Female	-1.0	-0.5*	-2.2
Rheumatic fever and rheumatic heart disease	Male	-4.5	-3.6	1.9
	Female	-4.3	-4.0	1.0
Stroke	Male	-3.4	-2.9	-3.4
	Female	-3.6	-3.4	-3.4
All cardiovascular disease	Male	-3.8	-3.3	-3.3
	Female	-3.6	-3.3	-3.6
All causes of death	Male	-2.2	-1.9	-2.2
	Female	-1.8	-1.7	-1.8

* Annual rates of change are statistically significant at 5% level. All other rates of change are significant at the 1% level.

(a) Refers to 1994 Rural, Remote and Metropolitan (RRMA) classification.

Source: AIHW National Mortality Database.

Table 9: Cardiovascular disease risk factors for urban, rural, remote areas^(a), 1995

Risk factor	Sex	Per cent		
		Urban	Rural	Remote
Diabetes type 2 ^(b)	Male	1.9	2.0	1.5
	Female	1.6	1.4	1.4
High blood pressure ^(c)	Male	16.8	18.8	17.8
	Female	14.8	15.0	16.1
Overweight	Male	62.5	64.6	65.4
	Female	47.1	46.0	53.2
Physical inactivity	Male	32.8	30.9	39.2
	Female	34.2	32.2	33.8
Smoking	Male	26.8	**	27.5*
	Female	20.3*	22.8	21.1

* Rates should be interpreted with caution as the relative standard errors are between 25% and 50%.

** Rates are not presented as relative standard errors are greater than 50%.

(a) Refers to 1994 Rural, Remote and Metropolitan (RRMA) classification. Includes persons aged 18 years and over.

(b) Also includes data from people aged less than 18 years.

(c) High blood pressure includes all persons with high blood pressure and those receiving treatment for high blood pressure.

Note: Age-standardised to the 1991 Australian population.

Sources: AIHW analysis of the 1995 National Health Survey (Australian Bureau of Statistics); AIHW analysis of the 1995 National Nutrition Survey (Australian Bureau of Statistics and Commonwealth Department of Health and Aged Care).

Table 10: Total health system costs of diseases of the circulatory system by health sector and disease type, 1993–94

ICD-9 chapter	Hospital inpatients			Drugs							Total costs ^(d)
	Public hospitals ^(a)	Private hospitals	Non-inpatients	Nursing homes	Medical services ^(b)	Prescription	Over-the-counter	Allied health	Research	Other ^(c)	
\$ million											
<i>Coronary heart disease</i>	412.5	144.0	17.7	72.5	87.9	97.6	7.7	5.5	10.7	38.1	894.4
Heart attack	114.1	10.8	0.5	25.3	3.2	0.8	0.2	0.1	2.0	7.2	164.1
Other	298.5	133.2	17.3	47.3	84.8	96.8	7.5	5.4	8.7	31.0	730.3
<i>Diseases of arteries, arterioles, capillaries</i>	130.8	33.9	15.5	36.5	21.8	5.8	4.8	2.1	6.6	11.3	269.0
Atherosclerosis	30.4	5.8	6.8	8.1	1.7	0.3	1.4	0.1	2.7	2.5	59.6
Aortic aneurysm	36.0	6.3	3.8	2.9	5.0	1.1	0.9	0.2	1.4	2.5	60.2
Other peripheral vascular disease	64.4	21.8	4.9	25.5	15.1	4.4	2.6	1.8	2.5	6.3	149.3
<i>Diseases of pulmonary circulation</i>	18.6	2.9	0.7	5.3	2.6	1.7	0.3	0.2	1.0	1.4	34.6
<i>Diseases of veins, lymphatics, other</i>	87.4	57.7	11.7	32.1	45.9	17.4	5.9	2.2	2.6	11.7	274.7
<i>Phlebitis & thrombophlebitis</i>	3.4	0.9	2.9	1.7	9.6	3.7	2.0	0.7	0.3	1.1	26.2
Varicose veins of leg	30.2	27.4	1.2	3.9	6.8	1.5	0.4	0.6	0.7	3.2	76.0
Hemorrhoids	19.6	20.9	1.8	4.2	17.3	9.6	1.3	0.7	0.8	3.4	79.3
Other	34.2	8.5	5.9	22.3	12.2	2.7	2.3	0.3	0.9	4.0	93.2
<i>High blood pressure^(e)</i>	18.7	4.3	31.8	6.7	216.6	409.6	66.5	20.1	21.8	34.9	831.0

Table 10 (continued): Total health system costs of diseases of the circulatory system by health sector and disease type, 1993–94

ICD-9 chapter	Hospital inpatients				Drugs						Total costs ^(d)
	Public hospitals ^(a)	Private hospitals	Non-inpatients	Nursing homes	Medical services ^(b)	Prescription	Over-the-counter	Allied health	Research	Other ^(c)	
	\$ million										
<i>Rheumatic heart disease</i>	13.9	3.8	1.1	0.5	1.8	0.8	0.7	0.2	0.2	1.0	24.0
<i>Stroke</i>	235.2	34.2	13.7	265.4	31.5	10.3	2.7	4.8	5.9	27.0	630.5
<i>Other forms of heart disease</i>	255.5	55.7	41.5	167.1	92.9	55.4	25.7	4.7	11.0	31.5	740.9
Cardiac dysrhythmias	82.5	13.5	18.3	28.7	35.8	20.0	10.9	0.7	3.7	9.5	223.6
Heart failure	118.4	21.3	17.8	134.8	46.8	32.7	12.2	3.9	5.4	17.5	410.9
Non-rheumatic valvular disease	31.3	16.9	3.6	1.6	6.6	1.6	1.7	—	0.5	2.9	66.8
Cardiomyopathy and other heart diseases	23.3	4.1	1.7	2.0	3.6	1.0	0.9	0.1	1.4	1.6	39.6
<i>Prevention and screening</i>	0.0	0.0	8.5	—	1.4	0.1	0.8	—	0.2	0.5	11.6
<i>Unspecified treatment and aftercare</i>	3.4	1.0	1.1	0.6	1.1	0.7	0.1	—	0.1	0.4	8.6
Total	1,176.0	337.5	143.2	586.9	503.4	599.4	115.3	39.7	60.1	157.9	3,719.4

(a) Public acute, public psychiatric and repatriation hospitals.

(b) Medical services for private patients in hospitals are included under Public and Private hospitals; medical services include services by general practitioners, specialists as well as pathology tests, screening and other diagnostic services.

(c) Includes other institutional, non-institutional and administration expenditure.

(d) Excludes expenditure for public health services, community health services, ambulances, medical aids and appliances.

(e) High blood pressure includes all persons with high blood pressure and those receiving treatment for high blood pressure.

Source: Mathers C & Penm R 1999. Health system costs of cardiovascular disease and diabetes in Australia 1993–94. AIHW Cat. No. HWE 11 Canberra: AIHW.

