The health of the people of New South Wales

Report of the Chief Health Officer 2004

SHPN (PH) 040246

The health of the people of New South Wales

Report of the
Chief Health Officer
2004

NSW HEALTH

The health of the people of New South Wales

Report of the Chief Health Officer, 2004

NSW Department of Health
December 2004

State Health Publication No: PH 040246
ISBN: 0 7347 37815

Suggested citation:
Population Health Division. *The health of the people of New South Wales: Report of the Chief Health Officer, 2004*. Sydney: NSW Department of Health, 2004.

Recent related publications:
Population Health Division. *The health of the people of New South Wales: Report of the Chief Health Officer, 2002*. Sydney: NSW Department of Health, 2002.

Produced by:
Centre for Epidemiology and Research, Population Health Division, NSW Department of Health.

Further copies of this publication are available from:
The Better Health Centre Publications Warehouse
Locked Bag 5003
Gladesville NSW 2111
Tel: 612 9816 0452
Fax: 612 9816 0492
or from the Population Health Division website at:
www.health.nsw.gov.au/public-health/chorep

NSW HEALTH
Working as a Team

Contents

Foreword

This is the fifth edition of the report *The health of the people of New South Wales: Report of the Chief Health Officer*. The report gives a comprehensive picture of health in New South Wales, Australia, which will inform policy and planning for population health programs in our State.

Population health programs aim to promote health, create healthy environments, enable individuals and communities to make healthy choices, and reduce differences in health among population groups. They focus on identifying health risks, and developing ways to eliminate or reduce exposure to these risks. Population health programs provide opportunities not only to improve health but also, through prevention, to reduce the demand for acute services such as emergency department services and inpatient care. Nations across the world are renewing their commitment to population health approaches, in recognition of the likely health system costs of population ageing and chronic disease, and the potential affects of emerging diseases such as SARS.

This fifth edition of the report features a new chapter on refugee health, and new indicators on diverse topics including water quality, housing in Aboriginal communities, drink driving, the health of young people in custody, colonoscopy, congestive heart failure, complications of diabetes, sports injury, and psychological distress in teenagers. This edition also presents analyses of key indicators according to the new NSW area health service boundaries, and the new Access–Remoteness Index of Australia Plus (ARIA+), and provides a range of international comparisons.

I am delighted to see this evolution in the report and applaud the technical innovation, ingenuity, and hard work that have contributed to its production. But I am told that there is still much untapped potential in the health datasets that are collected routinely as part of health care, and through population-based registers and surveys.

One exciting initiative is the NSW Health Evaluation Research and Outcomes Network (HERON), a network of people interested in using population health databases for research that assists policy and planning. In 2003, a HERON subgroup was awarded a National Health and Medical Research Council Population Health Capacity Building Grant. The grant, of $2.5 million over 5 years, has linked investigators from 5 institutions. The investigators have already produced impressive output in the areas of cancer, maternal and perinatal health, and health inequalities, through applying new analytic techniques to routine data.

I am keen to further develop and strengthen links between epidemiological findings, such as those presented in this report, and their application in health policy and planning. To that end, I will be delighted to receive feedback from you about how you used this report, and how future editions can be enhanced.

Dr Gregory Stewart

Deputy Director-General Public Health and Chief Health Officer

December 2004

About this report

This report is the fifth in a series that began in 1996. It provides an overview of the health of the people of New South Wales, presents trends in key health indicators, demonstrates health inequalities, and highlights emerging health priorities and new health data sources. It is intended for a wide variety of users, including public health practitioners, planners, policy analysts, researchers, students, and health consumers.

This edition of the report contains information on over 250 population health indicators. Many of these have been retained and updated from the 2002 Report. A few indicators from the 2002 report have been dropped to allow the addition of new content on emerging priorities, while keeping the size of the printed report manageable. However, most of these indicators are still available in the online (Web) version of the report.

The latest available data are presented wherever possible, including hospitalisation data for 2002–03, deaths data for 2002, NSW Health Survey data for 2003, communicable diseases data for 2003, and emergency department attendance data for 2004. The 2004 report uses a new Australian standard population for calculating age-standardised rates for comparing trends over time (based on the 2001 Census instead of the 1991 census). There are over 30 indicators analysed by the new health area boundaries in New South Wales, which come into effect on 1 January 2005. A new Access–Remoteness Index for Australia Plus (ARIA+) has been used for urban–rural analyses, and new Socio-Economic Indices for Areas (SEIFA) based on the 2001 Census have been used.

Content

This report has 4 sections: Determinants of health, Burden of disease, Health inequalities, and Health priority areas. Each of the 4 sections of the report is divided into several chapters.

Section 1: Determinants of health includes chapters on the NSW population, social determinants of health, the environment, and health-related behaviours. The social determinants of health chapter provides updated data on income, social welfare benefits, crime rates, and socioeconomic scores by the new health area boundaries in NSW. The chapter on the environment updates indicators of air and water quality and includes data sources of drinking water used in urban and rural areas, unflued gas and wood heaters, and healthy living practices in Indigenous communities. The health-related behaviours chapter presents updates on the key health risk factors of smoking, physical activity, obesity and overweight, nutrition, and alcohol consumption, and includes new information about sexual health behaviours and alcohol-related motor vehicle crashes.

Section 2: Burden of disease presents information about the major causes of disease burden currently in NSW, life expectancy, death rates, causes of death, causes of hospitalisation, and international comparisons of life expectancy, infant mortality, cancer deaths, and self-rated health status.

Section 3: Health inequalities examines differentials in health among population groups in NSW. Chapters examine inequalities among Aboriginal and Torres Strait Islander peoples, overseas-born people, prisoner health (including the health of young people in custody), trends in the burden of disease or mortality by socioeconomic groups, and inequalities in rural and remote populations associated with the degree of remoteness from major service centres (using the new ARIA+ index). This section also includes a new chapter on the health of refugees.

Section 4: Health priority areas presents recent information on key health issues including cardiovascular diseases, diabetes mellitus, cancer, respiratory disease, injury and poisoning, mental health, oral health, pregnancy and the newborn period, and communicable diseases. New indicators include heart failure, abnormalities detected through cervical screening, kidney and eye complications associated with diabetes, and emergency department attendances for influenza and pneumonia during winter.

Sources and methods

This report uses data from a wide variety of sources. Most data sets were accessed and analysed via the Health Outcomes Information Statistical Toolkit (HOIST) datamart. Descriptions of the data sets, details of the analytic methods used, and guidance on how to interpret charts, are given in the Methods section.

Web version

The Web (HTML) version of this report includes downloadable versions of the charts and data tables. These are provided to facilitate re-use of the information contained in the report. You are encouraged to use these downloadable files in other documents or presentations, provided that no changes to the data are made and that the source is acknowledged. Please note that commercial use or resale of these downloadable files, or any other information contained in this report, is prohibited. The Web version of the report will also be updated regularly so that it reflects the most recently available data.

Contributors

The preparation of the fifth edition of *The health of the people of New South Wales: Report of the Chief Health Officer* was a team effort. This effort involved many people within the Centre for Epidemiology and Research in the indicator definition, data cleaning, data analysis and presentation, and text writing and editing for the report. It also involved many other people from within the NSW Department of Health, particularly within the Population Health Division, as well as other branches of the Department and external groups. The following list indicates the broad roles played by the many contributors.

FROM THE CENTRE FOR EPIDEMIOLOGY AND RESEARCH

Project management

Helen Moore and Hanna Noworytko.

Editors

Helen Moore, Louisa Jorm and Michael Giffin.

Programming infrastructure

Jill Kaldor, Tim Churches, Mark Cerny, Ray Ferguson and Allison Low.

Data analysis and/or biostatistical advice

Mark Cerny, Jill Kaldor, Kim Lim, Hanna Noworytko, Alan Willmore, Andrew Hayen, Clare Ringland, Behnoosh Khalaj, Diane Hindmarsh, Claire Monger, Katie Irvine, Frank Beard, David Muscatello, Helen Moore, Lee Taylor and Tim Churches.

Data management

Alan Willmore.

Text

Deborah Baker, Frank Beard, Margo Eyeson-Annan, Sue Hailstone, Lara Harvey, Andrew Hayen, Katie Irvine, Louisa Jorm, Jill Kaldor, Behnoosh Khalaj, Kim Lim, Claire Monger, Helen Moore, David Muscatello, Hanna Noworytko, Clare Ringland and Lee Taylor.

Administrative support

Margie Scott-Murphy and Julie Holbrook.

FROM OTHER PARTS OF NSW HEALTH AND OTHER ORGANISATIONS

Text and/or content advice

Pam Albany, Guncha Ansari, Jorge Aroche, Margaret Armstrong, Paul Armstrong, Aarthi Ayyar, Mark Bartlett, Bill Bellew, Alan Betts, Megan Black, Ann Brassil, Leslie Brodlo, Tony Butler, Paul Byleveld, Sue Campbell-Lloyd, Michael Collins, Cathryn Cox, Liz Develin, Carmine Di Campli, Karen Fogarty, Helen Gardiner, Rosalind Hecker, Rod Higgins, Diane Hindmarsh, Amanda Holt, Devon Indig, Ros Johnson, Michael Kakakios, Rachel Khoury, Sandy Leask, Hassan Mamoon, Guy Marks, Nidia Marneros, Darlene Mathen, Richard Matthews, Jeremy McAnulty, Margaret McDonald, Elayne Mitchell, Julie Anne Mitchell, Rebecca Mitchell, Francis Naoum, Robert Ramsay, Beverley Raphael, Geoff Richards, Chris Rissel, Gay Rixon, Renée Roos, Jayne Ross, John Sanders, Kym Scanlon, Margaret Scott, Neil Shaw, Vicky Sheppeard, Shanti Sivaneswaran, Mitchell Smith, Michael Staff, Jeff Standen, Gavin Stewart, Margaret Thomas, Elizabeth Tracey and Marshall Tuck.

Cover design

Michael Moriarty.

Desktop publishing

Margaret Chidgey.

Executive summary

This report presents information for more than 250 health indicators, arranged in thematic chapters covering determinants of health, burden of disease, health inequalities and health priority areas. This summary presents some of the key findings for the population overall, and for people at different stages of their lives.

How healthy are we?

Around 87,000 babies were born in NSW in 2002. Male babies could expect to live 78.1 years (similar to the national average), while female babies could expect to live 83.3 years (slightly longer than the national average). Only males and females born in Japan, males born in Sweden, and females born in France, could expect to live longer.

However, not all NSW residents can expect such a long life. The life expectancy of Aboriginal people is about 20 years less than the general population. An Aboriginal male born now can expect to live as long as a non-Aboriginal male born at the turn of the century, while an Aboriginal female born now can expect to live as long as a non-Aboriginal female born in the 1920s.

Longer lives are the result of reductions in the death rate. The age-adjusted death rate in NSW decreased by almost half (49%) over the 30-year period 1972–2002. The death rate in babies aged less than one year (infant mortality rate) has declined even more quickly, and stood at 4.6 per 1,000 livebirths in 2002 (lower than the national average). However, the infant mortality rate among Aboriginal babies in NSW was almost double the rate for the general population.

Although females born in NSW in 2002 could still expect to live longer than males, this difference decreased from 6.8 years in 1972 to 5.2 years in 2002. In 2002, the overall male death rate was 53% higher than the female death rate, down from a difference of 61% in 1972.

Around 46,000 NSW residents died in 2002. Cardiovascular diseases, including ischaemic heart disease and stroke, were the leading cause of death and were responsible for 40% of all deaths. The next most common causes of death were cancers (27%), chronic respiratory diseases (7%), nervous system diseases (5%), unintentional injuries and poisoning (4%), and digestive system diseases (3%).

Rates of premature death (before age 75 years) declined among all socioeconomic groups in NSW in the 20 years to 2002. By far the steepest decline was in the highest socioeconomic group, resulting in an increase in the relative ‘gap’ between this group and the rest of the population. The relative ‘gap’ between the lowest socioeconomic group and the middle two-thirds of the population appears to be narrowing.

In 2002, 70% of all premature deaths were due to causes that could potentially be reduced or avoided through promotion of healthy lifestyles, prevention or early detection of disease, or improved treatment and management of disease. Ischaemic heart disease and stroke together contributed more than one-third of these ‘avoidable’ deaths, with lung cancer and colorectal cancer the next largest causes. Compared with people who lived in metropolitan areas of NSW, people who lived in remote or very remote areas were more likely to die from causes classified as ‘avoidable’.

Just over 2 million hospitalisations were recorded in NSW in the financial year 2002–03. Between 1989–90 and 2002–03, the age-adjusted rate of hospitalisation increased by more than one-third (34%). In 2002–03, the most common causes of hospitalisation were 'factors influencing health' (including symptoms without a specific cause, admissions of newborn infants, and admissions for rehabilitation, nursing home and respite care), unintentional injuries (including injuries sustained in motor vehicle crashes and falls), digestive system diseases, and conditions relating to pregnancy and childbirth.

Around 8% of hospitalisations in NSW in the financial year 2002–03 were considered to be potentially avoidable through preventive care and early disease management (usually delivered by general practitioners or other primary health carers). People who lived in remote or very remote areas of NSW were more likely than others to be hospitalised for these conditions. The most important causes of these 'avoidable' hospitalisations over the period 2000–01 to 2002–03 were complications of diabetes, angina, chronic obstructive pulmonary disease, asthma, and congestive heart failure.

What are some of the important issues in babies and young children?

In 2002, deaths soon after birth, congenital abnormalities, and injury and poisoning, claimed the most lives of young children aged less than 5 years. About 7% of babies were born prematurely, and 6% were of low birthweight, while around 2% were reported to have a congenital abnormality. Rates of prematurity (12%) and low birthweight (12%) were much higher in Aboriginal babies than in the general population.

In 2002, 16 children aged 0–4 years drowned in NSW, and in the financial year 2002–03 there were 77 hospitalisations following near-drowning among children in this age group. There were a further 2,396 hospitalisations for injuries caused by falls, 498 hospitalisations for burn and scald injuries, and 644 hospitalisations for unintentional poisoning.

In 2001, most children aged 2–4 years consumed the recommended daily minimum quantity of fruits, but much of this was in the form of fruit juice, which is high in sugar. Less than one in 7 children in this age group consumed the recommended daily minimum quantity of vegetables.

At the end of June 2004, 90% of children aged 12 months to less than 15 months, and 91% of children aged 24–27 months, were fully immunised. These high immunisation rates have been accompanied by declines in notifications for vaccine-preventable diseases including rubella, pertussis and measles.

What are some of the important issues for school-aged children and young people?

Unintentional injuries were the leading cause of death in children and young people aged 5–24 years in 2002. Motor vehicle crash injuries killed 128 young people aged 15–24 years, and were responsible for 3,499 hospitalisations of people in this age group in the financial year 2002–03. More than three-quarters of these deaths and hospitalisations were in males. In 2002–03, there were 2,982 hospitalisations for injuries caused by falls in children aged 5–9 years, 1,092 hospitalisations for pedal cycle injuries among children aged 5–14 years, and 2,232 hospitalisations for injuries caused by interpersonal violence among children aged 0–14 years.

In 2001, 16% of children aged 5–14 years, and 15% of young people aged 15–24 years, had asthma. In the financial year 2002–03, there were 4,538 hospitalisations for asthma among NSW residents aged 5–34 years. Hospitalisation rates for asthma in this age group almost halved between 1989–

90 and 2002–03. Exposure to fumes from unflued heating is associated with an increased risk of asthma symptoms. In 2002, over one-third of NSW households used unflued heating, including unflued gas and slow combustion heaters, and open fireplaces.

About one in 6 (18%) NSW secondary school students reported high levels of psychological distress in 2002. A 2003 survey of young people in custody reported much higher levels of psychological distress in this vulnerable group. The death rate from suicide in males aged 15–24 years dropped by more than half between 1997 and 2002. In 2002, 61 males and 15 females aged 15–24 years died through suicide. Females in this age group, however, were more likely to be hospitalised for suicide attempts, with 1,772 hospitalisations of females and 774 hospitalisations of males recorded in the financial year 2002–03.

In 2002, 69% of NSW secondary school students reported drinking alcohol in the last year, and 30% reported drinking in the last 7 days. Under half (42%) of students reported ever smoking tobacco, while 12% of boys and 15% of girls reported smoking in the previous week, and 9% of students reported using cannabis in the previous 4 weeks. Use of tobacco and cannabis was lower than in 1999, while use of alcohol was similar. A 2003 survey of young people in custody reported much higher levels of smoking, alcohol use and illicit drug use in the general population of this age group.

Use of sun protection measures by secondary school students declined between 1999 and 2002, when around half or fewer of students reported that they wore hats or sunscreen when out in the sun. The majority of secondary school students reported doing moderate or vigorous physical activity on one to 4 occasions in the previous week.

Between 1993 and 2002, the teenage pregnancy rate in NSW declined from 39.7 to 25.6 per 1,000 teenagers. The teenage pregnancy rate was consistently higher in rural areas than in urban areas over this period.

What are some of the important issues for adults?

In NSW in 2002, injuries, both intentional and non-intentional, were by far the leading cause of death in young males aged 25–44 years, but cancers were the leading cause of death in females in this age group. Cancers, followed by cardiovascular diseases, were the major causes of death in people of both sexes aged 45–64 years.

In 2002, there were 31,075 new cases of cancer and 12,596 deaths from cancer in NSW. The most common types of cancers causing death among males were lung, prostate, and colorectal, and among females were breast, lung, and colorectal. The most common types of cancers diagnosed in males were prostate, colorectal, melanoma of skin, and lung, and in females were breast, colorectal, melanoma of skin, and lung. The death rate from lung cancer decreased by 35% in males between 1993 and 2002 but increased by 35% in females. Over the same period, death rates from both colorectal cancer and prostate cancer in NSW fell by almost 20%, the death rate from breast cancer fell by more than 20%, and the death rate from cervical cancer almost halved. In 2001 and 2002, just over half (53%) of women aged 50–69 years participated in breast cancer screening. In 2001 and 2002, just over 60% of women aged 20–69 years had a Pap test.

Coronary heart disease caused almost 9,000 deaths in 2002 and more than 54,000 hospitalisations in the financial year 2002–03. About 5,100 coronary

artery bypass graft procedures and 7,700 coronary angioplasty procedures were performed in that year. In 2002, stroke caused almost 5,000 deaths in NSW, and was the principal reason for over 18,000 hospitalisations in 2002–03. Death rates from both coronary heart disease and stroke have more than halved since 1983, as a result of both decreased incidence—associated with reductions in risk factors—and increased survival in those affected. Aboriginal residents of NSW were twice as likely as non-Aboriginal residents to be hospitalised for heart disease and stroke. Residents born in Lebanon, Fiji and India had higher rates of hospitalisation for coronary heart disease than the Australian-born.

In 2002 and 2003, 7% of males and 6% of females in NSW aged 16 years and over reported having diabetes or high blood sugar. This was a significant increase since 1997. In the financial year 2002–03, there were 15,173 hospitalisations with diabetes recorded as the principal diagnosis and 92,122 hospitalisations with diabetes as a comorbidity. Aboriginal residents of NSW were 4–5 times more likely than non-Aboriginal residents to be hospitalised for diabetes. NSW residents born in some overseas countries, particularly Lebanon, Fiji, Italy, India, and Greece, had higher rates of hospitalisation for diabetes than the Australian-born.

Among NSW residents aged 16 years and over in 2003, 13% of females and 9% of males reported high or very high levels of psychological distress. Almost 8% of adults reported that they were unable to manage daily activities on one or more days in the previous 4 weeks as a result of psychological distress. High levels of psychological distress were more common in prisoners and in refugees, compared with the general population of NSW.

Among NSW residents aged 16 years and over in 2003, 25% of males and 19% of females were current smokers, representing a decline of around 8% among males and 6% among females since 1989–90. However, smoking caused more than 6,500 deaths in NSW in 2002 and more than 55,000 hospitalisations in the financial year 2002–03—more than any other health behaviour. Smoking rates were higher in Aboriginal people than in non-Aboriginal people.

Among NSW residents aged 16 years and over in 2003, 41% of males and 30% of females reported risky drinking behaviours. Males were more likely than females to report these across all age groups. Alcohol use caused more than 1,500 deaths in NSW in 2002 and almost 38,000 hospitalisations in the financial year 2002–03.

Opiate (mainly heroin) overdose killed 160 NSW residents in 2002. The death rate from heroin overdose declined steeply between 1999 and 2002. In 2001, prisoners in NSW reported higher levels of illicit drug use than the general population, as well as higher levels of many other health risk factors such as smoking and alcohol use. Almost two-thirds (64%) of female and 40% of male prisoners were infected with hepatitis C virus. The prevalence of hepatitis C among a sample of Sydney injecting drug users was 68% in 2003, down from 85% in 1995.

In 2003, well over half of male (56%) and approaching half of female (41%) residents of NSW aged 16 years and over were overweight or obese. Only 50% of men and 41% of women were adequately physically active, 39% of men and 53% of women ate adequate quantities of fruit, and 12% of men and 27% women of ate adequate quantities of vegetables.

What are some of the important issues for older adults?

HIV diagnoses in NSW declined steadily through the 1990s and to 2001, but increased in 2002 and 2003. Among the 414 cases notified in 2003, 90% were males and 69% reported male-to-male sex as a primary risk factor. In NSW in 2001, less than half of males (46%) and just over one-third (37%) of females aged 16 years and over always used condoms when they had sex with a casual partner.

In 2002, cardiovascular diseases, followed by cancers, were the major causes of death in people of both sexes aged 65 years and over in NSW.

Almost 1,000 people died of heart failure in NSW in 2002, of whom most were over 75 years of age. In the financial year 2002–03, there 13,055 hospitalisations for heart failure, about half of which occurred among people aged over 75 years. Presentations to emergency departments for heart failure peaked in the winter months.

Chronic obstructive pulmonary diseases, including chronic bronchitis and emphysema, were responsible for around 2,000 deaths in NSW in 2002 and 19,500 hospitalisations in the financial year 2002–03. Around two-thirds of deaths and more than three-quarters of hospitalisations were in people aged 65 years and over.

In 2002, 314 people died in NSW, with falls as a principal or contributing cause of death. People aged 65 years and over accounted for more than three-quarters of all fall-related deaths. The rate of fall-related deaths in NSW increased from 1997 to 2001, but decreased slightly in 2002. In the financial year 2002–03, there were 36,976 hospitalisations of NSW residents following a fall. More than half of those hospitalised following a fall (56%) were aged 65 years or more.

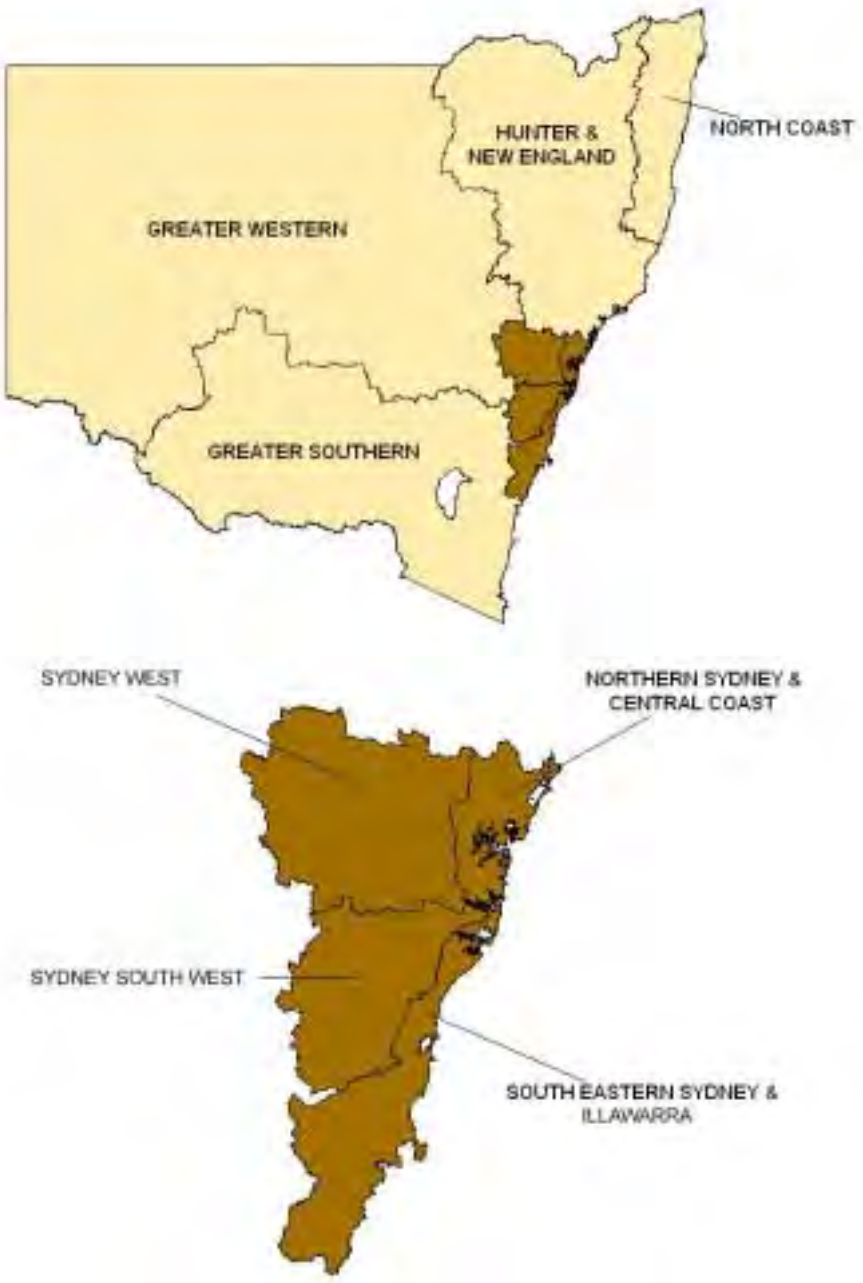
Just under half of all presentations to NSW emergency departments for pneumonia in 2003, and of hospitalisations for pneumococcal disease in the financial year 2002–03, were in people aged 65 years and older. Vaccination for pneumococcal disease and influenza is recommended for all people aged 65 years and over (as well as for Aboriginal people aged 50 years and over, and for others who are at high risk of infection). In 2003, 76% of NSW residents aged 65 years and older had been vaccinated against influenza in the past year and just under half (47%) had been vaccinated for pneumococcal pneumonia in the past 5 years.

Levels of particle pollution in the air are associated with hospital admissions for cardiac disease in the elderly, and with respiratory symptoms. Improvements in particle levels were seen in NSW the 1980s but, recently, levels in urban areas have fluctuated with peaks seen in years of major bushfires. Rural areas may experience high particle levels in winter, in association with wood heater use.

In 2003, rates of edentulism (all natural teeth missing) among people aged 55 years and over in NSW ranged from 7% to 26% for males and 12% to 36% for females. In NSW in 2003, rates of overweight and obesity declined in older age groups among both sexes. Among people aged 75 years and over, 47% of males and 46% of females were overweight or obese, which compares with 68% of males and 54% of females aged 55–64 years. This may reflect higher death rates among older people who are overweight or obese.

Map of NSW area health services

These maps illustrate the current boundaries of the NSW area health services. Each is made up of a number of statistical local areas or local government areas, which are listed on page 369.



List of abbreviations

ABS	Australian Bureau of Statistics
ACAM	Australian Centre for Asthma Monitoring
ACIR	Australian Childhood Immunisation Register
ACS	Ambulatory care sensitive conditions
AGPS	Australian Government Publishing Service
AHR	Airway hyper-responsiveness
AHS	NSW area health service or health area
AHTAC	Australian Health Technology Advisory Committee
AIDS	Acquired Immune Deficiency Syndrome
AIHW	Australian Institute of Health and Welfare
ARIA+	Accessibility–Remoteness Index for Australia Plus
ARMCANZ	Agricultural and Resource Management Council of Australia and New Zealand
ASHR	Australian Study of Health and Relationships
BFv	Barmah Forest virus
BMI	Body mass index
BSP	Back-scattering coefficient for particles
CATI	Computer Assisted Telephone Interviewing
CABG	Coronary artery bypass graft
CI	Confidence interval
COB	Country of birth
COPD	Chronic obstructive pulmonary disease
DALY	Disability-adjusted life years
DEC	Department of Environment and Conservation
dmft	The number of deciduous (infant) teeth that are decayed, missing or have been filled due to caries (tooth decay)
DMFT	The number of permanent (adult) teeth that are decayed, missing or have been filled due to caries (tooth decay)
DTP	Diphtheria–tetanus–pertussis combined vaccine (also called triple antigen vaccine)
ED	Emergency department
ERP	Estimated resident population
ESRD	End-stage renal disease
F	Female
HARP	Health and Air Research Program
HIV	Human immunodeficiency virus
HOIST	Health Outcomes Information Statistical Toolkit (see Methods section)
ICD-9	International Classification of Diseases, 9th Revision
ICD-9-CM	International Classification of Diseases, 9th Revision, Clinical Modification
ICD-10	International Classification of Diseases, 10th Revision

ICD-10-AM	International Classification of Diseases, 10th Revision, Australian Modification
IDDM	Insulin-dependent diabetes mellitus
IRMRC	NSW Injury Risk Management Research Centre
IRSD	Index of Relative Socioeconomic Disadvantage (a SEIFA index)
ISC	NSW Inpatients Statistics Collection (see Methods section)
LGA	Local government area
LL 95% CI	Lower limit of 95% confidence interval for rate
M	Male
microg/dL	Micrograms per decilitre
mg/L	Milligrams per litre
MMR	Measles–mumps–rubella combined vaccine
NAC	National Asthma Campaign
NATSEM	National Centre for Social and Economic Modelling
NDD	Notifiable Diseases Database (see Methods section)
NHS	Australian Bureau of Statistics National Health Survey (see Methods section)
NEPC	National Environment Protection Council
NHMRC	National Health and Medical Research Council
NIDDM	Non-insulin-dependent diabetes mellitus
No.	Number
NO_2	Nitrogen dioxide
NSW	New South Wales
NSWHS	New South Wales Health Surveys
OECD	Organization for Economic Cooperation and Development
PM_{10}	Particulate matter <10 microns in diameter
$PM_{2.5}$	Particulate matter <2.5 microns in diameter
ppm	parts per million
RPI	Regional pollutant index
RRv	Ross River virus
SEIFA	Australian Bureau of Statistics Socio-Economic Indices for Areas
SES	Socioeconomic status
SLA	Statistical local area
SIDS	Sudden Infant Death Syndrome
STIs	Sexually transmissible infections
UL 95% CI	Upper limit of 95% confidence interval for rate
UVR	Ultraviolet radiation
WHO	World Health Organization
YLD	Years of healthy life lost due to disability
YLL	Years of life lost due to premature death

1 Determinants of health

Section 1

Chapter 1.1

NSW population

- The 2003 estimated residential population of NSW was 6,686,757. This represents an average annual growth rate of approximately 1.10% in the years 1998–2003, similar to the average annual growth rate of 1.11% in the years 1993–1998.
- By 2017, it is estimated that the population of NSW will be approximately 7,700,000, which represents an average annual increase of 1.07% on the 2003 population.
- In 2003, approximately half the NSW population was aged 36 years or more (the median age was 35 years for males and 37 years for females).
- In 2003, the female population slightly outnumbered the male population. Due to lower death rates in females, the proportion of females in the population increases with age. Females made up 56% of the NSW population aged 65 years or more, and 64% of the population aged 80 years or more.
- In 2001, approximately 71% of the NSW population lived in metropolitan areas, 21% lived in inner-regional areas, and 8% in outer-regional and remote areas.

In this chapter

Introduction

Age and sex are important determinants of the health of individuals. The age and sex structure of different populations is reflected in their patterns of illness and use of health services. This chapter presents information on the age and sex distribution of NSW residents in 2003 (including a breakdown by area health service), and gives population projections for NSW for 2022.

Country of birth, Indigenous status, and living in a rural or remote area are also important demographic determinants of health. More information on these population groups can be found in the chapters on country of birth, Aboriginal and Torres Strait Islander peoples, and rural and remote populations.

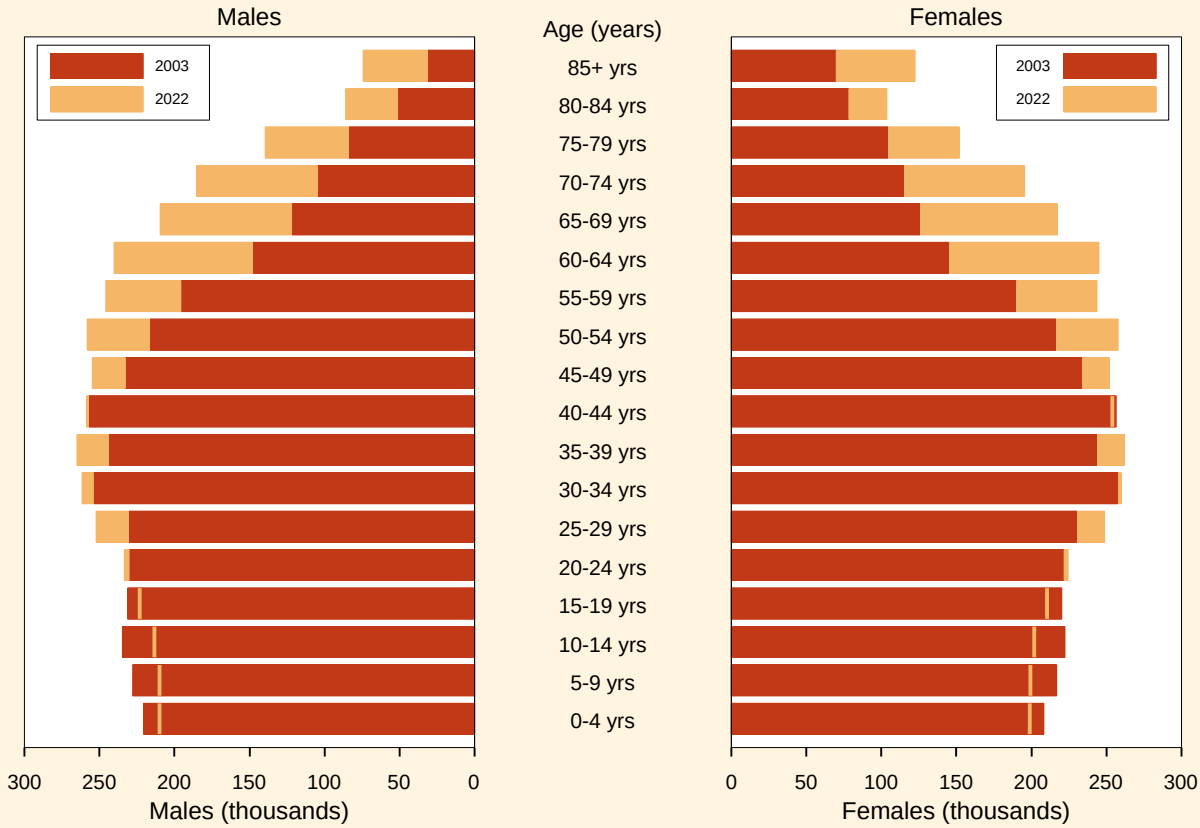
For more information:

Australian Bureau of Statistics. *Population projections, Australia*. ABS Catalogue no. 3222.0. Canberra: ABS, 2003. Available at www.abs.gov.au/ausstats.

Australian Bureau of Statistics. *Population, Australian States and Territories: Electronic Delivery*. ABS Catalogue no. 3239.0.55.001. Canberra: ABS, 2003. Available at www.abs.gov.au/ausstats.

Australian Bureau of Statistics. *1996 and 2001 Census Community Basic Profile*. Canberra: ABS, 2002. Available at www.abs.gov.au.

NSW population, estimated residential population 2003 and projected population in 2022, by sex and age



Note: Population estimates as at 30 June each year. Where a bar does not have a segment for 2022, the number of people in that category is predicted to decrease by 2022. The predicted number is shown as a lighter coloured line on the overlying 2003 bar.

Source: Australian Bureau of Statistics, Preliminary estimated residential populations based on 2001 Census counts and mid-series experimental population projections (ABS, unpublished).

- In NSW, the estimated residential population in 2003 (based on data collected in the 2001 Census) was 6,686,757. This represents an average annual growth rate of approximately 1.10% in the years 1998–2003, compared to an average annual growth rate of 1.11% in the years 1993–1998. By 2022, it is estimated that the population of NSW will be approximately 7,700,000, which represents an average annual increase of 1.07% on the 2003 population.
- In 2003, approximately half the NSW population was aged 36 years or more (the median age was 35 years for males and 37 years for females). In 1998, the median age was 35 years (34 years for males and 35 years for females), while in 1993 it was 33 years (32 and 34 years for males and females respectively). The median age predicted for 2022 is 41 years (40 years for males and 42 years for females).
- The female population slightly outnumbered the male population in 2003. Due to lower death rates in females, the proportion of females in the population increases with age. Females made up 56% of the NSW population age 65 years or more, and 64% of the population aged 80 years or more.
- In 2001, approximately 71% of the NSW population lived in metropolitan areas, 21% lived in inner-regional areas, and 8% in outer-regional and remote areas.

For more information

Australian Bureau of Statistics website at www.abs.gov.au.

Population pyramid

Sex	5 year age group	30 June 2003	30 June 2022
Males	0–4	221034	209842
	5–9	228456	210225
	10–14	235214	213444
	15–19	231724	223325
	20–24	230335	234150
	25–29	231031	252738
	30–34	254538	262243
	35–39	243989	265360
	40–44	257525	259154
	45–49	232909	255248
	50–54	217070	258777
	55–59	195780	246356
	60–64	148094	240984
	65–69	122062	210224
	70–74	105103	185859
	75–79	83954	140008
	80–84	51685	86230
	85+	31565	74861
	All ages	3322068	3829028
Females	0–4	208734	198962
	5–9	217177	199389
	10–14	223040	201850
	15–19	220765	210613
	20–24	221826	224879
	25–29	231172	249431
	30–34	258397	260591
	35–39	244117	262774
	40–44	256930	254081
	45–49	234317	252172
	50–54	216764	258093
	55–59	190603	244205
	60–64	145702	245372
	65–69	126263	217731
	70–74	115604	195862
	75–79	105145	152191
	80–84	78309	103949
	85+	69824	122820
	All ages	3364689	3854965
Persons	0–4	429768	408804
	5–9	445633	409614
	10–14	458254	415294
	15–19	452489	433938
	20–24	452161	459029
	25–29	462203	502169
	30–34	512935	522834
	35–39	488106	528134
	40–44	514455	513235
	45–49	467226	507420
	50–54	433834	516870
	55–59	386383	490561
	60–64	293796	486356
	65–69	248325	427955
	70–74	220707	381721
	75–79	189099	292199
	80–84	129994	190179
	85+	101389	197681
	All ages	6686757	7683993

Note: Population estimates as at 30 June each year. Where a bar does not have a segment for 2022, the number of people in that category is predicted to decrease by 2022.

Source: Australian Bureau of Statistics, Preliminary estimated residential populations based on 2001 Census counts and mid–series experimental population projections (ABS, unpublished).

NSW population by health area

Sex	Health area	Age (Years)									
		0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49
Males											
	All NSW	221034	228456	235214	231724	230335	231031	254538	243989	257525	232909
	Sydney South West	46233	45370	44672	45470	49751	52251	56500	52564	51868	44972
	South Eastern Sydney & Illawarra	34558	33853	34781	36238	44126	46618	49381	44364	44597	39159
	Sydney West	40210	40427	40334	40238	40670	39671	42867	40438	41787	37040
	Northern Sydney & Central Coast	33498	34413	35929	36150	36232	36438	40730	39644	41812	38041
	Hunter & New England	26601	29123	30736	29451	26165	24209	27523	27028	30563	28982
	North Coast	13582	16175	18455	16469	10959	9980	12400	13940	17404	17309
	Greater Southern	15499	17116	17951	16476	13458	13110	15013	15728	17915	16791
	Greater Western	10853	11979	12356	11232	8974	8754	10124	10283	11579	10615
Females											
	All NSW	208734	217177	223040	220765	221826	231172	258397	244117	256930	234317
	Sydney South West	43282	42749	42272	43600	50053	53743	57693	50742	50796	45210
	South Eastern Sydney & Illawarra	32503	32273	33085	35214	42352	45784	48390	42627	42795	38918
	Sydney West	38041	38173	38297	38477	38740	39497	43206	40403	41515	37726
	Northern Sydney & Central Coast	31753	32991	34155	34207	35736	37169	42616	41315	43546	39664
	Hunter & New England	25166	27882	29488	28085	24415	23446	27756	27722	30803	28586
	North Coast	13013	15503	17137	15444	9971	10417	13389	15262	18759	17786
	Greater Southern	14730	16382	17151	15317	12363	12542	15094	15712	17578	16157
	Greater Western	10246	11224	11455	10421	8196	8574	10253	10334	11138	10270
Persons											
	All NSW	429768	445633	458254	452489	452161	462203	512935	488106	514455	467226
	Sydney South West	89516	88119	86944	89070	99805	105994	114193	103306	102664	90182
	South Eastern Sydney & Illawarra	67060	66126	67866	71452	86477	92402	97771	86991	87392	78077
	Sydney West	78251	78600	78631	78715	79410	79168	86073	80841	83302	74766
	Northern Sydney & Central Coast	65251	67404	70084	70357	71968	73607	83346	80959	85358	77705
	Hunter & New England	51767	57005	60224	57536	50580	47655	55279	54750	61366	57568
	North Coast	26595	31678	35592	31913	20930	20397	25789	29202	36163	35095
	Greater Southern	30229	33498	35102	31793	25821	25652	30107	31440	35493	32948
	Greater Western	21099	23203	23811	21653	17170	17328	20377	20617	22717	20885

Note: Population estimated as at 30 June 2003.

Source: Australian Bureau of Statistics estimated resident populations (ABS, unpublished).

NSW population by health area (continued)

Sex	Health area	Age (Years)								
		50–54	55–59	60–64	65–69	70–74	75–79	80–84	85 +	All ages
Males										
	All NSW	217070	195780	148094	122062	105103	83954	51685	31565	3322068
	Sydney South West	40372	34844	25518	20626	17319	13243	7759	4577	653908
	South Eastern Sydney & Illawarra	36421	33335	25676	21653	18721	15486	9661	5957	574586
	Sydney West	34971	30347	20743	15282	11750	8983	5363	3002	534123
	Northern Sydney & Central Coast	35322	32889	24411	19437	17791	15014	10280	6642	534673
	Hunter & New England	27228	25744	20281	17430	15072	12157	7331	4325	409949
	North Coast	16536	14659	12044	11112	10499	8555	5251	3265	228594
	Greater Southern	15823	14475	11862	10093	8558	6535	3800	2358	232561
	Greater Western	10397	9487	7559	6429	5393	3981	2240	1439	153674
Females										
	All NSW	216764	190603	145702	126263	115604	105145	78309	69824	3364689
	Sydney South West	40410	32757	24538	21185	19008	16469	11805	10060	656374
	South Eastern Sydney & Illawarra	36385	32921	25370	22458	21164	19603	14678	12968	579486
	Sydney West	34845	28898	19659	15553	13395	11992	8692	7090	534199
	Northern Sydney & Central Coast	37300	33617	24951	21216	20508	20091	16352	15915	563102
	Hunter & New England	27238	25179	20147	17894	16449	14858	10887	9586	415587
	North Coast	15927	14716	12402	11823	10793	9629	6953	5935	234859
	Greater Southern	15065	13671	11406	9862	8755	7685	5486	4917	229873
	Greater Western	9594	8844	7229	6272	5532	4818	3456	3353	151209
Persons										
	All NSW	433834	386383	293796	248325	220707	189099	129994	101389	6686757
	Sydney South West	80782	67600	50056	41811	36327	29712	19563	14637	1310282
	South Eastern Sydney & Illawarra	72806	66257	51046	44111	39885	35089	24340	18925	1154072
	Sydney West	69816	59245	40402	30835	25145	20975	14055	10092	1068322
	Northern Sydney & Central Coast	72622	66506	49362	40653	38299	35105	26632	22557	1097775
	Hunter & New England	54466	50923	40428	35324	31521	27015	18218	13911	825536
	North Coast	32463	29375	24446	22935	21292	18184	12204	9200	463453
	Greater Southern	30888	28146	23268	19955	17313	14220	9286	7275	462434
	Greater Western	19991	18331	14788	12701	10925	8799	5696	4792	304883

Note: Population estimated as at 30 June 2003.

Source: ABS estimated resident populations (ABS, unpublished).

Chapter 1.2

Social determinants

- Social factors such as income, socioeconomic status, employment status, educational attainment, and crime rates, are associated with inequalities in health.
- In 2001, more than one-quarter of males and just over 40% of females aged 15–64 years had weekly incomes of less than $300. One in 8 households had a weekly income of less than $300.
- Among NSW area health services, the North Coast Area Health Service had the largest proportion of low-income households, while the Sydney West and Northern Sydney & Central Coast Area Health Services had the smallest proportions of such households.
- The proportion of the population receiving income support varied widely among areas. Overall, of those in the eligible age groups:
  - — 67% received the age pension;
  - — 7.7% received disability or sickness benefits;
  - — 4.4% received unemployment benefits;
  - — 30% of families received parenting payment.
- Among families, 44% comprised couples with dependent children, while 10% were one-parent families with dependent children.
- The unemployment rate has remained relatively steady since 2000, and stood at 5.2% for males and 5.7% for females in June 2004. However, unemployment rates vary by area and age group. Almost 13% of young people aged 15–24 years who live outside Sydney are unemployed.
- The Year 12 retention rate has increased since 2000 and is currently 70.5%. NSW has one of the lowest school retention rates of any Australian state or territory.
- More than 81,000 assaults and robberies and 374,000 thefts were recorded in NSW in 2003. Outer-regional and remote areas have higher rates of assaults and robberies and thefts than inner-regional or metropolitan areas.
- People living in outer-regional and remote areas are more socioeconomically disadvantaged than residents of inner-regional and metropolitan areas, as measured by composite indexes that combine factors including unemployment, education, early school leaving, occupation, non-English speaking background, Indigenous origin, and economic resources.

In this chapter

- Individual weekly income
- Household weekly income by health area
- Age pension and disability and sickness benefits by health area
- Unemployment and family assistance benefits by health area
- Dependent children by health area
- Unemployment rate
- Unemployment rate by region and age
- Year 12 retention rate
- Crime rates by health area
- Socioeconomic indexes by health area

Introduction

There is strong and unequivocal evidence, from Australia and other developed countries, that factors such as income, socioeconomic status, employment status, and educational attainment are associated with inequalities in health (see, for example: Eckersley et al., 2001; Oliver and Exworthy, 2003). These inequalities are significant from both social justice and economic perspectives—not only can they be considered 'unfair' and preventable but they also have high direct and indirect costs on the health system (Sainsbury and Harris, 2001).

The mechanisms—at both individual and community levels—through which social and economic factors influence health, and through which health inequalities perpetuate, are only beginning to be understood. Nonetheless, there is growing interest in identifying opportunities for the health sector to act to reduce health inequalities. In response, the NSW Department of Health has developed the NSW Health and Equity Statement *In All Fairness* (NSW Department of Health, 2004). As well as setting out priorities for action by NSW Health, the statement recognises that many of the factors that contribute to health inequalities lie outside the control of the health system. It emphasises the need for strong partnerships among clinicians, community and consumer groups, and other government and non-government organisations, to tackle these issues, and provides guidance on how to build these partnerships. It will act as a platform for future planning and decision-making within the NSW health system to reduce 'gaps' in health and health outcomes.

This chapter presents data on social and economic factors that are associated with health. Trends in a range of health indicators according to a summary measure of socioeconomic status (the Australian Bureau of Statistics Index of Relative Socioeconomic Disadavantage) are explored in the chapter on socioeconomic status.

For more information:

Australian Institute of Health and Welfare website at www.aihw.gov.au.

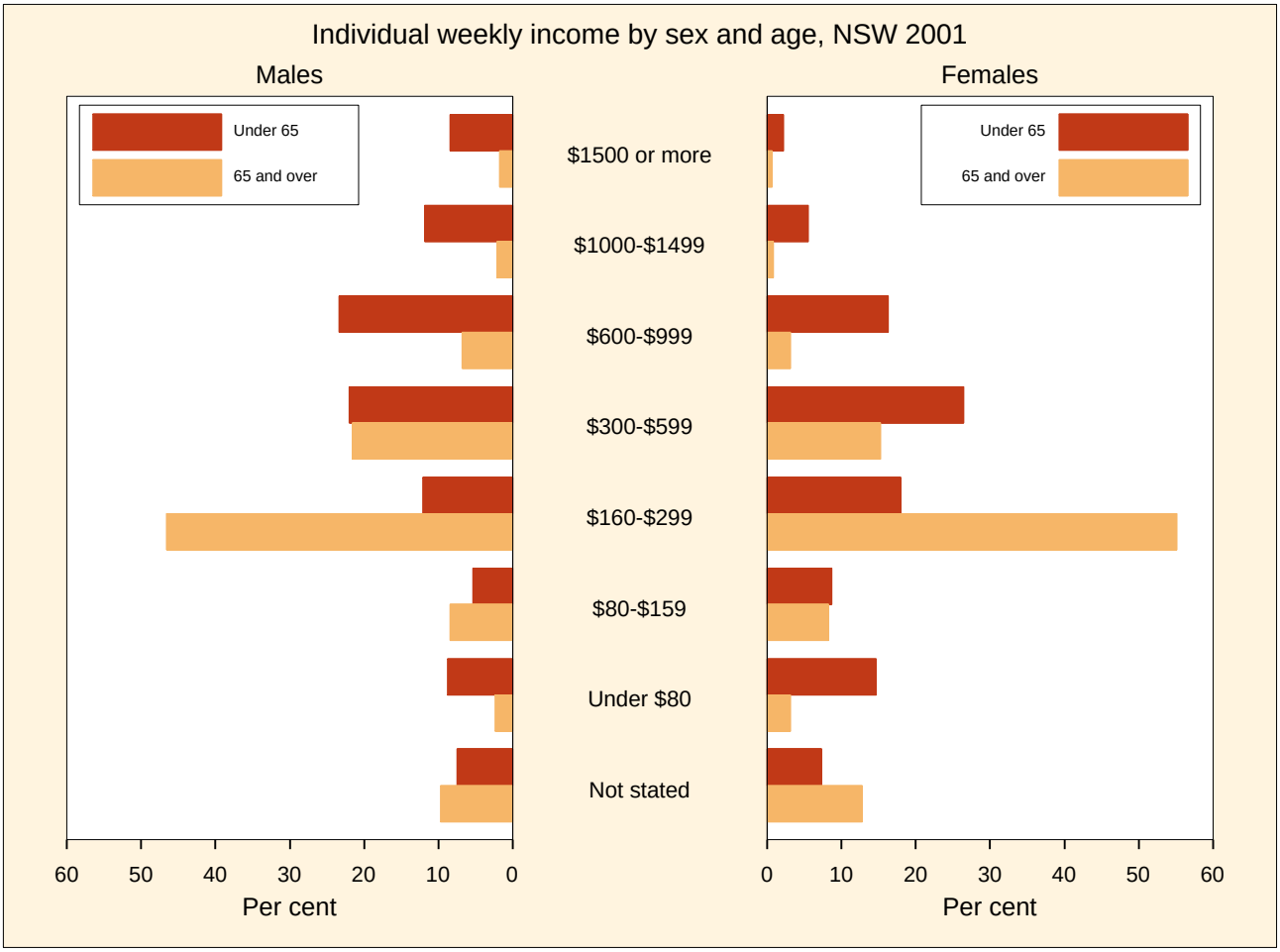
Australian Bureau of Statistics website at www.abs.gov.au.

NSW Department of Health. *NSW Health and Equity Statement: In All Fairness.* Sydney: NSW Department of Health, 2004.

Eckersley R, Dixon J and Douglas B (editors). *The social origins of health and wellbeing.* Cambridge: Cambridge University Press, 2001.

Oliver A and Exworthy M (editors). *Health inequalities. Evidence, policy and implementation. Proceedings from a meeting of the Health Equity Network.* London: The Nuffield Trust, 2003.

Sainsbury P and Harris E. Health inequalities: Something old, something new. *N S W Public Health Bull* 2001; 12(5): 117–119.



			Not stated	<$80	$80–$159	$160–$299	$300–$599	$600–$999	$1000–$1499	$1500+	Total
Number	Males	Under 65	184701	112723	252876	459024	487474	247807	176837	158387	2079829
	Females		308418	183094	378067	554655	342409	118180	48516	154866	2088205
	Persons		493119	295817	630943	1013679	829883	365987	225353	313253	4168034
	Males	65 and over	8859	30695	168966	78339	24886	7850	6850	35438	361883
	Females		15175	38860	257891	71573	15190	4357	3389	60216	466651
	Persons		24034	69555	426857	149912	40076	12207	10239	95654	828534
	Males	Total	193560	143418	421842	537363	512360	255657	183687	193825	2441712
	Females		323593	221954	635958	626228	357599	122537	51905	215082	2554856
	Persons		517153	365372	1057800	1163591	869959	378194	235592	408907	4996568
Per cent	Males	Under 65	8.9	5.4	12.2	22.1	23.4	11.9	8.5	7.6	100.0
	Females		14.8	8.8	18.1	26.6	16.4	5.7	2.3	7.4	100.0
	Persons		11.8	7.1	15.1	24.3	19.9	8.8	5.4	7.5	100.0
	Males	65 and over	2.4	8.5	46.7	21.6	6.9	2.2	1.9	9.8	100.0
	Females		3.3	8.3	55.3	15.3	3.3	0.9	0.7	12.9	100.0
	Persons		2.9	8.4	51.5	18.1	4.8	1.5	1.2	11.5	100.0
	Males	Total	7.9	5.9	17.3	22.0	21.0	10.5	7.5	7.9	100.0
	Females		12.7	8.7	24.9	24.5	14.0	4.8	2.0	8.4	100.0
	Persons		10.4	7.3	21.2	23.3	17.4	7.6	4.7	8.2	100.0

Note: Includes all NSW residents aged 15 years and over, based on individual weekly income.

Source: ABS 2001 Census Basic Community Profile (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

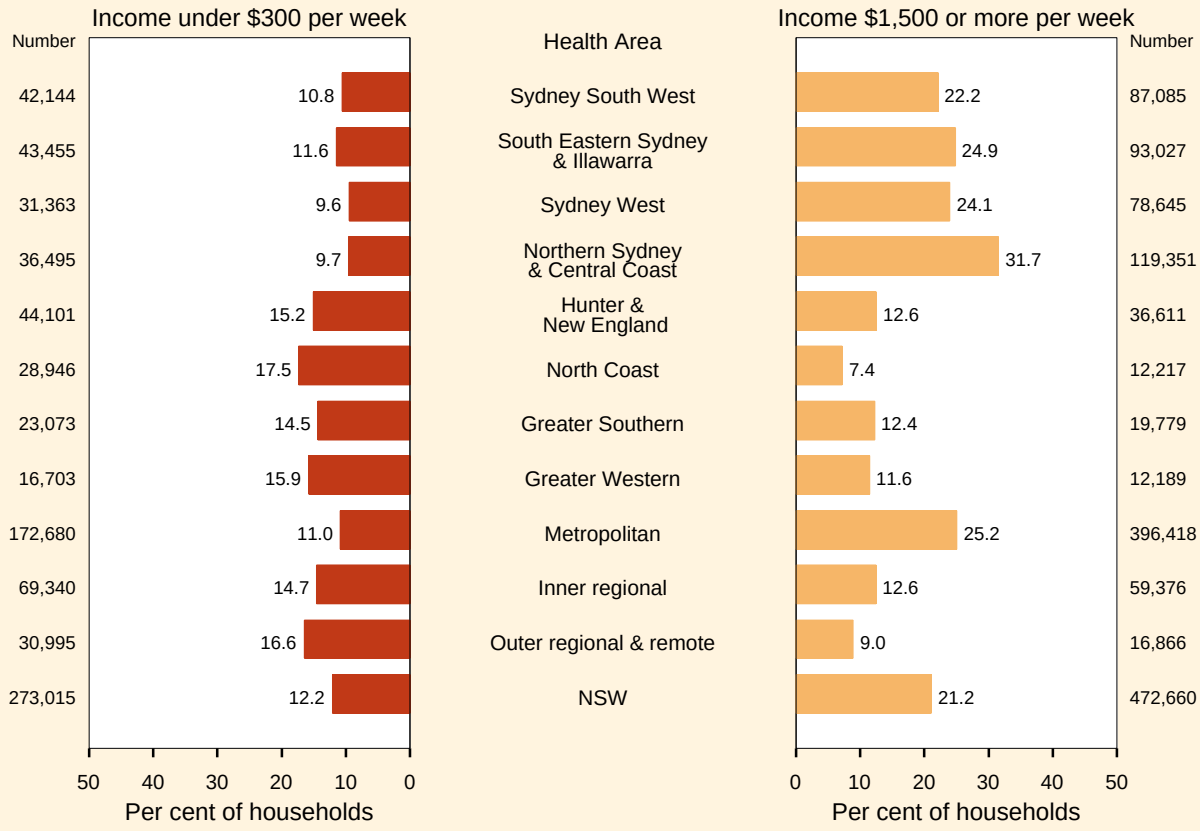
- Income is one of the main determinants of poverty, which is closely linked to poor health.
- In NSW in 2001, over one-quarter of males aged 15–64 years had weekly incomes of less than $300, while almost 60% of males aged 65 years or over had incomes in this range.
- Females had lower incomes in both age groups. Just over 40% of females aged under 65 years and almost 70% of females aged 65 years and over had weekly incomes of less than $300.

For more information:

Australian Bureau of Statistics website at www.abs.gov.au.

Australian Bureau of Statistics. *Australian social trends 2004*. Canberra: ABS, 2004.

Household weekly income, by income group and health area, NSW 2001



Note: Includes all NSW residents aged 15 years and over. Figures based on household income.

Source: ABS 2001 Census Basic Community Profile (HOIST). Centre for Epidemiology and Surveillance, NSW Department of Health.

- In 2001, 273,015 households in NSW (12.2%) had a weekly income of less than $300. The North Coast Area Health Service had the largest proportion of households with a weekly income of less than $300 (17.5%) while the Sydney West (9.6%) and Northern Sydney & Central Coast (9.7%) Area Health Services had the smallest proportion of low-income households.
- In the same year, 472,660 households in NSW (21.2%) had a weekly income of $1,500 or more. The Northern Sydney & Central Coast Area Health Service (31.7%) had the largest proportion of high-income households, while the North Coast Area Health Service (7.4%) had the smallest proportion of such households.
- Metropolitan areas had a larger proportion of high-income households (26.2%) and a smaller proportion of low-income households (10.8%), when compared to households in inner-regional areas (18.0% and 12.9%) and outer-regional and remote areas (9.4% and 16.3%).

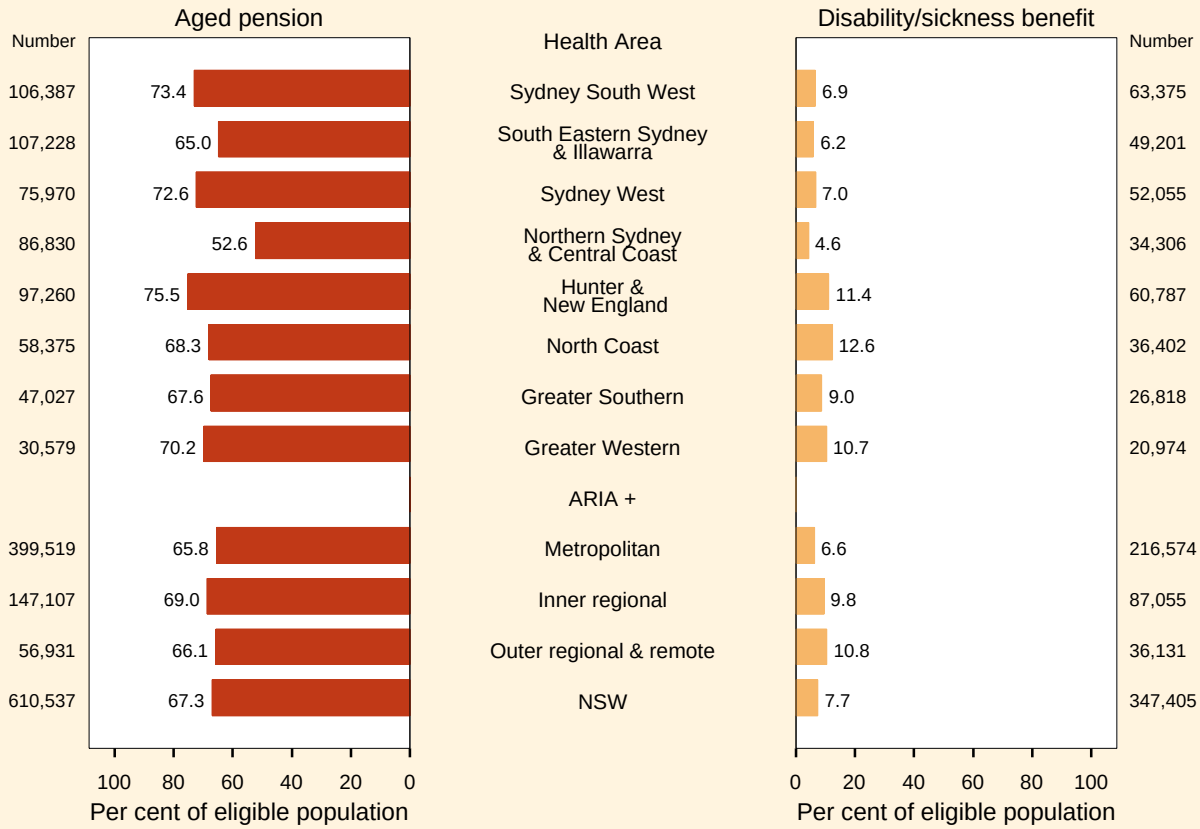
For more information:

Australian Bureau of Statistics. *Australian social trends 2004*. Canberra: ABS, 2004.

Saunders P. Income and welfare special article: Poverty and deprivation in Australia. *Yearbook Australia, 1996*. Canberra: ABS, 1996.

Fincher R, Nieuwenhuysen J (editors). *Australian poverty: Then and now*. Melbourne: Melbourne University Press, 1998.

Aged pension, disability and sickness benefit recipients by health area, NSW June 2004



Note: The eligible population for aged pensions comprised persons aged 65 years and over and for disability and sickness benefits, comprised persons aged 15–64 years. Disability and sickness benefits included disability support pension, sickness allowance, mobility allowance, and carer allowance.

Source: Centrelink, Canberra (unpublished data).

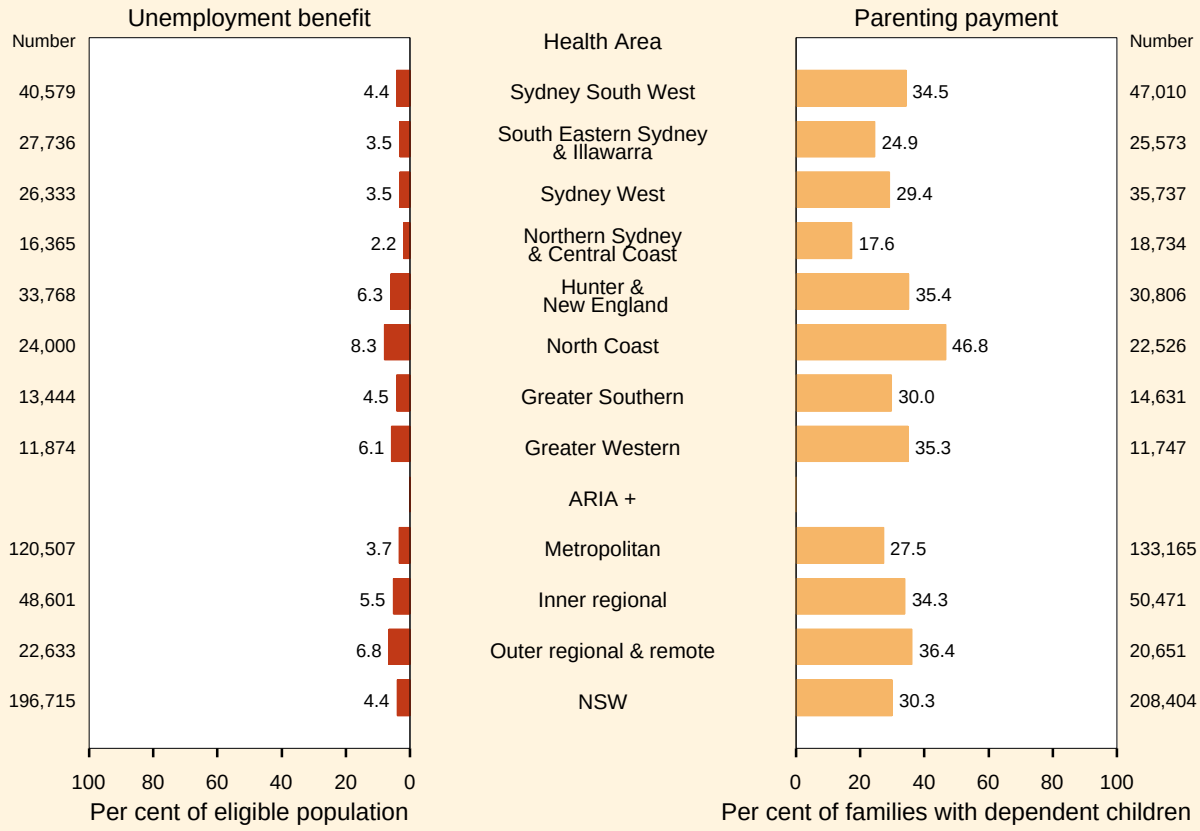
- The level of receipt of age pension or sickness or disability benefits provides an indication of the number of people who are both economically disadvantaged and have high need for health services.
- The age pension is both income and assets tested. It is currently payable at age 65 years. In June 2004, 610,537 people in NSW received the age pension. This constituted 67.3% of the total NSW population in the eligible age group. The Hunter & New England and South Western Sydney Area Health Services had the largest proportion of older people receiving the age pension (75.5% and 73.4%) while the Northern Sydney & Central Coast Area Health Service had the smallest proportion (52.6%). Older people living in inner-regional areas (69%) were more likely to receive the age pension than those living in metropolitan areas (65.8%) or outer-regional and remote areas (66.1%).
- Government benefits for people who need support as a result of disability or sickness include: disability support pension, sickness allowance, mobility allowance, and carer allowance. In June 2004, 347,405 people in NSW received disability or sickness benefits. This comprised 7.7% of people in the eligible age group. The North Coast Area Health Service had the largest proportion of residents receiving these benefits (12.6%) and the Northern Sydney & Central Coast Area Health Service had the smallest proportion (4.6%). People in the eligible age group living in outer-regional and remote areas (10.8%) and inner-regional areas (9.8%) were more likely to receive these benefits than those living in metropolitan areas (6.6%).

For more information:

Centrelink website at www.centrelink.gov.au.

Walker A, Abello A. *Changes in the health status of low income groups in Australia: 1977–78 to 1995.* Discussion Paper no. 53. Canberra: National Centre for Social and Economic Modelling, University of Canberra, 2000.

Unemployment and family assistance benefit recipients by health area, NSW June 2004



Note: The eligible population for unemployment benefits comprised persons aged 15–64 years. Unemployment figures as at 30 June 2004. Unemployment benefits comprised Youth Allowance, Newstart Allowance, and Mature Age Allowance. Family assistance benefits comprised Parenting Payments (single and partnered).

Source: Centrelink, Canberra (unpublished data).

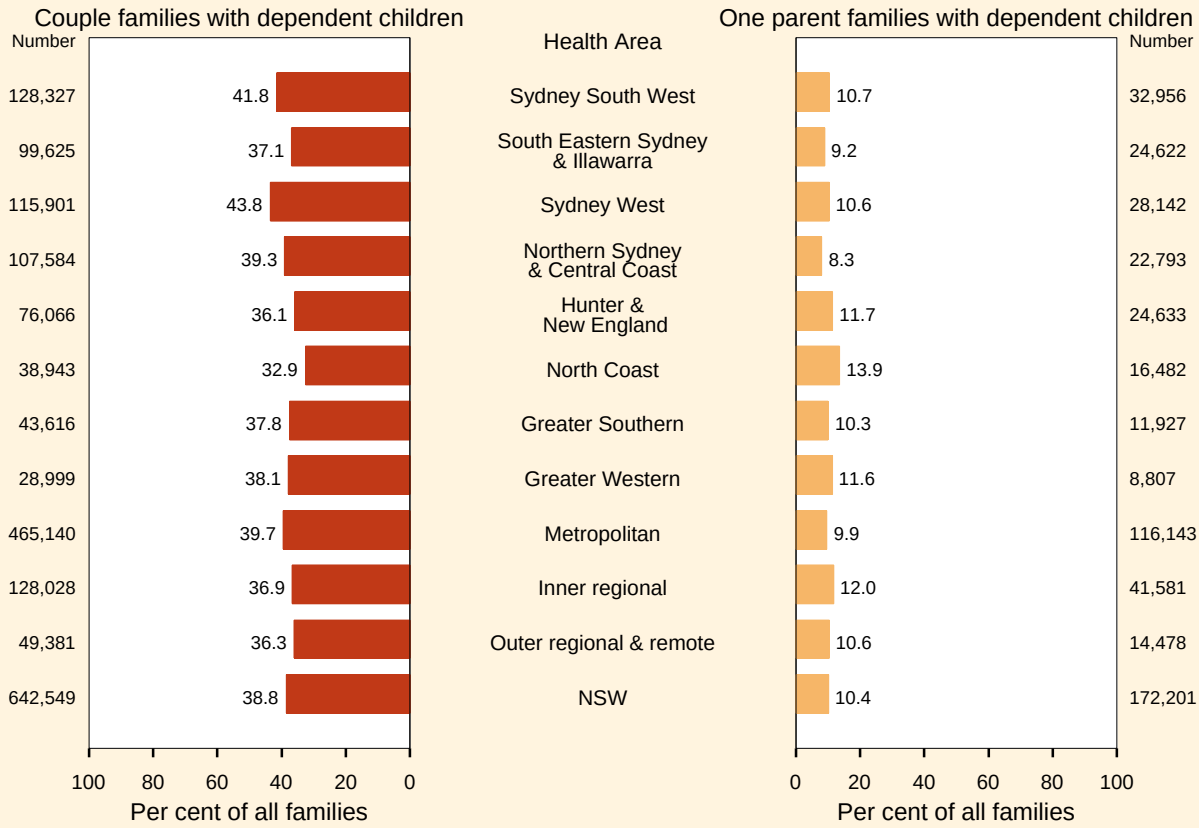
- The level of receipt of income support in a community provides a measure of the amount of poverty.
- Benefits paid to unemployed people include Youth Allowance (for unemployed people aged under 21 or people under 25 years undertaking full-time studies), Newstart Allowance (for unemployed people aged 21 years or over), and Mature Age Allowance (for older unemployed people aged 60 years or over and below age pension age). In June 2004, 196,715 (4.4%) of people in the eligible age group in NSW received unemployment benefits. The North Coast Area Health Service had the largest proportion of working age adults receiving unemployment benefits (8.3%) while the Northern Sydney & Central Coast Area Health Service had the smallest (2.2%). Almost one in 6 (15.6%) working age adults living in outer-regional and remote areas received unemployment benefits, compared to 8.2% of those in inner-regional areas and 3.7% of those living in metropolitan areas.
- Family assistance benefits are paid to help with the cost of raising children. They include the Family Tax Benefit, which is income tested, and the Parenting Payment, which is subjct to more stringent income and assets tests. In June 2004, 208,404 (30.3%) families with dependent children in NSW received the Parenting Payment. The North Coast Area Health Service had the largest proportion of families receiving Parenting Payment (46.8%), while the Northern Sydney & Central Coast Area Health Service (17.6%) had the smallest. More than one-third of families with dependent children in inner-regional (34.3%) and outer-regional and remote (36.4%) areas of NSW received this benefit, compared with just over one-quarter (27.5%) of these families living in metropolitan areas.

For more information:

Centrelink website at www.centrelink.gov.au.

Australian Institute of Health and Welfare website at www.aihw.gov.au.

Couple and one-parent families with dependent children by health area, NSW 2001



Note: Dependent children are family members under 15 years and those aged 15–24 years attending an educational institution full-time.

Source: Australian Bureau of Statistics, 2001 Census Basic Community Profiles (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

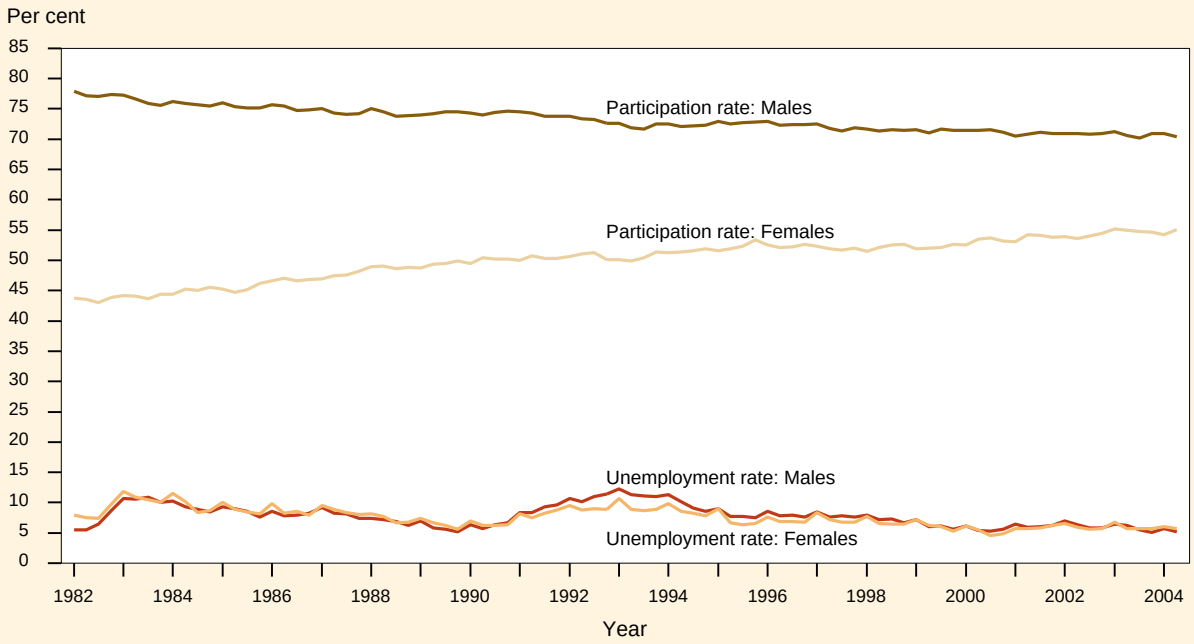
- The family and family structure have a strong impact on the health and wellbeing of children and their parents. Inadequate family income is more common in single-parent families, and family breakdown can also have adverse social and health consequences for children and their parents.
- In 2001, there were 642,549 couples with dependent children in NSW, which is 38.8% of all families. The Sydney West Area Health Service had the largest proportion of these families (43.8%) and the North Coast Area Health Service had the smallest proportion (32.9%).
- There were 172,201 one-parent families with dependent children in NSW in 2001. This constituted 10.4% of all families. The North Coast Area Health Service had the largest proportion of one-parent families with dependent children (13.9%) and the Northern Sydney & Central Coast Area Health Service had the smallest (8.3%). Inner-regional areas (12.0%) had a larger proportion of one-parent families with dependent children, compared with outer-regional and remote areas (10.6%) and metropolitan areas (9.9%).

For more information:

Australian Bureau of Statistics. *Australian social trends 2004*. Canberra: ABS, 2004.

Australian Institute of Health and Welfare website at www.aihw.gov.au.

Unemployment and labour force participation rates by sex, NSW 1982 to 2004



Year	Quarter	Male unemployment rate Per cent	Female unemployment rate Per cent	Male unemployment to population ratio Per cent	Female unemployment to population ratio Per cent	Male participation rate Per cent	Female participation rate Per cent
2003	March	6.4	6.8	4.6	3.8	71.3	55.1
	June	6.2	5.7	4.4	3.1	70.6	55.0
	September	5.5	5.7	3.8	3.1	70.2	54.7
	December	5.1	5.7	3.6	3.1	70.9	54.6
2004	March	5.7	6.0	4.1	3.3	71.0	54.3
	June	5.2	5.7	3.7	3.2	70.4	55.0

Note: Unemployed people = people aged 15 years and over who were not employed but were actively looking, and available, for work. Unemployment rate = the number of unemployed people expressed as a percentage of the labour force. Unemployment to population ratio = the number of unemployed people expressed as a percentage of the civilian population aged 15 years and over. Participation rate = the labour force expressed as a percentage of the civilian population aged 15 years and over.

Source: Australian Bureau of Statistics Monthly Labour Force Data.

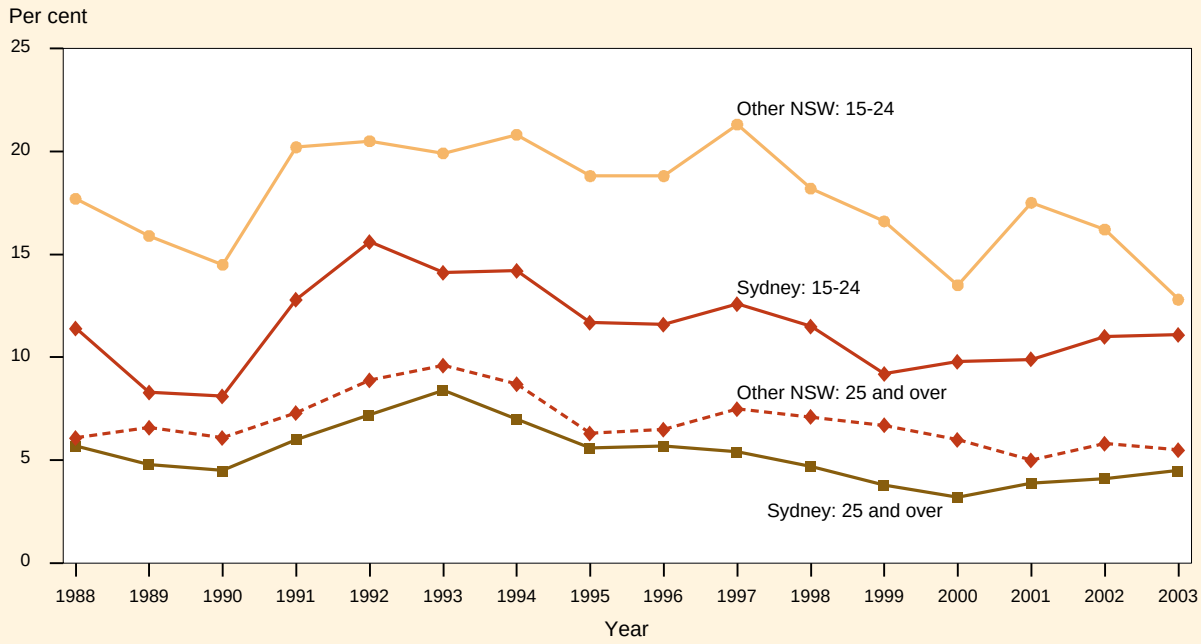
- Health problems that are associated with unemployment include: depression and other mental health problems, chronic illnesses such as cardiovascular disease, and high levels of risk behaviours such as smoking. Job loss can be a consequence of ill health. Unemployment also causes ill health, by reducing people's ability to purchase goods and services—such as adequate nutrition and housing—and through its psychosocial effects, including lowered self-esteem and loss of social networks (Mathers and Schofield, 1998).
- The unemployment rate in NSW peaked in 1993 at 11.6% of males and 9.5% of females, declined from 1994 to 2000, and has remained relatively steady since then, standing at 5.2% for males and 5.7% for females in June 2004. The unemployment rate is calculated as a percentage of the labour force, rather than of the entire population of working age. This latter percentage (known as the 'unemployment to population ratio') has also declined over recent years. It stood at 3.7% for males and 3.2% for females in June 2004, down from a high of 8.4% of males and 4.7% of females in 1993.
- The male labour force participation rate declined from more than 77% in 1982 to less than 71% in 2004. In the same period, the female participation rate rose, from less than 44% to 55%.

For more information:

Australian Bureau of Statistics website at www.abs.gov.au.

Mathers CD and Schofield DJ. Health consequences of unemployment: The evidence. *Med J Aust* 1998; 168: 178–182.

May unemployment rate by region of residence and age, NSW 1988 to 2003



Region	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Sydney: 15–24	11.4	8.3	8.1	12.8	15.6	14.1	14.2	11.7	11.6	12.6	11.5	9.2	9.8	9.9	11.0	11.1
Other NSW: 15–24	17.7	15.9	14.5	20.2	20.5	19.9	20.8	18.8	18.8	21.3	18.2	16.6	13.5	17.5	16.2	12.8
Sydney: 25 and over	5.7	4.8	4.5	6.0	7.2	8.4	7.0	5.6	5.7	5.4	4.7	3.8	3.2	3.9	4.1	4.5
Other NSW: 25 and over	6.1	6.6	6.1	7.3	8.9	9.6	8.7	6.3	6.5	7.5	7.1	6.7	6.0	5.0	5.8	5.5

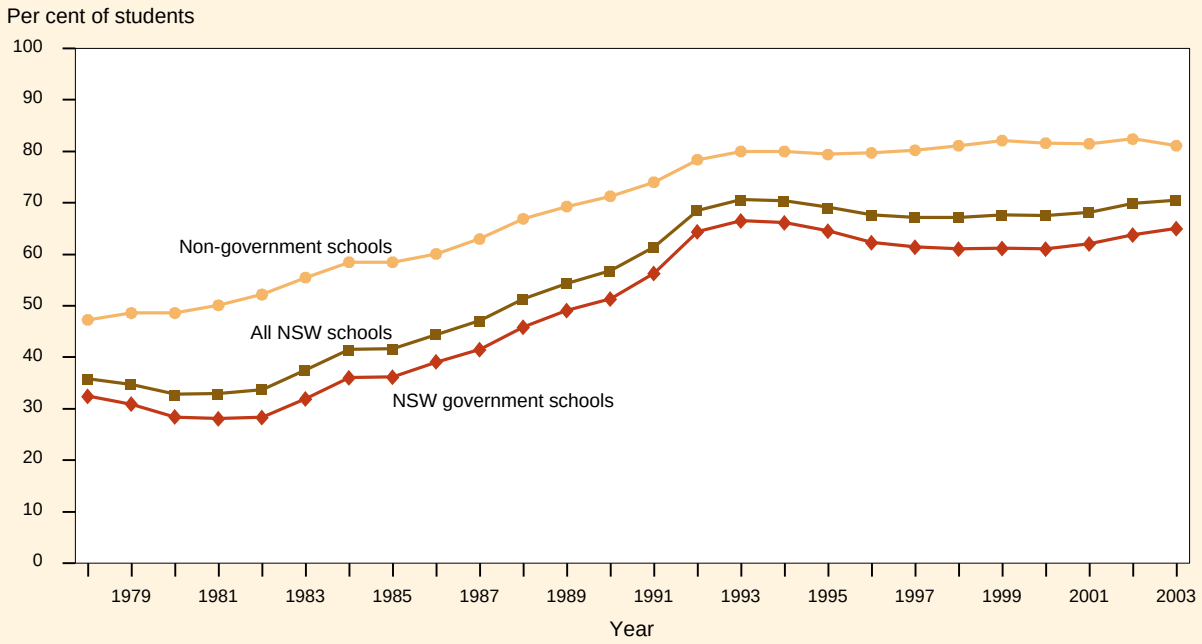
Note: Unemployed people = people aged 15 years and over who were not employed but were actively looking, and available, for work. Unemployment rate = the number of unemployed people expressed as a percentage of the labour force.

Source: Australian Bureau of Statistics Monthly Labour Force Data.

- Unemployment and its accompanying health effects are not distributed evenly through the population. Unemployment rates in NSW are highest among people aged less than 25 years, and are higher in rural and regional areas than in urban areas.
- Over the period 1988–2003, unemployment rates among people aged less than 25 years were around double the rates for older people in Sydney and were consistently more than double in the remainder of NSW.
- The unemployment rate for 15–24 year olds in Sydney peaked at 15.6% in 1992 before declining to 9.2% in 1999 and then rising to 11.1% in 2003. For 15–24 year olds in the remainder of NSW, unemployment rates peaked at 21.3% in 1997 but had declined to 12.8 by 2003.
- Unemployment rates were also consistently higher outside of Sydney among people aged 25 years and over. The unemployment rate in this age group peaked in 1993 at 8.4% in Sydney and 9.6% in the rest of NSW. It then declined to 3.2% in Sydney in 2000 and 5.0% in the remainder of NSW in 2001, before rising slightly in both areas to stand at 4.5% in Sydney and 5.5% in the rest of NSW by 2003.
- Overall participation rates changed little over the period shown, for both age groups and in both regions (data not shown).

For more information:
Australian Bureau of Statistics website at www.abs.gov.au.

Student retention to Year 12 by school type, NSW 1978 to 2003



	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
NSW government schools	32.4	30.9	28.4	28.1	28.3	32.0	36.1	36.2	39.1	41.5	45.9	49.1	51.4
Non-government schools	47.3	48.6	48.6	50.1	52.2	55.5	58.5	58.5	60.1	63.0	66.9	69.3	71.3
All NSW schools	35.8	34.7	32.8	32.9	33.7	37.5	41.5	41.7	44.4	47.1	51.3	54.4	56.8
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
NSW government schools	56.3	64.4	66.5	66.2	64.5	62.3	61.4	61.1	61.2	61.0	62.0	63.8	65.0
Non-government schools	74.0	78.4	80.0	80.0	79.4	79.7	80.2	81.1	82.1	81.6	81.5	82.4	81.1
All NSW schools	61.4	68.5	70.6	70.4	69.1	67.7	67.2	67.2	67.6	67.5	68.2	69.9	70.5

Note: The apparent school retention rate is the number of full-time students who are enrolled in Year 12 in a given year expressed as a percentage of their cohort group at the commencement of secondary schooling.

Source: NSW Department of Education and Training (unpublished data).

- The estimated lifetime cost to Australia of each early school-leaver is $74,000. Half of this is a direct monetary cost and the remaining half is a social cost. Costs borne largely by the individual early school-leaver include reduced chances of employment, fewer opportunities for job mobility and training, decreased financial security, and reduced cultural enjoyment. Costs to government and the community include increased social welfare costs, increased demand for health services, higher costs of crime prevention and detection, and decreased social cohesion (King, 1999).
- The Year 12 retention rate in NSW doubled between 1978 and 1994, reaching a high of 70.6% in 1993. It then decreased slightly before increasing to 70.5% in 2003. NSW has the third lowest school retention rate of Australian states and territories, ahead of only the Northern Territory and South Australia (ABS, 2004).
- The retention rate was consistently higher in non-government than in government schools (81.1%, compared with 65.0% in 2003). Government school retention rates may be more greatly affected by students transferring to the TAFE system to complete their secondary education. Transfers between government and non-government sectors also affect retention rates.
- Female students have consistently higher retention rates. In 2003, the retention rate for females was 75.3%, compared with 65.8% for males (data not shown).

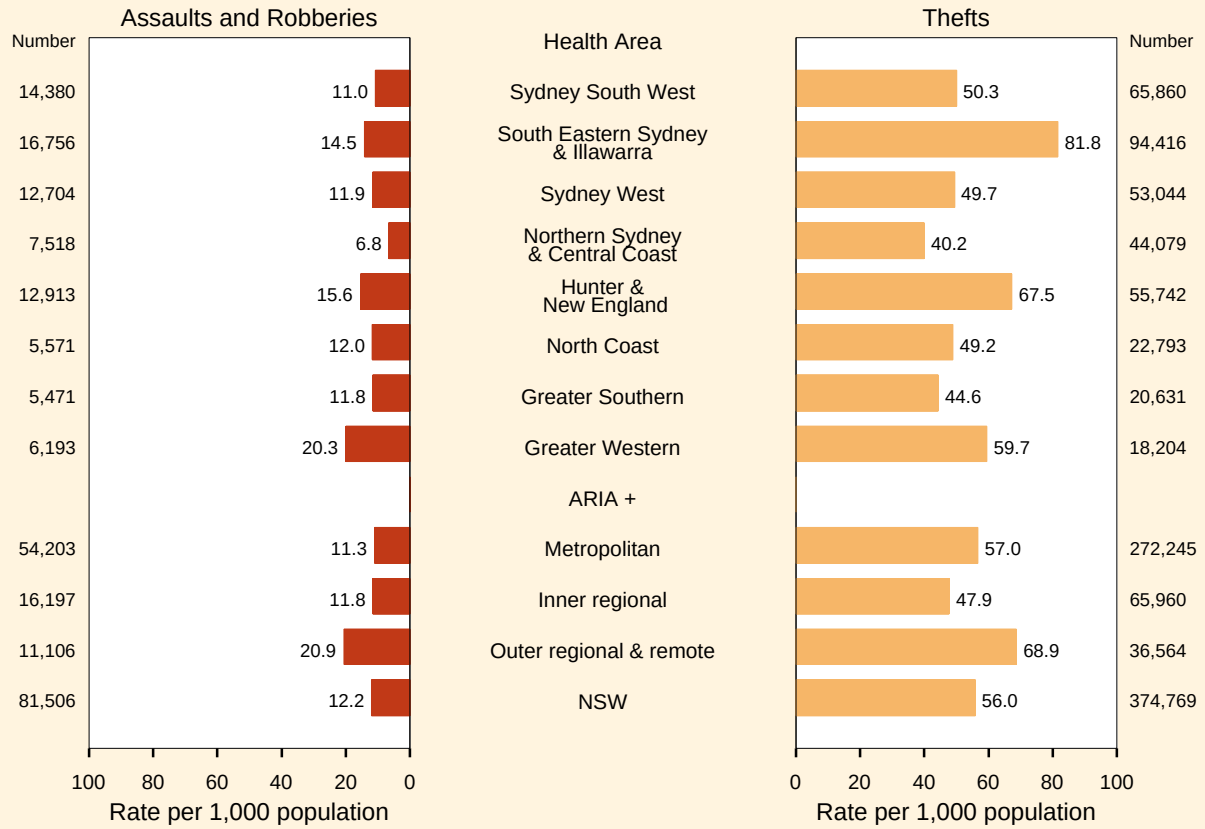
For more information:

King A. *The Cost to Australia of Early School Leaving.* Report commissioned by the Dusseldorp Skills Forum. Canberra: National Centre for Social and Economic Modelling, University of Canberra, 1999.

Australian Bureau of Statistics. *Australian social trends 2004.* Canberra: ABS, 2004.

Australian Bureau of Statistics website at www.abs.gov.au.

Assaults and robberies or thefts reported to police by health area, NSW 2003



Note: The counting units are recorded criminal incidents. A large number of assaults, sexual assaults, and robberies, are not reported to the police.

Source: NSW Recorded Crime Statistics 2003, NSW Bureau of Crime Statistics and Research. Available at www.agd.nsw.gov.au/bocsar1.nsf/pages/crimestatsindex.

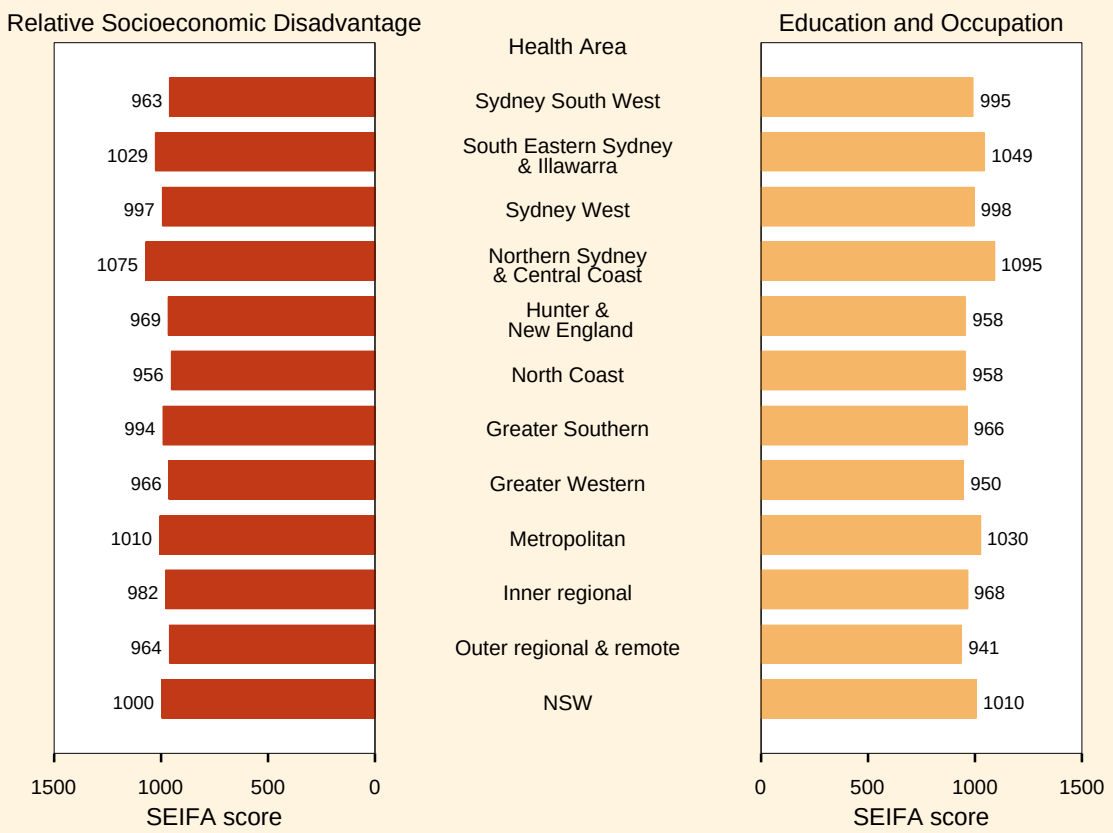
- Crime has adverse effects on health. Personal violence and assault, including domestic violence, has direct short-term and long-term effects on the physical and mental health of its victims and witnesses. Victims of property crime may also suffer psychological harm. Additionally, fear of crime may be a factor that limits some people's enjoyment of life. Crime and ill-health also share common causes. Areas with high crime rates tend to have higher death rates, indicating that the social origins of crime—including social disorganisation, income inequality and low social capital—are also causes of ill-health (Kawachi et al., 1999).
- In 2003, a total of 81,506 assaults and robberies were reported in NSW, giving a rate of 12.2 per 1,000 residents. In the same year, there were 374,769 reported thefts (56 per 1,000 NSW residents). These figures underestimate the true rates of these crimes, because a large number of assaults, sexual assaults, and robberies are not reported to the police. Outer-regional and remote areas (20.9 per 1,000 residents) had rates of assaults and robberies almost twice those in inner-regional (11.8 per 1,000) and metropolitan (11.3 per 1,000) areas. The rate of assaults and robberies ranged from 6.8 per 1,000 in the Northern Sydney & Central Coast Area Health Service to 20.3 per 1,000 in the Greater Western Area Health Service. Outer-regional and remote areas also had the highest rate of thefts (68.9 per 1,000 residents), followed by metropolitan (57 per 1,000) and inner-regional (47.9 per 1,000) areas. The rate of thefts ranged from 40.2 per 1,000 in the Northern Sydney & Central Coast Area Health Service to 81.8 per 1,000 in the South Eastern Sydney & Illawarra Area Health Service.

For more information:

Kawachi I, Kennedy BP and Wilkinson RG. Crime: Social disorganization and relative deprivation. *Soc Sci Med* 1999; 48: 719–731.

Doak P, Fitzgerald J and Ramsay M. *New South Wales recorded crime statistics 2003.* Sydney: NSW Bureau of Crime Statistics and Research, 2004.

Socioeconomic Indices For Areas (SEIFA) scores by health area, NSW 2001



Note: Australian scores are the reference point and are set to 1,000 for each index. Scores for area health services are population-weighted means of the scores of their constituent census collector districts.

Source: ABS Socio-Economic Indices for Areas (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Socio-Economic Indexes for Areas (SEIFA) were constructed by the Australian Bureau of Statistics from 2001 Census of Population and Housing data. These indexes allow comparison of the social and economic conditions across Australia. The reference score for the whole of Australia is set to 1,000. Lower scores indicate lower socioeconomic status (ABS, 2004).
- The graph presents scores for 2 of the SEIFA indexes, the Index of Relative Socioeconomic Disadvantage (IRSD) and the Index of Education and Occupation (EDUOCC). The IRSD combines variables relating to education, occupation, non-English speaking background, indigenous origin, and the economic resources of households. The EDUOCC combines variables relating to occupational classification, unemployment, early school leaving, and lack of educational qualifications (ABS, 2003).
- The Northern Sydney & Central Coast Health Area had the highest scores for both indexes (IRSD 1,075; EDUOCC 1,095), followed by South Eastern Sydney & Illawarra Health Area (IRSD 1,029; EDUOCC 1,049). The most disadvantaged areas were the North Coast Health Area (IRSD 956; EDUOCC 958) and the Greater Western Health Area (IRSD 966; EDUOCC 950).
- For people living in metropolitan areas, IRSD was 1,004 and EDUOCC 1,030, while the corresponding scores for regional and remote areas were IRSD 965 and EDUOCC 940. The highest IRSD score (1,006) was seen for people living in inner-regional areas, although the EDUOCC score for people in these areas was slightly lower than average at 998.
- Trends in a range of health indicators according to IRSD score are presented in the chapter on socioeconomic status.

For more information:

Australian Bureau of Statistics. *Socio-Economic Indexes for Areas, Australia 2001*. ABS Catalogue no. 2039.0. Canberra: ABS, 2003.

Chapter 1.3

The environment

- Human health and the environment are inextricably linked.
- The main contributors to air pollution in cities are industry and motor vehicles and wood-burning heaters. In the last 10 years in Sydney:
  - the number of days on which levels of ozone in the air have exceeded recommended levels has fluctuated;
  - levels of particulate air pollution have peaked at the time of bushfires.
- A range of indicators of the quality of drinking water, and of the water used for recreation, are monitored continuously. Recent testing data indicate that:
  - drinking water supplied by the Sydney and Hunter Water Corporations meets Drinking Water Guidelines and is of good quality;
  - although the overall compliance rate for rural water supplies is high, results from individual supplies vary substantially;
  - the level of fluoride in drinking water supplied by the Sydney and Hunter Water Corporations stayed within the required limits for the majority of samples tested in 2003. Just over two-thirds of the samples in rural water supplies met the fluoride standards in 2003;
  - pesticides have been detected in less than 2% of samples in rural drinking water supplies in recent years, and rarely in samples supplied by the Sydney and Hunter Water Corporations.
- Leaded petrol has been the main source of exposure to lead for most NSW children, except for those living near major sites for lead mining and processing, such as Broken Hill. In recent years:
  - the mean blood lead level of NSW children has dropped significantly, along with sales of leaded petrol;
  - blood lead levels among preschool children living in Broken Hill have declined steadily.
- The Housing for Health program aims to assess, repair, and replace health hardware so that houses are safe and the occupants have the ability to carry out healthy living practices. Surveys conducted on 492 houses 6 months apart identified major improvements in key areas of safety—and facilities such as working showers and laundries—as a result of the program.

In this chapter

Introduction

Human health and the environment are inextricably linked. In rural areas, issues as diverse as land use, agricultural practice, water quality, and biodiversity, all affect human health. Similarly, air and water quality, transport choice, urban form, and environmental health infrastructure underpin the health status of people in the urban and built environments. Increasingly, the effects on human health of global phenomena such as population growth and climate change are also recognised at a local level.

Responsibility for the management of environmental health hazards is deployed across 3 tiers of government. The Commonwealth and States work cooperatively to set environmental standards for drinking water and air quality. In NSW, the NSW Department of Environment and Conservation has carriage of the most important legislation governing controls on air and water quality, chemical hazards, and contaminated land. The NSW Department of Health has specific responsibilities in relation to drinking water, and a miscellany of infectious hazards linked to premises and the built environment including public air conditioning systems, tattooing, and the funeral industry. The NSW Department of Health and public health units in area health services work in partnership with local government to manage these hazards effectively. The NSW Department of Health also manages statewide programs such as the Aboriginal Environmental Health Program, the NSW Drinking Water Monitoring Program, and the Arboviral Disease Program. Increasingly, the NSW Department of Health is becoming involved in assessment of the health effects of major developments within NSW.

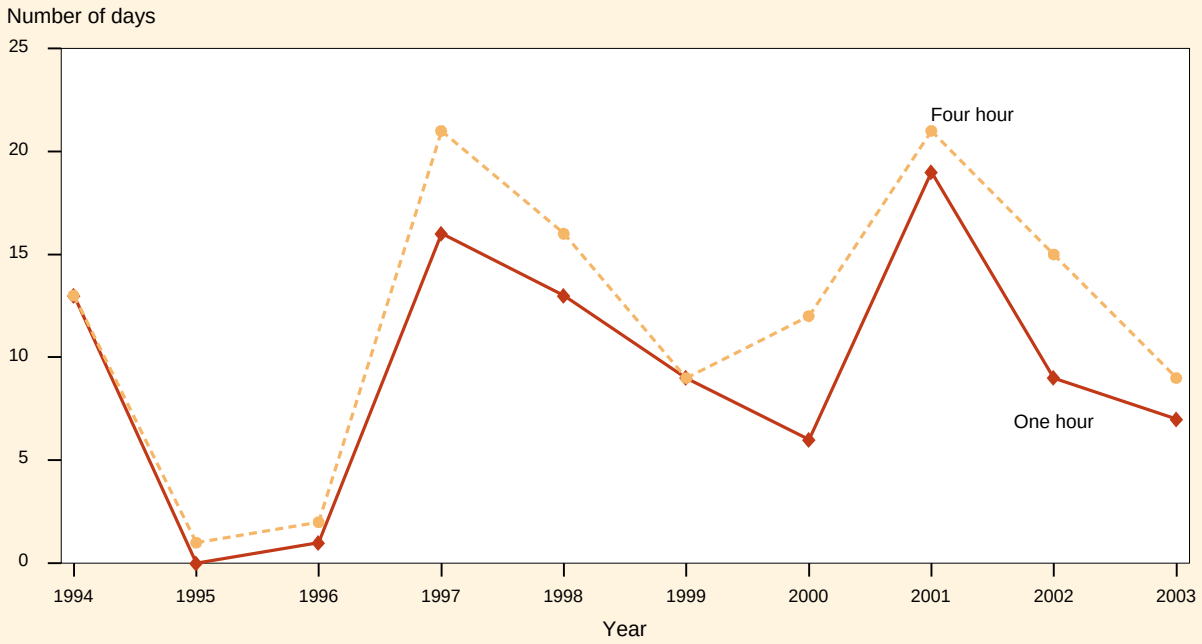
This chapter presents an overview of some important indicators of environmental health status in NSW, including air and water quality, arboviral infections, mesothelioma incidence, and blood lead levels. It has been designed to complement rather than duplicate the comprehensive information presented in the Environment Protection Authority's *New South Wales State of the Environment* reports.

For more information:

NSW Department of Environment and Conservation. *New South Wales State of the Environment 2003.* Sydney: NSW Department of Environment and Conservation, 2003. Available at www.environment.nsw.gov.au/SOE/soe2003/index.htm.

EnHealth Council, which reports to the National Public Health Partnership, is the peak environmental health body in Australia. EnHealth website at http://enhealth.nphp.gov.au.

Days one-hour and four-hour ozone standards exceeded, Sydney, NSW 1994 to 2003



Number of days	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
1 hour	13	0	1	16	13	9	6	19	9	7
4 hour	13	1	2	21	16	9	12	21	15	9

Note: Current national standard for ozone is 0.10 parts per million for a 1-hour average and 0.08 parts per million for a 4-hour average.

Source: NSW Department of Environment and Conservation, incorporating Environment Protection Authority.

- Ozone is a photochemical air pollutant that can affect human health. Ozone causes irritation of the eyes and respiratory tract, and has been associated with increased deaths from and rates of episodes of asthma.
- Ozone in the lower atmosphere is produced from photochemical reactions between oxides of nitrogen (including NO_2) and reactive organic compounds (which are also found in motor vehicle emissions). This reaction is catalysed by sunlight. Ozone contributes to photochemical pollution. Ozone also occurs naturally in the upper atmosphere where it absorbs ultraviolet radiation.
- In Sydney, the number of days when the 1-hour and 4-hour ozone standards have been exceeded has fluctuated, with lowest recordings for both these measures in 1995 and highest recordings in 2001. In 2003, the 1-hour ozone standard was exceeded on 7 days and the 4-hour ozone standard was exceeded on 9 days.
- Weather conditions and events such as bushfires cause much of the annual variability in the number of days on which ozone standards are exceeded. Increasing motor vehicle use may increase average levels of ozone in the longer term.

For more information:

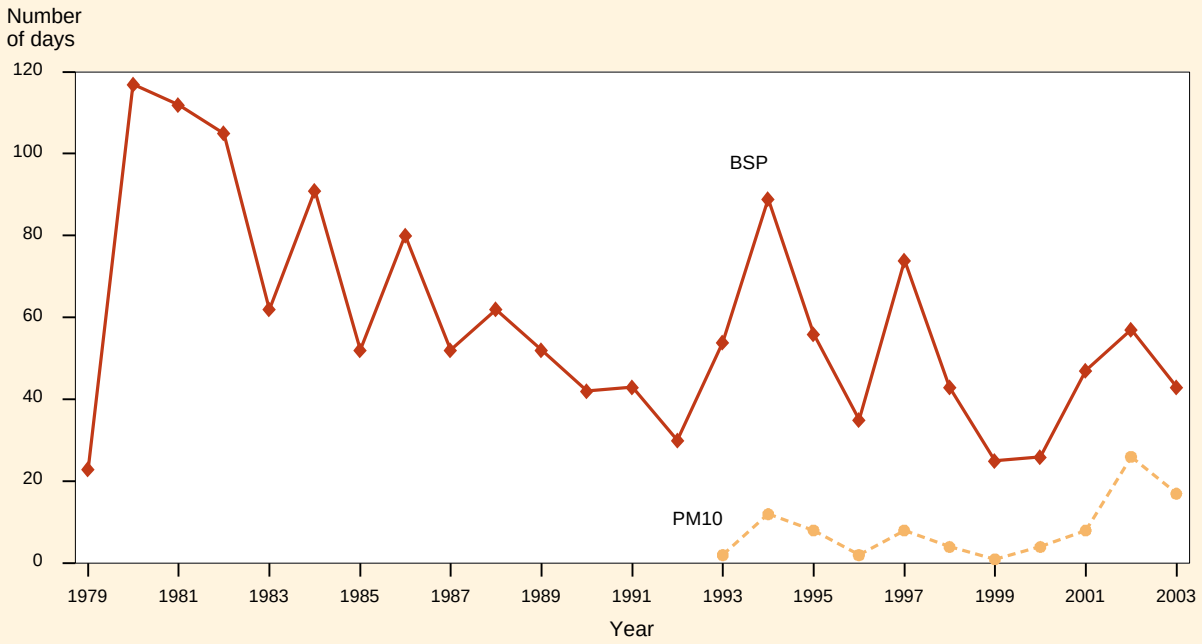
NSW Department of Environment and Conservation. *New South Wales State of the Environment 2003.* Sydney: NSW Department of Environment and Conservation, 2003. Available at www.environment.nsw.gov.au/SOE/soe2003/index.htm.

Jalaludin B, Chey T, O'Toole B, Smith W et al. Acute effects of low levels of ambient ozone on peak expiratory flow rate in a cohort of Australian children. *Int J Epidemiol* 2000; 29: 549–557.

Levy JL, Carrothers TJ, Tuomisto JT, Hammitt JK and Evans JS. Assessing the public health benefits of reduced ozone concentrations. *Environ Health Perspect* 2001; 109: 1215–1226.

The Health and Air Research Program newsletters, NSW Department of Health website at www.health.nsw.gov.au/public-health/ehb/harp/harp.html.

Days visibility and atmospheric fine particle standards exceeded, Sydney region, NSW 1979 to 2003



Note: BSP = particles that backscatter light. The NSW standard for visibility is < 2.1 BSP units (equivalent to a visibility of 9 km). PM_{10} = particulate material less than 10 micrometres in diameter. The standard for PM_{10} is 50 micrograms per cubic metre averaged over 24 hours. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Department of Environment and Conservation, incorporating Environment Protection Authority.

- Associations between levels of atmospheric particles, daily mortality, hospital admissions for cardiac disease, and respiratory symptoms, have been found in cities around the world. Studies in the United States have also found that people living in cities with high particle pollution levels are more likely to die of lung cancer or heart-lung conditions (Pope et al., 2002.
- Recent work has demonstrated that particle pollution is absorbed from the lungs into the blood and from there affects the heart, either directly or through inflammatory effects (Yeates and Mauderly, 2001).
- The major sources of particle pollution in urban areas are wood combustion for domestic heating and motor vehicles, particularly diesel-powered. Improvements in particle levels were seen in the 1980s, due to the elimination of backyard burning and emission controls on vehicles. However, there has not been a clear trend over the last 10 years. The peaks seen in the 90s were in years of major bushfires.
- Rural areas in NSW may experience high particle levels in winter related to wood heater use. Wood heater use and smoking also increase particle levels inside homes. The NSW Department of Environment and Conservation is trialling a wood heater buy back program in some rural towns.
- Atmospheric particles can be measured in terms of visibility (due to scattering of light by particles) or the actual ambient concentration of particles, expressed as concentration of PM_{10} (particulate matter of less than 10 micrometres in diameter). The National Environment Protection Council set a national PM_{10} standard in 1998, and an advisory reporting standard for a finer fraction of particles ($PM_{2.5}$) was set in 2003.

For more information:

NSW Department of Environment and Conservation. *New South Wales State of the Environment 2003.* Sydney: NSW Department of Environment and Conservation, 2003. Available at www.environment.nsw.gov.au/SOE/soe2003/index.htm.

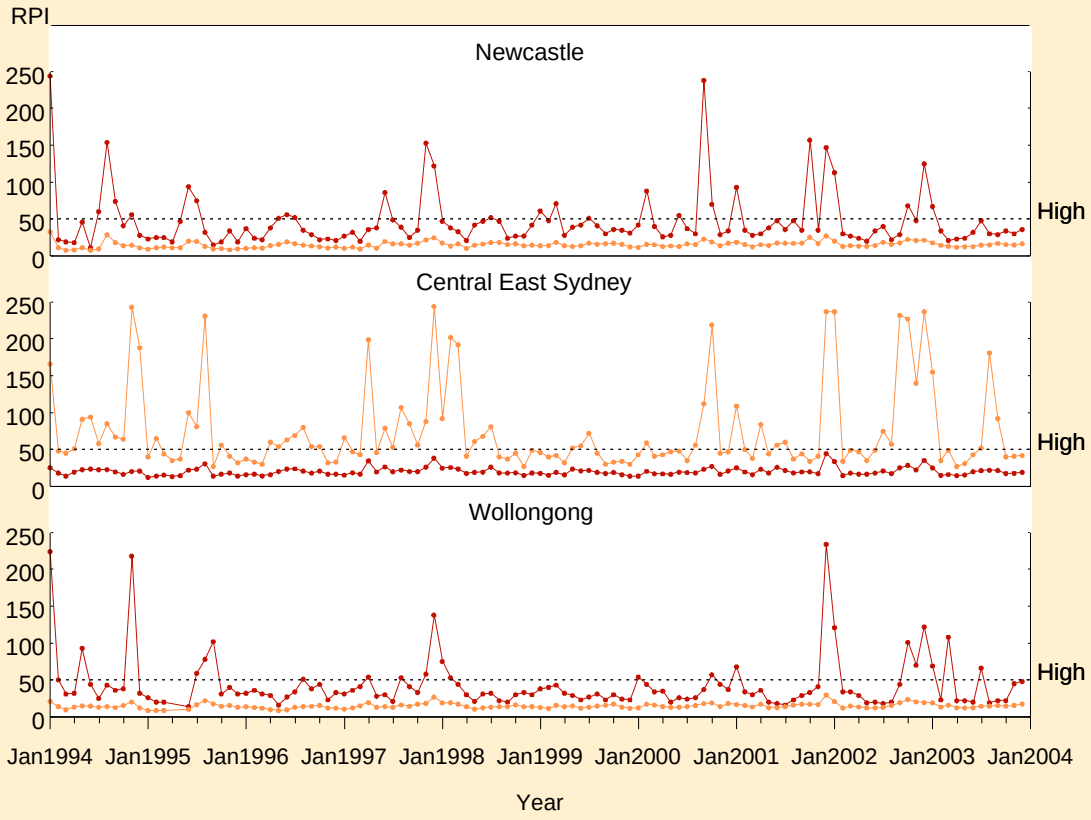
Morgan G, Corbett S, Wlodarczyk J. Air Pollution and Hospital Admissions in Sydney, Australia, 1990 to 1994. *Am J Public Health* 1998; 88: 1761–66.

Morgan G, Corbett S, Wlodarczyk J, Lewis P. Air Pollution and Daily Mortality in Sydney, Australia, 1989 through 1993. *Am J Public Health* 1998; 88: 759–764.

Pope CA, Burnett RT, Thun MJ, Calle EE et al. Lung cancer, cardiopulmonary mortality and long-term exposure to fine particulate air pollution. *JAMA* 2002; 287: 1132–1141.

Yeates DB and Mauderly JL (editors). Inhaled Enviromental–Occupational Irritants and Allergens: Mechanisms of Cardiovascular and Systemic Responses. *Environ Health Perspect* 2001; 109(S–4).

Regional Pollution Index monthly maximum and monthly mean, Sydney, Newcastle and Wollongong regions, NSW 1994 to 2003



Note: RPI data is reported twice daily on the NSW Department of Environment and Conservation website. This graph shows the monthly maximum and monthly mean RPI. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

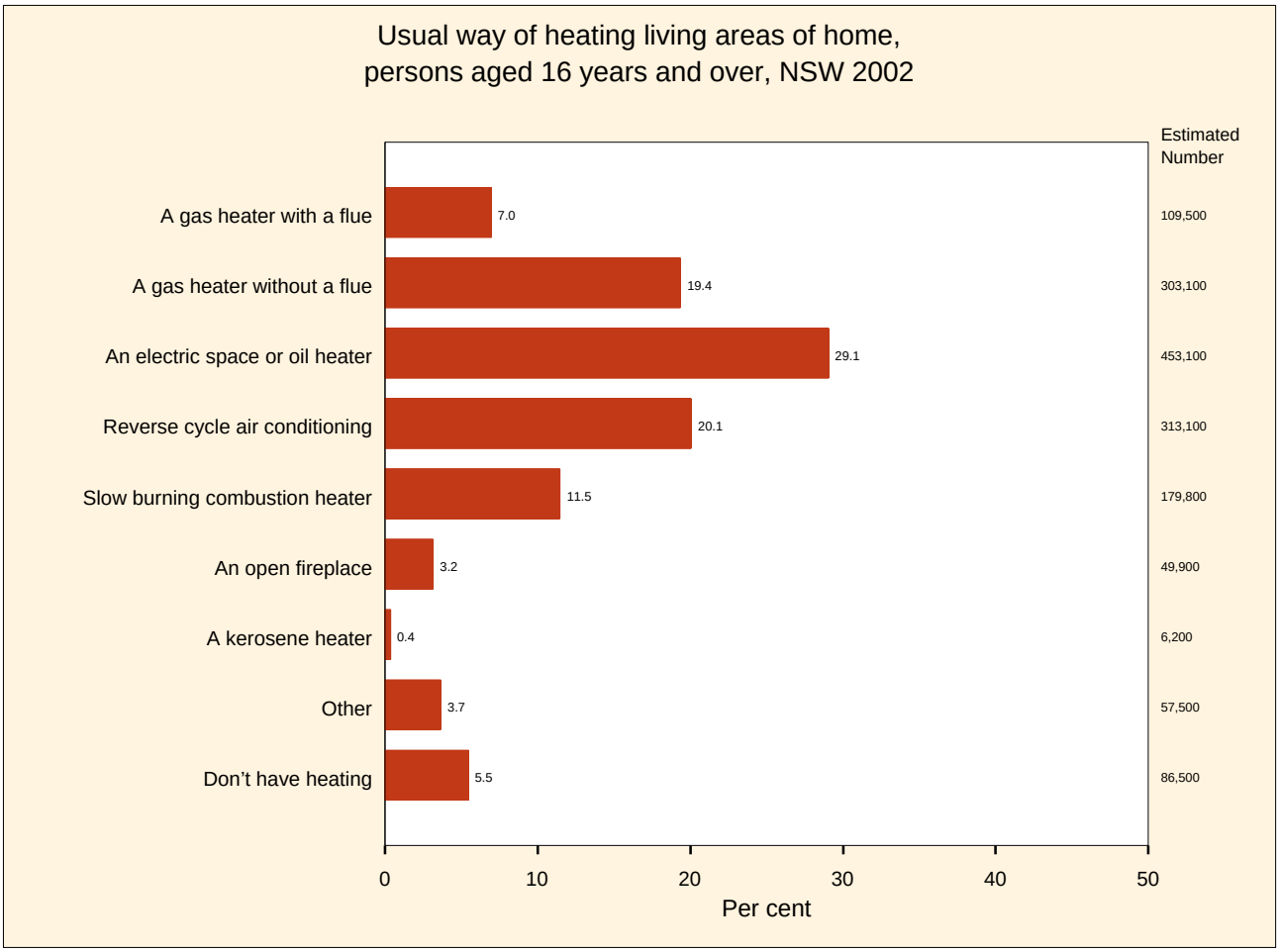
Source: NSW Department of Environment and Conservation, incorporating Environment Protection Authority.

- The regional pollutant index (RPI) has been developed by the NSW Department of Environment and Conservation to provide twice daily reporting of pollutant levels in Sydney, Lower Hunter, and Illawarra. The RPI is produced for 3 regions in Sydney (Central Eastern Sydney, North Western Sydney, and South Western Sydney); 3 sites in the Lower Hunter (Newcastle, Wallsend, and Beresfield); and 2 sites in The Illawarra (Wollongong and Albion Park).
- The RPI is based on 3 pollutants: fine particles (measured by visibility), nitrogen dioxide, and ozone. The RPI reports on the highest pollutant that has exceeded its standard. A high RPI indicates that at least one of the 3 pollutants has exceeded its goal during the reporting period. Using information about forecast weather conditions, the NSW Department of Environment and Conservation also provides a forecast of pollution levels for the Sydney region the following day.
- The very high levels shown on the graphs are mainly associated with bushfires. The usual contributors to air pollution in these 3 cities are industry and motor vehicles, with significant contributions from wood heaters overnight in the winter.
- The NSW Government's 25-year air quality management plan, *Action for Air*, was reviewed in 2001. An important action identified for NSW Health was the promotion of 'active transport'. Active transport includes walking, cycling, and using public transport instead of private vehicles. This not only generates less pollution but also improves health through increased physcial activity.

For more information:

NSW Department of Environment and Conservation. *New South Wales State of the Environment 2003.* Sydney: NSW Department of Environment and Conservation, 2003. Available at www.environment.nsw.gov.au/SOE/soe2003/index.htm.

NSW Environment Protection Authority. *Action for Air.* Sydney: EPA, 1998. Available at www.environment.nsw.gov.au/air/actionforair/index.htm.



Note: Estimates based on 3,398 respondents. 9 (0.26%) not stated (Don't Know or Refused) for the usual way they heat the living areas of their home.

Source: NSW Health Survey 2002 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Burning fuels (like natural gas or wood) in the home releases products of combustion, which include water vapour, carbon monoxide, and other gases. In homes where this occurs, it is important to ensure adequate ventilation and proper maintenance of appliances (NSW Department of Health, 2003 and 2004).
- A recent study of school children aged 8–11 years in Belmont, NSW, showed that being exposed to fume-emitting heaters in the first year of life was associated with an increased risk of asthma symptoms (Phoa et al., 2004). The study authors conclude that, if confirmed in other settings, this finding would require a review of the range of heating types that are appropriate for use in households in which young children live.
- Unflued gas heaters and open wood fires are 2 sources of home heating that release products of combustion. The 2002 NSW Health Survey included questions about the usual methods for heating homes. Respondents to this survey reported that unflued gas heating was the usual method for 19.4% of homes, and open wood-fires were used by 3.2% of homes.

For more information:

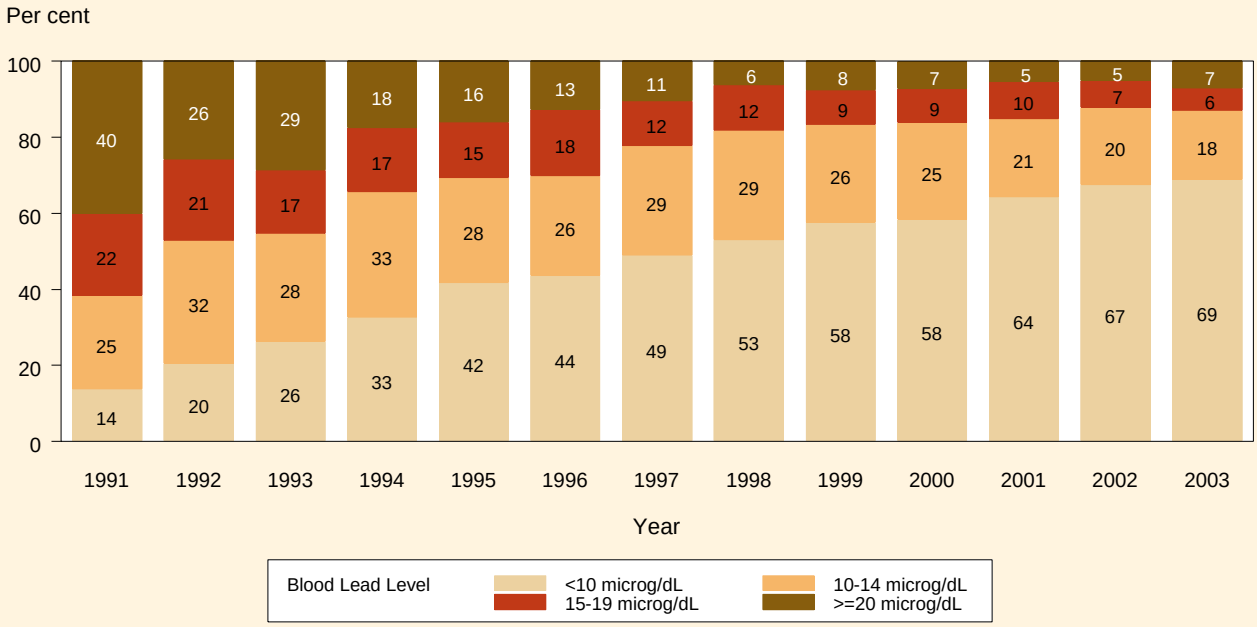
Phoa LL, BG Toelle, Ng K, Marks GB. Effects of gas and other fume emitting heaters on the development of asthma during childhood. *Thorax* 2004; 59(9): 741–5.

NSW Department of Environment and Conservation. *New South Wales State of the Environment 2003.* Sydney: NSW Department of Environment and Conservation, 2003. Available at www.environment.nsw.gov.au/SOE/soe2003/index.htm.

NSW Department of Health. *Wood smoke from wood-fired home heaters.* Sydney: NSW Department of Health, 2003.

NSW Department of Health. *Unflued gas heaters.* Sydney: NSW Department of Health, 2004.

Blood lead levels in children aged 1 to 4 years, Broken Hill, NSW 1991 to 2003



Note: NHMRC recommended standard is 10 micrograms per decilitre (microg/dL) or less.

Source: Broken Hill Child and Family Centre, Lead Program.

- Once absorbed into the body, lead can impair children's mental and physical development. The National Health and Medical Research Council (NHMRC) goal is to achieve a blood lead level of less than 10 micrograms per decilitre (microg/dL).
- Small children engaging in hand–mouth activity are particularly at risk of ingesting lead. Lead soot on eating utensils and flakes of lead paint in soil or house dust may be sources of lead. The removal of lead from petrol has been associated with significant decreases in air lead levels in Sydney, largely removing this source of exposure.
- Broken Hill, North Lake Macquarie, and Port Kembla have been the major sites of lead mining and processing in NSW. Broken Hill was one of the world's largest lead mines. Natural deposition, and lead mining and smelting, have left lead contamination throughout the city.
- The NSW Lead Management Action Plan established the Lead Reference Centre and Environmental Lead Centres in Broken Hill and North Lake Macquarie. Their activities have included: blood lead monitoring and case management, collaboration with the NSW Department of Environment and Conservation and industry to reduce emissions, removal of lead contaminated soil and house dust, and community education.
- There has been a steady decline in blood lead levels among preschool children (1–4 years) living in Broken Hill over recent years. The percentage of children in Broken Hill with blood lead levels in the recommended range has increased from 14% in 1991 to 69% in 2003. The NSW Government is funding an integration strategy in Broken Hill to incorporate the monitoring of blood lead levels in children, case management, and lead education into the early childhood services in Broken Hill.
- Elevated blood lead levels became a notifiable condition in NSW in 1997. Most notifications in children are from known contaminated areas, or are associated with home renovations in inner-Sydney.

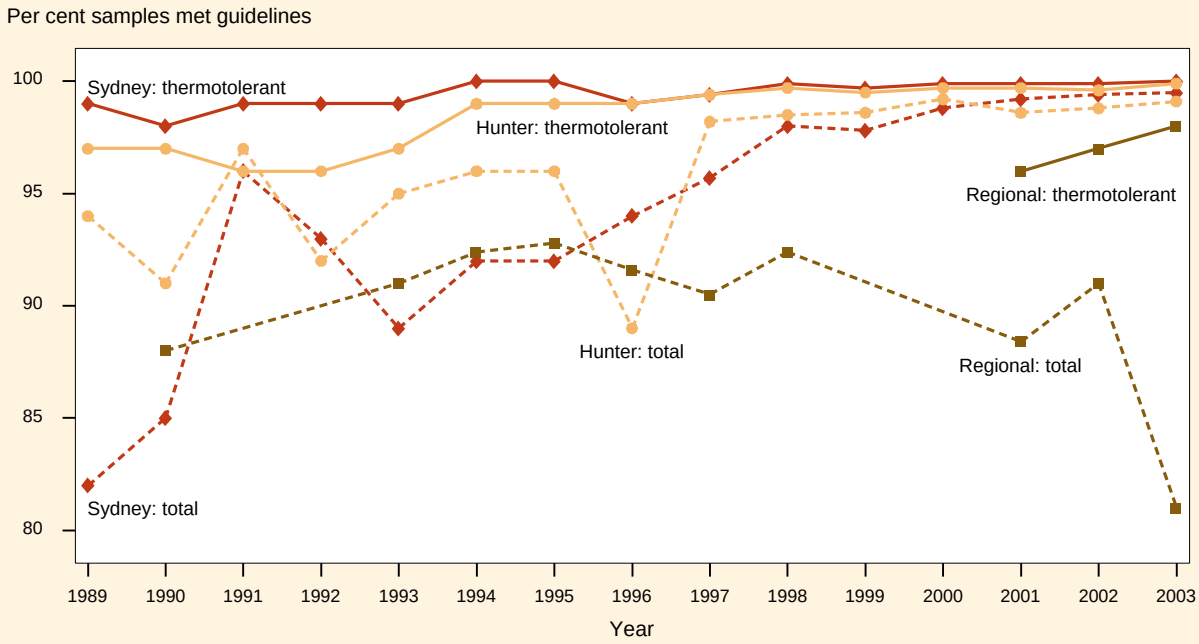
For more information:

Lyle D, Balding B, Burke H, Bragg S. NSW lead management program in Broken Hill. *N S W Public Health Bull* 2001; 12(6):165–167.

National Health and Medical Research Council. *Lead in Australians. Summary statement of the 115th session of the NHMRC, 2 June 1993, regarding revision of the 1987 guidelines for lead in Australians.* Canberra: NHMRC, 1993.

The NSW Department of Environment and Conservation Lead Reference Centre. Available at www.environment.nsw.gov.au/leadsafe/publications.htm.

Thermotolerant and total coliform counts in drinking water, Sydney, Hunter and regional water supplies, NSW 1989 to 2003



Note: Results for regional total coliform counts are for financial years and are for all regional (rural and remote) water supplies as a whole. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: Sydney Water and Hunter Water Corporations' Quarterly Reports and NSW Health Drinking Water Monitoring Program Database.

- Drinking water supplies in NSW are monitored for possible faecal contamination. Monitoring is performed by water supply authorities with oversight by the NSW Department of Health. *E. Coli* or thermotolerant coliforms are used as the primary indicator species, and total coliforms are a secondary indicator. The presence of these organisms in the water supply may indicate the presence of pathogenic microorganisms.
- The NHMRC–ARMCANZ Australian Drinking Water Guidelines state that 98% of samples should contain no *E. coli* or thermotolerant coliforms, and that 95% of samples should contain no total coliforms. Water testing results from the Sydney and Hunter Water Corporations indicate that drinking water meets the Guidelines and is of good quality.
- The Drinking Water Monitoring Program was introduced by the NSW Department of Health in October 2000 to provide a framework for regional and rural water suppliers. Under the program, the Department offers free drinking water analysis to local councils for public water supplies through the Division of Analytical Laboratories.
- The NSW Drinking Water Database stores information and monitoring results for regional and rural water supplies. It has been operational since 1 January 2001 and microbiological compliance monitoring results are entered on a weekly basis.
- In rural and regional areas, water supplies achieved a 97% compliance rate for thermotolerant coliforms in 2002 and a 98% compliance in 2003. Compliance with Guideline recommendations for monitoring frequency varies widely throughout the State.

For more information:

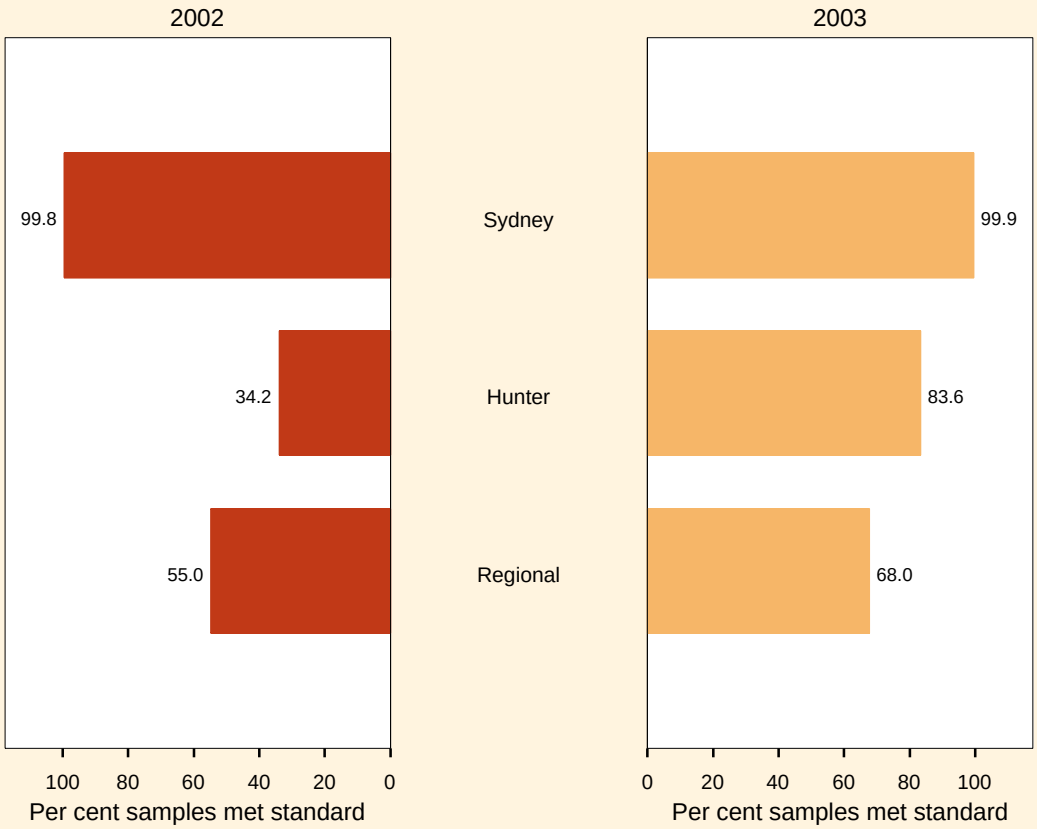
NSW Department of Environment and Conservation. *New South Wales State of the Environment 2003.* Sydney: NSW Department of Environment and Conservation, 2003. Available at www.environment.nsw.gov.au/SOE/soe2003/index.htm.

National Health and Medical Research Council and Agricultural Resource Management Council of Australia and New Zealand. *Australian Drinking Water Guidelines 2001.* Canberra: NHMRC, 2001. Available at www.health.gov.au/nhmrc/publications/synopses/eh19syn.htm.

The Sydney Water Corporation website at www.sydneywater.com.au.

The Hunter Water Corporation website at www.hwc.com.au.

Fluoridation of drinking water, samples within operating range, Sydney, Hunter and regional water supplies, NSW 2002 to 2003



Note: The *Fluoridation Code of Practice* specifies that samples should be within the range of 0.9–1.5 mg/L.

Source: Sydney Water and Hunter Water Corporations' Quarterly Reports and NSW Health Drinking Water Monitoring Program Database.

- Fluoridation of drinking water reduces dental caries. It is carried out under the provisions of the *NSW Fluoridation of Public Water Supplies Act 1957*.
- Under the Act, water supply authorities are responsible for fluoridating water, for daily testing of fluoride concentration, and for submitting results of testing to the NSW Department of Health.
- Optimal benefit is achieved with a dose of approximately 1.0 milligram of flouride per litre of water (mg/L). Increasing the dose above 1.0 mg/L leads to rapidly decreasing additional dental health benefits, with no measurable benefit beyond 1.5 mg/L.
- The Code of Practice for the Fluoridation of Public Water Supplies requires that greater than 95% of all routine fluoride samples fall within the fluoride concentration operating range of 0.90 mg/L to 1.50 mg/L.
- Water testing results from Sydney Water Corporation indicate that 99.8% and 99.9% of routine fluoride samples were within the fluoride concentration operation range for the years 2002 and 2003 respectively.
- In December 2002, Hunter Water Corporation increased its target dose rate for fluoride from 0.9 mg/L to 1mg/L to achieve optimal benefit. The improvement from a 34% compliance rate in 2002 to 84% in 2003 demonstrates this change. In rural and regional water supplies that fluoridate, the compliance rate increased from 55% in 2002 to 68% in 2003.

For more information:

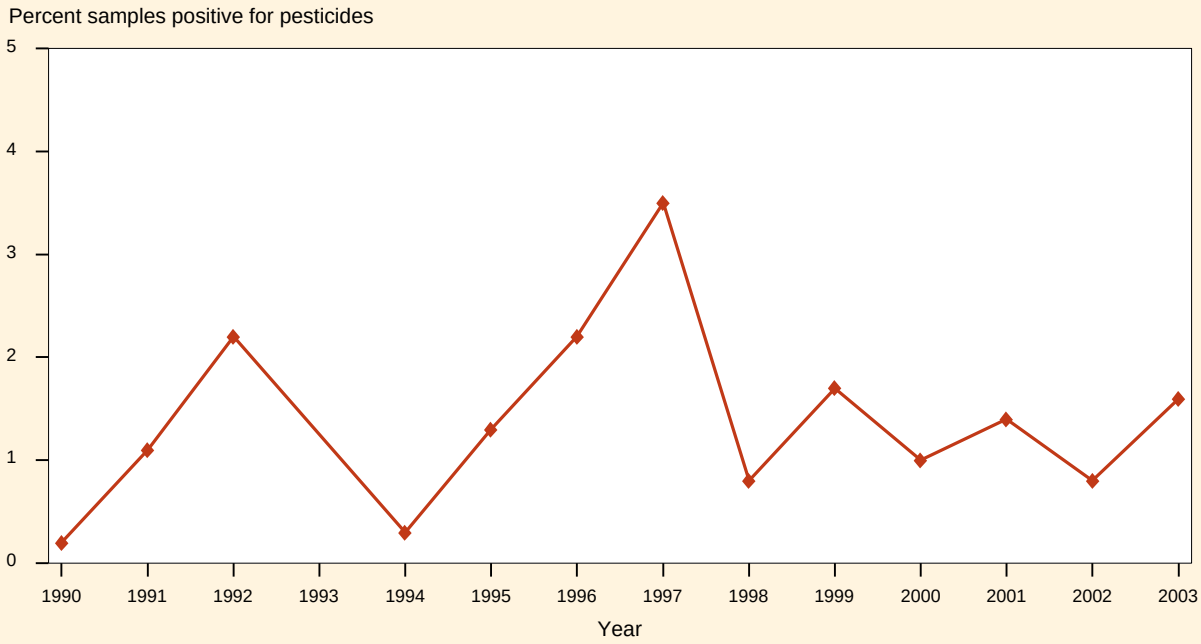
NSW Department of Environment and Conservation. *New South Wales State of the Environment 2003*. Sydney: NSW Department of Environment and Conservation, 2003. Available at www.environment.nsw.gov.au/SOE/soe2003/index.htm.

National Health and Medical Research Council and Agricultural Resource Management Council of Australia and New Zealand. *Australian Drinking Water Guidelines 2001*. Canberra: NHMRC, 2001. Available at www.health.gov.au/nhmrc/publications/synopses/eh19syn.htm.

The Sydney Water Corporation website at www.sydneywater.com.au.

The Hunter Water Corporation website at www.hwc.com.au.

Pesticides in regional drinking water supplies
NSW 1990 to 2003



Note: The NHMRC–ARMCANZ Australian Drinking Water Guidelines 1996 (updated 2001) specify permissible levels of different pesticides in drinking water. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

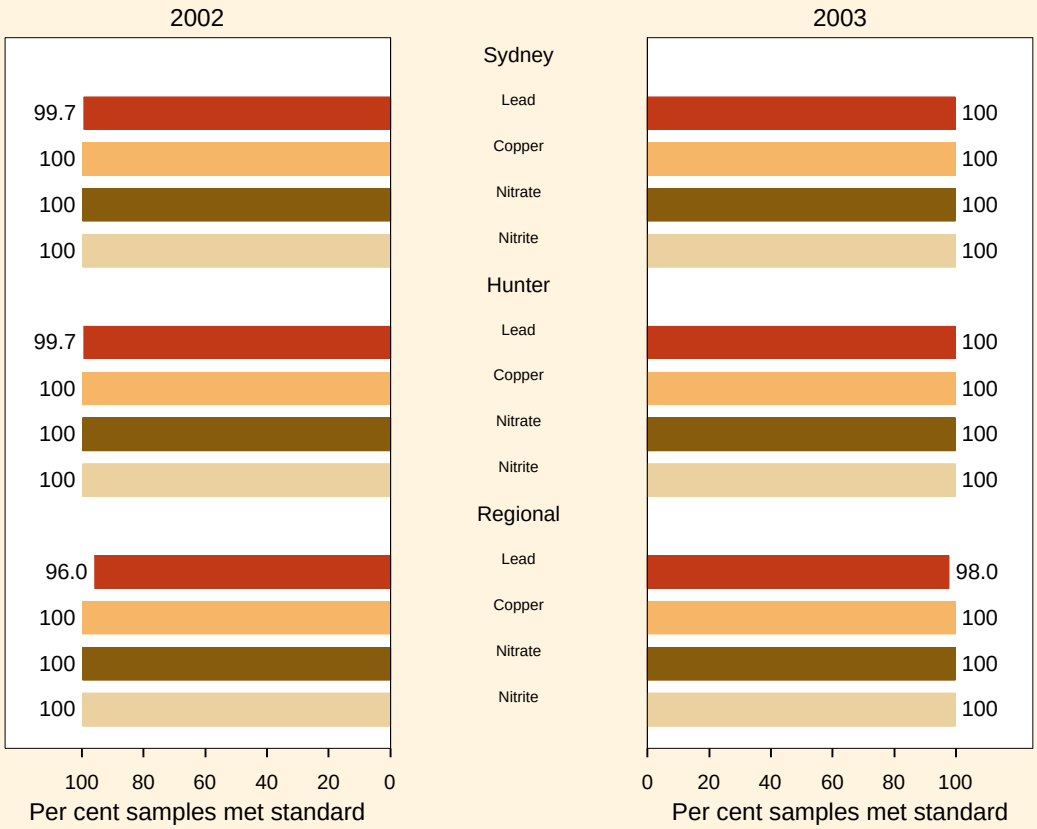
Source: Sydney Water and Hunter Water Corporations' Quarterly Reports and NSW Health Drinking Water Monitoring Program Database.

- Pesticides include many different agricultural chemicals, such as insecticides, herbicides, and other classes of chemicals. Some chemicals may be authorised for use in water or water catchment areas; otherwise their presence in drinking water or catchment areas indicates contamination.
- Results from Sydney Catchment Authority, and the Sydney Water and Hunter Water Corporations indicate that pesticides were not detected in raw water sources or water supplied to customers between 1990 and 2001. In 2002 and 2003, pesticides were detected in 0.01% and 0.02% of samples collected by the Sydney Catchment Authority and the Sydney Water Corporation. Pesticides were not detected in samples collected by the Hunter Water Corporation in 2002, but were detected in 1.5% of samples collected in 2003. No samples, however, exceeded the Australian Drinking Water Guidelines (NHMRC, 2001).
- Since 1999, the program monitoring for pesticides in NSW regional and rural water supplies occured through targeted surveys in 5–6 local government areas or catchments each year. The council or water supply authority conducts the sampling and testing is undertaken by the NSW Department of Health. Water supply authorities not participating in this program are expected to carry out sufficient monitoring to satisfy themselves that their water supply is not at risk of pesticide contamination.
- In 2002 and 2003, 849 samples were collected and analysed for pesticides in regional and rural NSW. Pesticides were detected in only 10 of these drinking water samples, and all results satisfied the Australian Drinking Water Guidelines (NHMRC, 2001).

For more information:

National Health and Medical Research Council and Agricultural Resource Management Council of Australia and New Zealand. *Australian Drinking Water Guidelines 2001*. Canberra: NHMRC, 2001. Available at www.health.gov.au/nhmrc/publications/synopses/eh19syn.htm.

Inorganic chemicals in drinking water, Sydney, Hunter and regional water supplies, NSW 2002 to 2003



Note: The NHMRC–ARMCANZ Australian Drinking Water Guidelines 1996 (updated 2001) specify permissible levels of inorganic chemicals affecting health in drinking water.

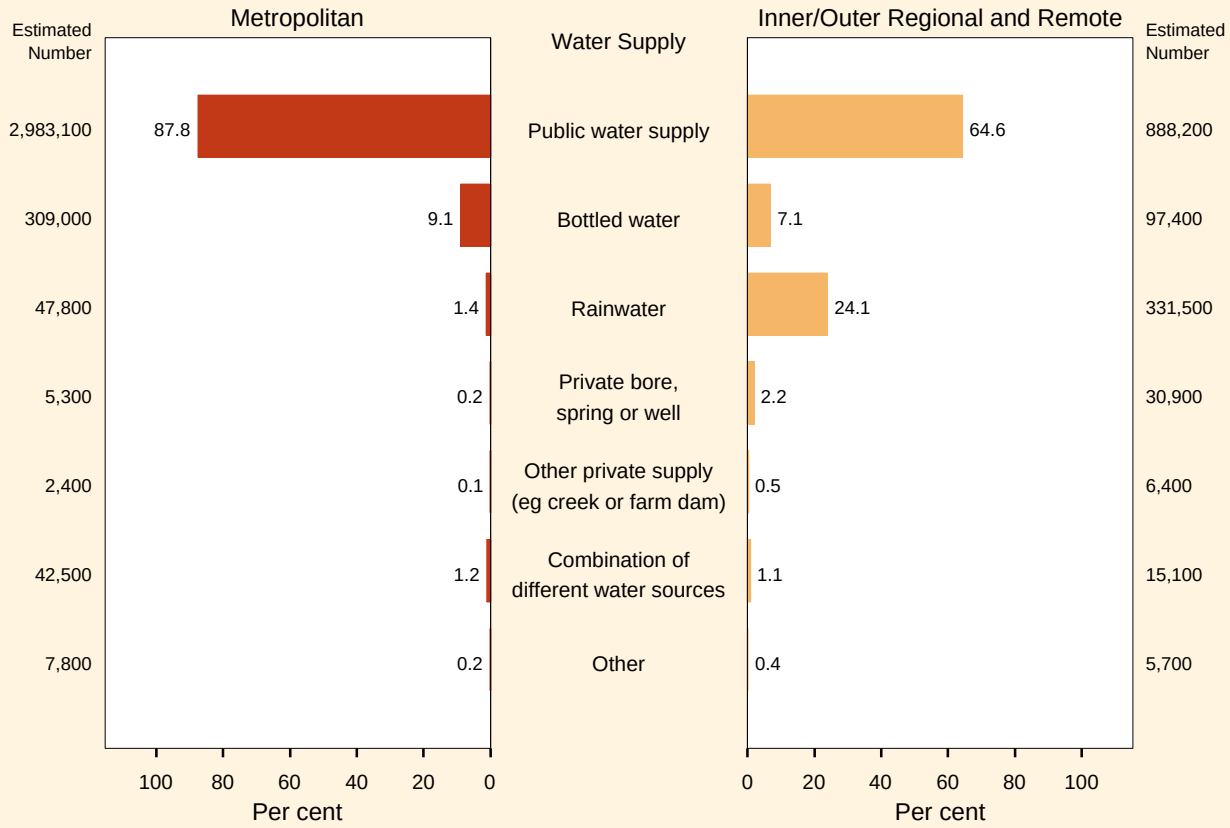
Source: Sydney Water and Hunter Water Corporations' Quarterly Reports and NSW Health Drinking Water Monitoring Program Database.

- Drinking water supplies in NSW are monitored for contamination with several inorganic chemicals that may present health concerns or aesthetic issues.
- Lead is a cumulative poison that can severely affect the central nervous system. Lead may be present in drinking water as a result of the corrosion of household plumbing. It is recommended that the concentration of lead in drinking water should not exceed 0.01 mg/L, and performance is considered acceptable if 95% of results meet this value (NHMRC, 2001).
- Water testing results from Sydney Water and Hunter Water Corporations indicate that the lead guideline was met in 99.7% of samples taken in 2002 and 100% of samples taken in 2003. In rural and regional NSW, the lead guideline was met in 96% and 98% of samples in 2002 and 2003 respectively.
- In high concentrations, copper may cause gastrointestinal symptoms. Water with low pH and hardness may cause corrosion of copper pipes and fittings, increasing the concentration of copper in drinking water. The concentration of copper in drinking water should not exceed 2.0 mg/L (NHMRC, 1996).
- Intensification of farming practices and sewage effluent disposal to streams have led to increasing amounts of nitrate in some waters. Toxicity of nitrate to humans is due to its reduction to nitrite, which affects the transportation of oxygen to the tissues. The NHMRC recommends that the concentration of nitrate and nitrite in drinking water should not exceed 50 mg/L and 3 mg/L respectively (NHMRC, 2001).
- Water testing results from Sydney Water Corporation, Hunter Water Corporation, and regional and rural water supplies, indicate that these guidelines for copper, nitrate, and nitrite were met in 100% of samples in 2002 and 2003.

For more information:

National Health and Medical Research Council and Agricultural Resource Management Council of Australia and New Zealand. *Australian Drinking Water Guidelines 2001.* Canberra: NHMRC, 2001. Available at www.health.gov.au/nhmrc/publications/synopses/eh19syn.htm.

Usual source of drinking water by type and location, persons aged 16 years and over, NSW 2003



Note: Estimates based on 3,759 respondents. 2 (0.05%) not stated (Don't Know or Refused).

Source: NSW Health Survey 2003 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Most people in NSW receive good quality drinking water that is safe to drink. Public drinking water supplies in NSW are monitored routinely. In regional areas, local councils supply and monitor drinking water. There are many more tests conducted on tap water than bottled water (NSW Department of Health, 2002).
- In the 2003 NSW Health Survey, participants were asked about their usual source of drinking water.
- In metropolitan areas, 87.8% of people stated that they obtained their drinking water from a public water supply; 9.1% from bottled water; 1.4% from rainwater; 1.2% from a combination of sources; and less than 1% from a private bore, well, spring or other private supplies (such as creeks or farm dams), or other sources.
- In inner- and outer-regional areas and remote areas, 64.6% of people obtained their drinking water from a public water supply; 24.1% from rainwater; 7.1% from bottled water; 2.7% from a private bore, well, spring or other private supplies (such as creeks or farm dams); and 1.1% a combination of sources.

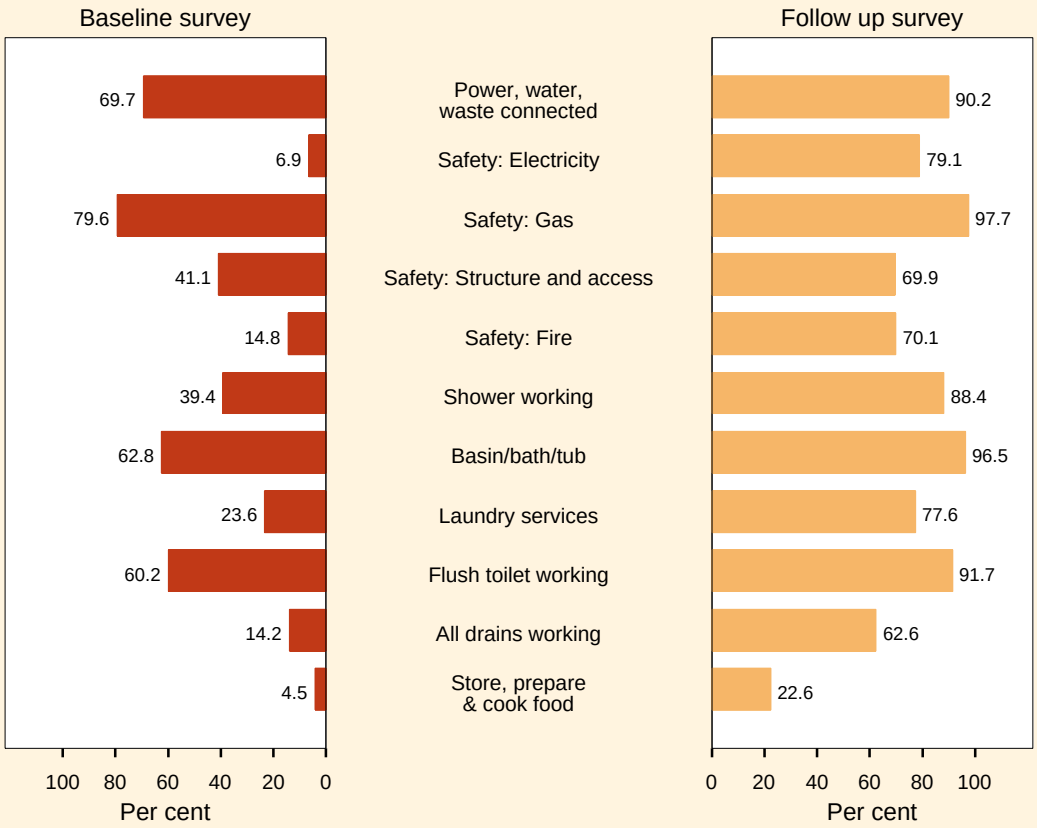
For more information:

NSW Department of Health. *Drinking water and public health*. Sydney: NSW Department of Health, 2002.

NSW Department of Health. Water Quality and Health website at www.health.nsw.gov.au/public-health/ehb/water/drinkwater.html.

Centre for Epidemiology and Research, NSW Department of Health. New South Wales Adult Health Survey 2003. *N S W Public Health Bulletin* 2004; 15(S-4).

Healthy Living Practices implementation by type of practice, houses in selected Indigenous communities, NSW 2003



Note: Follow up survey is conducted 6–12 months after the baseline survey. 492 houses were included in analysis. 88 houses had gas connected and were assessed for gas safety.

Source: Healthy Living Practices baseline and follow up surveys, Environmental Health Branch, NSW Department of Health.

- The Housing for Health program aims to assess, repair or replace health hardware so that houses are safe and the occupants have the ability to carry out healthy living practices. It aims to improve the health status of Aboriginal people, particularly children. Housing for Health has been delivered to Aboriginal communities in NSW through the Aboriginal Communities Development Program. Between 1998 and 2003, 20 community projects have been conducted under this program.
- Two surveys were conducted on 492 houses in remote communities in NSW 6 months apart. The first survey involved the simultaneous collection of data that identified problems in the key areas of Safety (electrical, gas, structural, and fire) and Healthy Living Practices (including facilities for washing people, washing clothes, removing sewage and waste, and improving nutrition), and on-the-spot maintenance. This was followed by a capital works program and follow-up survey to assess improvements, and a further maintenance program.
- Between the 2 surveys, major improvements were demonstrated in houses in Safety: 20.5% improvement in power, water and waste connection, 72.2% improvement in electrical safety, just under 30% improvement in structural safety; and in Healthy Living Practices: 31.5% improvement in flushing toilets working, more than 50% improvement in laundry services, and 49% improvement in working showers. The worst area in both surveys was having functioning facilities to store, prepare, and cook food adequately (4.5% of houses achieved the required standard in the first survey but only 22.6% achieved the standard in the second survey).

For more information:

Pholeros P, Rianow S, Torzillo P. *Housing for Health: Towards a Health Living Environment for Aboriginal Australia.* Healthabitat: Newport Beach, 1993.

Commonwealth Department of Family and Community Services. *National Indigenous Housing Guide* (2nd edition). Canberra: Commonwealth of Australia, 2003.

Chapter 1.4

Health-related behaviours

- Unhealthy behaviours contribute significantly to the burden of death and ill-health in NSW. For example:
  - smoking causes more than 6,500 deaths and more than 55,000 hospitalisations each year;
  - use of alcohol causes around 1,500 deaths and more than 37,000 hospitalisations each year.
- Among adults in 2003:
  - 25% of men and 19% of women were current smokers;
  - 56% of men and 41% of women were overweight or obese;

  while only:
  - 50% of men and 41% of women were adequately physically active;
  - 39% of men and 53% of women ate adequate quantities of fruit;
  - 12% of men and 27% of women ate adequate quantities of vegetables.
- Among secondary school students aged 12–16 years in 2003:
  - 12% of boys and 15% of girls smoked in the previous week;
  - 31% of boys and 28% of girls consumed alcohol in the previous week;
  - 24% of boys and 19% of girls had used cannabis at least once;

  and only:
  - 52% of boys and 30% of girls usually wore a hat in the sun;
  - 35% of boys and 46% of girls usually use a sunscreen.
- Among children aged up to 12 years in 2001:
  - 93% ate adequate quantities of fruit, but much of this is in the form of fruit juice, which is high in sugar;
  - 13% ate adequate quantities of vegetables.
- Encouragingly, though:
  - smoking rates have declined among both men and women since 1977;
  - in 2002–03, for both sexes, the number of ex-smokers was greater than the number of current smokers;
  - smoking rates and cannabis use in secondary school students have continued to decline since 1996;
  - the death rate from heroin overdose has declined steeply since 1999.

In this chapter

- Physical activity in adults
- Physical activity in secondary school students
- Overweight and obesity in adults
- Perception of weight in secondary school students
- Fruit and vegetable consumption in adults
- Fruit and vegetable consumption in secondary school students
- Fruit and vegetable consumption in children
- Food insecurity by socioeconomic status
- Sun protection in secondary school students
- Hat type worn by secondary school students
- Smoking status
- Smoking in adults
- Quitting smoking
- Attitudes to smoking bans
- Smoking in secondary school students
- Death and illness attributable to smoking
- Alcohol use in adults
- High risk alcohol use by rurality
- Alcohol use in secondary school students
- Alcohol-related motor vehicle crashes
- Death and illness attributable to alcohol
- Substance use in secondary school students
- Cannabis use in secondary school students
- Deaths from opiates and psychostimulants
- Ambulance attendances for drug overdose
- Methadone program use
- Condom use with casual partners

Introduction

Good health enhances the quality of life and benefits the community. The opportunity to participate in and contribute to society is maximised in a healthy population. Organisational, economic, and environmental factors have major influences on the health of individuals. However, health-related behaviours also contribute significantly to cardiovascular and respiratory diseases, cancer, and other conditions that account for much of the burden of morbidity and mortality in later life.

Measuring and reporting health behaviours provides important information for planning public health programs and for evaluation, at the macro level, of the net gains of these programs. The health behaviours described in this chapter include: physical activity, fruit and vegetable consumption, overweight and obesity, sun protection, smoking, and alcohol and illicit drug use.

This chapter includes information from the 1997–98 and 2002 and 2003 NSW Health Surveys; the 2001 NSW Child Health Survey; the Australian Bureau of Statistics (ABS) National Health Surveys; the 1993, 1996, 1999, and 2002 Australian Secondary School Students' Surveys; the NSW Department of Health Inpatient Statistics Collection, and ABS mortality data.

Apparent trends in some health indicators should be interpreted with caution, because data come from a range of surveys that used different modes. They may reflect real changes in the prevalence of behaviours, or differences due to variations in sampling and data collection methods.

For details of the methods used for analysing data from the 2002 and 2003 NSW Health Surveys and 2001 NSW Child Health Survey, refer to the Methods section.

For more information:

Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004. Available at www.aihw.gov.au/publications/index.cfm/title/10014.

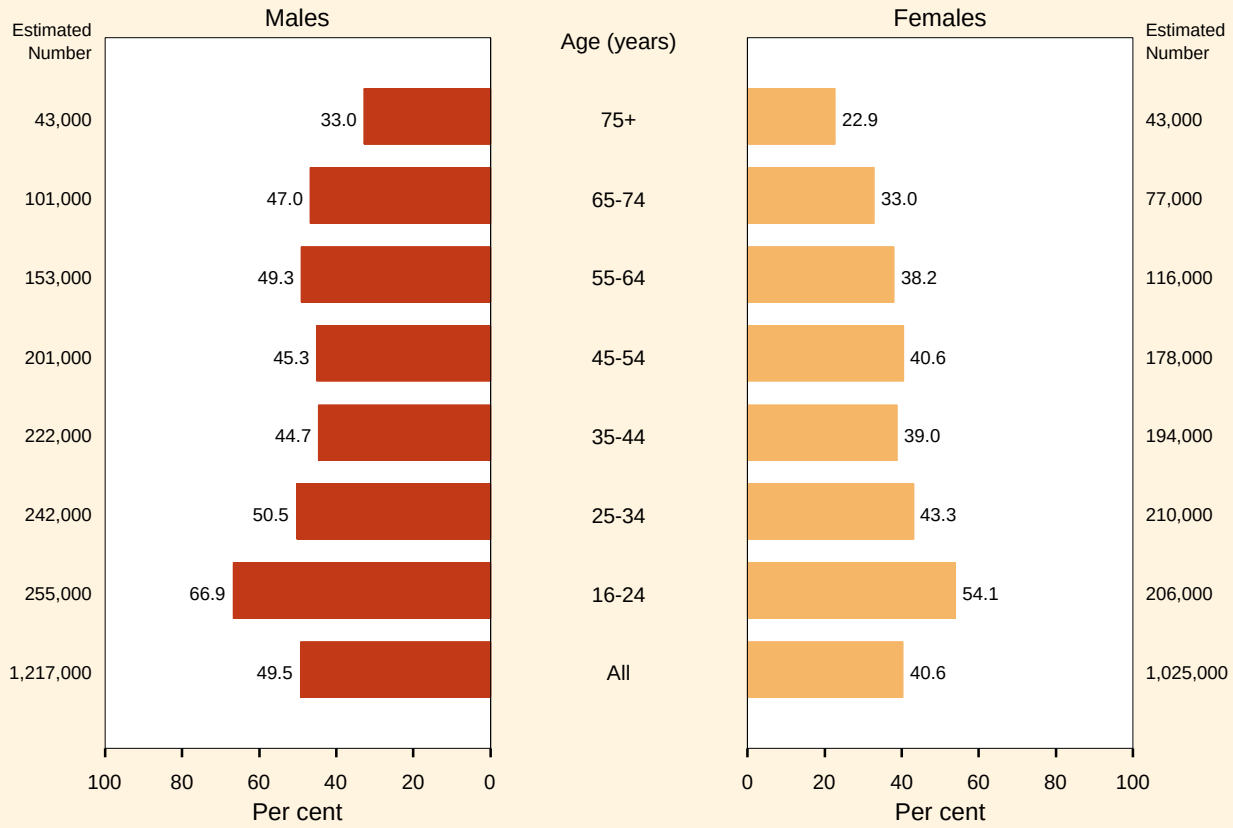
NSW Department of Health. The health behaviours of secondary school students in New South Wales 2002. *N S W Public Health Bull* 2004; 15(S-2).

Centre for Chronic Disease Prevention and Health Advancement, NSW Department of Health, website at www.health.nsw.gov.au/public-health/health-promotion.

Australian Bureau of Statistics. *How Australians measure up.* Catalogue no. 4359.0. Canberra: ABS, 1999.

Harris E, Sainsbury P, Nutbeam D (editors). *Perspectives on health inequity.* Sydney: Australian Centre for Health Promotion, 1999.

Adequate physical activity by age and sex, persons aged 16 and over, NSW 2003



Note: Adequate physical activity is a total of 150 minutes per week on 5 separate occasions. The total minutes were calculated by adding minutes in the last week spent walking (continuously for at least 10 minutes), minutes doing moderate physical activity, plus x 2 minutes doing vigorous physical activity. Estimates are based on 13,005 respondents. 3 (0.02%) were 'not stated' (Don't Know or Refused).

Source: NSW Health Survey 2003 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Physical inactivity accounts for almost 7% of the total burden of disease and injury in Australia, second only to tobacco (Mathers et al., 1999). Physical activity is a preventive factor for cardiovascular disease, cancer, mental illness, diabetes mellitus, and injury. To maintain health, it is recommended that moderate intensity activity be carried out on most, and preferably all, days of the week for at least 30 minutes per day (Commonwealth Department of Health and Ageing, 1999). Moderate intensity activity includes brisk walking, dancing, swimming, and cycling.
- In 2003, 45.0% of respondents to the NSW Health Survey aged 16 years and over reported adequate levels of physical activity. More males (49.5%) than females (40.6%) reported that they undertook adequate physical activity.
- Adequate levels of activity were most frequently reported by males (66.9%) and females (54.1%) aged 16–24 years, and least frequently reported by males aged 75 years and over (33.0%) and females aged 75 years and over (22.9% to 33.3%).

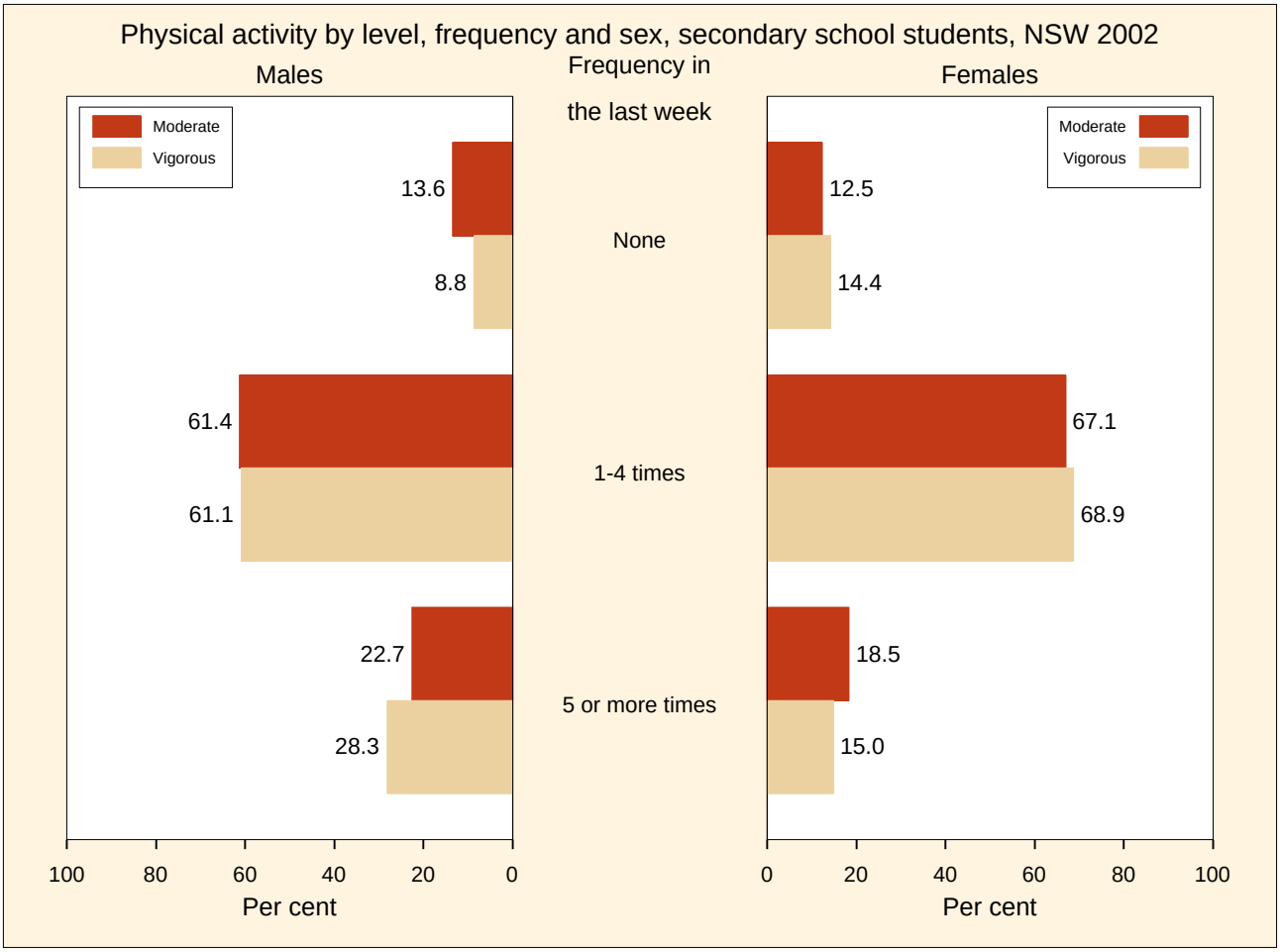
For more information:

Mathers C, Vos T, Stevenson C. *The burden of disease and injury in Australia.* AIHW Catalogue no. PHE 17. Canberra: AIHW, 1999. Available at www.aihw.gov.au/bod/index.html.

Bauman A, Bellew B, Vita P, Brown W, Owen N. *Getting Australia active: Towards better practice for the promotion of physical activity*. National Public Health Partnership. Melbourne, Australia, March, 2002. Available at www.nphp.gov.au/publications/sigpah/gaa_summary.pdf.

NSW Physical Activity Task Force. *Simply Active Everyday: A plan to promote physical activity in NSW 1998–2002 Evaluation Report*. NSW Department of Health 2004. Available at www.health.nsw.gov.au/pubs/2004/pdf/simply_active.pdf.

Commonwealth Department of Health and Ageing. *National Physical Activity Guidelines for Australians.* Canberra: CDOHA, 1999. Available at www.health.gov.au/internet/wcms/Publishing.nsf/Content/health-pubhlth-publicat-document-physguide-cnt.htm/$FILE/physguide.pdf.



Note: Vigorous physical activity was defined as doing 'an activity for at least 30 minutes that made you sweat and breathe hard (for example: basketball, netball, soccer, football, running, fast bike riding, fast dancing, aerobics)'. Moderate physical activity was defined as doing 'an activity for at least 30 minutes that did not make you sweat or breathe hard (for example: slow bike riding, swimming, pushing a lawn mower, mopping floors, brisk walking)'. Estimates are based on 6,180 respondents.

Source: NSW Department of Health. The health behaviours of secondary school students in New South Wales 2002. *N S W Public Health Bull* 2004; 15(S-2).

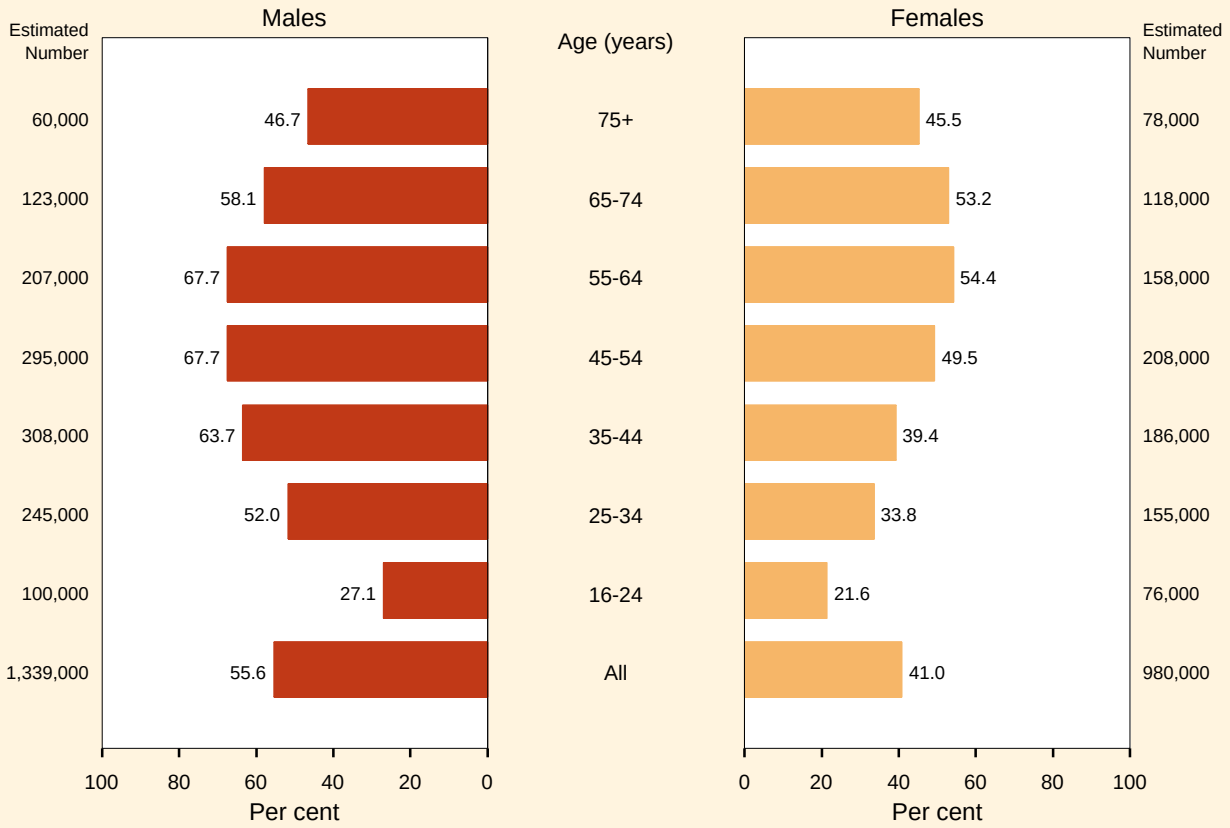
- It is increasingly difficult for children and adolescents to participate in a physically active lifestyle. Sedentary recreational activities, such as watching television and videos and playing computer games have increased, as has the practice of driving children to school (Booth, 2000a).
- It has been estimated that 20–25% of Australian children are not sufficiently physically active and are at risk of becoming inactive adults (Booth, 2000b). Australian recommendations for levels of physical activity in young people are currently being developed. It is likely that children and adolescents will be advised to participate in at least 60 minutes of moderate-intensity physical activity every day.
- In NSW in 2002, the majority of secondary school students reported doing moderate or vigorous physical activity on 1–4 occasions in the previous week. One-third of students reported doing either moderate or vigorous activity at least 5 times in the previous week. A small proportion of students reported not doing any moderate or vigorous activity. The rate of inactivity in females increased with age from 3% for those aged 12–15 years to 9% for those aged 16–17 years, but did not change substantially with age for males (5% of those aged 12–15 years and 4% of those aged 16–17 years).

For more information:

Booth, ML. What strategies can be used to promote and maintain adequate levels of physical activity in Australian children? *Med J Aust* 2000a; 173: S7–S8.

Booth, ML. What proportion of Australian children are sufficiently physically active? *Med J Aust* 2000b; 173: S6–S7.

Overweight and obesity by age and sex, persons aged 16 and over, NSW 2003



Note: Body Mass Index (BMI) = weight(kg)/height*height(m). BMI categories were as follows: underweight = BMI<18.5; acceptable weight = 18.5<=BMI<25; overweight = 25<=BMI<30; obese = BMI=30. Estimates based on 12,448 respondents. 560 (4.3%) not stated for height or weight.

Source: NSW Health Survey 2003 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

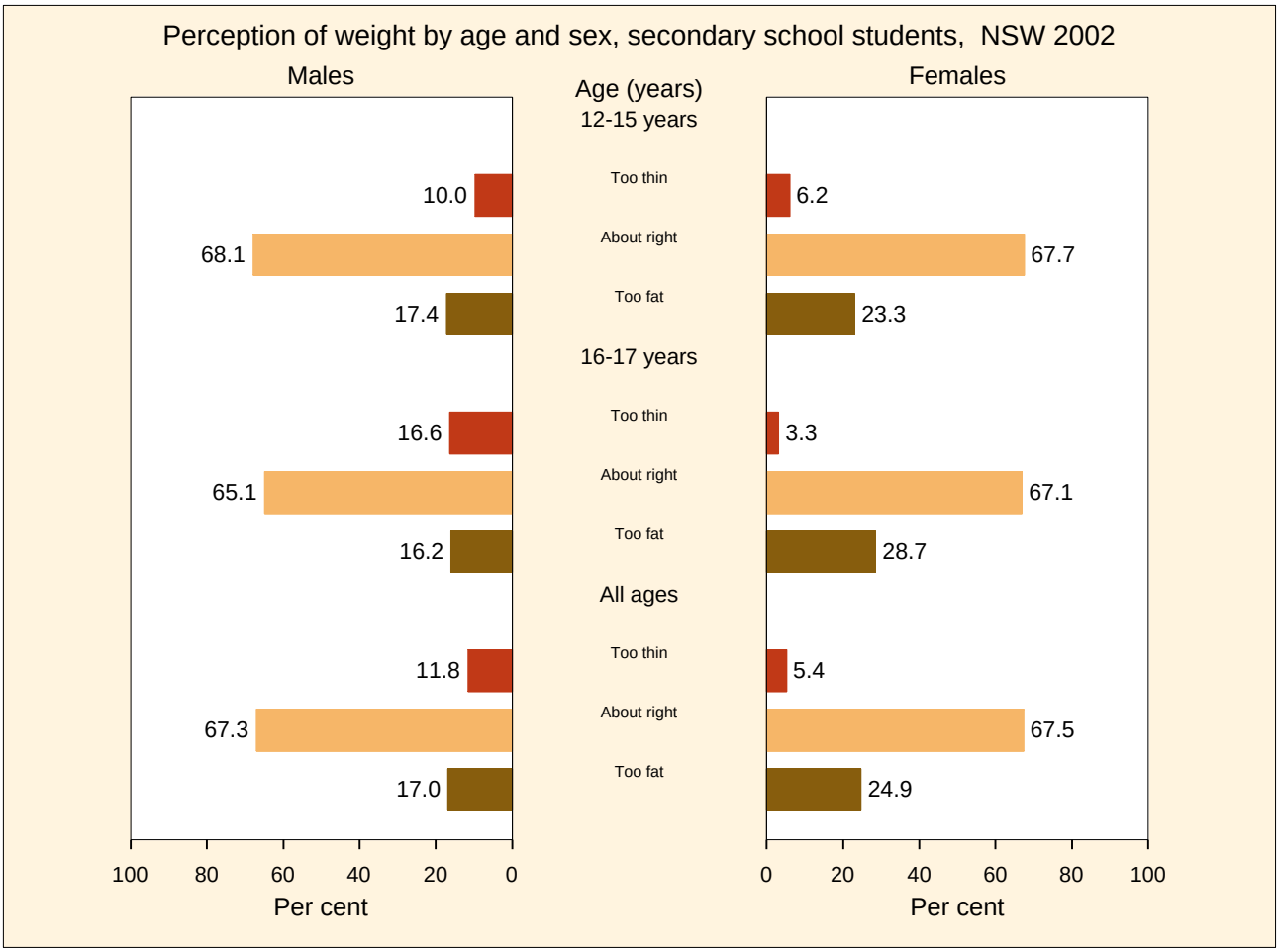
- In 2003, 48.3% of the NSW population was classified as overweight or obese, on the basis of self-reported height and weight. More males (55.6%) than females (41%) were classified as overweight or obese.
- The proportion of respondents classified as overweight or obese rose steadily with age in both sexes until age 55–64 years then declined among older respondents. Across all ages more males than females were classified as overweight or obese.
- Among males, the proportion classified as overweight or obese was lowest among those aged 16–24 years (27.1%) and highest among those aged 45–64 years (67.7%).
- Among females, the proportion classified as overweight or obese was lowest among those aged 16–24 years (21.6%) and highest among those aged 55–64 years (54.4%).
- The NSW Department of Health has developed a strategic plan for public health nutrition in NSW. *Eat Well NSW: Strategic Directions for Public Health Nutrition 2003–2007* includes population health strategies to promote healthy weight, healthy eating habits, increased energy expenditure, and increased prevalence of life skills that support healthy decision-making (NSW Department of Health, 2002).

For more information:

Flood V, Webb K, Lazarus R, Pang G. Use of self-report to monitor overweight and obesity in populations: Some issues for consideration. *Aust N Z J Public Health* 2000; 24: 96–99.

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

National Health and Medical Research Council. *Clinical Practice Guidelines for the Management of Overweight and Obesity in Adults.* Canberra, 2003. Available at www.obesityguidelines.gov.au.



Note: Estimates are based on 2,639 respondents.

Source: NSW Department of Health. The health behaviours of secondary school students in New South Wales 2002. *N S W Public Health Bull* 2004; 15(S-2).

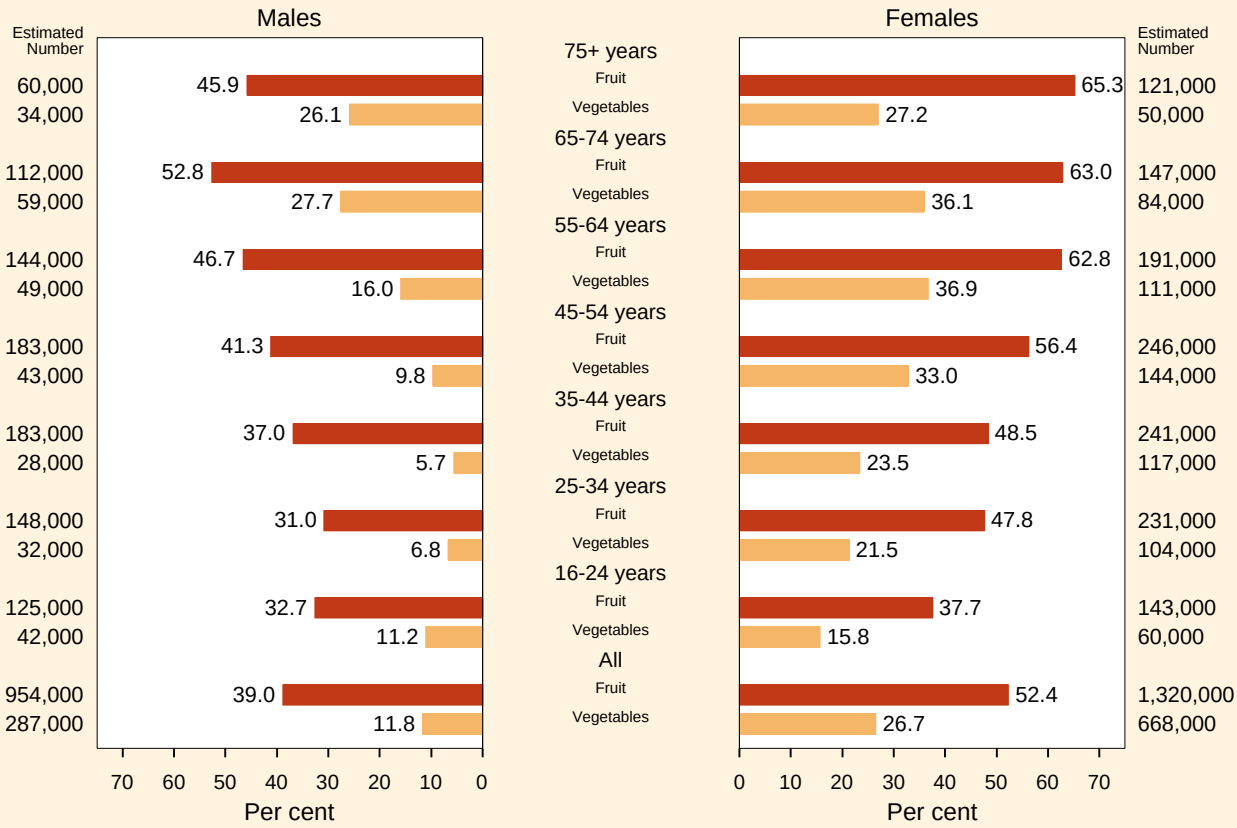
- A survey that measured the height and weight of NSW school students found about 80% of Year 8 and 10 boys were acceptable weight, and one-fifth were overweight or obese, as determined by Body Mass Index (Booth et al., 2001). Similar results were found for female students.
- Information on students' weight was not collected in the 2002 Australian Secondary School Students' Survey. However, students were asked how they perceived their weight. Around two-thirds of students thought they were about the right weight, around 9% thought they were too thin, and around 21% thought they were too fat.
- One-quarter of females considered themselves too fat, compared to 17% of males. Forty-three per cent of students were trying to lose weight (females 55%; males 31%). Eleven per cent of students were trying to gain weight, and 44% were trying to stay the same weight or were not doing anything about their weight (data not shown).

For more information:

Booth M, Baur L, and Denny-Wilson E. *Australian standard definition of child adolescent overweight and obesity.* Canberra: Commonwealth Department of Health and Ageing, 2001 (unpublished).

NSW Centre for Public Health Nutrition. *Report on the weight status of NSW: 2003.* Sydney: CPHN, 2003. Available at www.cphn.biochem.usyd.edu.au.

Fruit and vegetable daily consumption in recommended quantity by age and sex, persons aged 16 years and over, NSW 2003



Note: Recommended daily consumption of vegetables is 4 serves for females aged over 12 years and males aged 12–18 years or over 60 years, and 5 serves for males aged 19–60 years. One serve is equivalent to 1/2 cup of cooked vegetables or one cup of salad vegetables. Recommended daily consumption of fruit is 3 serves for people aged 12–18 years, and 2 serves for people aged 19 years and over. One serve is equivalent to one medium piece or 2 small pieces of fruit. Estimates based on 12,945 respondents. 127 (0.98%) not stated for serves of vegetables eaten and 86 (0.2%) not stated for serves of fruit eaten.

Source: NSW Health Survey 2002 and 2003 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

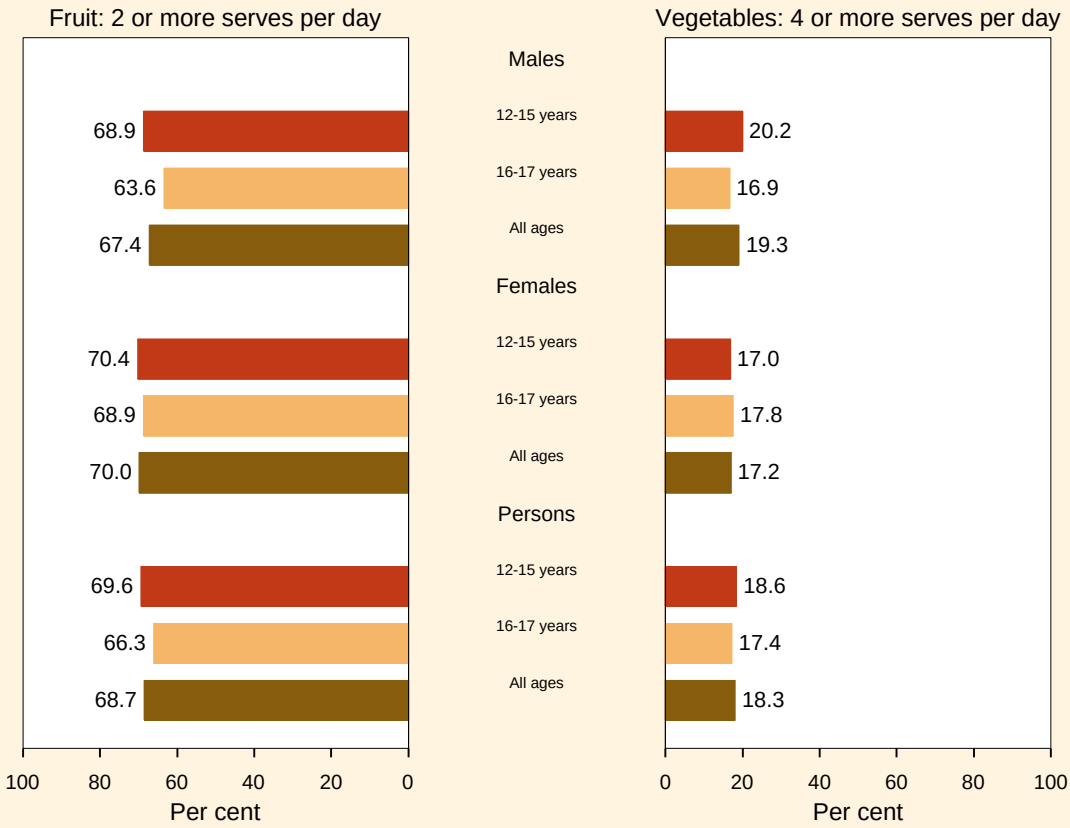
- Adequate consumption of fruit and vegetables contributes substantially to protection against a number of diseases including coronary heart disease, stroke, cancer, type 2 diabetes, osteoporosis, dental caries, gall bladder disease, and diverticular disease. Vegetables and fruit are significant sources of antioxidants, dietary fibre, folate, and complex carbohydrates. The fibre and low-energy content of fruit and vegetables may benefit weight control (NSW Department of Health, 2002).
- In 2003, more than twice as many females (26.7%) as males (11.8%) reported eating the recommended quantity of vegetables each day. More females than males reported adequate consumption across all age groups. The proportion of females who reported adequate consumption of vegetables increased with age until age 65 years then declined. Consumption among males increased with age between 44 and 74 years.
- Just over half of females (52.4%), and 39.0% of males reported eating the recommended quantity of fruit each day. Adequate consumption of fruit increased with age in both sexes until age 74 then declined. Across all age groups, more females than males reported adequate consumption of fruit.
- The NSW Department of Health strategic planning document *Eat Well NSW Strategic Directions for Public Health Nutrition 2003–2007* includes strategies for increasing consumption of vegetables and fruit.

For more information:

NSW Department of Health. *Eat Well NSW Strategic Directions for Public Health Nutrition 2003–2007*. Sydney: NSW Department of Health, 2002. Available at www.health.nsw.gov.au/pubs/e/pdf/eatwellnsw.pdf.

NSW Centre for Public Health Nutrition. *Report on the consumption of vegetables and fruit in NSW: 2003*. Sydney: CPHN, 2003. Available at www.cphn.biochem.usyd.edu.au.

Fruit and vegetable daily consumption by age and sex, secondary school students, NSW 2002



Note: Serve of vegetables: 1/2 cup of cooked vegetables or one cup of salad vegetables. Serve of fruit: one medium piece, 2 small pieces or one cup of diced. Estimates are based on 6,180 respondents.

Source: NSW Department of Health. The health behaviours of secondary school students in New South Wales 2002. *N S W Public Health Bull* 2004; 15(S-2).

- Establishing healthy eating habits in childhood and adolescence is an important basis for short and long term health. Nutrition guidelines advise that children and adolescents should consume plenty of vegetables, legumes, fruits, and cereals (National Health and Medical Research Council, 2003).
- *The Australian Guide to Healthy Eating* defines the appropriate quantities of foods for different age groups (Commonwealth Department of Health and Ageing, 1998). The recommended daily consumption for adolescents is 3 serves of fruit and 4 serves of vegetables or legumes.
- In 2002, secondary school students most commonly reported eating 2–3 serves of fruit per day (44%), followed by one serve or less (28%), 4–5 serves (17%), or 6 serves or more per day (7%). One per cent of students indicated that they did not eat fruit.
- In 2002, 47% of students reported eating 2–3 serves of vegetables per day, and 30% reported eating one serve or less per day, while fewer reported eating 4–5 (13%) or 6 or more (5%) serves per day. Three per cent of students reported that they did not eat vegetables.
- There were no substantial differences in reported fruit and vegetable intake between males and females, or younger students (12–15 years) compared to older students (16–17 years).

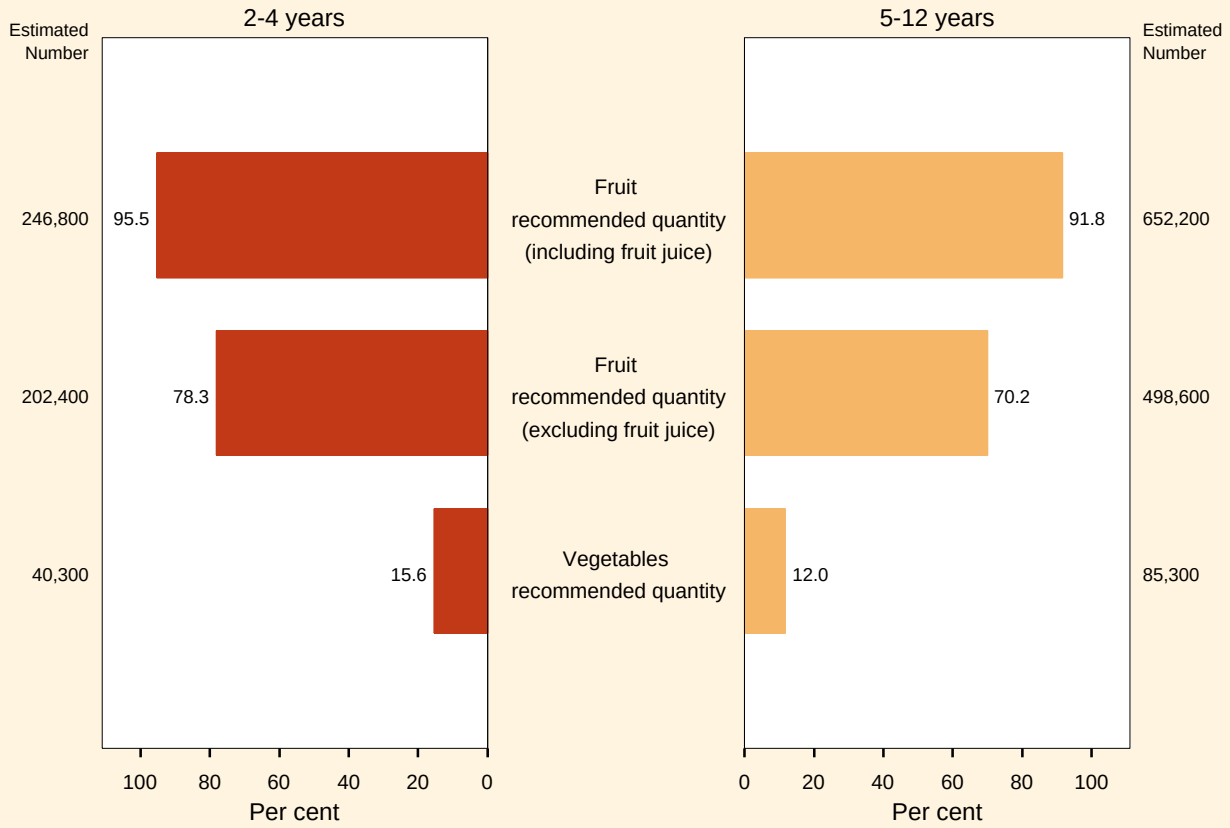
For more information:

National Health and Medical Research Council. *Dietary Guidelines for Children and Adolescents*. Canberra: Commonwealth of Australia, 2003. Available at www.health.gov.au/nhmrc/publications/pdf/n34.pdf.

Commonwealth Department of Health and Ageing. *The Australian Guide to Healthy Eating*. Canberra: Commonwealth of Australia, 1998. Available at www.health.gov.au/pubhlth/strateg/food/guide/index.htm.

NSW Centre for Public Health Nutrition. *Report on the consumption of vegetables and fruit in NSW: 2003*. Sydney: CPHN, 2003. Available at www.cphn.biochem.usyd.edu.au.

Fruit and vegetable daily consumption in recommended quantity by age, children aged 2-12 years, NSW 2001



Note: Recommended daily consumption of vegetables is 2 or more serves for children aged 2–7, 3 or more serves for children aged 8–11, and 4 or more serves for children aged 12. One serve is equivalent to 1/2 cup of cooked vegetables or one cup of salad vegetables. Recommended daily consumption of fruit is one or more serves for children aged 2–11, and 3 or more serves for children aged 12. One serve is equivalent to one medium piece of fruit, 1/2 cup of fruit juice or 2 tablespoon of dried fruit. Estimates based on 7,916 respondents.

Source: NSW Child Health Survey 2001 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Adequate fruit and vegetable intake protects against coronary heart disease, hypertension, stroke, diabetes mellitus, and many forms of cancer, and may aid weight control.
- In the 2001 NSW Child Health Survey, most children aged 2–4 years (95.5%) and 5–12 years (91.8%) were reported to consume the recommended daily minimum quantity of fruits (including fruit juice). However, around 60% of the serves of fruit consumed by children were in the form of fruit juice. Because most fruit juices contain added sugars and little fibre, they are not recommended as a substitute for fresh fruits (National Health and Medical Research Council, 2003). If fruit juice was excluded, the proportion of children reported to consume the recommended minimum daily quantity of fruits dropped considerably, to 78.3% among 2–4 year olds and 70.2% among 5–12 year olds (NSW Department of Health, 2002).
- Less than one in 7 children aged 2–4 years (15.6%) and one in 8 children aged 5–12 years (12.1%) were reported to consume the recommended daily minimum quantity of vegetables.

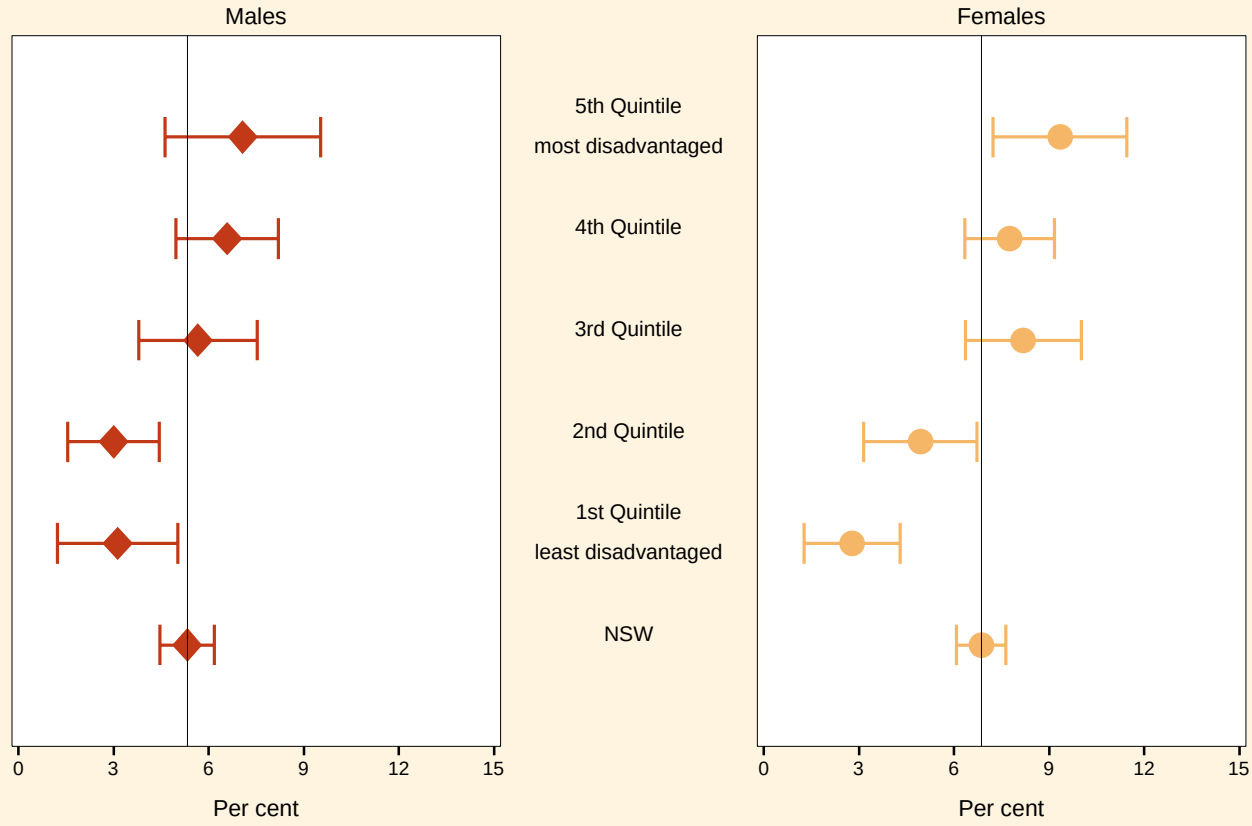
For more information:

National Health and Medical Research Council. *Dietary Guidelines for Children and Adolescents*. Canberra: Commonwealth of Australia, 2003. Available at www.health.gov.au/nhmrc/publications/pdf/n34.pdf.

NSW Centre for Public Health Nutrition. *Report on the consumption of vegetables and fruit in NSW: 2003*. Sydney: CPHN, 2003. Available at www.cphn.biochem.usyd.edu.au.

Centre for Epidemiology and Research, NSW Department of Health. New South Wales Child Health Survey 2001. *N S W Public Health Bulletin* 2002; 13(S-4).

Food insecurity in the last 12 months by socioeconomic status and sex, persons aged 16 years and over, NSW 2003



Quintile of socioeconomic disadvantage		Estimated Number	Per cent	LL 95% CI	UL 95% CI
1st Quintile least disadvantaged	Persons	22000	2.9	1.7	4.1
2nd Quintile	Persons	36000	3.9	2.8	5.1
3rd Quintile	Persons	73000	6.9	5.6	8.3
4th Quintile	Persons	93000	7.2	6.1	8.2
5th Quintile most disadvantaged	Persons	80000	8.2	6.6	9.8
NSW	Persons	304000	6.1	5.5	6.7

Note: Respondents were asked 'In the last 12 months, were there any times that you ran out of food and couldn't afford to buy more?'. Estimates are based on 13,001 respondents. 7 (0.05%) were 'not stated' (Don't Know or Refused). LL/UL 95%CI = Lower and upper limits of the 95% confidence interval for the point estimate.

Source: NSW Health Survey 2003 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

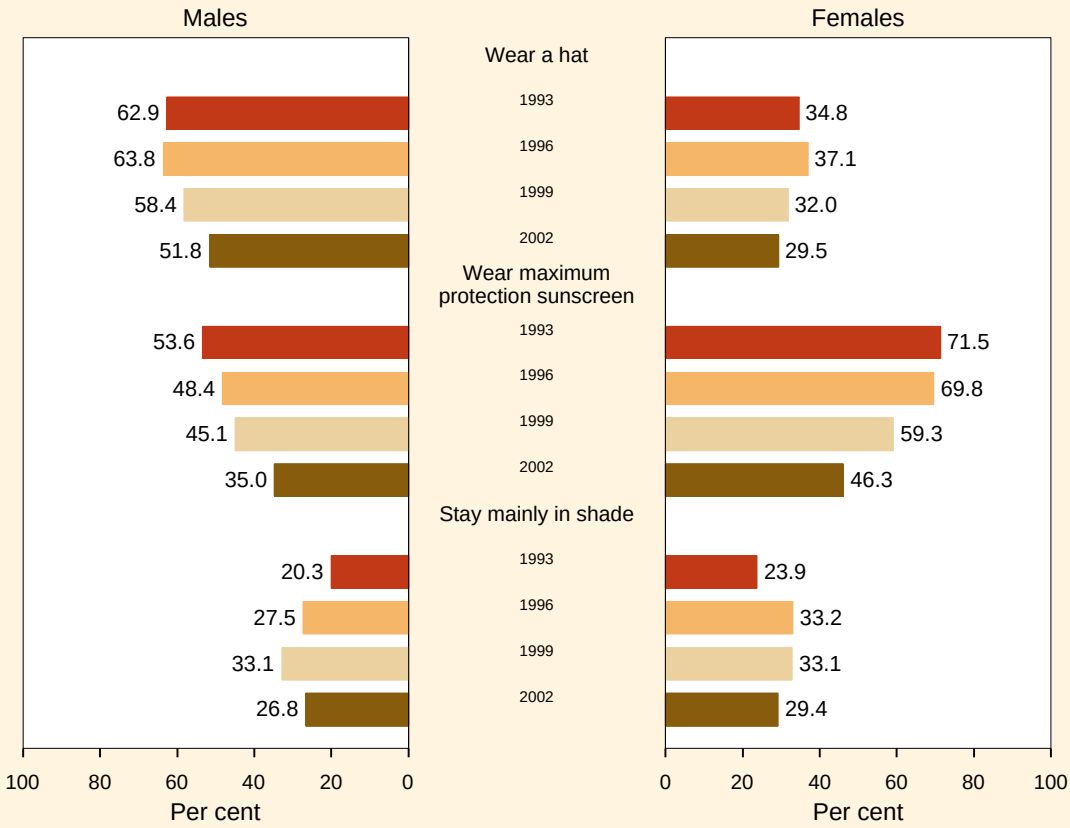
- Despite the good quality of the NSW food supply, there are some groups who lack food security: that is, do not have sufficient access at all times to sufficient food for an active and healthy life. Food insecurity is a likely contributor to ill health associated with socioeconomic disadvantage.
- In the 2003 NSW Health Survey, 6.1% of people in NSW reported that they had experienced food insecurity in the last 12 months, in that they had run out of food and could not afford to buy more. A greater proportion of females (6.9%) than males (5.3%) reported food insecurity.
- Food insecurity increased with decreasing socioeconomic status in both males and females. However, more females than males reported that they experienced food insecurity across all quintiles of socioeconomic disadvantage, except the least disadvantaged (most affluent) quintile.

For more information:

National Public Health Partnership. *Eat Well Australia. An agenda for action for public health nutrition, 2000–2010.* Canberra: Strategic Inter-Governmental Nutrition Alliance, 2001. Available at www.nphp.gov.au/publications/#signal.

NSW Department of Health. *Eat Well NSW Strategic Directions for Public Health Nutrition 2003–2007.* Sydney: NSW Department of Health, 2002. Available at www.health.nsw.gov.au/pubs/e/pdf/eatwellnsw.pdf.

Sun protection behaviour by sex, secondary school students, NSW 1993, 1996, 1999 and 2002



Note: Students who responded 'usually' or 'always' to the following questions: 'Thinking about sunny days in summer, when you are outside for an hour or more between 11.00 a.m. and 3.00 p.m., how often would you: wear a hat, wear maximum protection sunscreen, stay mainly in the shade?' Maximum protection sunscreen includes SPF30+ for 2002, both SPF15+ and SPF30+ for 1999, and SPF15+ only for 1996. Estimates are based on the following numbers of respondents: 1996, 10,026; 1999, 7,348; 2002, 6,180.

Source: NSW Department of Health. The health behaviours of secondary school students in New South Wales 2002. *N S W Public Health Bull* 2004; 15(S–2).

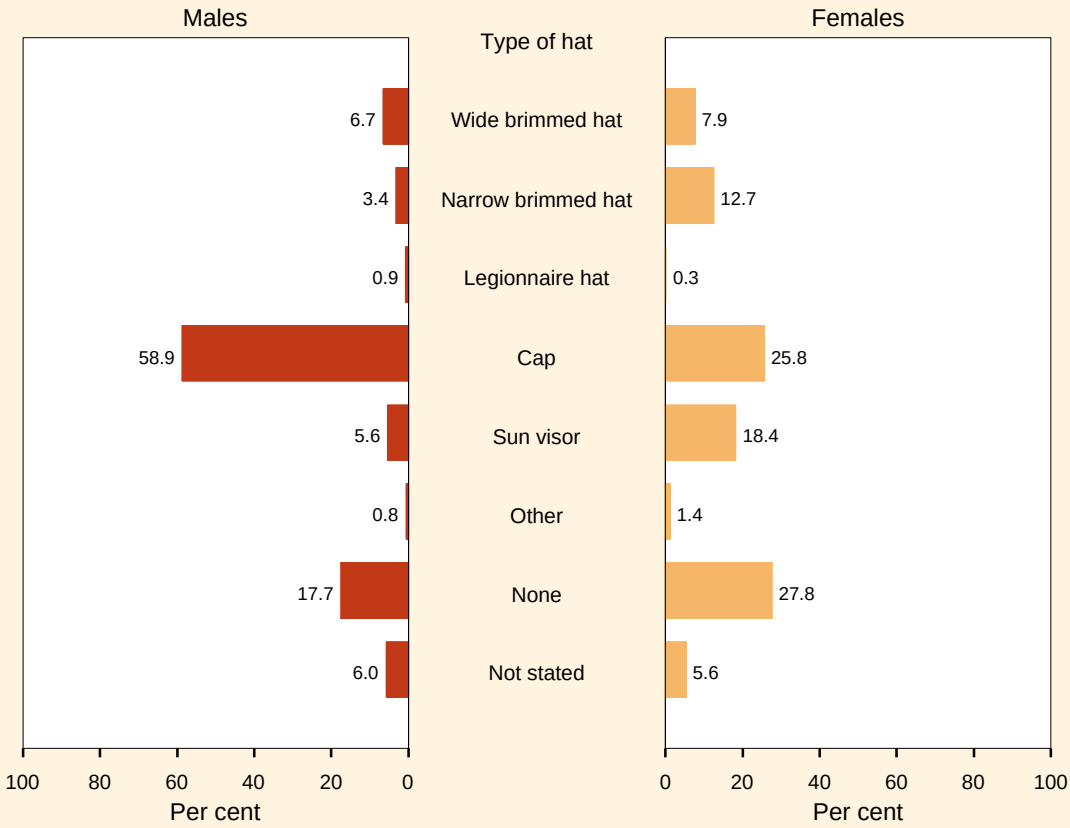
- Some sun exposure is beneficial to health. It helps the body to produce vitamin D, which is essential for healthy bones. However, excessive sun exposure can lead to sunburn in the short-term and to melanoma and other skin cancers in the long-term.
- Australia has one of the highest rates of melanoma in the world, and the incidence of melanoma continues to rise. Non-melanoma skin cancers are the most common cancers diagnosed in Australia (AIHW, 2004).
- In 2002, the most commonly reported sun protection measures among female secondary school students were wearing sunscreen (46.3%), wearing a hat (29.5%), and staying mainly in the shade (29.4%). Among males, the most commonly reported measures were wearing a hat (51.8%), wearing sunscreen (35.0%), and staying mainly in the shade (26.8%).
- Between 1993 and 2002, the proportion of students wearing hats in NSW declined from 49.0% to 40.6%. The proportion of students wearing maximum protection sunscreen also declined from 62.5% to 40.7%, while the proportion of students who reported mainly staying in the shade increased from 22.1% to 28.1%.
- The *Skin Cancer Strategic Plan 2001–2005* outlines policy direction, population and setting, and monitoring priorities for NSW (The Cancer Council NSW and NSW Department of Health, 2001).

For more information:

Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004. Available at www.aihw.gov.au/publications/index.cfm/title/10014.

The Cancer Council NSW and NSW Department of Health. *Skin Cancer Prevention Strategic Plan for NSW 2001–2005.* Sydney: NSW Department of Health, 2001.

Type of hat worn in summer by sex, secondary school students, NSW, 2002



Note: Students were asked: 'What type of hat do you wear most often on a sunny day in summer?' Estimates based on 6,108 respondents.

Source: NSW Department of Health. The health behaviours of secondary school students in New South Wales 2002. *N S W Public Health Bull* 2004; 15(S-2).

- In 2002, male secondary school students (51.8%) were more likely than females (29.5%) to report wearing a hat on a sunny day. With increasing age, both male and female students were less likely to report usually or always wearing a hat. Just under one-quarter (24.2%) of females aged 17 years indicated that they wore a hat, compared to 43.3% of females aged 12 years. For males, the rate decreased from 63.1% of students aged 12 years to 40.3% of those aged 17 years.
- In 2002, a cap was the type of hat most often worn by male (58.9%) and female (25.8%) students. A sun visor was the next most common type of hat worn by female students (18.4%).
- With increasing age, both males and females were less likely to report wearing the recommended wide-brimmed hat. For females, this rate decreased from 12.4% of students aged 12 years to 7.2% of those aged 17 years. For males, it decreased from 9.5% of students aged 12 years to 4.1% of those aged 17 years.

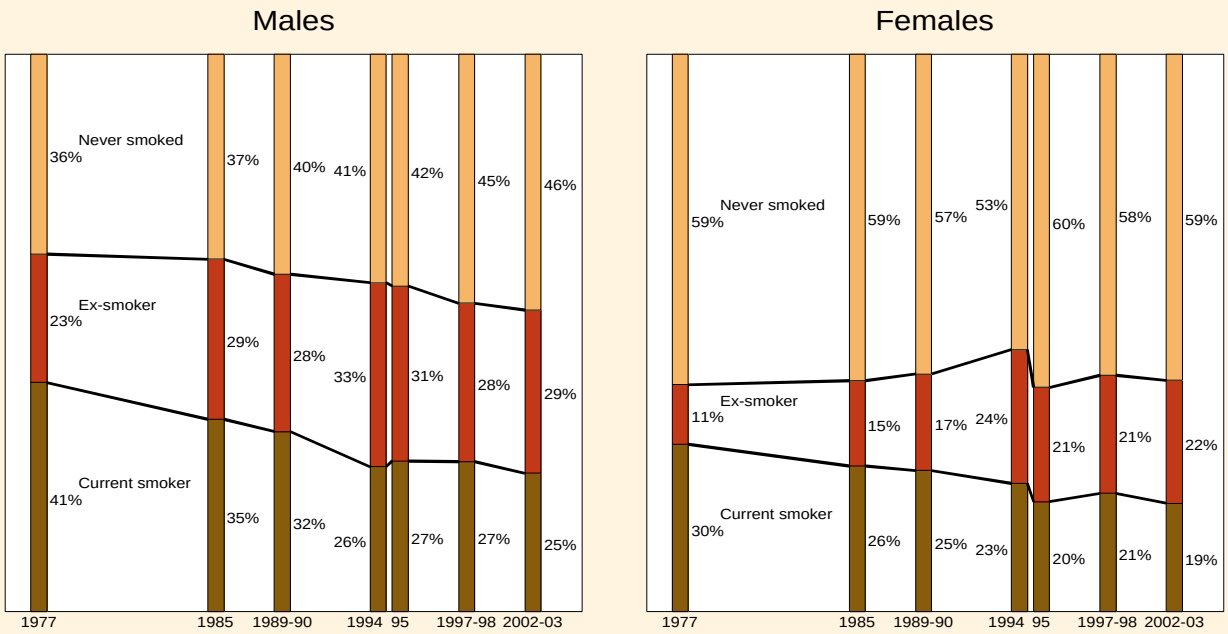
For more information:

The Cancer Council NSW and NSW Department of Health. *Skin Cancer Prevention Strategic Plan for NSW 2001–2005*. Sydney: NSW Department of Health, 2001.

The Cancer Council Australia. *National Cancer Prevention Policy 2004–06*. NSW: The Cancer Council Australia, 2004. Available at www.cancer.org.au/documents/NatCancerPreventPol_04–06.pdf.

Greenwood JS, Soulos, GP, Thomas ND. *Under cover: Guidelines for shade planning and design*. Sydney: NSW Cancer Council and NSW Department of Health, 1998.

Smoking status by sex, persons aged 16 and over, NSW 1977 to 2002-03



Note: Current smoking includes daily and occasional smoking.

Source: ABS Survey of Alcohol and Tobacco Consumption Patterns, 1977 (ABS Catalogue no. 4312.0); ABS *Life Style: Health Risk Factors, NSW 1985* (ABS Catalogue no. 4311.1); ABS and NSW Department of Health *State of Health in NSW* (ABS Catalogue no. 4330.1); NSW Health Promotion Survey 1994; ABS National Health Survey 1995; NSW Health Surveys 1997 and 1998; and NSW Health Surveys 2002 and 2003 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Cigarette smoking is a major contributor to death and illness in NSW. Smoking contributes to a range of diseases including coronary heart disease, cancers (including lung cancer, mouth cancers, and cervical cancer), stroke, and chronic lung disease (US Department of Health and Human Services, 2004).
- This chart presents data on smoking from 1977. Data were collected by both face-to-face interviews (1977, 1985, 1989–1990 and 1995 surveys) and telephone interviews (1994, 1997–1998, and 2002–2003 surveys), so apparent trends over time need to be interpreted with caution.
- Overall, the data suggest that smoking rates in NSW have declined by around 8% among men and 6% among women since 1989–1990. Most of this decline occurred between 1989–1990 and 1995. In 2002–2003, in both sexes, the number of ex-smokers was greater than the number of current smokers.
- Among females, much of the decline in smoking rates is attributable to an increase in smoking cessation, with a smaller decrease in smoking uptake. Among males, however, a decrease in smoking uptake rather than an increase in the quit rate explains most of the overall decline.

For more information:

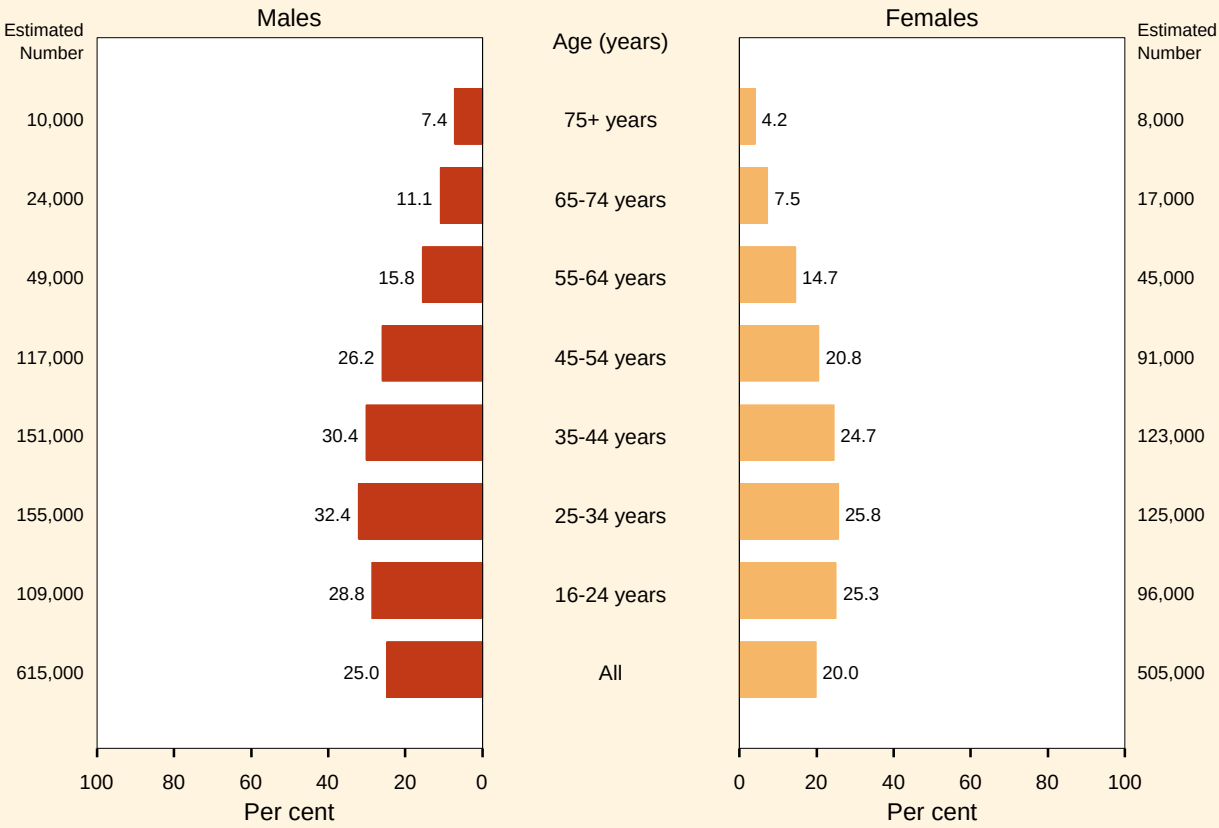
Ridolfo B, Stevenson C. *The quantification of drug-caused mortality and morbidity in Australia, 1998.* Canberra: Australian Institute of Health and Welfare, 2001. Available at www.aihw.gov.au.

Graham-Clarke P, Nathan S, Stoker L, Bauman A, and Wise M. *Smoking: Best practice for reducing the prevalence of smoking in the areas of NSW.* State Health Publication no. HP96006. Sydney: NSW Department of Health, 1996.

NSW Department of Health tobacco website at www.health.nsw.gov.au/public-health/health-promotion/tobacco.

US Department of Health and Human Services. *The Health Consequences of Smoking: A Report of the Surgeon General.* Atlanta: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2004.

Current smoking by age and sex, persons aged 16 years and over, NSW 2003



Note: Current smoking includes daily and occasional use. Estimates based on 13,002 respondents. 6 (0.05%) not stated for current smoking status.

Source: NSW Health Survey 2003 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Smoking is a leading cause of mortality and morbidity in NSW and is the main cause or a significant cause of many diseases including cancer and cardiovascular disease, the leading causes of death. Tobacco use (including passive smoking) is responsible for the greatest burden of premature death and disability of all behavioural risk factors (Mathers et al., 1999).
- This graph presents data on current smoking from the 2003 NSW Health Survey. Overall, 25% of males and 20% of females were current 'daily' or 'occasional' smokers. Comparison with previous survey data suggests that smoking rates in NSW have declined by approximately 8% among men and 6% among women since 1989–90.
- Rates of current smoking were highest in young adults. The prevalence of current smoking peaked in the 25–34 year age group in both males (32%) and females (25.8%), and declined with age to 7.4% among males and 4.2% among females aged 75 years and over.

For more information:

Mathers C, Vos T, Stevenson C. *The burden of disease and injury in Australia.* AIHW Catalogue no. PHE 17. Canberra: AIHW, 1999. Available at www.aihw.gov.au/bod/index.html.

NSW Department of Health tobacco website at www.health.nsw.gov.au/public-health/health-promotion/tobacco.

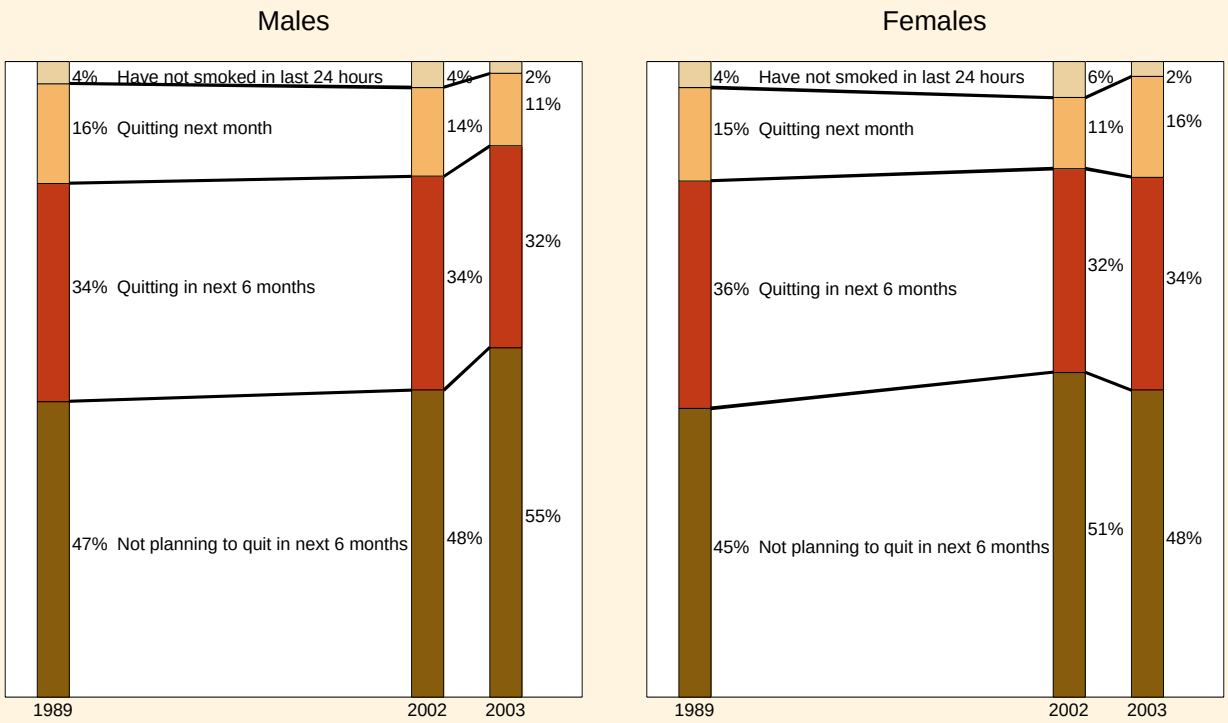
US Department of Health and Human Services. *The Health Consequences of Smoking: A Report of the Surgeon General.* Atlanta: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2004.

Ridolfo B, Stevenson C. *The quantification of drug caused morbidity and mortality in Australia,* 1998. Canberra: Australian Institute of Health and Welfare, 2001.

Fiore MC, Baily WC, Cohen SJ, et al. *Treating tobacco use and dependence. Clinical Practice Guideline.* Rockville MD: US Department of Health and Human Service, 2000.

Doll R, Peto R, Boreham J and Sutherland I. Mortality in relation to their smoking: 50 years' observations on male British doctors. *BMJ* 2004; 328: 1519–28.

Quitting smoking status by year and sex, current smokers aged 16 years and over, NSW 1989 to 2003



Note: Current smokers were asked the question: 'Which of the following best describes how you feel about your smoking?' Options ranged from not planning on quitting in the next 6 months, through planning on quitting in the next month or 6 months, to not having smoked in the last 24 hours or 6 months (2002 and 2003 only). Estimates are based on the following numbers of respondents who currently smoke daily or occasionally: 1998, 4,272; 2002, 2,486; 2003, 2,587. Intention to quit smoking was not stated for: 1998, 131(3.1%); 2002, 90 (3.49%); 2003 99 (3.69%).

Source: NSW Health Survey 1998, 2002 and 2003 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Smoking cessation, or quitting, has immediate and important health benefits for individuals of all ages. Ex-smokers have improved life expectancy and reduced risk of smoking-related disease, compared to continuing smokers (Fiore et al., 2000).
- In the NSW Health Survey, respondents who are current smokers are asked a question about their intention to quit smoking. Between 1998 and 2003, the proportion of males intending to quit smoking in the next month declined from 15.7% to 11.4%.
- Overall, there has been an increase in the proportion of females intending to quit smoking in the next month, from 14.7% in 1998 to 15.8% in 2003. This is largely due to a sharp increase between 2002 and 2003, from 11.2% to 15.8%.
- Between 1998 and 2003, the proportion of current smokers intending to quit smoking within the next 6 months declined overall in both males and females. However, among females there was a slight increase in the proportion intending to quit in the next 6 months between 2002 and 2003.
- The use of nicotine replacement therapies, such as gum, patches, inhaler, or Buproprion, doubles the chance of successfully quitting smoking (Silagy et al., 2001). The *Quitline* provides smoking cessation information and an advice service and is accessible for the cost of a local call throughout NSW.

For more information:

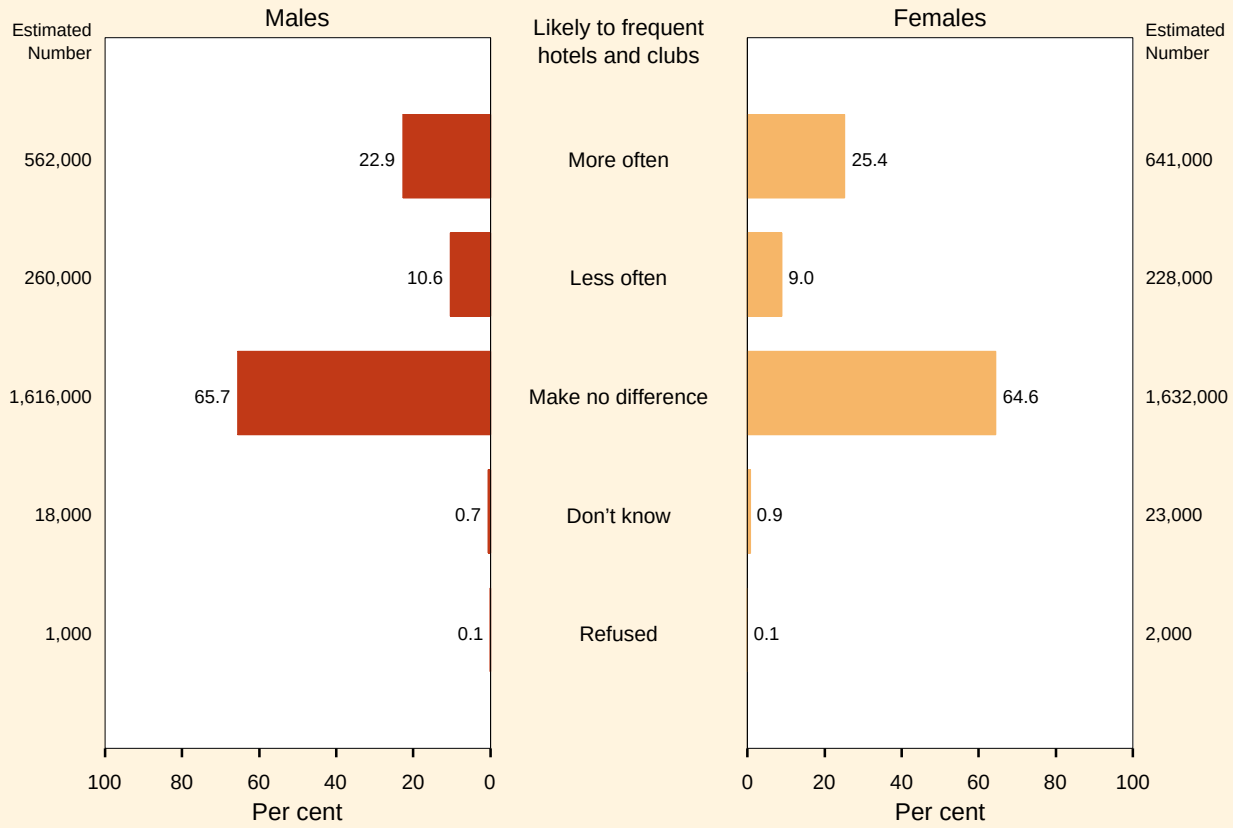
Silagy C, Lancaster T, Stead L, Mant D, Fowler G. *Nicotine replacement therapy for smoking cessation.*The Cochrane Library, Issue 3. Oxford: Update Software, 2001.

Fiore MC, Baily WC, Cohen SJ, et al. *Treating tobacco use and dependence. Clinical Practice Guideline.* Rockville MD: US Department of Health and Human Service, 2000.

NSW *Quitline* phone 131 848.

NSW Department of Health tobacco website at www.health.nsw.gov.au/public-health/health-promotion/tobacco.

Change in attitude to frequenting hotels and clubs if smoking was banned, by sex, persons aged 16 years and over, NSW 2003



Note: Respondents were asked 'If there was a total ban on smoking in hotels and licensed bars, would you be likely to go there More often, Less often, It would make no difference'. Estimates are based on 12,884 respondents. 124 (0.95%) not stated (Don't know or Refused).

Source: NSW Health Survey 2003 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Exposure to environmental tobacco smoke carries well documented health risks. These include lung cancer, heart disease, asthma attacks, eye irritation, acute respiratory tract irritation and chronic respiratory symptoms, and illnesses (National Health and Medical Research Council, 1997).
- The *NSW Smoke-free Environment Act 2000* requires most enclosed public places in NSW to be smoke-free. Smoking is now banned in many public places including most workplaces, restaurants and cafes, commercial premises, and on public transport.
- In the 2003 NSW Health Survey, the effect of a ban on smoking in hotels and licensed bars was assessed by asking people if they would be more or less likely to attend hotels and licensed bars if smoking was banned in these venues. Almost one-quarter (24.4%) of respondents said that they would be more likely to attend hotels and licensed bars if there was a total ban on smoking, while 9.9% of respondents said that they would be less likely to attend. Almost two-thirds of respondents (65.8%) said a total ban on smoking in hotels and licensed bars would make no difference to their attendance.

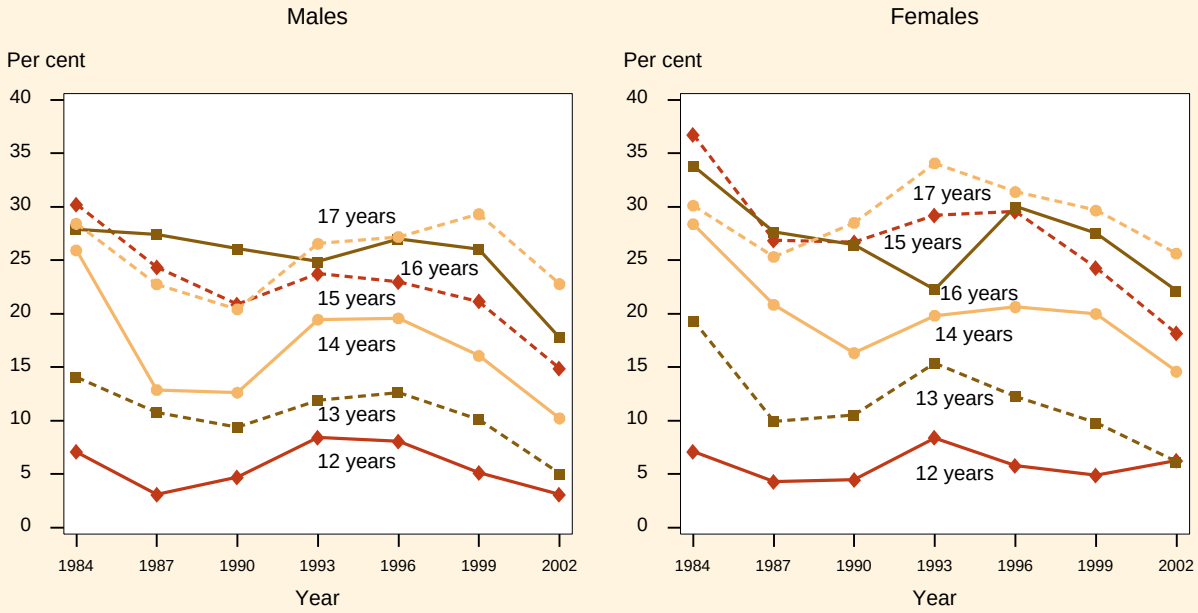
For more information:

Mathers C, Vos T, Stevenson C. *The burden of disease and injury in Australia.* AIHW Catalogue no. PHE 17. Canberra: AIHW, 1999. Available at www.aihw.gov.au/bod/index.html.

NSW Department of Health tobacco website at www.health.nsw.gov.au/public-health/health-promotion/tobacco.

National Health and Medical Research Council. The health effects of passive smoking: A Scientific Information Paper. Canberra: NHMRC, 1997. Available at www.health.gov.au/nhmrc/advice/nhmrc/foreword.htm.

Recent smoking by age and sex, secondary school students, NSW, 1993 to 2002



	Age (years)	1993 Per cent	1993 LL 95%CI	1993 UL 95%CI	1996 Per cent	1996 LL 95%CI	1996 UL 95%CI	1999 Per cent	1999 LL 95%CI	1999 UL 95%CI	2002 Per cent	2002 LL 95%CI	2002 UL 95%CI
Males	All ages	18.4	16.3	20.5	18.6	16.6	20.6	16.7	14.7	18.8	11.6	10.1	13.2
Females	All ages	20.9	18.4	23.4	20.6	19.0	22.3	18.6	16.7	20.5	14.9	12.9	17.0
Persons	All ages	19.6	17.8	21.5	19.6	18.3	20.8	17.7	16.1	19.2	13.3	11.9	14.7

Note: Recent smoking: smoking on at least one day in the week prior to the survey. Estimates are based on the following numbers of respondents: 1993, 10,026; 1999, 7348; 2002, 6180. LL/UL 95%CI = Lower and upper limits of the 95% confidence interval for the point estimate.

Source: NSW Department of Health. The health behaviours of secondary school students in New South Wales 2002. *N S W Public Health Bull* 2004; 15(S-2).

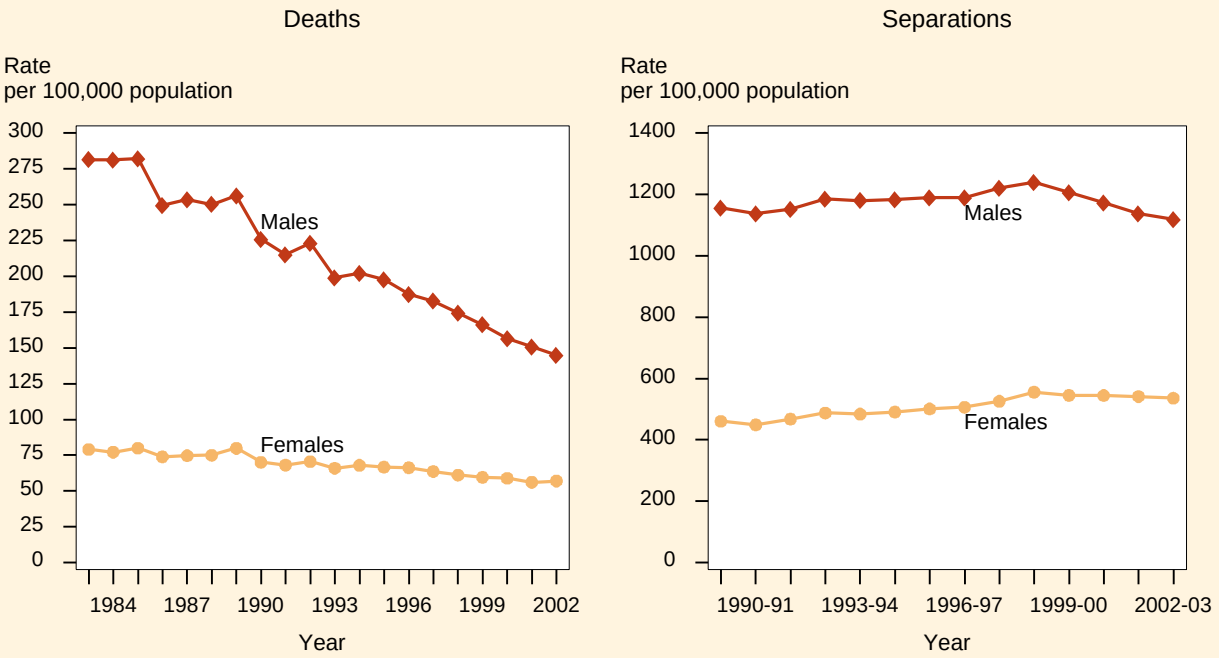
- Most people who go on to become long-term smokers start smoking during their secondary school years and early uptake is associated with heavier smoking patterns and greater difficulty in quitting (US Department of Health and Human Services, 1994). Nicotine dependence is established rapidly even among adolescents (Fiore et al., 2000) and preventing young people from commencing smoking will reduce smoking-related deaths and illness in the long term.
- Among NSW secondary school students in 2002, around 42% of both males and females reported ever smoking. The percentage of ever smokers fell each year that the survey was conducted, from 67% in 1984 to 42% in 2002 (data not shown).
- Recent smoking refers to smoking on at least one day in the week prior to the survey. The percentage of recent smokers fell from 22.3% in 1984 to 13.3% in 2002. Between 1999 and 2002, there was a substantial decrease in recent smoking, from 17.7% to 13.3%, which was observed in both sexes and across all age groups except females aged 12 years.

For more information:

Fiore MC, Baily WC, Cohen SJ, et al. *Treating tobacco use and dependence. Clinical Practice Guideline.* Rockville MD: US Department of Health and Human Service, 2000.

US Department of Health and Human Services. *Preventing Tobacco Use Among Young People: A Report of the Surgeon General.* Atlanta: US Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 1994.

Smoking attributed deaths, 1983 to 2002, and hospital separations, 1989-90 to 2002-03 , NSW



			1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Number	Deaths	Persons	6944	7039	7298	6846	7086	7152	7574	6835	6746	7129
	Separations	Persons	.	.	.	.	.	.	41245	41211	42923	45108
Rate per	Deaths	Persons	160.6	159.4	161.6	145.9	148.1	146.5	151.9	134.4	129	133.6
100,000 population	Separations	Persons	.	.	.	.	.	.	769	755.8	772.3	798.9

			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	Deaths	Persons	6613	6924	6913	6861	6861	6753	6702	6626	6553	6608
	Separations	Persons	45614	46741	48058	49376	52201	54853	54687	54974	55087	55350
Rate per	Deaths	Persons	121	123.7	120.7	116.8	113.4	108.5	104.7	100.7	96.6	94.8
100,000 population	Separations	Persons	796.6	802.2	809.7	813.4	840.3	864	843.3	828.7	811.7	800.6

Note: Deaths and hospital separations attributable to smoking were calculated using age- and sex-specific aetiologic fractions from AIHW, 2001. Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Deaths are for calendar years. Separations are for financial years. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

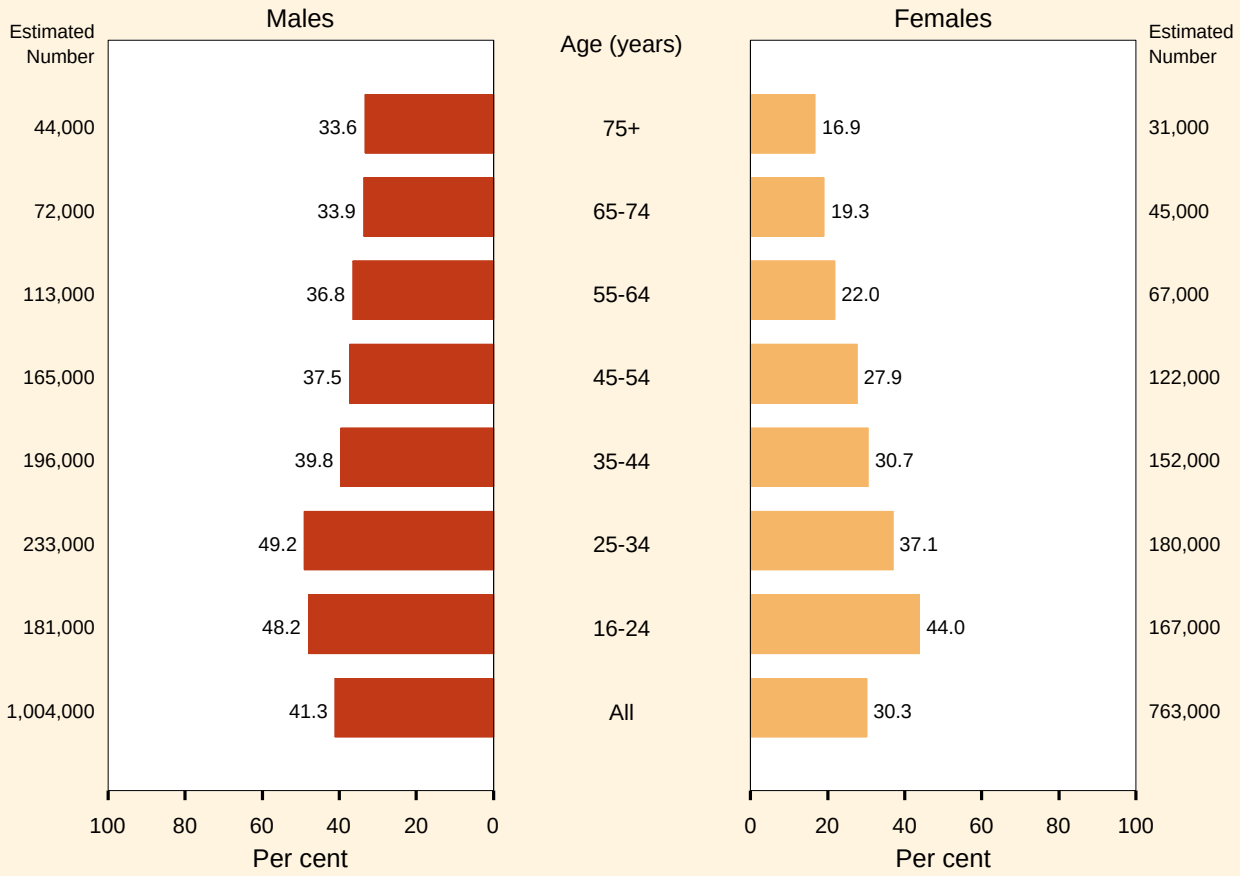
Source: Australian Institute of Health and Welfare (aetiologic fractions), 2001. NSW Department of Health Inpatient Statistics Collection (ISC) data and ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Tobacco smoking is the leading preventable cause of morbidity and premature mortality, particularly from cardiovascular disease; cancers of the lung, larynx, and mouth; and chronic obstructive pulmonary disease.
- The data presented here were derived by applying aetiologic fractions (the probability that a particular case of illness or death was caused by smoking) to death and hospital morbidity data for NSW.
- In NSW in 2002, smoking caused an estimated 4,321 male and 2,304 female deaths (about 18% of all male and 10% of all female deaths). In 2002–03, it is estimated that smoking caused 35,868 hospitalisations among males and 19,450 hospitalisations among females (about 4% of male and 2% of female hospitalisations).
- Between 1983 and 2002, the age-adjusted rate of deaths attributable to smoking in NSW declined by around 41% (49% in males and 28% in females).
- The age-adjusted rate of smoking-related hospitalisations in females increased by around 13% between 1989–90 but decreased by 7% in males over the same period.

For more information:

Peto R, Lopez AD, Boreham J, Thun M, Heath Jr C. *Mortality from Smoking in Developed Countries 1950–2000.* Oxford: Oxford University Press, 2004. Available at http://rum.ctsu.ox.ac.uk/~tobacco.

Risk drinking behaviour by age and sex, persons aged 16 years and over, NSW 2003



Note: 'Risk drinking' was defined as one or more of the following: drinking more than 14 standard drinks per week for females, or more than 28 standard drinks per week for males; reporting at least one 'heavy drinking' day in the past 12 months; or consuming alcohol every day. Estimates based on 12,886 respondents. 122 (0.94%) not stated for alcohol risk factors.

Source: NSW Health Survey 2003 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- At low levels, alcohol provides health benefits for some people, particularly in reduction of risk of heart disease from middle age. However, regular excessive alcohol consumption increases the risk over time of chronic ill health and premature death. Episodic heavy drinking places the drinker and others at risk of injury and death (NHMRC, 2001).
- Respondents to the 2003 NSW Health Survey were asked about their alcohol use. Reported usual weekly intake, heavy drinking days (4 or 6 drinks per day for females and males respectively), and alcohol-free days, were combined to give an overall measure of 'risk drinking'. In total, 41.3% of males and 30.3% of females reported risky drinking behaviours. Males were more likely than females to report this in all age groups.
- Males aged 16–34 years and females aged 16–24 years were most likely to report risk drinking. The proportion of people reporting risk drinking declined with age. However, 33.6% of males and 16.9% of females aged 75 years and over were still reporting risky drinking behaviour.
- *Outcomes of the NSW Summit on Alcohol Abuse: Changing the Culture of Alcohol Use in NSW*. (NSW Government, 2004) sets out a 4-year plan for changing the culture of alcohol abuse across 8 broad areas of action.

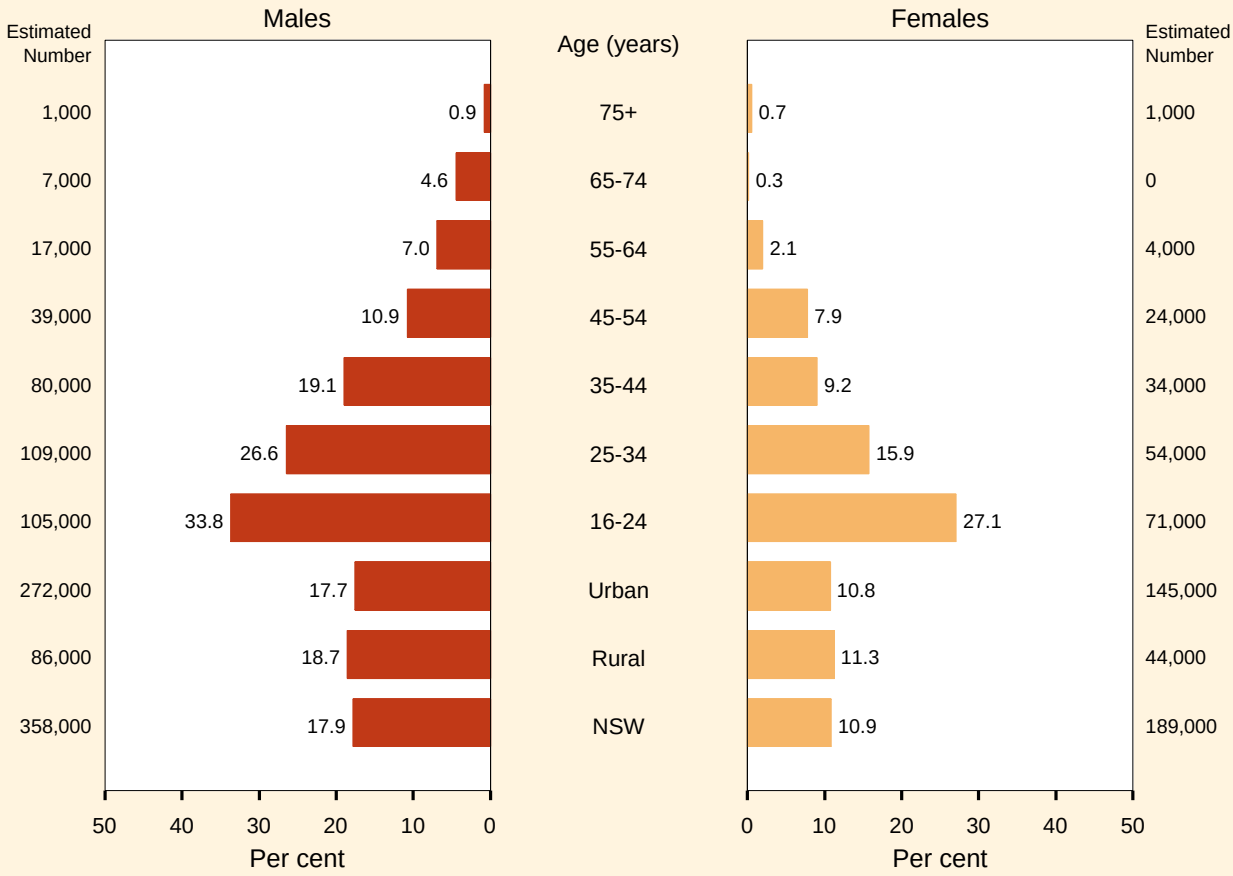
For more information:

National Health and Medical Research Council. *Australian Alcohol Guidelines: Health Risks and Benefits*. Canberra: Commonwealth of Australia, 2001. Available at www.health.gov.au/nhmrc/publications/synopses/ds9syn.htm.

National Drug Research Institute. *Australian alcohol indicators 1990–2001: Patterns of alcohol use and related harms for Australian states and territories*. Perth: Curtin University of Technology, 2003. Available at: www.ndri.curtin.edu.au/pdfs/naip006fullreport.pdf.

NSW Government. *Outcomes of the NSW summit on alcohol abuse 2003: Changing the culture of alcohol use in New South Wales*. Sydney: NSW Government, 2004. Available at www.alcoholinfo.nsw.gov.au/alcohol_summit_03/home.

High risk drinking behaviour by age, sex and rurality, persons aged 16 years and over, NSW 2003



Note: 'Risk drinking' was defined as those who consume alcohol and have had [11 or more if male; 7 or more if female] drinks in a day. The questions used to define the indicator were 'How often do you usually drink alcohol?' and 'In the past 4 weeks how often have you had [11 or more if male; 7 or more if female] drinks in a day?'. Numbers <1,000 shown as 0 in the graph. Estimates are based on 9,427 respondents. 32 (0.34%) not stated (Don't Know or Refused).

Source: NSW Health Survey 2003 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In Australia in 2001, it was estimated that the net benefit from low-risk alcohol use was 29,138 years of life saved. However, 48,703 years of life were lost from risky or high-risk drinking. This represents a net loss from all alcohol consumption of 19,565 years of life (National Drug Research Institute, 2003).
- In NSW in 2003, 14.7% of all people were at high risk of harm in the short-term as a result of their drinking (11 or more drinks in a day for males; 7 or more drinks in a day for females). The proportion of males reporting short-term high-risk drinking was greater than the proportion of females across all age groups. The proportion of people participating in high-risk drinking behaviours was greatest among those aged 16–24 years for both males (33.8%) and females (27.1%). High-risk drinking declined progres-sively with age. Around 15% per cent of both urban residents and rural residents reported high risk drinking.
- *Outcomes of the NSW Summit on Alcohol Abuse: Changing the Culture of Alcohol Use in NSW* (NSW Government, 2004) sets out a 4-year plan for changing the culture of alcohol abuse across 8 broad areas of action.

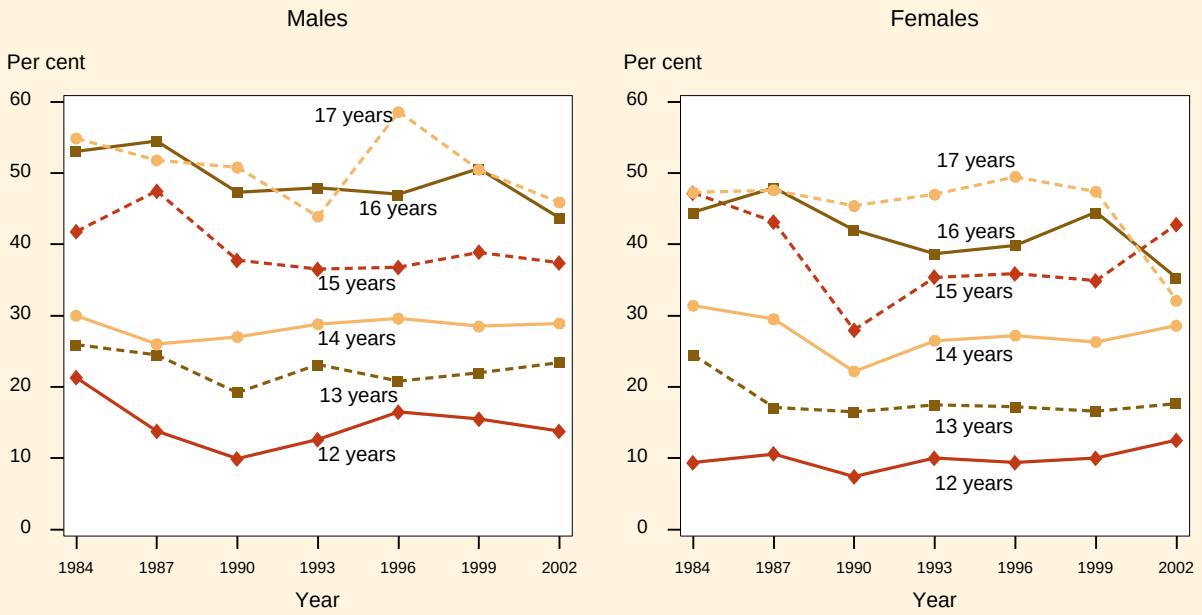
For more information:

National Health and Medical Research Council. *Australian: Health Risks and Benefits.* Canberra: Commonwealth of Australia, 2001. Available at www.health.gov.au/nhmrc/publications/synopses/ds9syn.htm.

National Drug Research Institute. *Australian alcohol indicators 1990–2001: Patterns of alcohol use and related harms for Australian states and territories.* Perth: Curtin University of Technology, 2003. Available at www.ndri.curtin.edu.au/pdfs/naip006fullreport.pdf.

NSW Government. *Outcomes of the NSW summit on alcohol abuse 2003: Changing the culture of alcohol use in New South Wales.* Sydney: NSW Government, 2004. Available at www.alcoholinfo.nsw.gov.au/alcohol_summit_03/home.

Recent alcohol consumption by age and sex, secondary school students aged 12-17 years, NSW 1984 to 2002



		1984	1987	1990	1993	1996	1999	2002
Males	All ages	33.8	34.5	30.0	30.7	32.5	32.5	31.4
Females	All ages	30.8	30.0	25.5	28.1	28.3	28.7	28.0
Persons	All ages	32.3	32.1	27.8	29.4	30.4	30.6	29.7

Note: Recent drinking: having an alcoholic drink in the last 7 days. Estimates are based on the following numbers of respondents: 1984, 4931; 1987, 4871; 1990, 5174; 1993, 4823; 1996: 10,026; 1999, 7348; 2002, 6180.

Source: NSW Department of Health. The health behaviours of secondary school students in New South Wales 2002. *N S W Public Health Bull* 2004; 15(S-2).

- In the short-term, excessive use of alcohol among adolescents can lead to falls, accidents (including motor vehicle accidents), risky sexual behaviour, and violent behaviour. In the longer term, alcohol dependency can lead to loss of control of one's life, while heavy ongoing use of alcohol can lead to damage to the pancreas and liver (cirrhosis), stomach ulcers, cognitive impairment, and an increased risk of some cancers (National Health and Medical Research Council, 2001).
- In 2002, 69.4% of NSW secondary school students reported drinking in the last year, and 44.5% reported drinking in the last 4 weeks. Recent drinking refers to having an alcoholic drink in the last 7 days. In 2002, 29.7% of students reported being recent drinkers. As expected, the percentage of recent drinkers generally increased as the age of students increased, from 13.2% among students aged 12 years to 38.7% among students aged 17 years in 2002.
- Males were more likely to report being recent drinkers than females, with 32.1% of females aged 17 years reporting that they were recent drinkers compared with 45.9% of males. The exception to this was in female students aged 15 years, where the percentage of recent drinkers was higher than in males of the same age (42.8% versus 37.6%) and higher than in females aged 17 years (32.1%).
- The NSW Summit on Alcohol Abuse 2003 addressed a range of social issues emergent from alcohol use and misuse, including special consideration for young people, in particular, preventing abuse and harm.

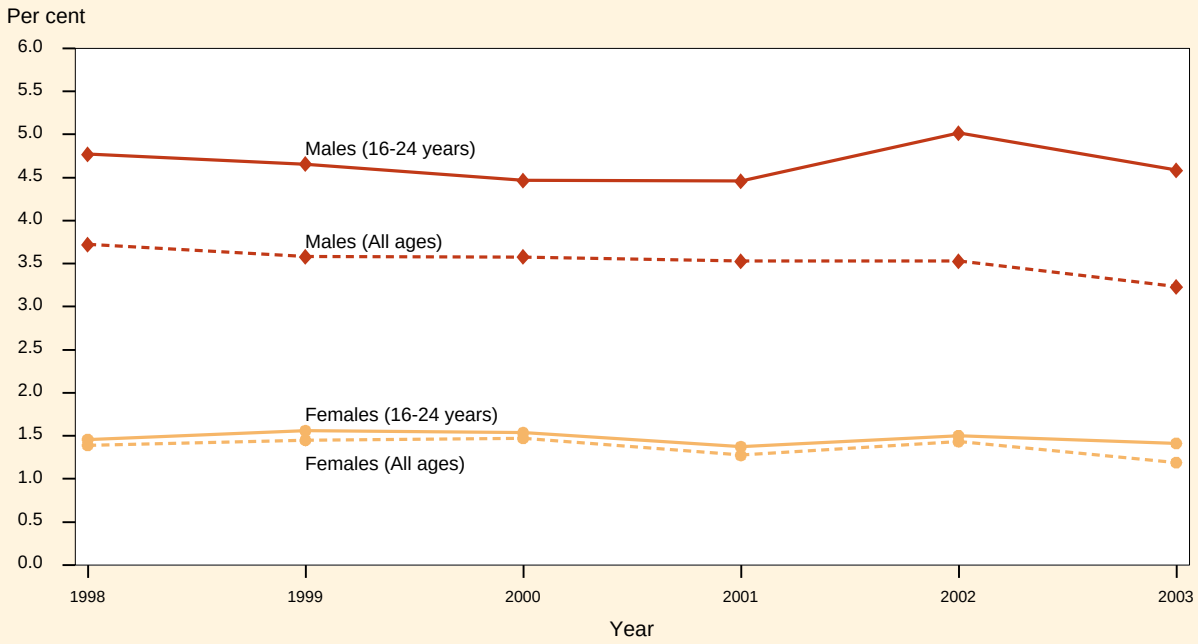
For more information:

National Health and Medical Research Council. *Australian Alcohol Guidelines: Health Risks and Benefits.* Canberra: Commonwealth of Australia, 2001. Available at www.health.gov.au/nhmrc/publications/synopses/ds9syn.htm.

National Drug Research Institute. *Australian alcohol indicators 1990–2001: Patterns of alcohol use and related harms for Australian states and territories.* Perth: Curtin University of Technology, 2003. Available at www.ndri.curtin.edu.au/pdfs/naip006fullreport.pdf.

NSW Government. *Outcomes of the NSW summit on alcohol abuse 2003: Changing the culture of alcohol use in New South Wales.* Sydney: NSW Government, 2004. Available at www.alcoholinfo.nsw.gov.au/alcohol_summit_03/home.

Alcohol-related motor vehicle crashes by sex, persons of all ages and 16-24 years, NSW 1998 to 2003



			1998	1999	2000	2001	2002	2003
Number	16–24 years	Persons	884	874	837	798	845	752
	All ages	Persons	2635	2568	2577	2421	2377	2071
Per cent of all crashes	16–24 years	Persons	3.7	3.6	3.5	3.4	3.8	3.5
	All ages	Persons	2.9	2.8	2.8	2.7	2.7	2.4

Note: Includes crashes that were reported to the police; occurred on a road open to the public; involved at least one moving road vehicle; and involved at least one person being killed or injured or at least one motor vehicle being towed away. Alcohol-related crashes are those where the vehicle controller was known to have a blood alcohol level exceeding the legal limit for that driver category.

Source: NSW Roads and Traffic Authority, 2004 (unpublished).

- Alcohol is rapidly absorbed into the bloodstream. It slows down functioning of the brain, causing loss of balance, reduced ability to judge speed and distance, impaired decision-making, and increased aggression. The amount of alcohol in the body is reported as a blood alcohol concentration (BAC) measured in grams per 100 millilitres of blood. In NSW, the general legal BAC level for driving is 0.05, while a special zero blood alcohol concentration limit applies for novice, younger, and some other categories of drivers (NSW Roads and Traffic Authority, 2004).
- Each year, approximately 20,000 drink-driving offences are committed in NSW, and around 100 fatalities result from alcohol-related crashes. Alcohol is a factor in approximately one in 6 fatal road crashes (NSW Roads and Traffic Authority, 2004; Briscoe, 2004).
- In NSW in 2003, 85,880 motor vehicle controllers (drivers and motorcycle riders) were involved in crashes that were reported to the police in which a person was killed or injured, or a motor vehicle was towed. Of these, 2,071 (2.4%) were known to have had a BAC above the legal limit.
- Of the vehicle controllers who were involved in alcohol-related crashes, the great majority (84%) were males. Almost one-third of male (31%) and a smaller proportion of female (5%) controllers in these crashes were aged 16–24 years.
- For males overall, the proportion of crashes that were alcohol-related decreased from 1998 to 2003. For both males and females aged 16–24 years, the proportion of alcohol-related crashes fluctuated over this same period.

For more information:

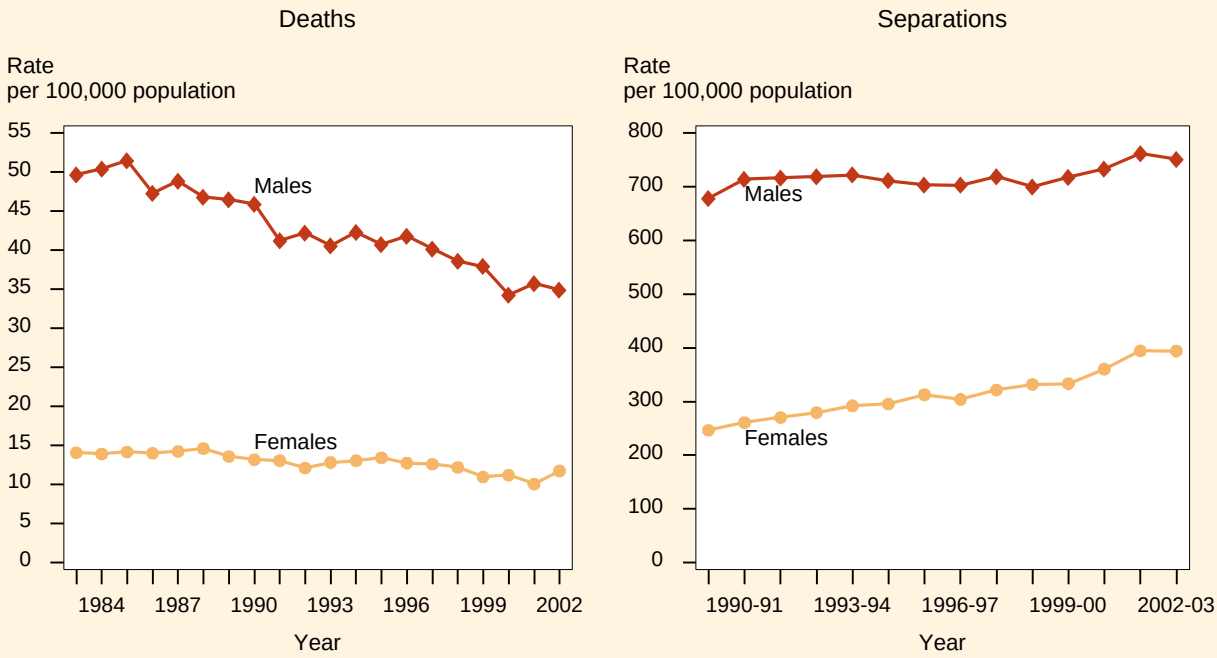
NSW Roads and Traffic Authority. *Drink driving action plan 2002–2004*. Sydney: NSW RTA, 2002. Available at www.rta.nsw.gov.au.

Briscoe, S. The impact of increased drink-driving penalties on recidivism rates in NSW. *Alcohol Studies Bulletin no. 5*. Sydney: NSW Bureau of Crime Statistics and Research, 2004.

NSW Roads and Traffic Authority. *Road traffic crashes in New South Wales 2003*. Sydney: NSW RTA, 2004. Available at www.rta.nsw.gov.au/roadsafety/downloads/accidentstats2003.pdf.

NSW Roads and Traffic Authority Zero Alcohol Limit website at www.rta.nsw.gov.au/roadsafety/drinkdriving/bloodalcohollimits/drinkinfoabout0_00.html.

Alcohol attributed deaths, 1983 to 2002, and hospital separations, 1989-90 to 2002-03, NSW



			1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Number	Deaths	Persons	1448	1504	1564	1503	1595	1570	1568	1551	1463	1479
	Separations	Persons	.	.	.	.	.	.	25860	27492	28012	28773
Rate per	Deaths	Persons	30.3	30.7	31.3	29.5	30.6	29.6	28.9	28.5	26.2	26.1
100,000 population	Separations	Persons	.	.	.	.	.	.	459.5	482.8	487.3	493.2

			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	Deaths	Persons	1471	1545	1550	1580	1570	1544	1510	1441	1482	1544
	Separations	Persons	29564	29701	30326	30443	31921	32095	33205	35092	37795	37991
Rate per	Deaths	Persons	25.8	26.6	26.2	26.3	25.5	24.6	23.6	22.1	22.2	22.7
100,000 population	Separations	Persons	501.6	498.2	502.9	497.7	514.3	509.8	519.5	540.6	572.3	566.8

Note: Deaths and hospital separations attributable to alcohol were calculated using age- and sex-specific aetiologic fractions from AIHW, 2001. Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards.Rates were age-adjusted using the Australian population as at 30 June 2001. Deaths are for calendar years. Separations are for financial years. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

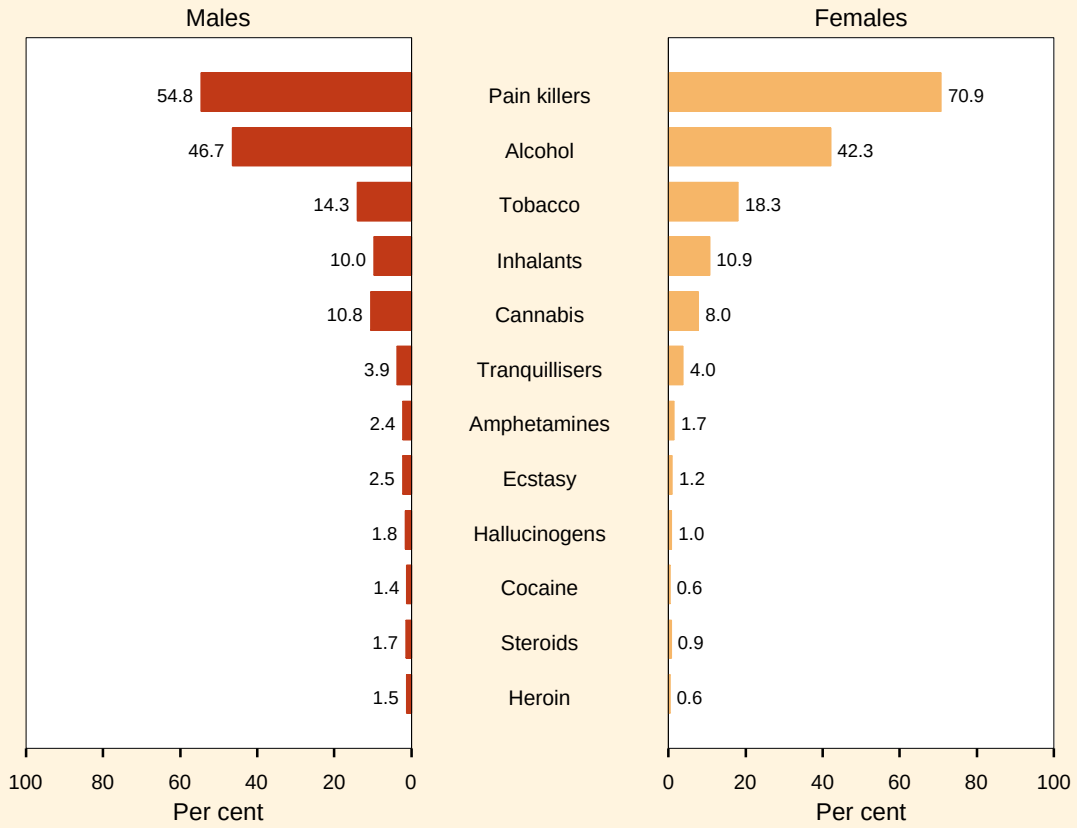
Source: Australian Institute of Health and Welfare (aetiologic fractions), 2001. NSW Department of Health Inpatient Statistics Collection (ISC) data and ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Diseases caused by risky and high risk drinking include some cancers, heart disease and stroke, liver disease, gastritis, and dementia. Misuse of alcohol is also a significant contributor to assaults, road injuries, domestic violence, and suicide. There are health benefits in regular consumption of a small amount of alcohol for those aged over 45 years. The protective effect is observable in ischaemic heart disease and possibly stroke and gallstones (National Health and Medical Research Council, 2001).
- In NSW in 2002, alcohol use caused an estimated 1,107 male and 437 female deaths (4.7% of all male and 2.0% of all female deaths). Between 1989 and 2002, the age-adjusted rate of deaths attributable to alcohol declined by around 21% (25% in males and 13% in females).
- In 2002–03 alcohol caused an estimated 24,368 hospitalisations among males and 13,624 hospitalisations among females (2.5% of all male and 1.2% of all female hospitalisations). The age-adjusted hospital separation rate increased between 1989–90 and 2002–03 by approximately 23% (11% in males and 60% in females).

For more information:

National Health and Medical Research Council. *Australian: Health Risks and Benefits.* Canberra: Commonwealth of Australia, 2001. Available at www.health.gov.au/nhmrc/publications/synopses/ds9syn.htm.

Substance use in the last four weeks by age and sex , secondary school students aged 12-17 years, NSW 2002



Note: Inhalant use includes sniffing spray cans and substances such as glue, paint, petrol or thinners. Hallucinogens include LSD, 'acid', 'trips', magic mushrooms, datura, and angel's trumpet. Estimates are based on 6,180 respondents.

Source: NSW Department of Health. The health behaviours of secondary school students in New South Wales 2002. *N S W Public Health Bull* 2004; 15(S-2).

- In NSW in 2002, female secondary school students were more likely to report ever using pain killers, while male students were more likely to report ever using cannabis. In terms of recent substance use in the last 4 weeks, female students reported using pain killers and smoking tobacco more often than male students, who were more likely to report drinking alcohol or using cannabis.
- About one-fifth of students reported ever inhaling substances, while one-tenth reported inhaling in the previous 4 weeks. As expected, the percentage of students who reported using substances increased with age. The only exception to this was for inhaled substances, where the proportion of students who reported recently using these fell from around 16% among students aged 12 years to around 5% among students aged 17 years.

For more information:

Australian Institute of Health and Welfare. *2001 National drug strategy household survey: State and territory supplement*. AIHW Catalogue no. PHE 37. Canberra: AIHW, 2002. Available at www.aihw.gov.au/publications/phe/ndshs01sts/ndshs01sts.pdf.

Australian Institute of Health and Welfare. *2001 National drug strategy household survey: Detailed findings*. AIHW Catalogue no. PHE 41. Canberra: AIHW, 2002. Available at www.aihw.gov.au/publications/phe/ndshs01df/ndshs01df-c00.pdf.

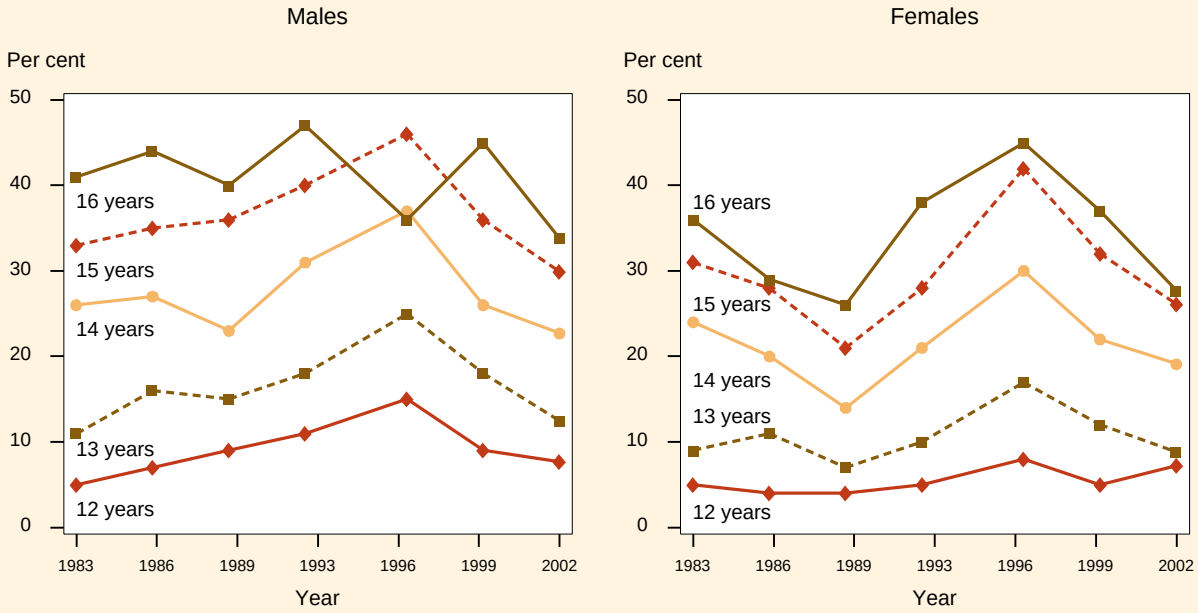
Office of Drug Policy, NSW Cabinet Office website at www.druginfo.nsw.gov.au.

Centre for Drug and Alcohol, NSW Department of Health. Available at www.health.nsw.gov.au/public-health/dpb.

National Drug and Alcohol Research Centre website at www.ndarc.med.unsw.edu.au/ndarc.nsf.

Australian Drug Information Network website at www.adin.com.au.

Cannabis use by age and sex, secondary school students aged 12-16 years, NSW 1983 to 2002



		1983	1986	1989	1992	1996	1999	2002
Males	12 years	5.0	7.0	9.0	11.0	15.0	9.0	7.7
	13 years	11.0	16.0	15.0	18.0	25.0	18.0	12.5
	14 years	26.0	27.0	23.0	31.0	37.0	26.0	22.7
	15 years	33.0	35.0	36.0	40.0	46.0	36.0	29.9
	16 years	41.0	44.0	40.0	47.0	36.0	45.0	33.8
Females	12 years	5.0	4.0	4.0	5.0	8.0	5.0	7.2
	13 years	9.0	11.0	7.0	10.0	17.0	12.0	8.8
	14 years	24.0	20.0	14.0	21.0	30.0	22.0	19.1
	15 years	31.0	28.0	21.0	28.0	42.0	32.0	26.1
	16 years	36.0	29.0	26.0	38.0	45.0	37.0	27.7

Note: Students were asked if they had ever 'smoked or used marijuana (grass, hash, cannabis, dope, mull, pot, a joint)'. Estimates are based on the following numbers of respondents: 1996: 10,026; 1999, 7,348; 2002, 6,180.

Source: NSW Department of Health. The health behaviours of secondary school students in New South Wales 2002. *N S W Public Health Bull* 2004; 15(S-2).

- Cannabis is the most commonly used illicit drug in Australia and one in 3 Australians aged 14 years and over report having used cannabis at least once in their lifetime (Australian Institute of Health and Welfare, 2002).
- From 1996 to 2002, there was a large fall in the reported use in cannabis among NSW secondary school students, with 9% of students reporting having used cannabis in the previous 4 weeks in 2002, compared to 17% in 1996.
- In 2002, among students who reported using cannabis in the last 4 weeks, 85% reported using other substances on the same occasion, most commonly alcohol (63%), tobacco (47%), and ecstasy (10%).
- From 1986 to 2002, more males than females reported using cannabis across all age groups. In 2002, 11% of male students reported using cannabis in the last 4 weeks, compared to 8% of female students.

For more information:

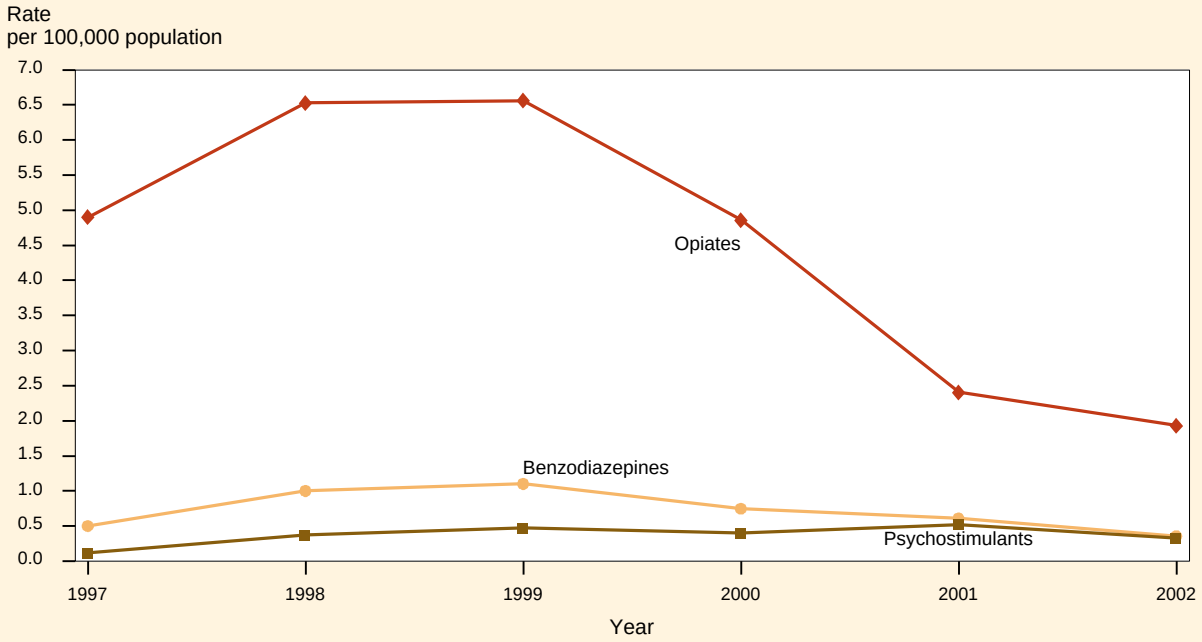
Australian Institute of Health and Welfare. *2001 National drug strategy household survey: State and territory supplement*. AIHW Catalogue no. PHE 37. Canberra: AIHW, 2002. Available at www.aihw.gov.au/publications/phe/ndshs01sts/ndshs01sts.pdf.

Australian Institute of Health and Welfare. *2001 National drug strategy household survey: Detailed findings*. AIHW Catalogue no. PHE 41. Canberra: AIHW, 2002. Available at www.aihw.gov.au/publications/phe/ndshs01df/ndshs01df-c00.pdf.

Office of Drug Policy, NSW Cabinet Office website at www.druginfo.nsw.gov.au.

National Drug and Alcohol Research Centre website at www.ndarc.med.unsw.edu.au/ndarc.nsf.

Opioid, psychostimulant and benzodiazepine-related deaths, persons aged 15-44 years, NSW 1997 to 2002



				1997	1998	1999	2000	2001	2002
Number	Opiates	Persons	15–44 years	317	422	425	316	158	128
			All ages	348	463	481	367	192	160
	Benzodiazepines	Persons	15–44 years	32	65	71	49	40	24
			All ages	41	78	91	62	54	37
	Psychostimulants	Persons	15–44 years	8	24	31	26	34	22
			All ages	9	27	36	31	37	26
Rate per 100,000 persons	Opiates	Persons	15–44 years	4.9	6.5	6.6	4.9	2.4	1.9
			All ages	5.4	7.2	7.5	5.7	2.9	2.4
	Benzodiazepines	Persons	15–44 years	0.5	1.0	1.1	0.7	0.6	0.4
			All ages	0.7	1.2	1.4	0.9	0.8	0.6
	Psychostimulants	Persons	15–44 years	0.1	0.4	0.5	0.4	0.5	0.3
			All ages	0.1	0.4	0.6	0.5	0.6	0.4

Note: Deaths were classified using ICD-10. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production.

Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

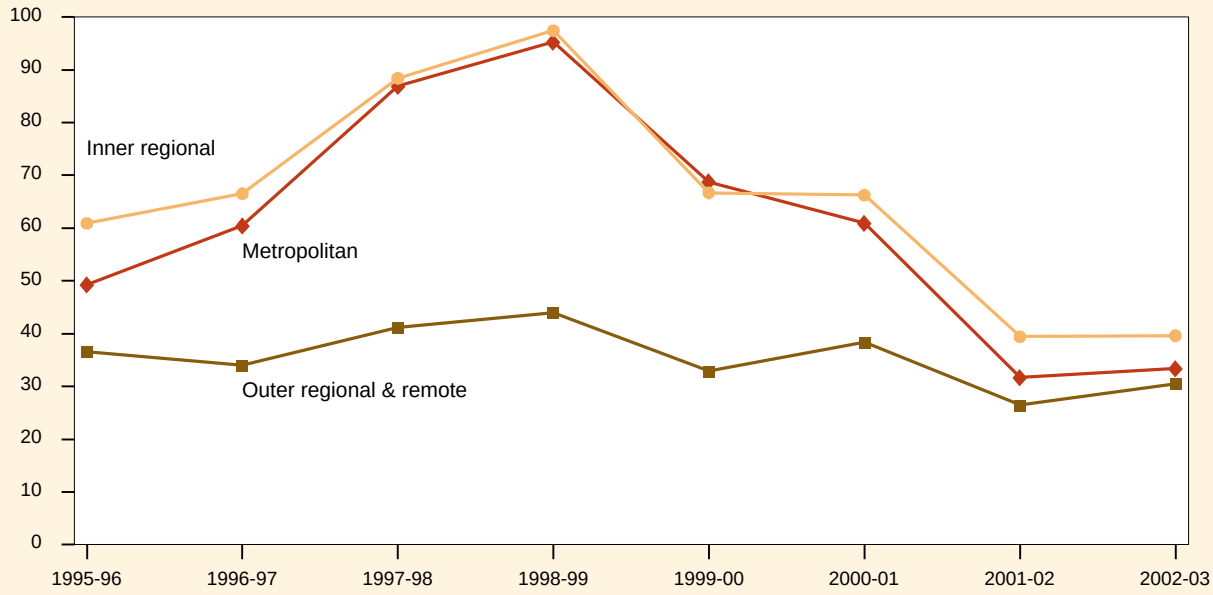
- Opioid deaths represent a large proportion of illicit drug deaths in Australia, and opioid deaths from heroin, morphine, or methadone are a source of public concern. Most opioid deaths are from heroin (Barker and Degenhardt, 2003).
- Opioid overdose deaths peaked in NSW in 1999, and have declined in each year since. In late 2000, a heroin shortage became apparent in Sydney and other Australian capital cities. There is no definitive explanation for the shortage; however, severe droughts affected the 'Golden Triangle' region of Laos, Myanmar, and Thailand. Policing operations have been cited as another factor (Johns, 2004). In 2002, males represented 82% of all opiate-related deaths in NSW.
- Benzodiazepines are a prescribed medication and are not illegal. Psychostimulants include cocaine and amphetamines. Deaths from benzodiazepines have declined in NSW since 1999, while deaths from psychostimulants have been stable.

For more information:

Barker B, Degenhardt L. *Accidental drug-induced deaths in Australia, 1997–2001*. NDARC Technical Report no. 165. Sydney: National Drug and Alcohol Research Centre, UNSW, 2003.

Johns R. *Drug offences: An update on crime trends, diversionary programs and drug prisons*. Briefing Paper no. 7/04. Sydney, NSW Parliamentary Library Research Service, 2004. Available at www.aic.gov.au/research/drugs/publications/other.html#nsw.

Drug overdoses attended by ambulance by region of attendance, NSW 1995-96 to 2002-03



		1995–96	1996–97	1997–98	1998–99	1999–00	2000–01	2001–02	2002–03
Metropolitan	Number	2162	2688	3902	4327	3162	2842	1497	1588
Inner-regional		772	839	1143	1274	883	889	535	543
Outer-regional and remote		189	176	216	231	173	203	141	162
NSW		3123	3703	5261	5832	4218	3934	2173	2293
Metropolitan	Rate per	49.3	60.5	86.9	95.3	68.8	61.0	31.7	33.4
Inner-regional	100,000	60.9	66.5	88.4	97.4	66.7	66.3	39.4	39.6
Outer-regional and remote	population	36.6	34.0	41.2	44.0	32.9	38.4	26.5	30.5
NSW		50.7	59.5	83.4	91.5	65.4	60.2	32.9	34.4

Note: Location of ambulance attendances where the Ambulance Service Protocol 28 (drug overdose and poisoning) was used and where a narcotic antagonist (such as Naloxone–Narcan) was administered. Some opiate overdose cases may not have a narcotic antagonist because some ambulance officers are not authorised to administer a narcotic antagonist. Statistical Local Areas were assigned to the Accessibility–Remoteness Index of Australia Plus (ARIA+). ARIA+ category of major cities was classified as metropolitan.

Source : Ambulance Service of NSW case sheet database (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Non-fatal opioid overdoses are common among heroin users. Non-fatal overdoses are episodes where loss of consciousness and depression of respiration occurs but is not fatal (Warner-Smith et al., 2000).
- The rate of ambulance attendance for drug overdose in NSW was at its highest in 1998–99 (91.5 per 100,000 population), and lowest in 2001–02 (32.9 per 100,000). In 2002–03, the rates of ambulance attendance for drug overdose were highest in inner-regional areas (39.6 per 100,000) compared with metropolitan areas (33.4 per 1000,000) and outer-regional and remote areas (30.5 per 100,000).
- From 2000–01 to 2001–02, there was a 48% decline in ambulance attendances in metropolitan areas. In late 2000, a heroin shortage became apparent in Sydney and other Australian capital cities. There is no definitive explanation for the shortage; however, severe drought affected the 'Golden Triangle' region of Laos, Myanmar and Thailand. Policing operations have been cited as another factor (Johns, 2004).
- The majority of calls to the NSW Ambulance Service occurred in larger cities, particularly in Sydney. The 2 most common Local Government Areas in Sydney were Fairfield and South Sydney, where the largest NSW heroin markets are concentrated (Maher et al., 1998).

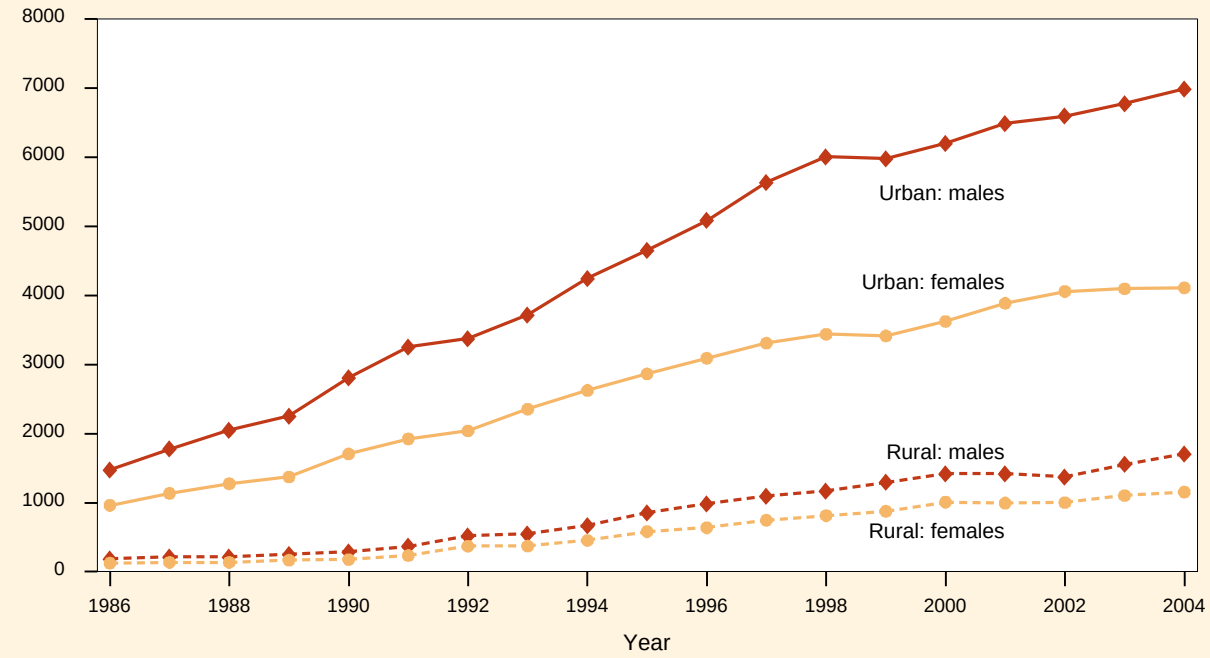
For more information:

Johns R. *Drug Offences: An update on crime trends, diversionary programs, and drug prisons.* Briefing Paper no. 7/04. Sydney: NSW Parliamentary Library Research Service, 2004.

Maher L, Dixon D, Lynskey M and Hall W. *Running the risks.* Sydney: National Drug and Alcohol Research Centre, 1998.

Warner-Smith M, Lynskey M, Darke S and Hall W. *Heroin Overdose: Prevalence, Correlates, Consequences and Interventions.* Monograph No. 24, Sydney: National Drug and Alcohol Research Centre, 2000.

Clients of the NSW Methadone/Buprenorphine Program by region of treatment and sex, NSW 1986 to 2004



		1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Urban	Persons	2441	2914	3328	3625	4521	5182	5417	6071	6871	7521
Rural	Persons	314	353	355	424	471	606	894	926	1123	1439
Justice Health	Persons	0	0	0	0	17	15	23	279	274	451
NSW	Persons	2755	3267	3683	4049	5009	5803	6334	7276	8268	9411

		1996	1997	1998	1999	2000	2001	2002	2003	2004
Urban	Persons	8174	8943	9442	9389	9818	10374	10649	10871	11095
Rural	Persons	1626	1843	1983	2173	2427	2418	2375	2660	2862
Justice Health	Persons	471	507	542	787	1008	1333	1354	1472	1566
NSW	Persons	10271	11293	11967	12349	13253	14125	14378	15003	15523

Note: Data extracted as at 30 June each year. Location is derived from the postcode of the dosing point. Health areas in metropolitan Sydney, Central Coast, Hunter, and Illawarra were classified as urban.

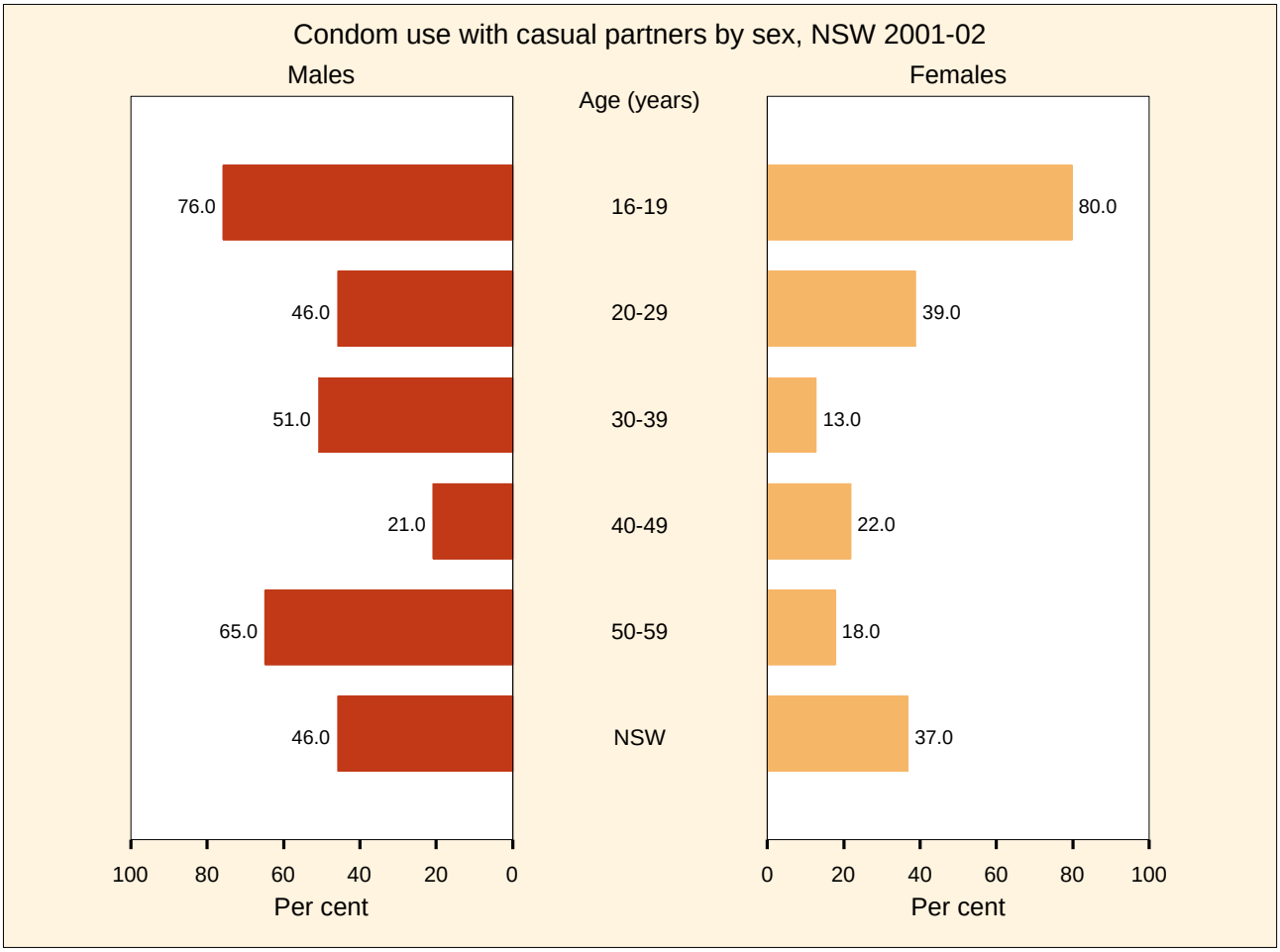
Source: Pharmaceutical Drugs of Addiction System, NSW Department of Health.

- Methadone maintenance is an effective treatment for opioid dependence (Mattick et al., 2003).
- The NSW Methadone–Buprenorphine Program seeks to reduce the social, economic, and health harms from the use of illegal opioids (NSW Department of Health, 1999). The NSW Drug Summit was held in May 1999. This was followed by the publication of the NSW Government Plan of Action, which committed over $54 million to the expansion and improvement of the quality of methadone treatment services in NSW.
- In 2004, 10,008 males were on the NSW methadone program, representing 64% of all clients on program. In 2004, 71% of methadone clients were in treatment in urban areas, with 18% in rural areas and 10% in the correctional system. Since 1986, the number of clients on the methadone program has increased almost six-fold.
- In August 2001, buprenorphine, another opioid replacement therapy, became available as an additional treatment for opioid dependence. It is effective in the long-term as a maintenance treatment, and in the short-term as an appropriate drug for an opioid withdrawal program.

For more information:

Mattick R, Breen C, Kimber J, Davoli M. *Methadone maintenance therapy versus no opioid replacement therapy for opioid dependence*. Cochrane Review. Cochrane Library. Volume 1, 2003.

NSW Department of Health. *The NSW Methadone Maintenance Treatment Clinical Practice Guidelines*. Sydney: NSW Department of Health, 1999. Available at www.health.nsw.gov.au/public-health/dpb/publications/pdf/methadone_clinicalpractice_guidelines.pdf.



Note: Estimates are based on 310 respondents who had casual partners in the last 6 months, who were asked a series of questions to measure how often they used condoms for vaginal intercourse in the 6 months prior to being interviewed.

Source: Australian Study of Health and Relationships 2001–02 (unpublished).

- The latex condom is effective as a contraceptive and provides protection against the transmission of human immunodeficiency virus and other sexually transmissible infections, including genital warts, chlamydia, herpes, and gonorrhoea.
- The Australian Study of Health and Relationships of 2001–02 collected information on recent condom use from those respondents who were sexually active in the 6 months prior to being interviewed. Among NSW respondents, consistent condom use with casual partners was reported more frequently by males (46%) than females (37%), and was most frequently reported by people of both sexes aged 16–19 years. Respondents were much less likely to report always using condoms with regular partners, whether live-in or non-live-in. These findings were similar to those for Australia as a whole (de Visser et al., 2003a).
- Among male respondents in the Australian Study of Health and Relationships who used condoms in the year prior to being interviewed, 23.8% reported that they had experienced at least one condom breakage, and 18.1% reported that they had experienced at least one condom slippage, in the past year. Experience of condom breakage or slippage was more commonly reported by younger men and those using larger numbers of condoms (de Visser et al., 2003b).

For more information:

De Visser R, Smith A, Rissel C, et al. Safer sex and condom use among a representative sample of adults. *Aust N Z J Public Health* 2003a; 27: 223–9.

De Visser R, Smith A, Rissel C, et al. Experience of condom failure among a representative sample of men. *Aust N Z J Public Health* 2003b; 27: 217–22.

2 Burden of disease

Section 2

Chapter 2.1

Burden of disease

- Life expectancy in NSW continues to increase. In 2002:
  - —newborn males could expect to live for 78.1 years, while newborn females could expect to live for 83.3 years;
  - — men who had reached age 65 years could expect to live to 82.8 years of age, while women who had reached age 65 years could expect to live to 86.4 years of age;
  - — although females can still expect to live longer than males, the difference between the sexes is decreasing.
- The age-adjusted death rate in NSW has almost halved in the last 20 years.
- The most important causes of premature death (before age 75 years) are: in males, ischaemic heart disease, lung cancer and stroke; in females, ischaemic heart disease, stroke and breast cancer.
- In NSW in 2002, the infant mortality rate was 4.6 per 1,000 livebirths.
- Hospital separations have increased by 30% in NSW over the last decade, with the rate consistently higher in females. In 2002–03, the most common causes of hospital separations were: factors influencing health, unintentional injuries, and digestive system diseases.
- In 2003, over 86% of all NSW residents aged less than 55 years and 75% of residents aged over 55 years rated their health as 'good' or better.
- The disability adjusted life year (DALY) is a measure of overall disease burden that combines measures of years of life lost due to premature death and years lived with disability. In terms of DALYs, the major causes of disease burden are: in males, ischaemic heart disease, stroke and lung cancer; in females, ischaemic heart disease, stroke and dementia.
- Ambulatory care sensitive conditions are those for which hospitalisation is considered potentially avoidable through preventive care and early disease management. Hospitalisation rates for these conditions increased by 12% in NSW in the last 13 years.
- Around one-half of all hospitalisations for ambulatory care sensitive conditions were for diabetes complications, asthma, angina, chronic obstructive pulmonary disease, or congestive heart failure.

In this chapter

Introduction

This chapter focuses on trends in life expectancy and death rates in NSW, and examines the major causes of death, hospitalisation and disability. A number of measures are used to explore the relative contribution of various diseases, conditions and causes of injury to this loss of life and disability. Traditional indicators—such as life expectancy and age-adjusted death and hospitalisation rates—are examined first. Then newer indicators are presented, beginning with indicators that use the 'global burden of disease' approach, followed by indicators analysing ambulatory care sensitive conditions. Finally, international comparisons of 4 key indicators are presented. The concepts of the burden of disease approach and ambulatory care sensitive conditions require further introduction.

The major limitation of using only death and hospitalisation data to assess the burden that particular diseases or causes of injury place on the community is that conditions that cause substantial suffering or disability but which don't result in death or hospitalisation are overlooked. The global burden of disease approach aims to address these limitations, by using a summary health gap measure called the 'disability

adjusted life year' (DALY), and by comprehensively assessing the complete spectrum of disease that occurs in a population.

The DALY aims to quantify the amount of full health lost due to disease or injury occurring in a particular period, by adding the burden arising from premature deaths in that period to the burden of incident (new) cases of disease or injury occurring in that same period. The burden is not simply the count of deaths and new cases, but is quantified by multiplying the number of incident deaths or cases by an estimate of relative severity of disability caused by the condition, known as the disability weight, and by the duration of the loss of health. The disability weight is measured on a scale of 0–1, and is constructed so that 0 means full health and 1 means death. The duration of loss of health or loss of life is limited by an 'ideal' life expectancy from a life table chosen for each study.

An optional discounting factor to reflect the greater importance people, on average, place on the loss of health in the near future compared with the distant future, can also be incorporated into the calculation. Age-weighting to assign different weights based on the economic and social welfare value of people at different ages can also be incorporated. To be consistent with the methodology used in Australia, discounting, but not age-weighting, is incorporated into the measures given in this report.

The DALY for a cause of disease or injury is calculated separately for each age group defined, and for each sex. The total burden of that disease is the sum of the DALYs for all age groups and both sexes. This additive feature of DALYs is central to its application to different aggregations and disaggregations of populations and causes of disease or injury.

The fatal component of the DALY is called 'years of life lost due to premature death' (YLL) and the nonfatal component is called the 'years of healthy life lost due to disability' (YLD). The DALY for a cause of disease or injury in a population is equal to the sum of the YLL and YLD values for that cause in the population. DALYs, YLLs, and YLDs can be summed across multiple causes to provide aggregate burden of disease and injury estimates for a population.

Ambulatory care sensitive conditions are those for which hospitalisation is considered potentially avoidable through preventive care and early disease management, usually delivered in an ambulatory setting, such as primary health care (for example by general practitioners or community health centres).

Hospitalisation rates for ambulatory care sensitive conditions are used as an indicator of access to, and quality of, primary care. Other factors that influence rates include disease prevalence in the community, hospital admission and coding practices, and personal choices about seeking health care. The conditions reported here as ambulatory care sensitive are presented in 3 categories: vaccine-preventable conditions, acute conditions, and chronic conditions.

More information on the methods used for calculating life expectancy and age-adjusted death and hospitalisation rates can be found in the Methods section. The values for life expectancy that appear in this report may differ slightly from those published by the Australian Bureau of Statistics due to minor differences in these methods. The ICD-10 and ICD-9 codes used for each indicator are included in the disease and procedure codes appendix.

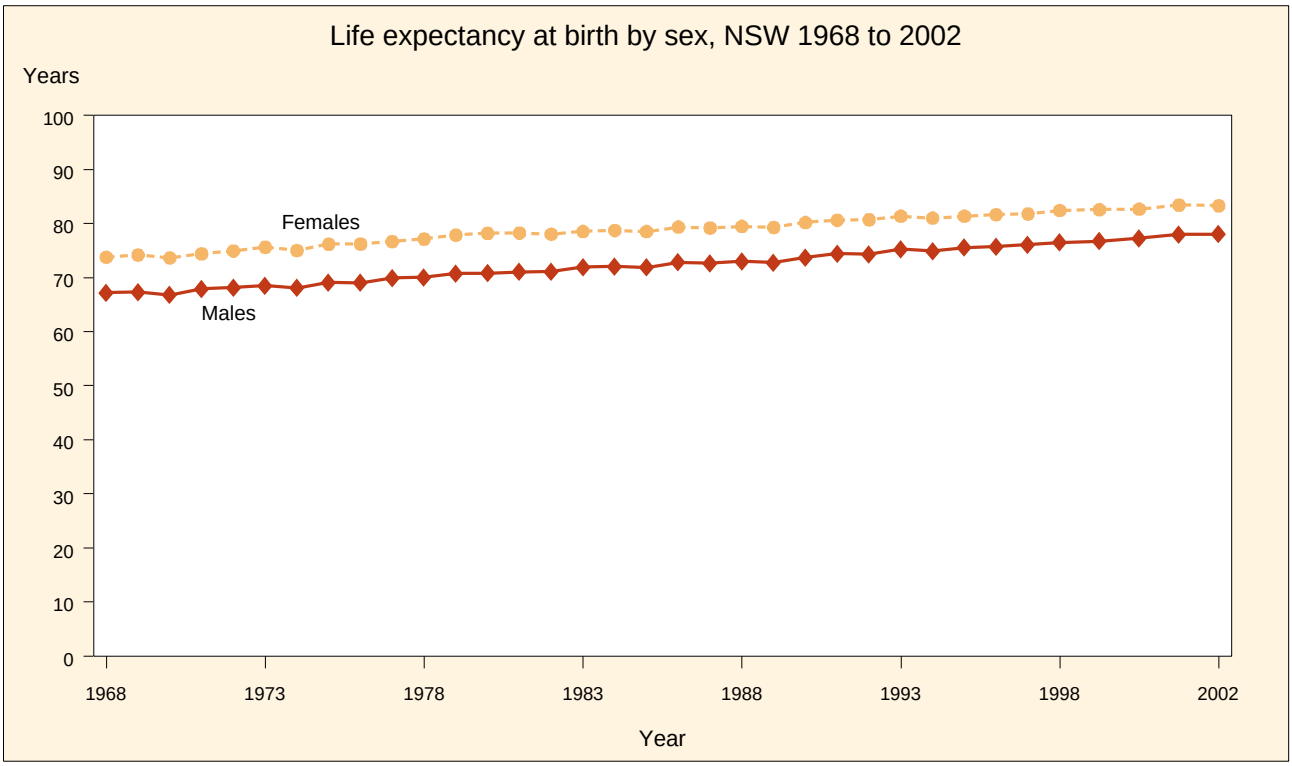
For more information:

Australian Institute of Health and Welfare website at www.aihw.gov.au.

Mathers C, Vos T, Stevenson C. *The burden of disease and injury in Australia.* AIHW Catalogue no. PHE 17. Canberra: AIHW, 1999. Available at www.aihw.gov.au/bod/index.html.

Victorian Department of Human Services Burden of Disease website at http://hn01.dhs.vic.gov.au/bodw.

Harvard University Global Burden of Disease Unit at www.hsph.harvard.edu/organizations/bdu.



		1968	1973	1978	1983	1988	1993	1998	2002
NSW	Males	67.2	68.6	70.0	71.9	73.0	75.3	76.5	78.1
	Females	73.8	75.6	77.1	78.5	79.5	81.4	82.4	83.3
Australia	Males	67.4	68.7	70.4	72.2	73.3	75.3	76.6	78.1
	Females	74.2	75.7	77.5	79.0	79.9	81.4	82.4	83.1

Note: Life expectancy was calculated using the method of Chiang (see Methods section).

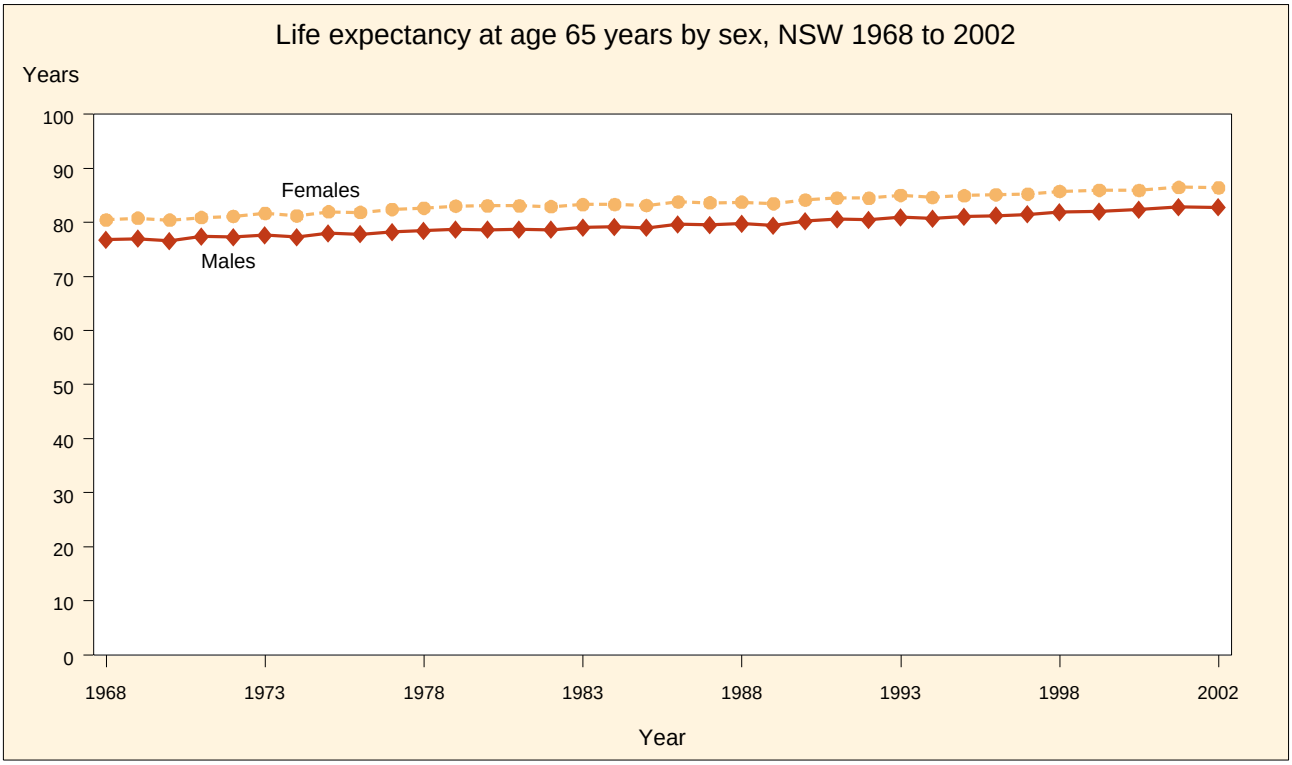
Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Life expectancy at birth is an estimate of the number of years a person can expect to live, on average, assuming that death rates continue at levels that prevailed in the year of their birth. This is a practical assumption, because although death rates generally do change over a person's lifetime, it is difficult to predict what these changes will be.
- In NSW, between 1968 and 2002, life expectancy at birth steadily increased, from 67.2 to 78.1 for males, and from 73.8 to 83.3 for females. These figures were similar to those for Australia as a whole.
- Although females can still expect to live longer than males, the difference between the sexes is decreasing. In NSW in 2002, female life expectancy was 5.2 years higher than for males, compared with 6.6 years higher in 1968.
- Life expectancy at birth in Australia compares very favourably with other developed countries. For Australian males in 2002, life expectancy at birth was only 0.5 years behind Japan, and 0.1 years behind Sweden. For Australian females, life expectancy at birth was 2.3 years behind Japan, 0.5 years behind France, 0.3 years behind Switzerland, and equal to Spain (WHO, 2004).
- However, life expectancy at birth for Aboriginal and Torres Strait Islander people is approximately 20 years less than for non-Indigenous people. See Chapter 3.1 for more information on the health status of the Aboriginal and Torres Strait Islander population of NSW.

For more information:

Australian Bureau of Statistics. *Deaths, Australia 2002.* ABS Catalogue no. 3302.0. Canberra: ABS, 2003.

World Health Organization. *The World Health Report 2004. Changing history.* Geneva: WHO, 2004. Available at www.who.int/whr/2004/en.



		1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
NSW	Males	76.8	77	76.6	77.4	77.3	77.6	77.3	78	77.8	78.2	78.4	78.7
	Females	80.5	80.8	80.4	80.9	81.1	81.7	81.2	82	81.9	82.4	82.6	83
Australia	Males	76.9	77.2	76.9	77.5	77.6	77.7	77.6	78.1	77.9	78.5	78.6	78.8
	Females	80.6	81	80.6	81.2	81.4	81.6	81.4	82.2	82	82.6	82.8	83.1

		1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
NSW	Males	78.6	78.7	78.6	79	79.2	79	79.7	79.6	79.8	79.4	80.2	80.6
	Females	83.1	83.1	82.9	83.3	83.3	83.1	83.8	83.6	83.7	83.5	84.1	84.5
Australia	Males	78.8	78.9	78.8	79.3	79.4	79.4	79.9	79.8	80	79.7	80.4	80.7
	Females	83.2	83.3	83.1	83.7	83.5	83.4	84	83.9	84.1	83.7	84.4	84.7

		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
NSW	Males	80.5	81	80.7	81.1	81.2	81.5	81.9	82	82.4	82.8	82.8
	Females	84.5	85	84.6	84.9	85.1	85.2	85.7	86	85.9	86.5	86.4
Australia	Males	80.6	81	80.8	81.2	81.3	81.6	81.9	82.2	82.5	82.8	82.8
	Females	84.5	85	84.7	85	85.1	85.3	85.8	85.9	86.1	86.4	86.3

Note: Life expectancy was calculated using the method of Chiang (see Methods section).

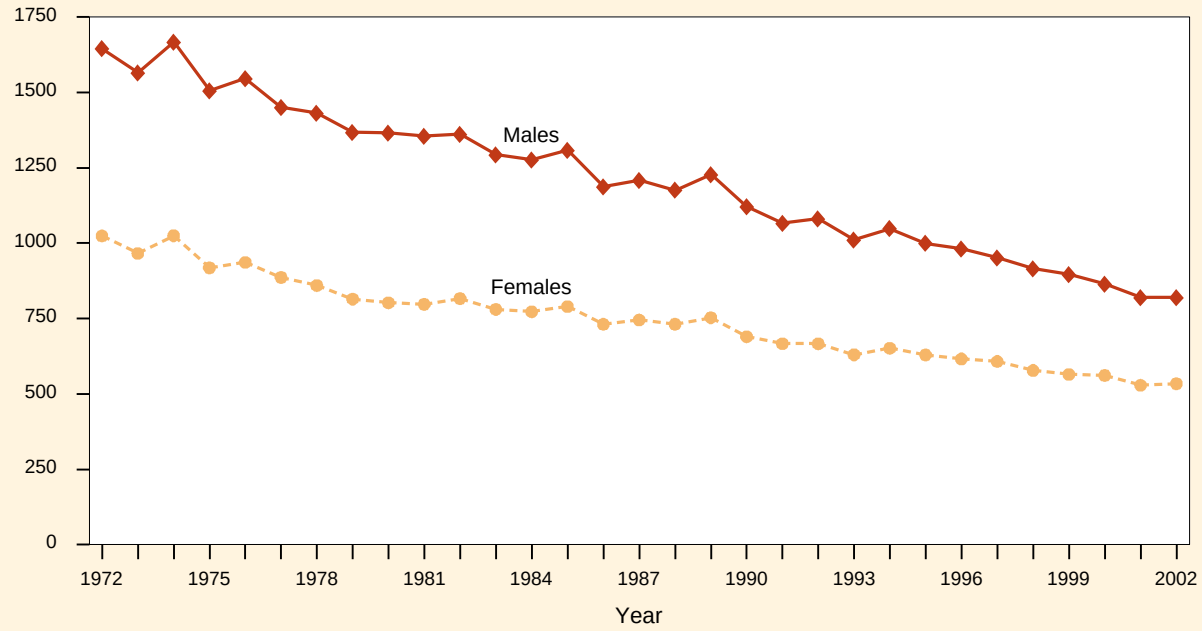
Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Life expectancy at 65 years of age is an estimate of the average age at death for someone who turns 65 in a given year, assuming that death rates prevailing in that year continue unchanged. Death rates generally do change over time, but this assumption is more reasonable for a 65 year-old than for someone just born, because the maximum additional lifespan at age 65 is much shorter.
- Life expectancy at age 65 years is influenced by lifestyle, and nutritional and environmental factors, as well as access to and the quality of health services.
- In NSW between 1968 and 2002, life expectancy at age 65 years increased from 76.8 to 82.8 years for males, and from 80.5 to 86.4 years for females.
- Although females who reach the age of 65 years can expect to live longer than males of the same age, this difference is less than the difference in life expectancy at birth. This reflects the fact that males are at greater risk of dying before they reach the age of 65 years, primarily from injury, suicide, and cardiovascular disease.

For more information:

World Health Organization. *Healthy Life Expectancy.* Geneva: WHO, 2002. Available at www.who.int/whosis/hale.

Deaths from all causes by sex, NSW 1972 to 2002



		1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Number	Males	23273	22714	24168	22389	23191	22086	22230	21530	22037	22256	22849
	Females	18949	18291	19826	18208	19057	18452	18276	17663	17845	18294	19144
	Persons	42222	41005	43994	40597	42248	40538	40506	39193	39882	40550	41993
Rate	Males	1645.1	1565.7	1667.6	1506.7	1546.9	1450.7	1431.2	1367.5	1365.7	1355.6	1362.2
per 100,000	Females	1024.6	966.5	1025.3	918.8	936.7	887	860.1	815	802.7	797.8	817
population	Persons	1286	1221	1292.8	1164.8	1190.7	1119.1	1096.3	1043.8	1036.8	1028.6	1043.1

		1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Number	Males	22081	22327	23364	22278	23306	23245	24599	23149	22653	23476	22540
	Females	18775	19084	20083	19298	20151	20233	21328	19927	19891	20394	19871
	Persons	40856	41411	43447	41576	43457	43478	45927	43076	42544	43870	42411
Rate	Males	1293.6	1277	1308.2	1188.3	1208.2	1176	1228.5	1122.3	1066.3	1081.1	1012
per 100,000	Females	781	773	790.1	731.6	746	731.7	753.5	690.1	667.3	666.6	630.4
population	Persons	990.9	980.6	1003.4	922.9	941.2	919.9	953.7	874.1	837.3	842.8	792.8

		1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	Males	23866	23316	23567	23612	23444	23679	23529	23109	23790
	Females	21156	21021	21249	21699	21205	21391	22034	21417	22291
	Persons	45022	44337	44816	45311	44649	45070	45563	44526	46081
Rate	Males	1048.7	999.8	981	952	915.3	897.5	864.7	820.4	820.2
per 100,000	Females	652	630	616.8	608.4	578.6	565.1	561.8	529.6	534.6
population	Persons	821.3	786.5	772.5	756.5	724	709.2	694.9	657	659.5

Note: Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production.

Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

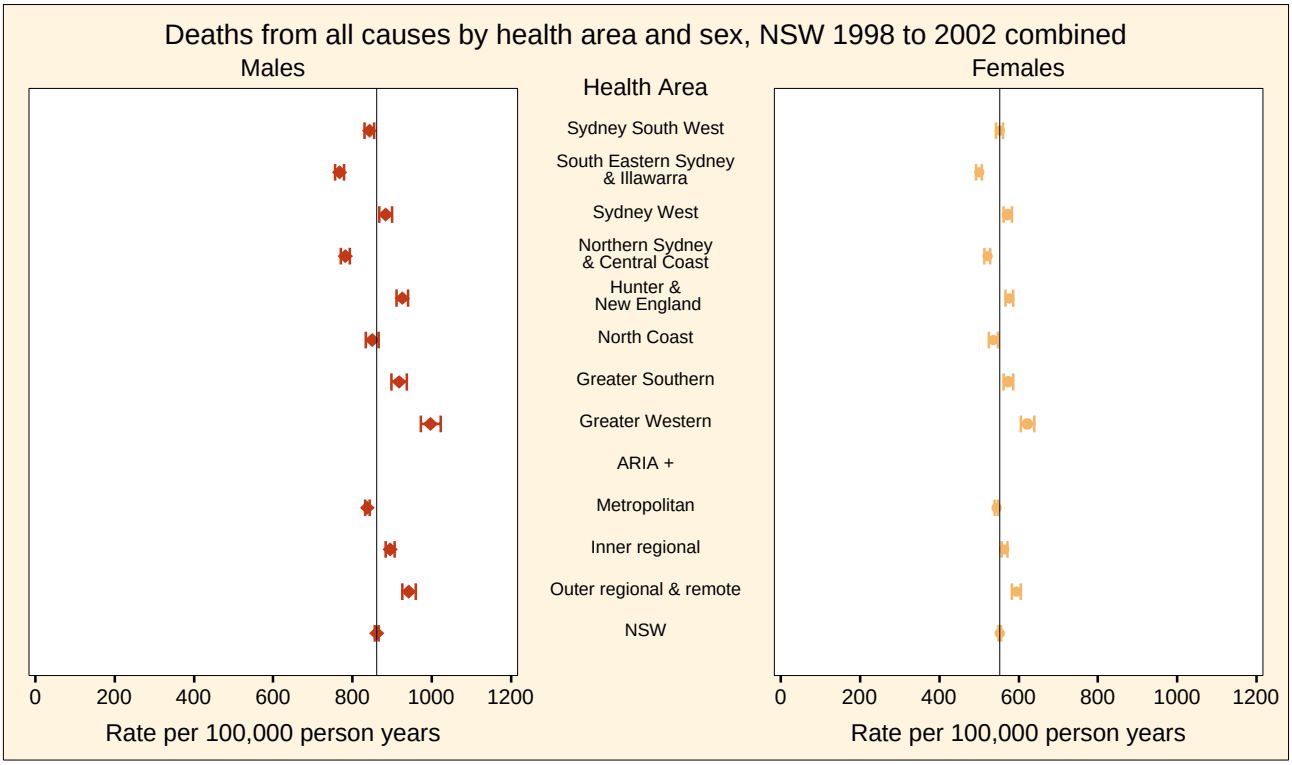
- The age-adjusted death rate in NSW decreased by 49% over the period 1972 to 2002 (50.1% for males and 47.8% for females).
- In 2002, the age-adjusted male death rate was 53% higher than the female death rate. This difference has declined steadily from 61 per cent in 1972.
- Because of the overall reduction in death rates, the absolute number of deaths of NSW residents rose by only 9% between 1972 (42,222 deaths) and 2002 (44,526 deaths). This is despite a 37% increase in the NSW population over that time.

For more information:

Australian Bureau of Statistics. *Deaths, Australia 2002.* ABS Catalogue no. 3302.0. Canberra: ABS, 2003.

Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004. Available at: www.aihw.gov.au/publications/index.cfm/title/10014.

Australian Bureau of Statistics website at www.abs.gov.au.



Health area		Deaths	Rate per 100,000 population	LL 95% CI	UL 95% CI
Sydney South West	Persons	35796	678.6	671.5	685.7
South Eastern Sydney & Illawarra	Persons	37196	616.5	610.2	622.8
Sydney West	Persons	26783	703.9	695.4	712.5
Northern Sydney & Central Coast	Persons	41024	628.9	622.8	635.0
Hunter & New England	Persons	32721	730.9	722.9	738.8
North Coast	Persons	19039	679.4	669.7	689.3
Greater Southern	Persons	17362	728.5	717.6	739.4
Greater Western	Persons	12221	788.0	774.1	802.1
Metropolitan	Persons	151569	670.0	666.6	673.3
Inner-regional	Persons	51606	711.2	705.0	717.3
Outer-regional and remote	Persons	22141	755.8	745.8	765.9
NSW	Persons	225631	687.3	684.4	690.1

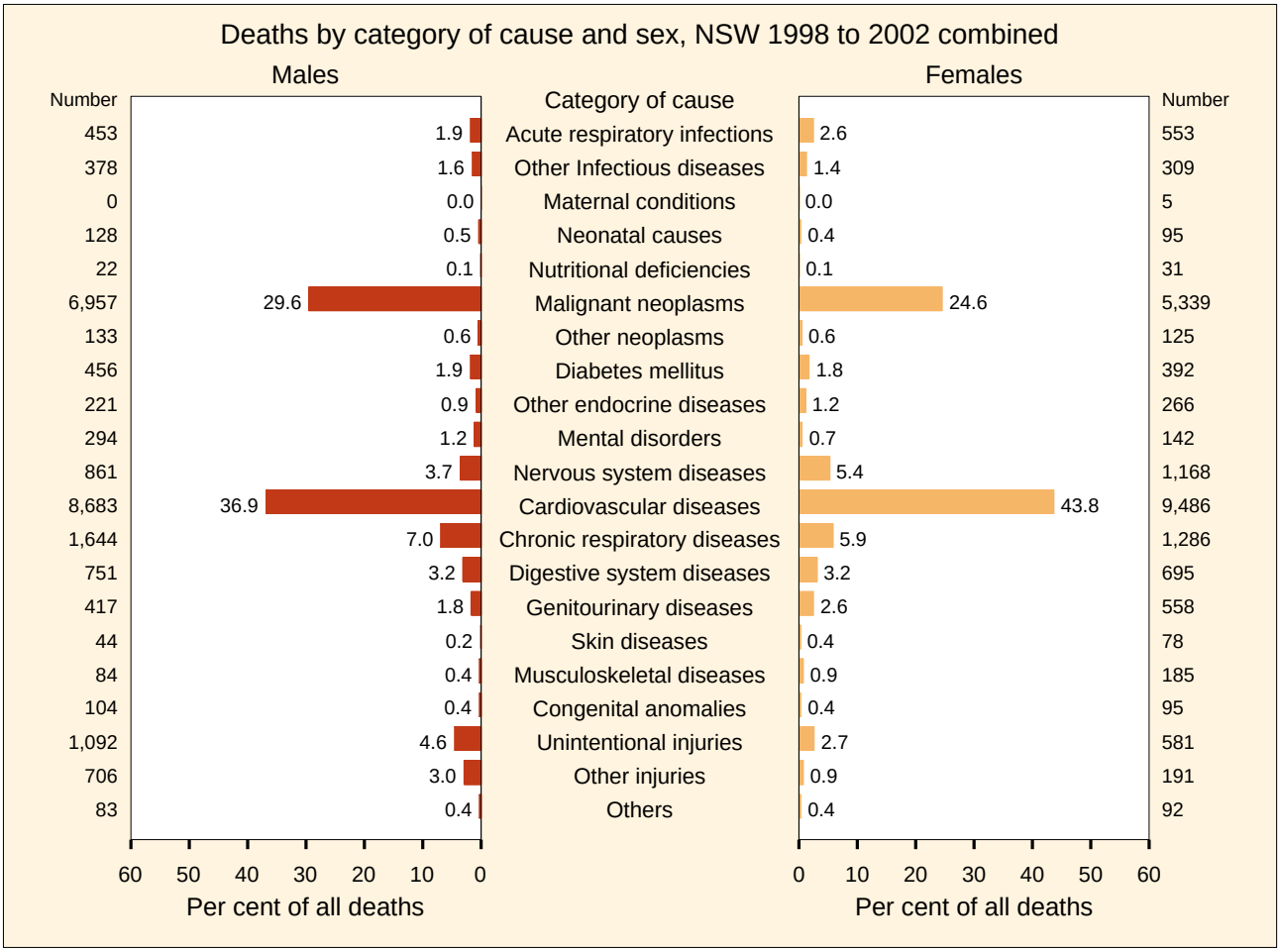
Note: Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. LL/UL 95%CI = Lower and upper limits of the 95% confidence interval for the point estimate. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- The age structure of the populations of geographic areas varies, with some areas having a greater proportion of older people. Age-adjustment (also known as age-standardisation) allows comparison of death rates across geographic areas after removing the effects of these different age structures.
- For 1998 to 2002, the lowest age-adjusted death rates in NSW were in the South Eastern Sydney & Illawarra and Northern Sydney & Central Coast Health Areas. For the South Eastern Sydney & Illawarra Health Area, male and female deaths rates were 11% and 9% lower than the respective death rates for all NSW. For the Northern Sydney & Central Coast Health Area, male and female death rates were 9% and 6% lower than for all NSW.
- In the same period, the highest age-adjusted death rates were seen in the Greater Western Health Area, with male and female death rates 16% and 13% cent higher, respectively, than the NSW averages for each sex.
- There is a clear gradient of increasing death rates with increasing geographic remoteness.
- Variations in death rates among health areas reflect the distribution of the underlying social and economic determinants of health. Variation in death rates by socioeconomic status are examined in more detail in Chapter 3.5.

For more information:

Australian Bureau of Statistics. *Causes of Death, Australia 2002.* ABS Catalogue no. 3303.0. Canberra: ABS, 2003.



Note: Mean numbers of deaths per annum for each cause category are shown. Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production.

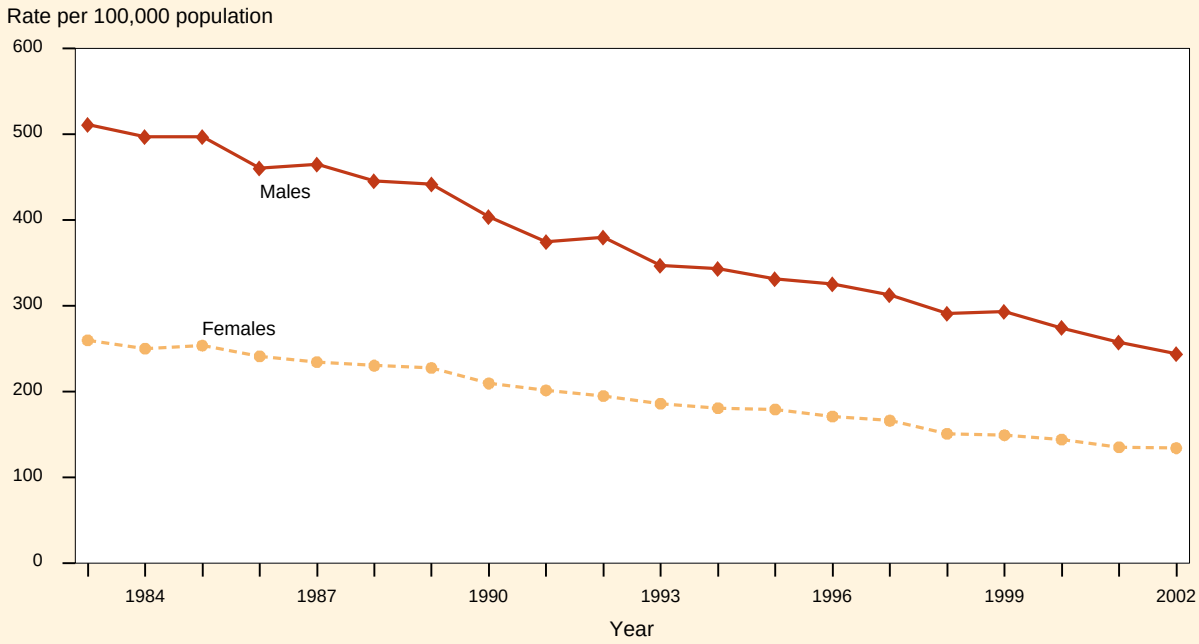
Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In NSW between 1998 and 2002, cardiovascular disease including ischaemic heart disease and stroke, was the leading cause of death. It was responsible for 40% of all deaths (37% of male and 44% of female deaths). The next most common cause of death was malignant cancers (neoplasms), accounting for 27% of all deaths (30% of male and 25% of female deaths).
- In the 0–4 year age group, deaths in the first 28 days of life (the neonatal period) contributed 42% of deaths. This was followed by congenital anomalies (22%), and unintentional injury and poisoning (8%).
- In the 5–14 year age group, unintentional injuries and poisoning were the leading cause of death (28%), followed by malignant cancers (19%) and congenital anomalies (11%).
- In the 15–24 year age group, unintentional injuries and poisoning were the leading cause of death (41% of all deaths; 44% of male deaths and 33% of female deaths).
- In males aged 25–44 years, unintentional injuries and poisoning were the leading cause of death (25%), followed closely by intentional injuries and injuries of undetermined intent (24%). In females in this age group, malignant cancers were the leading cause of death (36%).
- In the 45–64 year age group, malignant cancers were the leading cause of death, accounting for 40% of male deaths and 55% of female deaths. The next leading cause of death in this age group was cardiovascular diseases (31% of male and 18% of female deaths).
- In persons 65 years and older, cardiovascular diseases dominated, and were responsible for 42% of male and 49% of female deaths. Malignant cancers were the next most common cause (30% of male and 21% of female deaths).

For more information:

Australian Bureau of Statistics. *Causes of Death, Australia 2002.* ABS Catalogue no. 3303.0. Canberra: ABS, 2003.

Potentially avoidable deaths, persons aged under 75 years, by sex, NSW 1983 to 2002



		1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Number	Males	11781	11681	11913	11267	11617	11325	11405	10541	9996	10282
	Females	6586	6453	6638	6421	6328	6294	6311	5894	5756	5625
	Persons	18367	18134	18551	17688	17945	17619	17716	16435	15752	15907
Rate	Males	510.9	497	497.1	460	465	445.1	441.4	403.9	374.6	379.4
per 100,000	Females	259.9	250	253.6	241.2	234.6	230.3	227.6	209.6	201.4	195
population	Persons	378.8	367.4	369.5	345.8	344.6	333.5	330	303.1	284.9	284

		1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	Males	9529	9648	9423	9387	9139	8634	8836	8376	7986	7682
	Females	5435	5383	5391	5186	5097	4689	4673	4558	4331	4345
	Persons	14964	15031	14814	14573	14236	13323	13509	12934	12317	12028
Rate	Males	346.6	343.3	331.3	325.5	312.3	290.9	293.2	274.2	257.2	243.9
per 100,000	Females	186	180.6	179.3	171.1	166.2	150.8	149.2	144.1	135.3	134.2
population	Persons	263.5	259.4	252.9	246	237.4	219.5	219.9	208.2	195.4	188.3

Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001.

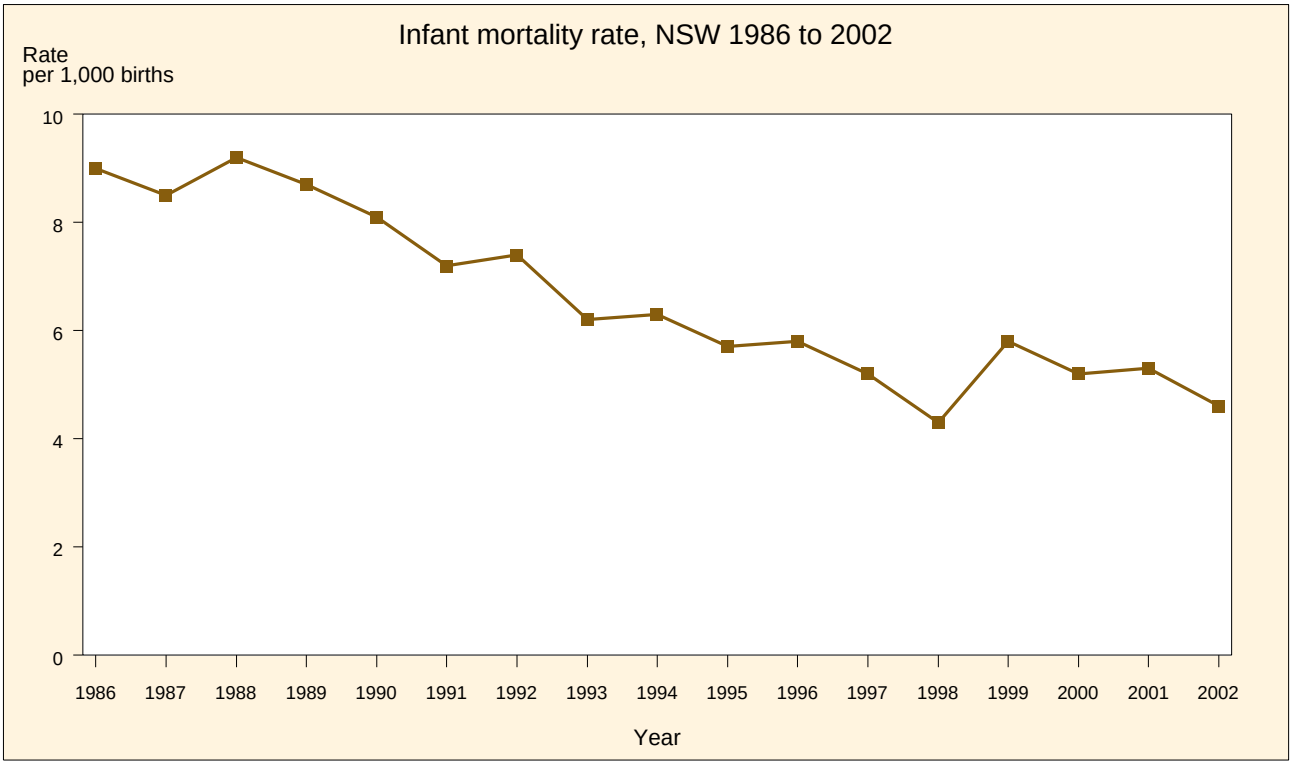
Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Deaths classified as 'avoidable' are those that could potentially be avoided through the activities of the health and related sectors (Tobias and Jackson, 2001). In NSW in 2002, nearly 8,000 deaths in males and more than 4,000 deaths in females aged under 75 years were potentially avoidable. This represented 70% of all premature deaths compared with 80% in 1983. Over the same 20-year period, the rate of avoidable death fell by 56% (males 58%, females 55%).
- The causes of avoidable deaths can be further divided into those that may be prevented through 'primary', 'secondary', and 'tertiary' interventions. Primary interventions are aimed at preventing a condition developing; for example, through lifestyle modification. Secondary interventions detect or respond to a condition early in its progression, such as cancer screening. Tertiary level interventions treat an active condition to reduce its severity and prolong life, such as heart revascularisation.
- More information on trends in primary, secondary, and tertiary avoidable deaths over time, and by socioeconomic status, is presented in the Socioeconomic Status chapter of this report.

For more information:

Tobias M, Jackson G. Avoidable mortality in New Zealand, 1981–97. *Aust N J Z Public Health* 2001; 25: 12–20.

Australian Bureau of Statistics. *Deaths, Australia 2002.* ABS Catalogue no. 3302.0. Canberra: ABS, 2003.



		1986	1987	1988	1989	1990	1991	1992	1993	1994
Number of deaths	NSW	759	731	775	744	733	632	688	552	551
	Australia	2154	2116	2132	2004	2145	1836	1843	1591	1512
Mortality rate	NSW	9.0	8.5	9.2	8.7	8.1	7.2	7.4	6.2	6.3
per 1,000 births	Australia	8.8	8.7	8.7	8.0	8.2	7.1	7.0	6.1	5.9

		1995	1996	1997	1998	1999	2000	2001	2002
Number of deaths	NSW	498	499	451	371	504	447	449	397
	Australia	1449	1460	1341	1252	1408	1290	1309	1264
Mortality rate	NSW	5.7	5.8	5.2	4.3	5.8	5.2	5.3	4.6
per 1,000 births	Australia	5.7	5.8	5.3	5.0	5.7	5.2	5.3	5.0

Note: Infant mortality rate is defined as the number of deaths in children < 1 year per 1,000 livebirths.

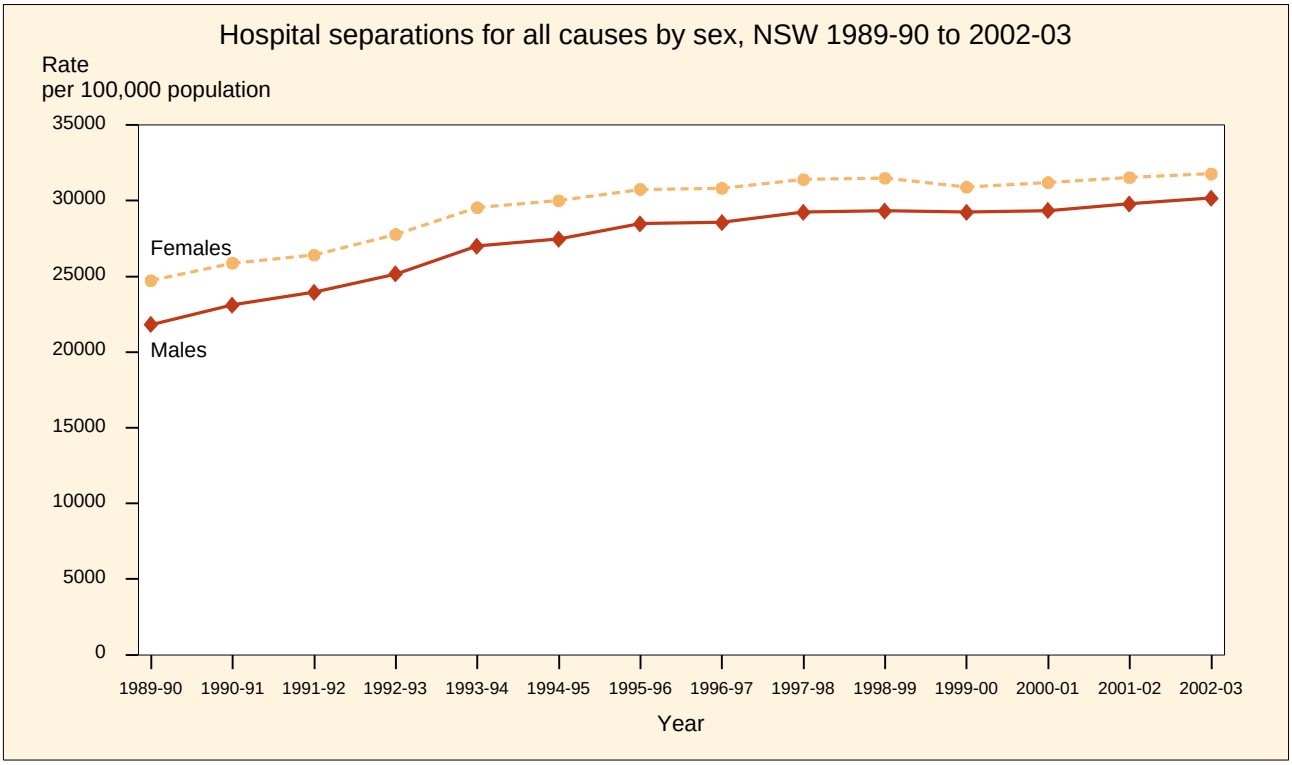
Source: Australian Bureau of Statistics. *Deaths, Australia 2002*. Canberra: ABS, 2003. Centre for Epidemiology and Research, NSW Department of Health.

- The infant mortality rate is the number of deaths in children aged under one year per 1,000 livebirths. In NSW in 2002, the infant mortality rate was 4.6 per 1,000 livebirths, 49% lower than in 1986. This compares with a decline of 43% for Australia as a whole over the same period. In NSW, the rate has fluctuated between 4 and 6 per 1,000 since 1995. This should be viewed in the light of the huge reduction in infant mortality rates that has occurred since 1900, when the rate for Australia was more than 100 per 1,000 livebirths—in other words, one infant in 10 died in their first year of life.
- Most infant deaths occur in the first 4 weeks of life. These are recorded as perinatal deaths—see the Pregnancy and the newborn chapter of this report for more information. Of the 397 deaths in NSW infants in 2002, 69% occurred in the neonatal period (up to 28 days of life).
- In NSW in 2002, conditions originating in the perinatal period accounted for 54% of infant deaths. These conditions include spontaneous preterm labour, infections, hypertension, haemorrhage, and maternal conditions affecting the newborn. Congenital abnormalities accounted for another 20%, and sudden infant death syndrome (SIDS) accounted for 11% (Australian Bureau of Statistics, 2002). Following a National Reducing the Risks Campaign, which commenced in 1991, there has been a dramatic fall in the number of SIDS deaths. In NSW, SIDS deaths fell from 131 in 1991 to 45 in 2002.

For more information:

Australian Bureau of Statistics. *Deaths, Australia 2002.* ABS Catalogue no. 3302.0. Canberra: ABS, 2003.

Australian Institute of Health and Welfare website at www.aihw.gov.au.



		1989–90	1990–91	1991–92	1992–93	1993–94	1994–95	1995–96
Number	Males	577505	619117	652219	694029	761030	783545	823974
	Females	725139	768107	795326	846192	911285	935708	972539
	Persons	1302643	1387224	1447545	1540221	1672315	1719253	1796513
Rate	Males	21827.9	23105.8	23968.6	25167.7	27024.1	27479.3	28492.7
per 100,000	Females	24726.7	25881.9	26408.1	27777.3	29549.0	30000.1	30753.4
population	Persons	23050.7	24266.0	24965.4	26247.9	28057.0	28514.9	29401.7

		1996–97	1997–98	1998–99	1999–00	2000–01	2001–02	2002–03
Number	Males	841010	874077	888792	899768	920689	953035	978533
	Females	990324	1022668	1040193	1036198	1062809	1089177	1110171
	Persons	1832133	1896800	1929011	1935968	1983517	2042254	2088720
Rate	Males	28567.4	29255.4	29334.3	29240.5	29353.7	29803.6	30167.5
per 100,000	Females	30824.4	31396.9	31483.9	30900.8	31201.6	31525.9	31771.3
population	Persons	29510.7	30122.5	30210.2	29865.5	30087.4	30485.0	30790.7

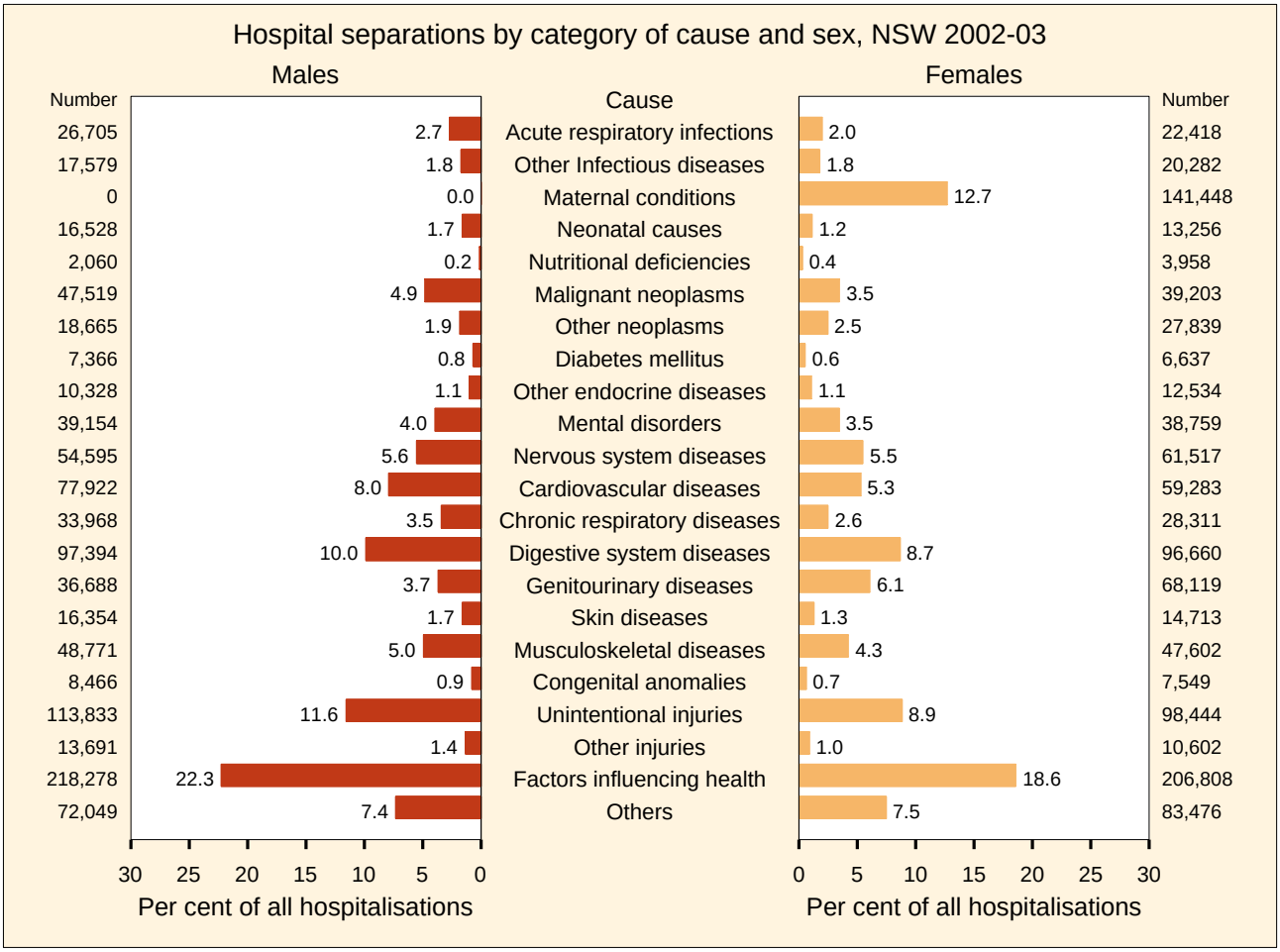
Note: Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2001–02 and 2002–03 include an estimate of the small number of interstate hospitalisations, data for which were unavailable at the time of production.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Hospital separations are a summary measure of illness (or morbidity) in the population. A hospital separation occurs whenever a patient is admitted to hospital (including a day-only admission) and is then discharged, transferred to another hospital, or dies while in hospital. Rates of hospital separations are influenced by the age structure of the population, the incidence of acute disease and injury in the population, availability of health services, and availability of treatment options for diseases and injuries.
- On average, older people use hospitals more than younger people. Age-adjustment (also known as age-standardisation) allows examination of trends in hospitalisation rates without the influence of changing age patterns in the population over time.
- Between 1989–90 and 2002–03, the age-adjusted hospital separation rate in NSW increased by 34% (38% for males and 28% for females).
- Throughout this period, the age-adjusted female hospital separation rate has been consistently higher than the rate for males. However, the gap has decreased, with rates in 2002–03 being only 5% higher in females than males, compared with 13% in 1989–90.

For more information:

Australian Institute of Health and Welfare. *Australian Hospital Statistics 2001–02. Health Services Series no. 20.* Canberra: Australian Institute of Health and Welfare, 2003.



Note: Hospital separations were classified using ICD-10-AM. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002–03 include an estimate of the small number of interstate hospitalisations, data for which were unavailable at the time of production.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

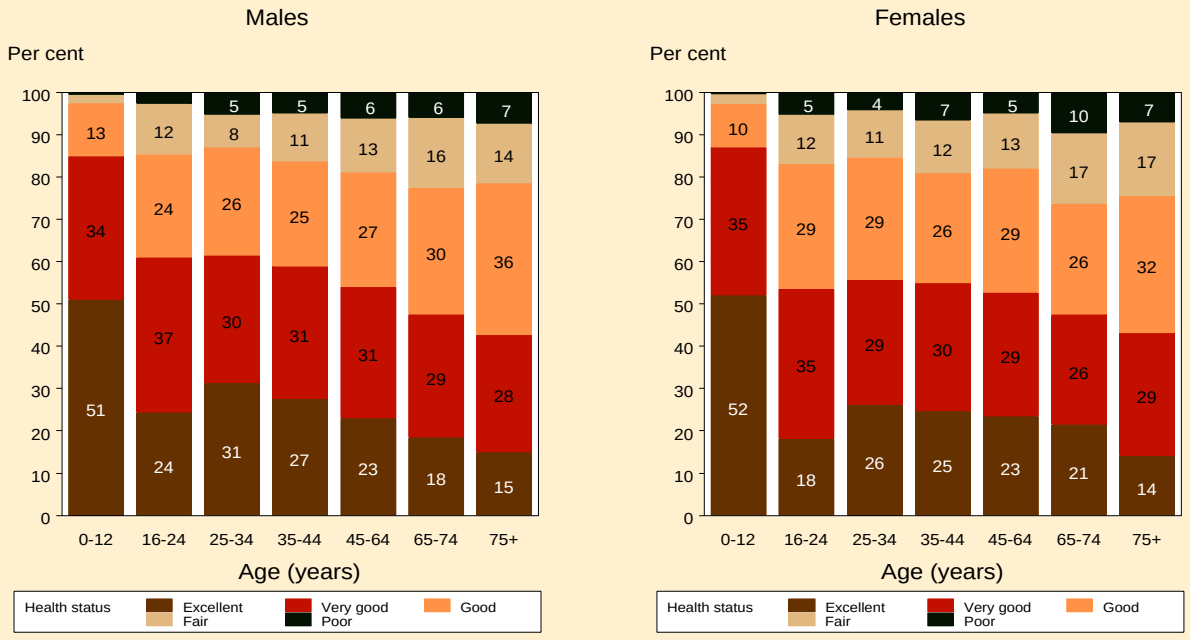
- In 2002–03, the most common cause of hospitalisation in NSW was 'Factors influencing health' (20%). This category includes symptoms and signs without a specific cause; admissions of liveborn infants; and admissions for rehabilitation, nursing home and respite care.
- Unintentional injuries were the next biggest cause of hospitalisation (10%). Among males, this category accounted for 12% of hospitalisations. Among females it was the third most common cause (9%). The second most common cause of hospitalisation among females was maternal conditions (13%).
- Digestive system diseases were the next most common cause of hospitalisation, and were responsible for 9% of all hospitalisations (males 10%, females 9%).

For more information:

Australian Institute of Health and Welfare website at www.aihw.gov.au.

Australian Institute of Health and Welfare. *Australian Hospital Statistics 2001–02. Health Services Series no. 20.* Canberra: Australian Institute of Health and Welfare, 2003.

Self-rated health, NSW 2001 and 2003 combined



Note: Parents and carers responded on behalf of children aged 0–12 years. Respondents were asked the following question: 'In general, would you say your–your child's health is excellent, very good, good, fair or poor?'. Estimates based on 12,992 adult and 9,425 child respondents. 16 (0.12%) adults and 2 (0.02%) children not stated for self-rated health.

Source: NSW Health Survey 2003 and New South Wales Child Health Survey 2001 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

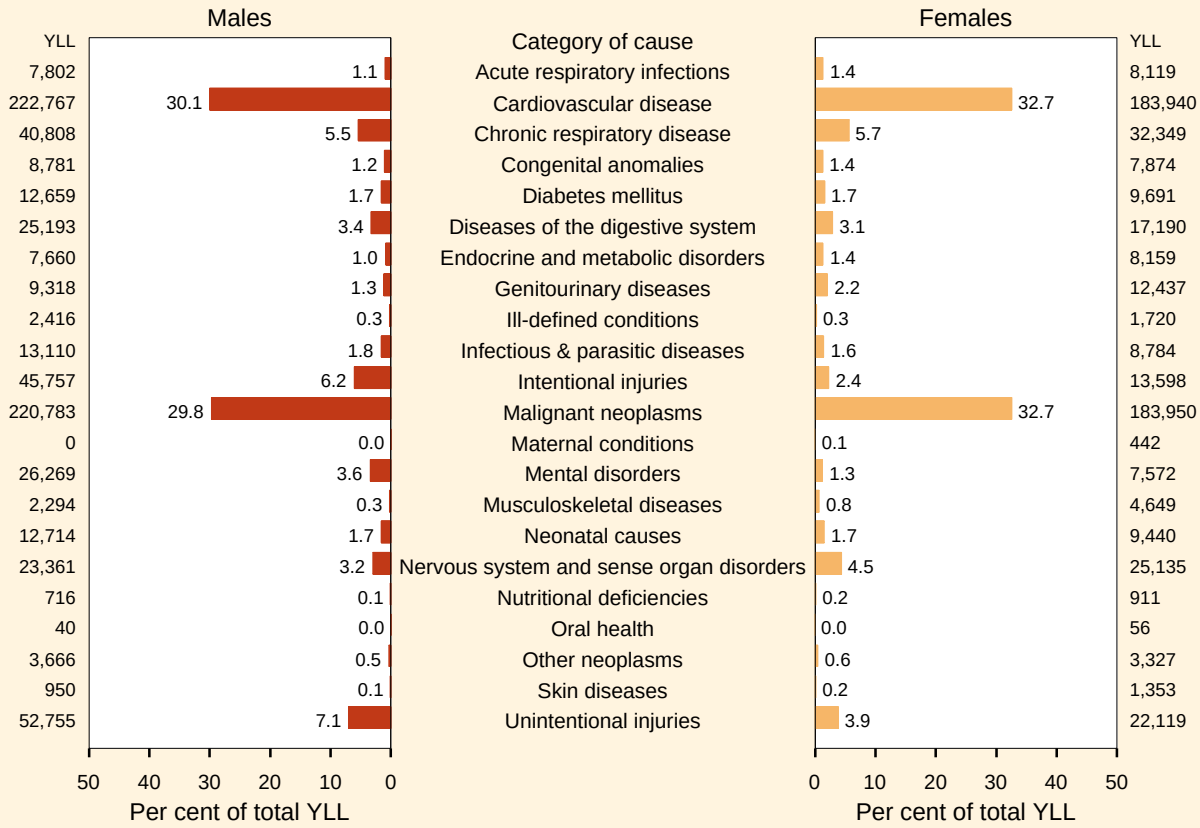
- An individual's rating of his or her own health is a fundamental measure of health status. Longitudinal studies worldwide have consistently shown that self-rated health is a strong and independent predictor of subsequent illness and premature death.
- In the 2003 adult and 2001 child NSW Health Surveys, males and females showed very similar patterns of self-reported health status.
- Based on rating by parents and carers, just over one-half of children aged under 13 years experienced excellent health, and a further one-third experienced very good health.
- Among 16–24 year olds, females were less likely to report excellent health status (18%) than males (24%). In the same age group, females were twice as likely to report poor health status, although this proportion was small (males 2.7%, females 5.4%).
- Among 25–34 year olds, 31% of males and 26% of females reported excellent health, while 30% and 29% respectively reported very good health.
- Among 35–44 year olds and 45–64 year olds, approximately one-quarter of males and females reported excellent health and approximately 30% of each sex reported very good health status.
- Among 65–74 year olds, approximately 20% of males and females reported excellent health, and just over one-quarter reported very good health. Females in this age group were more likely to report poor health status (10%) than males (6%).
- Among males and females aged 75 years and over, approximately 15% reported excellent health status and approxmately 29% reported very good health status. Only 7% of people in this age group reported poor health status.
- Less than 20% of people aged under 65 years, and less than 30% of those aged 65 years and over, rated their health as fair or poor.

For more information:

Centre for Epidemiology and Research, NSW Department of Health. New South Wales Adult Health Survey 2003. *N S W Public Health Bull* 2004; 15(S-4).

Centre for Epidemiology and Research, NSW Department of Health. New South Wales Child Health Survey 2001. *N S W Public Health Bull* 2002; 13(S-3).

Years of life lost to premature mortality (YLL) by category of cause and sex, NSW 1999-01



Note: Based on deaths of NSW residents registered in 1999–01 and Australian cohort life expectancies 1999–01. YLL were discounted by 3% per year and not age weighted.

Source: Australian Institute of Health and Welfare, 2004 (unpublished).

- The years of life lost due to premature death (YLL) forms the mortality component of the disability adjusted life year (DALY). See the chapter introduction for an explanation of the DALY, discounting, and age weighting.
- Between 1999 and 2001 in NSW, there was an average of 434,211 YLL of which males accounted for 246,606 (57%) and females for 187,605 (43%). In males, cardiovascular diseases (30%), and malignant cancers (neoplasms) (30%), followed by unintentional injuries (7%), were the major categories of causes of YLL. In females, cardiovascular diseases (33%), and malignant neoplasms (33%) followed by chronic respiratory diseases (6%) were the major categories of causes of YLL.
- Compared with females, males experienced a substantially greater relative YLL burden from both intentional injuries (7% versus 4%) and unintentional injuries (6% versus 2%).

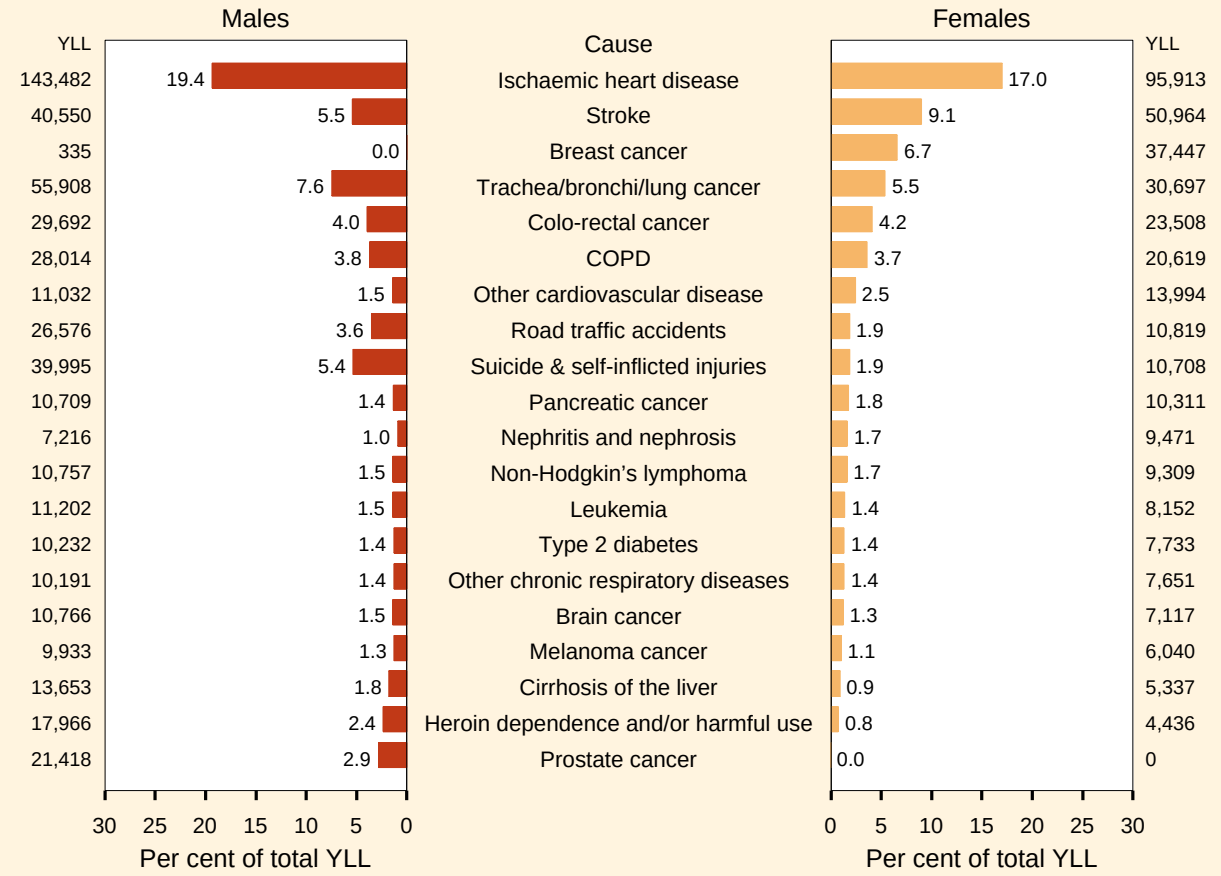
For more information:

Mathers C, Vos T, Stevenson C. *The burden of disease and injury in Australia.* AIHW Catalogue no. PHE 17. Canberra: AIHW, 1999. Available at www.aihw.gov.au/bod/index.html.

Victorian Department of Human Services Burden of Disease website at http://hn01.dhs.vic.gov.au/bodw.

Harvard University Global Burden of Disease Unit at www.hsph.harvard.edu/organizations/bdu.

Leading causes of years of life lost to premature mortality (YLL) by sex, NSW 1999 to 2001 combined



Note: Based on deaths of NSW residents registered in 1999–01 and Australian cohort life expectancies 1999–01. YLL were discounted by 3% and not age weighted.

Source: Australian Institute of Health and Welfare, 2004 (unpublished).

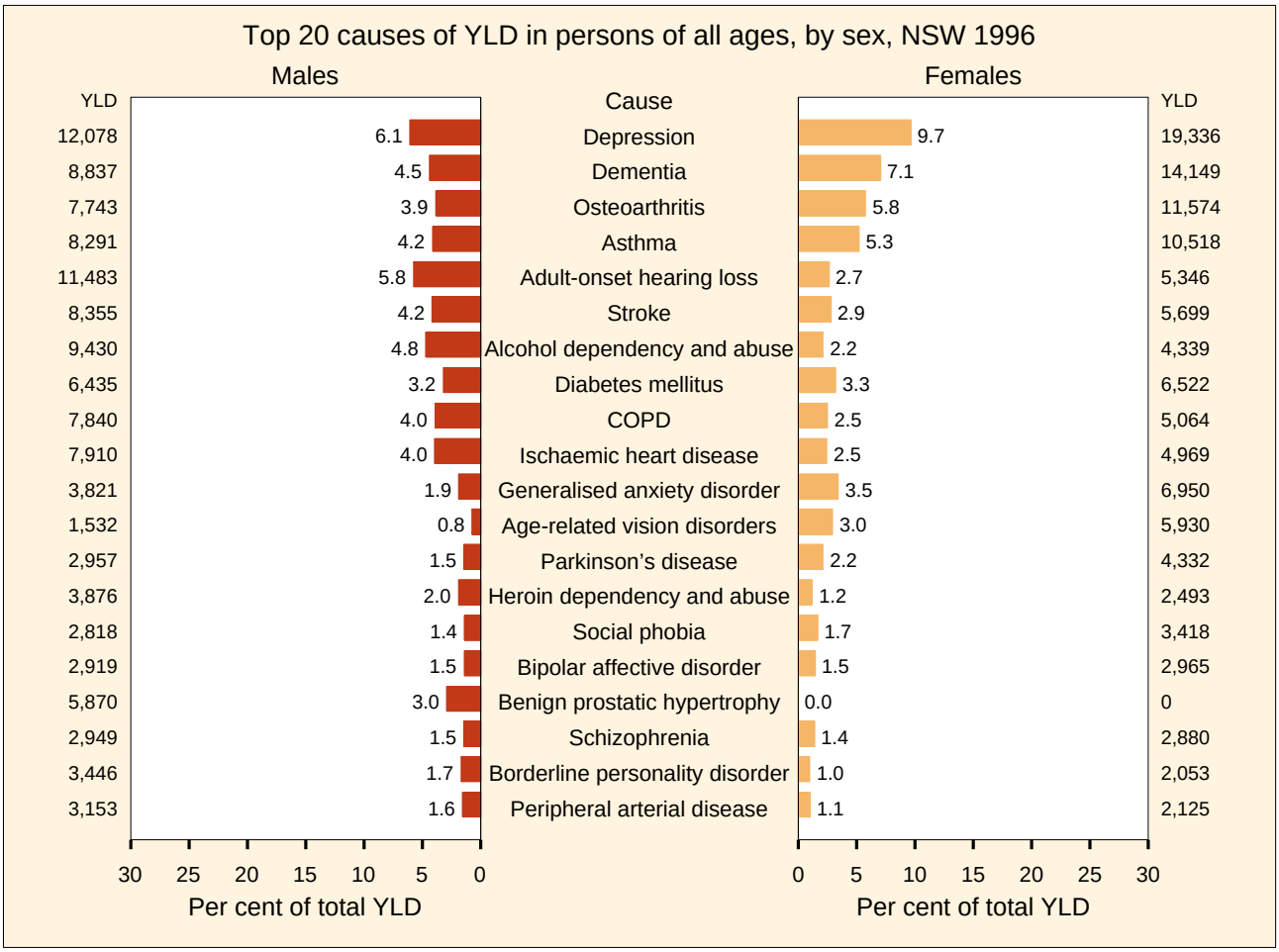
- Years of life lost due to premature death (YLL) form the mortality component of the disability adjusted life year (DALY). See the chapter introduction for an explanation of the DALY, discounting, and age weighting.
- Of the average 424,211 YLL estimated for NSW between 1996 and 2001, the top 20 ranked causes accounted for on average 293,284 YLL (68%). The conditions causing the greatest burden of YLL overall ischaemic heart disease (79,798 YLL, 18%), stroke (30,505 YLL, 7%), and lung cancer (28,868 YLL, 7%).
- In males, the highest ranking causes were ischaemic heart disease (47,827 YLL, 19% of male YLL), followed by lung cancer (18,636 YLL, 8%), and stroke (13,517 YLL, 5%). In females, the highest ranking causes were ischaemic heart disease (31,971 YLL, 17% of female YLL), followed by stroke (16,988 YLL, 9%), and breast cancer (12,482 YLL, 7%).
- The relative YLL burden in males for suicide and self-harm was more than double that in females (5.4% versus 1.9%) and road traffic injuries (3.6% versus 1.9%).

For more information:

Mathers C, Vos T, Stevenson C. *The burden of disease and injury in Australia.* AIHW Catalogue no. PHE 17. Canberra: AIHW, 1999. Available at www.aihw.gov.au/bod/index.html.

Victorian Department of Human Services Burden of Disease website at http://hn01.dhs.vic.gov.au/bodw.

Harvard University Global Burden of Disease Unit at www.hsph.harvard.edu/organizations/bdu.



Note: YLD were approximated for NSW from national results from the Australian Burden of Disease and Injury Study 1996. YLDs were discounted by 3% and not age weighted.

Source: 1996 Australian Burden of Disease and Injury study. Australian Institute of Health and Welfare 1999. ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

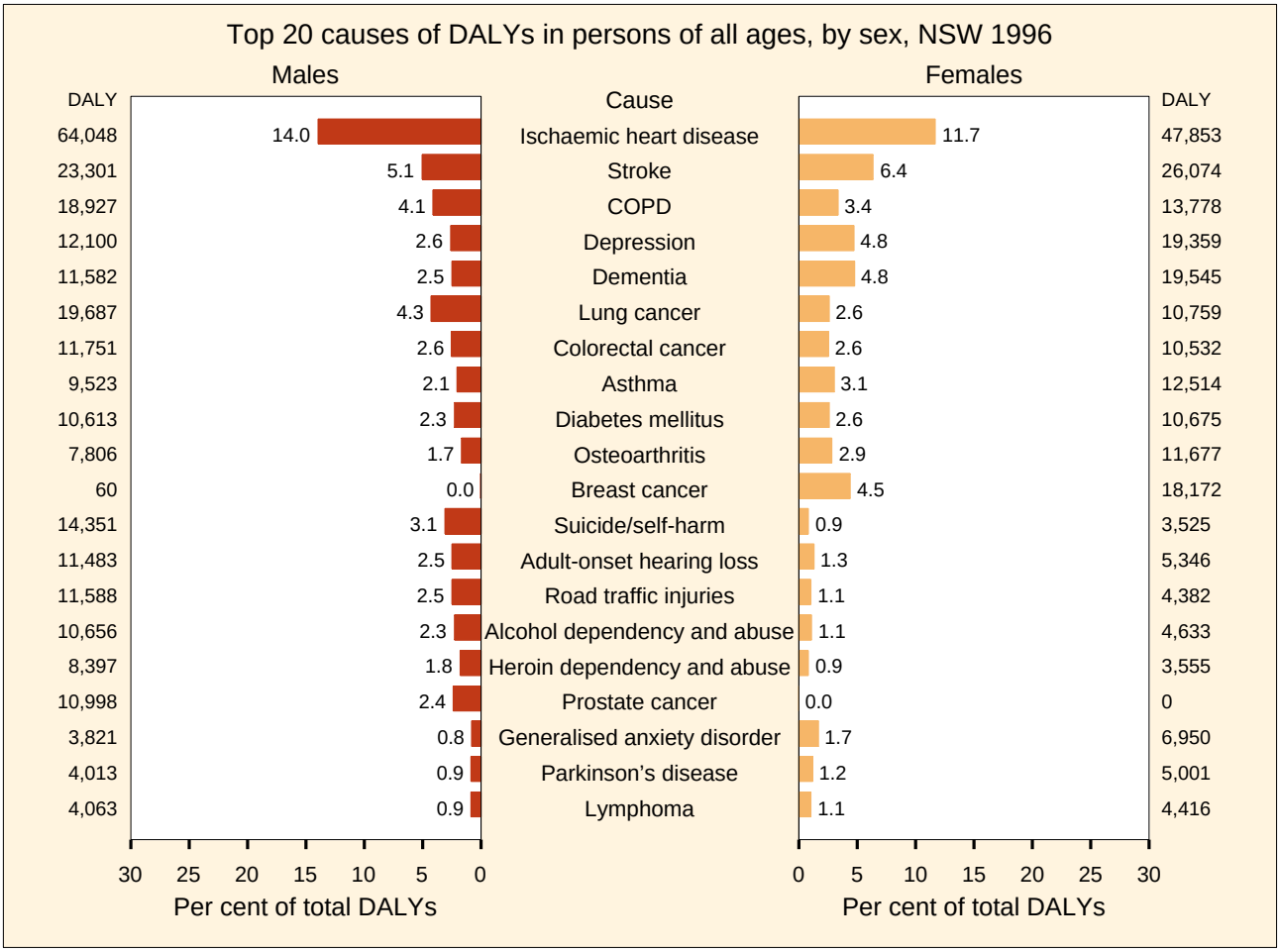
- Years of life lived with disability (YLD) form the morbidity or non-fatal component of the disability adjusted life year (DALY). See the chapter introduction for an explanation of the DALY, discounting, and age weighting. Note that the YLD for NSW were approximated from national figures from the Australian Burden of Disease Study 1996 (AIHW, 1999).
- Of the total 397,815 YLD estimated for NSW in 1996, the top 20 ranked causes overall accounted for 242,407 YLD (61%). The conditions causing the greatest burden of YLD overall were depression (31,414 YLD, 8%), dementia (22,986 YLD, 6%), and osteoarthritis (19,317 YLD, 5%).
- In males, the highest ranking causes were depression (12,078 YLD, 6% of male YLD), followed by adult-onset hearing loss (11,483 YLD, 6%), and alcohol dependency and abuse (9,430 YLD, 5%). In females, the highest ranking causes were depression (19,336 YLD, 10% of female YLD), followed by dementia (14,149 YLD, 7%), and osteoarthritis (11,574 YLD, 6%).
- The relative YLD burden in males was more than double that in females for adult-onset hearing loss (5.8% versus 2.7%), alcohol dependency (4.8% versus 2.2%), and attention deficit hyperactivity disorder (1.6% versus 0.6%).
- The relative YLD burden in females was more than double that in males for age-related vision disorders (3.0% versus 0.8%).

For more information:

Mathers C, Vos T, Stevenson C. *The burden of disease and injury in Australia.* AIHW Catalogue no. PHE 17. Canberra: AIHW, 1999. Available at www.aihw.gov.au/bod/index.html.

Victorian Department of Human Services Burden of Disease website at http://hn01.dhs.vic.gov.au/bodw.

Harvard University Global Burden of Disease Unit at www.hsph.harvard.edu/organizations/bdu.



Note: COPD = chronic obstructive pulmonary disease. The contribution of deaths from each cause to the corresponding DALYs was estimated in full, based on deaths of NSW residents registered in 1996. The contribution of non-fatal diseases and injuries was approximated, using national results from the Australian Burden of Disease and Injury Study 1996. DALYs were discounted by 3% per year and not age weighted.

Source: 1996 Australian Burden of Disease and Injury study. Australian Institute of Health and Welfare 1999. ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

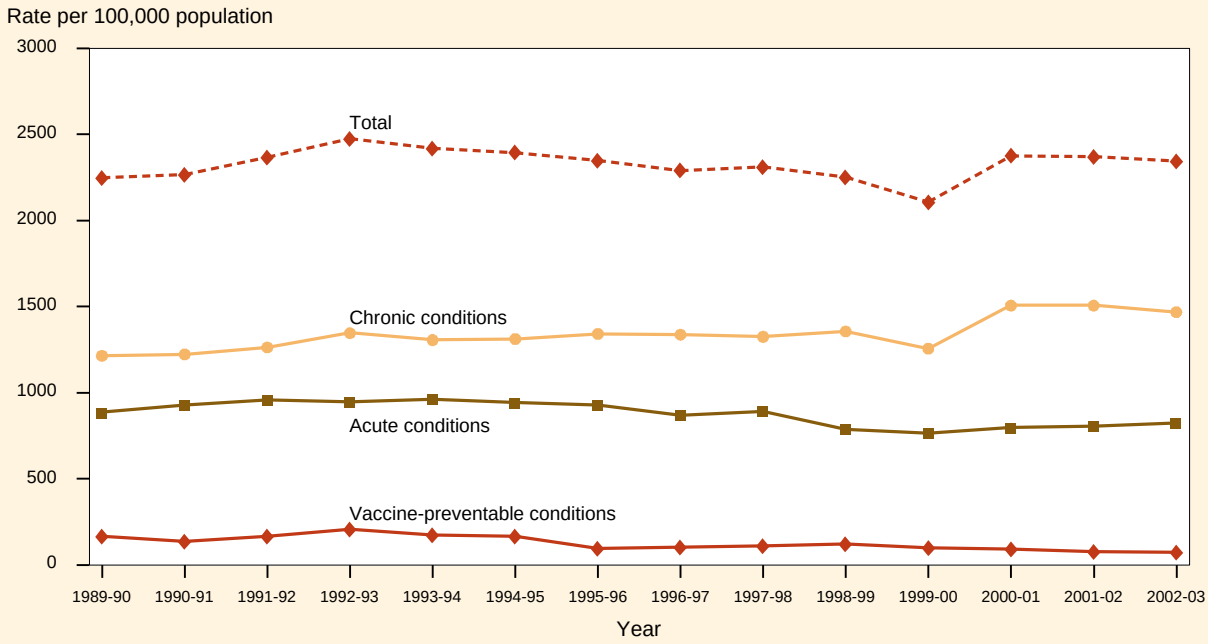
- The disability adjusted life year (DALY) is a summary measure that combines, for a particular population, the sum of years of life lost (YLL) due to premature death due to a particular cause with estimates of the sum of years lived with disability (YLD) due to the same cause. See the chapter introduction for an explanation of the DALY.
- Of the total 864,652 DALYs estimated for NSW in 1996, the top 20 ranked causes overall accounted for 507,516 DALYs (59 per cent). The conditions causing the greatest burden of DALYs overall were ischaemic heart disease (111,901 DALYs, 13%), stroke (49,375 DALYs, 6%), and chronic obstructive pulmonary disease (32,706 DALYs, 4%).
- In males, the highest ranking causes were ischaemic heart disease (64,048 DALYs, 14% of male DALYs), followed by stroke (23,301 DALYs, 5%), and lung cancer (19,687 DALYs, 4%). In females, the highest ranking causes were ischaemic heart disease (47,853 DALYs, 12% of female DALYs), followed by stroke (26,074 DALYs, 6%), and dementia (19,545 DALYs, 5%).
- The relative DALY burden in males was more than double that in females for suicide and self-harm, road traffic injuries, alcohol dependency and abuse, heroin dependency and abuse, HIV–AIDS, and cirrhosis of the liver.
- The relative DALY burden in females was more than double that for males for generalised anxiety disorder and age-related vision disorders.

For more information:

Mathers C, Vos T, Stevenson C.The burden of disease and injury in Australia. AIHW Catalogue no. PHE 17. Canberra: AIHW, 1999. Available at www.aihw.gov.au/bod/index.html.

Harvard University Global Burden of Disease Unit at www.hsph.harvard.edu/organizations/bdu.

Ambulatory care sensitive conditions: hospital separations by category, NSW 1989-90 to 2002-03



	Condition	1989–90	1990–91	1991–92	1992–93	1993–94	1994–95	1995–96
Number	Total	125620	128429	136159	144022	142615	143016	142426
Rate per 100,000 population	Total	2248.1	2267.7	2366.0	2474.2	2418.0	2395.0	2348.6
	Condition	1996–97	1997–98	1998–99	1999–00	2000–01	2001–02	2002–03
Number	Total	141542	145207	143659	136760	157260	159896	160525
Rate per 100,000 population	Total	2291.2	2311.4	2250.5	2107.7	2376.3	2371.1	2346.1

Note: Categories are not mutually exclusive. Numbers for 2001–02 and 2002–03 include an estimate of the small number of interstate hospitalisations of NSW residents, data for which were unavailable at the time of production. Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

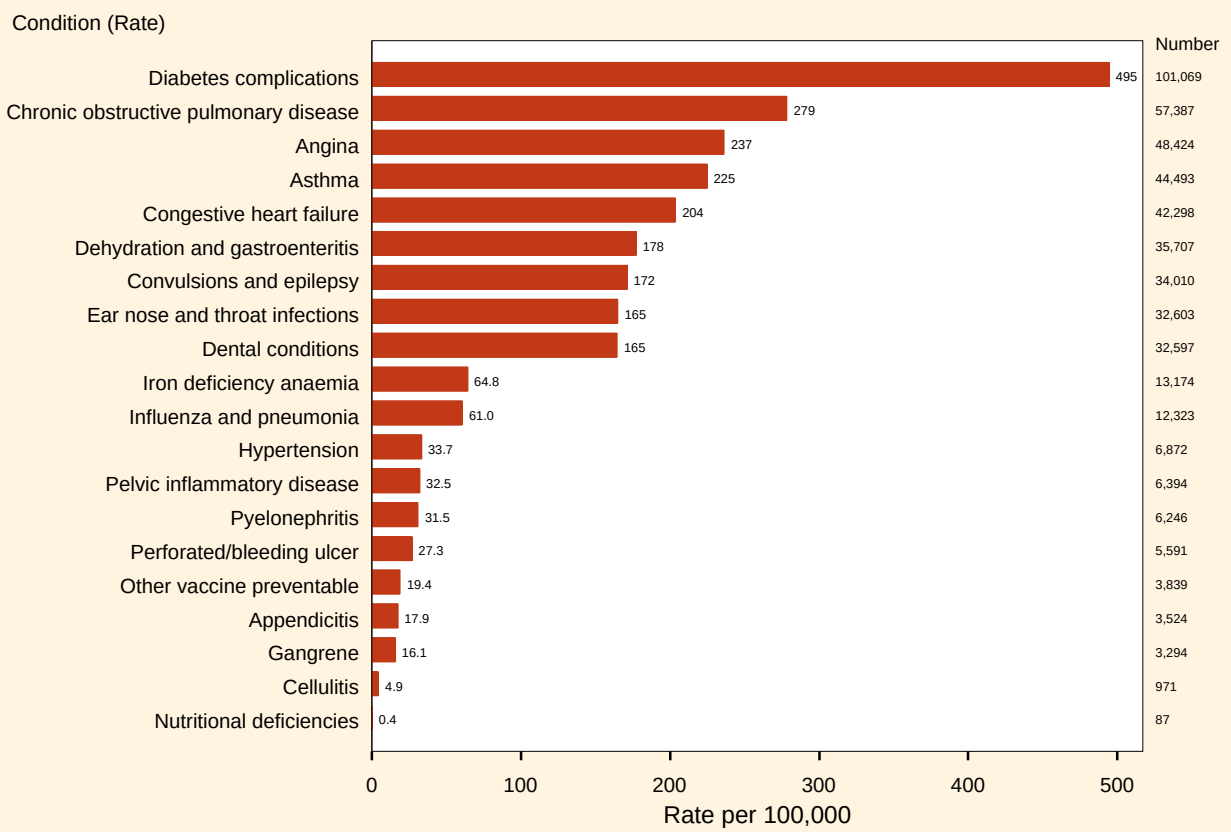
Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST), ambulatory care sensitive hospitalisation definitions modified from Victorian Department of Human Services 2002. Centre for Epidemiology and Research, NSW Department of Health.

- Ambulatory care sensitive conditions are those for which hospitalisation is considered potentially avoidable through preventive care and early disease management, usually delivered through primary care (for example, by general practitioners).
- Hospitalisation rates for ambulatory care sensitive conditions are used as an indicator of access to, and quality of, primary care. Other factors that influence rates include disease prevalence, hospital admission and coding practices, and personal choices about seeking health care.
- Three categories of ambulatory care sensitive conditions are presented. Vaccine-preventable conditions include influenza, bacterial pneumonia, measles, mumps, rubella, and pertussis. Acute conditions include dehydration and gastroenteritis, kidney infection, perforated ulcer, cellulitis, pelvic inflammatory disease, ear nose and throat infections, and dental conditions. Although these may not be preventable, hospitalisation can be avoided through timely primary care. Chronic conditions include diabetes complications, asthma, angina, hypertension, congestive heart failure, and chronic obstructive pulmonary disease. These may be preventable through risk factor reduction, but can also be managed effectively through primary care to prevent deterioration and hospitalisation.
- In NSW between 1989–90 and 2002–03, rates of hospitalisation for ambulatory care sensitive conditions increased by 4%. Chronic conditions were responsible for this increase. They increased by 35%, while the less common acute and vaccine-preventable conditions decreased by 7% and 56% respectively. The increase in chronic conditions reported in 2000–01 largely reflects changes coding of diabetes complications.

For more information:

Victorian Department of Human Services. *The Victorian ambulatory care sensitive conditions study*. Melbourne: VDHS, 2002.

Ambulatory care sensitive conditions: hospital separations by condition type, NSW 2000-01 to 2002-03 combined



Note: Numbers for 2001–02 and 2002–03 include an estimate of the small number of interstate hospitalisations of NSW residents, data for which were unavailable at the time of production. Hospital separations were classified using ICD-10-AM. Rates were age-adjusted using the Australian population as at 30 June 2001.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST), ambulatory care sensitive hospitalisation definitions modified from Victorian Department of Human Services 2002. Centre for Epidemiology and Research, NSW Department of Health.

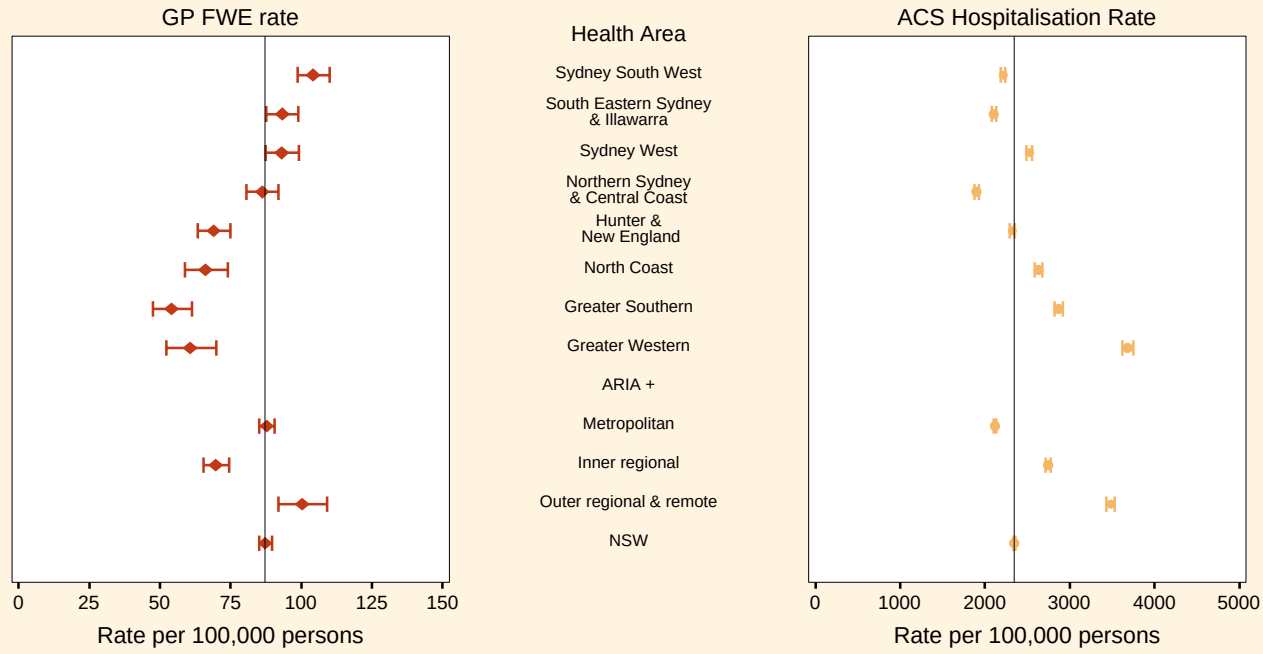
- Ambulatory care sensitive conditions are those for which hospitalisation is considered potentially avoidable through preventive care and early disease management, usually delivered in an ambulatory setting, such as primary health care (for example, by general practitioners or community health centres).
- A comparison of rates for individual conditions defined as ambulatory care sensitive provides an indication of the relative burden that they contribute.
- Diabetes complications, angina, chronic obstructive pulmonary disease (COPD), and asthma accounted for just over half (51%) of all ambulatory care sensitive hospitalisations in NSW during the period 2001–02 to 2002–03. In this period, diabetes complications (for example: visual and renal impairment, leg and foot ulcers) had the highest separation rate and accounted for the largest total number of bed days among all ambulatory care sensitive conditions. Diabetes complications also accounted for the highest separation rate for potentially avoidable hospitalisations in all other Australian states and territories (AIHW, 2003).
- The next most common ambulatory care sensitive conditions resulting in hospitalisation in NSW were angina, COPD, and asthma. Hospital separations for asthma as a principal diagnosis have been gradually decreasing in NSW (see Chapter 4.4) but represented around 9% of potentially avoidable hospitalisations during 2001–02 to 2002–03.

For more information:

Victorian Department of Human Services. *The Victorian ambulatory care sensitive conditions study: Opportunities for Targeting Public Health and Health Services Intervention.* Melbourne: VDHS, 2002.

Australian Institute of Health and Welfare. *Australian Hospital Statistics 2001–02. Health Services Series no. 20.* Canberra: Australian Institute of Health and Welfare, 2003.

Ambulatory care sensitive conditions: general practitioners, 2000-01 and hospital separations, 2002-03 by health area, NSW



Note: FWE = full workload eqivalent. Numbers for 2002–03 include an estimate of the small number of interstate hospitalisations of NSW residents, data for which were unavailable at the time of production. Hospital separations were classified using ICD-10-AM. Rates were age-adjusted using the Australian population as at 30 June 2001. Lower and upper limits of the 95% confidence interval are shown. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

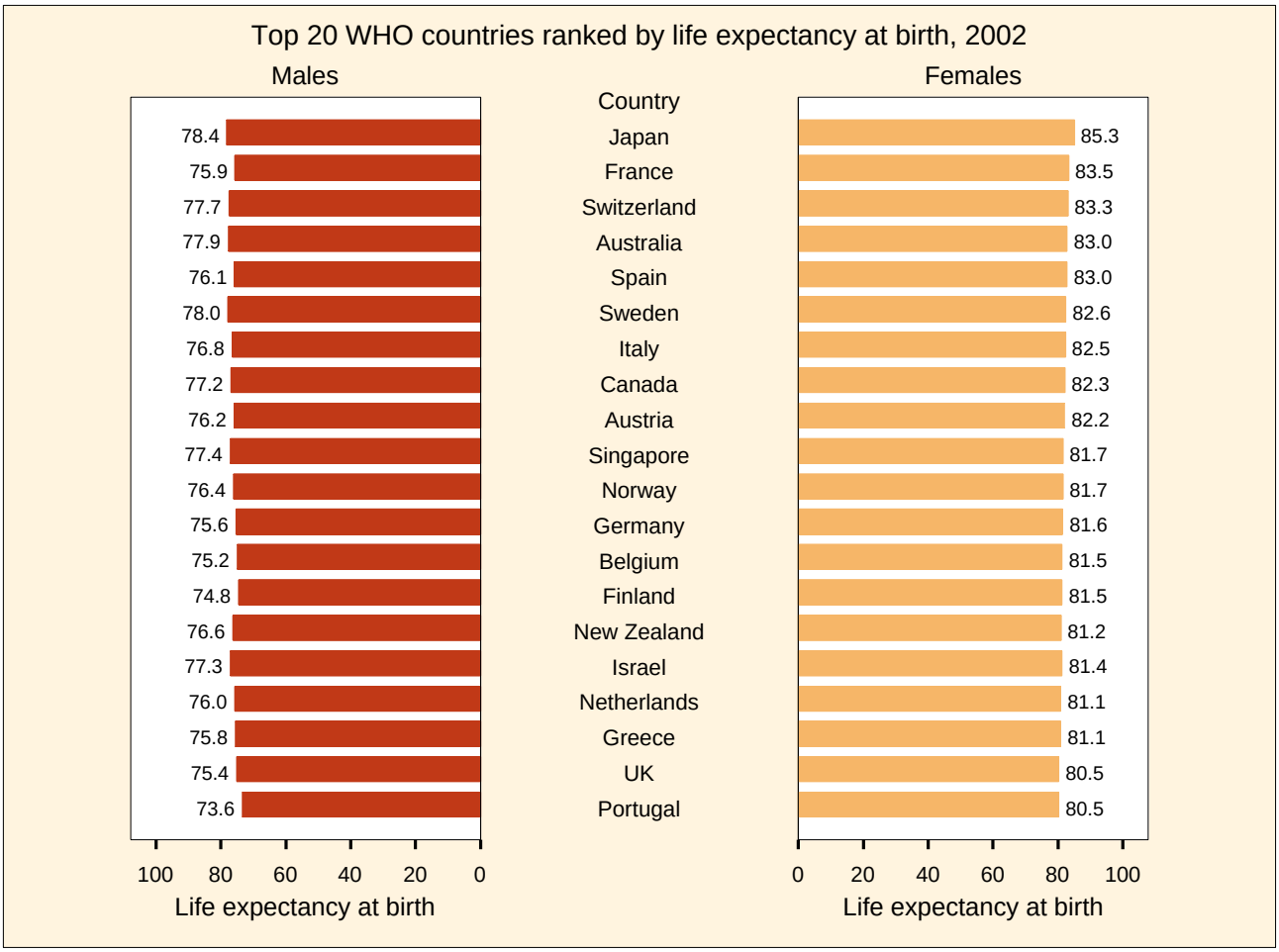
Source: Health Wiz, Prometheus Information Pty Ltd 2003. NSW Inpatient Statistics Collection and ABS population estimates (HOIST), ambulatory care sensitive hospitalisation definitions modified from Victorian Department of Human Services 2002. Centre for Epidemiology and Research, NSW Department of Health.

- Ambulatory care sensitive conditions are those for which hospitalisation is considered potentially avoidable through preventive care and early disease management, usually delivered in an ambulatory setting, such as primary health care (for example by general practitioners or community health centres).
- Hospitalisations for ambulatory care sensitive conditions are used as an indicator of access to, and quality of, primary care. Several studies in the United States have shown an inverse relationship between the availability of primary care and ambulatory care sensitive condition admissions (Basu et al., 2002), although hospitalisation rates may be affected by other factors such as disease prevalence, patients' compliance, and patterns of seeking care.
- In NSW in 2002–03, there was an inverse correlation between the availability of general practitioners—as measured by the number of general practitioner full workload equivalents (FWE) per head of population—and hospitalisation rates for ambulatory care sensitive conditions at the area health service level. Greater Western and Greater Southern Area Health Services had the highest rates of hospitalisations and the lowest general practioner availability.
- There was a clear trend of increased hospital admission rates for ambulatory care sensitive conditions with increasing levels of remoteness. However, general practitioner availability showed a different pattern, with the lowest rates of general practitioner FWEs in inner-regional areas, and the highest rates in outer-regional and remote areas, Greater rates of general practitioner FWEs are required, to provide services in more remote areas, because of the large travel distances in these areas.

For more information:

Victorian Government Department of Human Services. *The Victorian ambulatory care sensitive conditions study: Preliminary analyses.* Melbourne: VGDHS, 2001.

Basu J, Friedman B, and Burstin H. Primary Care, HMO Enrollment, and Hospitalisation for Ambulatory Care Sensitive Conditions. *Med Care* 2002; 40(12): 1260–1269.



Note: Excludes countries with a population in 2002 of less than one million people.

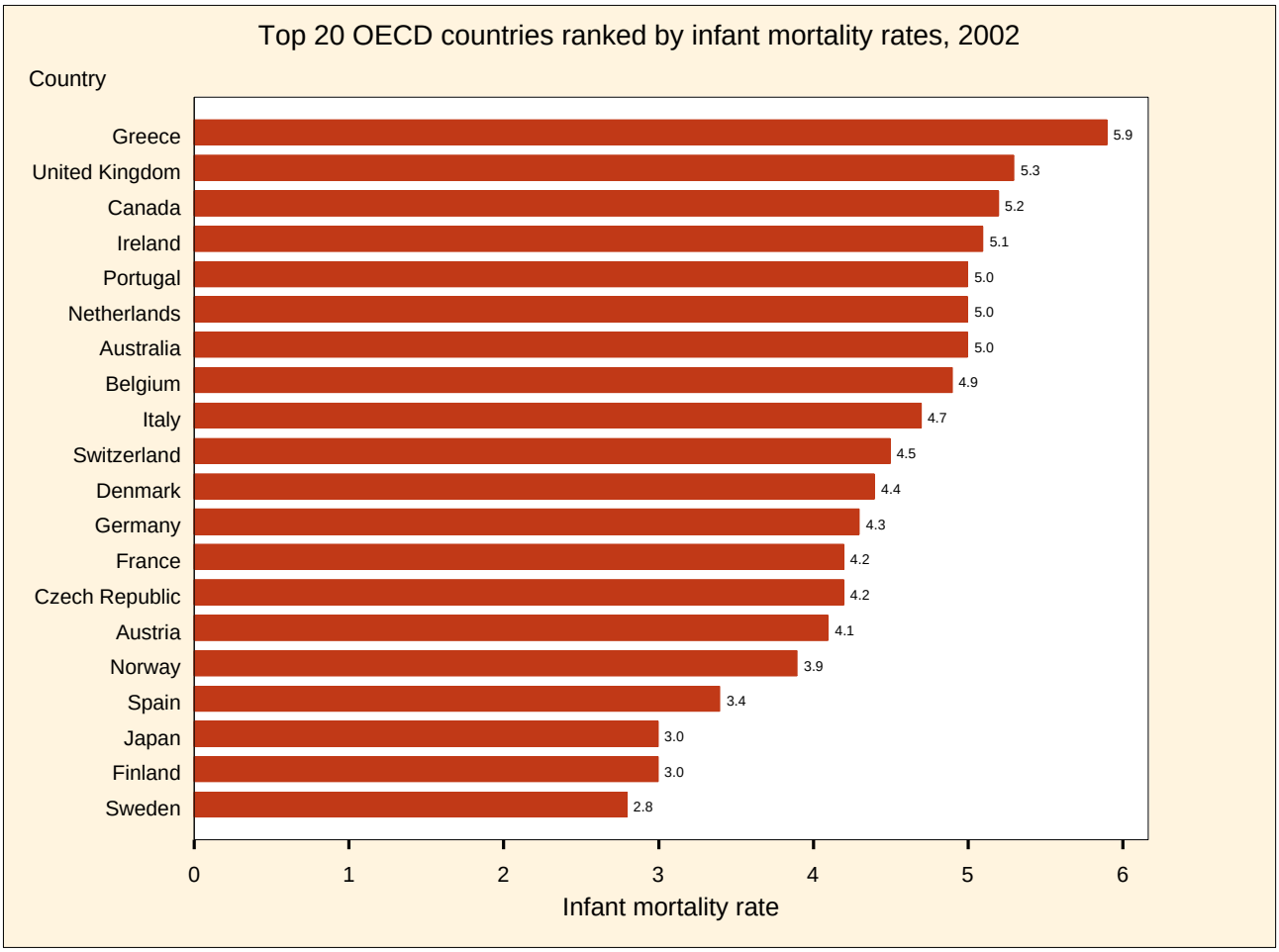
Source: The World Health Report 2004. WHO, Geneva 2004.

- Life expectancy at birth is an estimate of the average length of time (in years) that a person can expect to live, assuming that the prevailing rates of death for each age group will remain the same for the lifespan of that person.
- Life expectancy at birth is an important fundamental summary measure of a population's health status. It is influenced by many factors including socioeconomic status, the quality of the health system and the ability of people to access it, biomedical risk factors, and social and genetic factors.
- There have been large gains in life expectancy at birth across the more developed countries; on average there has been an increase of 8.7 years over the 40 year period from 1960–2000 (OECD, 2003). The greatest contributors to this improvement have been reductions in infant and child mortality, together with rapidly falling death rates from cardiovascular disease (heart disease and stroke).
- The Australian population has one of the highest life expectancies in the world. The expected life span of people born in Australia in 2002 was 80.4 years overall. The expected life for females was 83.0 years (equal fourth highest) and 77.9 for males (third highest).
- In 2002, Japan (85.3 years), France (83.5 years) and Switzerland (83.3 years) had life expectancies higher than Australia for females. For males, only Japan (78.4 years) and Sweden (78.0 years) had life expectancies higher than Australia. Life expectancies in Australia were slightly higher than in countries such as Spain, Canada, and New Zealand, and higher again than in the United Kingdom and the United States.

For more information:

World Health Organization. *The World Health Report 2004. Changing history.* Geneva: WHO, 2004. Available at www.who.int/whr/2004/en.

Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004. Available at www.aihw.gov.au/publications/index.cfm/title/10014.



Note: Excludes countries with a population in 2002 of less than one million people. Figures for Norway and Canada were from 2001.

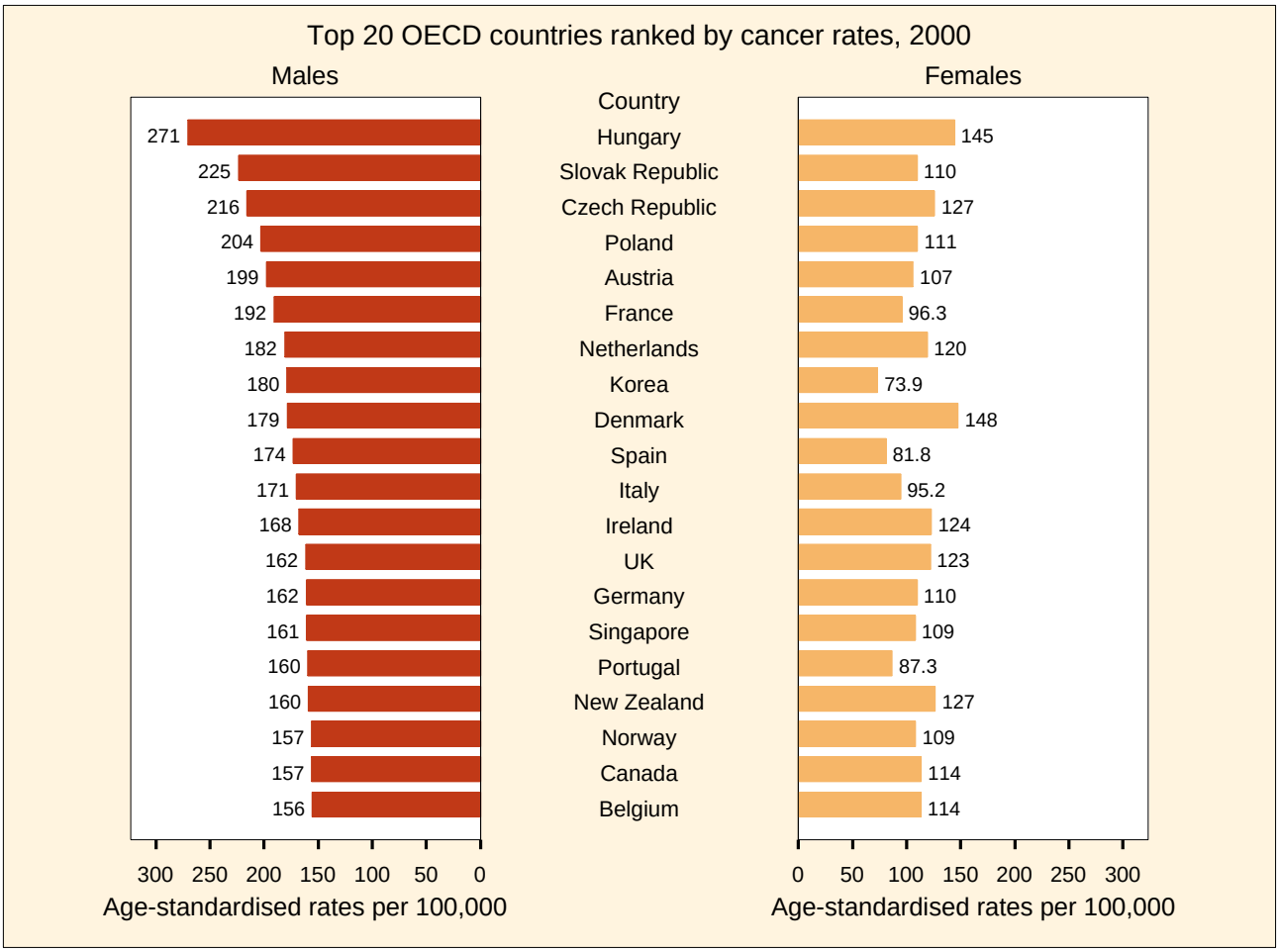
Source: OECD Health Data 2004, first edition. Available at www.oecd.org/statisticsdata/0,2643,en_2649_34631_1_119656_1_1_1,00.html.

- Infant mortality is an important indicator of the health of both pregnant women and newborns, and reflects social and economic factors, such as average income level, income distribution within a country, and the availability and accessibility of health services. In relation to health services, infant mortality is an indicator of the quality of antenatal care, the effectiveness of obstetric services, and the quality of infant care in the hospital and in the community.
- Infant mortality in Australia is declining; with a two-fold reduction in mortality rate achieved over the past 2 decades. In 2002, the infant mortality rate for Australia was 5.0 deaths per 1,000 livebirths, the fourteenth lowest for the OECD countries. The infant mortality rate in Australia is influenced by high death rates among Indigenous infants. Sweden had the lowest infant mortality rate with 2.8 deaths per 1,000 livebirths, followed by Finland and Japan (equal second with 3.0 deaths per 1,000 livebirths).
- The large reductions in infant mortality seen in the first half of the twentieth century were as result of improvements in social and public health conditions, combined with the development of mass immunisation programs and the effective use of antibiotics. More recent reductions in mortality have been attributed to the decline in deaths from sudden infant death syndrome (SIDS), following national public education campaigns commenced in the early 1990s, which promoted placing babies on their back or side to sleep in such a way that they are unable to roll onto their stomach.

For more information:

Organization for Economic Cooperation and Development. *Health at a glance. OECD indicators 2003.* Paris: OECD, 2003.

National Health Performance Committee, 2004. *National report on Health Sector Performance Indicators 2003.* Canberra: Australian Institute of Health and Welfare, 2004.



Note: Excludes countries with a population in 2002 of less than 1 million people. USA was ranked 22nd for males (rate = 152.6) and Australia was ranked 25th for males (rate = 147.1). USA was ranked 10th for females (rate = 111.9) and Australia was ranked 19th for females (rate = 99.0). Rates were standardised using the world standard population.

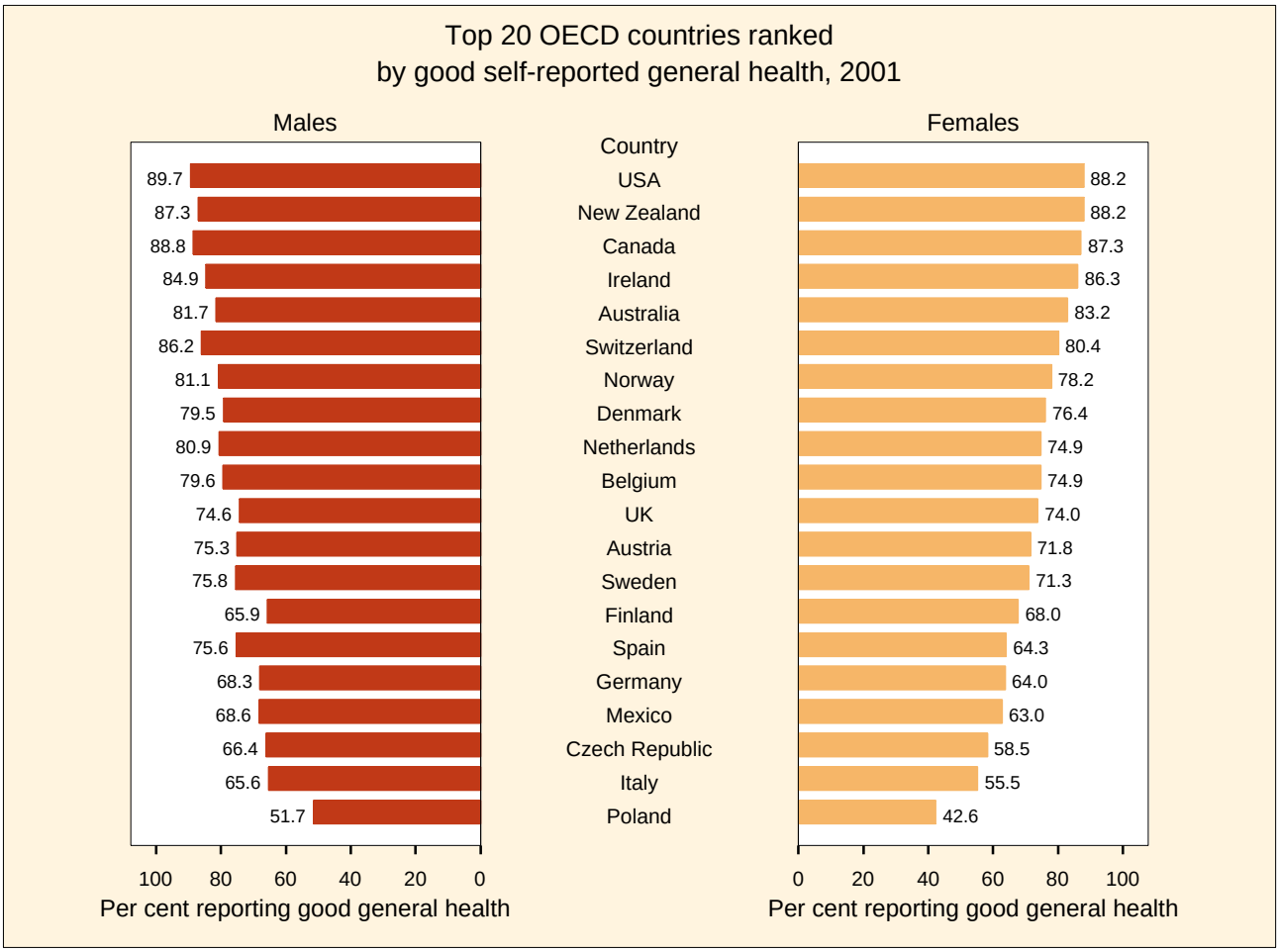
Source: GLOBOCAN 2002 database. Cancer Incidence, Mortality and Prevalance Worldwide, Lyon, IARC Press, 2004. Available at www-depdb.iarc.fr/globocan/GLOBOframe.htm.

- Cancer is the second leading cause of mortality in most OECD countries, after diseases of the circulatory system. In any given year, deaths for cancer account for some 20% to 30% of all deaths. In Australia, Canada, Ireland, Italy, New Zealand, the United Kingdom, and the United States, death rates for cancer peaked in the 1980s and have declined since then. Reductions in mortality can be attributed to changes in lifestyle and public health interventions to reduce known risk factors, such as smoking and high blood pressure, in conjunction with improvements in medical care and social and economic conditions.
- In 2000, the mortality rate for cancer for Australian males was 147.1 per 100,000, the twenty-fifth highest for the OECD countries. The rate for Australian females was 99.0 per 100,000, the nineteenth highest for OECD countries.
- Australia has the highest incidence of some cancers by world standards; for example, it has the highest incidence of melanoma among males and second highest incidence (after New Zealand) of melanoma among females.

For more information:

Organization for Economic Cooperation and Development. *Health at a glance. OECD indicators 2003.* Paris: OECD, 2003.

Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004. Available at www.aihw.gov.au/publications/index.cfm/title/10014.



Note: Excludes countries with a population in 2002 of less than one million people. Most countries report categories of 'very good', 'good', 'fair', 'poor', or 'very poor' general health in surveys. The USA, Canada, and Australia also report the category of 'excellent' health. 'Good general health' is defined using the 'excellent', 'very good' and 'good' categories combined (where avaliable). Data for Australia and most countries are from 2001; however, data from 1997, 1998, and 2002 were used for some countries.

Source: Organization for Economic Cooperation and Development. *Health at a glance. OECD indicators 2003*. Paris: OECD, 2003.

- Self-rated health is a fundamental measure of health status and health outcomes, and is believed to primarily reflect physical health problems (acute and chronic conditions and physical functioning) and, to a lesser extent, health behaviours and mental health problems. Longitudinal studies have shown that self-rated health is a strong and independent predictor of subsequent illness and premature death.
- Cross-country differences in self-reported health status are often difficult to interpret because people's rating of their own health may be affected by a number of factors, including variations in the formulation of survey questions and responses, and cultural differences.
- In 2001, 83.2% of females and 81.7% of males in Australia rated their health as 'good'. The 'good' general health category includes 'excellent', 'very good', and 'good' categories. This was fifth highest for OECD countries.
- The highest proportion of people reporting good health was from the United States of America, followed by New Zealand, Canada, and Ireland with 85 to 90% cent of the adult population of these countries assessing their health to be 'good' or better. On the other end of the scale, the proportion of people reporting being in good health was lowest in Portugal, Japan, and Korea, as well as some Central and Eastern European countries, where less than one-half of the adult population reported being in good health.

For more information:

Organization for Economic Cooperation and Development. *Health at a glance. OECD indicators 2003*. Paris: OECD, 2003.

3 Health inequalities

Section 3

Chapter 3.1

Aboriginal and Torres Strait Islander peoples

- Around 134,888 Indigenous people live in NSW, making up just over 2% of the total population.
- In 2001, a higher percentage of Indigenous than non-Indigenous families had an income less than $500 per week; Indigenous households were more likely than others to be multi-family and to live in rented homes; Indigenous adults were more likely to be unemployed and to have no post-school qualifications; and young Indigenous adults and children were less likely to use a computer at home.
- In 1999–2001, newborn Indigenous males in NSW could expect to live 57 years, and newborn Indigenous females could expect to live 64 years. This was about 20 years less than the life expectancy for the general population.
- Indigenous people are more likely to die at younger ages. People aged less than 25 years make up around 11% of deaths of Indigenous people, compared with 1% of deaths among non-Indigenous people. Deaths among people aged 65 years and over comprise around 37% of Indigenous deaths, compared with 80% of non-Indigenous deaths.
- Around 12% of Indigenous babies are born prematurely, and a similar percentage are of low birthweight. These rates are higher than for the general population.
- Indigenous people have higher smoking rates than non-Indigenous people and are more likely to report drinking alcohol at levels that are risky for health.
- Indigenous people have higher hospitalisation rates than non-Indigenous people for many health conditions. Compared with non-Indigenous people, Indigenous people in NSW:
  - — are 1.7 times more likely to be hospitalised for injury and poisoning;
  - — are twice as likely to be hospitalised for heart disease and stroke;
  - — are 4–5 times more likely to be hospitalised for diabetes;
  - — are 3–5 times more likely to be hospitalised for chronic respiratory diseases;
  - — are 3 times more likely to be hospitalised for acute respiratory diseases;
  - — are more likely to be hospitalised as children for middle ear infections.

In this chapter

Introduction

In 2001, there were an estimated 134,888 Aboriginal and Torres Strait Islander people living in NSW, comprising just over 2% of the total population. NSW has the greatest number of Indigenous people of any Australian state or territory, while the Northern Territory has the highest proportion of Indigenous people (comprising 29% of the total population of the territory) (AIHW, 2003).

There was a 16% increase in the Aboriginal and Torres Strait Islander population in the 2001 Census from the 1996 Census. This was due to both 'natural' increases in the Indigenous population (births and migration) as well as increasing numbers of people identifying as Aboriginal and Torres Strait Islander on census forms (AIHW, 2003). Many health data collections also rely on individuals self-identifying as Aboriginal or Torres Strait Islander or both. Due to the difficulty in measuring the impact of natural increases in the Indigenous population versus the over- or under-identification of Indigenous status in these data collections, the resulting calculations of rates of deaths, illness, and disease in Indigenous populations are considered to be experimental estimates and, as such, must be treated with caution.

Despite these caveats, the analysis of available data support what is well-known by Indigenous communities: that Indigenous people bear a greater burden of ill-health than the rest of the population, both in NSW and elsewhere in Australia (AIHW, 2003). The first national summary report on 56 health performance indicators for Aboriginal and Torres Strait Islander people identified the following areas of concern in comparison with non-Indigenous Australians: lower life expectancy; higher rates of chronic disease risk factors and deaths; higher rates of hospitalisations and deaths from injuries and assaults; higher rates of sexually-transmissible infections; lower per capita rates of expenditure on health promotion and primary health care; and the poor quality of information on Indigenous people in many datasets (AIHW, 2004).

In NSW, Indigenous status is collected in a range of health datasets, including the Midwives Data Collection, ABS Mortality Data, the Admitted Patients Data Collection, the Emergency Department Information System, the Notifiable Diseases Data Collection, the NSW Health Survey Program, and the Central Cancer Registry Data Collection. While the under-identification of Aboriginality, and therefore

under-reporting of health measures, is an issue in all of these collections, a number of initiatives are in place to improve the collection and recording of Indigenous status. The Aboriginal Health Branch of the NSW Department of Health is working in collaboration with the NSW Registrar of Births, Deaths and Marriages to provide better quality and more timely data for deaths occurring in NSW public hospitals and has also implemented the Collecting Patient Registration Information Training Program in NSW public hospitals to improve the identification and recording of a number of data items that patients or staff may consider to be sensitive information (AIHW, 2004).

In 1996–97, a change in coding practice for Indigenous status in hospital morbidity data resulted in a disproportionately large number of hospital separations being attributed to Indigenous people, and this affects some of the health indicators reported in this chapter.

The methods used for analysing and presenting death and hospitalisation data are described in more detail in the Methods section.

NSW Health is committed to working in partnership with Aboriginal people and other government agencies to improve health outcomes for Aboriginal people. The *NSW Aboriginal Affairs Plan 2003–2012*, sub-titled *Two Ways Together: A new way of doing business with Aboriginal people*, adopts a whole-of-government approach to develop partnerships between Aboriginal people and government to improve the social, economic, cultural and emotional wellbeing of Aboriginal people (NSW Department of Aboriginal Affairs, 2004). The NSW Department of Health is the lead agency for the Health Cluster Group, one of 7 groups established in priority areas for action in NSW (the other groups are Education, Economic Development, Justice, Families and Young People, Culture and Heritage, and Housing and Infrastructure). Each group has developed joint goals, targets and action plans to coordinate interventions and monitor outcomes through key indicators. This chapter includes reports on the key indicators developed by the Health Cluster Group including life expectancy, infant mortality, low birthweight babies, antenatal care, cardiovascular disease, diabetes, trauma injuries associated with alcohol, vaccine-preventable diseases and immunisation in children, acute respiratory infections, skin infections, and gastrointestinal illness. Information on renal dialysis among Indigenous people due to end-stage renal disease associated with diabetes is in the Diabetes chapter of this report.

The control of risk factors for chronic disease and the management of chronic diseases such as heart disease and diabetes in Aboriginal communities is a priority for the NSW health system. The NSW Aboriginal Vascular Health Program has been in place for a number of years to implement initiatives driven by local Indigenous communities in partnership with local health services, to prevent and manage chronic disease (NSW Department of Health, 2004). The NSW Aboriginal Chronic Disease Service Framework is being developed to define standards for the delivery of care by mainstream health services in partnership with Aboriginal communities (NSW Department of Health, 2004). Standards have been developed in 4 areas: partnerships, health promotion, early intervention, and workforce (NSW Department of Health, unpublished).

For more information:

Australian Bureau of Statistics and Australian Institute of Health and Welfare. *The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples.* ABS Catalogue no. 4704.0. Canberra: ABS, 2003.

Australian Institute of Health and Welfare. *National summary of the 2001 and 2002 jurisdictional reports against the Aboriginal Torres Strait Islander health performance indicators.* Canberra: AIHW, 2004.

NSW Department of Aboriginal Affairs. *NSW Aboriginal Affairs Plan 2003–2012. Two ways together, Partnerships: A new way of doing business with Aboriginal people.* Sydney: DAA, 2004.

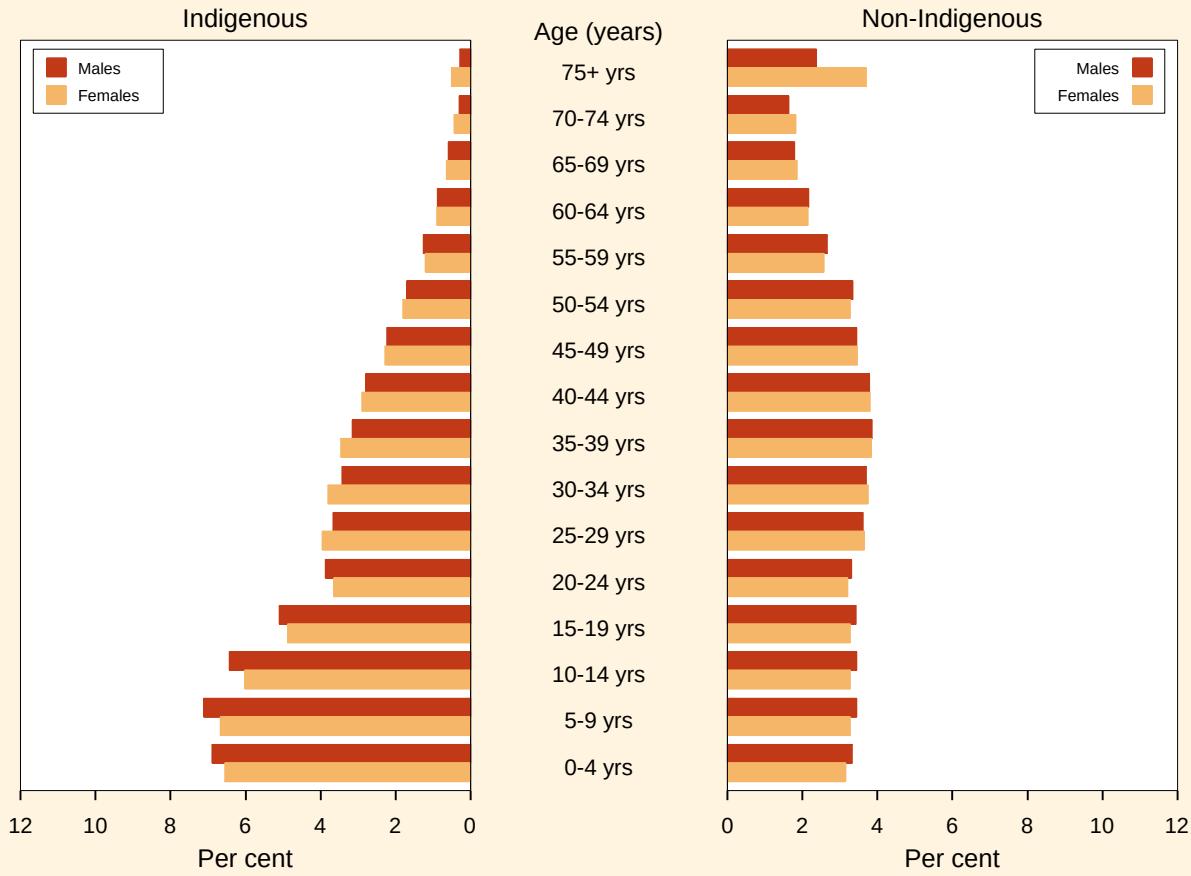
Office of Aboriginal and Torres Strait Islander Health, Department of Health and Ageing website at www.health.gov.au/oatsih.

Australian Institute of Health and Welfare website at www.aihw.gov.au.

NSW Department of Health. *NSW Aboriginal Chronic Disease Service Framework.* Sydney: NSW Department of Health, 2004. Available at http://internal.health.nsw.gov.au/sd/igfs/hp/avhp/cdframework.html.

Australian Institute of Health and Welfare website at www.aihw.gov.au.

Age and sex distribution of population by Indigenous status, NSW 2001



Note: Estimated residential populations based on the *2001 ABS Census of Population and Housing*.

Source: ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In NSW in 2001, there were an estimated 134,888 Aboriginal and Torres Strait Islander people living in NSW, comprising just over 2% of the total NSW population and around 29% of the total Indigenous population in Australia. NSW has the largest number of Indigenous people of any Australian state or territory (AIHW, 2003).
- The age–sex population pyramids for Indigenous and non-Indigenous persons in NSW are strikingly different. In 2001, the Indigenous population was younger, with around 40% of the population under 15 years of age, compared with 20% of the non-Indigenous population. The Indigenous population declined steadily after age 9 years, whereas the non-Indigenous population did not decline until after age 54 years. The percentage of the Indigenous population aged 65 years and over was just under 3%, compared with just over 13% for the non-Indigenous population. The corresponding figures for those aged 75 years or over are less than 1% Indigenous compared with over 6% for the non-Indigenous population. There is also a substantial drop in the size of the Indigenous population between 10–14 years and 15–19 years, reflecting a relatively high mortality rate among older teenagers.
- The shape of the population pyramids also reflects higher death rates and shorter life expectancy for both Indigenous and non-Indigenous males compared with females. The ratio of females to males in children aged under 15 years was similar for Indigenous (0.94) and non-Indigenous (0.95) populations. In those aged 65 years and older, however, the female to male ratio was higher in the Indigenous population (1.34) compared with the non-Indigenous population (1.27), indicating a higher death rate among Indigenous males.

For more information:

Australian Bureau of Statistics and Australian Institute of Health and Welfare. *The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples.* ABS Catalogue no. 4704.0. Canberra: ABS, 2003.

National Centre for Aboriginal and Torres Strait Islander Statistics website at www.abs.gov.au.

Estimated and projected Indigenous residential population, NSW 1991 to 2009

Type		1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Estimated residential population	Males	53616	55033	56449	57807	59297	60774	62110	63454	64779	66105	67432
	Females	53713	55082	56525	57986	59382	60759	62174	63568	64901	66199	67456
	Persons	107329	110115	112974	115793	118679	121533	124284	127022	129680	132304	134888

Type		2002	2003	2004	2005	2006	2007	2008	2009
Projected residential population	Males (low series)	68513	69616	70733	71867	73018	74192	75385	76606
	Females (low series)	67656	68751	69862	71001	72164	73350	74570	75819
	Persons (low series)	136169	138367	140595	142868	145182	147542	149955	152425
	Males (high series)	70035	72738	75550	78470	81503	84651	87931	91332
	Females (high series)	69160	71845	74627	77531	80546	83686	86957	90372
	Persons (high series)	139195	144583	150177	156001	162049	168337	174888	181704

Note: Indigenous population as at 30 June each year.

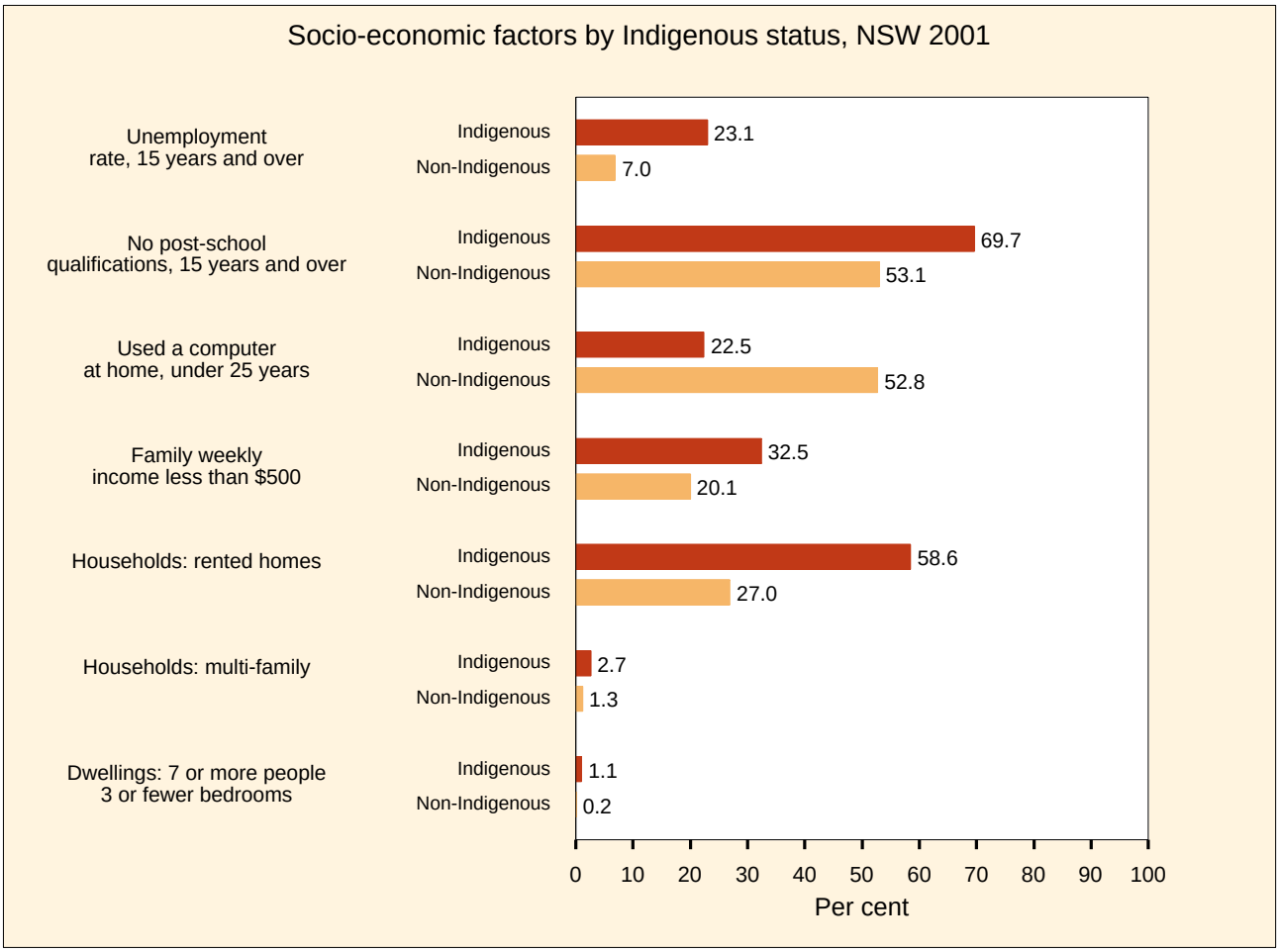
Source: Australian Bureau of Statistics. *30 June 1991–30 June 2009. Experimental projections of the Aboriginal and Torres Strait Islander Population*. Catalogue no. 3238.0. Canberra: ABS, 2004.

- The Aboriginal and Torres Strait Islander population in Australia grew by 16% in the period between the 1996 and 2001 Censuses (AIHW, 2003). Three-quarters of this increase was a 'natural' increase explained by demographic factors (births and migration), with the remaining 4% increase, or 'unexplained' growth, attributable to other factors such as improvements in Census methods and increased self-identification as Indigenous (AIHW, 2003). The Australian Bureau of Statistics has produced experimental projections of the Indigenous population to 2009, based on assumptions about the 'natural' (low series) and the 'unexplained' (high series) population growth in the Indigenous population (ABS, 2004).
- In 2009, the Indigenous population in NSW is projected to increase to 153,454 through natural factors, an increase of just under 14% from 2001. Under the assumption that the unexplained growth in the Indigenous population between 1996 and 2001 will continue, the population is projected to grow to 182,932, an increase of around 36% from 2001.

For more information:

Australian Bureau of Statistics and Australian Institute of Health and Welfare. *The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples.* ABS Catalogue no. 4704.0. Canberra: ABS, 2003.

Australian Bureau of Statistics. *Experimental estimates and projections, Indigenous Australians. 30 June 1991–30 June 2009*. Catalogue no. 3238.0. Canberra: ABS, 2004.



Note: Employed include engaged in Community Development Employment Program.

Source: Australian Bureau of Statistics. *Indigenous profile. New South Wales.* Catalogue no. 2002.0. Canberra: ABS, 2002.

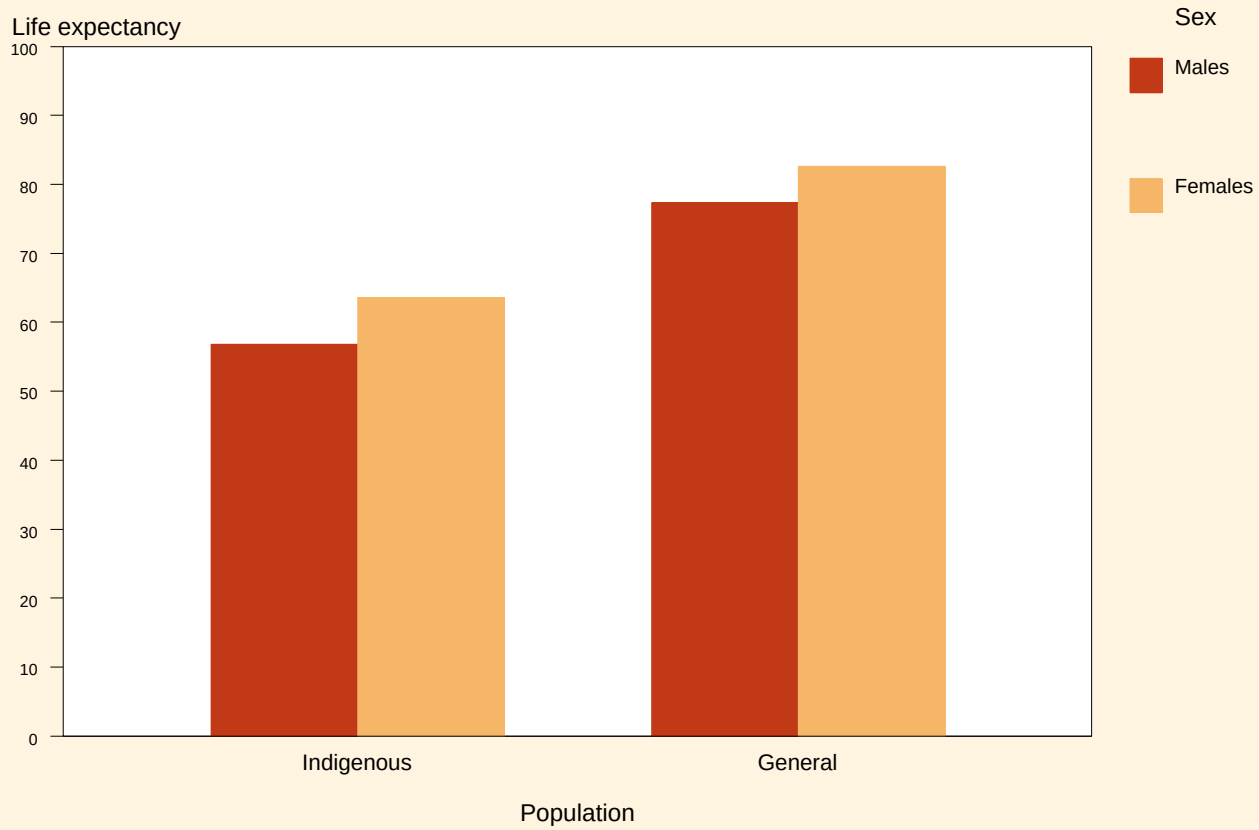
- Aboriginal and Torres Strait Islander people are the most disadvantaged group in Australia, as measured by a range of socioeconomic indicators (NSW Department of Aboriginal Affairs, 2004). The increased burden of disease carried by the Indigenous population cannot, however, be fully explained by socioeconomic disadvantage either alone, or in combination with other health risk factors such as smoking, risk drinking, and poor housing (AIHW, 2004). Colonisation and the loss of land has undermined the economic, spiritual, and cultural basis of Indigenous society and has led to a loss of control by Indigenous people of their own affairs (NSW Department of Aboriginal Affairs, 2004). This loss of control, both actual and perceived, may contribute to poorer health (AIHW, 2004).
- In 2001, the Indigenous population in NSW had an unemployment rate over 3 times that of the non-Indigenous population (23.1% versus 7.0%). The percentage of the Indigenous population aged over 15 years with no post-school qualifications was almost 20% higher among Indigenous (69.7%) than non-Indigenous (53.1%) people.
- More Indigenous (32.5%) than non-Indigenous (20.1%) families had a weekly income of less than $500. Compared with non-Indigenous households, Indigenous households were more than twice as likely to live in rented homes (58.6% versus 27.0%), and Indigenous (2.7%) were more likely than non-Indigenous (1.3%) households to be multi-family.
- Young Indigenous adults and children were less than half as likely to use a computer at home compared with their non-Indigenous counterparts (22.5% compared with 52.8%).

For more information:

NSW Department of Aboriginal Affairs. *Introducing Indigenous Australia. Background briefing.* Sydney: NSW DAA, 2004. Available at www.daa.nsw.gov.au.

Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004. Available at www.aihw.gov.au/publications/aus/ah04/index.html.

Estimated life expectancy among Indigenous population and observed life expectancy among general population by sex, NSW 1999 to 2001 combined.



		Life expectancy
Indigenous population	Males	56.8
	Females	63.6
General population	Males	77.3
	Females	82.6

Note: Life expectancies for the Indigenous population are experimental estimates. Figures for the general population are for 2002.

Source: Australian Bureau of Statistics. *Deaths, Australia 2001,* Catalogue no. 3302.0, Canberra: ABS, 2002; and Australian Bureau of Statistics, *Demography, New South Wales,* Catalogue no. 3311.1.55.001, Canberra: ABS, 2004.

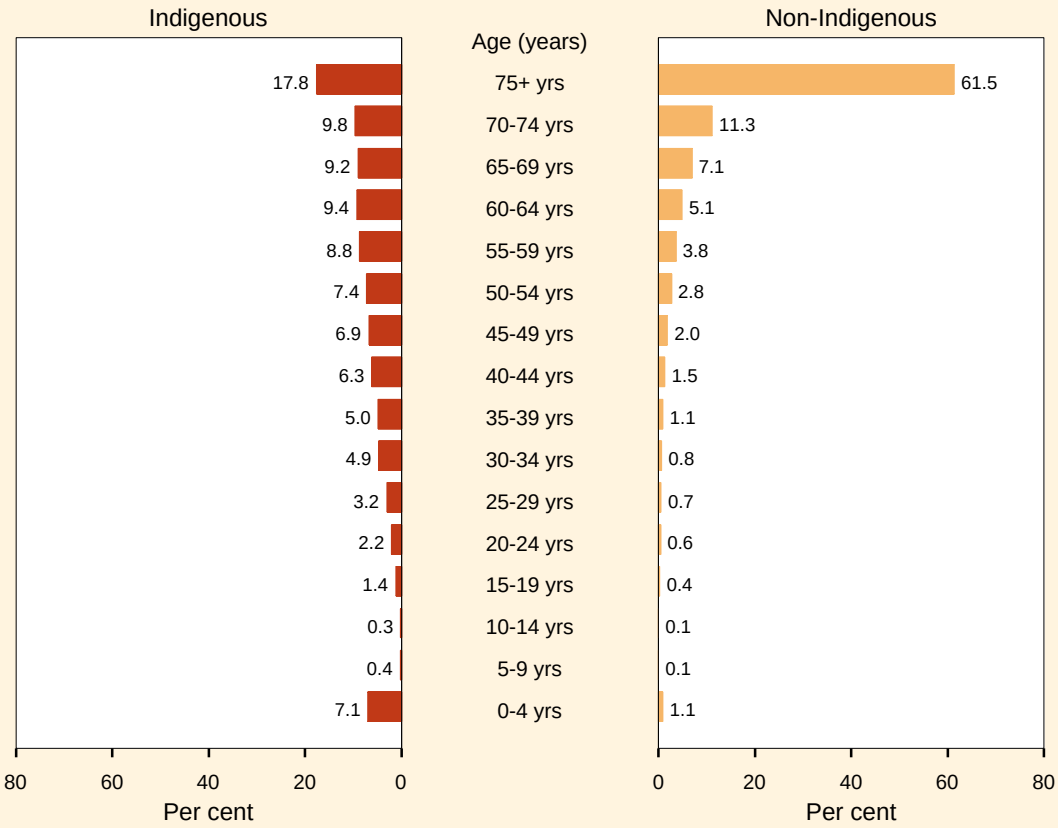
- Life expectancy is the number of years a person can expect to live, if current age-specific mortality rates were to continue for his or her lifetime. Reliable information on births, deaths, and the total population is needed to calculate life expectancy. There is uncertainty about the reliability of this information for Indigenous people, so experimental methods were used by the Australian Bureau of Statistics to calculate life expectancies for Indigenous people.
- In 1999–2001, the life expectancies of Indigenous males and females in NSW were estimated to be 56.8 and 63.6 years respectively. The life expectancy of both Indigenous males and females was estimated to be about 20 years less than the general population. Life expectancy at the level estimated for Indigenous people in 1999–2001 was experienced by males in the general population in Australia in the period 1901–10 and by females in the period 1920–22 (AIHW, 2004).
- Experimental estimates of Indigenous life expectancy in NSW for the period 1999–2001 are similar to other states and territories. Estimates of the life expectancy of Indigenous males vary from 55.1 years in South Australia to 56.8 years in NSW and Victoria, and for Indigenous females from 61.0 years in South Australia to 63.8 years in Victoria (ABS, 2002).

For more information:

Australian Institute of Health and Welfare. *Australia's Health 2004*. Canberra: AIHW, 2004. Available at www.aihw.gov.au/publications/aus/ah04/index.html.

Australian Bureau of Statistics. *Deaths, Australia 2001.* ABS Catalogue no. 3302.0. Canberra: ABS, 2002.

Deaths from all causes by age and Indigenous status, NSW 2000 to 2002 combined



Note: Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production.

Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

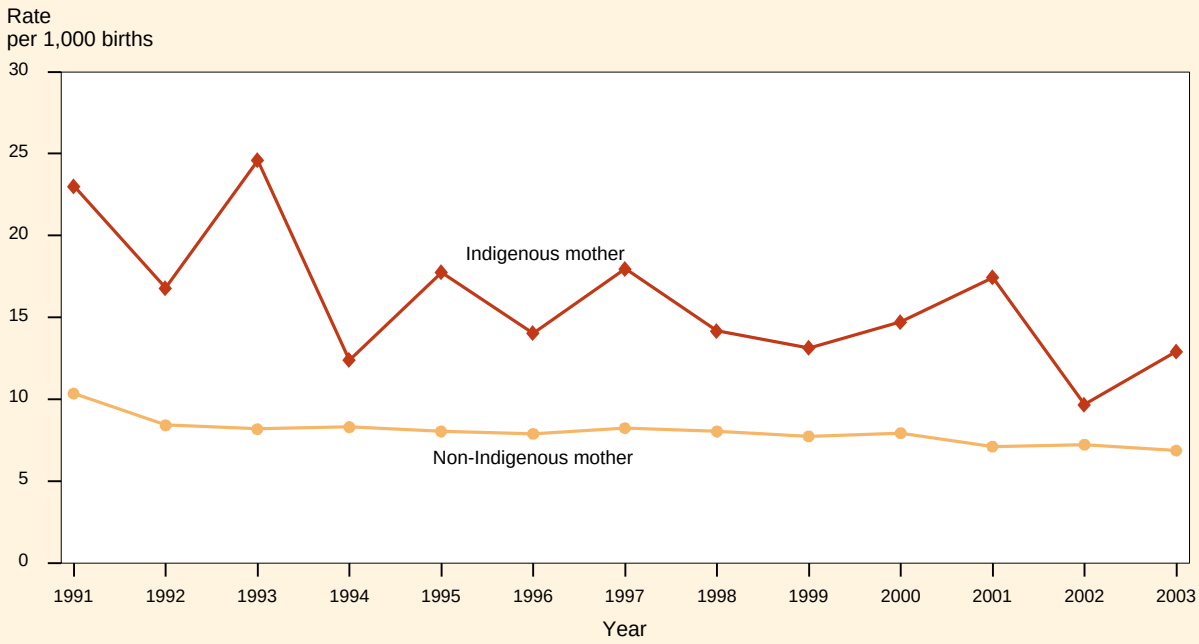
- The registration of Indigenous deaths in NSW improved significantly from 1998 compared with previous years. However, Indigenous deaths continue to be under-enumerated. In the period 1999 to 2001, the ratio of registered to expected Indigenous deaths ranged from 0.43 to 0.46, indicating that over half of the Indigenous deaths are not being recorded (AIHW, 2003).
- Deaths among Indigenous people are more likely to occur at younger ages. Over the period 2000–2002, deaths in people aged less than 25 years made up 11.4% of deaths of Indigenous people compared with 1.3% of deaths among non-Indigenous people. The proportion of deaths of children aged less than 5 years was more than 7 times greater among Indigenous than non-Indigenous people, while the proportion of deaths of teenagers aged 15–19 years was 3 times greater among Indigenous people (ABS, 2003). Deaths among people aged 65 years and over comprised around 37% of Indigenous deaths compared with 80% of non-Indigenous deaths.
- The median age at death for Indigenous males and females in 2002 in NSW was 56.3 and 61.9 years respectively, around 20 years less than for non-Indigenous males and females (76.5 and 82.3 years respectively) (ABS, 2003).
- While registration of Indigenous deaths has improved, there is insufficient information at present to comment on the patterns of causes of death. The NSW Department of Health is working in collaboration with the NSW Registrar of Births, Deaths and Marriages to improve the recording of Aboriginality on death certificates for deaths occurring in NSW public hospitals (AIHW, 2004).

For more information:

Australian Bureau of Statistics. *Deaths, Australia 2002.* ABS Catalogue no. 3302.0. Canberra: ABS, 2003.

Australian Institute of Health and Welfare. *National summary of the 2001 and 2002 jurisdictional reports against the Aboriginal Torres Strait Islander health performance indicators.* Canberra: AIHW, 2004.

Perinatal deaths of babies by mother's Indigenous status, NSW 1991 to 2003



		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Perinatal deaths	Indigenous	19	31	24	33	29	27	31	37	21	28
	Non-Indigenous	713	683	663	705	672	655	676	592	602	575
	Total	732	714	687	738	701	682	707	629	623	603
Rate per 1,000 births	Indigenous	12.4	17.8	14.1	18.0	14.2	13.2	14.7	17.5	9.7	12.9
	Non-Indigenous	8.3	8.0	7.9	8.2	8.0	7.8	7.9	7.1	7.2	6.9
	Total	8.4	8.2	8.0	8.5	8.2	7.9	8.1	7.4	7.3	7.0

Note: Perinatal deaths include stillbirths and deaths within 28 days of birth. Babies of at least 400 grams birthweight or at least 20 weeks gestation were included. Births to mothers resident outside NSW were excluded. Births for which mother's Indigenous status were not stated were classified as non-Indigenous.

Source: NSW Midwives Data Collection (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Between 1991 and 2001, the perinatal mortality rate (stillbirths and deaths within 28 days of birth) among babies born to Indigenous mothers in NSW was more than 13 per 1,000 total births. This dropped to 9.7 per 1,000 births in 2002; however, the rate increased again to 12.9 per 1,000 births in 2003, indicating that the drop between 2001 and 2002 was probably due to chance. The rate for non-Indigenous babies was 7.2 per 1,000 births in 2002.
- The highest perinatal mortality rates occur to babies of teenage mothers (under 20 years) (Laws et al., 2004). Teenage pregnancy rates are around 5 times higher among Aboriginal mothers (22.3%) in NSW compared with all mothers (Centre for Epidemiology and Research, 2003).
- The NSW Midwives Data Collection (MDC) only collects information on the Indigenous status of mothers, so underestimates the total number of Indigenous babies born. In addition, only around two-thirds of births to Indigenous mothers are reported as such to the MDC, and some neonatal deaths that occur after transfer or discharge from the hospital of birth may not be reported to the MDC.
- In the period 1998–2000, the reported perinatal mortality rate for babies of Indigenous mothers was 20.1 per 1,000 total births for Australia overall, compared to 15.5 per 1,000 births in NSW (AIHW, 2003). The NSW rate was the lowest of all Australian states and territories.

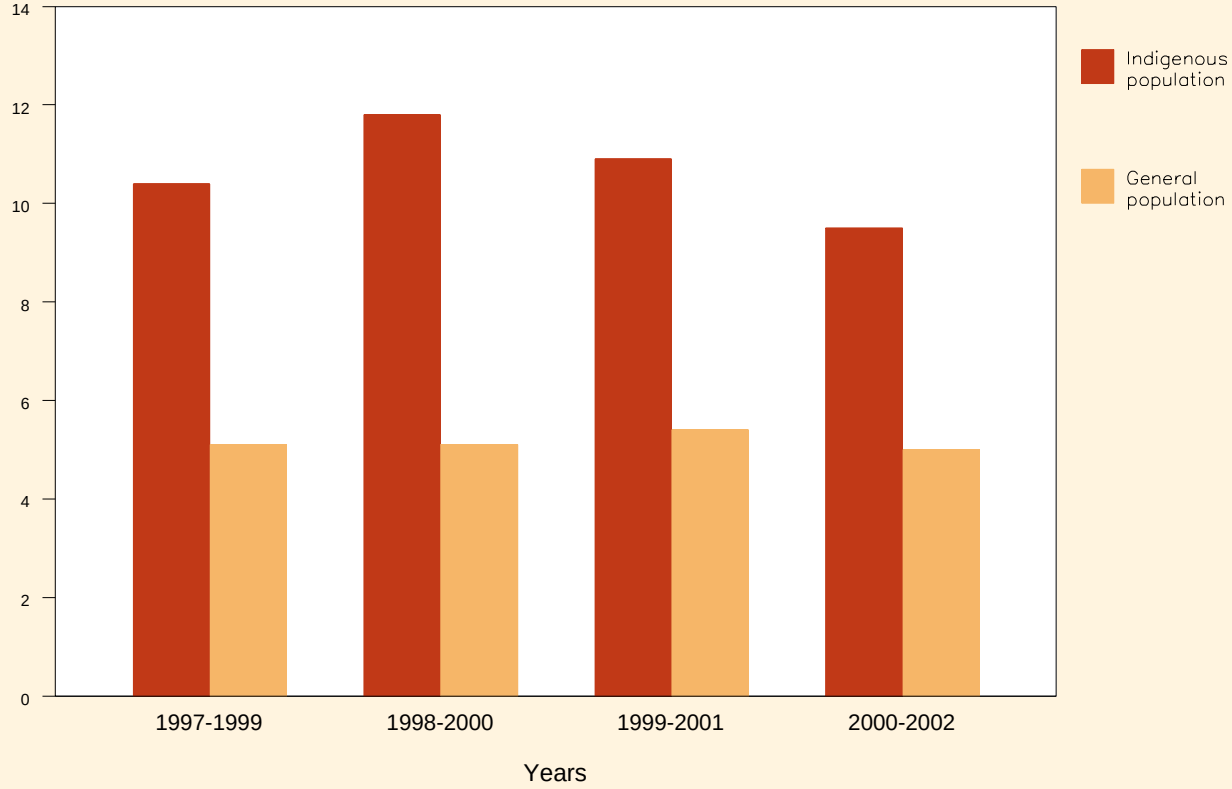
For more information:

Australian Bureau of Statistics and Australian Institute of Health and Welfare. *The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples.* ABS Catalogue no. 4704.0. Canberra: ABS, 2003.

Laws PJ, Sullivan EA. *Australia's mothers and babies 2001.* Sydney: AIHW National Perinatal Statistics Unit, 2004.

Centre for Epidemiology and Research. New South Wales Mothers and Babies 2002. *N S W Public Health Bull* 2003; 14(S-3). Available at www.health.nsw.gov.au/public-health/mdc/mdcrep02.html.

Infant mortality among Indigenous population and general population, NSW 1997-1999 to 2000-2002



		1997–1999	1998–2000	1999–2001	2000–2002
Indigenous population	Males	10.2	11.9	11	10.4
	Females	10.5	11.7	10.8	8.6
	Persons	10.4	11.8	10.9	9.5
General population	Persons	5.1	5.1	5.4	5

Note: Infant mortality rate is defined as the number of deaths in children < 1 year per 1,000 livebirths. Indigenous infant mortality rates are calculated using Indigenous births, using the 3 calendar year intervals shown. General population infant mortality rates are calculated using total births.

Source: Australian Bureau of Statistics. *Deaths, Australia 2002.* Catalogue no 3302.0. Canberra: ABS, 2003.

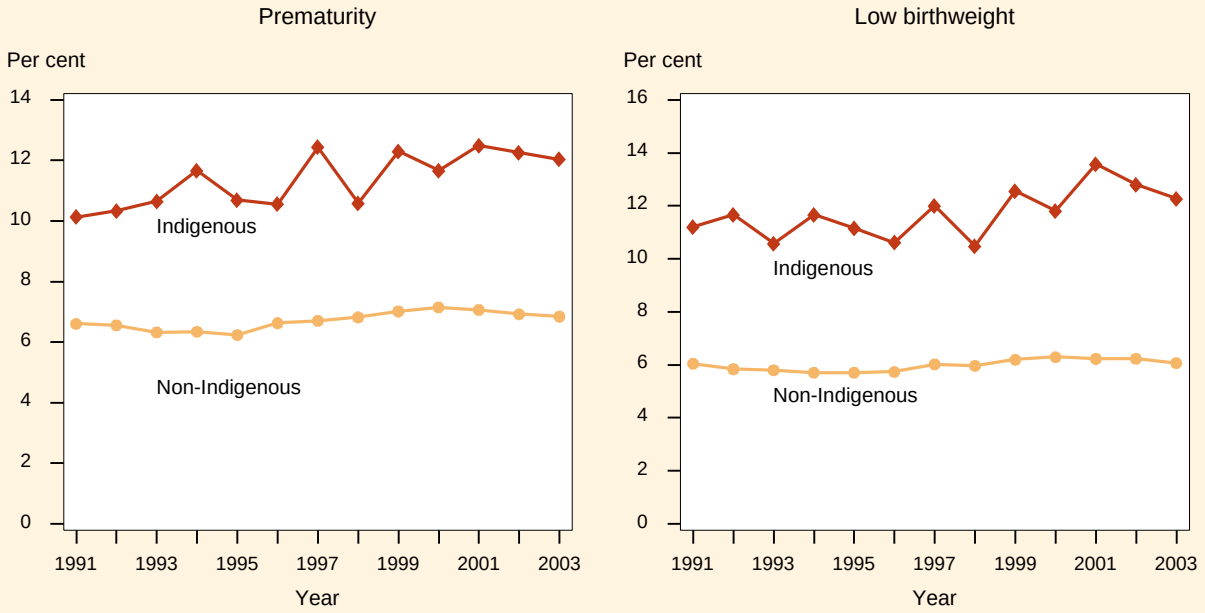
- Infant mortality is defined as the death of a live-born baby within the first year of life. This measure is indicative of the quality of antenatal care as well as obstetric services, and of infant care and maternal health (AIHW, 2004).
- The Australian Bureau of Statistics (ABS) reports on infant mortality rates for the Indigenous populations of NSW, Queensland, South Australia, Western Australia, and the Northern Territory. Overall, some decline in Indigenous infant mortality rates is apparent but, due to the small number of infant deaths, no reliable trend is evident (ABS, 2003).
- Infant mortality rates in NSW in the period from 2000 to 2002 were the lowest of any of the 5 states and territories reported. For Indigenous males, the rate in NSW was 10.4 deaths per 1,000 births, compared with 18.3 per 100,000 births in the Northern Territory. The female rates for the same period ranged from 8.6 deaths per 1,000 births in NSW to 17.8 per 1,000 births in the Northern Territory. Infant mortality rates for all of the 5 states and territories reported were higher than for Indigenous communities in other countries in 2000 including New Zealand Maori (7.8 per 1,000 births), Native American Indians (8.3 per 1,000 births) and the First Nations peoples in Canada (6.2 per 1,000 births) (AIHW, 2004).

For more information:

Australian Bureau of Statistics. *Deaths, Australia 2002.* ABS Catalogue no. 3302.0. Canberra: ABS, 2003.

Australian Institute of Health and Welfare. *National summary of the 2001 and 2002 jurisdictional reports against the Aboriginal Torres Strait Islander health performance indicators.* Canberra: AIHW, 2004.

Premature and low birth weight babies by mother's Indigenous status, NSW 1991 to 2003



			1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Number	Premature	Indigenous	179	187	181	229	217	253	246	265	266	261
		Non-Indigenous	5442	5295	5571	5739	5702	5933	6091	5875	5766	5730
		Total	5621	5482	5752	5968	5919	6186	6337	6140	6032	5991
	Low Birthweight	Indigenous	179	195	182	221	215	258	249	288	278	266
		Non-Indigenous	4897	4851	4821	5156	4986	5242	5363	5180	5187	5082
		Total	5076	5046	5003	5377	5201	5500	5612	5468	5465	5348
Per cent	Premature	Indigenous	11.7	10.7	10.6	12.4	10.6	12.3	11.7	12.5	12.3	12.0
		Non-Indigenous	6.3	6.2	6.6	6.7	6.8	7.0	7.1	7.1	6.9	6.8
		Total	6.4	6.3	6.7	6.8	6.9	7.1	7.3	7.2	7.1	7.0
	Low Birthweight	Indigenous	11.7	11.2	10.6	12.0	10.5	12.6	11.8	13.6	12.8	12.3
		Non-Indigenous	5.7	5.7	5.7	6.0	6.0	6.2	6.3	6.2	6.2	6.1
		Total	5.8	5.8	5.8	6.1	6.1	6.3	6.4	6.4	6.4	6.2

Note: Births for which gestational age was less than 37 weeks were classified as premature. Infants with a birthweight less than 2,500 grams were classified as low birthweight. Infants who were at least 400 grams birthweight or at least 20 weeks gestation were included. Births to mothers resident outside NSW were excluded.

Source: NSW Midwives Data Collection (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

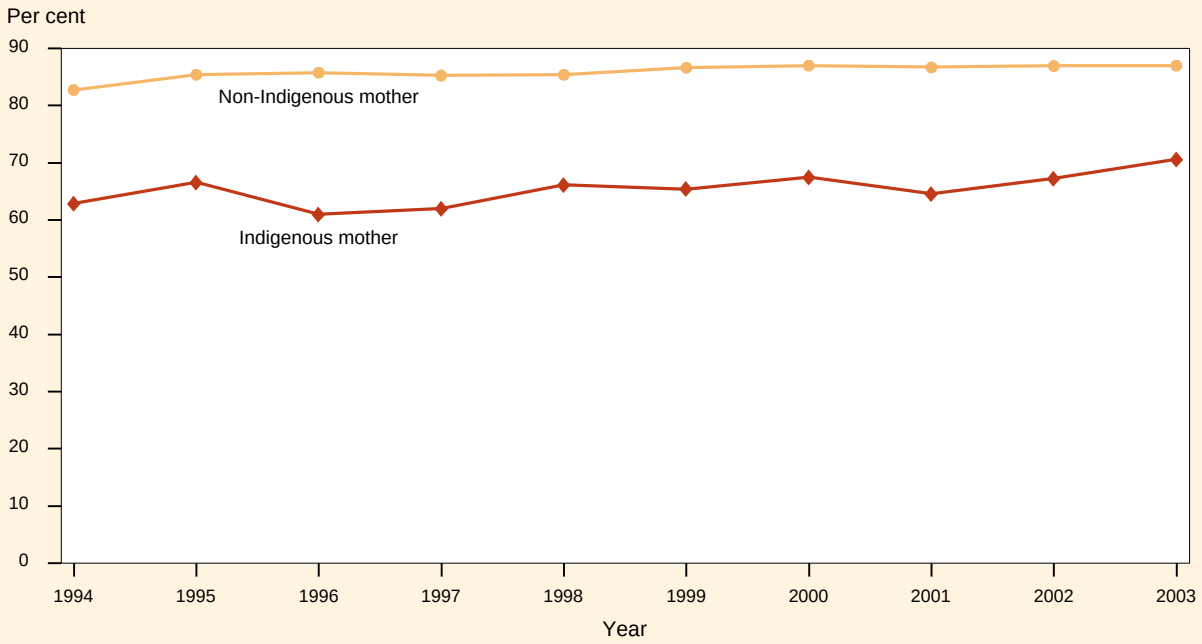
- Premature birth before 37 weeks gestation is associated with mortality and morbidity in newborn babies and sometimes with long-term disabilities (NHMRC, 1997). There is a correlation between prematurity and low birthweight (weighing less than 2,500 grams).
- In 2003, 2,175 babies were born to Indigenous mothers in NSW; 2.5% of all births. As the NSW Midwives Data Collection (MDC) only collects information on the Indigenous status of mothers, it underestimates the total number of Indigenous babies born. Maternal Aboriginality is also under-reported on the MDC. In 2002, it is estimated that only 69% of all babies born to Indigenous mothers were reported as such.
- In 2003, the rates of low birthweight and prematurity in Indigenous babies were 12.3% and 12.0% respectively. These compare with 6.2% and 7.0% respectively for NSW babies overall.
- Smoking in pregnancy and being a teenage mother are risk factors for both low birthweight and prematurity. In 2002, 58.0% of Indigenous mothers reported smoking in the second half of pregnancy and 22.3% were teenagers (Centre for Epidemiology and Research, 2003).

For more information:

Centre for Epidemiology and Research. New South Wales Mothers and Babies 2002. *N S W Public Health Bull* 2003; 14(S-3). Available at www.health.nsw.gov.au/public-health/mdc/mdcrep02.html.

National Health and Medical Research Council. *Clinical practice guidelines: Care around preterm birth.* Canberra: NHMRC, 1997.

First antenatal visit before 20 weeks gestation by Indigenous status, NSW 1994 to 2003



		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Number	Indigenous	957	1150	1038	1134	1338	1331	1410	1352	1441	1509
	Non-Indigenous	69924	71551	71063	71931	70330	71994	72831	70841	71146	71619
	Total	70881	72701	72101	73065	71668	73325	74241	72193	72587	73128
Per cent	Indigenous	62.9	66.6	61.0	62.0	66.2	65.4	67.5	64.6	67.3	70.6
	Non-Indigenous	82.7	85.4	85.7	85.2	85.4	86.6	87.0	86.7	86.9	87.0
	Total	82.4	85.0	85.2	84.8	84.9	86.1	86.5	86.1	86.4	86.6

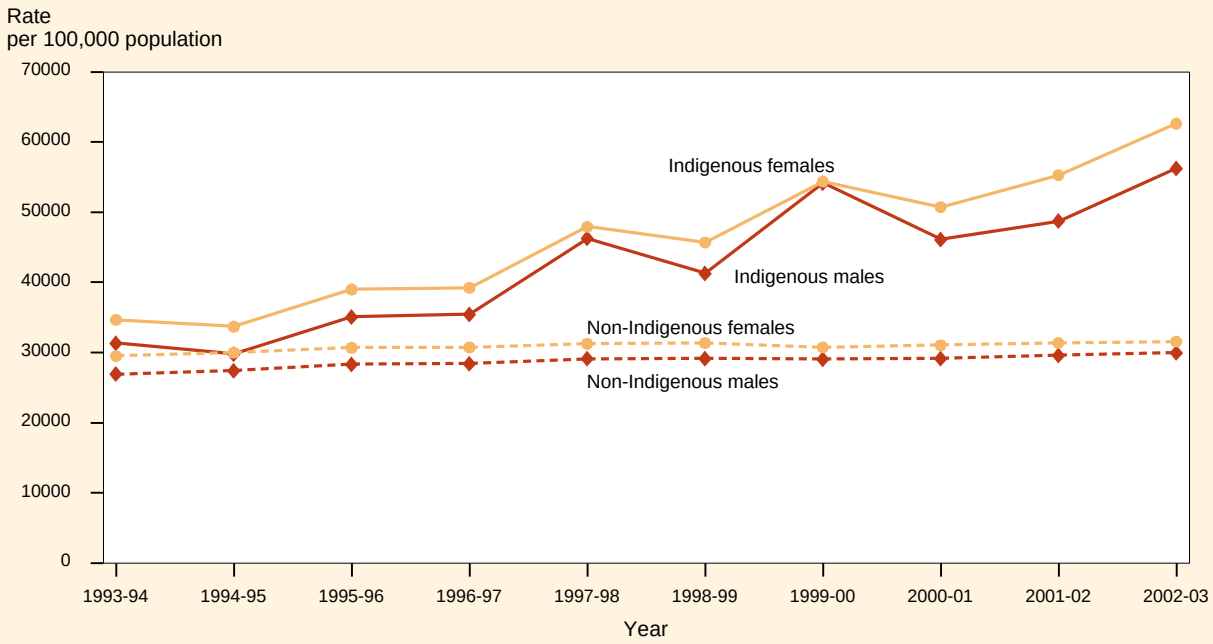
Source: NSW Midwives Data Collection (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- The purpose of antenatal visits is to monitor the health of both the mother and baby, provide advice to promote the health of both the mother and baby, and to identify antenatal complications so as to provide appropriate intervention at the earliest time. Potential complications include antepartum haemorrhage, placenta praevia, placenta abruptio, prolonged rupture of membranes, gestational diabetes, threatened preterm labour, hypertensive disease of pregnancy, rhesus isoimmunisation, cervical incompetence, threatened miscarriage, and problems secondary to multiple pregnancy.
- In NSW, the proportion of Indigenous mothers who commenced antenatal care before 20 weeks gestation was stable at about 65–67% between 1998 and 2002 but increased slightly to 70.3% in 2003. The proportion of non-Indigenous mothers who commenced antenatal care before 20 weeks gestation was also stable at about 85% to 87% over the same period to 2003.
- The under-utilisation of antenatal and postnatal services by Indigenous mothers is associated with inappropriate and inaccessible maternal health services, lack of long-term targeted Indigenous maternal health programs, and the itinerancy of many Indigenous women. This results in inadequate management of complications during pregnancy and the perinatal period and leads to increased perinatal mortality and morbidity.
- NSW Health provides antenatal services to pregnant women through public hospitals or shared care with general practitioners and Aboriginal Community Controlled Health Services. The NSW Aboriginal Maternal and Infant Health Strategy is currently being implemented in NSW to improve antenatal care for Aboriginal and Torres Strait Islander mothers (NSW Department of Health, 2003).

For more information:

NSW Department of Health. *The NSW Aboriginal Perinatal Health Report.* Sydney: NSW Department of Health, 2003.

Hospital separations for all causes by Indigenous status and sex, NSW 1991-92 to 2001-02



			93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	Indigenous	Males	11107	10806	12408	13102	14156	14265	15687	16514	17415	18854
		Females	14045	13685	15509	16041	18745	18882	20116	20135	21251	23220
		Persons	25152	24491	27917	29149	32902	33147	35803	36658	38681	42074
	Non-Indigenous	Males	749923	772739	811566	827908	859921	874527	884081	904676	936276	960521
		Females	897240	922023	957030	974283	1003923	1021311	1016082	1043069	1068493	1087728
		Persons	1647163	1694762	1768596	1802984	1863898	1895864	1900165	1947755	2004796	2048266
Rate per 100,000 population	Indigenous	Males	31400.8	29809.5	35149.1	35443.9	46284.2	41313.3	54186.9	46125.6	48750.6	56259.0
		Females	34669.0	33724.5	39014.6	39254.4	47938.3	45698.1	54392.9	50723.7	55303.3	62634.1
		Persons	32879.7	31809.9	37055.3	37327.0	46307.8	43228.1	53623.7	48751.3	52334.5	59449.8
	Non-Indigenous	Males	26946.9	27424.1	28398.1	28475.6	29133.4	29215.2	29082.5	29196.8	29646.3	29983.1
		Females	29521.5	30000.2	30709.4	30769.1	31269.1	31368.0	30747.9	31073.2	31387.3	31593.5
		Persons	28013.4	28496.6	29342.0	29444.3	30009.2	30097.7	29713.6	29950.0	30340.4	30611.3

Note: Rates were age-adjusted using the Australian population as at 30 June 2001. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations.

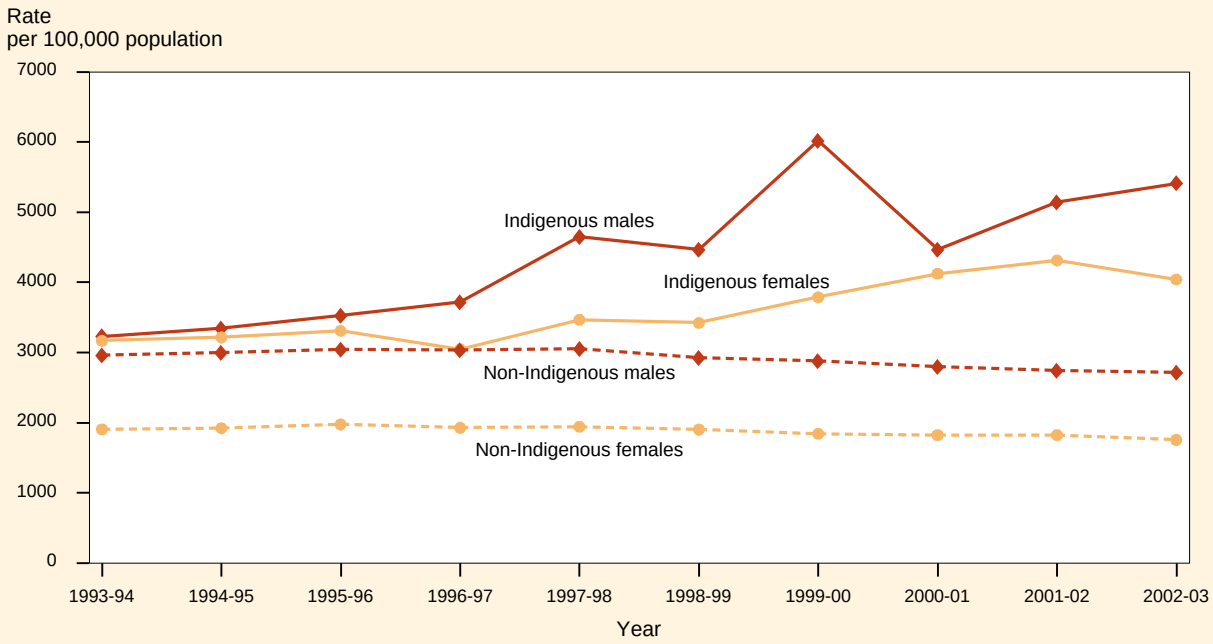
Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Indigenous status is likely to be substantially under-reported in NSW hospital morbidity data. Despite this, age-adjusted hospital separation rates for all causes among Indigenous people were substantially higher than those for non-Indigenous people over the period 1993–94 to 2002–03. The increasing rates for Indigenous people over this period are likely to reflect improved recording of Indigenous status.
- In 2003–03, 2% of all hospitalisations in NSW were for Indigenous people. Hospital separation rates were around twice as high in Indigenous people (59,450 per 100,000), compared to non-Indigenous people (30,611 per 100,000).
- In 2002–03, the most common groups of conditions causing hospitalisation of Indigenous people were: factors influencing health (28%), mainly renal dialysis; maternal conditions, including childbirth (9%); injury and poisoning (9%); digestive system diseases (6%), and acute respiratory infections (5%).
- The Collecting Patient Registration Information Training Program is currently being implemented in NSW public hospitals to improve the identification and recording of a number of data items (including Aboriginality) in hospital data (AIHW, 2004).

For more information:

Australian Institute of Health and Welfare. *National summary of the 2001 and 2002 jurisdictional reports against the Aboriginal Torres Strait Islander health performance indicators*. Canberra: AIHW, 2004.

Cardiovascular disease hospital separations by Indigenous status and sex, NSW 1993-94 to 2002-03



			93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	Indigenous	Males	575	604	662	737	805	776	905	854	929	992
		Females	597	639	668	626	723	705	794	788	835	790
		Persons	1172	1243	1330	1364	1528	1481	1699	1642	1764	1782
	Non-Indigenous	Males	76280	78787	81639	83547	86268	84609	85038	84758	85540	86535
		Females	58951	60567	63577	63586	65632	65752	65260	66053	67479	66234
		Persons	135231	139354	145216	147161	151901	150361	150298	150812	153022	152772
Rate per 100,000 population	Indigenous	Males	3232.6	3350.9	3529.2	3722.2	4652.5	4465.9	6019.0	4470.0	5143.7	5412.8
		Females	3170.8	3218.5	3310.9	3047.2	3468.1	3425.4	3790.4	4126.4	4313.9	4045.3
		Persons	3229.3	3284.5	3431.8	3367.9	3968.0	3866.1	4665.5	4319.3	4701.1	4638.2
	Non-Indigenous	Males	2967.1	3000.7	3045.2	3040.8	3056.7	2929.4	2879.7	2796.0	2747.8	2721.2
		Females	1907.8	1924.4	1978.2	1930.8	1947.0	1904.7	1845.5	1826.9	1825.0	1758.4
		Persons	2401.5	2427.3	2474.7	2447.4	2465.0	2384.4	2329.3	2282.1	2260.6	2212.0

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Records where Indigenous status was not stated were classified as non-Indigenous. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

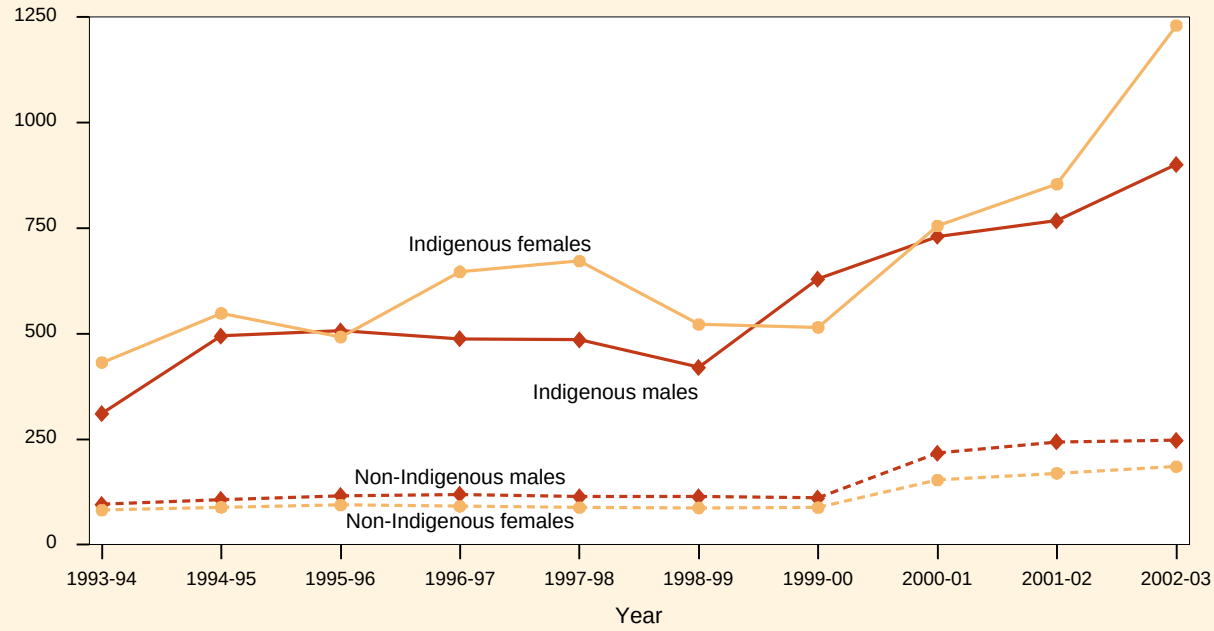
- In NSW over the period 1999–00 to 2002–03, age-adjusted hospital separation rates for cardiovascular diseases (including coronary heart disease, stroke, peripheral vascular disease, and heart failure) among Indigenous people were more than twice as high as the rates for non-Indigenous people. In 2003–03, the rate among Indigenous people was 4,638 per 100,000 population compared with 2,212 per 100,000 population for non-Indigenous people.
- Indigenous Australians have higher levels of risk factors for cardiovascular disease. In 2001, Indigenous adults aged 15 years and over (61%) were more likely than non-Indigenous adults (42%) to be classified as overweight or obese. Indigenous people aged 18 years and over were more than twice as likely to be current smokers (51%) compared with non-Indigenous people (24%) (AIHW, 2003).
- The NSW Aboriginal Vascular Health Program works in collaboration with area health services and Aboriginal Community Controlled Health Services to improve the prevention and management of vascular conditions among Aboriginal people (NSW Department of Health, 2004).

For more information:

Australian Institute of Health and Welfare. *Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples 2003.* AIHW Catalogue no. IHW-11. Canberra: AIHW, 2003. Available at www.aihw.gov.au/publications/ihw/hwaatsip03/hwaatsip03.pdf.

NSW Department of Health. *Evaluation of the NSW Aboriginal Vascular Health Program.* Sydney: NSW Department of Health, 2004. Available at www.health.nsw.gov.au/pubs/2004/ab_evaluation.html.

Diabetes hospital separations by Indigenous status and sex , NSW 1993-94 to 2002-03



			93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	Indigenous	Males	76	119	119	110	109	117	129	162	169	221
		Females	113	140	124	154	167	144	150	196	213	286
		Persons	189	259	243	264	276	261	279	358	382	507
	Non-Indigenous	Males	2578	2935	3230	3399	3322	3371	3339	6630	7601	7824
		Females	2508	2754	2969	2935	2863	2894	2968	5422	6112	6841
		Persons	5086	5689	6199	6334	6185	6265	6307	12052	13713	14666
Rate per 100,000 population	Indigenous	Males	311.6	494.5	506.9	488.2	485.9	421.0	630.5	730.7	767.9	901.9
		Females	432.0	548.3	492.3	646.8	672.0	522.1	515.3	755.6	854.3	1230.1
		Persons	371.9	529.1	499.6	573.8	591.1	486.8	559.2	747.2	821.9	1095.1
	Non-Indigenous	Males	96.0	107.4	116.6	119.5	114.8	114.1	110.8	217.6	243.8	247.2
		Females	82.4	89.0	94.5	91.2	88.2	87.6	88.5	153.4	169.7	185.0
		Persons	88.3	97.6	104.6	104.6	100.2	99.8	98.6	183.2	203.8	213.6

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Records where Indigenous status was not stated were classified as non-Indigenous. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

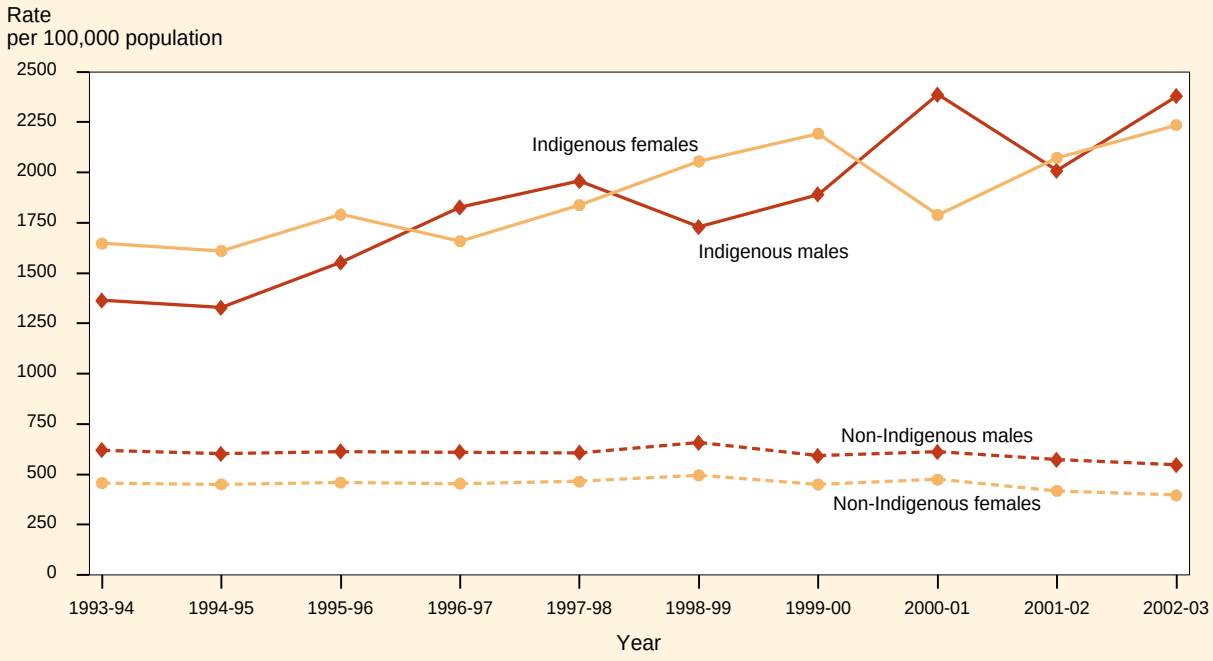
- While type 1 (early-onset, insulin-dependent) diabetes is rare among Indigenous people, type 2 diabetes (later-onset, usually non-insulin dependent) is highly prevalent. In 2001, 11% of Indigenous people reported that they had diabetes, compared with 3% of non-Indigenous people (AIHW, 2004). The onset of diabetes occurs earlier among Indigenous people, which leads to a greater burden of illness associated with the complications of diabetes, including kidney damage. Haemodialysis for kidney disease was the most common procedure for Indigenous people in Australian hospitals in 2001–02 (AIHW, 2004).
- In NSW, age-adjusted hospitalisation rates for a primary diagnosis of diabetes mellitus among Indigenous people were 4–5 times higher than the rates for non-Indigenous people over the period 1993–94 to 2002–03.

For more information:

Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004. Available at www.aihw.gov.au/publications/index.cfm/title/10014.

NSW Department of Health. *Evaluation of the NSW Aboriginal Vascular Health Program.* Sydney: NSW Department of Health, 2004. Available at www.health.nsw.gov.au/pubs/2004/ab_evaluation.html.

Chronic respiratory disease hospital separations by Indigenous status and sex, NSW 1993-94 to 2002-03



			93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	Indigenous	Males	409	402	481.0	458	473	475	459	516	486	423
		Females	465	456	500	477	534	605	592	573	548	559
		Persons	874	858	981	935	1007	1080	1051	1090	1034	981
	Non–Indigenous	Males	17073	16844	17394	17477	17601	19366	17517	18354	17333	16673
		Females	13949	13962	14383	14473	15011	16119	14915	15902	14311	13810
		Persons	31022	30806	31777	31950	32612	35485	32432	34256	31643	30482
Rate per 100,000 population	Indigenous	Males	1364.4	1327.6	1554.9	1828.2	1957.5	1729.7	1890.7	2386.5	2009.3	2379.4
		Females	1647.0	1609.5	1790.8	1658.8	1838.3	2054.9	2193.5	1789.4	2073.2	2236.2
		Persons	1512.5	1460.7	1661.4	1684.5	1855.1	1888.5	2032.9	1986.1	2021.1	2233.3
	Non–Indigenous	Males	620.5	603.7	613.9	610.1	604.8	654.1	587.6	601.2	559.1	531.3
		Females	456.6	451.1	459.1	454.0	462.9	492.1	445.8	468.3	410.9	390.1
		Persons	525.9	515.6	525.1	520.5	523.4	561.8	505.2	524.9	475.8	451.9

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Records where Indigenous status was not stated were classified as non-Indigenous. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- The chronic respiratory diseases included in this analysis are asthma and chronic obstructive pulmonary disease (COPD) (which mainly consists of chronic bronchitis and emphysema). Cigarette smoking is the most common risk factor for COPD (AIHW, 2004). In 2001, Indigenous Australians aged 18 years and over were more than twice as likely to be current smokers (51%) compared with non-Indigenous persons (24%)(AIHW, 2003).
- Age-adjusted hospitalisation rates for chronic respiratory diseases among Indigenous people were consistently 3–5 times higher over the period 1993–94 to 2002–03.
- The NSW Aboriginal Chronic Disease Service Framework is being developed to define standards for the delivery of care by mainstream health services in partnership with Aboriginal communities in culturally appropriate ways (NSW Department of Health, 2004).

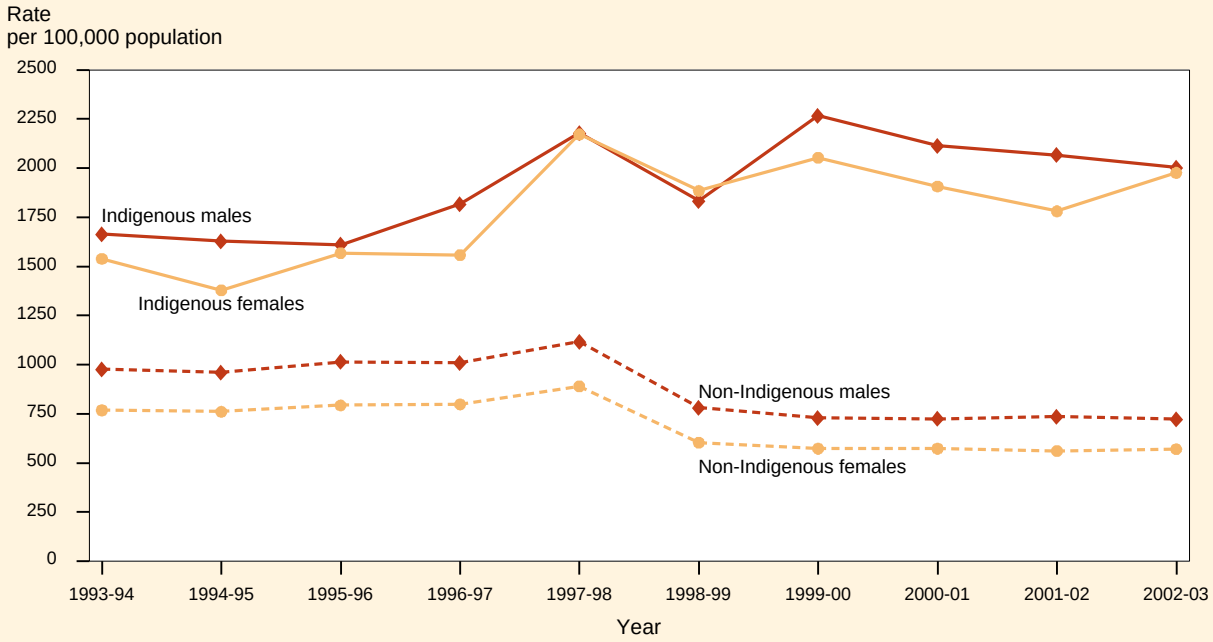
For more information:

Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004. Available at: www.aihw.gov.au/publications/index.cfm/title/10014.

Australian Institute of Health and Welfare. *Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples 2003.* AIHW Catalogue no. IHW-11. Canberra: AIHW, 2003. Available at www.aihw.gov.au/publications/ihw/hwaatsip03/hwaatsip03.pdf.

NSW Department of Health. *NSW Aboriginal Chronic Disease Service Framework.* Sydney, NSW Department of Health, 2004. Available at http//internal.health.nsw.gov. au/sd/igfs/hp/avhp/cdframework.html.

Acute respiratory infection hospital separations by Indigenous status and sex, NSW 1993-94 to 2002-03



			93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	Indigenous	Persons	1691	1598	1670	1832	2126	2192	1926	2159	1930	1922
	Non-Indigenous	Persons	51819	51406	54673	55185	61907	43007	40927	41036	41069	41327
Rate per 100,000 population	Indigenous	Persons	1585.0	1462.2	1601.0	1679.9	2199.8	1882.4	2135.1	2017.8	1902.7	1995.2
	Non-Indigenous	Persons	865.5	853.0	896.7	896.7	996.9	685.9	646.4	643.5	643.6	641.0

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Data table for the graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

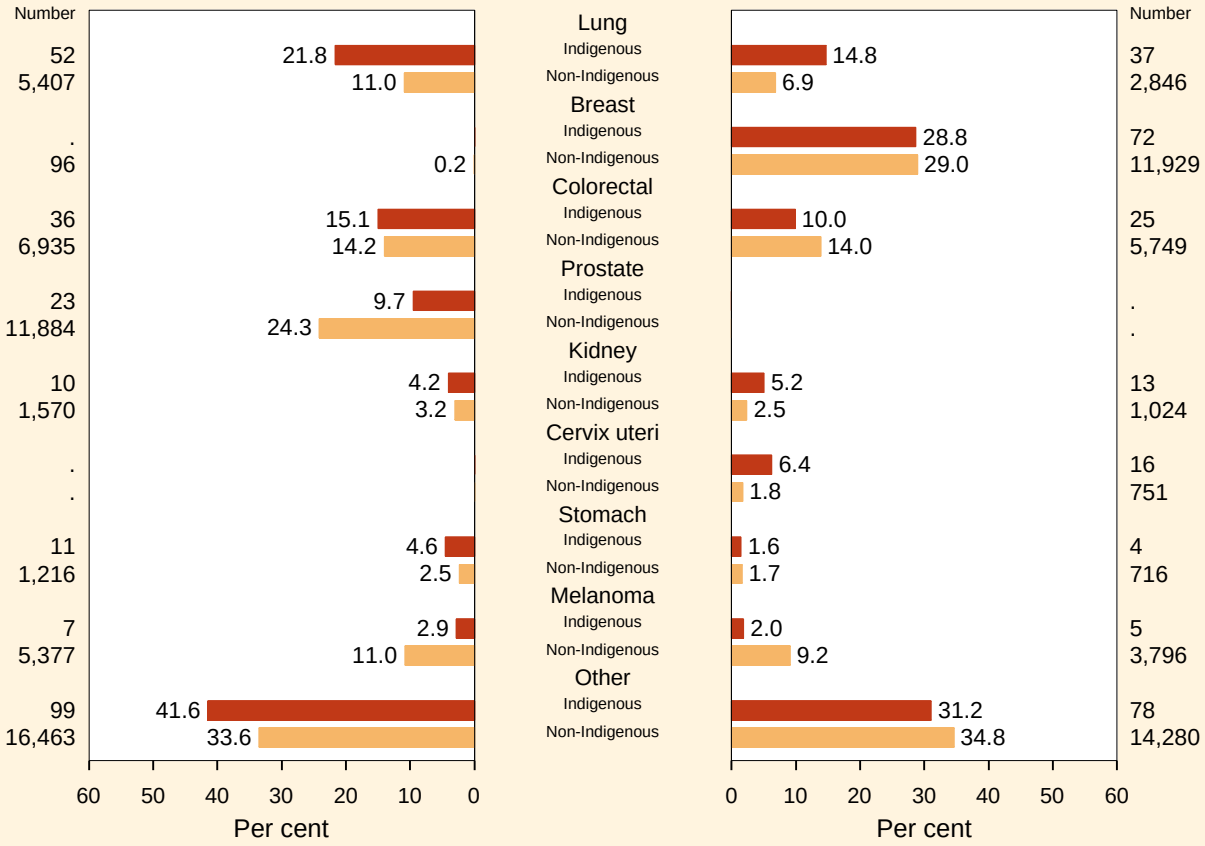
- A healthy physical environment is defined as housing and health-related essential infrastructure, including the supply of electricity, safe drinking water, and sewage removal. If these elements, collectively termed 'health hardware', are not functioning well a variety of infectious and parasitic diseases, including acute respiratory infections, can result (AIHW, 2003). The acute respiratory diseases included in this analysis are acute upper respiratory infections (such as tonsillitis, sinusitis, and laryngitis), influenza, and pneumonia.
- In NSW between 1993–94 and 2002–03, hospitalisation rates for acute respiratory infections among Indigenous people were more than 3 times higher than the rates for non-Indigenous people. Part of the increase in Indigenous rates observed from 1997–98 may be due to improved reporting of Aboriginality in the hospital data.
- Vaccination to prevent influenza and invasive pneumococcal disease (including pneumonia) is currently recommended for Indigenous adults aged 15–49 years with risk factors, and for all Indigenous adults aged 50 years or more. In addition, vaccination to prevent invasive pneumococcal disease is funded nationally for Indigenous children aged 0–2 years. However, there are particularly high rates of hospitalisation for influenza in Indigenous children aged 0–4 years and both influenza and pneumococcal disease in adults aged 25 years or more. Neither of these groups are covered under the current Indigenous vaccination program (Menzies et al., 2004).

For more information:

Australian Institute of Health and Welfare. *Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples 2003.* AIHW Catalogue no. IHW-11. Canberra: AIHW, 2003. Available at www.aihw.gov.au/publications/ihw/hwaatsip03/hwaatsip03.pdf.

Menzies R, McIntyre P, Beard F. *Communicable Diseases Intelligence: Vaccine preventable diseases and vaccination coverage in Aboriginal and Torres Strait Islander People, Australia, 1999 to 2002.* Canberra: Commonwealth Department of Health and Ageing, 2004.

Cancer incidence for selected cancers by Indigenous status, NSW 2000 to 2002 combined



Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Records where Indigenous status was not stated were classified as non-Indigenous.

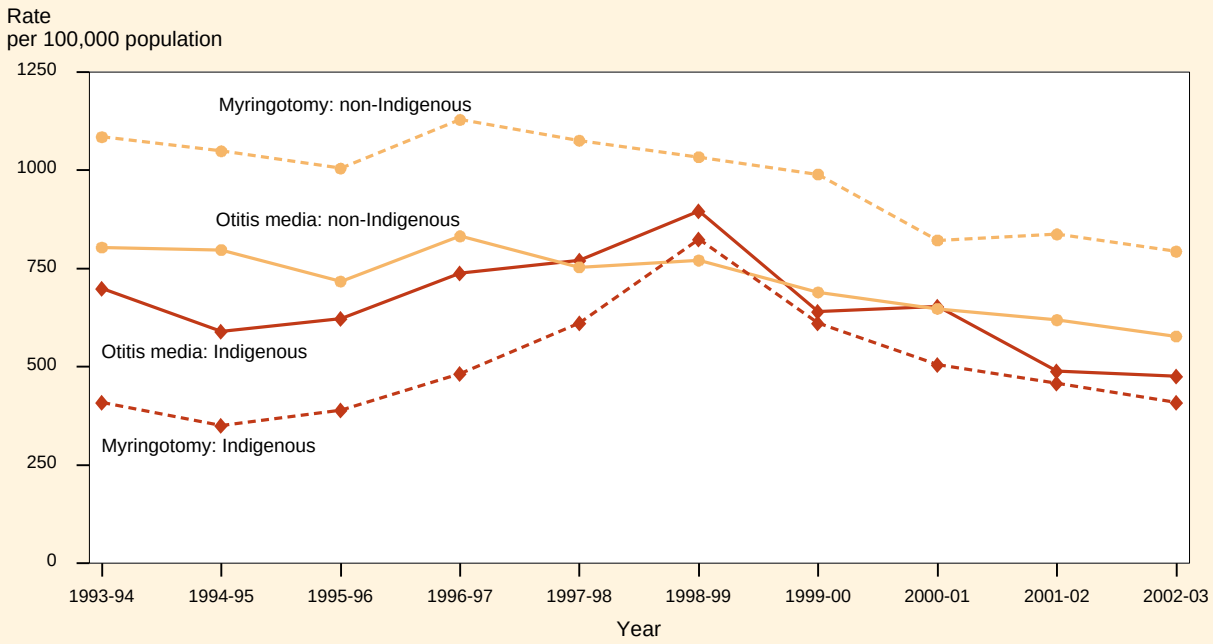
Source: NSW Central Cancer Registry incidence data and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- It is likely that there is considerable under-identification of Indigenous people in cancer registrations across Australia; however, this has not been quantified. In NSW, the NSW Central Cancer Registry relies on data on Aboriginality recorded mainly by hospitals, so there may be a bias in the cancer cases recorded as Indigenous towards those cancers that are more likely to require hospitalisation. Due to the under-reporting of Aboriginality in cancer data, analyses should focus on broad patterns rather than precise figures (AIHW, 2003).
- In NSW in the period 2000–2002 combined, around 18% (22% male and 15% female) of all new cases of Indigenous cancers registered in NSW were lung cancer; 15% were female breast cancer (29% of all female cancers); 13% were colorectal cancer (15% of all male and 10% of all female cancers); 5% were kidney (4% male and 5% female) and prostate cancers (10% of all male cancers). Cervical cancers and stomach cancers represented a higher proportion of new cases of cancer among Indigenous people (3% each) compared with non-Indigenous people (0.8% and 2% respectively). By contrast, melanoma of the skin made up a greater proportion of cases in non-Indigenous people (10%) compared with Indigenous people (3%).
- Studies of cancer incidence among Indigenous people in Western Australia, South Australia, Northern Territory, and Queensland have shown, in some jurisdictions, higher rates of lung, liver, pancreatic, and oesophageal cancers among Indigenous males and higher rates of cancer of the cervix and myeloid leukaemia among Indigenous females (AIHW, 2003).

For more information:

Australian Institute of Health and Welfare. *Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples 2003.* AIHW Catalogue no. IHW-11. Canberra: AIHW, 2003. Available at www.aihw.gov.au/publications/ihw/hwaatsip03/hwaatsip03.pdf.

Otitis media and myringotomy hospital separations by Indigenous status, children aged 10 years or below, NSW 1993-94 to 2002-03



				93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	Otitis media	Indigenous	Persons	218	188	201	244	256	299	220	227	173	170
		Non-Indigenous	Persons	6790	6777	6104	7104	6410	6536	5825	5427	5126	4742
	Myring-otomy	Indigenous	Persons	122	109	122	153	196	270	207	173	159	144
		Non-Indigenous	Persons	9129	8881	8527	9609	9136	8756	8353	6883	6936	6516
Rate per 100,000 population	Otitis media	Indigenous	Persons	698.7	589.6	621.4	737.3	770.1	895.2	640.2	653.1	489.0	475.6
		Non-Indigenous	Persons	803.1	796.9	716.5	831.8	752.8	770.2	689.0	647.4	618.6	577.2
	Myring-otomy	Indigenous	Persons	408.8	350.2	389.1	481.4	610.8	823.7	610.7	505.1	457.1	408.5
		Non-Indigenous	Persons	1084.2	1048.3	1004.3	1128.1	1075.0	1032.9	988.8	821.4	836.7	792.8

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Records where Indigenous status was not stated were classified as non-Indigenous. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

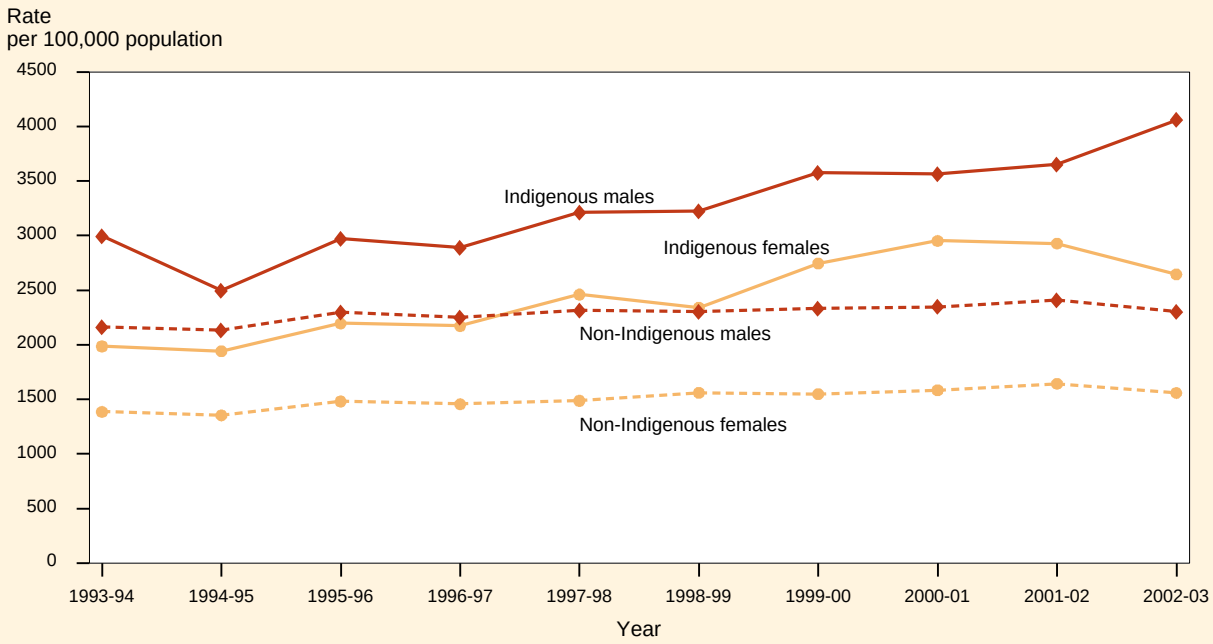
- Otitis media, or middle ear infection, commonly follows an upper respiratory tract infection in children. Repeated middle ear infections can lead to 'glue ear', perforated ear drum, hearing problems, and learning difficulties. Myringotomy is a surgical procedure, usually involving the insertion of small tubes called grommets, which release the fluid that builds up in the middle ear.
- The World Health Organization recognises that a prevalence of otitis media of greater than 4% in a population indicates a massive public health problem. Otitis media affects up to 10 times this proportion of children in many Indigenous communities in Australia (AIHW, 2003). In NSW, the rate of hospitalisation for otitis media in the period 1997–98 to 2002–03 was similar for both Indigenous and non-Indigenous children. The rate of myringotomy procedures was higher among the non-Indigenous population. This indicates that surgical treatment rates are lower in Indigenous children despite the higher prevalence of otitis media.
- The NSW Otitis Media Strategic Plan for Aboriginal Children encourages early detection, intervention, and treatment of otitis media in Aboriginal children (NSW Department of Health, 2000). The NSW Government has also funded a screening and intervention program for otitis media in Indigenous children under 6 years of age throughout the State.

For more information:

Australian Institute of Health and Welfare. *Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples 2003.* AIHW Catalogue no. IHW-11. Canberra: AIHW, 2003.

NSW Department of Health. *NSW Otitis Media Strategic Plan for Aboriginal Children.* Sydney: NSW Department of Health, 2000.

Injury and poisoning hospital separations by Indigenous status and sex, NSW 1993-94 to 2002-03



			93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	Indigenous	Males	1382	1215	1459	1460	1552	1569	1751	1876	1944	2005
		Females	967	913	1059	1021	1194	1149	1234	1408	1421	1333
		Persons	2349	2128	2518	2481	2746	2718	2985	3285	3366	3338
	Non-Indigenous	Males	63946	63496	69075	68180	70837	70967	72678	73726	76063	73338
		Females	42234	41726	46321	46412	48129	51281	51681	53583	56469	54231
		Persons	106180	105222	115396	114598	118967	122248	124359	127310	132538	127571
Rate per 100,000 population	Indigenous	Males	2995.8	2499.1	2970.8	2888.4	3211.2	3227.0	3578.2	3566.3	3653.4	4060.3
		Females	1986.4	1942.1	2196.6	2173.2	2461.0	2341.0	2745.6	2952.5	2928.8	2646.2
		Persons	2463.7	2217.5	2576.7	2547.6	2820.9	2769.3	3161.8	3282.0	3320.6	3304.9
	Non-Indigenous	Males	2165.6	2132.4	2298.5	2249.8	2315.2	2305.2	2333.7	2347.8	2408.1	2304.1
		Females	1387.0	1354.1	1482.3	1457.4	1488.3	1561.1	1550.1	1584.4	1644.9	1559.3
		Persons	1796.2	1763.0	1910.6	1873.2	1921.7	1953.2	1962.4	1986.8	2047.4	1950.1

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Records relating to acute hospital transfer and statistical discharge were excluded. Records where Indigenous status was not stated were classified as non-Indigenous. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

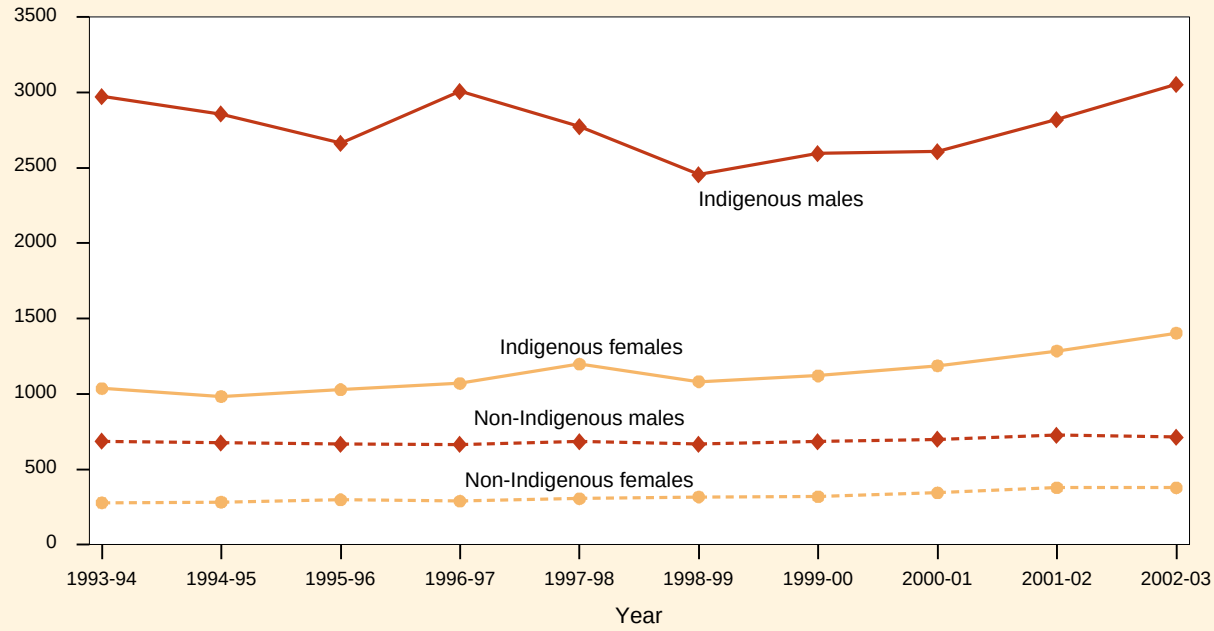
- In 2000–01, pooled national data showed that the most common causes of hospitalised injury among Indigenous people were assault (23% of male and 31% of female injuries); accidental falls (17% male and 15% female injuries); complications of medical or surgical care (10% male and 14% female injuries); and transport-related injuries (11% male and 7% female injuries) (AIHW, 2003).
- While Indigenous status is believed to be substantially under-reported in NSW hospital data, age-adjusted hospitalisation rates for injury and poisoning among Indigenous people were consistently higher than the rates for non-Indigenous people over the period 1993–94.
- The NSW Aboriginal Safety Promotion Strategy covers all aspects of safety promotion including injury, intentional self-harm, violence, the need for safe environments, and the need to feel safe (NSW Department of Health, 2003).

For more information:

Australian Institute of Health and Welfare. *Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples 2003.* AIHW Catalogue no. IHW-11. Canberra: AIHW, 2003. Available at www.aihw.gov.au/publications/ihw/hwaatsip03/hwaatsip03.pdf.

NSW Department of Health. *NSW Aboriginal Safety Promotion Strategy.* Sydney: NSW Department of Health, 2003.

Alcohol attributable hospital separations by Indigenous status, NSW 1993-94 to 2002-03



			93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	Indigenous	Males	1073	1077	1048	1145	1050	978	1023	1030	1150	1236
		Females	450	424	464	472	531	502	502	562	613	653
		Persons	1523	1500	1512	1618	1582	1480	1525	1592	1763	1889
	Non-Indigenous	Males	19703	19632	19648	19764	20607	20345	21170	21981	23190	23147
		Females	8338	8569	9167	9061	9732	10270	10510	11534	12852	12979
		Persons	28041	28201	28814	28825	30339	30615	31680	33515	36042	36127
Rate per 100,000 population	Indigenous	Males	2973.5	2856.8	2665.5	3007.2	2775.1	2457.4	2594.5	2609.0	2820.6	3056.1
		Females	1036.2	984.0	1029.7	1070.4	1199.2	1082.4	1120.9	1187.9	1286.0	1404.5
		Persons	1950.3	1866.8	1804.4	1988.8	1938.4	1727.6	1809.5	1834.7	1994.6	2151.8
	Non-Indigenous	Males	687.6	676.8	669.8	666.4	686.4	668.8	686.0	700.4	727.0	715.5
		Females	279.2	283.6	299.3	290.3	306.3	318.1	319.7	345.4	379.2	378.3
		Persons	478.8	475.7	480.0	473.2	491.2	488.4	497.6	518.0	548.3	542.2

Note: Excludes conditions where low-to-moderate alcohol consumption has an apparent protective effect. Hospital separations attributable to alcohol were calculated using age- and sex-specific aetiologic fractions from AIHW, 2001. Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Records where Indigenous status was not stated were classified as non-Indigenous. Rates were age-adjusted using the Australian population as at 30 June 2001. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations.

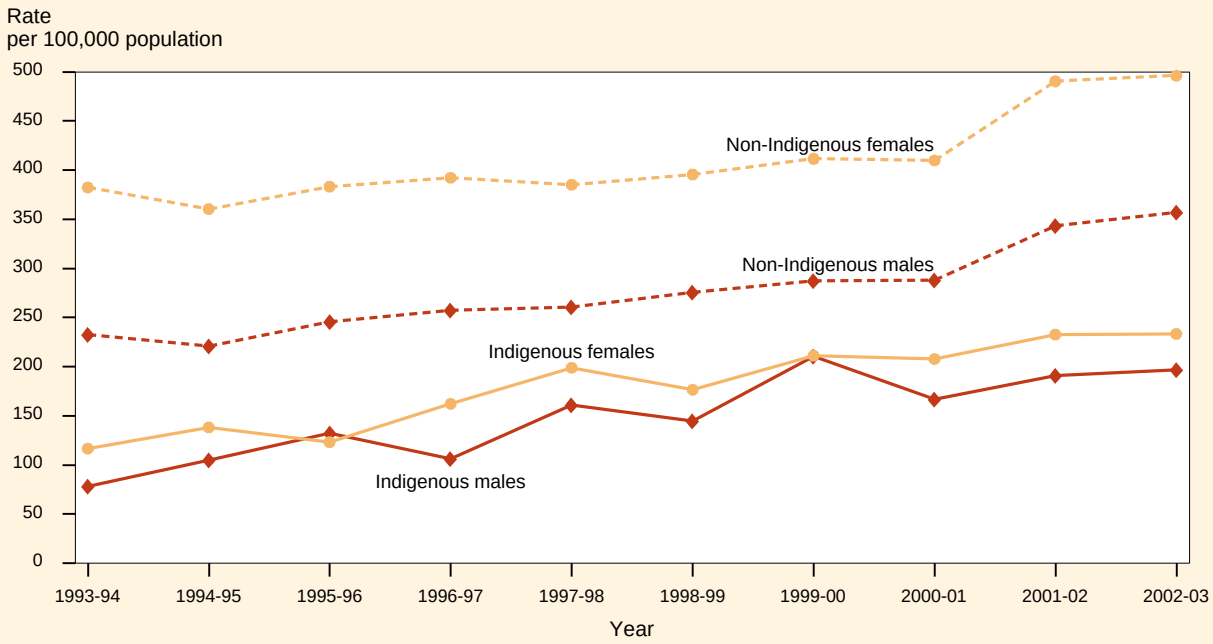
Source: Australian Institute of Health and Welfare (aetiologic fractions), 2001. NSW Department of Health Inpatient Statistics Collection data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Diseases caused by risky and high risk drinking include some cancers, heart disease and stroke, liver disease, pancreatitis, gastritis, and dementia. Misuse of alcohol is a significant contributor to assaults, road injuries, domestic violence, and suicide. While there are health benefits in regular consumption of a small amount of alcohol for those aged over 45 years, these must be balanced with the risks.
- Nationally in 2001, Indigenous adults were less likely to consume alcohol than non-Indigenous adults, but Indigenous adults who consumed alcohol were more likely to do so at risky or high risk levels (AIHW, 2003).
- In the period 1993–94 to 2002–03 in NSW, the rate of hospitalisations attributable to alcohol was consistently around 4 times higher in Indigenous people compared to non-Indigenous people. Injuries accounted for 34% of these hospitalisations in 2002–03.
- The outcomes of the NSW Summit on Alcohol Abuse 2003 (NSW Government, 2004) include a set of recommendations from a forum of Aboriginal community leaders (titled 'Talking about grog') that are planned for implementation over 4 years from 2003.

For more information:

NSW Government. *Outcomes of the NSW Summit on Alcohol Abuse 2003. Changing the cuture of alcohol use in NSW.* Sydney: NSW Government, 2004.

Removal and restoration of teeth hospital separations by Indigenous status and sex, NSW 1993-94 to 2002-03



			93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	Indigenous	Males	63	80	97	98	118	133	154	132	187	179
		Females	87	93	96	130	163	157	171	174	195	186
		Persons	150	173	193	228	281	290	325	306	382	365
	Non-Indigenous	Males	7257	6900	7673	8071	8176	8694	9105	9216	11052	11558
		Females	11761	11091	11825	12105	11888	12216	12772	12840	15470	15734
		Persons	19018	17991	19498	20200	20064	20910	21877	22056	26521	27292
Rate per 100,000 population	Indigenous	Males	78.0	104.9	132.4	106.4	161.1	144.7	210.4	166.9	190.9	196.6
		Females	116.6	138.2	123.3	162.2	199.0	176.6	211.3	207.8	232.8	233.5
		Persons	97.8	123.5	124.8	136.0	177.8	160.7	206.5	184.3	214.8	216.7
	Non-Indigenous	Males	232.6	220.7	245.5	257.1	260.4	275.7	287.3	288.2	343.1	356.9
		Females	382.4	360.5	383.3	392.2	385.3	395.6	411.6	409.8	490.5	496.2
		Persons	306.1	289.5	313.2	324.0	321.9	334.8	348.3	348.0	415.6	425.4

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Records where Indigenous status was not stated were classified as non-Indigenous. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

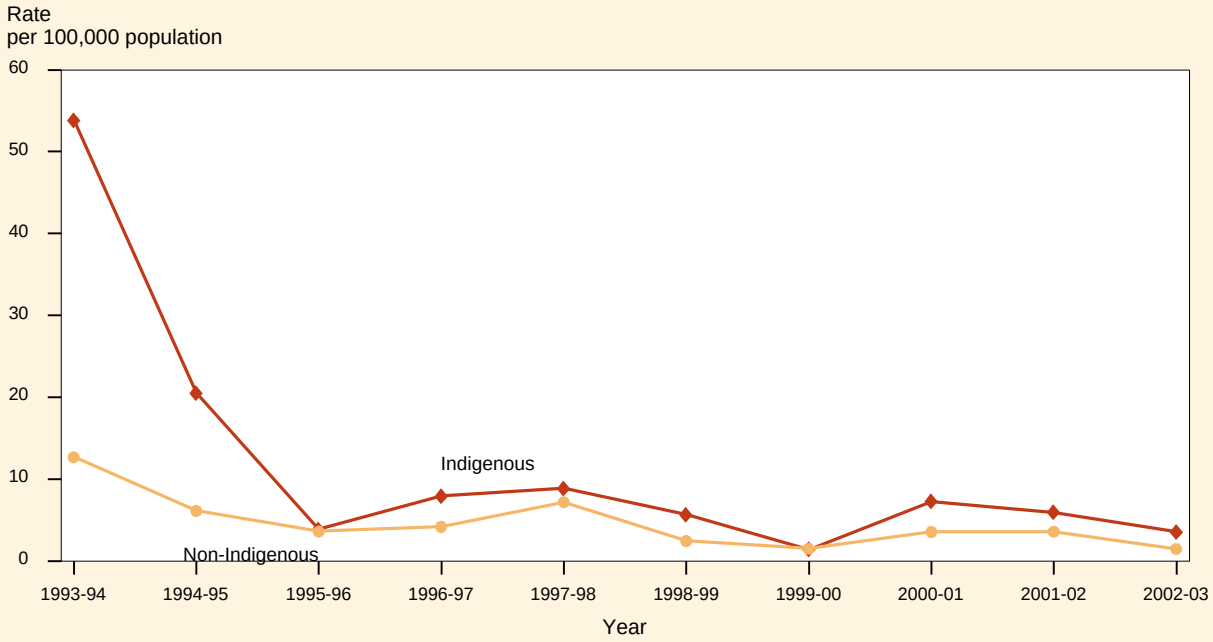
- Australians in all states and territories enjoy a relatively high standard of oral health. However, this high standard is not equally distributed among different age and social groups. Oral health is affected by a complex interplay of social, environmental, and economic factors. Indigenous populations have a higher percentage of people with no natural teeth (16%, compared with 10% non-Indigenous) and periodontal disease, both of which are associated with type 2 diabetes (AIHW, 2003).
- In NSW between 1993–94 and 2002–03, the rate of hospitalisation for the removal or restoration of teeth in Indigenous people was consistently lower than in non-Indigenous people. In 2002–03, the Indigenous rate was less than half the non-Indigenous rate.
- Indicators of access to dental services include the time since last dental visit, the number of dental visits, visiting the dentist for a problem rather than a check-up, and experiencing toothache. National data show that, based on these indicators, Indigenous people have poorer access to dental services, which may explain the lower rates of hospitalisation (Brennan and Carter, 1998).

For more information:

Australian Institute of Health and Welfare. *Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples 2003.* AIHW Catalogue no. IHW-11. Canberra: AIHW, 2003. Available at www.aihw.gov.au/publications/ihw/hwaatsip03/hwaatsip03.pdf.

Brennan DS, Carter KD. *Adult access to dental care. Indigenous Australians.* AIHW Catalogue no. DEN 40. Canberra: AIHW, 1998.

Pertussis, measles and haemophilus influenzae type B meningitis hospital separations by Indigenous status, children aged 15 years or below,



Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Records where Indigenous status was not stated were classified as non-Indigenous. Data table for the graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

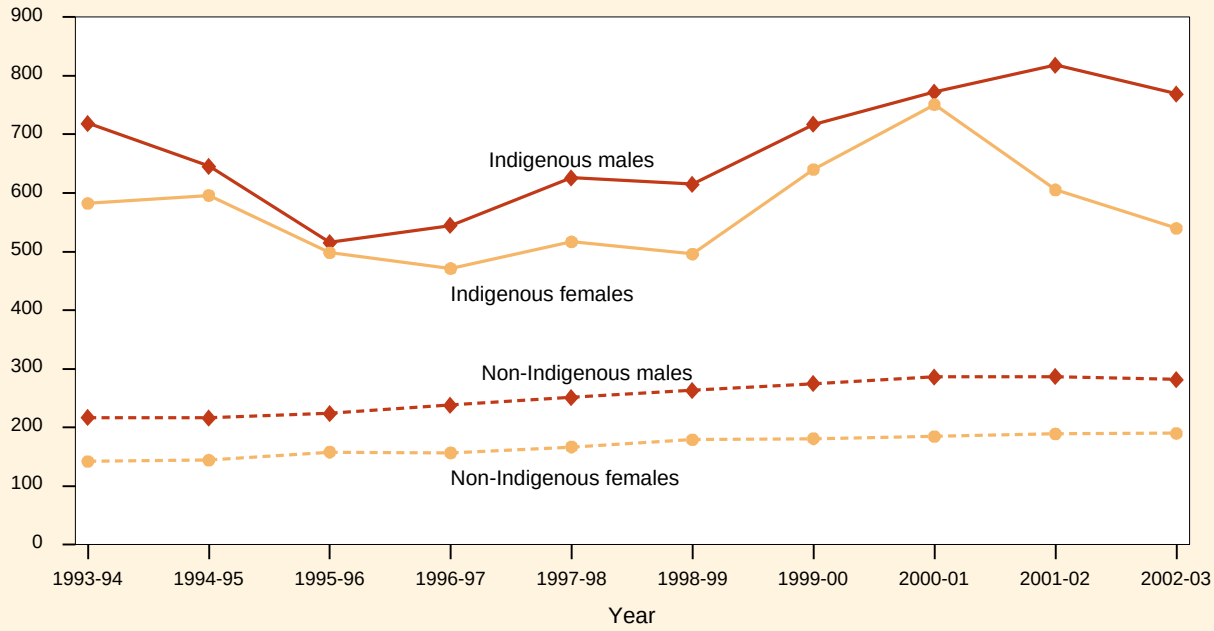
- Among Indigenous people nationally in the period 2000–2002, pertussis (whooping cough) was the most common vaccine preventable disease, followed by *Haemophilus influenzae* type b (Hib) and measles (42, 1.2 and 0.2 per 100,000 population respectively). However, Hib had the highest disease burden in comparison with non-Indigenous people (the incidence rate ratio of Indigenous to non-Indigenous was 9.7, compared with 0.9 for pertussis and 0.6 for measles) (Menzies et al., 2004). The highest incidence rates for pertussis and Hib in the Indigenous population were among infants and children aged 0–4 years. While vaccination for Hib has been successful in Indigenous infants and children, progress appears to have slowed relative to non-Indigenous children. (Menzies et al., 2004).
- In NSW in the period 1993–94 to 2002–03, hospitalisation rates for pertussis, measles, and Hib meningitis were consistently higher among Indigenous children aged under 15 years compared with non-Indigenous children. The differences were greatest in 1993–94, when the Indigenous to non-Indigenous hospitalisation rate ratio was 4:1, compared with 2.4:1 in 2002–03. The difference in 1993–94 was mainly due to a much higher rate of hospitalisation for measles among Indigenous children.
- Vaccination coverage data are available nationally for all children from the Australian Childhood Immunisation Register. These data show that in June 2004, 85% of Indigenous infants in NSW aged between 12 and 15 months were fully immunised, compared with 91% of infants overall (Centre for Epidemiology and Research, 2004). The comparable figures for Australia were 84% (Indigenous) and 91% (general population). Vaccination coverage data indicate that delayed vaccination of Aboriginal and Torres Strait Islander infants may be an important contributor to a higher rate of pertussis among Indigenous infants (Menzies et al., 2004).

For more information:

Menzies R, McIntyre P, Beard F. *Communicable Diseases Intelligence: Vaccine preventable diseases and vaccination coverage in Aboriginal and Torres Strait Islander People, Australia, 1999 to 2002.* Canberra: Department of Health and Ageing, 2004.

Centre for Epidemiology and Research. Communicable Diseases Report, NSW, for May–June 2004. *N S W Public Health Bull* 2004; 15(7–8).

Skin infection hospital separations by Indigenous status and sex, NSW 1993-94 to 2002-03



			93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	Indigenous	Persons	667	614	520	570	594	578	690	758	719	694
	Non-Indigenous	Persons	10584	10701	11517	12105	12984	13890	14496	15159	15493	15556
Rate per 100,000 population	Indigenous	Persons	645.5	632.5	514.0	512.5	574.8	557.5	687.5	768.9	701.7	638.4
	Non-Indigenous	Persons	180.3	180.5	191.3	198.1	209.5	221.5	228.3	235.9	238.5	236.6

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Records where Indigenous status was not stated were classified as non-Indigenous. Data table for the graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

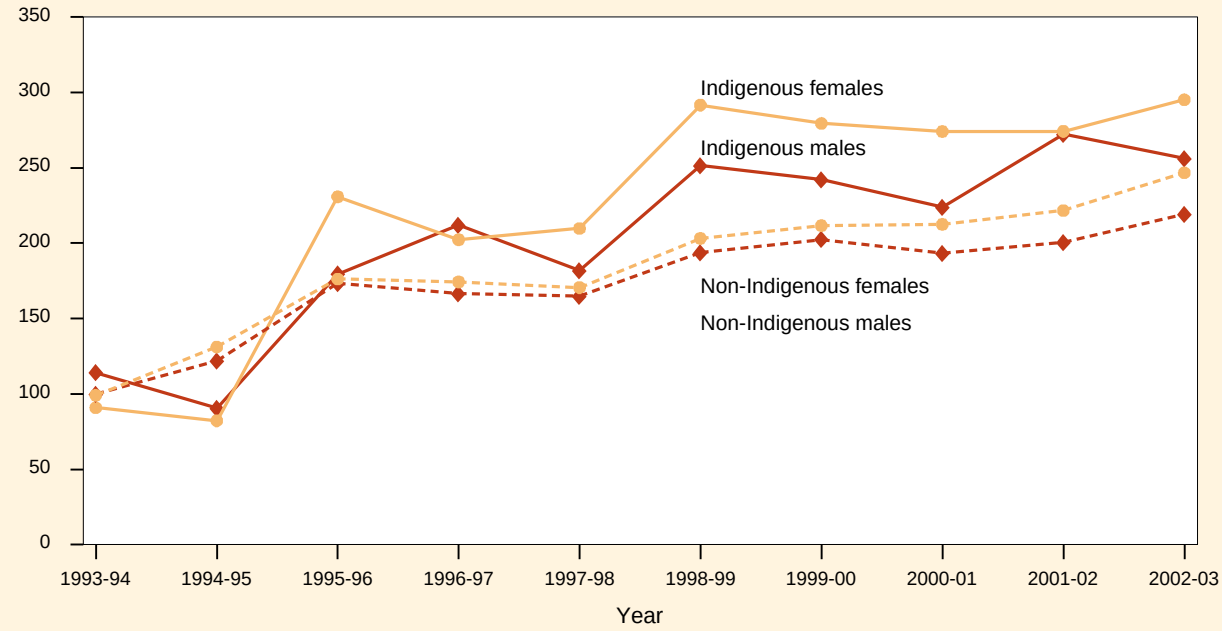
- A healthy physical environment is defined as housing and health-related essential infrastructure, including the supply of electricity, safe drinking water, and sewage removal. If these elements, collectively termed 'health hardware', are not functioning well, a variety of infectious and parasitic diseases, including skin infections, can result (AIHW, 2003). The skin infections in this analysis include staphylococcal infections, impetigo, cellulitis, absesses, and lymphadenitis associated with infections.
- In NSW between 1993–94 to 2002–03, hospitalisation rates for skin infections among Indigenous people were 2–3 times higher than the rates for non-Indigenous people. In 2002–03 in NSW, the rate for Indigenous people was 638 per 100,000 population compared with 237 per 100,000 for non-Indigenous people. Part of the increase observed from 1997–98 may be due to improved reporting of Aboriginality in the hospital data.
- The Housing for Health program aims to assess, repair or replace health hardware so that houses are safe and the occupants have the ability to carry out healthy living practices. It aims to improve the health status of Aboriginal people, particularly children. Housing for Health has been delivered to Aboriginal communities in NSW through the Aboriginal Communities Development Program. Between 1998 and 2003, 20 community projects have been conducted (NSW Department of Health, 2004).

For more information:

Australian Institute of Health and Welfare. *Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples 2003.* AIHW Catalogue no. IHW-11. Canberra: AIHW, 2003. Available at www.aihw.gov.au/publications/ihw/hwaatsip03/hwaatsip03.pdf.

NSW Department of Health. *Aboriginal Communities Development Program: Housing for Health.* Sydney: NSW Department of Health, 2004. Available at www.health.nsw.gov.au/public-health/ehb/aborig/hfh.html.

Gastrointestinal infection hospital separations by Indigenous status and sex, NSW 1993-94 to 2002-03



			93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	Indigenous	Persons	153	137	388	377	366	459	447	460	483	529
	Non-Indigenous	Persons	6164	7883	10965	10725	10554	12487	13024	12752	13213	14534
Rate per 100,000 population	Indigenous	Persons	99.1	86.2	213.3	207.7	198.6	277.9	264.0	256.5	275.3	282.0
	Non-Indigenous	Persons	99.9	126.8	175.2	170.7	168.1	199.1	207.4	203.3	211.6	233.2

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Records where Indigenous status was not stated were classified as non-Indigenous. Data table for the graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- A healthy physical environment is defined as housing and health-related essential infrastructure, including the supply of electricity, safe drinking water, and sewage removal. If these elements, collectively termed 'health hardware', are not functioning well, a variety of infectious and parasitic diseases, including gastrointestinal illnesses, can result (AIHW, 2003). The gastrointestinal illnesses in this analysis include salmonella infections, shigellosis and other bacterial, viral and parasitic gastrointestinal illnesses.
- In NSW between 1993–94 to 2002–03, hospitalisation rates for gastrointestinal illnesses among Indigenous people have been only slightly higher than the rates for non-Indigenous people. In 2002–03 in NSW, the rate for Indigenous people was 282 per 100,000 population compared with 233 per 100,000 for non-Indigenous people (20% higher). Part of the increase observed from 1997–98 may be due to improved reporting of Aboriginality in the hospital data.
- The Housing for Health program aims to assess, repair or replace health hardware so that houses are safe and the occupants have the ability to carry out healthy living practices. It aims to improve the health status of Aboriginal people, particularly children. Housing for Health has been delivered to Aboriginal communities in NSW through the Aboriginal Communities Development Program. Between 1998 and 2003, 20 community projects have been conducted (NSW Health, 2004).

For more information:

Australian Institute of Health and Welfare. *Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples 2003.* AIHW Catalogue no. IHW-11. Canberra: AIHW, 2003. Available at www.aihw.gov.au/publications/ihw/hwaatsip03/hwaatsip03.pdf.

NSW Department of Health. *Aboriginal Communities Development Program: Housing for Health.* Sydney: NSW Department of Health, 2004. Available at www.health.nsw.gov.au/public-health/ehb/aborig/hfh.html.

Chapter 3.2

Country of birth

- Approaching one in 3 NSW residents was born overseas and around one in 5 speaks a language other than English at home. Resident populations born in South Africa, India, China, Korea , New Zealand, and Fiji all grew by 20% or more between 1996 and 2001, as did populations speaking Hindi, Indonesian, Korean, Chinese, Serbian, and Vietnamese languages at home.
- In 2001, people speaking Vietnamese, Korean and Turkish languages at home were more than twice as likely as English speakers to have a household income of less than $400 per week.
- Overseas-born people generally have good health, but patterns of some health conditions and health risk factors vary with country of birth.
- Compared with the Australian-born, people born in some overseas countries:
  - are more likely to have premature babies (mothers born in Fiji);
  - are less likely to have their first antenatal vist before 20 weeks gestation (mothers born in Lebanon, Korea, Fiji, New Zealand, Indonesia, the Philippines, China, and Vietnam);
  - have high rates of hospitalisation for diabetes or its complications (males and females born in Lebanon, Fiji, Italy, India, and Greece; females born in the Philippines; males born in South Africa);
  - have high rates of hospitalisation for coronary heart disease (Lebanon, Fiji, and India) and cardiac revascularisation procedures (Lebanon, Fiji, India, and Greece);
  - have high rates of lung cancer (males and females born in the United Kingdom; females born in New Zealand);
  - have high rates of tuberculosis (Vietnam, the Philippines, India, Indonesia, China, Hong Kong, Korea, Fiji, Malaysia, and the Former Yugoslavia).
- Compared with people born in many overseas countries, people born in Australia:
  - have higher age-adjusted death rates from all causes combined;
  - have higher rates of lung cancer and colorectal cancer;
  - have higher rates of hospitalisation for injuries.

In this chapter

Introduction

Approaching one in 3 NSW residents was born overseas and around one in 5 speaks a language other than English at home. The composition and age structure of the overseas-born population reflects patterns of migration. After World War II, there was a large migration of Europeans to NSW, initially from Eastern Europe, then from the United Kingdom and Northern Europe, Greece, Italy, and the Former Yugoslavia. These were followed by people from the Middle East, mainly from Turkey, Lebanon, and Egypt. Most recently, migrants have come in large numbers from Asian countries, particularly China, Vietnam, and the Philippines. The net overseas migration (the difference between permanent and long-term arrivals and permanent and long-term departures) into Australia in 2002–03 was 125,300, of which NSW received the largest share (40%). Overseas migration contributed 85% of the total population growth in NSW in that year (ABS, 2004).

In general, overseas-born residents have better health than Australian-born residents. This reflects the 'healthy migrant effect', whereby people in good health are more likely to meet eligibility criteria, and to be willing and economically able to migrate. However, certain diseases and health risk factors are more prevalent among some country-of-birth groups. This reflects diverse social, economic, environmental, cultural, and genetic influences.

This chapter examines health differentials by country of birth. The Refugee health chapter presents information on specific health issues for people of refugee background.

More information on the methods used for analysing data is given in the Methods section.

For more information:

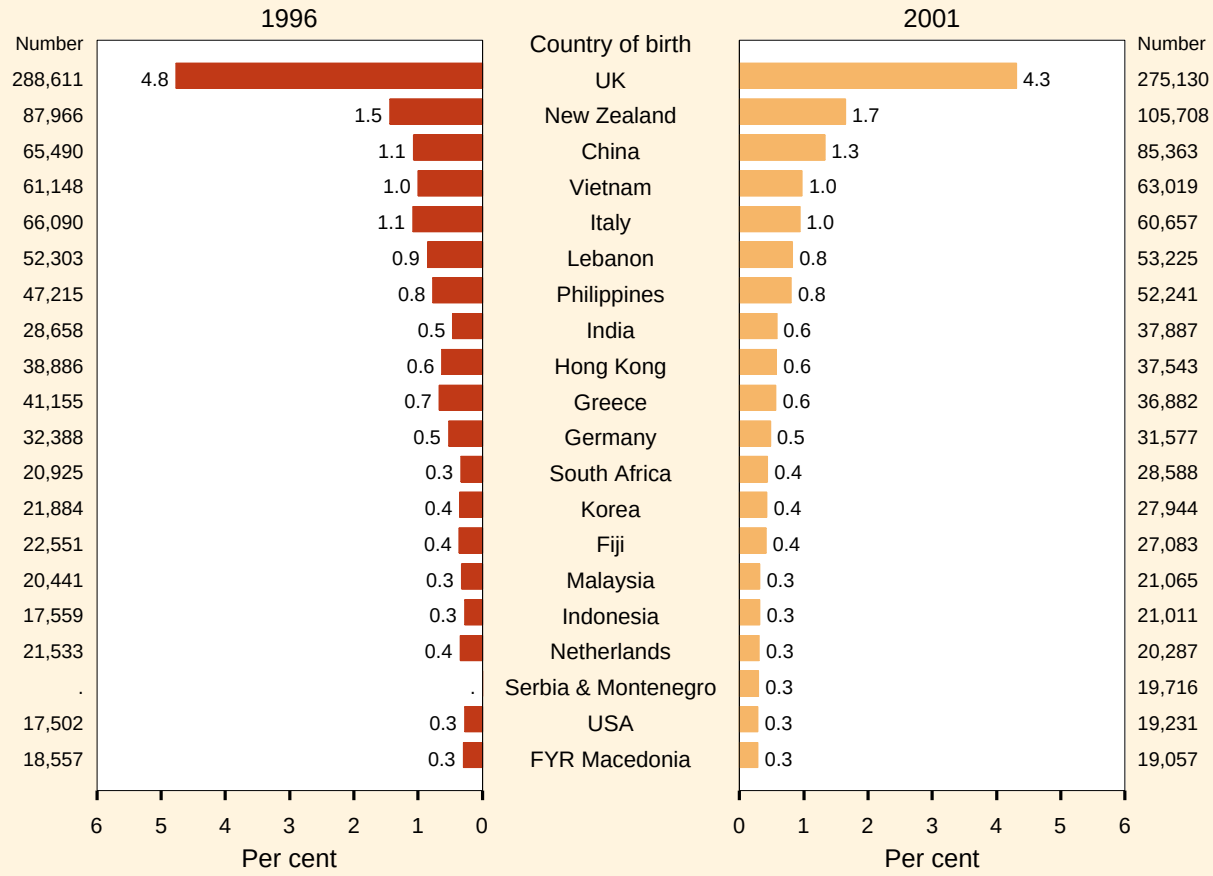
Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004. Available at: www.aihw.gov.au/publications/index.cfm/title/10014.

Strong K, Trickett P, Bhatia K. The health of overseas-born Australians 1998. *Aust Health Rev* 1998; 21: 124–133.

Australian Bureau of Statistics. *Migration, Australia.* ABS Catalogue no. 3412.0. Canberra: ABS, 2004.

Australian Institute of Health and Welfare, Singh M and de Looper M. *Australian health inequalities: 1 birthplace.* Bulletin no. 2. AIHW Catalogue no. AUS 27. Canberra: AIHW, 2002.

Country of birth, persons born outside Australia, NSW 1996 and 2001



Note: 72.8% and 69.9% respectively, of NSW residents in 1996 and 2001, were Australian-born. Comparable data for Serbia and Montenegro were not available from the ABS 1996 Census of Population and Housing.

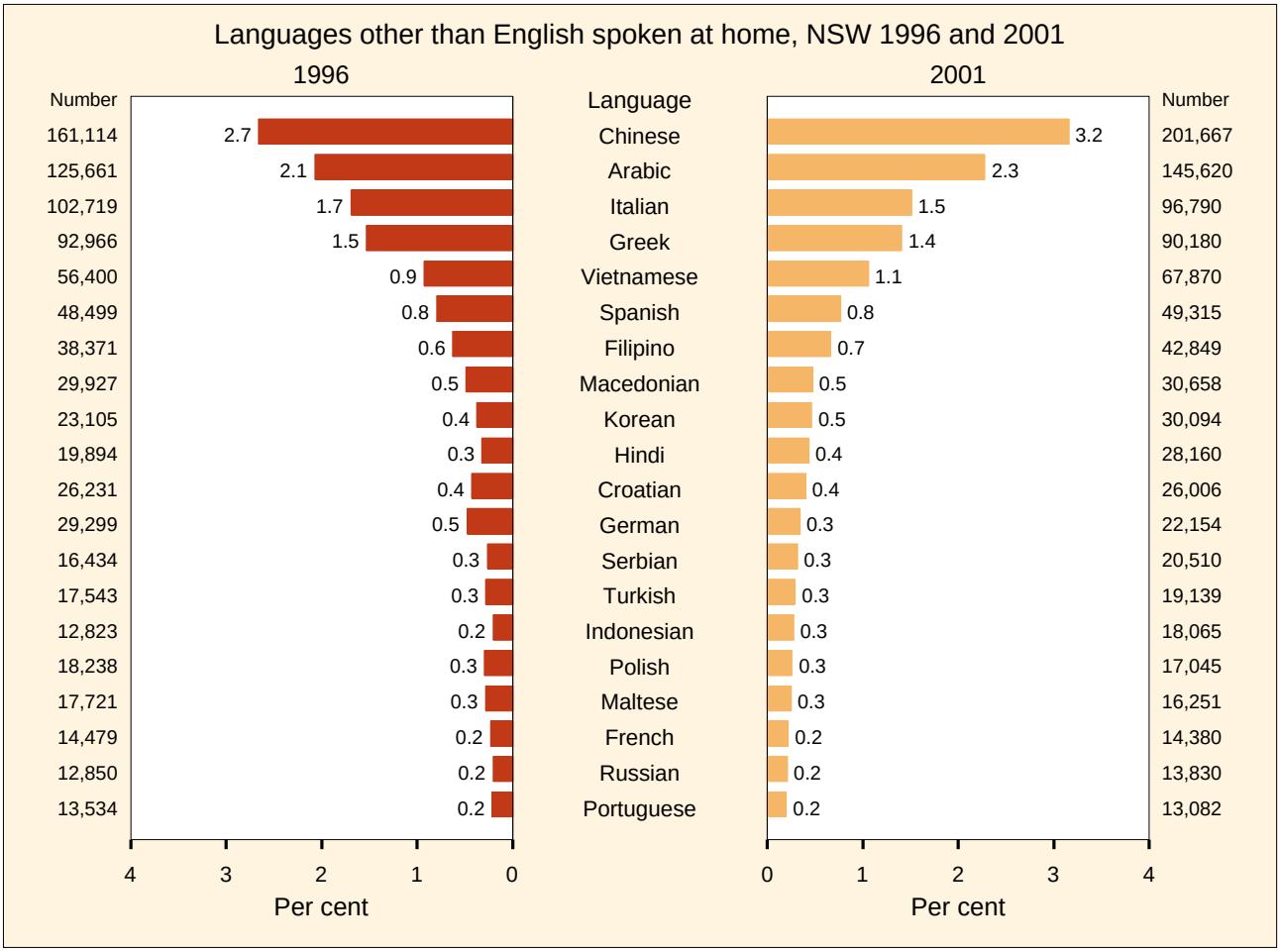
Source: ABS 1996 and 2001 Census Basic Community Profiles (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- The percentage of the NSW population born overseas rose from 27.2% in 1996 to 30.1% in 2001.
- In 2001, the largest number of overseas-born residents came from the United Kingdom followed by New Zealand, China, Vietnam, Italy, Lebanon, and the Philippines.
- The highest rates of growth between 1996 and 2001 occurred among resident populations born in South Africa (37%), India (32%), China (30%), Korea (28%), New Zealand (20%), Fiji (20%), and Indonesia (20%). In terms of absolute numbers, the largest population growth was seen in the Chinese-born (increased by 19,873 persons) followed by people born in New Zealand (17,742), India (9,229), South Africa (7,663), and Korea (6,060).
- Some overseas-born populations declined between 1996 and 2001, notably those born in Greece (10%), Italy (8.2%), the Netherlands (5.8%), and the United Kingdom (4.7%). This indicates that losses due to death and out-migration exceeded the number of new arrivals from these countries. Many migrants from these countries arrived in Australia as part of post-World War II migration flows. These country-of-birth groups, with the exception of the United Kingdom, have not been greatly augmented by ongoing migration since that time, so tend to have high proportions of older people. In 2000, around one-quarter of Australian residents born in the United Kingdom, Greece, Germany and the Netherlands, and almost 40% of the Italian-born, were aged 65 years and over (ABS, 2002).

For more information:

Australian Bureau of Statistics. *Australian social trends 2002*. Canberra: ABS, 2002.

Australian Bureau of Statistics website at www.abs.gov.au.



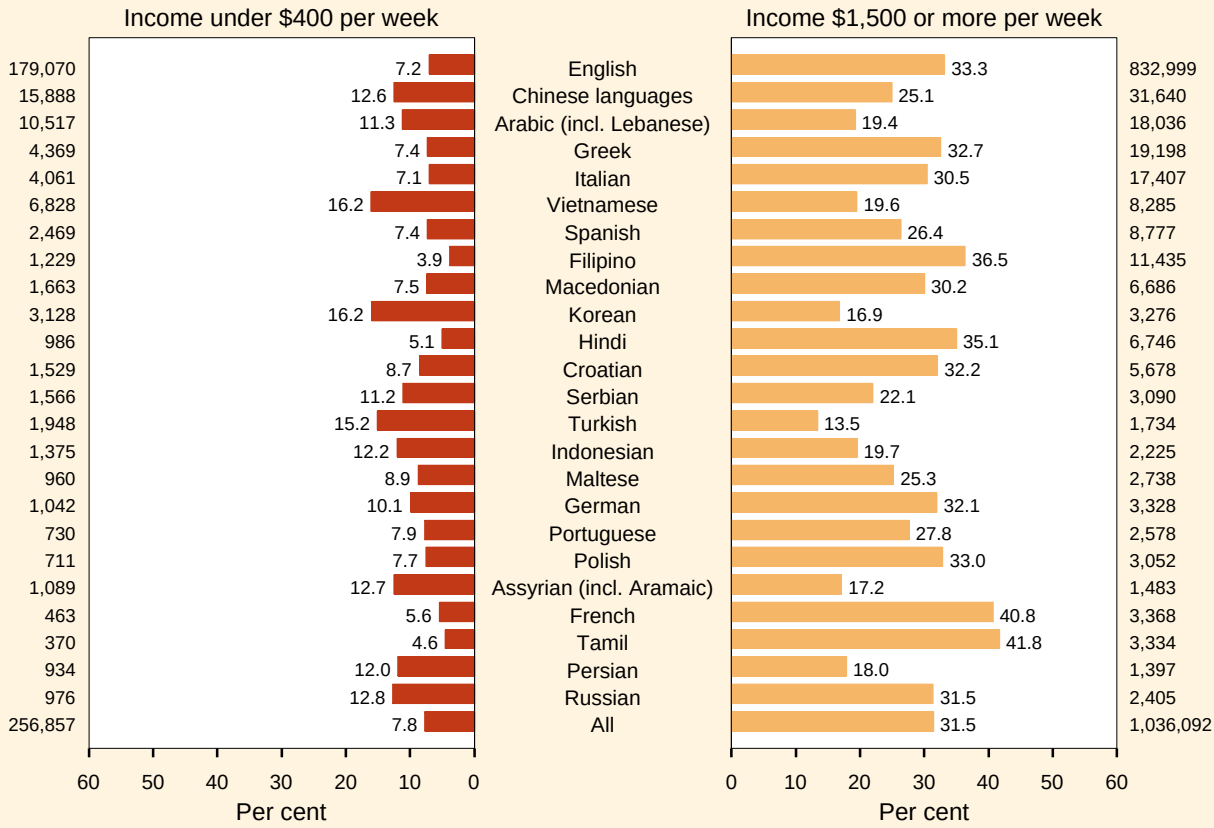
Note: 78.2% and 75.0% respectively, of NSW residents in 1996 and 2001, spoke only English at home.

Source: ABS 1996 and 2001 Census Basic Community Profiles (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In 2001, 25.0% of the NSW population reported that they spoke a language other than English at home, compared with 21.8% in 1996.
- Changes in the leading languages spoken at home between 1996 and 2001 reflect shifting migration patterns, as well as birth rates among migrant groups. The highest rates of growth occurred among people speaking Hindi (42%), Indonesian (41%), Korean (30%), Chinese (25%), Serbian (25%), and Vietnamese (20%) languages at home. In terms of absolute numbers, the largest population growth was seen in Chinese-speakers (increased by 40,553 persons), followed by people speaking Arabic (19,959), Vietnamese (11,470), Hindi (8,266), and Korean (6,989) languages.
- The German-speaking population declined by almost one-quarter (24%), with smaller declines observed in populations speaking Maltese (8.3%), Polish (6.5%), and Italian (5.8%) languages at home. These declines reflect the ageing of language groups that consist largely of migrants who arrived in Australia as part of post-World War II migration flows.

For more information:
Australian Bureau of Statistics website at www.abs.gov.au.

Household income group by language spoken at home, persons aged 15 to 64 years, NSW 2001



Note: These figures represent self-reported income, including earnings and government payments.

Source: ABS 2001 Census Basic Community Profiles (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

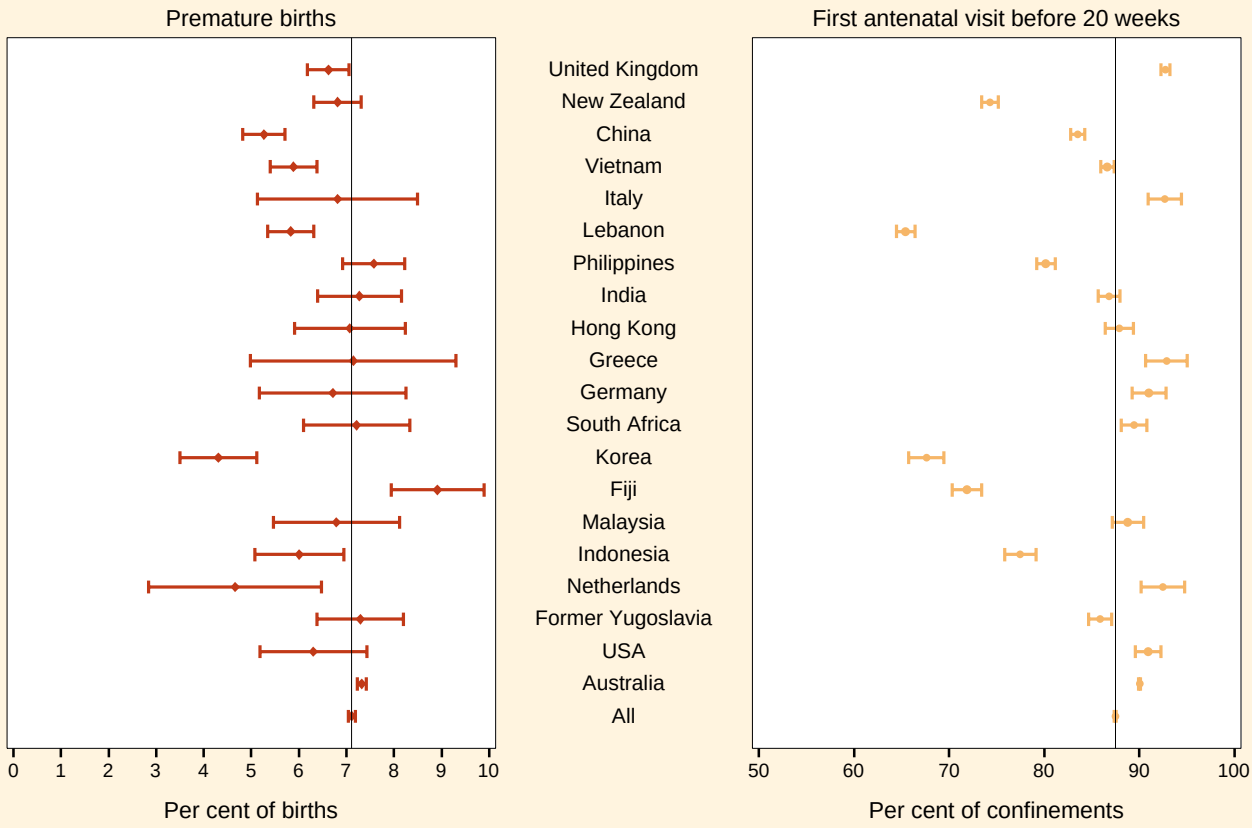
- Income is one of the main determinants of poverty, which is closely linked to poor health. Low incomes restrict the ability of households to access goods and services that have health benefits such as health care, healthy food, good quality housing, and opportunities to be physically active. Higher incomes may also provide psychological benefits such as a greater sense of control (ABS, 2004).
- In NSW in 2001, there was substantial variation in household income according to language spoken at home. People speaking Vietnamese (16%), Korean (16%), and Turkish (15%) languages at home were more than twice as likely as English-speakers (7.2%) to have a household income of less than $400 per week. More than one in 10 people speaking Arabic (including Lebanese), Serbian, Indonesian, German, Assyrian (including Aramaic), Chinese, Persian, and Russian languages also fell into this household income bracket.
- At the other end of the income spectrum, people speaking Tamil (42%), French (41%), Filipino (37%), and Hindi (35%) languages at home were more likely than English-speakers (33%) to have a household income of $1,500 or more per week.

For more information:

Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004.

Australian Bureau of Statistics website at www.abs.gov.au.

Premature births and first antenatal care visit before 20 weeks of gestation by maternal country of birth, NSW 1998 - 2002



Note: Premature birth: less than 37 weeks gestation. Rates of prematurity include stillbirths and livebirths of at least 20 weeks gestation or 400 grams birthweight. Lower and upper limits of the 95% confidence interval are shown.

Source: NSW Midwives Data Collection (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- A premature or preterm birth is a birth occurring before 37 weeks gestation. Preterm babies are more likely to die than term babies, and to suffer complications such as respiratory conditions, infection, and intra-cerebral haemorrhage.
- Over the 5-year period 1998–2002, 7.1% of all NSW babies were born before 37 weeks gestation. Rates of prematurity were lower than the state average for most overseas-born groups. Babies of mothers born in Fiji (8.9%) were more likely than the State average to be born prematurely.
- Early antenatal care allows the early detection and management of problems during pregnancy, and is associated with better outcomes for both mothers and babies.
- Over the 5-year period 1998–2002, 87.5% of all NSW mothers had their first antenatal visit before 20 weeks gestation. This figure varied according to mothers' country of birth, with mothers born in Lebanon (65%), Korea (68%), Fiji (72%), New Zealand (74%), Indonesia (78%), the Philippines (80%), China (84%), and Vietnam (87%) being less likely than the State average to have an antenatal visit in the first half of pregnancy.

For more information:

Centre for Epidemiology and Research. New South Wales Mothers and Babies 2002. *N S W Public Health Bull* 2003; 14(S-3).

Nassar N, Sullivan EA. *Australia's Mothers and Babies 1999.* AIHW National Perinatal Unit (Perinatal Statistics Series no. 11). Sydney: AIHW NPSU, 2001.

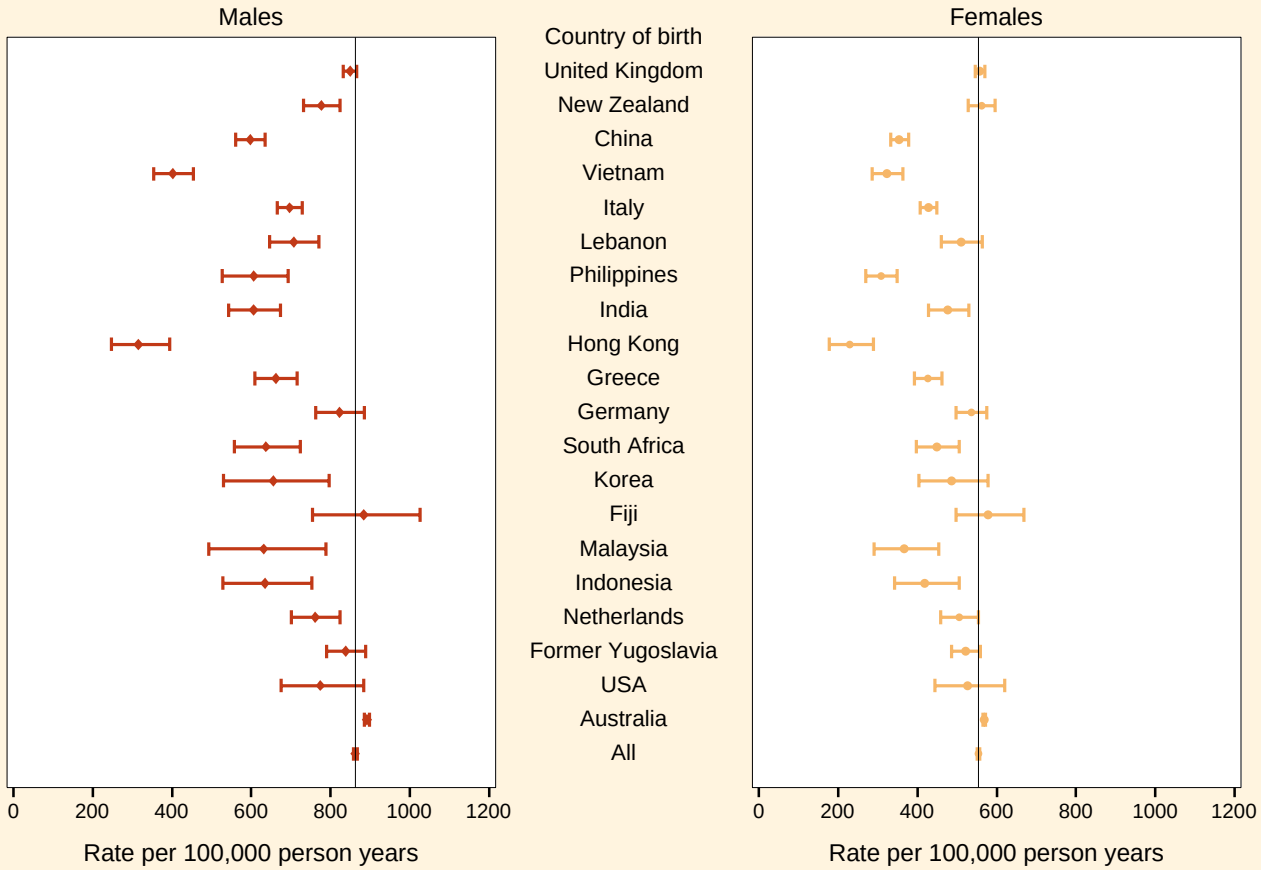
Premature births and first antenatal care visit before 20 weeks of gestation by maternal country of birth, NSW 1998–2002

Maternal country of birth	Total births	Premature births	Per cent	LL 95% CI	UL 95% CI	Total confinements	First antenatal visit before 20 weeks	Per cent	LL 95% CI	UL 95% CI
United Kingdom	12443	824	6.6	6.2	7.1	12216	11329	92.7	92.3	93.2
New Zealand	9685	660	6.8	6.3	7.3	9537	7085	74.3	73.4	75.2
China	9780	515	5.3	4.8	5.7	9683	8088	83.5	82.8	84.3
Vietnam	8836	520	5.9	5.4	6.4	8778	7605	86.6	85.9	87.3
Italy	866	59	6.8	5.1	8.5	847	785	92.7	90.9	94.4
Lebanon	8974	523	5.8	5.3	6.3	8821	5772	65.4	64.4	66.4
Philippines	6376	483	7.6	6.9	8.2	6317	5065	80.2	79.2	81.2
India	3313	241	7.3	6.4	8.2	3270	2839	86.8	85.7	88.0
Hong Kong	1852	131	7.1	5.9	8.2	1835	1613	87.9	86.4	89.4
Greece	546	39	7.1	5.0	9.3	532	494	92.9	90.7	95.0
Germany	1013	68	6.7	5.2	8.3	990	901	91.0	89.2	92.8
South Africa	2066	149	7.2	6.1	8.3	2032	1817	89.4	88.1	90.8
Korea	2392	103	4.3	3.5	5.1	2376	1606	67.6	65.7	69.5
Fiji	3276	292	8.9	7.9	9.9	3234	2325	71.9	70.3	73.4
Malaysia	1385	94	6.8	5.5	8.1	1374	1220	88.8	87.1	90.5
Indonesia	2463	148	6.0	5.1	6.9	2432	1884	77.5	75.8	79.1
Netherlands	515	24	4.7	2.8	6.5	504	466	92.5	90.2	94.8
Former Yugoslavia	3153	230	7.3	6.4	8.2	3080	2645	85.9	84.6	87.1
USA	1792	113	6.3	5.2	7.4	1754	1595	90.9	89.6	92.3
Australia	313479	22949	7.3	7.2	7.4	308254	277499	90.0	89.9	90.1
All	430304	30614	7.1	7.0	7.2	423424	370398	87.5	87.4	87.6

Note: Premature birth: less than 37 weeks gestation. Rates of prematurity include stillbirths and livebirths of at least 20 weeks gestation or 400 grams birthweight. LL/UL 95%CI = Lower and upper limits of the 95% confidence interval for the point estimate.

Source: NSW Midwives Data Collection (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

Deaths from all causes by country of birth and sex, NSW 1998 to 2002 combined



Note: Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Lower and upper limits of the 95% confidence interval are shown.

Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In the 5-year period 1998–2002, age-adjusted death rates among NSW residents born in most overseas countries were lower than in the Australian-born. Death rates among males born in Hong Kong (315 per 100,000) and Vietnam (402 per 100,000) were less than half the rate in Australian-born males (892 per 100,000). Females born in Hong Kong (229 per 100,000) and Vietnam (323 per 100,000) also had substantially lower death rates than Australian-born females (568 per 100,000). In general, NSW residents born in countries of South East Asia had lower death rates than residents of other backgrounds, while death rates among people born in the United Kingdom were close to those in the Australian-born.
- Death rates from some causes are higher among certain groups of overseas-born Australians. Females born in the United Kingdom and Ireland have higher death rate from cancers, specifically breast cancer, while both males and females born in these countries have higher death rates from lung cancer (AIHW, 2002).
- Low death rates among overseas-born residents reflect the 'healthy migrant effect' whereby people in good health are more likely to meet eligibility criteria, and to be willing and economically able to migrate. Migrants from many countries have a lower prevalence than the Australian-born of health risk factors such as overweight and obesity and alcohol consumption at risk levels. The relative health advantage that migrants have over Australian-born people tends to decrease with length of residence in Australia (AIHW, 2004).

For more information:

Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004.

Australian Institute of Health and Welfare: Singh M and de Looper M. *Australian health inequalities: 1 birthplace.* Bulletin no. 2. AIHW Catalogue no. AUS 27. Canberra: AIHW, 2002.

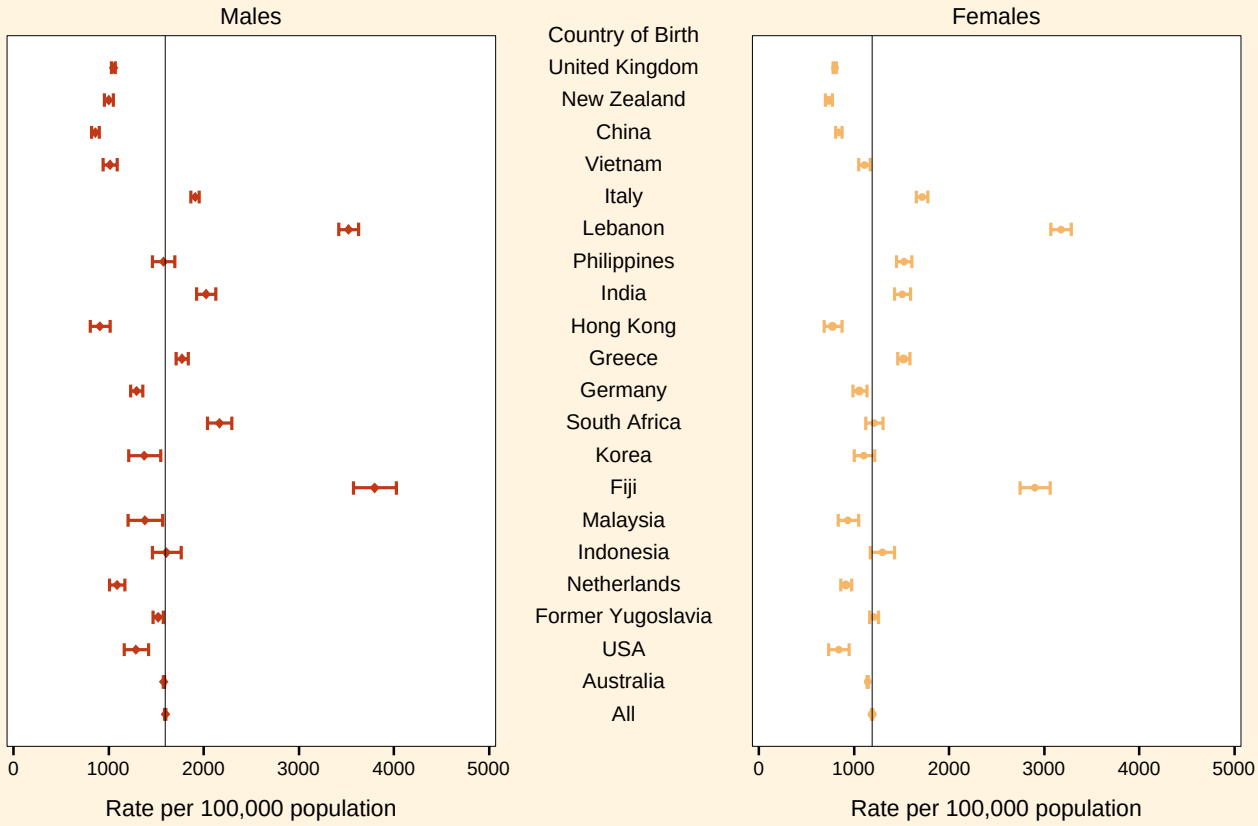
Deaths from all causes by country of birth and sex, NSW 1998 to 2002 combined

Country of Birth		Deaths	Rate per 100,000 population	LL 95% CI	UL 95% CI
United Kingdom	Males	10676	849.1	831.9	866.5
	Females	10016	557.6	545.2	570.2
	Persons	20692	692.3	682.0	702.7
New Zealand	Males	1316	776.4	731.0	823.7
	Females	1189	561.5	528.7	595.7
	Persons	2505	662.3	635.3	690.2
China	Males	1161	596.9	561.3	634.0
	Females	973	354.3	332.2	377.5
	Persons	2133	455.0	435.6	475.0
Vietnam	Males	404	401.6	353.0	453.9
	Females	331	322.7	285.4	363.2
	Persons	735	362.4	331.7	394.8
Italy	Males	2772	696.6	665.0	729.1
	Females	1732	427.7	406.9	449.2
	Persons	4504	563.4	544.3	583.0
Lebanon	Males	767	707.2	646.7	770.9
	Females	478	510.6	461.0	563.7
	Persons	1246	612.4	572.9	653.5
Philippines	Males	277	606.0	526.9	692.6
	Females	304	307.6	269.9	348.7
	Persons	581	400.9	364.9	439.1
India	Males	385	605.6	542.3	674.0
	Females	351	476.9	427.5	530.3
	Persons	736	537.2	497.6	579.0
Hong Kong	Males	112	314.9	246.7	393.3
	Females	95	228.8	177.0	289.2
	Persons	207	269.1	226.6	316.1
Greece	Males	1176	661.8	609.6	716.2
	Females	773	425.6	391.5	461.6
	Persons	1949	546.0	514.6	578.3
Germany	Males	1008	822.6	762.8	885.3
	Females	956	535.3	497.9	574.5
	Persons	1964	657.5	624.7	691.4
South Africa	Males	269	636.8	557.4	723.8
	Females	283	448.8	397.3	505.0
	Persons	552	522.3	478.4	569.1
Korea	Males	167	655.5	529.2	797.1
	Females	149	485.8	404.0	578.2
	Persons	316	558.4	488.7	634.2
Fiji	Males	276	883.6	753.7	1026
	Females	226	578.7	496.5	669.3
	Persons	502	703.4	632.3	779.4
Malaysia	Males	145	631.2	492.1	788.5
	Females	113	366.3	290.0	454.0
	Persons	258	467.7	398.2	543.9
Indonesia	Males	173	634.3	528.4	753.0
	Females	125	418.2	342.4	504.8
	Persons	298	511.8	449.1	580.1
Netherlands	Males	896	761.0	700.6	824.3
	Females	646	504.7	458.5	553.7
	Persons	1542	628.5	591.2	667.3
Former Yugoslavia	Males	1707	838.0	789.2	888.5
	Females	954	521.6	486.0	559.0
	Persons	2661	677.8	648.2	708.2
USA	Males	267	774.0	674.7	882.9
	Females	159	527.0	444.2	620.2
	Persons	426	658.9	594.6	727.9
Australia	Males	83645	891.8	885.6	898.0
	Females	81303	568.4	564.5	572.4
	Persons	164948	705.8	702.4	709.2
All	Males	117553	862.1	857.0	867.1
	Females	108345	553.4	550.1	556.8
	Persons	225897	688.1	685.2	690.9

Note: Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. LL/UL 95%CI = Lower and upper limits of the 95% confidence interval of the point estimate.

Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

Diabetes or diabetes complications hospital separations by country of birth, 1998-99 to 2002-03, NSW



Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Lower and upper limits of the 95% confidence interval are shown.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Non-insulin-dependent diabetes mellitus is the predominant form of diabetes in Australia. Complications of diabetes include ketoacidosis, retinopathy, and circulatory disorders. These complications are preventable to some degree, through good management of diabetes.
- In the 5-year period 1998–99 to 2002–03, hospitalisation rates for diabetes or its complications in NSW varied markedly according to country of birth. Hospitalisation rates for both males and females born in Lebanon and Fiji were more than double the rates in the Australian-born. Males and females born in Italy, India, and Greece; females born in the Philippines; and males born in South Africa, also had higher hospitalisation rates than their Australian-born counterparts. Relatively low hospitalisation rates were recorded for people of both sexes born in the United Kingdom, New Zealand, China, Hong Kong, the Netherlands, and the United States of America.
- Differences in hospitalisation rates among country-of-birth groups reflect variations in the incidence and prevalence of diabetes, in the severity of diabetes, and in how well diabetes is managed. The incidence and prevalence of diabetes is highest among Australians born in the Middle East and North Africa. However, patterns of incidence, prevalence, hositalisation, and deaths from diabetes do not vary consistently with country of birth (AIHW, 2003).

For more information:

Australian Institute of Health and Welfare: Holdenson Z et al. *A picture of diabetes in overseas-born Australians.* Bulletin no. 9. AIHW Catalogue no. AUS 38. Canberra: AIHW, 2003.

Australian Institute of Health and Welfare. *Diabetes: Australian Facts 2002.* AIHW Catalogue no. CVD 20 Diabetes Series no. 3. Canberra: AIHW, 2002.

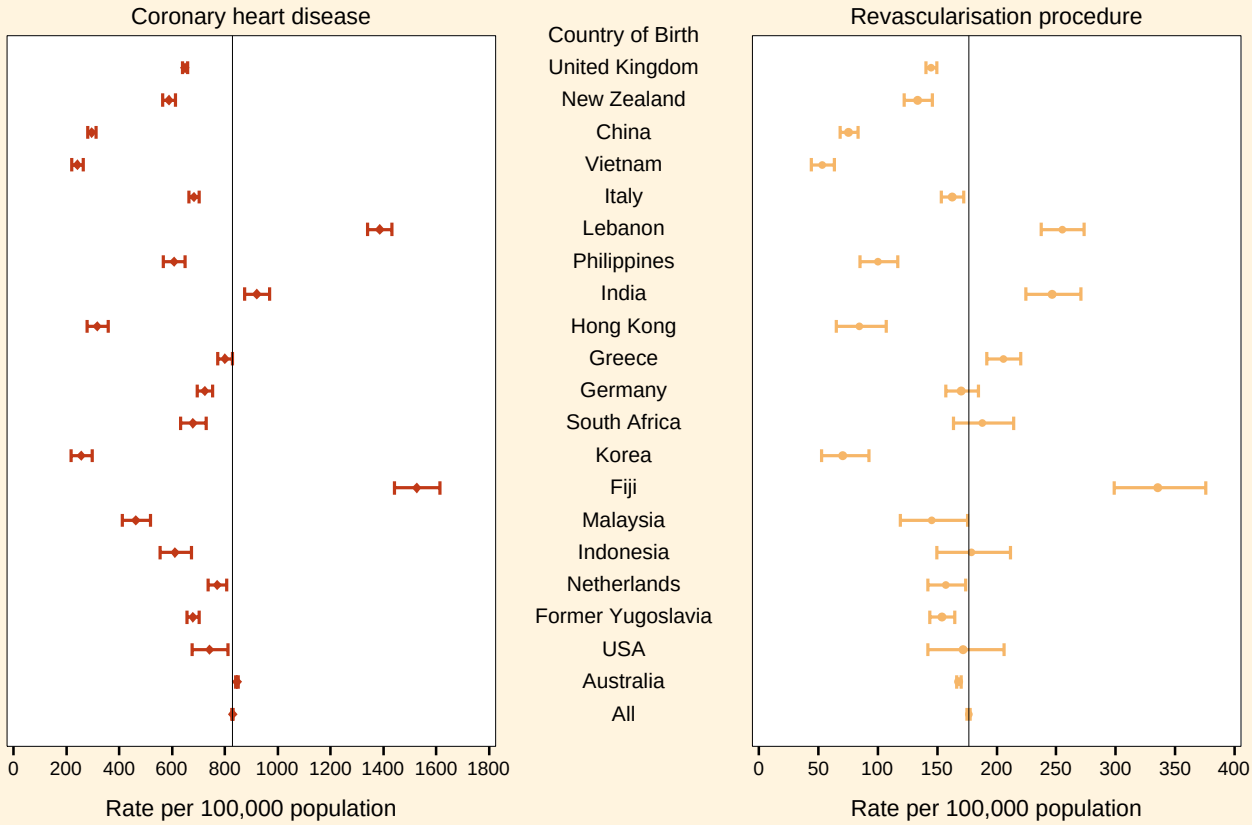
Diabetes or diabetes complications, hospital separations, by country of birth, 1998–99 to 2002–03, NSW

Country of birth		Hospitalisations	Rate per 100,000 population	LL 95% CI	UL 95% CI
United Kingdom	Males	13902	1050.2	1031.5	1069.2
	Females	11183	796.3	780.0	812.9
	Persons	25084	920.9	908.5	933.3
New Zealand	Males	2040	1000.1	953.0	1048.7
	Females	1646	735.6	698.4	774.3
	Persons	3685	865.4	835.7	895.8
China	Males	1943	859.8	820.4	900.5
	Females	2356	841.2	807.1	876.4
	Persons	4299	841.2	815.8	867.1
Vietnam	Males	985	1013.2	940.6	1089.3
	Females	1358	1107.0	1045.6	1170.9
	Persons	2343	1054.9	1008.7	1102.4
Italy	Males	9259	1909.7	1866.7	1953.4
	Females	6963	1716.5	1657.1	1777.0
	Persons	16222	1820.9	1784.7	1857.4
Lebanon	Males	5657	3523.3	3419.3	3629.4
	Females	4119	3176.1	3070.5	3284.1
	Persons	9776	3376.6	3302.1	3452.2
Philippines	Males	924	1575.9	1462.7	1694.7
	Females	1774	1524.4	1445.6	1606.1
	Persons	2698	1539.0	1474.3	1605.5
India	Males	1771	2022.4	1924.0	2124.2
	Females	1303	1506.8	1424.9	1592.0
	Persons	3074	1773.1	1709.0	1838.8
Hong Kong	Males	436	905.4	804.9	1013.3
	Females	343	774.2	683.7	872.3
	Persons	779	834.7	767.5	905.5
Greece	Males	4482	1771.8	1710.0	1835.0
	Females	3264	1523.3	1461.3	1586.8
	Persons	7746	1651.5	1607.9	1695.9
Germany	Males	1993	1292.6	1230.3	1356.9
	Females	1900	1058.8	985.2	1135.0
	Persons	3893	1162.3	1116.3	1209.5
South Africa	Males	1220	2164.7	2038.1	2296.8
	Females	760	1211.4	1124.8	1302.6
	Persons	1981	1682.3	1606.5	1760.6
Korea	Males	451	1373.7	1213.5	1545.5
	Females	498	1103.7	999.6	1215.0
	Persons	949	1186.9	1100.5	1277.6
Fiji	Males	1719	3795.9	3576.3	4023.5
	Females	1624	2900.4	2746.5	3059.9
	Persons	3343	3255.9	3131.0	3384.0
Malaysia	Males	444	1381.6	1207.0	1569.1
	Females	370	935.5	830.3	1049.2
	Persons	815	1116.0	1024.5	1212.4
Indonesia	Males	540	1605.3	1458.9	1761.3
	Females	438	1295.4	1171.8	1428.2
	Persons	978	1442.5	1347.5	1542.1
Netherlands	Males	1436	1087.0	1007.7	1169.3
	Females	1180	916.2	857.6	977.3
	Persons	2616	995.2	945.2	1046.6
Former Yugoslavia	Males	4289	1520.8	1465.9	1577.0
	Females	3039	1207.3	1161.1	1254.9
	Persons	7329	1358.9	1323.7	1394.6
USA	Males	496	1285.9	1163.7	1416.5
	Females	298	837.5	735.1	949.0
	Persons	794	1058.5	980.7	1140.5
Australia	Males	161412	1579.5	1571.7	1587.3
	Females	144307	1143.6	1137.7	1149.6
	Persons	305719	1333.8	1329.1	1338.5
All	Males	244144	1595.9	1589.5	1602.3
	Females	213031	1191.5	1186.5	1196.6
	Persons	457175	1374.4	1370.4	1378.4

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. LL/UL 95%CI = Lower and upper limits of the 95% confidence interval for the point estimate.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

Coronary heart disease and revascularisation procedure hospital separations by country of birth, NSW 1998-99 to 2002-03



Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2001–02 and 2002–03 include an estimate of the small number of interstate hospitalisations, data for which were unavailable at the time of production. Lower and upper limits of the 95% confidence interval are shown.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Coronary heart disease is caused by blockages in the arteries that supply blood to the heart muscle. It is responsible for almost one-quarter of years of life lost due to premature death in NSW. Revascularistion procedures (coronary artery bypass graft, and angioplasty with and without stenting) are used to restore adequate blood flow to blocked coronary arteries.
- Hospitalisation rates for coronary heart disease in NSW in the 5-year period 1998–99 to 2002–03 varied markedly according to country-of-birth. Hospitalisation rates for people born in Lebanon, Fiji, and India were much higher than for the Australian-born. People born in all other major countries of birth recorded lower hospitalisation rates for coronary heart disease than the Australian-born, with particularly low rates recorded for people born in the countries of South East Asia.
- Variations in the incidence of coronary heart disease by country-of-birth reflect differences in levels of risk factors (such as smoking, physical activity, obesity, and high blood pressure), environmental factors and genetic predisposition.
- Hospitalisation rates for revascularisation procedures also varied with country-of-birth. Again, the highest rates were recorded for people born in Fiji, Lebanon and India. The Greek-born also had a higher rate of these procedures than the Australian-born. The ratio of total coronary heart disease separations to separations for revascularisation procedures ranged from 3.2 and 3.4 for people born in Malaysia and Indonesia, respectively, to 5.0 for people born in Australia, 5.4 for people born in Lebanon and 6.1 for people born in the Philippines. Lower values for this ratio may reflect greater severity of disease among people who are hospitalised, or possibly greater access to cardiac surgery services.

For more information:

National Heart Foundation website at www.heartfoundation.com.au.

Australian Institute of Health and Welfare. *Heart, stroke and vascular diseases: Australian facts 2004.* AIHW Catalogue no. CVD 27. Cardiovascular Disease Series no. 22. Canberra: AIHW and National Heart Foundation of Australia, 2004.

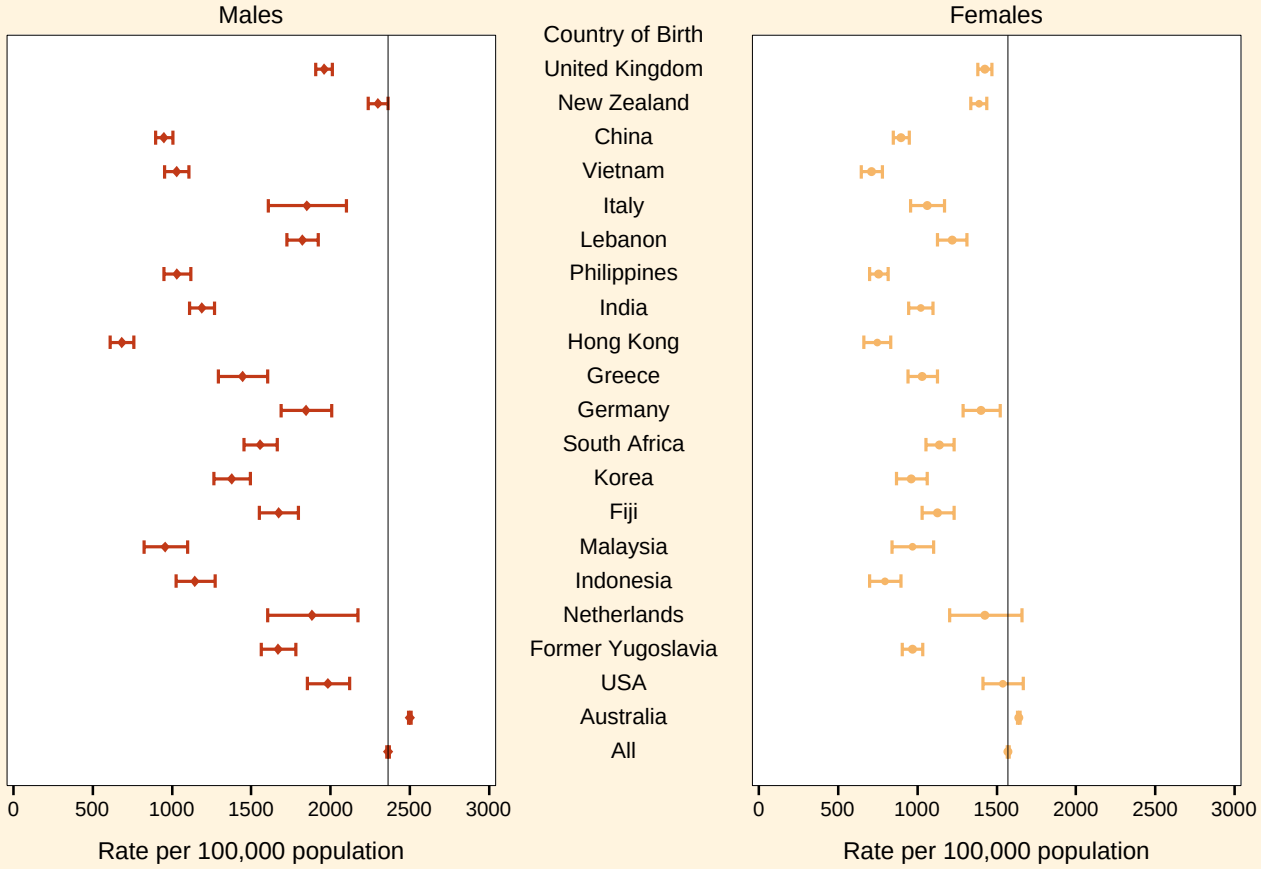
Coronary heart disease and revascularisation procedure hospital separations by country of birth, NSW 1998–99 to 2002–03

Country of birth		Coronary heart disease				Revascularisation procedures			
		Hospitali-sations	Rate per 100,000 population	LL 95% CI	UL 95% CI	Hospital-isations	Rate per 100,000 population	LL 95% CI	UL 95% CI
United Kingdom	Males	11960	876.6	860.8	892.6	2994	216.9	209.1	224.9
	Females	6097	410.2	399.7	420.9	944	68.6	64.2	73.2
	Persons	18057	648.1	638.5	657.7	3938	144.8	140.3	149.5
New Zealand	Males	1609	795.2	753.2	838.8	421	198.7	178.4	220.4
	Females	783	389.2	361.3	418.7	140	70.7	58.9	84.0
	Persons	2392	588.3	563.5	613.8	561	133.7	122.1	145.9
China	Males	1032	434.1	407.1	462.3	303	123.6	109.8	138.7
	Females	491	175.8	160.4	192.3	89	32.3	25.8	39.9
	Persons	1523	295.8	280.9	311.3	392	75.5	68.1	83.5
Vietnam	Males	356	301.4	266.8	338.8	99	80.0	63.4	99.3
	Females	211	186.6	161.0	214.9	36	29.5	20.3	41.2
	Persons	567	241.3	220.1	263.9	135	53.1	43.9	63.6
Italy	Males	4309	934.9	902.4	968.1	1162	249.2	233.3	265.9
	Females	1700	390.7	371.3	410.7	292	63.1	55.7	71.1
	Persons	6009	682.9	663.4	702.9	1454	162.8	153.6	172.3
Lebanon	Males	3022	1733.7	1663.8	1805.5	695	365.8	336.7	396.7
	Females	1204	964.0	905.5	1025.0	174	122.8	104.4	143.3
	Persons	4226	1386.0	1339.7	1433.3	869	255.0	237.2	273.8
Philippines	Males	596	985.0	896.7	1078.9	153	227.9	188.6	272.2
	Females	437	422.9	380.4	468.5	43	36.3	25.5	49.8
	Persons	1033	607.3	566.6	649.9	196	100.1	85.1	116.7
India	Males	1119	1242.7	1166.7	1322.2	351	367.9	328.7	410.3
	Females	489	582.6	531.6	637.1	105	119.9	98.0	145.3
	Persons	1608	920.5	874.8	968.0	455	246.8	224.2	271.1
Hong Kong	Males	224	456.4	391.2	528.4	67	130.5	96.7	171.0
	Females	84	169.7	129.4	217.2	21	37.7	20.8	61.2
	Persons	308	316.7	277.7	359.1	88	84.4	65.2	106.8
Greece	Males	2936	1160.3	1111.3	1210.6	873	330.6	305.3	357.3
	Females	998	434.8	405.7	465.3	199	78.6	67.2	91.3
	Persons	3934	800.2	771.7	829.4	1072	205.5	191.6	220.1
Germany	Males	1735	1044.3	991.4	1099.2	486	266.9	242.0	293.4
	Females	921	457.2	427.1	488.8	167	81.0	68.8	94.6
	Persons	2656	723.7	695.4	752.9	652	170.3	157.1	184.4
South Africa	Males	612	1054.0	964.9	1148.5	197	332.1	283.7	385.9
	Females	223	360.8	314.3	412.2	40	65.4	46.5	89.3
	Persons	835	679.2	632.0	728.9	237	187.9	163.8	214.5
Korea	Males	157	386.4	309.5	473.0	53	116.0	80.4	159.8
	Females	64	155.0	117.1	200.6	11	28.4	13.6	51.7
	Persons	221	256.0	218.3	297.7	64	70.6	52.5	92.5
Fiji	Males	1140	2227.4	2071.4	2390.5	297	550.7	478.3	629.7
	Females	454	937.2	845.6	1035.4	77	154.6	120.1	195.5
	Persons	1594	1526.4	1441.9	1614.1	374	335.7	298.7	375.7
Malaysia	Males	337	718.1	622.2	822.1	118	253.3	199.3	315.3
	Females	108	249.3	196.8	310.0	26	57.1	35.1	86.6
	Persons	445	462.4	410.9	517.7	144	145.3	118.7	175.4
Indonesia	Males	354	941.1	836.6	1054.1	121	299.5	245.5	361.3
	Females	106	309.6	252.0	376.1	24	65.2	41.3	97.7
	Persons	461	611.4	553.5	673.5	145	178.8	149.7	211.7
Netherlands	Males	1450	999.0	945.0	1055.2	326	222.1	196.8	249.6
	Females	679	507.8	467.7	550.1	109	81.9	66.1	100.2
	Persons	2129	770.7	736.7	805.8	435	157.2	141.9	173.8
Former Yugoslavia	Males	2774	896.5	858.5	935.6	742	216.3	199.7	233.8
	Females	1111	438.9	411.1	467.9	224	82.8	71.5	95.4
	Persons	3885	679.0	655.3	703.3	966	154.1	143.7	164.9
USA	Males	418	1029.6	924.6	1142.6	109	251.1	202.1	307.5
	Females	123	404.1	330.9	487.9	24	79.1	48.4	121.0
	Persons	541	742.5	677.0	812.2	133	171.9	141.9	206.1
Australia	Males	121096	1189.2	1182.4	1195.9	27665	266.7	263.6	269.9
	Females	70321	545.5	541.4	549.6	9870	80.1	78.5	81.7
	Persons	191418	845.6	841.8	849.4	37535	168.1	166.4	169.9
All	Males	179162	1157.4	1152.0	1162.8	43903	276.5	273.9	279.1
	Females	96397	527.4	524.1	530.8	14666	82.9	81.5	84.2
	Persons	275563	828.9	825.8	832.0	58569	176.4	175.0	177.8

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. LL/UL 95%CI = Lower and upper limits of the 95% confidence interval of the point estimate.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

Injury hospital separations by country of birth and sex, NSW 1998-99 to 2002-03



Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2001–02 and 2002–03 include an estimate of the small number of interstate hospitalisations, data for which were unavailable at the time of production. Lower and upper limits of the 95% confidence interval are shown.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Injury is a major cause of hospitalisation in NSW, most commonly associated with falls, transportation injuries, and complications following medical or surgical care.
- In NSW in the 5-year period 1998–99 to 2002–03, hospitalisation rates for injuries were much higher in the Australian-born than in any major overseas-born group. Only males born in New Zealand, and females born in Germany, the Netherlands and the United States of America, had hospitalisation rates approaching those of their Australian-born counterparts.
- The Australian-born had higher rates of hospitalisation than most other country-of-birth groups across all major injury categories, including falls, motor vehicle accidents, interpersonal violence, attempted suicide, cutting injuries, and poisoning (data not shown).
- These differences may relate in part to the higher rates of hospitalisation for injury, particularly transport injuries, in rural areas. The overseas-born population of Australia is highly urbanised, with almost 80% living in capital cities in 1998, compared with 54% of the Australian-born (ABS, 2002).

For more information:

Australian Bureau of Statistics. *Australian social trends 2002*. Canberra: ABS, 2002.

The National Injury Surveillance Unit website at www.nisu.flinders.edu.au.

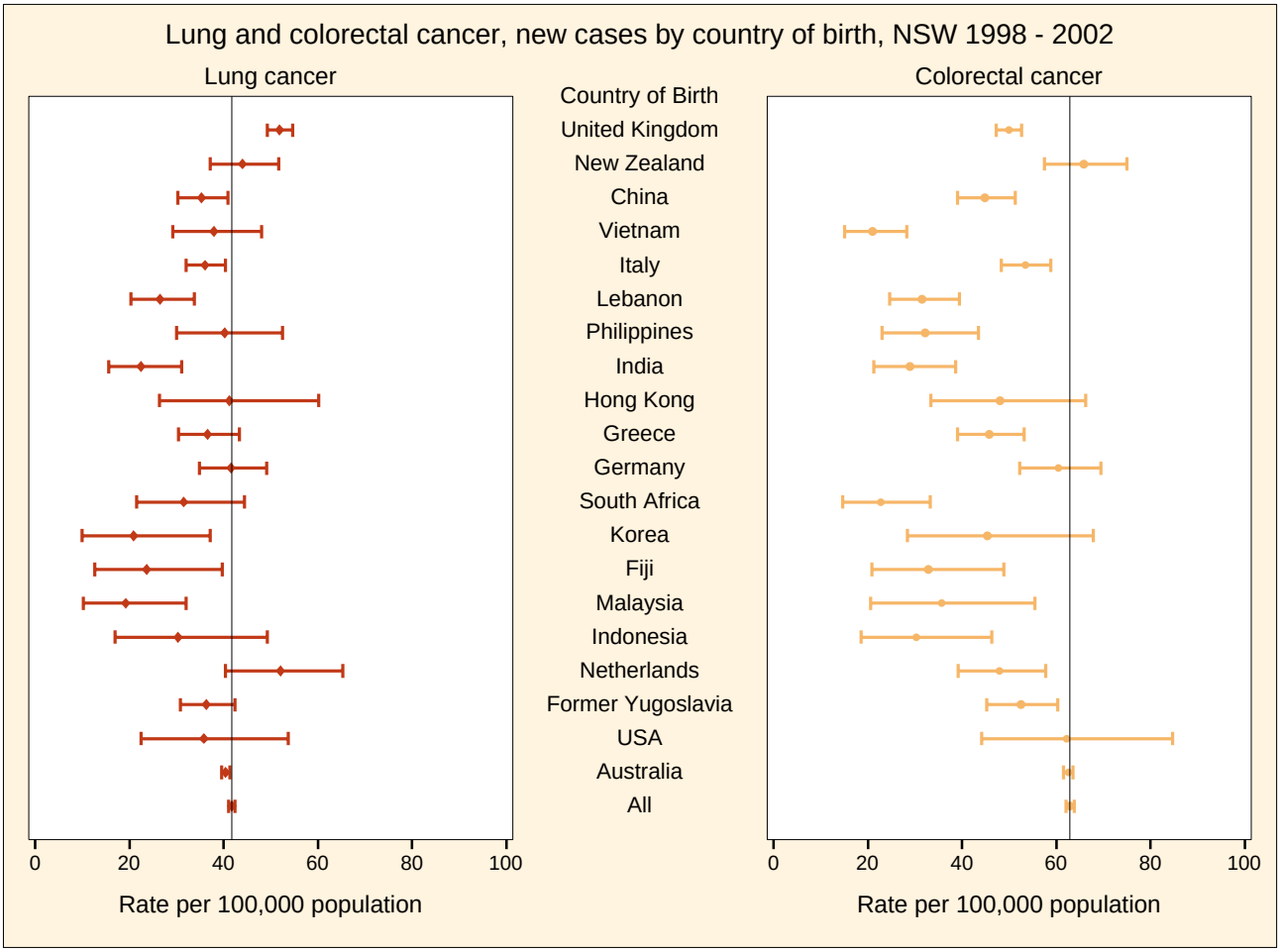
Injury Prevention and Policy Unit website at www.health.nsw.gov.au/public-health/health-promotion/injury-prevention/index.html.

Injury hospital separations by country of birth and sex, NSW 1998–99 to 2002–03

Country of birth		Hospitalisations	Rate per 100,000 population	LL 95% CI	UL 95% CI
United Kingdom	Males	13708	1960.2	1908.1	2012.9
	Females	13394	1425.4	1381.6	1469.8
	Persons	27102	1714.5	1680.2	1749.0
New Zealand	Males	6743	2298.5	2236.9	2361.2
	Females	3618	1387.4	1337.9	1438.0
	Persons	10361	1863.6	1823.8	1903.9
China	Males	2057	948.2	894.2	1004.0
	Females	2215	896.5	846.2	948.4
	Persons	4272	930.0	893.1	967.8
Vietnam	Males	1801	1027.8	953.4	1104.8
	Females	1103	710.5	645.3	778.6
	Persons	2904	876.9	826.9	928.3
Italy	Males	2964	1850.2	1608.5	2098.6
	Females	2859	1061.3	956.5	1169.0
	Persons	5823	1490.3	1351.4	1631.9
Lebanon	Males	2802	1821.9	1725.9	1920.6
	Females	1539	1218.8	1127.5	1313.5
	Persons	4341	1526.2	1459.9	1593.9
Philippines	Males	1043	1031.3	949.5	1117.0
	Females	1074	754.6	696.1	815.8
	Persons	2116	878.1	829.7	928.2
India	Males	1203	1188.2	1110.0	1269.7
	Females	857	1020.4	946.3	1098.4
	Persons	2060	1131.6	1076.8	1188.1
Hong Kong	Males	652	682.8	610.7	759.2
	Females	564	744.4	662.1	832.0
	Persons	1216	722.9	666.7	781.6
Greece	Males	1635	1444.3	1290.3	1604.0
	Females	1696	1030.3	939.5	1124.5
	Persons	3331	1243.9	1152.8	1337.4
Germany	Males	1460	1844.2	1687.4	2007.2
	Females	1613	1402.2	1286.2	1522.4
	Persons	3073	1640.2	1543.0	1740.0
South Africa	Males	1076	1555.5	1452.1	1663.6
	Females	789	1139.3	1053.1	1230.1
	Persons	1864	1346.6	1280.0	1415.6
Korea	Males	906	1375.7	1263.1	1493.9
	Females	614	961.0	867.6	1060.2
	Persons	1520	1168.1	1094.2	1244.8
Fiji	Males	1257	1672.5	1552.3	1797.8
	Females	797	1127.1	1028.6	1230.9
	Persons	2053	1396.7	1319.3	1476.8
Malaysia	Males	447	955.9	824.9	1096.4
	Females	425	966.6	839.7	1103.0
	Persons	873	986.6	891.8	1086.4
Indonesia	Males	541	1144.6	1026.7	1270.2
	Females	360	794.1	698.3	897.8
	Persons	901	960.8	885.2	1040.4
Netherlands	Males	962	1882.3	1604.4	2173.9
	Females	1040	1426.5	1202.9	1660.5
	Persons	2002	1682.1	1497.2	1873.2
Former Yugoslavia	Males	3004	1668.9	1561.5	1779.2
	Females	1853	968.3	904.5	1034.3
	Persons	4856	1327.6	1264.1	1392.4
USA	Males	1008	1982.7	1851.9	2119.8
	Females	693	1536.8	1413.1	1667.7
	Persons	1700	1742.9	1654.3	1834.6
Australia	Males	298662	2500.0	2490.8	2509.1
	Females	214562	1639.2	1632.1	1646.2
	Persons	513229	2088.9	2083.1	2094.7
All	Males	375819	2362.7	2355.1	2370.3
	Females	273740	1570.7	1564.8	1576.6
	Persons	649570	1984.8	1980.0	1989.7

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. LL/UL 95%CI = lower and upper limits of the 95% confidence interval of the point estimate.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.



Note: Rates were age-adjusted using the Australian population as at 30 June 2001. Lower and upper limits of the 95% confidence interval are shown.

Source: 2002 NSW Health Survey, ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Lung cancer is the third most common registered cancer in males in NSW, and the fifth most common registered cancer in females. It is the most common cause of cancer deaths in males, and the second most common cause (after breast cancer) of cancer deaths in females (Tracey et al., 2004). Tobacco smoking is the major risk factor for lung cancer, with current lung cancer rates reflecting smoking rates 20 years or more in the past.
- In NSW in the 5-year period 1998–2002, the incidence of lung cancer was lower in most major overseas-born groups than in the Australian-born. Only males and females born in the United Kingdom and females born in New Zealand had incidence rates exceeding those of their Australian-born counterparts. These patterns reflect lower levels of smoking among most migrant groups.
- Colorectal (bowel) cancer is the second most common registered cancer, and the third most common cause of cancer deaths, in both sexes. It is the most common cancer for both sexes combined (Tracey et al., 2004). Risk factors for colorectal cancer include personal or family history of colorectal cancer or polyps, poor diet, physical inactivity, and excess body weight (AIHW, 2004).
- In NSW in the 5-year period 1998–2002, the incidence of colorectal cancer was lower in most major overseas-born groups than in the Australian-born. Only people born in New Zealand, Germany, and the United States of America had incidence rates approaching those of their Australian-born counterparts. These patterns are likely to reflect lower levels of risk factors for colorectal cancer in many migrant groups.

For more information:

Tracey EA, Chen W, Sitas F. *Cancer in NSW: Incidence and mortality 2002.* Sydney: The Cancer Council NSW, 2004. Other publications can be found at the website www.cancercouncil.com.au.

Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004.

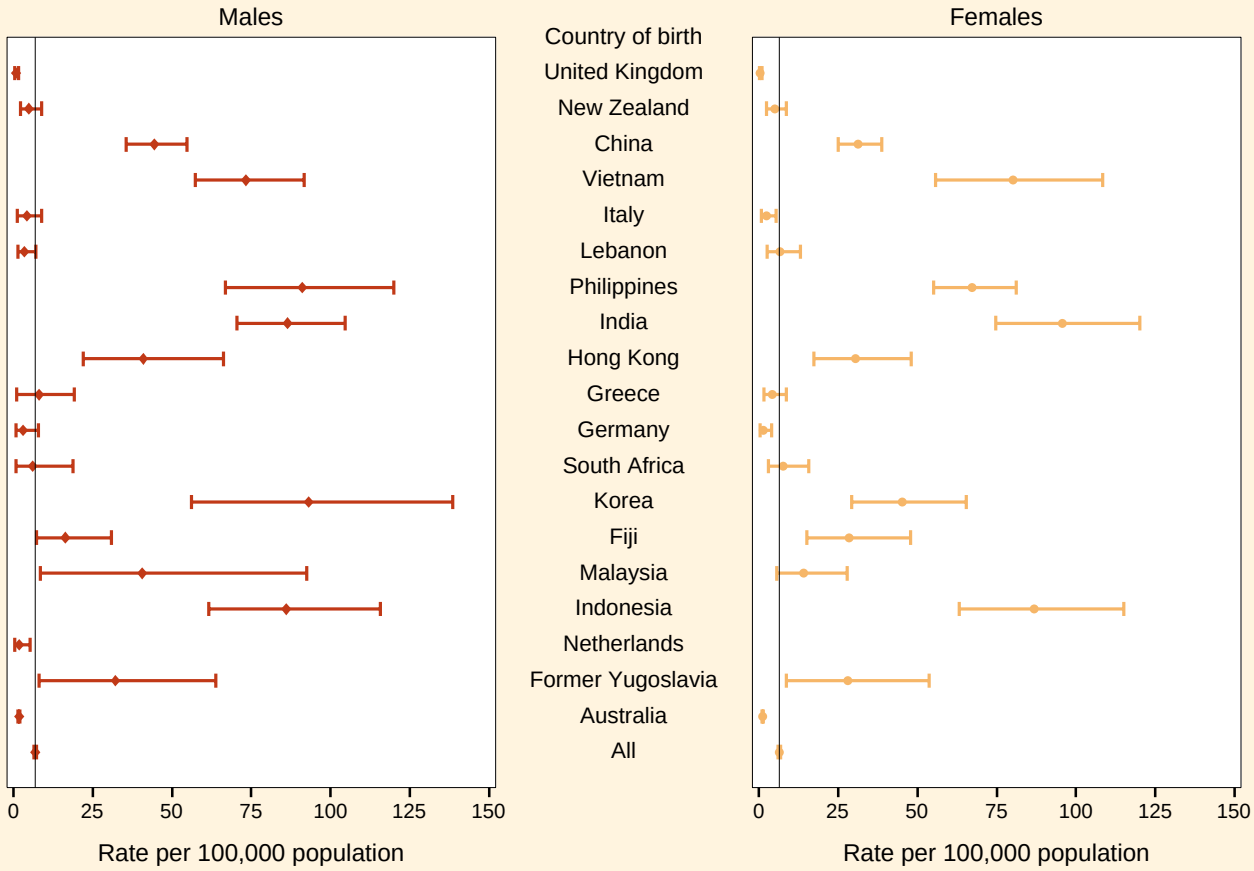
Lung and colorectal cancer, new cases by country of birth, NSW 1998–2002

Country of birth		Lung cancer				Colorectal cancer			
		Hospital-isations	Rate per 100,000 population	LL 95% CI	UL 95% CI	Hospital-isations	Rate per 100,000 population	LL 95% CI	UL 95% CI
United Kingdom	Males	972	71.3	66.9	75.9	795	59.2	55.1	63.5
	Females	499	34.8	31.8	38.1	602	41.5	38.1	45.1
	Persons	1471	51.9	49.2	54.6	1397	49.9	47.2	52.6
New Zealand	Males	90	52.7	41.7	65.6	147	87.4	72.9	103.6
	Females	72	37.3	28.9	47.3	100	47.5	38.2	58.2
	Persons	162	44.0	37.2	51.6	247	65.8	57.5	75.0
China	Males	121	52.8	43.5	63.5	112	49.5	40.3	60.0
	Females	60	20.8	15.8	26.8	113	41.3	33.9	49.8
	Persons	181	35.3	30.3	40.9	225	44.8	39.1	51.2
Vietnam	Males	60	64.7	47.1	86.0	26	22.3	12.8	35.1
	Females	20	17.1	9.9	27.2	29	20.3	12.9	30.1
	Persons	80	37.9	29.2	48.1	55	21.0	15.0	28.2
Italy	Males	296	59.1	52.0	66.8	322	66.4	58.6	74.8
	Females	48	11.5	8.1	15.9	160	39.1	32.4	46.6
	Persons	344	36.0	32.1	40.3	482	53.4	48.2	58.8
Lebanon	Males	57	39.5	28.5	52.8	62	41.7	30.7	55.0
	Females	20	12.6	7.6	19.7	28	20.4	13.0	30.3
	Persons	77	26.5	20.3	33.7	90	31.5	24.6	39.4
Philippines	Males	39	82.9	57.1	115.6	29	67.9	43.1	100.6
	Females	24	20.2	12.0	31.4	22	16.5	9.6	26.1
	Persons	63	40.2	30.0	52.5	51	32.2	23.0	43.5
India	Males	19	26.3	15.4	41.5	30	37.2	24.2	54.2
	Females	18	20.2	11.9	32.1	19	21.8	13.0	34.1
	Persons	37	22.4	15.7	31.1	49	29.0	21.2	38.6
Hong Kong	Males	20	46.0	22.8	78.4	25	52.6	29.9	83.1
	Females	16	38.1	19.9	64.8	27	45.3	26.7	70.1
	Persons	36	41.2	26.4	60.2	52	48.1	33.4	66.2
Greece	Males	148	62.9	51.4	75.8	133	50.3	40.6	61.2
	Females	21	8.7	5.1	13.6	88	39.9	31.0	50.4
	Persons	169	36.5	30.5	43.4	221	45.7	39.0	53.2
Germany	Males	97	58.6	46.6	72.4	116	72.1	58.2	88.0
	Females	51	27.6	20.1	36.8	96	50.2	40.4	61.6
	Persons	148	41.5	34.8	49.2	212	60.4	52.2	69.5
South Africa	Males	18	39.7	22.5	64.2	16	31.3	16.8	52.5
	Females	16	26.7	15.1	43.7	12	17.2	8.6	30.4
	Persons	34	31.5	21.5	44.4	28	22.7	14.7	33.3
Korea	Males	7	17.1	6.5	35.7	20	65.5	33.8	109.8
	Females	7	20.5	6.8	44.9	9	29.5	12.5	57.7
	Persons	14	20.9	10.0	37.1	29	45.4	28.3	67.8
Fiji	Males	4	11.8	3.0	30.8	12	34.6	14.9	65.0
	Females	12	31.2	15.1	56.1	17	32.7	18.1	53.8
	Persons	16	23.7	12.6	39.7	29	32.9	20.8	48.9
Malaysia	Males	10	28.7	11.5	56.5	15	41.8	19.7	74.5
	Females	7	11.6	3.8	25.6	15	29.1	11.7	54.8
	Persons	17	19.2	10.2	32.1	30	35.6	20.5	55.4
Indonesia	Males	9	32.6	12.6	65.8	11	31.7	15.3	57.7
	Females	9	28.6	12.3	55.5	11	29.4	14.1	53.6
	Persons	18	30.3	17.0	49.2	22	30.2	18.5	46.3
Netherlands	Males	106	68.7	55.9	83.4	76	52.8	41.1	66.6
	Females	32	33.4	15.9	56.2	51	42.2	29.7	57.6
	Persons	138	52.1	40.4	65.3	127	47.9	39.2	57.8
Former Yugoslavia	Males	170	58.5	48.5	69.7	185	69.6	57.3	83.3
	Females	32	12.7	8.3	18.4	85	35.1	27.3	44.2
	Persons	202	36.3	30.8	42.3	270	52.5	45.3	60.4
USA	Males	20	50.1	30.0	78.2	26	61.6	39.2	91.6
	Females	5	12.9	3.2	32.1	18	60.4	34.3	97.5
	Persons	25	35.8	22.5	53.8	44	62.2	44.2	84.7
Australia	Males	5934	59.7	58.2	61.2	7459	75.2	73.5	77.0
	Females	3241	26.2	25.3	27.1	6682	52.7	51.4	54.0
	Persons	9175	40.4	39.6	41.3	14141	62.5	61.5	63.6
All	Males	9180	61.6	60.3	62.9	11274	75.6	74.2	77.0
	Females	4625	26.1	25.3	26.8	9445	52.5	51.4	53.6
	Persons	13805	41.7	41.0	42.4	20719	62.9	62.0	63.7

Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. LL/UL 95%CI = Lower and upper limits of the 95% confidence interval for the point estimate.

Source: NSW Central Cancer Registry data and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

Tuberculosis notifications by country of birth and sex, NSW 1999-2003



Note: Rates were age-adjusted using the Australian population as at 30 June 2001. Lower and upper limits of the 95% confidence interval are shown.

Source: Communicable Diseases Branch, Notifiable Diseases Database and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Tuberculosis (TB) is caused primarily by the bacterial organism *Mycobacterium tuberculosis*. TB can present in a variety of ways, most commonly as lung disease characterised by a chronic cough, weight loss, fevers, and night sweats.
- Before World War II, TB was a major cause of illness and death in the Australian community. The subsequent development of effective antibiotic treatment, chest x-ray screening, and preventive therapy, have reduced the burden of disease in NSW to one of the lowest in the world.
- All doctors, laboratories, and hospitals are required by law to notify cases of TB to the NSW Department of Health. In the period 1999–2003, 2,165 cases of TB were notified. Among major country-of-birth groups, the highest notification rates were recorded for people born in Vietnam, the Philippines, India, and Indonesia. People born in China, Hong Kong, Korea, Fiji, Malaysia, and the Former Yugoslavia also had higher notification rates than the Australian-born. These variations in notification rates according to country of birth reflect variations in the prevalence of TB in migrants' countries of origin.
- A network of chest clinics exists throughout NSW to provide directly supervised therapy for people with disease, and to identify, screen, and treat people at risk of infection.

For more information:

The *NSW Public Health Bulletin* includes monthly reports of notifiable communicable diseases. Available at www.health.nsw.gov.au/public-health/phb/phb.html.

National communicable disease data are published in *Communicable Disease Intelligence*. Available at www.health.gov.au/pubhlth/cdi/cdihtml.htm.

Tuberculosis notifications by country of birth and sex, NSW 1999–2003

Country of birth		Notifications	Rate per 100,000 population	LL 95% CI	UL 95% CI
United Kingdom	Males	9	0.8	0.3	1.6
	Females	6	0.4	0.1	0.9
	Persons	15	0.6	0.3	1.0
New Zealand	Males	12	4.8	2.2	8.9
	Females	13	4.9	2.4	8.7
	Persons	25	4.7	2.9	7.1
China	Males	100	44.4	35.6	54.7
	Females	94	31.3	25.0	38.6
	Persons	194	36.3	31.1	42.0
Vietnam	Males	110	73.4	57.4	91.7
	Females	123	80.2	55.6	108.3
	Persons	233	75.6	61.2	91.4
Italy	Males	14	4.2	1.2	8.8
	Females	7	2.4	0.7	5.4
	Persons	21	3.5	1.5	6.2
Lebanon	Males	7	3.4	1.3	7.1
	Females	9	6.6	2.6	13.2
	Persons	16	5.0	2.6	8.6
Philippines	Males	77	91.1	66.8	119.9
	Females	135	67.3	55.0	81.2
	Persons	212	75.6	63.5	88.9
India	Males	121	86.3	70.4	104.6
	Females	99	95.8	74.7	120.2
	Persons	220	90.3	77.3	104.7
Hong Kong	Males	25	40.9	22.0	66.3
	Females	30	30.5	17.3	48.0
	Persons	55	35.8	24.0	50.3
Greece	Males	10	8.0	1.0	19.2
	Females	7	4.1	1.5	8.6
	Persons	17	6.4	2.2	12.5
Germany	Males	4	3.0	0.7	7.8
	Females	3	1.4	0.3	4.1
	Persons	7	2.1	0.8	4.4
South Africa	Males	3	6.0	0.8	18.8
	Females	7	7.6	3.0	15.7
	Persons	10	6.3	2.8	11.9
Korea	Males	51	93.0	56.1	138.5
	Females	41	45.2	29.2	65.3
	Persons	92	64.2	47.4	83.8
Fiji	Males	10	16.3	7.3	30.9
	Females	17	28.4	15.0	47.7
	Persons	27	23.5	14.2	36.0
Malaysia	Males	10	40.6	8.4	92.5
	Females	10	14.1	5.6	27.8
	Persons	21	23.9	11.6	41.0
Indonesia	Males	55	86.0	61.6	115.8
	Females	65	86.8	63.2	115.2
	Persons	120	86.6	69.4	106.2
Netherlands	Males	3	1.8	0.4	5.1
	Persons	3	1.0	0.2	2.8
Former Yugoslavia	Males	30	32.2	8.1	63.8
	Females	29	28.1	8.7	53.7
	Persons	59	30.1	14.1	49.6
Australia	Males	185	1.7	1.5	2.0
	Females	141	1.1	0.9	1.3
	Persons	326	1.3	1.2	1.5
All	Males	1086	6.9	6.5	7.3
	Females	1078	6.4	6.0	6.8
	Persons	2165	6.6	6.3	6.8

Note: Rates were age-adjusted using the Australian population as at 30 June 2001. LL/UL 95%CI = lower and upper limits of the 95% confidence interval for the point estimate.

Source: Communicable Diseases Branch. Notifiable Diseases Database and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

Chapter 3.3

Refugee health

- New South Wales is home to significant numbers of people of refugee background who have settled here over the past 60 years. Between 3,000 and 4,000 newly-arrived refugees settle in NSW each year.
- Most of these individuals arrive as permanent residents through the national migration program, and have undergone the same health screening as other migrants. Nevertheless, significant physical and psychological health issues may be present.
- A small proportion of the refugee population are holders of Temporary Protection Visas, having been released as refugees from immigration detention, or are asylum seekers living in the community. In NSW, some 1,500 of the latter group do not have access to Medicare.
- Approximately 7,000 refugees settled in NSW in the 2-year period 2002–2003. Half of this total was born in either Iraq (29.2%) or Sudan (19.6%). The proportion of settlers from African nations is increasing.
- Thirty-six per cent of refugee arrivals in this period were under the age of 16 years.
- The majority of refugees settle in greater western Sydney, the most common Local Government Areas of settlement being Fairfield (25.2%), Blacktown (12.3%), Liverpool (12.1%), and Auburn (11.1%). Increasing numbers, however, are settling in regional and rural centres.
- Data from a sample of attendees at a psychosocial assessment program, run by the NSW Service for the Treatment and Rehabilitation of Torture and Trauma Survivors, show that 36% of newly-arrived refugees reported their health as either ‘fair’ or ‘poor’, compared with only 19% of the general population.
- In the same sample of newly-arrived refugees, 41% reported sleeping difficulties, 25% said they often experienced nightmares, and 39% often experienced distressing thoughts about past torture and trauma experiences.
- In a serological survey of 236 young people of mainly refugee background, 31% had no immunity to measles, compared with 11% of people of similar age in the general NSW population. Sixteen per cent of young refugees tested lacked immunity to rubella, including one in 10 girls.

In this chapter

- Demographic characteristics
- Self-rated health status
- Immune status

Introduction

New South Wales is home to a number of different categories of people who are refugees or have refugee backgrounds. These include humanitarian migrants, asylum seekers, and Temporary Protection Visa (TPV) holders.

Each year Australia accepts over 10,000 'humanitarian migrants' who have fled their homeland to another country overseas and subsequently been awarded refugee status. Forty per cent of these refugees settle in NSW. They are permanent residents and have full access to Medicare. As with other migrants, health screening done overseas will have largely excluded people with active tuberculosis, HIV infection, and conditions likely to exceed a certain threshold of health expenditure.

People who seek asylum in Australia who have arrived with a valid visa are permitted to live in the community while their application for asylum is processed. There are currently some 5,000 such people in NSW. Using criteria legislated by the Commonwealth, one-third of these community-based asylum seekers are not permitted to work and are not eligible for Medicare.

Asylum seekers who arrive without a visa are placed in a Commonwealth Immigration Detention Centre. New South Wales has one such centre, at Villawood in southwestern Sydney. New South Wales also hosts some 2,000 TPV holders, who are people released from immigration detention, having been found to meet refugee criteria.

People of refugee background are recognised as one of the most vulnerable groups in society. Experiences of persecution, psychological trauma, disrupted access to health care, and other adverse effects of conflict, contribute to their health needs.

In 1999, the NSW Department of Health published the document *Strategic Directions for Refugee Health Care in NSW*, which provides a framework to guide the NSW health system in developing health services appropriate to the needs of refugees. In addition to area and statewide multicultural health services, there are 2 statewide health services that specifically target people of refugee background in NSW. The NSW Service for the Treatment and Rehabilitation of Torture and Trauma Survivors provides a range of ongoing professional services to refugees who have been exposed to torture and trauma and provides early health assessment and intervention services to newly arrived people from refugee-like backgrounds. The NSW Refugee Health Service works in collaboration with area health services, statewide multicultural health services, and other agencies, to improve access to health care for refugees and to foster more appropriate health care.

For more information:

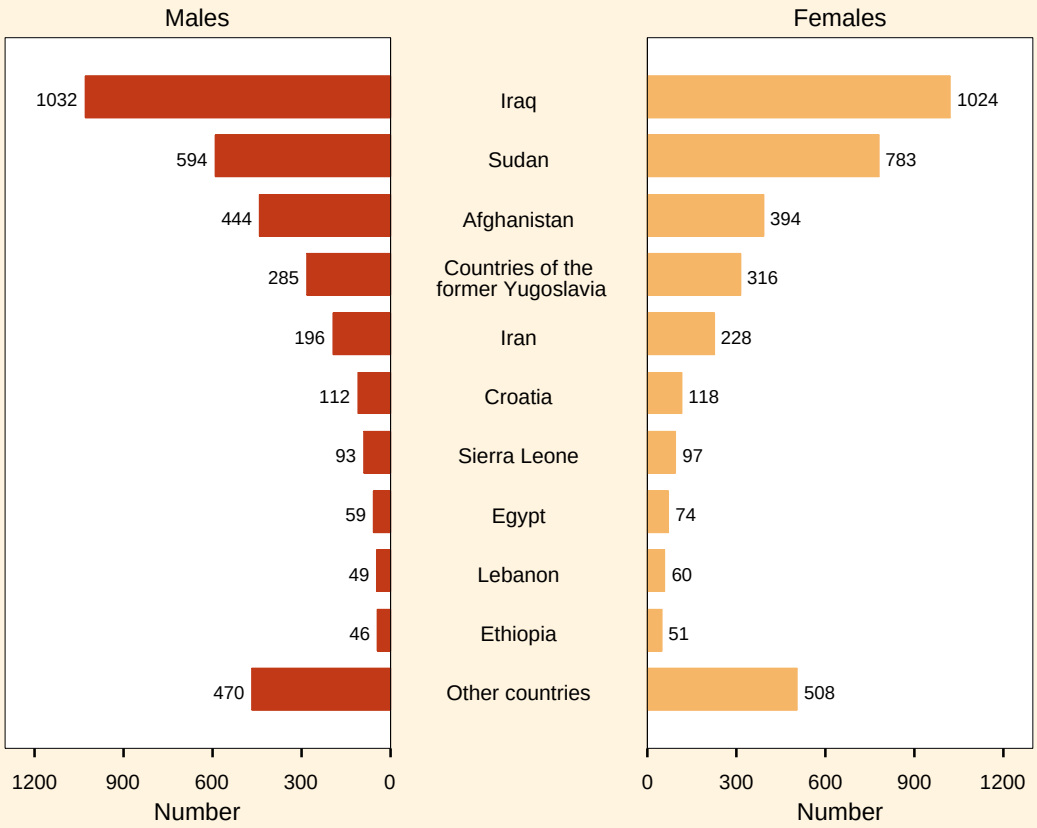
NSW Refugee Health Service website at www.refugeehealth.org.au.

The NSW Service for the Treatment and Rehabilitation of Torture and Trauma Survivors (STARTTS) website at www.startts.org.

The Department of Immigration and Multicultural and Indigenous Affairs website at www.immi.gov.au/refugee/migrating_refugee.htm.

Finney Lamb C, Smith M. Problems refugees face when accessing health services. *N S W Public Health Bull* 2002; 13 (7): 161–163. Available at www.health.nsw.gov.au/public-health/phb/html2002/july02html/refugeeshealth.html.

Humanitarian entrants to NSW by top 10 countries of birth and sex, NSW, 2002 and 2003 combined



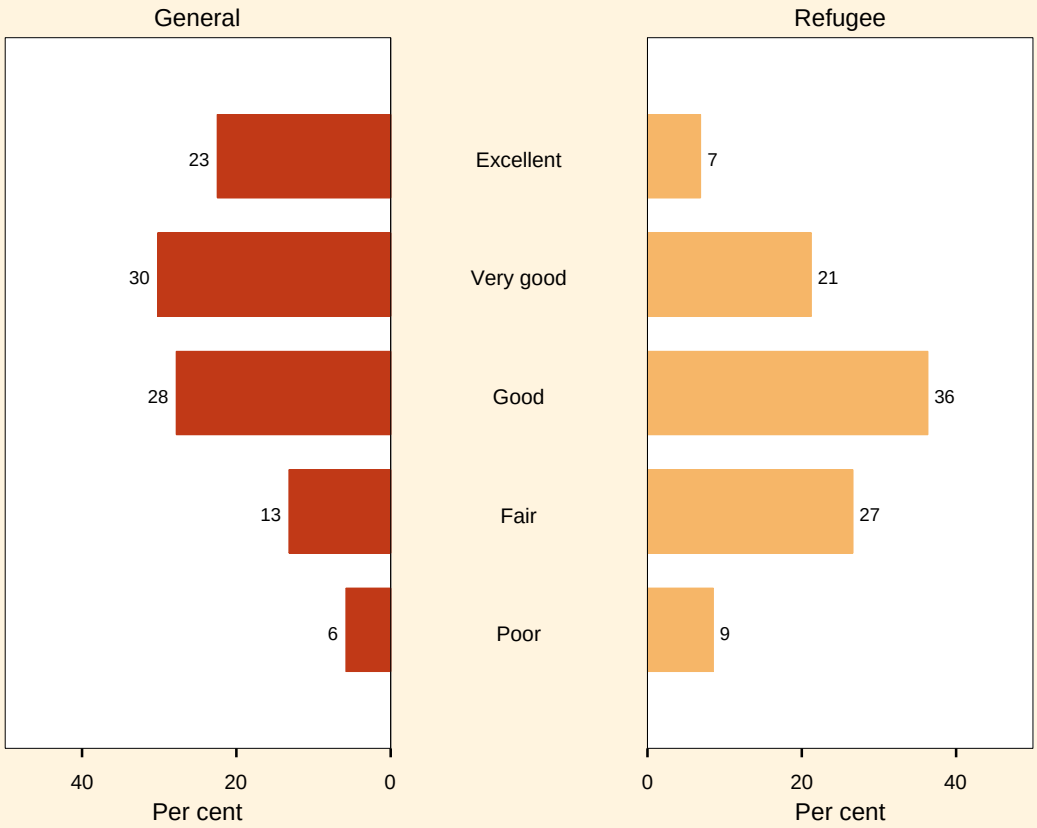
Note: These data relate principally to permanent migrants arriving under the Humanitarian Program (*N*=6,732), where the Commonwealth Government sets a quota of places each year for people from different regions of the world. Also included are data for 301 persons awarded a protection visa in Australia. 'Countries of the former Yugoslavia' denotes the applicant has not specified birthplace in terms of the nations now existing in the Balkan region, or has self-identified as being born in 'Yugoslavia'. Birth countries listed as Egypt or Lebanon most likely represent children born to refugees in exile in those countries.

Source: The Commonwealth Department of Immigration and Multicultural and Indigenous Affairs (DIMIA) Settlement Database.

- In the 2-year period from January 2002 to December 2003, 7,033 refugees came to NSW (DIMIA, 2004). Half of this total originated from just 2 countries: Iraq (29.2%) and Sudan (19.6%). Country of origin profiles shift each year depending on international conflicts, United Nations requests and Commonwealth Government decisions on intake. At present, the proportion of refugees settling in NSW from the African continent is rapidly increasing.
- The resettled refugee population is young, with 36% of arrivals in this period being under the age of 16 years. Almost 40% were aged between 25–54 years. Very few were older than 65 years. The majority of arrivals settle in greater western Sydney, with 60% choosing to live in just 4 Local Government Areas: Fairfield (25.2%), Blacktown (12.3%), Liverpool (12.1%), and Auburn (11.1%). Smaller but significant numbers are being dispersed to regional and rural locations; a trend that is increasing.
- Data on recent arrivals do not reflect communities that migrated since the late 1940s and settled in various parts of the State. Ageing refugees have particular issues and may present management challenges for health and aged care services.
- Information on the profile of refugee populations helps to highlight knowledge, skill, and service provision needs for health care professionals around the State.

For more information:
Commonwealth Department of Immigration and Multicultural and Indigenous Affairs Settlement Database online request facility website at www.immi.gov.au/settle/data/cold.htm.

Self-rated health status of refugees and the general population, persons aged 16 years and over, NSW 2003



Note: The refugee data (n=1,174) refer to recently arrived people assessed by the STARTTS early intervention program in the period 1998–2000. The general community data (n=13,008) were derived from the NSW Adult Health Survey, 2003.

Source: The NSW Service for the Treatment and Rehabilitation of Torture and Trauma Survivors (STARTTS) and the NSW Health Survey, 2003 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

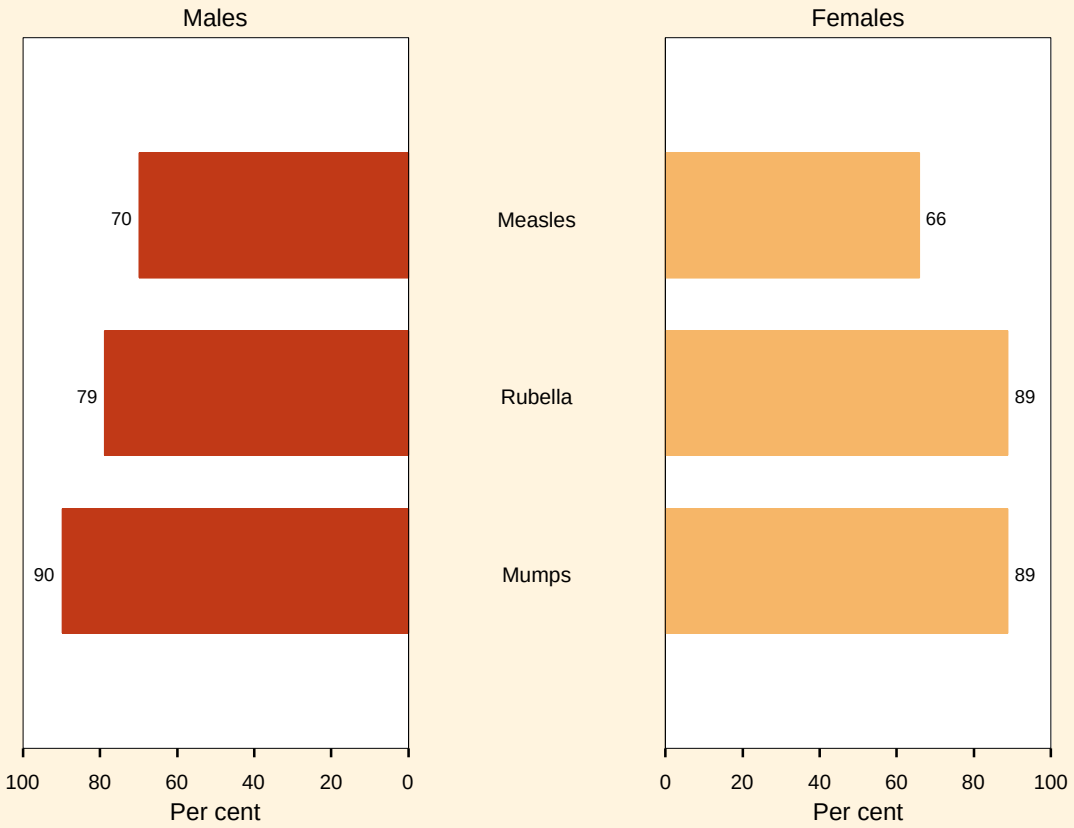
- The NSW Service for the Treatment and Rehabilitation of Torture and Trauma Survivors (STARTTS) was established in 1988. It provides services to facilitate the healing process for refugees who have been exposed to torture and trauma as well as early health assessment and intervention services to newly arrived people from refugee-like backgrounds. Refugees are referred to the STARTTS early intervention program shortly after arriving in Australia.
- The figures show poorer self-rated health status of refugees compared with the general community. Thirty-six per cent of this sample of newly-arrived refugees assessed by STARTTS reported their health as either 'fair' or 'poor', compared with only 19% of the general population. Refugees may rate their health poorly due to the psychological impact of persecution and other trauma that led to their flight, poor access to health care while in exile, and issues such as pain from poor oral health.
- These results are consistent with *The Longitudinal Survey of Immigrants to Australia*, which compiles data from 2 cohorts containing over 11,000 migrants. Compared with people who migrated under other visa categories, humanitarian entrants were more likely to: have a pre-existing long-term health condition; have suffered from a medical condition since arrival in Australia; have visited a health professional in the previous 4 weeks; have poorer self-assessed health status over the previous 4 weeks; and display psychological distress (DIMIA, 2004).

For more information:

Commonwealth Department of Immigration and Multicultural and Indigenous Affairs. *The Longitudinal Survey of Immigrants to Australia.* Canberra: DIMIA, 2004. Available at www.immi.gov.au/research/lsia/index.htm.

The NSW Service for the Treatment and Rehabilitation of Torture and Trauma Survivors website at www.startts.org.

Measles, mumps and rubella immunity, persons of refugee background aged 11-20 years in two Intensive English Centres, NSW 2002



Note: Estimates are based on 117 male and 119 female students.

Source: NSW Refugee Health Service.

- In 2001–2002, the NSW Refugee Health Service collaborated with the Sydney South West Public Health Unit and the NSW Department of Education in a pilot project of screening and immunisation at 2 Intensive English Centres (at Fairfield and Miller High Schools). These Centres were chosen because of the high percentage of students from refugee backgrounds attending (NSW Refugee Health Service, 2004). Such young people have often had immunisation disrupted, due to civil conflict in their countries of origin and during forced exile. Immunisation is not a pre-requisite for migrants or refugees who plan to settle in Australia.
- Following consent, serological screening was conducted on students to determine immunity to hepatitis B, measles, mumps, and rubella. Most of the students were from refugee backgrounds, including 114 (48%) from Iraq, with a further 40 (17%) from countries in the Balkans region. Of the 236 students, 110 (46.6%) required Measles–Mumps–Rubella (MMR) vaccine, as they were not immune to one or more of the 3 antigens. Of key importance is that one-third of the sample had no immunity to measles. This compares to only 11% of people of similar age in the general NSW community (Gidding and Gilbert, 2001). Additionally, one in 10 girls lacked immunity to rubella. Only 9 students (3.8%) had evidence of past exposure to, or immunisation against, hepatitis B. There were no hepatitis B carriers. The remaining 227 (96.2%) were offered hepatitis B vaccine.
- This pilot project has led to an ongoing program of immunisation at Intensive English Centres in the Sydney South West and Sydney West Area Health Services.

For more information:

NSW Refugee Health Service website at www.refugeehealth.org.au.

Gidding HF, Gilbert GL. Measles immunity in young Australian adults. *Commun Dis Intell*, 2001; 25: 133–136.

Chapter 3.4

Rural and remote populations

- Across Australia, people living in rural and remote areas generally have worse health than those living in metropolitan areas.
- Reasons for this health differential include geographic isolation, socioeconomic disadvantage, shortage of health care providers, greater exposure to injury risks, and poor health among Indigenous people.
- The population of NSW is highly urbanised. Less than one per cent of the total population live in areas classified as 'remote' or 'very remote', according to the Accessibility–Remoteness Index of Australia Plus (ARIA+).
- Indigenous people comprise almost one-third of the population of very remote areas.
- Compared with people who live in metropolitan areas, people who live in remote or very remote areas:
  - can expect to live 4 years less in remote areas and 10 years less in very remote areas;
  - are more likely to die from causes classified as 'avoidable';
  - report more visits to community health services and hospital emergency departments;
  - are more likely to be hospitalised for conditions for which hospitalisation can be avoided through prevention and early management;
  - are more likely to be hospitalised for coronary heart disease;
  - are more likely to die in motor vehicle crashes;
  - are more likely to die from gun-related injuries.

In this chapter

- Demography
- Life expectancy
- Potentially avoidable deaths
- Potentially avoidable hospitalisations
- Heart disease
- Injury
- Health service use

Introduction

An individual's place of residence within the State can affect the health outcomes they experience. Across Australia, people living in rural and remote areas have worse health generally than those living in metropolitan areas. Many factors contribute to this differential, including geographic isolation, socioeconomic disadvantage, shortage of health care providers, greater exposure to injury risks, and poor health.

This chapter presents a range of health indicators for NSW according to the newly enhanced Accessibility–Remoteness Index of Australia Plus classification (ARIA+). ARIA+ is widely accepted as Australia's most authoritative geographic measure of remoteness (CDHAC and GISCA, 1999). This classification differs from the ARIA classification used in the previous report in several ways. In the ARIA classification, categories were allocated on the basis of an average index score—0 (high accessibility) to 12 (high remoteness)—within each Statistical Local Area (SLA). This index score was based on the road distance from the closest service centre with a population of 5,000 people or more. Localities were grouped into 5 categories: 'highly accessible', 'accessible', 'moderately accessible', 'remote', and 'very remote' services (AIHW, 2004).

In ARIA+, the remoteness index value is based on distance to 5 categories of service centre, including centres with populations from 1,000–4,999 people. Populated localities with populations of greater than 1,000 persons are considered to contain at least some basic level of services (for example: health, education, or retail) (CDHAC and GISCA, 1999). Those service centres with larger populations are assumed to contain a greater level of service provision. Remoteness categories are assigned to Census Collection Districts (CDs) based on the average ARIA+ score within the CD. As CDs are generally smaller than SLAs, this provides a greater level of precision of the measure of remoteness (AIHW, 2004).

The names of the first 3 categories of remoteness—metropolitan, inner-regional, and outer-regional—have changed also from those used by ARIA. The names for remote and very remote classes remain the same although they are assigned slightly differently under ARIA+. The effect of this for NSW has been a redistribution of population among categories, although a similar proportion of the population are classified as living in remote and very remote areas. It has also meant that some SLAs have been reclassified.

The ARIA+ index does not provide specific information about the accessibility of health services. The service centres used to develop the classification were defined according to population size, rather than the presence of particular services such as hospitals or general practitioners or schools. However, there is a strong relationship between population size and service availability, particularly in regard to education and health services (CDHAC and GISCA, 1999).

The change to ARIA+ and several other changes in the methods used for preparing the current report prevent assessment of changes in the gradient of health by remoteness since 2002. This report used the 2001 Australian population for age-adjustment of rates. The 2002 report used the 1991 Australian population. There have also been changes to the coding of ambulatory care sensitive conditions (see Burden of disease chapter for further information).

NSW Health is working to improve the provision of health services in small rural and remote communities through providing telehealth services; rural nursing initiatives such as the Nurse Practitioner Services; workforce initiatives such as the Area of Need Program; medical service initiatives such as the NSW Resident Medical Officer Cadetship Scheme and Rural Medical Undergraduate Program; transport initiatives such as the Isolated Patients' Travel and Accommodation Scheme and implementation of the Transport for Health Initiative; and health service infrastructure development through the NSW Rural Hospital and Health Service Program.

The Rural Health Implementation Coordination Group (RHICG) was established in 2000 to advise on how to progress the commitments in the Government Action Plan relating to rural health and advise on additional strategies to improve health care.

The RHICG's *NSW Rural Health Report* was released in September 2002. The Report describes initiatives to be implemented over the next 5 years, which address 3 fundamental issues: attracting and retaining health care professionals; providing certainty and security for services provided in rural areas; and providing services closer to where rural people live. A number of RHICG initiatives have already been incorporated into planning and policy.

Renal, oncology, cardiology, and critical care services in rural NSW have been expanded, with the establishment of 5 centre-based renal services and new outreach services; the opening of the first 5 cardiac catheterisation laboratories; and additional oncology clinics. The NSW Institute of Rural Clinical Services and Teaching is being established to support rural health staff by facilitating the networking of services and clinicians, providing opportunities to trial new models of service delivery, and undertaking collaborative research. The NSW Rural Health Taskforce was established in 2003 to monitor and advise on progress in implementing the *NSW Rural Health Report*.

For more information:

Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004. Available at www.aihw.gov.au/publications/index.cfm/title/10014.

Australian Institute of Health and Welfare. *Rural, Regional and Remote Health: A guide to remoteness classifications*. AIHW Catalogue no. PHE 53. Canberra: AIHW, 2004. Available at www.aihw.gov.au.

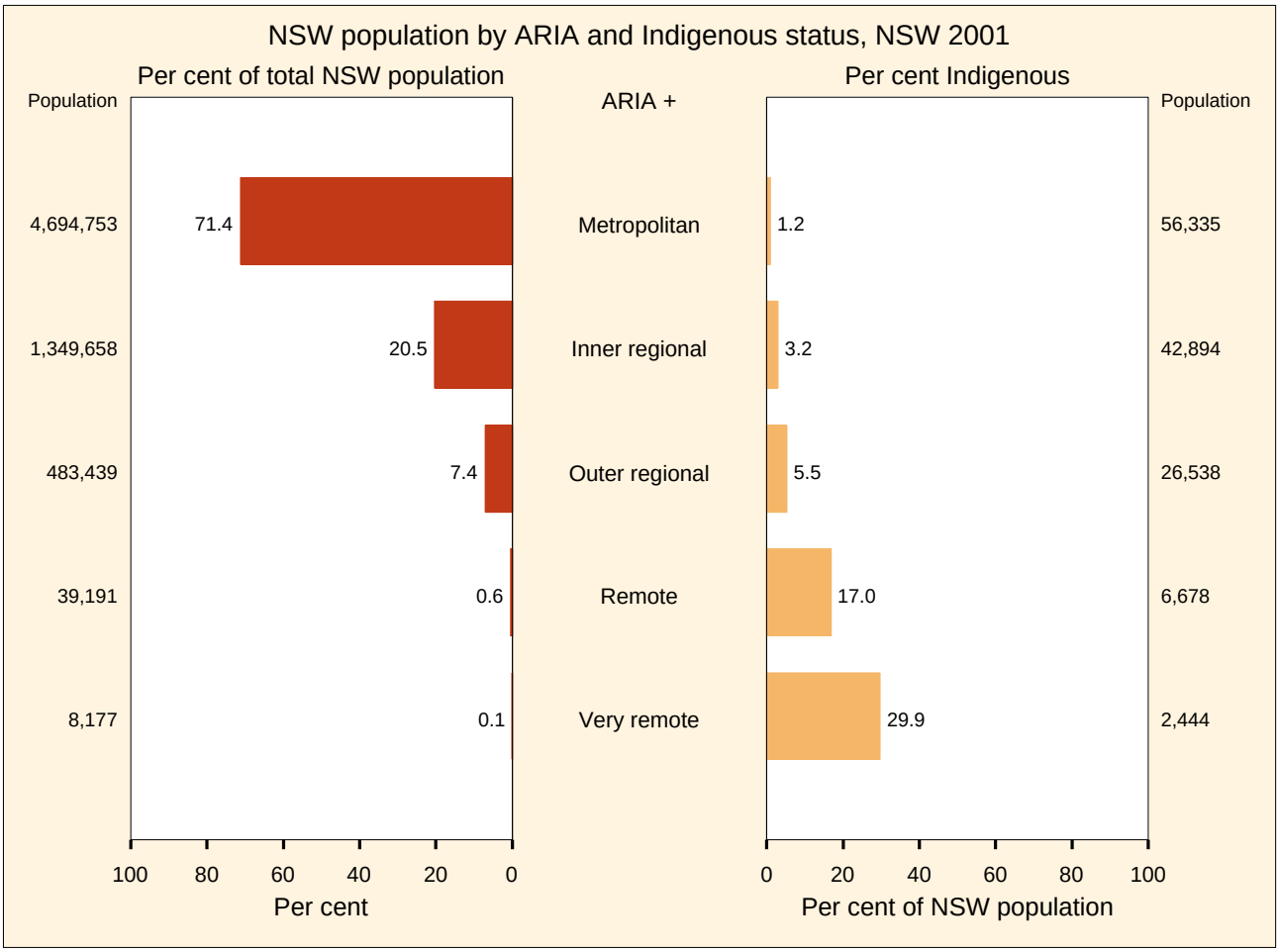
Australian Bureau of Statistics. *ASGC Remoteness Classification: Purpose and Use Census Paper no. 03–01 2003.* Available at www.abs.gov.au.

Commonwealth Department of Health and Ageing and the National Key Centre for Social Applications of Geographical Information Systems (GISCA). *Accessibility–Remoteness Index of Australia*. Occasional Papers Series no 5. Canberra: Commonwealth Department of Health and Aged Care, 1999.

National Key Centre for Social Applications of Geographical Information Systems at www.gisca.adelaide.edu.au.

NSW Department of Health's Rural health website at www.health.nsw.gov.au/rural.

Wearne SM et al. Training our future rural medical workforce. *MJA 2004;* 180(3): 101–102.



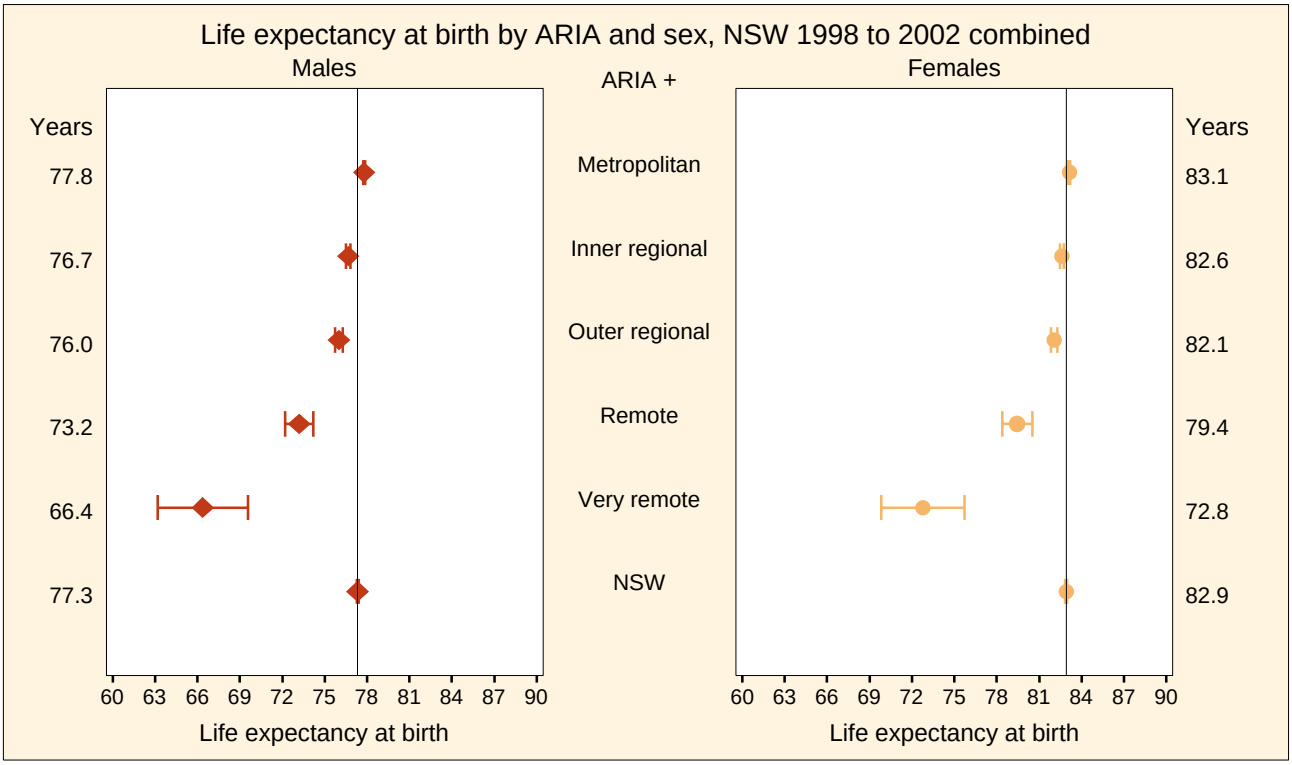
Note: Statistical Local Areas were assigned to the Accessibility–Remoteness Index of Australia Plus (ARIA+). 'Indigenous' is used here to refer to both Aboriginal and Torres Strait Islander people. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: Accessibility–Remoteness Index of Australia Plus (ARIA+) and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- The population of NSW is highly urbanised. Just over 47,000 people (0.7% of the population) live in areas classified as remote or very remote according to ARIA+.
- Areas classified as remote or very remote are clustered in the west and northwest of the State. The very remote category comprises the Statistical Local Areas (SLAs) of Bourke and Lord Howe Island, 68% of Central Darling, 42% of Brewarinna, 9% of Cobar, and 5% of Walgett. Two SLAs, Bogan and Coonamble, are classified as 100% remote and 19 SLAs inlcuding Walgett (95%), Cobar (91%), Carrathool (67%), Brewarrina (58%), and Lachlan (48%), and have a varying proportion of Census Collection Districts classified as remote.
- Among the new NSW area health services, only 3 (Greater Southern, Hunter & New England, and Greater Western) include SLAs that are classified as at least partly remote or very remote.
- Aboriginal people comprise 30% of the population of very remote areas, although less than 1 in 10 (6.8%) Indigenous people live in remote or very remote areas.

For more information:

Australian Institute of Health and Welfare. *Rural, Regional and Remote Health: A guide to remoteness classifications.* AIHW Catalogue no. PHE 53. Canberra: AIHW, 2004. Available at www.aihw.gov.au.



Note: Statistical Local Areas were assigned to the Accessibility–Remoteness Index of Australia Plus (ARIA+). Abridged current life tables using Chiang's method were used to calculate point estimates and confidence intervals for life expectancy (see Methods section). Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Lower and upper limits of the 95% confidence interval are shown. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: Accessibility–Remoteness Index of Australia Plus (ARIA+), ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

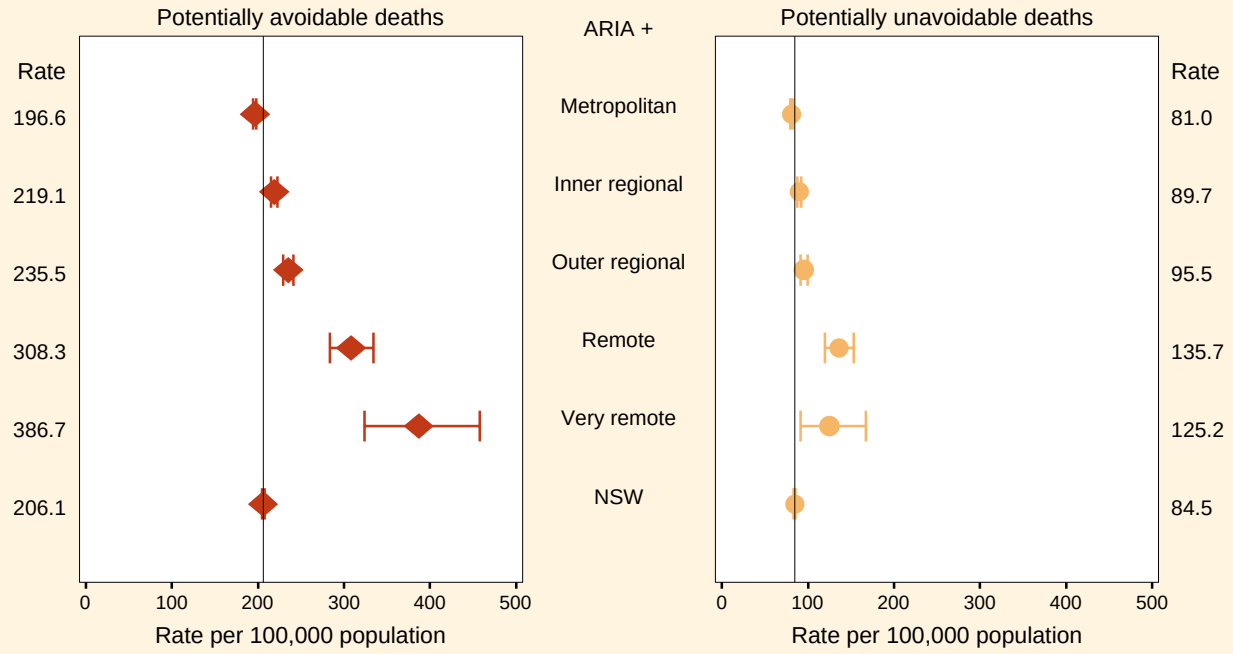
- Life expectancy at birth is an estimate of the average length of time (in years) that a person born now can expect to live, assuming that the current rates of death for each age group will remain the same for the lifetime of that person. In fact, death rates will almost certainly change over the lifetime of a person born now, because of changes in social and economic conditions, lifestyle and environmental factors, the quality of health care, and possibly the emergence of new diseases. However, because no-one knows what the death rates for each age group and sex will be in the future, the usual practice is to use the current rates of death to calculate life expectancy.
- In NSW in the period 1998–2002, life expectancy at birth decreased with remoteness but was lower for males across all categories of remoteness. For males it ranged from 66.4 years in very remote areas and 73.2 years in remote areas, to 77.8 years in metropolitan areas. In females, the corresponding figures were 72.8 years in very remote areas, 79.4 years in remote areas, and 83.1 years in metropolitan areas.
- Indigenous people make up almost 17% of the population of remote and 30% of very remote areas, but the overall life expectancy in these areas is still considerably above the estimated life expectancy for Indigenous residents of NSW (56.8 years for males and 63.6 years for females).
- Differences in life expectancy according to ARIA+ category reflect higher death rates from many causes in rural and remote areas The high proportion of Indigenous people in remote areas acts to lower the average life expectancy in these areas. By contrast, the migration of the frail aged towards less remote areas is likely to increase the estimated average life expectancy in remote areas.

For more information:

Australian Institute of Health and Welfare, *Rural, Regional and Remote Health: A study on mortality.* AIHW Catalogue no. PHE 45. Canberra: AIHW, 2003. Available at www.aihw.gov.au.

Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004. Available at www.aihw.gov.au/publications/index.cfm/title/10014.

Potentially avoidable deaths, persons aged less than 75 years, NSW 1998 to 2002 combined



Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Lower and upper limits of the 95% confidence interval are shown. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm. Statistical Local Areas were assigned to the Accessibility–Remoteness Index of Australia Plus (ARIA+).

Source: Accessibility–Remoteness Index of Australia Plus (ARIA+), ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

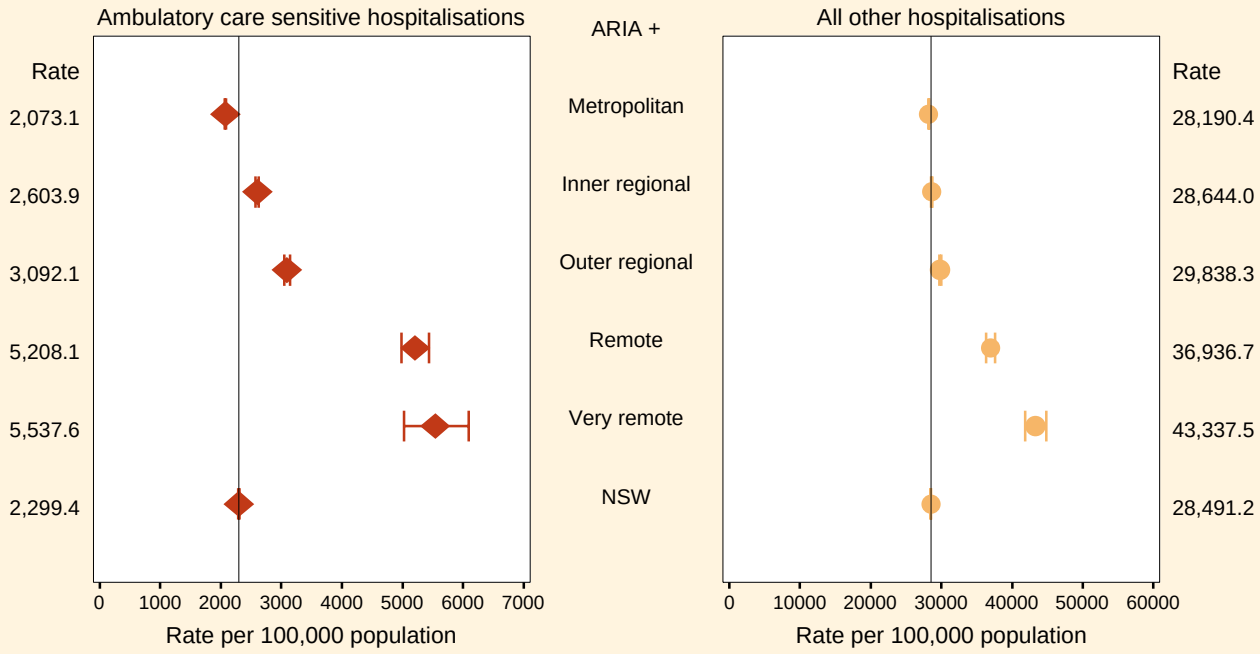
- Classification of premature deaths as 'avoidable' and 'unavoidable' gives an indication of the potential scope for closing health gaps. More information about the classification of avoidable deaths is given in the Methods section. Deaths classified as avoidable are those that could potentially be avoided through the activities of the health and related sectors (Tobias and Jackson, 2001).
- In NSW in the period 1998–2002, the rate of premature death from all causes increased with remoteness, as did death rates from avoidable causes. The rate of potentially avoidable deaths was twice as high in very remote areas compared with metropolitan areas. The rate from causes classified as unavoidable also increased with remoteness, though less dramatically. This was 1.6 times higher in very remote areas than in metropolitan areas. Three-quarters of premature deaths were potentially avoidable in very remote areas, compared to 71% in metropolitan areas.
- In very remote areas, the rate of avoidable death in Indigenous people was 4 times higher than in non-Indigenous people. Among Indigenous people, the rate of avoidable deaths was 2.2 times higher in very remote areas than in metropolitan areas. Among non-Indigenous people, the rate of avoidable deaths in very remote areas was only 1.3 times the rate in metropolitan areas. For Indigenous people in remote areas, 74% of deaths were avoidable deaths.
- These findings indicate that there is scope for closing the health gap between residents of remote and more accessible areas through targeting health services and programs towards Indigenous people in remote areas.

For more information:

Tobias M, Jackson G. Avoidable mortality in New Zealand, 1981–97. *Aust N J Z Public Health* 2001; 25: 12–20.

Australian Institute of Health and Welfare. *Rural, Regional and Remote Health: A study on mortality*. AIHW Catalogue no. PHE 45. Canberra: AIHW, 2003. Available at www.aihw.gov.au.

Ambulatory care sensitive and all other conditions, hospital separations 2002-03 by ARIA, NSW



Note: Hospital separations were classified using ICD-10-AM. Rates were age-adjusted using the Australian population as at 30 June 2001. Lower and upper limits of the 95% confidence interval are shown. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm. Numbers for 2002–03 include an estimate of the small number of interstate hospitalisations, data for which were unavailable at the time of production. Statistical Local Areas were assigned to the Accessibility–Remoteness Index of Australia Plus (ARIA+).

Source: Accessibility–Remoteness Index of Australia Plus (ARIA+), NSW Inpatient Statistics Collection, and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

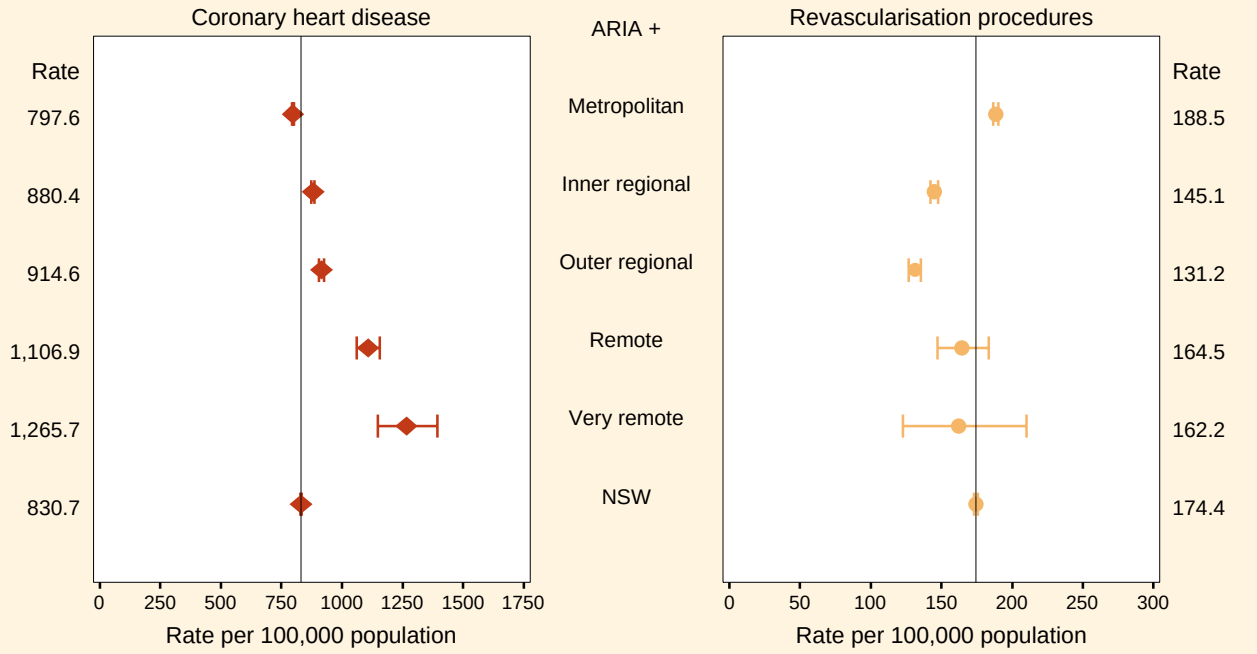
- Ambulatory care sensitive conditions are those for which hospitalisation is thought to be avoidable through prevention and/or early disease management. Hospitalisation rates for these conditions are used as an indicator of access to, and quality of, primary care. However, they are also influenced by other factors, including disease prevalence, hospital admission practices, and personal choices about seeking health care. The ambulatory care sensitive conditions considered here include acute, chronic and vaccine preventable conditions such as influenza, asthma, congestive heart failure, and diabetes complications (see Methods section).
- In NSW in 2002–03, hospitalisation rates for ambulatory care sensitive conditions increased with remoteness. The rate among residents of very remote areas was 2.7 times higher compared to the rate for residents of metropolitan areas. Hospitalisation rates for all other conditions also increased with remoteness, though less markedly, with the rate 1.5 times higher among residents of very remote areas than for residents of metropolitan areas. Hospitalisations for ambulatory care sensitive conditions made up 12% of all hospitalisations in very remote areas, compared to only 6.9% in metropolitan areas.
- The pronounced gradient in rates of hospitalisation for ambulatory care sensitive conditions reflects barriers to accessing primary care and specialist services in remote areas. These include geographic isolation, transport difficulties, shortages of general practitioners, limited after-hours services, and lack of bulk-billing practices (see Burden of disease chapter). Other contributing factors may include the higher prevalence of many health conditions among Indigenous people, and a greater propensity to admit to hospital people who come from remote areas.

For more information:

The Victorian Ambulatory Care Sensitive Conditions Study: 2001–02. Melbourne: Victorian Department of Human Services, 2004.

National Health Performance Committee. *National Report on Health Sector Performance Indicators 2003*. Canberra: AIHW, 2004.

Coronary heart disease and revascularisation procedures hospital separations by ARIA, NSW 1998-99 to 2002-03



Note: Rates were age-adjusted using the Australian population as at 30 June 2001. Lower and upper limits of the 95% confidence interval are shown. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm. Numbers for 2001–02 and 2002–03 include an estimate of the small number of interstate hospitalisations, data for which were unavailable at the time of production. Statistical Local Areas were assigned to the Accessibility–Remoteness Index of Australia Plus (ARIA+).

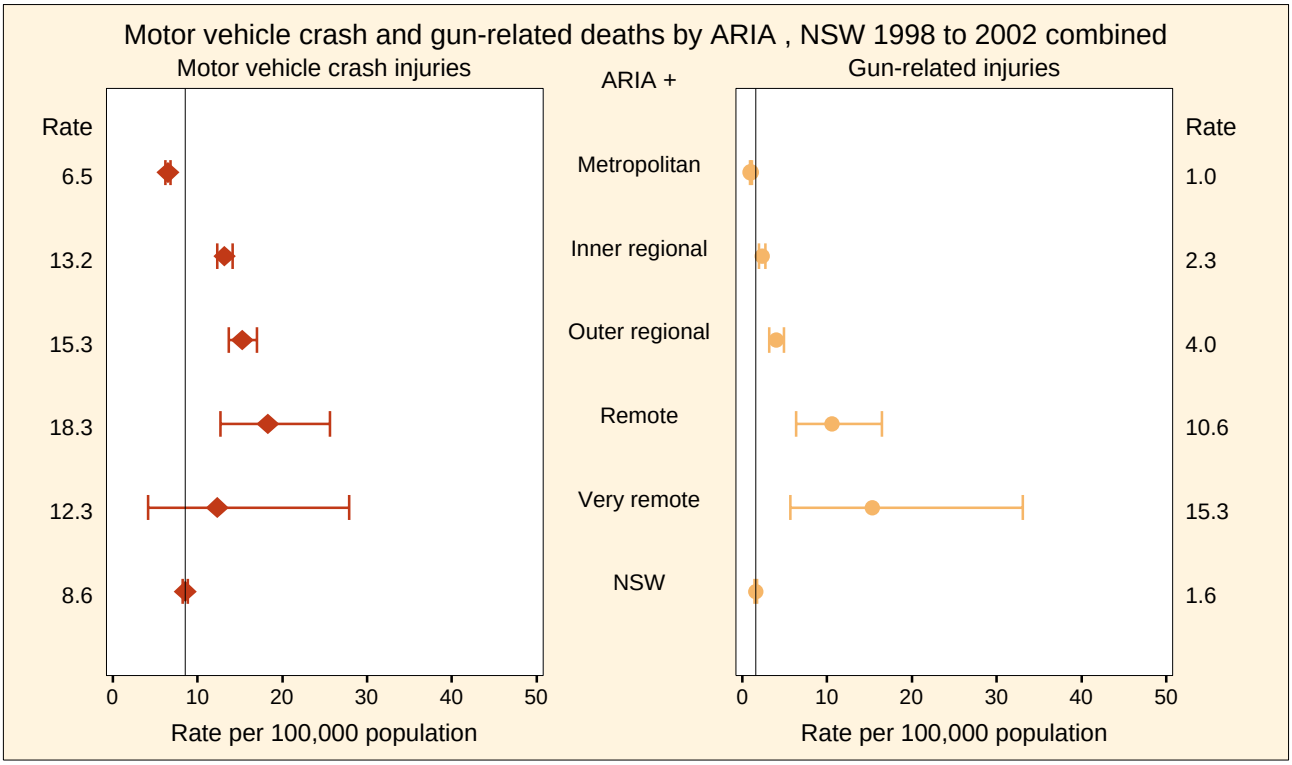
Source: Accessibility–Remoteness Index of Australia Plus (ARIA+), NSW Inpatient Statistics Collection, and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Coronary heart disease is caused by blockages in the arteries that supply blood to the heart muscle. Revascularisation procedures (coronary artery bypass graft and angioplasty) are used to restore adequate blood flow to blocked coronary arteries.
- Hospitalisation rates for coronary heart disease in the period 1998–99 to 2002–03 were highest among people living in remote and very remote areas of NSW, and lowest among those living in metropolitan areas. Variations in the incidence of coronary heart disease may reflect differ-ences in levels of risk factors such as smoking. Higher levels of these risk factors are seen among Indigenous people. Admission practices can also vary due to the requirement for precautions associated with greater distances and limited access to other service types.
- Among Indigenous people, residents of very remote areas were 2.9 times more likely than residents of metropolitan areas to be hospitalised for coronary heart disease. The corresponding figure for non-Indigenous people was 1.1 times.
- Hospitalisation rates for revascularisation procedures also varied with ARIA+ category, although this was not clearly related to remoteness.
- The ratio of separations for revascularisation procedures to total coronary heart disease separations did decrease with remoteness, from 0.24 for people living in metropolitan areas to 0.14 for people living in very remote areas. Lower values for this ratio may relate to lesser severity of disease among people who are hospitalised, as well as lesser access to cardiac surgery services.
- Recent studies in Canada and New Zealand have found that patients admitted to a hospital without cardiac interventional facilities receive fewer investigations and less revascularisation than patients admitted to centres with such facilities.

For more information:

Alter DA, Tu JV, Austin PC, Naylor CD. Waiting times, revascularization modality, and outcomes after acute myocardial infarction in all hospitals with and without revascularization facilities in Canada. *J Am Coll Cardiol* 2003; 42(3): 410–9.

Ellis C, et al. Acute Coronary Syndrome patients in New Zealand receive less invasive management when admitted to hospitals without invasive facilities. *N Z Med J* 2004; 117(1197): U954.



Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Lower and upper limits of the 95% confidence interval are shown. Statistical Local Areas were assigned to the Accessibility–Remoteness Index of Australia Plus (ARIA+). Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: Accessibility–Remoteness Index of Australia Plus (ARIA+), ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

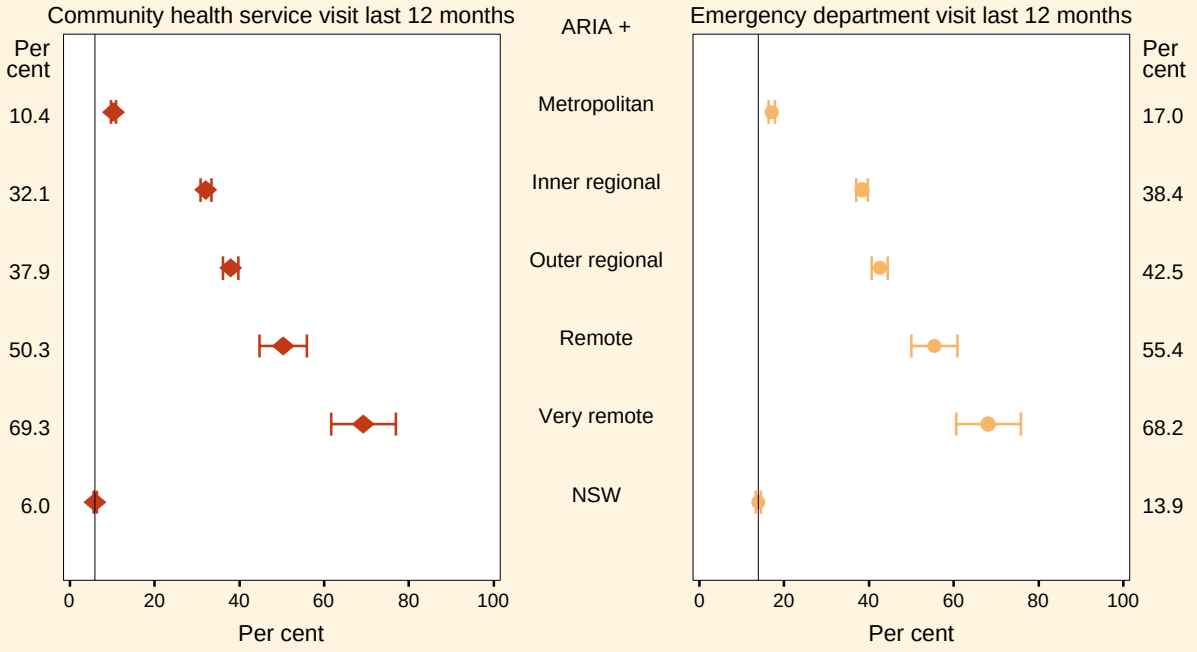
- In NSW, between 1998 and 2002, death rates due to many causes of injury tended to increase with remoteness. Death from all causes of injury and poisoning combined was more than twice as likely in remote areas than in metropolitan areas, while death from motor vehicle crashes was 3 times more likely and death from gun-related injuries was more than 10 times more likely.
- Of the road traffic crashes recorded by the NSW Roads and Traffic Authority (RTA) in 2002, 64% of fatalities occurred on country roads. Of these, 21% occurred on country urban and 43% on country non-urban roads (RTA, 2003).
- The pattern of increasing mortality from injury with increasing remoteness was particularly seen in males. In remote areas, males were 3.8 times more likely than females to die in a motor vehicle crash, while males were 2.6 times more likely to die from this cause in metropolitan areas. Almost all those who died of a gun-related injury in remote areas were males.
- High injury death rates in remote areas may be due in part to the high death among Indigenous people from these causes. However, non-Indigenous residents of rural and remote areas also experience elevated death rates from injury and poisoning. Death rates among non-Indigenous residents of remote areas were 2.5 times higher than in their metropolitan counterparts.

For more information:

Roads and Traffic Authority. *Preliminary Traffic Accident Data for January 2003: Monthly Bulletin.* Sydney: RTA Road Strategy Branch, 2003.

Australian Institute of Health and Welfare, *Rural, Regional and Remote Health: A study on mortality.* AIHW Catalogue no. PHE 45. Canberra AIHW 2003. Available at www.aihw.gov.au.

Community health service and emergency department visits by ARIA, persons aged 16 years and over, NSW 2002 and 2003



Note: Statistical Local Areas were assigned to the Accessibility–Remoteness Index of Australia Plus (ARIA+).

Source: Accessibility–Remoteness Index of Australia Plus (ARIA+) and NSW Health Survey 2002 and 2003 (HOIST). Centre for Epidemiology and Research, NSW Department of Health. Lower and upper limits of the 95% confidence interval are shown. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

- Patterns of health service use reflect not only patterns of illness, but differences in the availability and accessibility of health services and in the way people choose to use them.
- Emergency department and community health service visits during the 12 months 2002–03 were more likely with increasing remoteness. People living in very remote areas were more than 4 times more likely to report an emergency department visit, and almost 7 times more likely to report a community health service visit, than residents of metropolitan areas.
- Greater use of community health services and emergency departments in rural and remote areas reflects lesser availability of general practitioner services. However, there is some indication that the number of general practitioner services has increased in remote areas in Australia. In 2001, there were 118 per 100,000 in major cities, compared with 81 per 100,000 in very remote areas (AIHW, 2003). However, the rate of bulk billing has declined in all areas, which may negate some of this increase in availability (National Health Performance Committee, 2004).
- NSW Health is working to improve access to health services in rural and remote areas. The Area of Need Program permits overseas-trained doctors to work in areas where it is difficult to recruit a locally-trained doctor. A number of other programs also involve the recruitment of overseas-trained doctors.
- To increase the number of doctors who take up rural practice, NSW Health offers scholarships to doctors to work and study in rural locations and gain their specialist medical qualifications. Eight NSW Rural Health Training Units have been established to focus on the issues of recruitment and retention of health professionals in rural and remote NSW. Procedural general practitioner training positions have been established to ensure the skills base of rural general practitioners is maintained.

For more information:

National Health Performance Committee. *National Report on Health Sector Performance Indicators 2003.* Canberra AIHW, 2004.

Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004. Available at www.aihw.gov.au/publications/index.cfm/title/10014.

Australian Institute of Health and Welfare. *Medical Labour Force 2001.* Canberra: AIHW, 2003.

NSW Rural Hospital and Health Service Program. Available at www.asset.gov.com.au/ruralhospitals.

NSW Rural Health Plan September 2002. Available at www.health.nsw.gov.au/rural/pdf/ruralresponse.pdf.

Chapter 3.5

Socioeconomic status

- In NSW and Australia, as in other states and countries, disparities occur between socioeconomic groups in many measures of mortality and morbidity, partly due to differences in health behaviours and risk factors between groups but also due to inequalities in the health system.
- Rates of premature death have declined among all socioeconomic groups over the past 20 years in NSW.
- By far the steepest decline has been among the highest socioeconomic group, resulting in an increase in the relative gap between this group and the rest of the population.
- The relative gap between the lowest socioeconomic group and the middle two-thirds of the population appears to be narrowing.
- A similar pattern was also seen for:
  - deaths from causes classified as 'potentially avoidable' through primary, secondary, and tertiary health system interventions;
  - teenage mothers.
- A different pattern exists for hospitalisations that can potentially be avoided through prevention and early disease management. Over the 9 years to 2002–03, the relative gap in rates of these hospitalisations was the same for the lowest and highest socioeconomic groups, but the gap between the lowest socioeconomic group and the rest of the population appears to be closing.
- The relative gap in life expectancy has been stable, as has the relative gap in unavoidable mortality in females. In males, the relative gap in unavoidable mortality between the lowest socioeconomic groups and the rest of the population appears to be closing.
- The highest socioeconomic group has had consistently lower rates of mortality, hospitalisations, and births to teenage mothers, compared to both the lowest socioeconomic group and the rest of the population, and has had relatively greater reductions—particularly in avoidable causes of death—than the other 2 groups. This suggests inequalities in the distribution of health benefit in NSW.

In this chapter

- Life expectancy
- Premature deaths from all causes
- Potentially avoidable deaths
- Primary potentially avoidable deaths
- Secondary potentially avoidable deaths
- Tertiary potentially avoidable deaths
- Unavoidable deaths
- Potentially avoidable hospitalisations
- Teenage mothers

Introduction

There is a growing volume of literature that records the effect of the socioeconomic gradient on health (for instance: Eckersley, Dixon and Douglas, 2001; Oliver and Exworthy, 2003; Wanless, 2004; NSW Department of Health, 2004; Queensland Health, 2004; and Fitzpatrick and Jacobson, 2001). These show—over a number of countries and under different health systems—that a gradient exists; as socioeconomic disadvantage increases there is a concomitant increase in mortality and morbidity, as well as in behaviours and risk factors that affect health outcomes, such as the level of smoking, exercise, and type of diet. There is concern that such inequality is increasing both in NSW (Hayen et al., 2002) and overseas (Fitzpatrick and Jacobsen, 2001).

In 2004, NSW Health implemented the NSW Health and Equity Statement *In All Fairness* (NSW Department of Health, 2004). It aims to address health inequalities both through the development of policies and programs that address health inequalities and the integration with other government and non-government agencies that aim to improve social cohesion and other aspects of community life in a way that addresses some of the 'midstream' and 'upstream' causes of the socioeconomic gradient (Turrell, 2001). The beneficial effect of such a cross-departmental approach was credited with causing a reduction in the gap in infant mortality between groups involving the highest and lowest quartile of income in New York, which occurred between 1988 and 2001 (Racine and Joyce, 2004).

This chapter considers the trends across socioeconomic groups in NSW of several key health indicators, many of which relate to various forms of potentially avoidable conditions. These include premature mortality (death before the age of 75) from all causes; potentially unavoidable and avoidable deaths, with the avoidable deaths being split into those amenable to primary, secondary, or tertiary prevention; avoidable hospitalisations; life expectancy; and teenage pregnancy. Potentially avoidable deaths refer to deaths before the age of 75 that 'should not occur in the presence of effective and timely health care' (Nolte and McKee, 2004). Deaths amenable to primary prevention could be avoided based on current knowledge of the causes of the disease and consequent promotion of healthy lifestyle (such as healthy eating and encouraging exercise) or legislative change (for instance, against smoking in public buildings). Those amenable to secondary prevention could have been prevented by screening, or other early intervention practices. Tertiary preventable causes of death could be prevented by timely medical intervention. These categories are based on the work of Tobias and Jackson (2001). Avoidable hospitalisations refer to those conditions where hospitalisation could be avoided by timely primary health care (by general practitioner services or community health centres). As this primary care is usually in the form of a 'walk in' consultation, these hospitalisations are referred to as 'ambulatory care sensitive' hospitalisations.

Both the absolute change in rates of these indicators over time and the relative rate of change between socioeconomic groups are presented. Such information is an important and ongoing requirement to assess the success of any initiative aiming to reduce the current level of inequality.

There have been some changes in the methods used in the 2004 report compared to the previous report. The codes that were used for potentially avoidable deaths and hospitalisations are based a review of Tobias and Jackson's (2001) codes undertaken by the Public Health Information and Development Unit (PHIDU) as part of a national project to standardise the disease categories and exclusion criteria used (see www.publichealth.gov.au/projects.htm for further information). Also of note is that the Australian Bureau of Statistics released a new SEIFA index based on the 2001 Census. This is not exactly the same as the disadvantage indices from previous censuses due to a review of methodology. However, according to the ABS Information Paper, the index of disadvantage from the 2001 census uses the same method and same variables, and 'is most comparable to its 1996 counterpart' (ABS, 2001). Small area boundaries (Statistical Local Areas) used by the ABS also changed significantly for the 2001 census. As a consequence, some adjustment of boundaries between the health data, population data, and disadvantage index was required. New standard populations based on the 2001 Census were also used. All these factors have resulted in some slight changes in the numbers and/or rates presented for socioeconomic categories. To compare relative rates of decline in rates of death and hospitalisation—among socioeconomic groups—a Poisson model, adjusted for age, was fitted to the data.

Further details on the methods used in this report can be found in the Methods section.

For more information:

Australian Bureau of Statistics. *Socio-Economic Indexes for Areas, Australia 2001.* ABS Catalogue no. 2039.0. Canberra: ABS, 2003.

Eckersley R, Dixon J and Douglas B (editors). *The social origins of health and wellbeing.* Cambridge: Cambridge University Press, 2001.

Fitzpatrick J and Jacobson B. *Mapping Health Inequalities Across London.* London: London Health Observatory, 2001.

Hayen A, Lincoln D, Moore H, and Thomas M. Trends in Potentially Avoidable Mortality in NSW. *N S W Public Health Bull* 2002; 13(11–12): 226–236.

Jackson G and Tobias M. Potentially avoidable hospitalisations in New Zealand, 1989–98. *Aust N Z J Public Health* 2001; 25(3): 212–219.

NSW Department of Health. *NSW Health and Equity Statement: In All Fairness.* Sydney: NSW Department of Health, 2004.

Nolte E and McKee M. *Does healthcare save lives? Avoidable mortality revisited.* London: The Nuffield Trust, 2004.

Oliver A and Exworthy M (editors). *Health inequalities. Evidence, policy and implementation. Proceedings from a meeting of the Health Equity Network.* London: The Nuffield Trust, 2003.

Queensland Health. *Health determinants Queensland 2004 at a Glance.* Brisbane: Queensland Health, 2004.

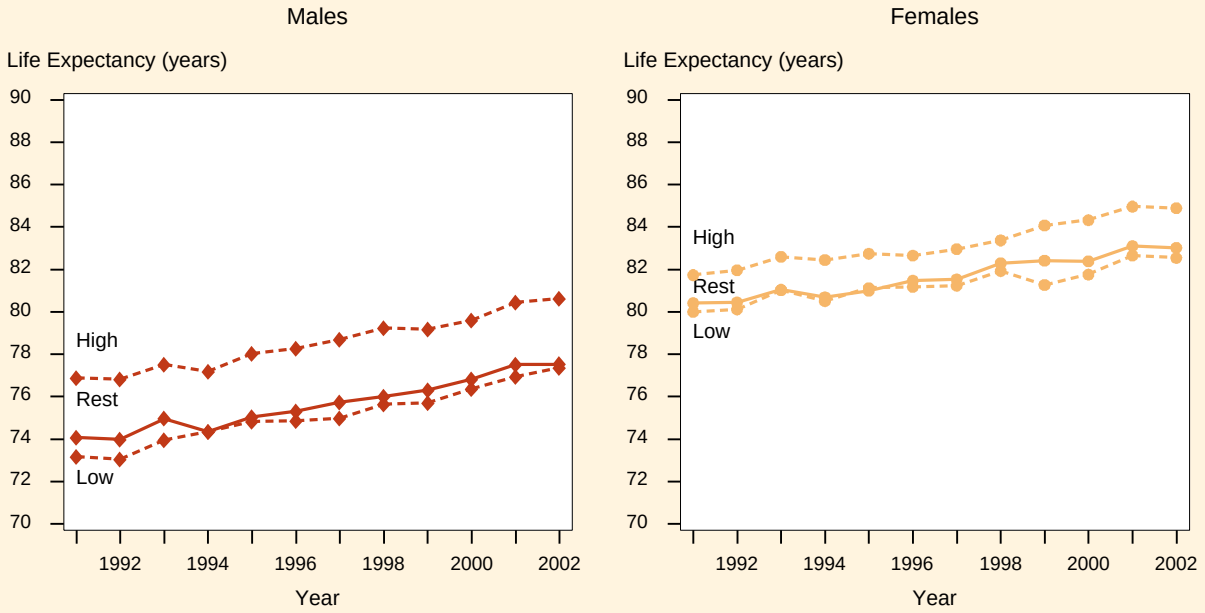
Racine AD and Joyce TJ. The Disappearing Income Gradient in New York City Birth Outcomes: Thirteen years of Convergence From 1988 to 2001. *Pediatrics* 2004; 114(1): 51–57.

Tobias M and Jackson G. Avoidable mortality in New Zealand, 1981–97. *Aust N Z J Public Health* 2001; 25(1): 12–20.

Turrell G. Income inequality and health: In search of fundamental causes. *The Social Origins of Health and Wellbeing.* Eckersley R, Dixon J, and Douglas B (editors). Cambridge: Cambridge University Press, 2001.

Wanless D. *Securing Good Health for the Whole population: Final report.* London: HM Treasury, 2004.

Life expectancy at birth in highest and lowest socioeconomic status quintiles and rest of population by sex, NSW 1991 to 2002



SES group		1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Lowest quintile	Persons	77.3	77.3	77.9	77.9	78.0	78.7	78.5	79.0	79.8	79.9
Rest of population	Persons	78.0	77.5	78.0	78.4	78.6	79.1	79.3	79.6	80.3	80.3
Highest quintile	Persons	80.2	80.0	80.5	80.6	81.0	81.4	81.8	82.1	82.9	82.9
NSW	Persons	78.3	77.9	78.5	78.7	79.0	79.5	79.7	80.0	80.7	80.7

Note: Life expectancy was calculated using the method of Chiang (see Methods section). Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: ABS Socio-Economic Indices for Areas (SEIFA) and ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

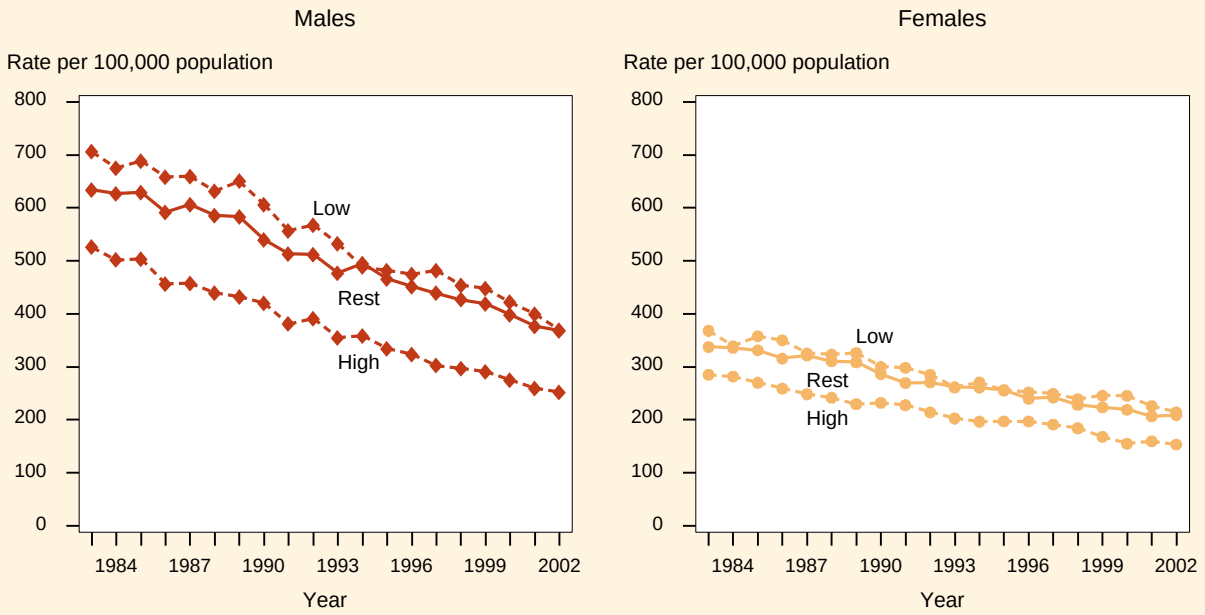
- Although life expectancy of Australians born in the year 2002 is, on average, 80.7 years, people in the highest quintile of socioeconomic (SES) disadvantage are expected to live an average of 3 years longer than those in the lowest quintile of disadvantage. This replicates findings in other countries (AIHW, 2004). In comparison, there is a 20-year difference in life expectancy between Indigenous and non-Indigenous Australians (ABS, 2000).
- In NSW, life expectancies at birth in 2002 of 78.1 years for males and 83.3 years for females were slightly higher than the Australian average of 76.9 and 82.2 respectively (AIHW, 2004). In the 12 years between 1991 and 2002, life expectancy increased for all SES groups for both males and females. The increase was greater for males than for females for all SES groups, averaging 3.6 years for males and 2.7 years for females. The increase was slightly greater in the highest SES group (3.3 years) compared to the lowest SES group (3.2 years) and the rest of the population (3.1 years). Life expectancy was consistency higher in the highest SES group.
- Based on the ratio of the life expectancies between the SES groups, there was no trend towards a widening or narrowing of the gap among them, except for females where an apparent drop in life expectancy occurred in the lowest SES group in 1999. This may be an anomaly caused by using new SEIFA figures from 1999 onwards.

For more information:

Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004. Available at www.aihw.gov.au/publications/index.cfm/title/10014.

Australian Bureau of Statistics website at www.abs.gov.au.

Deaths, premature, in highest and lowest socioeconomic status quintiles and rest of population by sex, persons aged 75 years and less, NSW 1983 to 2002



	SES group		1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	Lowest quintile	Persons	4420	4512	4443	4428	4457	4277	3378	3299	3157	3479
	Rest of population	Persons	12286	12673	12277	11896	11897	11606	12377	12056	11566	11107
	Highest quintile	Persons	3280	3298	3183	3144	3008	2961	2885	2730	2688	2630
	NSW	Persons	19987	20484	19910	19505	19408	18911	18691	18137	17443	17267
Rate per 100,000 population	Lowest quintile	Persons	396.5	378.5	367.7	361.7	364.4	345.1	345.9	333.6	312.7	291.6
	Rest of population	Persons	365.3	374.9	358.0	343.0	338.3	326.0	319.7	307.5	290.6	287.5
	Highest quintile	Persons	274.2	273.1	261.9	256.6	244.0	238.5	226.9	213.3	207.8	201.4
	NSW	Persons	351.9	354.2	340.1	329.4	324.6	312.8	305.2	292.9	277.5	271.2

Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

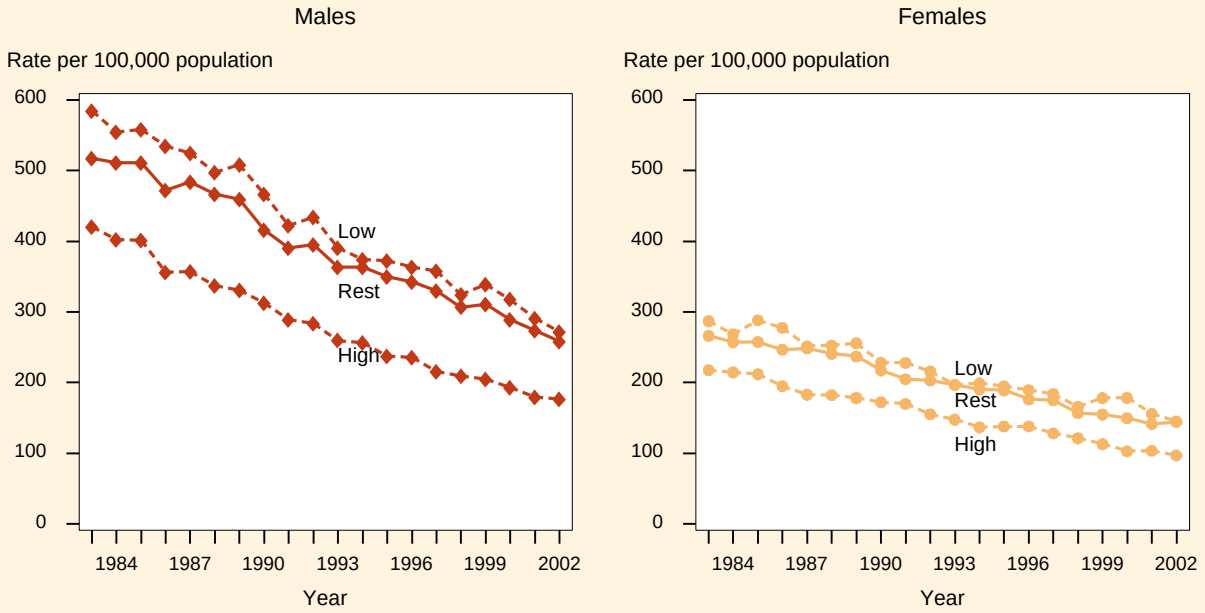
Source: ABS Socio-Economic Indices for Areas and ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In NSW between 1983 and 2002, rates of premature death (before the age of 75 years) fell across all socioeconomic (SES) groups for both sexes. In males, death rates fell by 52% in the highest SES group, 48% in the lowest group, and 42% in the rest of the population. In females, rates fell by 46% in the highest SES group, 43% in the lowest SES group, and 38% in the rest of the population.
- The difference in death rates between the highest and lowest SES groups decreased from 180 to 117 per 100,000 in males, and from 83 to 61 per 100,000 in females over the 20-year period.
- In relative terms, however, the gap between highest and lowest SES groups actually widened. In males, the rate of decline in premature deaths was significantly higher in the highest SES group (3.8% per year) than in either the lowest SES group (3.4%), or the rest of the population (2.9%). The decline in death rate in the middle group was significantly slower than in the lowest SES group.
- In females, the decline in premature deaths was significantly faster in the highest SES group (3.2% per year) than in either of the other groups. The rate of decline in lowest SES (2.9%) and middle groups (2.7%) did not differ significantly.

For more information:

Taylor R. Mediation of the effects of social and economic status on health and mortality: The roles of behaviour and constitution. *The social origins of health and wellbeing.* Eckersley R, Dixon J, Douglas B (editors). Cambridge: Cambridge University Press, 2002.

Deaths, potentially avoidable, in highest and lowest socioeconomic status quintiles and rest of population by sex, persons aged 75 years and less, NSW 1983 to 2002



	SES group		1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	Lowest quintile	Persons	3268	3407	3409	3363	3292	3024	2516	2452	2252	2483
	Rest of population	Persons	9308	9292	9160	8924	8807	8213	8939	8557	8216	7734
	Highest quintile	Persons	2388	2332	2240	2252	2096	2031	2004	1875	1822	1771
	NSW	Persons	14964	15031	14814	14573	14236	13323	13509	12934	12317	12028
Rate per 100,000 population	Lowest quintile	Persons	292.8	285.8	282.3	275.1	269.8	244.2	257.8	247.7	223.1	208.3
	Rest of population	Persons	276.8	274.2	266.8	257.1	250.6	230.6	231.4	218.5	206.8	200.4
	Highest quintile	Persons	199.9	193.0	184.5	183.6	169.8	163.4	157.3	146.4	140.3	135.4
	NSW	Persons	263.5	259.4	252.9	246.0	238.2	220.3	220.7	208.9	196.1	189.0

Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: ABS Socio-Economic Indices for Areas and ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

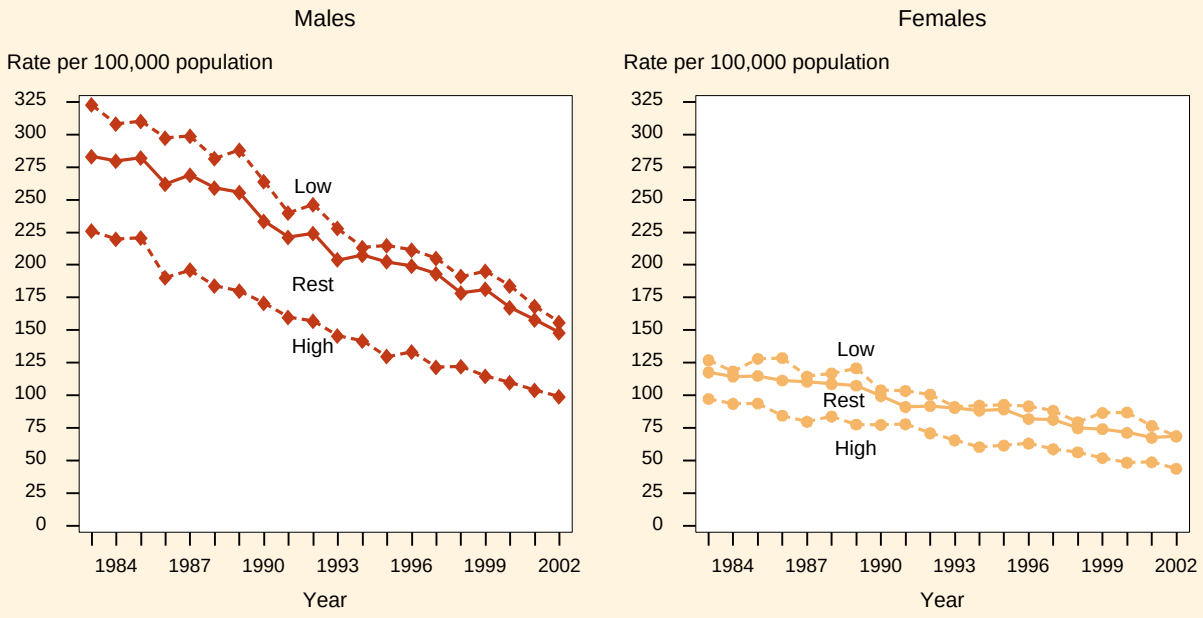
- Deaths classified as 'avoidable' are those that could *potentially* be avoided through the activities of the health and related sectors (Tobias and Jackson, 2001). In 2002, 70% of all premature deaths (deaths before 75 years) were due to potentially avoidable causes, compared to 80% in 1983. Over the 20-year period, the rate of potentially avoidable death fell by 52% in males and by 48% females.
- In absolute terms, the gap in rates of avoidable death between the highest and lowest SES groups narrowed over the 20-year period. The difference in death rates decreased from 164 to 95 per 100,000 in males, and from 70 to 48 per 100,000 in females.
- In males, the relative rate of decline in avoidable deaths was significantly faster in the highest SES group (4.6% per year) than in either the lowest SES group (4.0%), or the rest of the population (3.6%). The decline in death rate in the middle group was significantly slower than in the lowest SES group.
- In females, the decline in avoidable deaths was significantly faster in the highest SES group (4.2% per year) than in either of the other groups, but the rate of decline in the lowest SES (3.6%) and middle groups (3.5%) did not differ significantly.
- In 2002, ischaemic heart disease and stroke contributed over one-third of all avoidable deaths, with lung cancer and colorectal cancer the next largest causes.

For more information:

Tobias M and Jackson G. Avoidable mortality in New Zealand, 1981–97. *Aust N Z J Public Health* 2001; 25(1): 12–20.

Nolte E and McKee M. *Does healthcare save lives? Avoidable mortality revisited.* London The Nuffield Trust, 2004.

Deaths potentially avoidable by primary prevention in highest and lowest socioeconomic status quintiles and rest of population by sex, persons aged 75 years and less, NSW 1983 to 2002



	SES group		1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	Lowest quintile	Persons	1773	1810	1843	1838	1779	1666	1368	1340	1234	1333
	Rest of population	Persons	4884	4955	4950	4821	4787	4484	4902	4645	4458	4170
	Highest quintile	Persons	1235	1198	1143	1185	1099	1095	1052	1003	981	923
	NSW	Persons	7891	7963	7939	7869	7694	7282	7355	7022	6690	6451
Rate per 100,000 population	Lowest quintile	Persons	159.2	152.2	153.0	151.0	146.2	134.8	140.4	135.4	122.4	112.0
	Rest of population	Persons	145.4	146.3	144.3	139.1	136.2	125.9	127.0	118.7	112.3	108.1
	Highest quintile	Persons	103.3	98.9	94.0	96.4	88.8	87.9	82.3	78.2	75.6	70.4
	NSW	Persons	139.1	137.4	135.6	133.0	128.8	120.4	120.2	113.5	106.5	101.3

Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

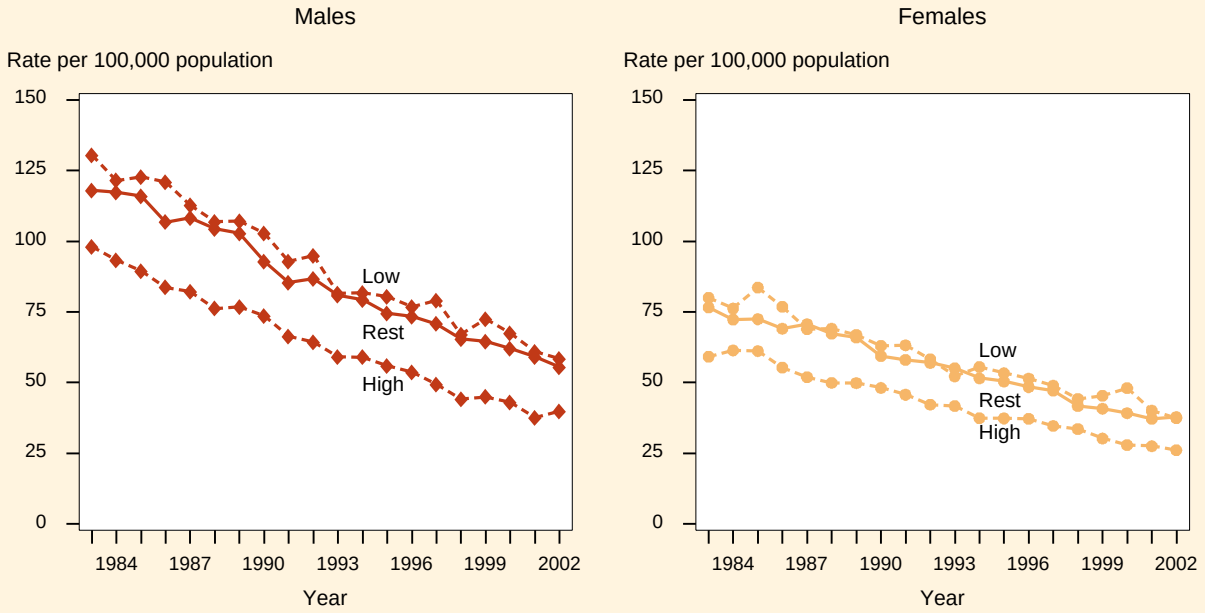
Source: ABS Socio-Economic Indices for Areas and ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- 'Primary' level health interventions are those that can prevent illness or injury before it occurs, such as campaigns to promote healthy lifestyles. The major causes of death that are potentially amenable to primary prevention ('primary avoidable deaths') in NSW are ischaemic heart disease and lung cancer.
- Primary avoidable deaths account for just over half of all potentially avoidable deaths in NSW. This proportion increased from 51% in 1983 to 54% in 1995, and has remained at around this level since then.
- The annual number of primary avoidable deaths in NSW fell from 9,364 in 1983 to 6,451 in 2002. Over the 20-year period, the rate of these deaths fell by 50% in males and 45% in females.
- Those in the highest SES bracket experience the lowest rates of primary avoidable deaths. The difference in rates of these deaths between the highest and lowest SES groups fell between 1983 and 2002: from 96.7 to 56.8 per 100,000 in males and from 29.6 to 24.7 per 100,000 in females. However, among both sexes, the relative rate of decline was significantly greater in the highest SES group than in the other groups. In males, the decline in primary avoidable deaths in the highest SES group (4.3% per year) was significantly greater than in the lowest SES (3.8%) and middle (3.3%) groups. In females, the decline in primary avoidable deaths was also significantly faster in the highest SES group (3.9% per year) than in the lowest (3.2%) and middle (3.1%) SES groups.
- These findings suggest that the success of interventions to prevent illness and injury varies according to socioeconomic status.

For more information:

Tobias M and Jackson G. Avoidable mortality in New Zealand, 1981–97. *Aust N Z J Public Health* 2001; 25(1): 12–20.

Deaths potentially avoidable by secondary prevention in highest and lowest socioeconomic status quintiles and rest of population by sex, persons aged 75 years and less, NSW 1983 to 2002



	SES group		1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	Lowest quintile	Persons	746	820	809	786	781	693	568	567	507	568
	Rest of population	Persons	2257	2193	2119	2096	2057	1897	2035	1985	1916	1801
	Highest quintile	Persons	594	574	559	548	514	479	474	451	421	427
	NSW	Persons	3596	3587	3488	3435	3356	3076	3083	3009	2848	2802
Rate per 100,000 population	Lowest quintile	Persons	66.6	68.5	66.6	63.9	63.7	55.5	58.7	57.7	50.5	47.8
	Rest of population	Persons	67.4	64.9	62.0	60.4	58.6	53.3	52.4	50.4	48.0	46.5
	Highest quintile	Persons	49.7	47.5	46.0	44.7	41.7	38.6	37.3	35.2	32.4	32.7
	NSW	Persons	63.5	62.0	59.6	57.9	56.2	50.8	50.3	48.5	45.3	44.0

Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

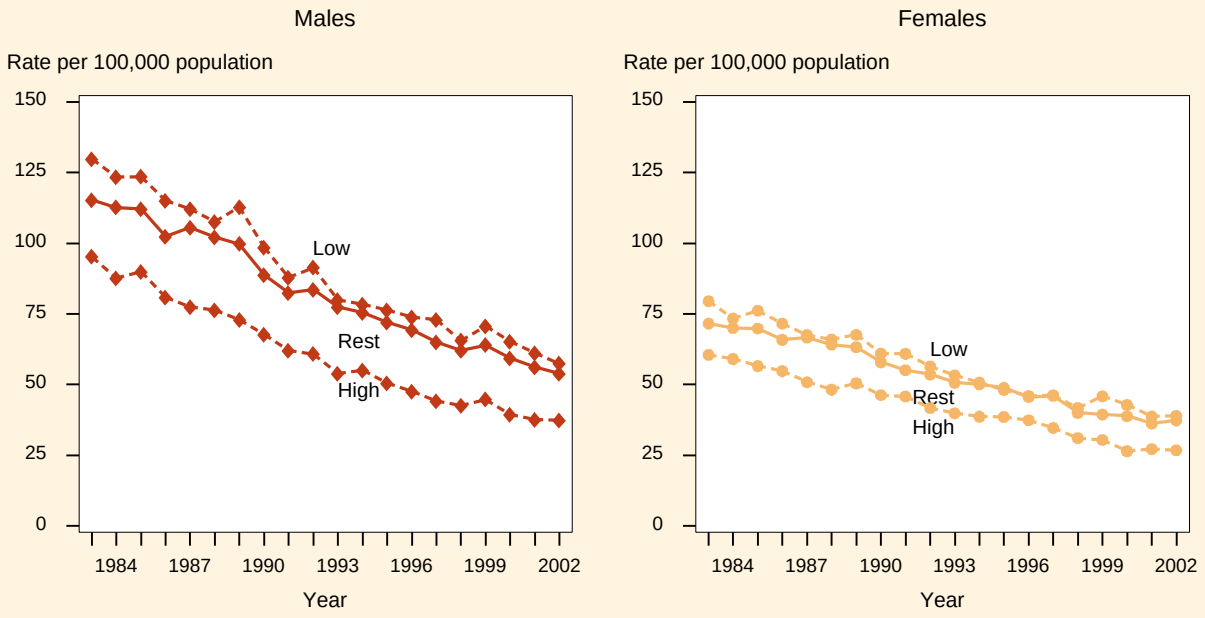
Source: ABS Socio-Economic Indices for Areas and ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- 'Secondary' level health interventions are those that can prevent the worsening or recurrence of health conditions: for example, screening for early detection and treatment of cancers. The major causes of death that are potentially amenable to secondary prevention ('secondary avoidable deaths') in NSW are ischaemic heart disease, stroke, and colorectal cancer.
- Secondary avoidable deaths account for around one-quarter of all avoidable deaths in NSW. This proportion has gradually declined, from 24.5% in 1983 to 23.3% in 2002.
- The annual number of secondary avoidable deaths in NSW fell from 4,499 in 1983 to 2,802 in 2002. Over the 20-year period, rates of secondary avoidable deaths fell by 55% in males and 52% in females, suggesting that early detection and treatment of risk factors for major diseases has been effective.
- In males, the decline in secondary avoidable deaths was significantly faster in the highest SES group (4.9% per year) than in either of the other groups, but the rate of decline in the lowest SES (4.2%) and middle groups (4.0%) did not differ significantly.
- In females, the relative reduction for the highest SES group was 4.5% compared to 4.0% for the lowest SES group and 3.9% for the rest of the population. Only the difference between the highest and middle SES groups was significant.
- These findings suggest that the success of screening and early treatment varies according to socioeconomic status.

For more information:

Tobias M and Jackson G. Avoidable mortality in New Zealand, 1981–97. *Aust N Z J Public Health* 2001; 25(1): 12–20.

Deaths potentially avoidable by tertiary prevention in highest and lowest socioeconomic status quintiles and rest of population by sex, persons aged 75 years and less, NSW 1983 to 2002



	SES group		1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	Lowest quintile	Persons	744	769	750	733	726	660	575	539	507	578
	Rest of population	Persons	2149	2122	2069	1989	1945	1813	1984	1909	1824	1747
	Highest quintile	Persons	552	556	532	513	480	453	473	418	417	416
	NSW	Persons	3445	3447	3353	3240	3157	2937	3043	2876	2755	2749
Rate per 100,000 population	Lowest quintile	Persons	66.4	64.5	62.1	59.7	59.4	53.5	58.1	54.0	49.8	48.2
	Rest of population	Persons	63.5	62.3	60.0	57.1	55.3	50.8	51.5	48.9	46.1	45.5
	Highest quintile	Persons	46.3	46.3	44.1	42.1	39.0	36.5	37.3	32.8	32.2	31.9
	NSW	Persons	60.4	59.4	57.1	54.6	52.8	48.6	49.8	46.5	43.9	43.3

Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

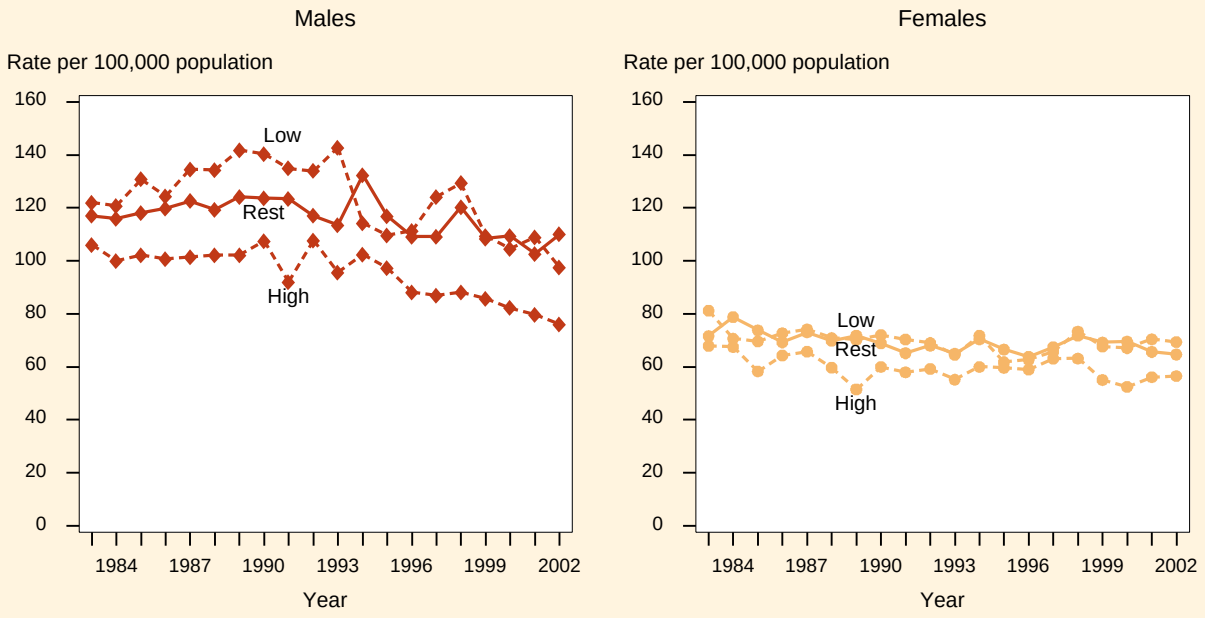
Source: ABS Socio-Economic Indices for Areas and ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- 'Tertiary' level health interventions are those that can cure diseases or extend life through medical or surgical treatment. The major cause of death that is potentially amenable to tertiary intervention ('tertiary avoidable deaths') in NSW is ischaemic heart disease.
- Tertiary avoidable deaths account for just under one-quarter of all avoidable deaths in NSW. This proportion declined from 24.3% in 1983 to 22% in 1998, increasing to 22.9% in 2002.
- The annual number of tertiary avoidable deaths in NSW fell from 4,471 in 1983 to 2,749 in 2002. Over the 20-year period, rates of these tertiary avoidable deaths fell by 55% in males and 50% in females.
- In males, the decline in tertiary avoidable deaths in the highest SES group (5.1% per year) was significantly greater than in the lowest SES (4.4%) and middle (4.1%) groups.The decline in death rate in the middle group was significantly slower than in the lowest SES group.
- In females, rates of tertiary avoidable deaths declined by 4.4% per year in the highest SES group, 3.8% in the lowest SES group, and 4.1% in the middle SES group. These differences were not significant.
- These findings suggest that medical and surgical interventions have been more effective in reducing death rates in people of higher socioeconomic status, especially among males.

For more information:

Tobias M and Jackson G. Avoidable mortality in New Zealand, 1981–97. *Aust N Z J Public Health* 2001; 25(1): 12–20.

Deaths, premature and unavoidable, in highest and lowest socioeconomic status quintiles and rest of population by sex, persons aged 75 years and less, NSW 1983 to 2002



	SES group		1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	Lowest quintile	Persons	1152	1105	1034	1065	1165	1253	862	847	905	996
	Rest of population	Persons	2978	3381	3117	2972	3090	3393	3438	3499	3350	3373
	Highest quintile	Persons	892	966	943	892	912	930	881	855	866	859
	NSW	Persons	5022	5452	5094	4929	5167	5576	5181	5201	5121	5228
Rate per 100,000 population	Lowest quintile	Persons	103.7	92.7	85.4	86.6	94.6	100.9	88.2	85.9	89.6	83.3
	Rest of population	Persons	88.4	100.7	91.2	85.9	87.7	95.4	88.4	89.0	83.8	87.1
	Highest quintile	Persons	74.3	80.1	77.4	73.0	74.2	75.1	69.6	66.9	67.5	66.0
	NSW	Persons	88.4	94.8	87.1	83.3	86.3	92.3	84.5	84.0	81.4	82.0

Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: ABS Socio-Economic Indices for Areas and ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- All causes of mortality before the age of 75 years that are not preventable or otherwise avoidable through earlier intervention are considered to be 'unavoidable' (Tobias and Jackson, 2001).
- In 1983, deaths from unavoidable causes accounted for 20% of all premature deaths (before the age of 75 years), increasing to 30% in 2002. While rates of premature death over the 20-year period have fallen by 43%, rates of unavoidable death have fallen by only 12%.
- In absolute terms, the gap in unavoidable mortality between the highest and lowest SES groups has fluctuated between 12 and 47 per 100,000 for males and between 2 and 18 per 100,000 for females over the 20-year period.
- For males, the relative change in rates was similar for the lowest and highest SES groups (1.3% and 1.5% per year respectively), but declines in unavoidable mortality in both these groups were significantly faster than in the middle 60% of the population where the rate reduced by 0.6% per year.
- The rate of reduction in females was 0.5% per year across all 3 SES groups. The highest SES group experienced a rate of unavoidable mortality 16% lower than that of the lowest SES group and rest of the population. The lowest and middle group did not differ significantly.

For more information:

Tobias M and Jackson G. Avoidable mortality in New Zealand, 1981–97. *Aust N Z J Public Health* 2001; 25(1): 12–20.

Ambulatory care sensitive hospital separations in highest and lowest socioeconomic status quintiles and rest of population by sex, NSW 1994-95 to 2002-03

	SES group		94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	Lowest quintile	Persons	33959	33614	34104	34775	33697	28615	35713	36177	37716
	Rest of population	Persons	86210	86341	85830	88444	87314	86146	97208	99594	99309
	Highest quintile	Persons	22847	22471	21575	21988	22648	21999	24339	24271	23631
	NSW	Persons	143016	142426	141509	145207	143659	136760	157259	160043	160658
Rate	Lowest quintile	Persons	2838.6	2763.3	2797.4	2800.4	2662.8	2356.5	2665.8	2653.7	2735.4
per 100,000	Rest of population	Persons	2449.1	2416.8	2357.7	2387.2	2318.2	2220.2	2517.8	2527.8	2480.2
population	Highest quintile	Persons	1822.4	1764.8	1675.3	1679.6	1709.4	1606.4	1745.4	1714.6	1649.5
	NSW	Persons	2395.0	2348.6	2299.2	2320.0	2258.8	2115.4	2384.8	2381.7	2356.3

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

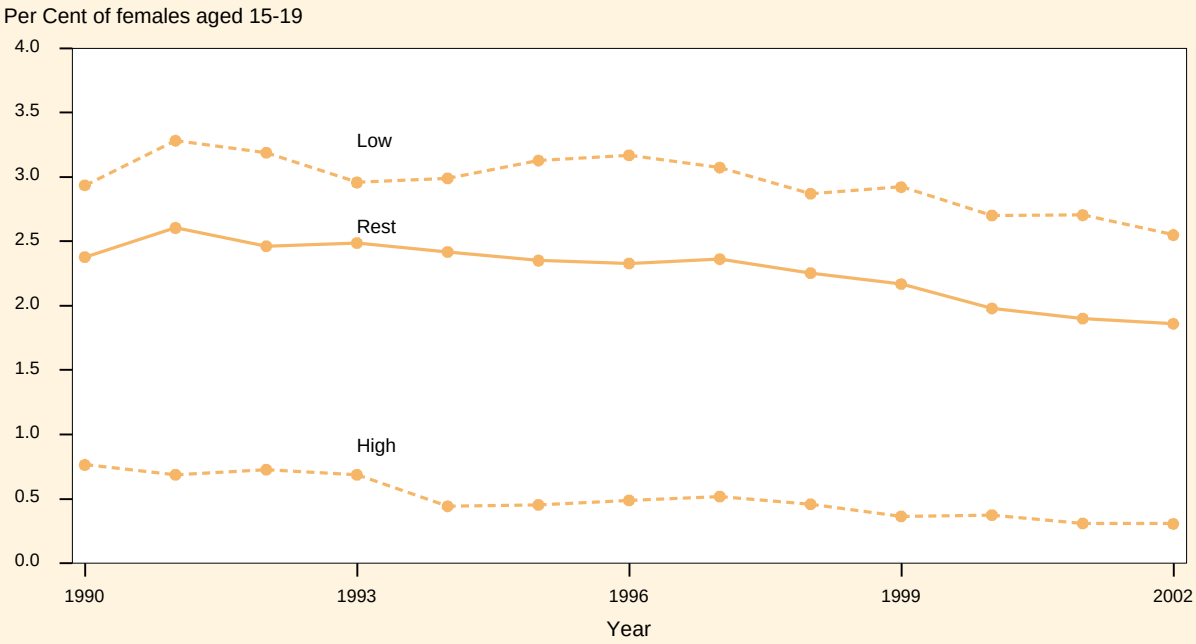
Source: Avoidable hospitalisation fractions were modified from from Victorian Department of Human Services, 2001. ABS Socio-Economic Indices for Areas and NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Ambulatory care sensitive (ACS) conditions are those for which hospitalisation is considered potentially avoidable through preventive medical care and early disease management, usually delivered in an ambulatory setting such as primary health care.
- In NSW in 2002–03, hospitalisations for ACS conditions accounted for 8.3% of all admissions, similar to the proportion in 1994–95. Unlike rates of potentially avoidable mortality, rates of hospitalisation for ACS conditions were only slightly lower in females than in males.
- The graph shows a discontinuity in 1998–99, which occurs for all SES groups and both sexes. This coincides with an increase in the contribution of chronic conditions and a change in the disease classification system.
- In 2002–03, the rate of hospitalisation for ACS conditions in the lowest SES group was 64% higher in males and 66% higher in females that in the highest SES group. The rates for the lowest SES group and the rest of the population might be getting closer. This is shown in males particularly, where the rate for the lowest SES group was 15% higher in 1994–95 and only 7% higher in 2002–03.
- Although the burden of potentially avoidable hospitalisations for ACS conditions has fluctuated over time, perhaps due to administrative changes, there has consistently been a higher burden in the lowest SES group. There appears to be a narrowing of the gap between the middle of the population and the lowest SES group, especially in males.

For more information:

Victorian Department of Human Services. *The Victorian ambulatory care sensitive conditions study: Preliminary analyses.* Melbourne: VDHS, 2001.

Teenage mothers in highest and lowest socioeconomic status quintiles and rest of population, NSW 1990 to 2002



	SES group	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	Lowest quintile	1295	1401	1329	1210	1199	1250	1282	1178	1115	1357	1273	1290	1216
	Rest of population	3131	3332	3051	2941	2977	2877	2759	2851	2742	2543	2371	2323	2280
	Highest quintile	338	295	303	297	168	169	208	219	193	152	159	134	134
	NSW	4790	5032	4683	4452	4347	4297	4250	4248	4050	4057	3804	3747	3631
Per cent of females aged 15–19 years	Lowest quintile	2.9	3.3	3.2	3.0	3.0	3.1	3.2	3.1	2.9	2.9	2.7	2.7	2.6
	Rest of population	2.4	2.6	2.5	2.5	2.4	2.4	2.3	2.4	2.3	2.2	2.0	1.9	1.9
	Highest quintile	0.8	0.7	0.7	0.7	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.3
	NSW	2.2	2.4	2.3	2.2	2.2	2.2	2.1	2.1	2.0	2.0	1.8	1.8	1.7

Note: The percentage of teenage mothers is the number of livebirths among women aged less than 20 years as a proportion of the female population aged 15–19 years. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Midwives Data Collection, ABS Socio-Economic Indices for Areas and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- The health risks of pregnancy and childbirth are higher for new mothers in their teenage years than for mothers in their 20s. For the mother, there is a higher risk of some medical complications, such as high blood pressure; and, for the baby, there is a greater risk of low birthweight, prematurity, and stillbirth.
- Between 1990 and 2002, the percentage of teenage mothers decreased overall from 2.2% to 1.7% of women aged 15–19 years. This decline was seen across all SES groups, with rates declining from 0.8% to 0.3% of young women in the highest SES group, from 2.9% to 2.6% of young women in the lowest SES group, and from 2.4% to 1.9% of young women in the rest of the population. The absolute gap between the highest and lowest SES groups, which was 2.1% in 1990, increased for a number of years, reaching a maximum of 2.7% in 1996. Since then, the gap has decreased to 2.3%. In 2002, a teenage girl in the lowest SES group was nearly 9 times more likely to have a child than one in the highest SES group, compared with 3.6 times in 1990.
- In relative terms, the rate in the highest SES group decreased by 7.3% per year, compared with 0.92% for the lowest SES group and 1.84% for the rest of the population.
- Therefore, although the percentage of teenage mothers has declined overall in the last 11 years, there is an increasing relative gap between the highest SES group and lower SES groups in NSW.

For more information:

Centre for Epidemiology and Research. New South Wales Mothers and Babies 2002. *N S W Public Health Bull* 2003; 14(S-3).

NSW Department of Health. *NSW Health and Equity Statement: In All Fairness*. Sydney: NSW Department of Health, 2004.

Chapter 3.6

Prisoner health

- There are over 8,000 full-time prison inmates aged 18 years and over in NSW. In 2002, the average age of inmates was 33 years for males and 31 years for females.
- In 2003, 94% of inmates were males, and 17% of male inmates and 28% of female inmates identified as being of Aboriginal and/or Torres Strait Islander descent.
- In 2001, 83% of female and 78% of male inmates were current smokers.
- A history of drug abuse is common among prisoners. In 2001, 53% of males and 74% of females reported having injected drugs at some time in the past.
- Hepatitis C virus infection is strongly associated with injecting drug use and is common among prisoners. In 2001, 40% of male prisoners and 64% of female prisoners were hepatitis C antibody positive.
- Around 300 young people aged 14–21 years are under detention in juvenile justice centres in NSW on any one day.
- In 2003, more than 90% of young people in custody were males, and more than one-third (41%) identified as being of Aboriginal and/or Torres Strait Islander descent.
- More than one-third (43%) of young people in custody had a history of parental imprisonment and 11% had a parent who was currently incarcerated.
- The great majority of young people in custody reported having consumed alcohol (96%) and having been drunk (85%) at some time in the past.
- One-fifth (19%) of young people in custody reported that they had injected drugs in the 12 months prior to incarceration.
- The majority (88%) of young people in custody reported symptoms consistent with a clinical mental health disorder.

In this chapter

Introduction

Prisoners are a highly-stigmatised group, characterised by social and psychological disadvantage. Poor educational attainment, unemployment, social isolation, interpersonal conflicts, financial dependence, and substance abuse, are defining characteristics of prisoner populations.

The NSW Corrections Health Service was a statutory health corporation established under the *NSW Area Health Services Act, 1997*. In July 2004, the NSW Corrections Health Service changed its name to Justice Health. Justice Health is responsible for the provision of health services to more than 18,000 people annually in 28 correctional centres, 11 periodic detention centres, 2 transitional centres, 8 police-cell complexes, 14 local court complexes, and 9 juvenile justice centres.

In 1996, the NSW Corrections Health Service conducted a survey of the NSW inmate population in order to provide reliable data to inform an evidence-based approach to health service development. Given the success of the 1996 survey, it was decided to repeated it after 5 years. Several new topics were incorporated into the 2001 survey, to reflect areas of emerging concern such as intellectual disability, head injury, and mental health.

The NSW Department of Juvenile Justice manages young offenders by means of supervision within the community, or within juvenile justice centres, under remand or control (sentenced) orders. Young offenders are aged between 10–18 years of age under the *NSW Children's (Criminal Proceedings) Act, 1987* and associated legislation. Depending on the security and risk level of a detainee, they can be transferred into the adult correctional system when they turn 18 years of age. Around 300 juveniles are being cared for by the NSW Department of Juvenile Justice on any one day.

Between January and March 2003, all young people remanded to a period of control in any of the 9 juvenile detention centres in NSW were eligible for inclusion in a health survey. This chapter presents results from this survey, and from the adult inmate surveys, including indicators of health risk factors, chronic diseases, mental disorders, and communicable diseases.

For more information:

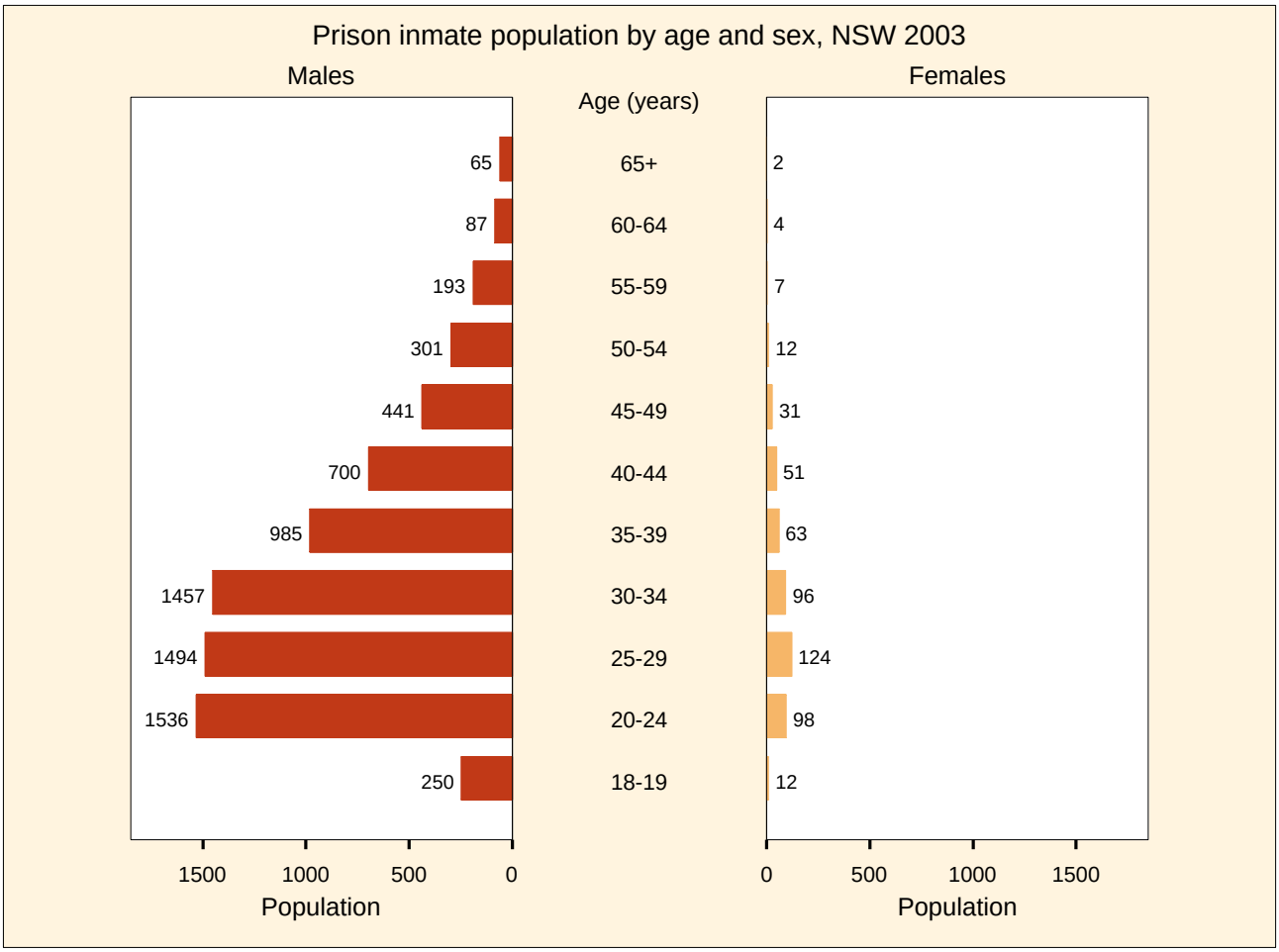
Butler T. *Preliminary findings of the NSW Inmate Health Survey*. Sydney: NSW Corrections Health Service, 1997.

Butler T and Milner L. *The 2001 Inmate Health Survey.* Sydney: NSW Corrections Health Service, 2003.

Allerton M, Kenny D, Champion U, Butler T. *2003 NSW Young People in Custody Health Survey: A summary of key findings.* Sydney: NSW Department of Juvenile Justice, 2003. Available at www.aic.gov.au/conferences/2003-juvenile/kenny.html.

Justice Health. *2002–2003 Annual Report*. Sydney: Justice Health, 2003. Available at www.justicehealth.nsw.gov.au/areas/corrections/docs/chs_ar_02-03.pdf.

Corben S. *NSW Inmate Census 2003: Summary of characteristics.* Statistical Publication no. 25. Sydney: NSW Department of Corrective Services, January 2004.



Note: Includes inmates held in gazetted correctional centres in NSW and inmates on the Work Release II Program, as at midnight on 30 June 2003. Excludes inmates on periodic detention.

Source: NSW Inmate Census 2001 and 2003, NSW Department of Corrective Services.

- At the end of June 2003, there were 8,100 adult prisoners in full-time custody in NSW, representing 35% of the national total. This was a 10% increase on the 2002 daily average of 7,356 inmates.
- The prisoner population was predominantly male (94%) and young, with a median age of 33 years for males and 31 years for females. Close to half of both male (44%) and female (47%) prisoners were aged less than 30 years.
- Aboriginal and Torres Strait Islander people were over-represented in the NSW correctional system, comprising 18% of the prisoner population, compared with 2% of the general community. The rate of imprisonment among the indigenous population of NSW was 2,160 per 100,000 population aged 18 years and over, compared with 110 per 100,000 for the general community.
- Northern Sydney Area Health Service had the lowest rate of incarceration (30 per 100,000 population aged 18 years and over) and Far West Area Health Service the highest (250 per 100,000). One in 8 (12%) NSW prisoners was born overseas or interstate.

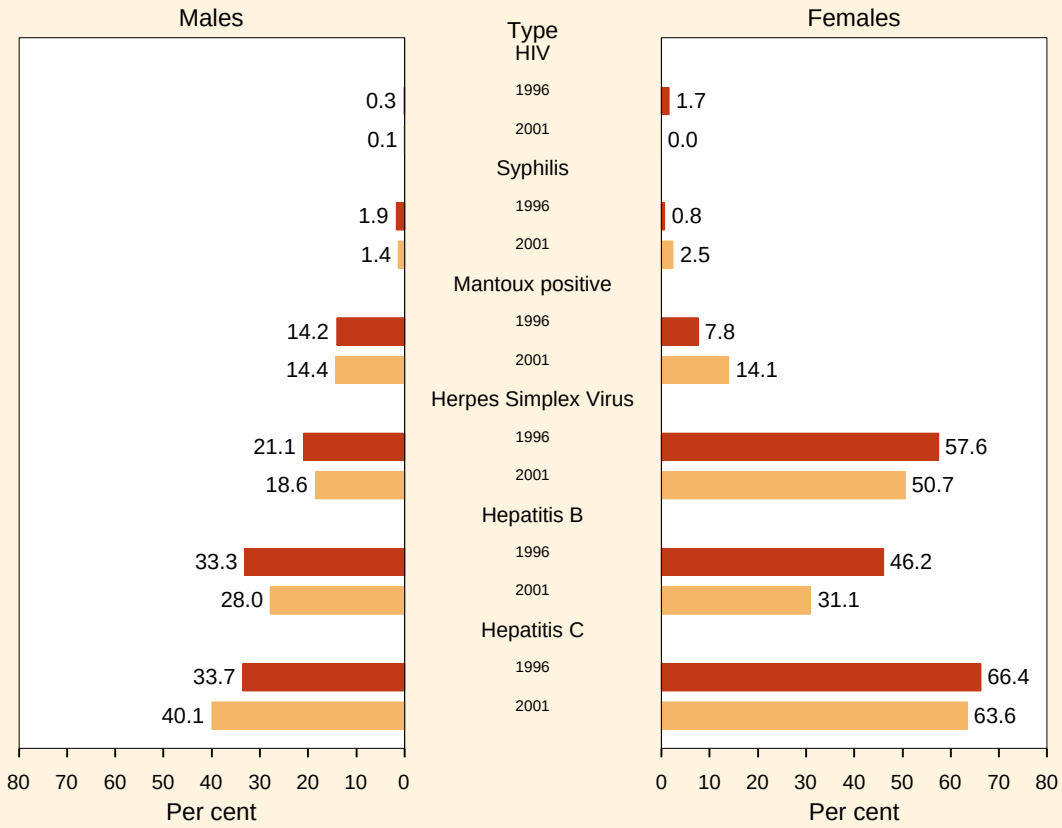
For more information:

Corben S. *NSW Inmate Census 2003: Summary of characteristics.* Statistical Publication no. 25. Sydney: NSW Department of Corrective Services, January 2004.

Corben S. *NSW Inmate Census 2001: Summary of characteristics.* Statistical Publication no. 23. Sydney: NSW Department of Corrective Services, April 2002.

Australian Bureau of Statistics. *Corrective Services, September Quarter 2003.* Catalogue no. 4512.0. Canberra: ABS, 2003.

Communicable diseases, prevalence by sex, prison inmates, NSW 1996, 2001



Note: The 2001 survey included 747 male and 167 female respondents. Pathology test results were available for some respondents only: 93.4% (HIV antibody); 81.8% (syphilis); 89.8% (Mantoux); 90.4% (herpes simplex virus type 2); 93.5% (hepatitis B core antibody) and 93.2% (hepatitis C antibody). The 1996 survey included 657 male and 132 female respondents. Pathology test results were available for some respondents only: 94.4% (HIV antibody and hepatitis G RNA); 94.8% (syphilis); 80.5% (Mantoux); 94.7% (herpes simplex virus type 2); 94.2% (hepatitis B core antibody) and 93.7% (hepatitis C antibody).

Source: 1996 and 2001 NSW Inmate Health Surveys, Justice Health.

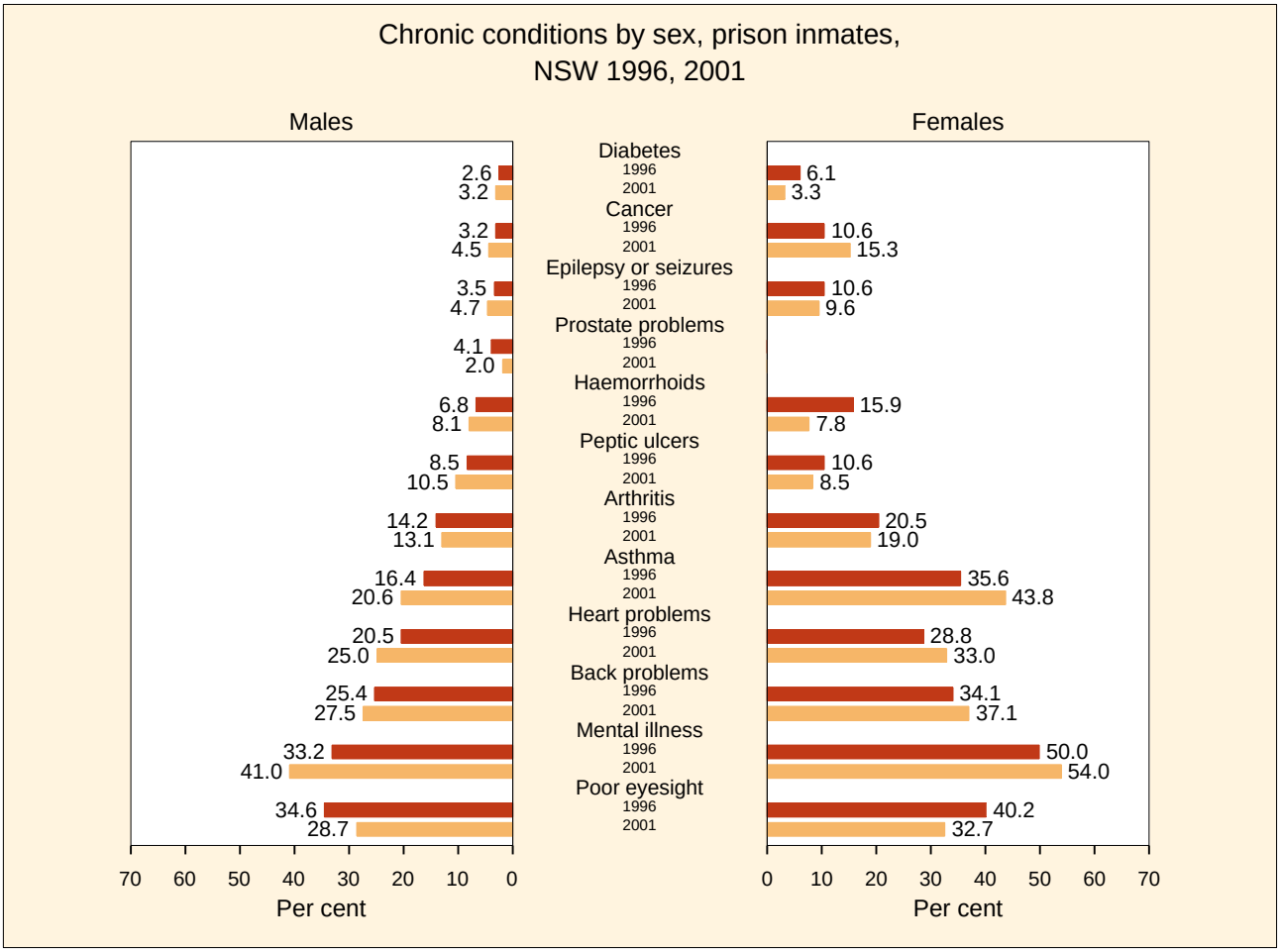
- Hepatitis C virus infection is strongly associated with injecting drug use. In 2001, the prevalence of infection with hepatitis C virus in male prisoners was 40%, an increase from the 1996 figure of 34%. The prevalence of infection in female prisoners in 2001 was 64%, similar to the 1996 figure of 66%. The prevalence of infection with hepatitis C virus was 74% among prisoners with a history of injecting drug use. These figures compare with a prevalence of about 1.1% in the general community of Australia, and 56% among those who have injected drugs (National Centre in HIV Epidemiology and Clinical Research, 2003).
- The prevalence of antibodies to hepatitis B virus among prisoners decreased between the 1996 and 2001 surveys in both males (from 46% to 28%) and females (from 33% to 31%). This may reflect the effect of immunisation programs aimed at high risk groups.
- The prevalence of infection with HIV is low among inmates. In both 1996 and 2001, the inmate health surveys did not detect any undiagnosed cases.
- In 2001, 14% of both male and female prisoners were Mantoux tuberculin skin test positive, which provides evidence of exposure to tuberculosis.

For more information:

Butler T. *Preliminary findings of the NSW Inmate Health Survey.* Sydney: NSW Corrections Health Service, 1997.

Butler T and Milner L. *The 2001 Inmate Health Survey.* Sydney: NSW Corrections Health Service, 2003.

National Centre in HIV Epidemiology and Clinical Research. *HIV–AIDS, viral hepatitis and sexually transmissible infections in Australia. Annual Surveillance Report 2003.* Sydney: National Centre in HIV Epidemiology and Clinical Research, University of New South Wales, 2003.



Note: Estimates based on 657 male and 132 female respondents in 1996 and 747 male and 167 female respondents in 2001. Survey respondents were asked: 'Have you ever been told by a doctor that you have any of the following illnesses–conditions?'. For mental illness, survey respondents were asked: 'Have you ever received treatment or assessment by a psychiatrist or doctor for an emotional or mental problem?'. Heart problems include hypertension, chest–angina pain, heart murmur, and palpitations.

Source: 1996 and 2001 NSW Inmate Health Surveys, Justice Health.

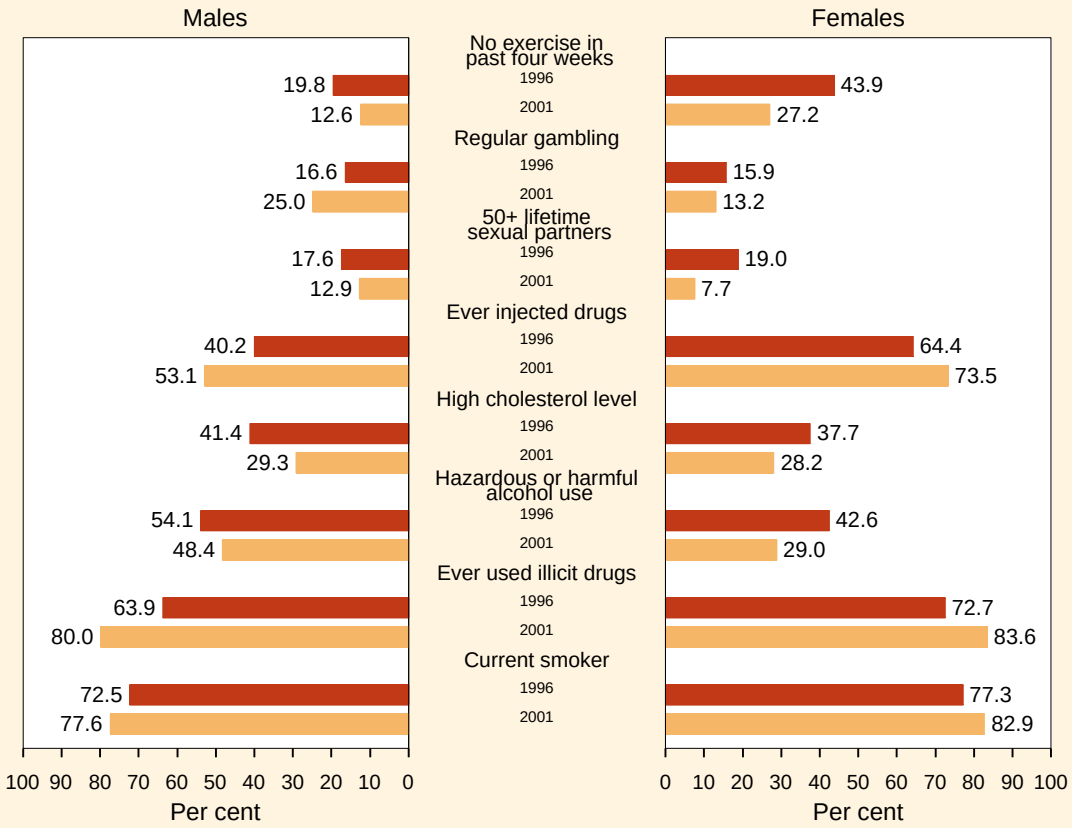
- Prison inmates report high levels of chronic illness, despite their relative youth. In 2001, the 3 most prevalent chronic health conditions reported by both male and female prisoners were asthma, back problems, and poor eyesight.
- More than one-third of both female (39%) and male (45%) prisoners reported that they had sustained at least one head injury resulting in a loss of consciousness at some time in the past.
- In 2001, 32% of male and 44% of female prisoners reported experiencing dental problems in the past 4 weeks, an increase from 1996. Twenty-three per cent of female and 37% of male prisoners reported that they had not seen a dentist for at least 2 years.
- More than one-half of female prisoners (54%) and more than one-third of males (41%) reported that they had received some form of treatment or assessment, by a psychiatrist or doctor, for an emotional or mental problem during their life. Depression was the most common diagnosis reported by both females (40%) and males (23%), while 3% of females and 5% of males reported a diagnosis of schizophrenia. Between 1996 and 2001, there were increases in the proportion of male prisoners who required referral for further assessment for major depression, schizophrenia, or manic depression.

For more information:

Butler T and Milner L. *The 2001 Inmate Health Survey.* Sydney: NSW Corrections Health Service, 2003.

Butler T. *Preliminary findings of the NSW Inmate Health Survey.* Sydney: NSW Corrections Health Service, 1997.

Health risk factors by sex, prison inmates, NSW 1996, 2001



Note: Estimates based on 657 male and 132 female respondents in 1996 and 747 male and 167 female respondents in 2001. Regular gambling refers to more than 3 times per week in the 12 months before imprisonment. Cholesterol and blood sugar pathology tests were based on non-fasting samples. High blood cholesterol refers to a level of 5.5 mmol/L or greater. Lifetime sexual partners of more than 50 includes some inmates who reported being sex workers and had had a large but unknown number of partners.

Source: 1996 and 2001 NSW Inmate Health Surveys, Justice Health.

- Prisoners engage in a range of health risk behaviours, such as smoking tobacco, consuming harmful or hazardous quantities of alcohol, and injecting drugs.
- Levels of some risk behaviours showed improvement between the 1996 and 2001 inmate health surveys. Among prisoners who were sexually active in the 12 months prior to imprisonment, the proportion who reported never having used condoms decreased among both females (from 34% to 4%) and males (from 38% to 24%). The proportion of prisoners who reported that they had exercised in the 4 weeks before interview increased among both females (from 56% to 73%) and males (from 80% to 87%). The proportion of males with high blood cholesterol levels decreased from 41% to 29%.
- The prevalence of other health risk factors increased between the 1996 and 2001 surveys. The proportion of male prisoners reporting that they had ever used illicit drugs increased (from 64% to 80%), as did the proportion reporting regular gambling prior to imprisonment (from 17% to 25%). While there was an increase between 1996 and 2001 in the proportion of males reporting current smoking (from 73% to 78%), there was also an increase in the proportion who had undertaken some form of smoking reduction strategy (from 42% to 56%).

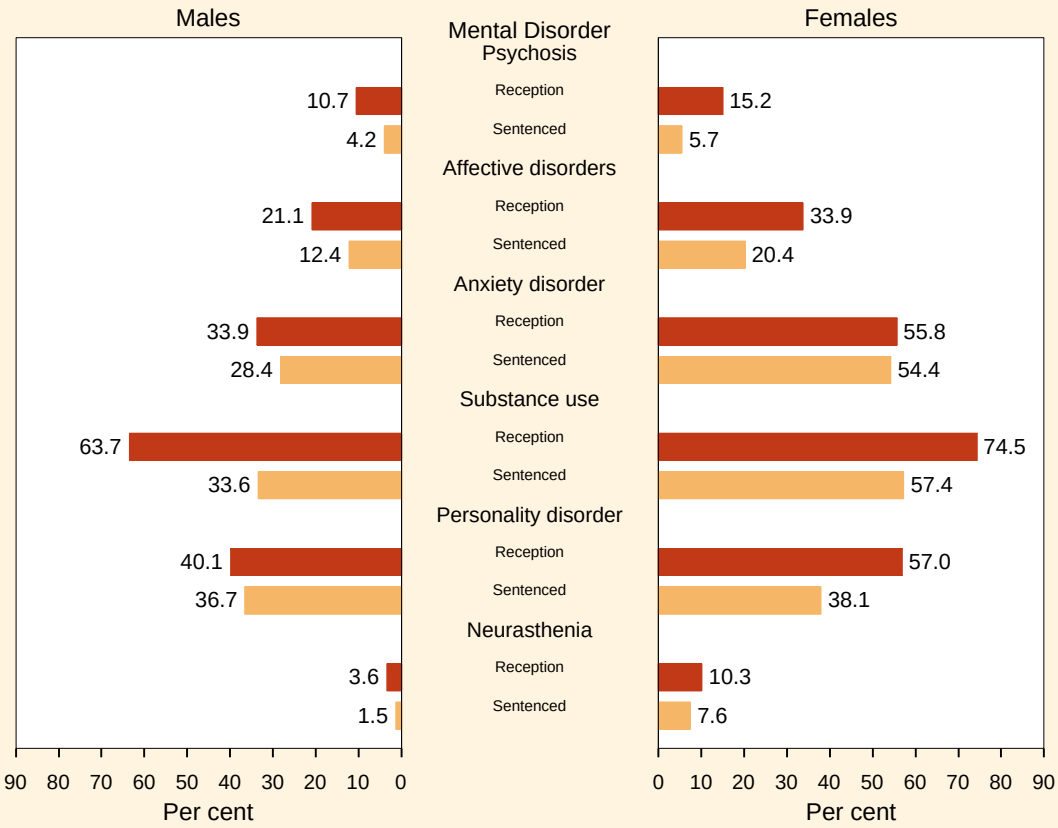
For more information:

Centre for Epidemiology and Research. New South Wales Adult Health Survey 2002. *N S W Public Health Bull* 2003; 14(S-4).

Butler T. *Preliminary findings of the NSW Inmate Health Survey*. Sydney: NSW Corrections Health Service, 1997.

Butler T and Milner L. *The 2001 Inmate Health Survey*. Sydney: NSW Corrections Health Service, 2003.

Mental disorders by sex and inmate status, prison inmates, NSW 2001



Note: The sample consisted of 566 sentenced prisoners (458 males; 108 females) and 921 reception prisoners (756 males; 165 females). Sentenced prisoners are those who were already serving a custodial sentence at the time of interview. Reception prisoners were those who are remanded into custody pending further judicial process, which may have resulted in a custodial sentence. Reception prisoners were screened within 24 hours following their arrival into custody. These data are 12-month prevalence estimates of major disorders coded using ICD-10.

Source: Mental Health Reception Assessment Project and 2001 NSW Inmate Health Survey, Justice Health.

- In 2001, a sample of inmates was screened for psychiatric disorders on reception to the NSW correctional system. These 'reception' inmates were remanded into custody pending further judicial process, in contrast to the already sentenced inmates who were assessed as part of the 2001 Inmate Health Survey.
- The majority of male (78%) and female (90%) reception prisoners were found to have had a mental disorder in the 12 months prior to interview. The corresponding figures for prisoners already sentenced were 61% for males and 79% for females.
- Substance use disorders were the most common diagnostic group among both reception (66%) and sentenced (38%) inmates.
- Anxiety disorders, most commonly Post-traumatic Stress Disorder, were the next most frequent mental disorder, affecting more than one-third of both the reception (38%) and sentenced (33%) imates.
- Almost one-quarter (23%) of reception inmates had experienced an affective disorder, most commonly depression, in the previous 12 months, compared with 14% of sentenced inmates.
- The prevalence of mental disorders among inmates was much higher than in the general community. In the 1997 National Survey of Mental Health and Wellbeing, an estimated 18% of people aged 18 years and over had experienced a mental disorder in the 12 months prior to interview (ABS, 1998).

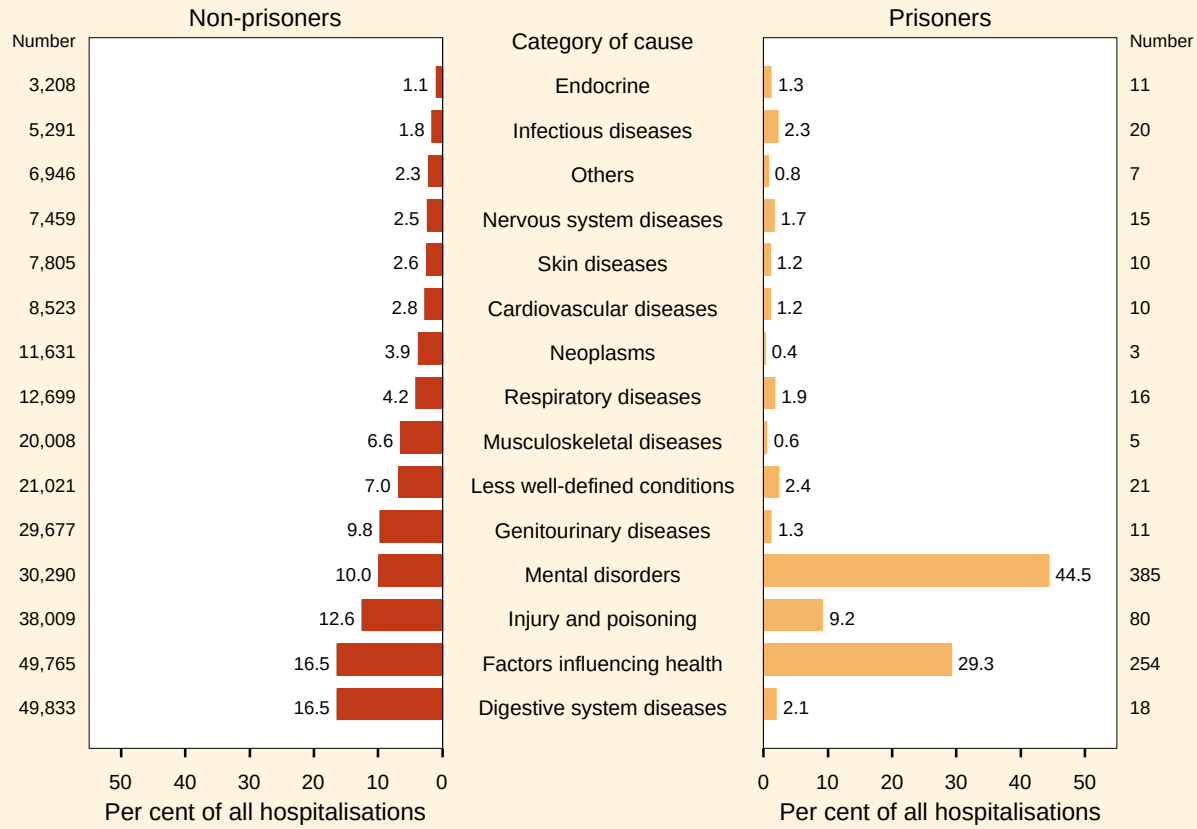
For more information:

Butler T, Allnutt S. *Mental illness among New South Wales prisoners.* Sydney: NSW Corrections Health Service, 2003.

Australian Bureau of Statistics. *Mental health and wellbeing profile of adults.* Catalogue no. 4326.0. Canberra: ABS, 1998.

Australian Institute of Health and Welfare. *Australia's health 1998: The sixth biennial health report of the Australian Institute of Health and Welfare.* Canberra: AIHW, 1998.

Hospital separations by category of cause and incarceration status, persons aged 20-39 years, NSW 2002-03



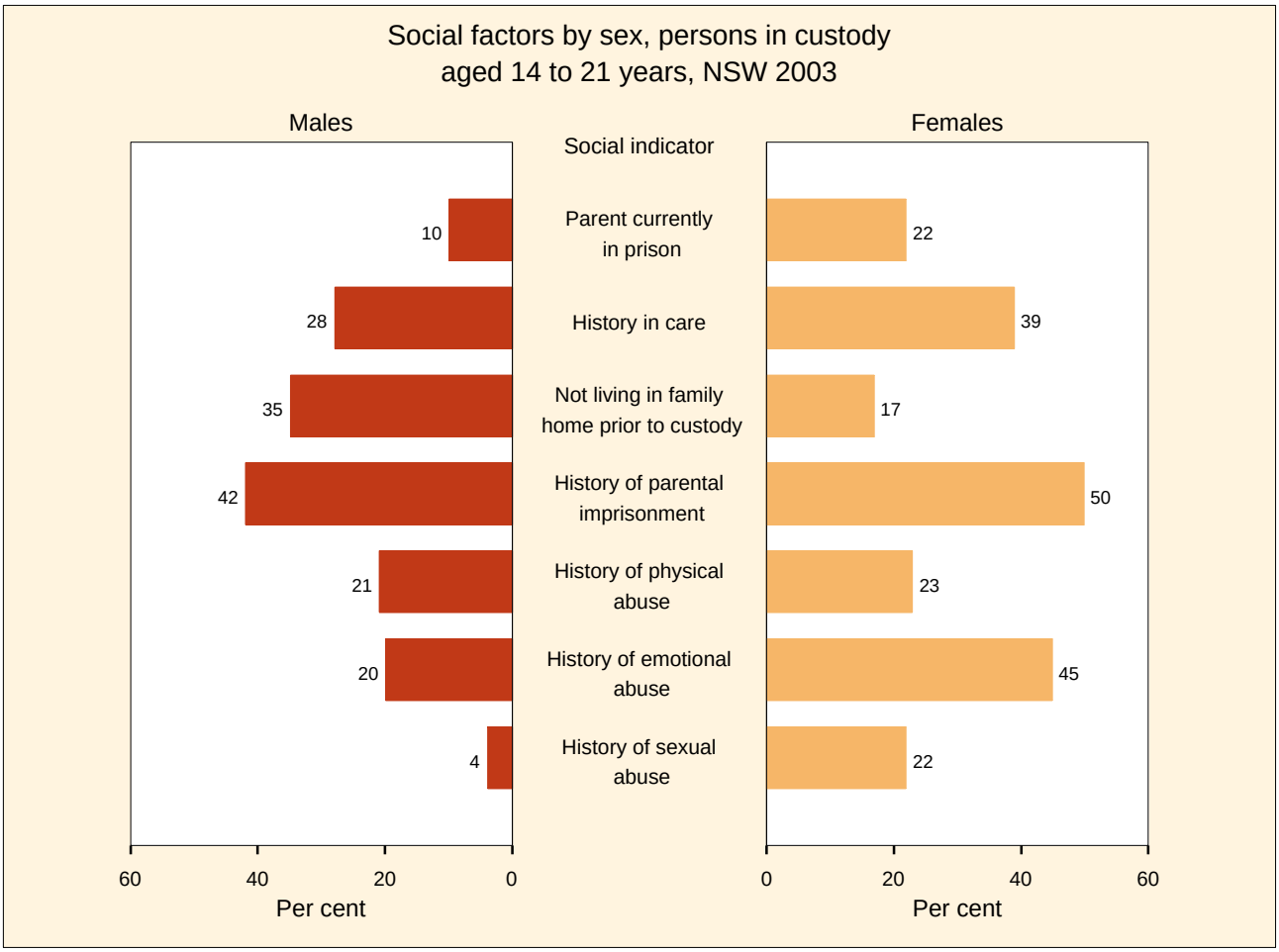
Note: Hospital separations were classified using ICD-10-AM. Rates were age-adjusted using the Australian population as at 30 June 2001.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- When prisoners in NSW require hospitalisation they are taken to either Long Bay (for males) or Mulawa (for females) Correctional Centre Hospitals, except in cases when transfer to a public hospital is necessary. Long Bay Correctional Centre Hospital has a bed capacity of 119 and had a 92% occupancy rate in 2002–03, while Mulawa has a bed capacity of 6.
- In 2002–03, there were 1,239 hospitalisations for prisoners of all ages in these 2 hospitals, with 70% of these for prisoners aged 20–39 years and 73% for male prisoners. In Long Bay Correctional Centre Hospital, the average length of stay for male psychiatric patients was 111.3 days and for male medical admissions was 14.6 days. This compares with 15.3 and 4 days for the general NSW community. Long Bay Correctional Centre Hospital houses mentally ill inmates transferred from within the prison system to the hospital, and also forensic patients (that is, those found not guilty by reason of insanity or deemed unfit to stand trial). Forensic prisoners can only be discharged with the permission of the Minister for Health. Mulawa Correctional Centre Hospital had an average length of stay of 3 days for female admissions in 2002–03.
- In 2002–03, mental disorders were the most common cause of hospitalisation in Long Bay and Mulawa Correctional Centre Hospitals, accounting for almost one-half (45%) of all hospitalisations (84% in males and 16% in females). Among these, the 2 most common categories of mental disorders were disorders due to psychoactive substance use (70%) and schizophrenia (19%). Only 10% of hospitalisations among non-prisoners of a comparable age range are for mental disorders.
- The second most common cause of hospitalisations in prisoners was for factors influencing health. This category includes ICD-10-AM codes for symptoms and signs without a specific cause, admission for rehabilitation, and respite care.

For more information:

Justice Health. *2002–2003 Annual Report.* Sydney: Justice Health, 2003.



Note: The sample consisted of 242 young people in custody of whom 223 (92%) were male and 19 (8%) were female. This represents 76% of all young people in custody at the time of the survey.

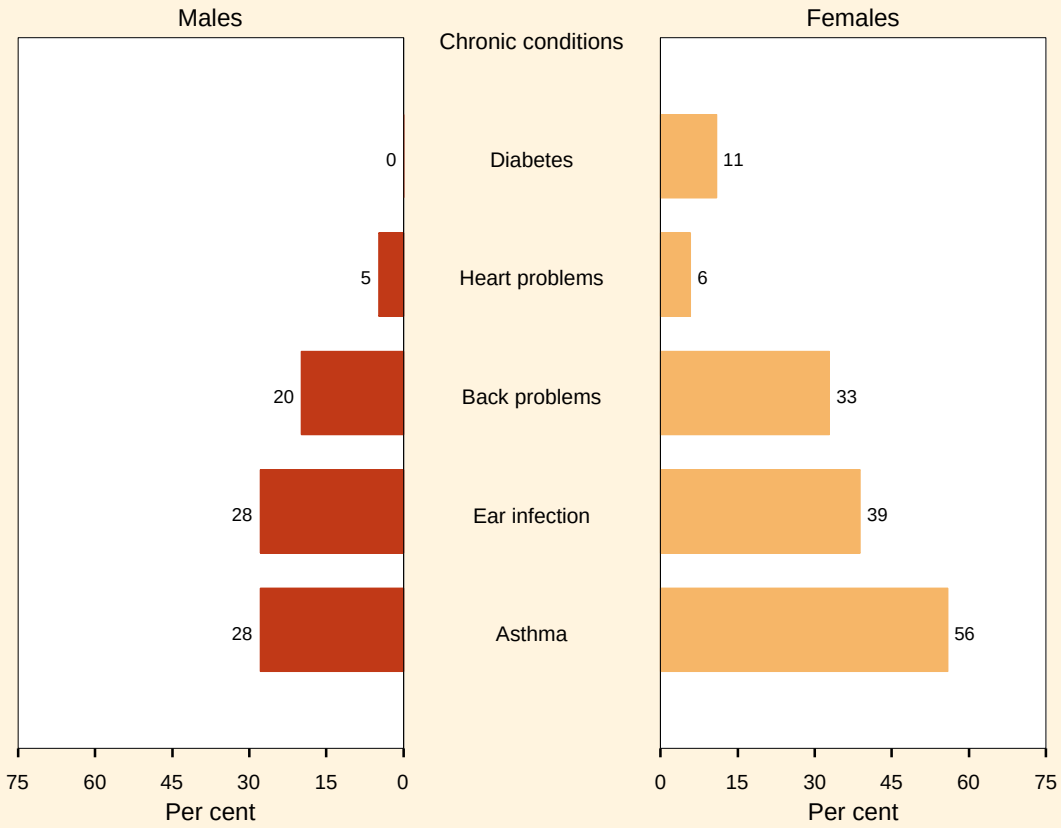
Source: 2003 NSW Young People in Custody Health Survey, NSW Department of Juvenile Justice.

- Many young people in custody have characteristics suggesting highly unstable backgrounds and a high degree of social disadvantage. Among the young people assessed by the 2003 Young People in Custody Health Survey, more than one-third (43%) had a history of parental imprisonment and 11% had a parent who was currently incarcerated. More than one-quarter (28%) had a history of being in out-of-home care.
- More than than one-fifth of young people in custody reported that they had been physically abused at some time (21% of males and 23% of females), while 20% of males and 45% of females reported emotional abuse. Four per cent of males and 22% of females reported experiencing sexual abuse.
- The young people in detention also had poor educational attainment. The majority had left school without achieving a minimal qualification (75% left before Year 10), had not regularly attended school in the 6 months prior to custody (82%), and had been suspended from school (91%). The mean age of leaving school was 14.5 years for young males and 14.6 years for young females. The average overall academic achievement of young offenders was well below expected norms for their age.
- The pattern of results from the survey suggests that, compared to other adolescents, many young people in custody may have difficulty understanding, communicating, and solving problems using language or numbers. The practical reasoning skills of this group, however, are close to those of a typical adolescent. Sixty per cent of subjects could read at a low average or better standard, with 50% able to spell at an average or better standard.

For more information:

Allerton M, Kenny D, Champion U, Butler T. *2003 NSW Young People in Custody Health Survey: A summary of key findings.* Sydney: NSW Department of Juvenile Justice, 2003.

Chronic conditions by sex, persons in custody aged 14 to 21 years, NSW 2003



Note: The sample consisted of 242 young people in custody of whom 223 (92%) were male and 19 (8%) were female. This represents 76% of all young people in custody at the time of the survey.

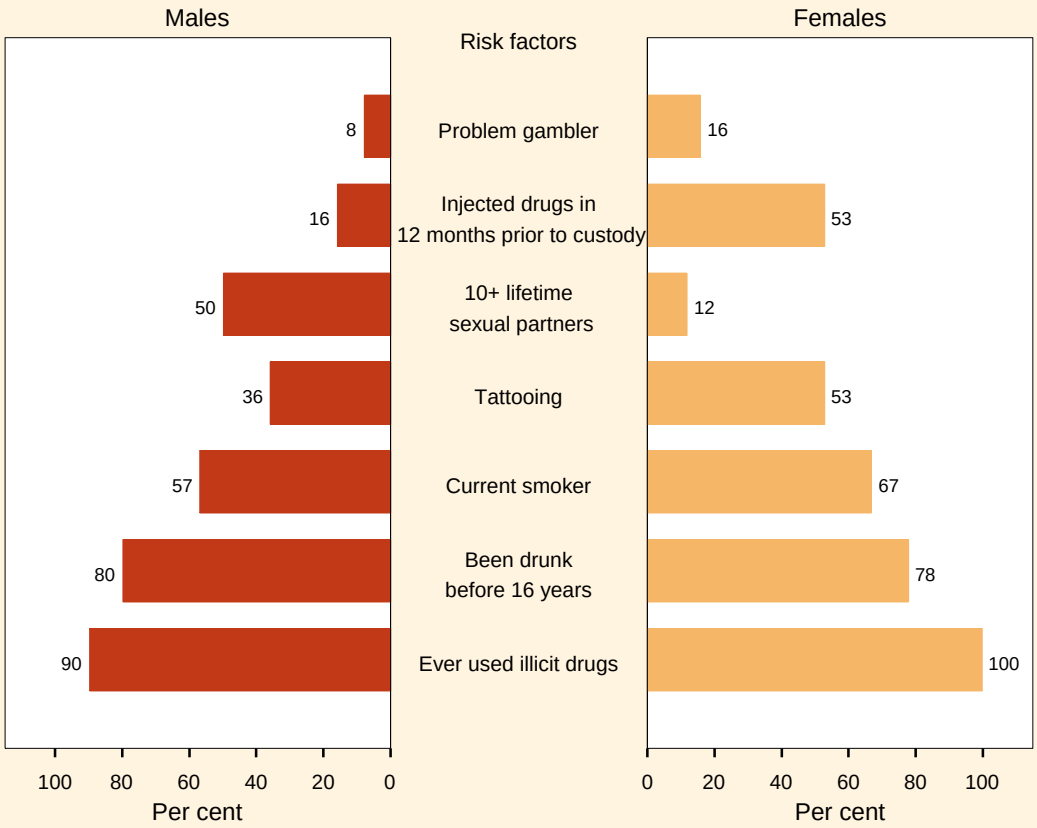
Source: 2003 NSW Young People in Custody Health Survey, NSW Department of Juvenile Justice.

- A range of acute and chronic illnesses were prevalent among young offenders surveyed in the 2003 Young People in Custody Health Survey. Asthma was reported by 28% of young males and 56% of young females surveyed. Over one-half (51%) of those with asthma reported that they had their last attack over one year ago; 28% had an attack in the one month prior to interview. Many of those with asthma had been hospitalised for the condition (45% of young males and 40% of young females). Of these, over one-half (54%) had attended hospital only once, while one-quarter (27%) reported more than 5 hospital visits for asthma.
- The prevalence of infection with bloodborne viruses and sexually transmissible diseases was high among young offenders, particularly for hepatitis B core antibody (11% in males and 18% in females) and hepatitis C antibody (8% of males and 18% of females). No cases of HIV infection were detected by the survey.
- Recent health conditions (in the past 4 weeks) were also assessed in the survey. Sleep problems (reported by 40% of males and 67% of females) and energy loss or fatigue (reported by 34% of males and 33% of females) were the most common recent conditions reported by young offenders of both sexes. Just under one-third (32%) of young offenders who had their hearing assessed using an audiometry test had a mild hearing loss while 3% had a moderate to profound hearing loss.

For more information:

Allerton M, Kenny D, Champion U, Butler T. *2003 NSW Young People in Custody Health Survey: A summary of key findings.* Sydney: NSW Department of Juvenile Justice, 2003.

Health risk factors by sex, persons in custody aged 14 to 21 years, NSW 2003



Note: The sample consisted of 242 young people in custody of whom 223 (92%) were male and 19 (8%) were female. This represents 76% of all young people in custody at the time of the survey. Problem gamblers coded according to the criteria developed by Fisher (based on DSM-IV criteria).

Source: 2003 NSW Young People in Custody Health Survey, NSW Department of Juvenile Justice.

- The results of the 2003 Young People in Custody Health Survey showed a higher level of health risk factors in young offenders than in the general community. Virtually all young people in custody (90% of males and 100% of females) reported that they had used illicit drugs at some time, with 16% of males and 53% of females reporting that they had injected drugs in the 12 months prior to custody. Among those with a history of injecting drug use, 4% reported sharing needles or injecting equipment in the month prior to interview, 29% reported sharing needles or injecting equipment between one and 6 months prior to interview, and 51% reported that drug use had caused problems with schools, friends, health, police, and parents.

- Most young offenders screened by the survey had had sexual intercourse (93%). The reported median age of first intercourse was 13 years for males and 14 years for females. Most young people in custody reported having more than one sexual partner. Forty-nine per cent of young males and 57% of young females reported either that they never used condoms or they used them less than half of the time with casual partners.

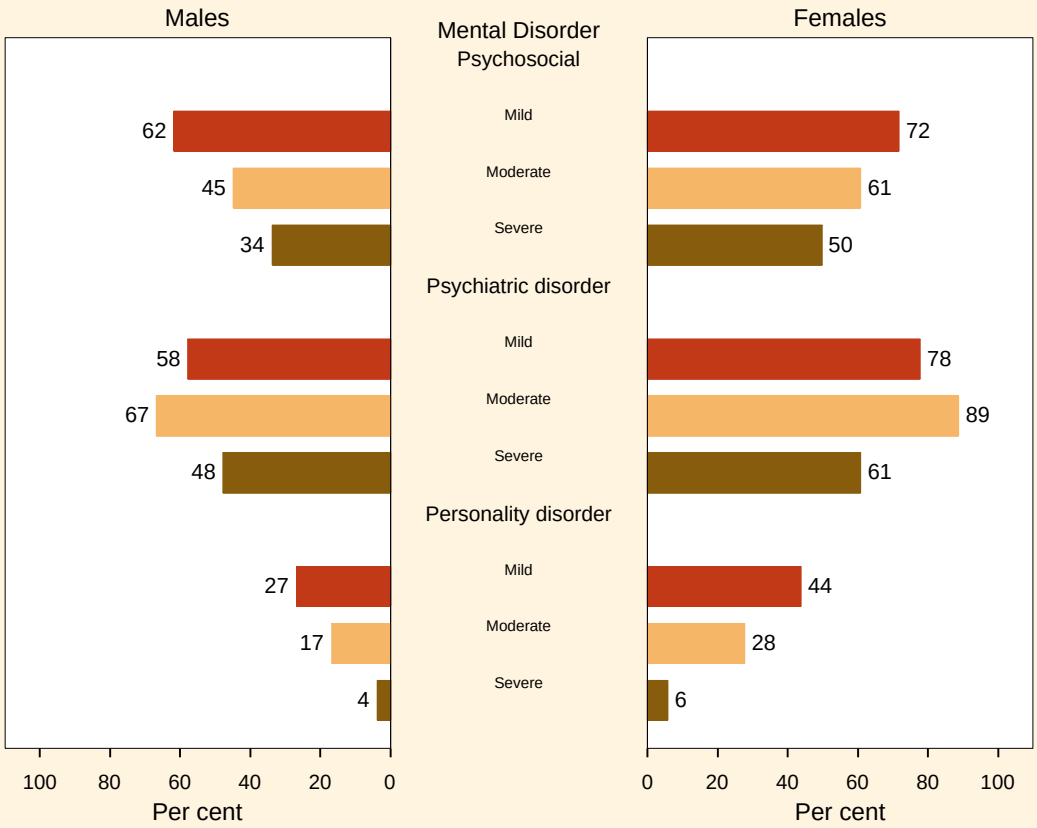
- Despite tobacco use being illegal in juvenile detention centres, 58% of young people reported they currently smoked (57% of males and 67% of females). Of the current smokers, 91% did so on a weekly or more frequent basis. The average age for commencing smoking was 12 years for both young males and young females.

- Almost all (96%) of young offenders reported that they had consumed alcohol and most (80%) reported that they had been drunk before the age of 16 years.

For more information:

Allerton M, Kenny D, Champion U, Butler T. *2003 NSW Young People in Custody Health Survey: A summary of key findings.* Sydney: NSW Department of Juvenile Justice, 2003.

Mental disorders by sex, persons in custody aged 14 to 21 years, NSW 2003



Note: The sample consisted of 242 young people in custody of whom 223 (92%) were male and 19 (8%) were female. This represents 76% of all young people in custody at the time of the survey. The Adolescent Psychopathology Scale (APS) generates 40 scales to describe a range of psychological and psychiatric symptoms warranting possible referral or intervention. These scales are based on DSM-IV criteria for psychiatric, personality, and psychosocial problems. These scales can be broadly grouped into 3 categories: psychosocial, psychiatric, and personality. The scales are scored as mild, moderate, or severe. The moderate and severe categories indicate a likely mental illness.

Source: 2003 NSW Young People in Custody Health Survey, NSW Department of Juvenile Justice.

- High levels of mental health problems were recorded among young offenders participating in the 2003 Young People in Custody Health Survey.
- More than three-quarters (79%) of young offenders reported mild, moderate, or severe symptoms consistent with a psychosocial problem, most frequently psychosocial difficulties associated with substance use (52%), aggression (47%), interpersonal problems (45%), and anger (26%).
- The great majority (88%) of young offenders reported mild, moderate, or severe symptoms consistent with a psychiatric disorder, most commonly conduct disorder (61%), substance abuse disorder (61%), adjustment disorder (39%), attention deficit hyperactivity disorder (30%), and schizophrenia (21%).
- More than one-third (35%) of young offenders reported mild, moderate, or severe symptoms consistent with a personality disorder.
- Approximately 30% of the sample had high or very high levels of psychological distress according to the Kessler-10 scale, which corresponds to a greater than 50% chance of an anxiety or depressive disorder. Almost one in 5 (19%) young males and one in 4 (24%) young females reported that they had seriously considered attempting suicide at some time in the past (Allerton et al., 2003).

For more information:

Allerton M, Kenny D, Champion U, Butler T. *2003 NSW Young People in Custody Health Survey: A summary of key findings.* Sydney: NSW Department of Juvenile Justice, 2003.

4 Health priority areas

Section 4

Chapter 4.1

Cardiovascular diseases

- Cardiovascular diseases cause about 18,000 deaths and more than 150,000 hospitalisations of NSW residents each year. Coronary heart disease and stroke are the 2 major conditions contributing to this disease burden.
- Coronary heart disease caused almost 9,000 deaths in 2002, or 25 deaths every day.
- Death rates, and numbers of deaths, from coronary heart disease are higher in males than in females. Death rates are higher in outer-regional and remote areas of NSW than in metropolitan areas.
- Death rates from coronary heart disease have more than halved since 1983. This is due to both:
  - decreased incidence, associated with reductions in some risk factors, including smoking, saturated fats in the diet, and levels of blood pressure;
  - increased survival, as a result of improvements in medical and surgical treatment and follow-up care.
- Coronary heart disease is responsible for more than 54,000 hospitalisations each year. About 5,100 coronary artery bypass graft procedures and 7,700 coronary angioplasty procedures were performed in 2002–03.
- In 2002, stroke caused almost 5,000 deaths in NSW, or about 13 deaths each day.
- Death rates from stroke are slightly higher in males than in females, but more females die from stroke. Death rates are higher in outer-regional and remote areas compared to metropolitan and inner-regional areas.
- Death rates from stroke have more than halved since 1983, as a result of both reduced incidence of stroke and improved survival after stroke.
- Stroke was the principal reason for over 18,000 hospitalisations in 2002–03.
- The hospitalisation rate for stroke is gradually declining. However, its contribution to the burden of disability will increase because the population is getting older and survival after stroke is increasing.
- In NSW, almost 1,000 people died of heart failure in 2002, and there were over 13,000 hospitalisations for heart failure in 2002–03.
- Attendances for heart failure at hospital emergency departments peak in the winter months.

In this chapter

Introduction

Cardiovascular (or circulatory) diseases comprise all diseases of the heart and blood vessels, including coronary heart disease, stroke (or cerebrovascular disease), heart failure, and peripheral vascular disease. Cardiovascular disease was made a NSW state priority area in 1995 and a national health priority area in 1996, as part of an initiative to reduce its effect in Australia.

Coronary heart disease (or ischaemic heart disease)—causing angina and acute myocardial infarction (or 'heart attack')—and stroke, are the major forms of cardiovascular disease causing death and illness. They share a number of behavioural risk factors such as tobacco smoking, physical inactivity, poor diet, heavy alcohol consumption; and physiological risk factors such as high blood pressure, elevated blood lipids, diabetes mellitus, and overweight–obesity. Risk factors for cardiovascular diseases are also shared with other chronic diseases such as diabetes and chronic obstructive pulmonary diseases, so coordination of prevention, early detection, and other strategies for these conditions should lead to better outcomes.

The NSW Department of Health has developed a series of clinical service frameworks for improving health care for people with chronic and complex health problems. The aims are to improve the quality of life of these people and their carers and families, and to prevent crisis situations and urgent admissions to hospitals (NSW Department of Health, 2003a). *The NSW Clinical Service Framework for Heart Failure* outlines best practice standards for the prevention and diagnosis of, and care for, people with chronic heart failure (NSW Department of Health, 2003b).

This chapter presents recent data on deaths and hospitalisations in NSW for cardiovascular diseases as a group, coronary heart disease, and stroke. The methods used for analysing and presenting death and hospitalisation data are described in more detail in the Methods section.

For more information:

Australian Institute of Health and Welfare. *Heart, stroke and vascular diseases, Australian Facts: 2004.* AIHW Catalogue no. CVD 27. Canberra: AIHW, Heart Foundation of Australia, 2004. Available at www.aihw.gov.au.

Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004. Available at www.aihw.gov.au/publications/index.cfm/title/10014.

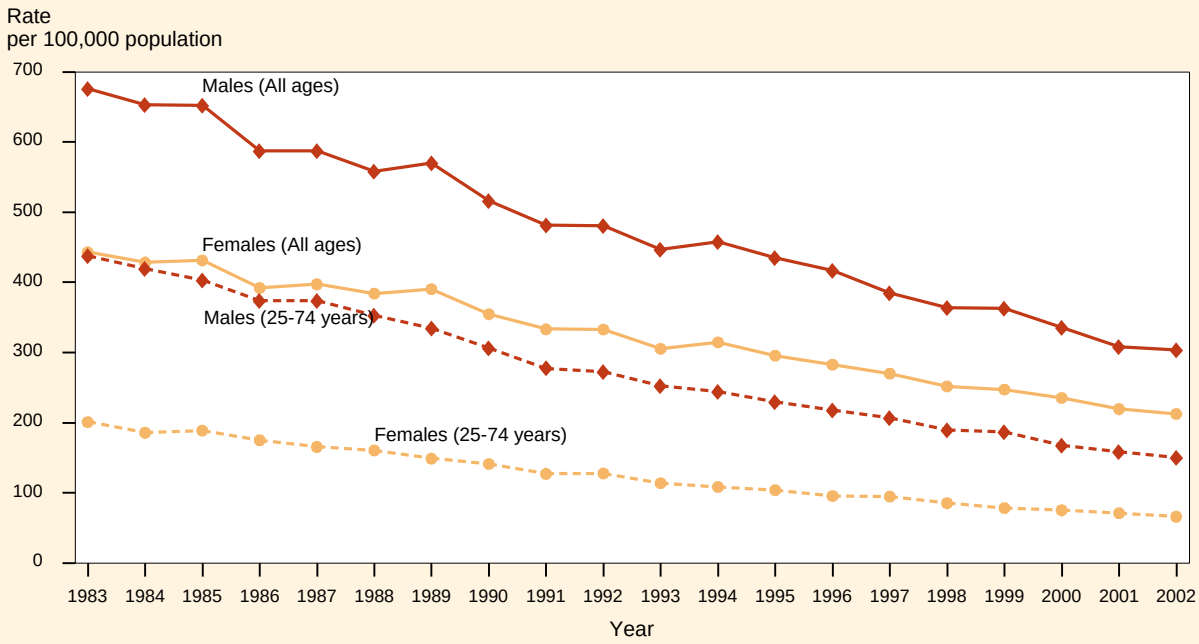
National Heart Foundation website at www.heartfoundation.com.au.

National Stroke Foundation website at www.strokefoundation.com.au.

NSW Department of Health. *NSW Chronic and Complex Care Programs Progress Report, for program activity to 30 September 2002.* Sydney: NSW Department of Health, 2003a.

NSW Department of Health. *NSW clinical service framework for heart failure.* Sydney: NSW Department of Health, 2003b.

Cardiovascular disease deaths by sex, persons of all ages and 25-74 years old, NSW 1983 to 2002



			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	25–74 years	Males	4367	4320	4112	3957	3831	3572	3581	3264	3132	3019
		Females	2183	2138	2066	1912	1907	1740	1613	1552	1481	1390
		Persons	6550	6458	6178	5869	5738	5312	5194	4816	4613	4409
	All ages	Males	9345	9781	9525	9456	9073	8883	9106	8730	8347	8507
		Females	9722	10363	10067	9990	9902	9538	9758	9657	9340	9388
		Persons	19067	20144	19592	19446	18975	18421	18864	18387	17687	17895
Rate per 100,000 population	25–74 years	Males	252.7	244.2	229.7	217.7	206.9	189.8	187.2	168.1	158.4	150.3
		Females	114.1	108.7	104.3	95.7	94.9	85.6	78.9	75.5	71.3	66.4
		Persons	180.7	174.0	164.8	154.7	149.3	136.4	131.8	120.9	114.2	107.7
	All ages	Males	446.6	457.9	435.1	416.6	384.8	363.7	363.0	335.9	307.9	303.8
		Females	305.5	314.7	295.8	283.0	270.1	251.8	247.7	235.5	219.7	212.8
		Persons	367.6	377.7	356.1	341.7	321.4	301.7	298.8	280.8	260.2	253.9

Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production.

Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

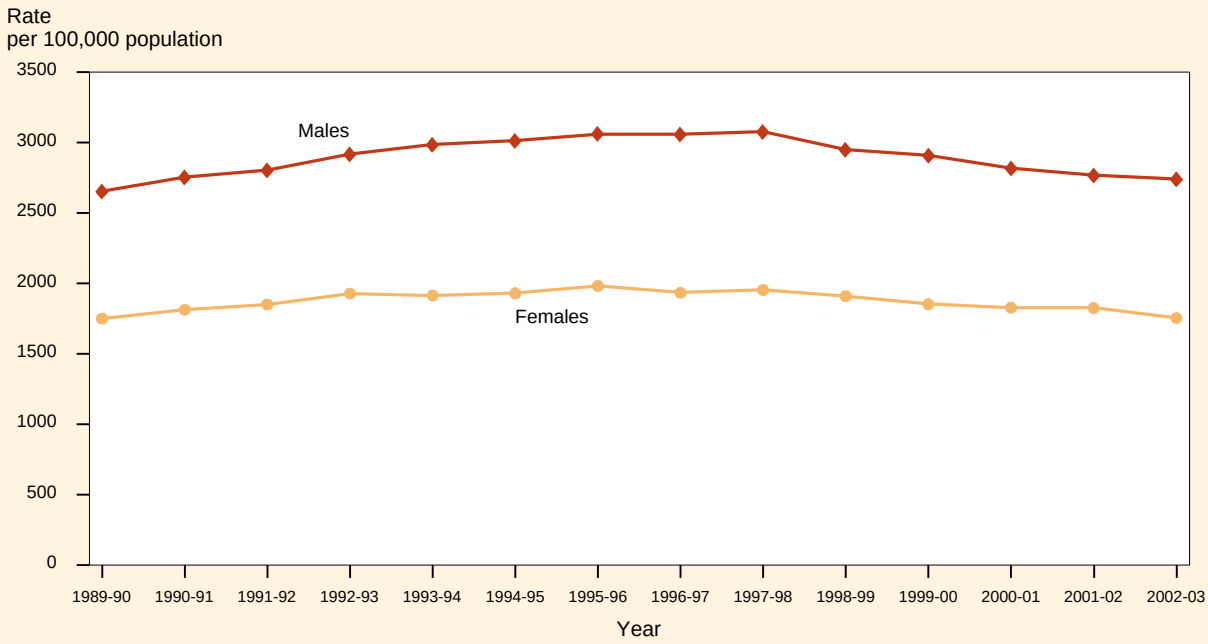
- In 2002, cardiovascular diseases accounted for 17,895 deaths (39% of all deaths) in NSW, or 49 deaths each day.
- In 2002, coronary heart disease caused about half (51%) and stroke caused more than one-quarter (26%) of cardiovascular disease deaths in NSW. The next most common causes were heart failure and peripheral vascular disease.
- In the 25–74 years age group, cardiovascular diseases kill twice as many males as females, and for all ages the male death rate from these diseases is 1.5 times the female rate.
- Death rates from cardiovascular disease have more than halved since 1982. This decline has been steeper in males than in females. The decline can be attributed to both reduced incidence of cardiovascular disease and improved survival of people with disease. Reductions in some risk factors, including smoking, saturated fats in the diet, and levels of blood pressure, have contributed to reducing the incidence of disease. Improved survival is the result of advances in medical treatment (including increased use of drugs to lower blood pressure and cholesterol, and antiplatelet and anticoagulant agents), emergency and surgical care, and rehabilitation and follow-up care (AIHW, 2004).

For more information:

Australian Institute of Health and Welfare. *Heart, stroke and vascular diseases, Australian Facts: 2004.* AIHW Catalogue no. CVD 27. Canberra: AIHW, Heart Foundation of Australia 2004. Available at www.aihw.gov.au.

Australian Bureau of Statistics. *Causes of Death, Australia 2002.* ABS Catalogue no. 3303.0. Canberra: ABS, 2003.

Cardiovascular disease hospital separations by sex, NSW 1989-90 to 2002-03



		1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00	2000–01	2001–02	2002–03
Number	Males	76855	79391	82301	84284	87073	85385	85943	85445	86227	87209
	Females	59548	61206	64245	64212	66355	66457	66054	66772	68237	66897
	Persons	136403	140597	146546	148525	153429	151842	151997	152218	154468	154109
Rate per 100,000 population	Males	2983.8	3012.8	3059.5	3055.8	3076.0	2949.6	2908.3	2815.8	2766.2	2737.5
	Females	1913.6	1929.1	1982.0	1932.9	1952.3	1908.6	1851.7	1828.0	1824.6	1753.0
	Persons	2411.0	2435.9	2484.4	2456.9	2477.0	2396.7	2344.7	2291.4	2268.5	2216.8

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations.

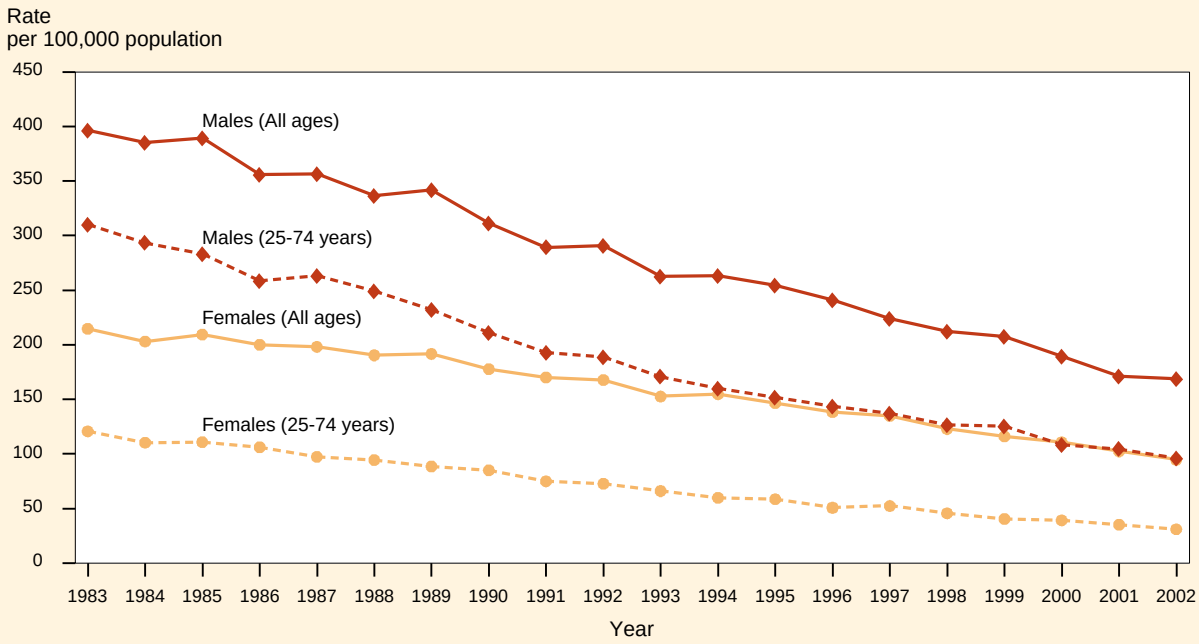
Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Cardiovascular diseases were the principal reason for 154,109 hospitalisations of NSW residents (7.4% of all hospitalisations) in the financial year 2002–03. More than one-third of these (36%) were for coronary heart disease and 12% were for stroke. The next most common causes were heart failure and peripheral vascular disease.
- In NSW, the hospitalisation rate for cardiovascular disease for males was 1.6 times the female rate in 2002–03. Hospital use for cardiovascular disease increases with age, with people aged 55 years and over contributing over three-quarters of hospitalisations in Australia (AIHW, 2004).
- Between 1989–90 and 2002–03, the hospitalisation rate for cardiovascular disease increased gradually to a peak in 1997–98, and since then has declined slightly.
- Trends in hospitalisations for cardiovascular disease do not directly reflect the incidence of disease. They are based on episodes rather than people (one person can be hospitalised multiple times) and include elective admissions for diagnostic or surgical procedures. They are influenced by the death rate before reaching hospital, and by hospital admission practices.

For more information:

Australian Institute of Health and Welfare. *Heart, stroke and vascular diseases, Australian Facts: 2004.* AIHW Catalogue no. CVD 27. Canberra: AIHW, Heart Foundation of Australia, 2004. Available at www.aihw.gov.au.

Coronary heart disease deaths by sex, persons of all ages and 25-74 years old, NSW 1983 to 2002



			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	25–74 years	Males	2953	2824	2718	2609	2534	2385	2399	2109	2069	1929
		Females	1272	1187	1167	1020	1061	929	835	811	735	653
		Persons	4225	4011	3885	3629	3595	3314	3234	2920	2804	2582
	All ages	Males	5706	5811	5718	5635	5431	5315	5354	5022	4748	4801
		Females	4868	5103	4984	4881	4931	4643	4555	4515	4343	4167
		Persons	10574	10914	10702	10516	10362	9958	9909	9537	9091	8968
Rate per 100,000 population	25–74 years	Males	170.9	159.8	151.8	143.7	137.0	126.8	125.5	108.6	104.6	96.0
		Females	66.2	60.0	58.7	50.9	52.6	45.7	40.7	39.3	35.3	31.1
		Persons	116.7	108.2	103.7	95.9	93.6	85.3	82.2	73.4	69.5	63.0
	All ages	Males	262.6	263.2	254.2	240.9	224.1	212.1	207.6	189.2	171.2	168.6
		Females	152.8	154.8	146.6	138.5	134.9	123.0	116.1	110.7	102.5	94.9
		Persons	200.5	201.8	192.3	183.1	174.3	162.3	156.4	145.4	133.8	127.4

Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production.

Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

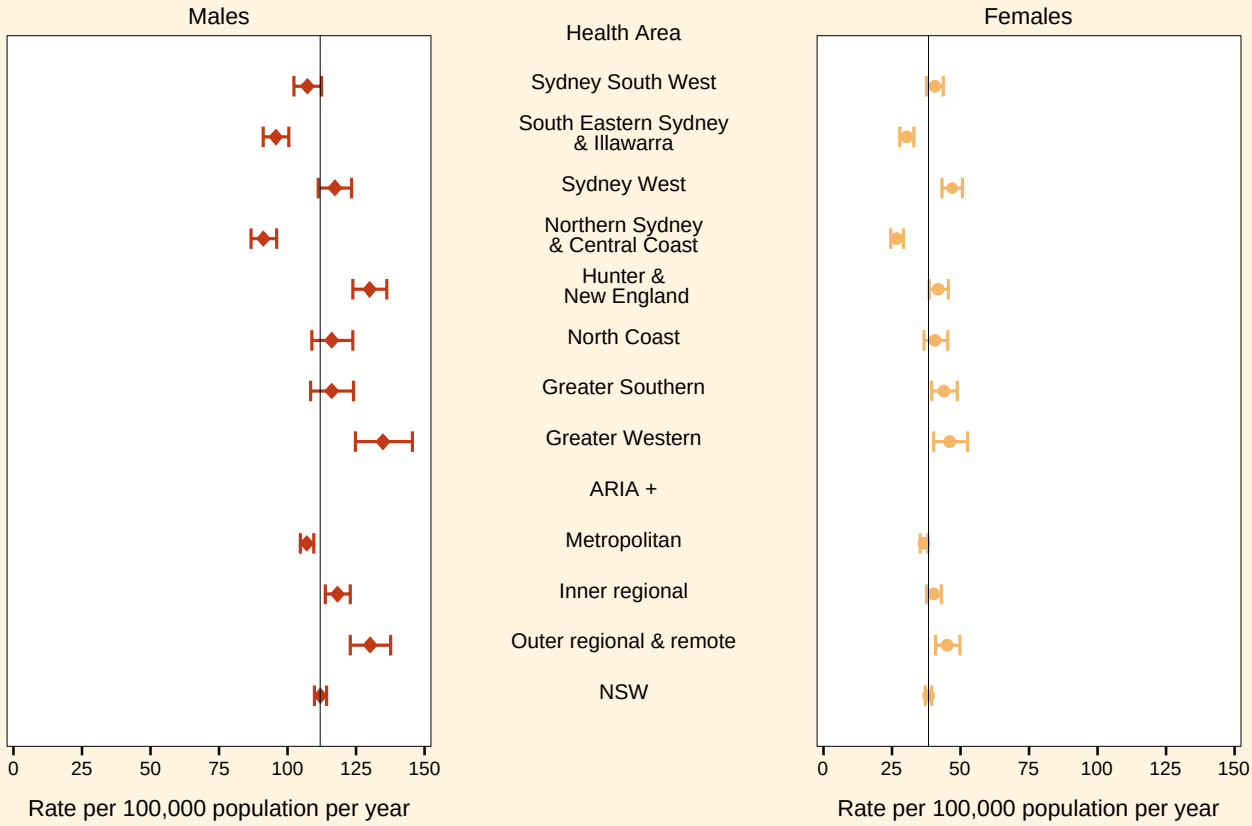
- Coronary heart disease is caused by blockages in the coronary arteries that supply blood to the heart muscle. Myocardial infarction (heart attack) occurs when one of the coronary arteries suddenly becomes completely blocked, which can lead to the death of part of the heart muscle.
- In 2002, coronary heart disease accounted for 8,968 deaths (20% of all deaths) in NSW, or around 25 deaths every day.
- Coronary heart disease kills more males than females. In the 25–74 years age group, the male death rate from this cause is 3.1 times the female rate, and for all ages the male death rate is 1.8 times the female rate.
- Death rates from coronary heart disease have more than halved since 1983. The declining death rate can be attributed to both reduced incidence of coronary heart disease and improved survival of people with disease.
- The decreasing death rate is reflected in an Australia-wide decrease in total coronary heart disease events (deaths plus non-fatal hospital admissions). The rate of acute coronary heart disease events fell by 22% for males and 23% for females between 1993–94 and 2000–01 (National Health Peformance Committee, 2004).

For more information:

Australian Institute of Health and Welfare. *Heart, stroke and vascular diseases, Australian Facts: 2004.* AIHW Catalogue no. CVD 27. Canberra: AIHW, Heart Foundation of Australia 2004. Available at www.aihw.gov.au.

National Health Performance Committee. *National report on Health Sector Performance Indicators 2003.* Canberra: Australian Institute of Health and Welfare, 2004.

Coronary heart disease deaths by health area and sex, persons aged 25 -74 years, NSW 1998 to 2002



Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Lower and upper limits of the 95% confidence interval are shown. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

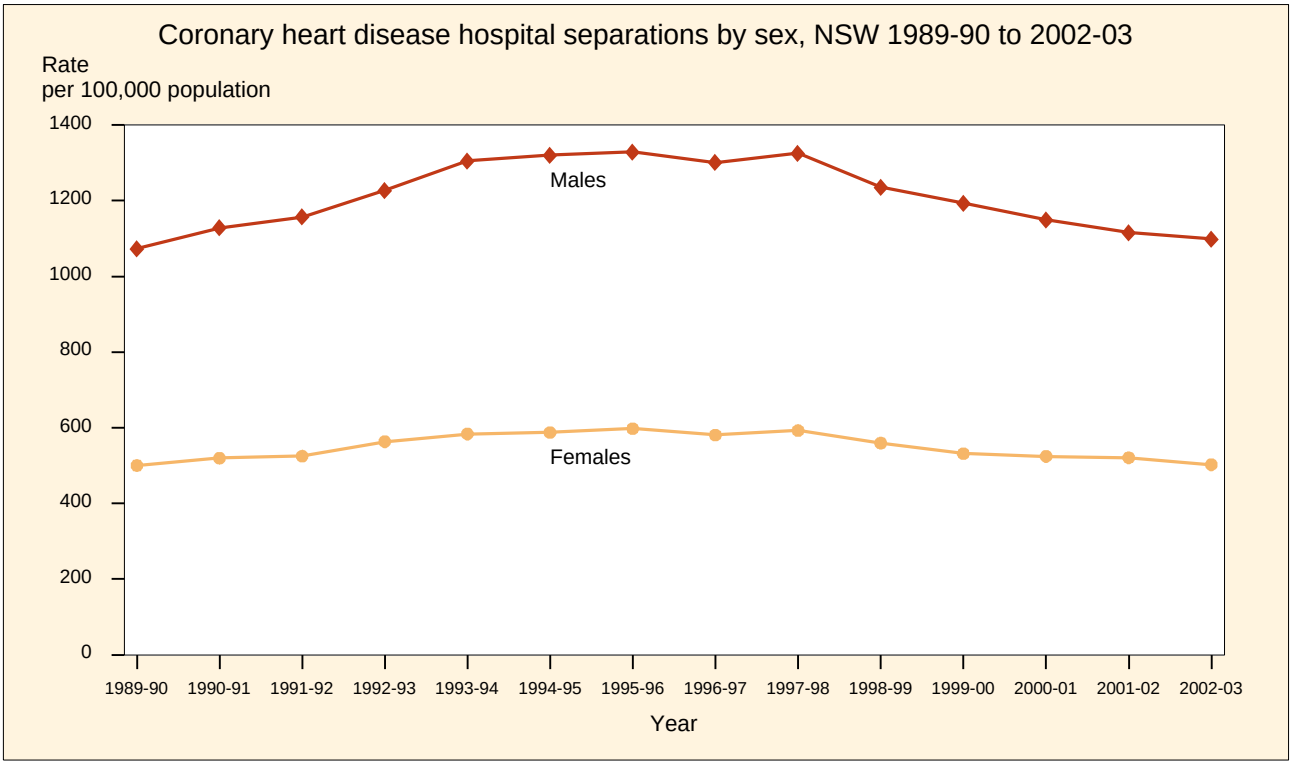
Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In the period 1998–2002, there was substantial geographic variation in rates of premature death from coronary heart disease in NSW.
- Residents of the Northern Sydney & Central Coast and South Eastern Sydney & Illawarra Area Health Services had the lowest age-adjusted rates of premature death from coronary heart disease. In both males and females, higher-than-average rates were recorded in the Sydney West, Hunter & New England, North Coast, Greater Southern and Greater Western Area Health Services. For both males and females, residents of outer-regional and remote areas of NSW had higher death rates from coronary heart disease than those living in inner-regional areas, who in turn had higher death rates than those living in metropolitan areas.
- Although death rates from coronary heart disease were relatively low in metropolitan areas, over half of all coronary heart disease deaths occurred among residents of metropolitan areas, reflecting the concentration of the NSW population in urban areas.
- The higher death rates from coronary heart disease in inner-regional and outer-regional and remote areas reflect differences in socioeconomic conditions, in the prevalence of risk factors, and in access to and use of health services. They are also influenced by the high rates of coronary heart disease among Indigenous people.

For more information:

Australian Institute of Health and Welfare. *Heart, stroke and vascular diseases, Australian Facts: 2004.* AIHW Catalogue no. CVD 27. Canberra: AIHW, Heart Foundation of Australia, 2004. Available at www.aihw.gov.au.

Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004.



		1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00	2000–01	2001–02	2002–03
Number	Males	34559	35679	36559	36672	38394	36590	36006	35571	35389	35618
	Females	18283	18730	19463	19298	20201	19524	18969	19143	19550	19212
	Persons	52842	54409	56022	55971	58595	56114	54975	54714	54941	54832
Rate	Males	1305.0	1320.4	1328.7	1301.2	1325.2	1236.5	1193.2	1149.5	1116.1	1099.2
per 100,000	Females	583.8	587.6	597.8	581.0	592.9	559.8	531.7	524.5	521.0	502.5
population	Persons	928.3	938.7	947.0	924.7	944.1	884.1	847.1	823.3	806.4	788.4

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In the 2001 National Health Survey, 1.9% of adults reported they had coronary heart disease. Coronary heart disease was the principal reason for 54,832 hospitalisations of NSW residents (2.6% of all hospitalisations) in 2002–03.
- The hospitalisation rate for coronary heart disease for males is around 2.2 times the rate for females. Hospital use for coronary heart disease increases with age, with people aged 60 years and over contributing about three-quarters of hospitalisations in Australia (AIHW, 2004).
- The hospitalisation rate for coronary heart disease increased gradually from 1996–97, peaking in 1995–96, and then declined.
- The decreasing hospitalisation rate is reflected in an Australia-wide decrease in total coronary heart disease events (deaths plus non-fatal hospital admissions). This decrease is partly due to fewer hospitalisations among those who have been hospitalised before, which in turn is due to better drug treatment and use of coronary revascularisation procedures (National Health Peformance Committee, 2004).
- Trends in hospitalisations for coronary heart disease do not directly reflect the incidence of disease. They are are based on episodes rather than people (one person can be hospitalised multiple times) and include elective admissions for diagnostic or surgical procedures. They are influenced by the death rate before reaching hospital, and by hospital admission practices.

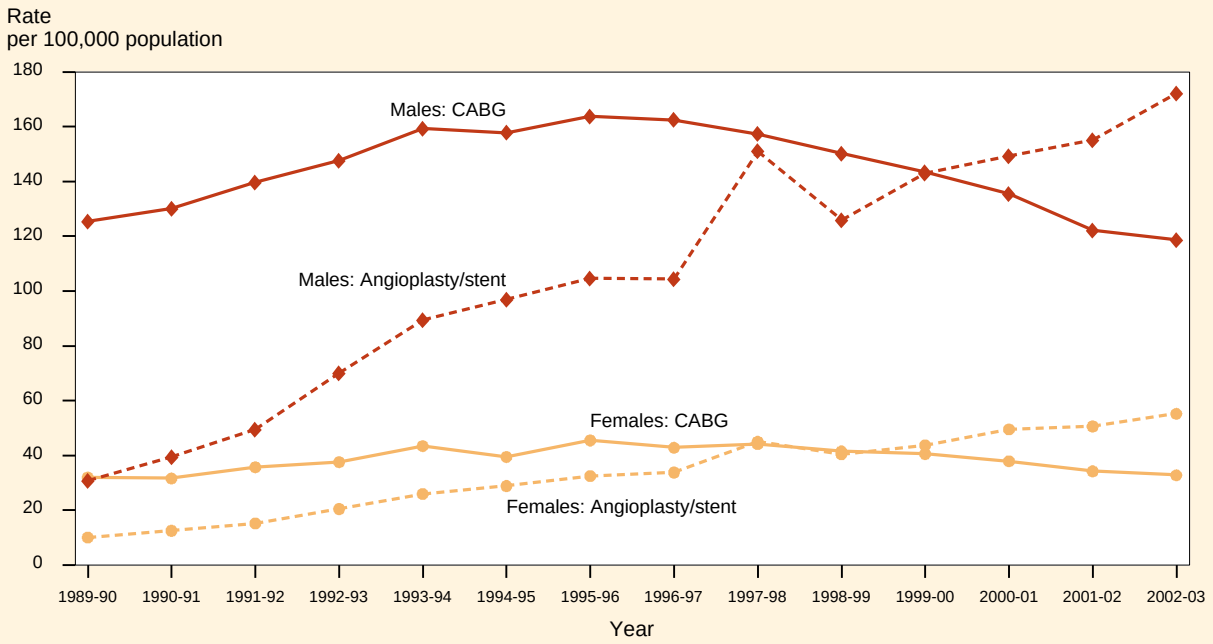
For more information:

Australian Institute of Health and Welfare. *Heart, stroke and vascular diseases, Australian Facts: 2004.* AIHW Catalogue no. CVD 27. Canberra: AIHW, Heart Foundation of Australia, 2004. Available at www.aihw.gov.au.

National Health Performance Committee. *National report on Health Sector Performance Indicators 2003.* Canberra: Australian Institute of Health and Welfare, 2004.

Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004.

Coronary artery bypass graft and angioplasty with stent, hospital separations by sex, NSW 1989-90 to 2002-03



			1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00	2000–01	2001–02	2002–03
Number	Coronary artery bypass graft	Males	4423	4439	4684	4749	4697	4558	4457	4299	3967	3924
		Females	1363	1253	1467	1407	1473	1421	1417	1344	1241	1202
		Persons	5786	5692	6151	6156	6170	5979	5874	5643	5208	5126
	Coronary angioplasty–stent	Males	2479	2740	2990	3051	4514	3855	4447	4749	5031	5693
		Females	791	893	1026	1085	1492	1365	1500	1749	1836	2037
		Persons	3270	3633	4016	4136	6006	5220	5947	6498	6867	7730
Rate per 100,000 population	Coronary artery bypass graft	Males	159.3	157.8	163.7	162.5	157.3	150.2	143.5	135.6	122.2	118.6
		Females	43.4	39.4	45.5	42.9	44.2	41.5	40.6	37.9	34.2	32.8
		Persons	99.2	96.3	102.1	100.3	98.4	93.5	90.1	84.8	76.6	74.1
	Coronary angioplasty–stent	Males	89.5	97.0	104.7	104.3	151.0	125.9	142.9	149.3	155.1	172.2
		Females	26.0	28.9	32.5	33.8	45.0	40.4	43.7	49.5	50.6	55.2
		Persons	57.2	62.4	67.7	68.2	96.6	82.2	91.9	98.1	101.3	111.8

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Revascularisation procedures (coronary artery bypass graft, or CABG, and coronary angioplasty with and without stenting) are used to restore adequate blood flow to blocked coronary arteries. CABG involves using blood vessel grafts to bypass blocked coronary arteries. Coronary angioplasty involves inserting a catheter with a balloon into a coronary artery, and inflating the balloon to clear blockages. Stents (expanding metal tubes) may be inserted during the procedure, to hold the artery open. The CABG prodedure has been used extensively since the early 1970s, coronary angioplasties since the early 1980s, and stents since 1993.
- In the financial year 2002–03, 5,126 CABG procedures and 7,730 coronary angioplasty procedures were performed in NSW. Around three-quarters of these were in males.
- The rate of CABG procedures increased gradually in NSW between 1989–90 and 1995–96, before declining by about 25% up to 2002–03. In contrast, the rate of coronary angioplasty procedures has steadily increased, overtaking CABG in 2000–01.

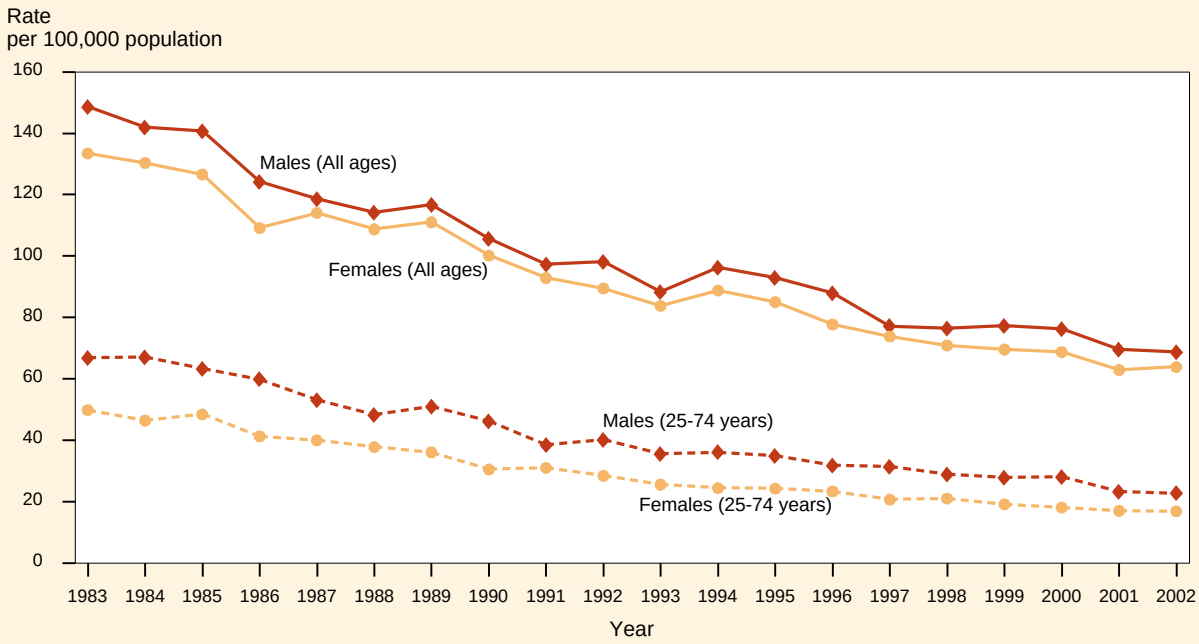
For more information:

Australian Institute of Health and Welfare. *Heart, stroke and vascular diseases, Australian Facts: 2004.* AIHW Catalogue no. CVD 27. Canberra: AIHW, Heart Foundation of Australia 2004.

Davies J, Senes S. *Coronary angioplasty in Australia 1999.* AIHW Catalogue no. CVD 19. Canberra: AIHW and National Heart Foundation of Australia, 2002.

Davies J, Senes S. *Cardiac surgery in Australia 1999.* AIHW Catalogue no. CVD 22. Canberra: AIHW and National Heart Foundation of Australia, 2003.

Stroke deaths by sex, persons aged 25-74 years and all ages, NSW 1983-2002



			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	25–74 years	Males	614	642	626	583	586	548	534	545	462	458
		Females	490	482	485	467	416	428	392	371	355	355
		Persons	1104	1124	1111	1050	1002	976	926	916	817	813
	All ages	Males	1721	1930	1921	1884	1740	1785	1846	1911	1812	1866
		Females	2668	2927	2906	2753	2726	2704	2759	2850	2698	2848
		Persons	4389	4857	4827	4637	4466	4489	4605	4761	4510	4714
Rate per 100,000 population	25–74 years	Males	35.7	36.1	35.1	32.0	31.5	29.0	27.9	28.1	23.4	22.8
		Females	25.6	24.5	24.3	23.4	20.8	21.1	19.2	18.1	17.1	16.9
		Persons	30.3	30.1	29.5	27.5	25.9	24.9	23.4	22.9	20.2	19.9
	All ages	Males	88.4	96.3	93.0	88.0	77.2	76.5	77.4	76.2	69.6	68.7
		Females	83.8	88.8	85.0	77.7	73.8	71.0	69.6	68.8	62.9	63.9
		Persons	86.7	93.0	89.3	82.5	76.5	74.1	73.3	72.8	66.2	66.7

Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production.

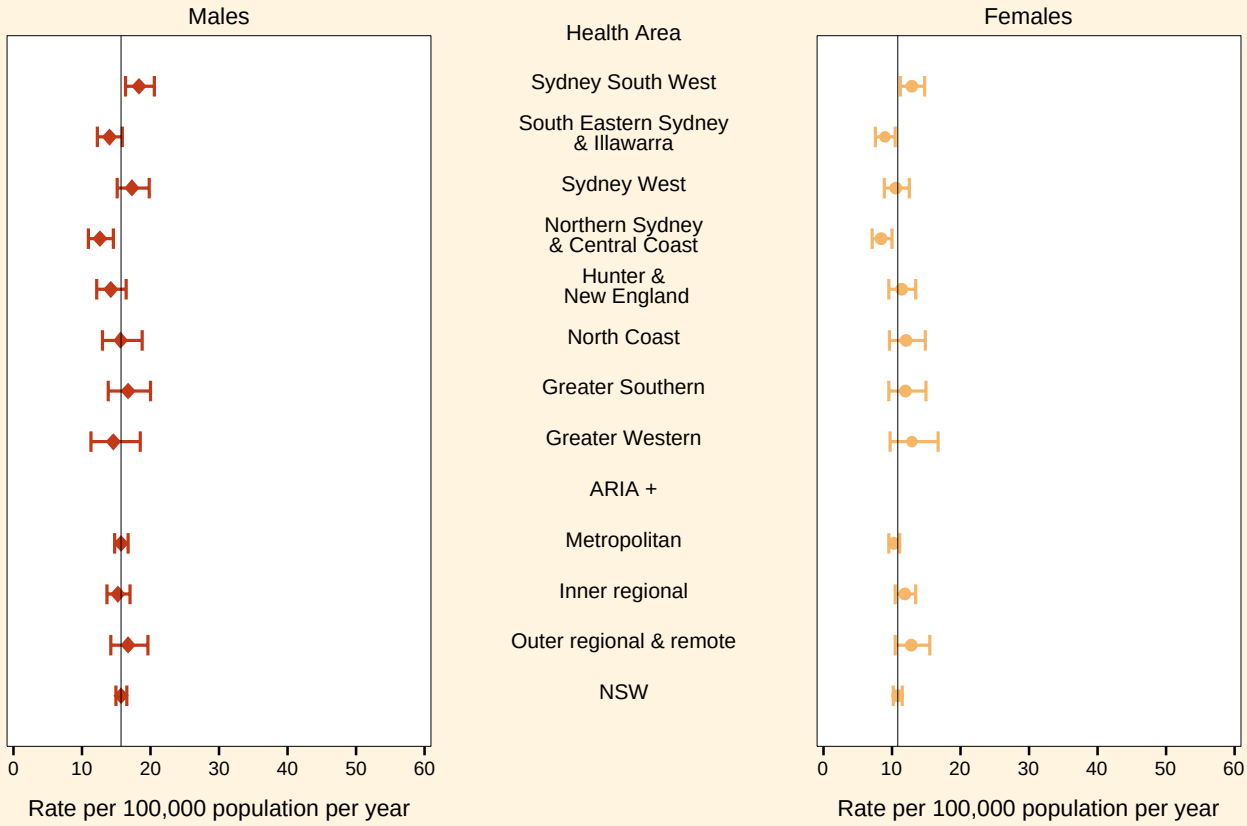
Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Stroke, or cerebrovascular disease, refers to sudden blockage of blood vessels supplying the brain (ischaemic stroke), or bleeding into the brain (haemorrhagic stroke). Stroke can result in brain damage and impairment of functions such as movement and communication. About one-third of those who have a stroke will die within 12 months, while a further one-third will require assistance from others for activities of daily living (AIHW, 2004).
- In 2002, stroke caused 4,714 deaths (10% of all deaths) in NSW, or about 13 deaths each day.
- Death rates from stroke are slightly higher in males than in females, reflecting the underlying higher incidence of cardiovascular disease at younger ages in males. However, larger numbers of females die from stroke. This is because more females live to older ages, when the death rate from stroke is higher.
- Death rates from stroke have more than halved since 1983. This decline can be attributed to both reduced incidence of stroke and improved survival after stroke. Reductions in some risk factors, including smoking and high blood pressure, have contributed to reducing incidence. Improved survival is the result of increased use of drugs to lower blood pressure, antiplatelet and anticoagulant agents, and improvements in care and rehabilitation after stroke (AIHW, 2004).

For more information:

Australian Institute of Health and Welfare. *Heart, stroke and vascular diseases, Australian Facts: 2004.* AIHW Catalogue no. CVD 27. Canberra: AIHW, Heart Foundation of Australia, 2004. Available at www.aihw.gov.au.

Stroke deaths by health area and sex, persons aged 25-74 years, NSW 1998 to 2002



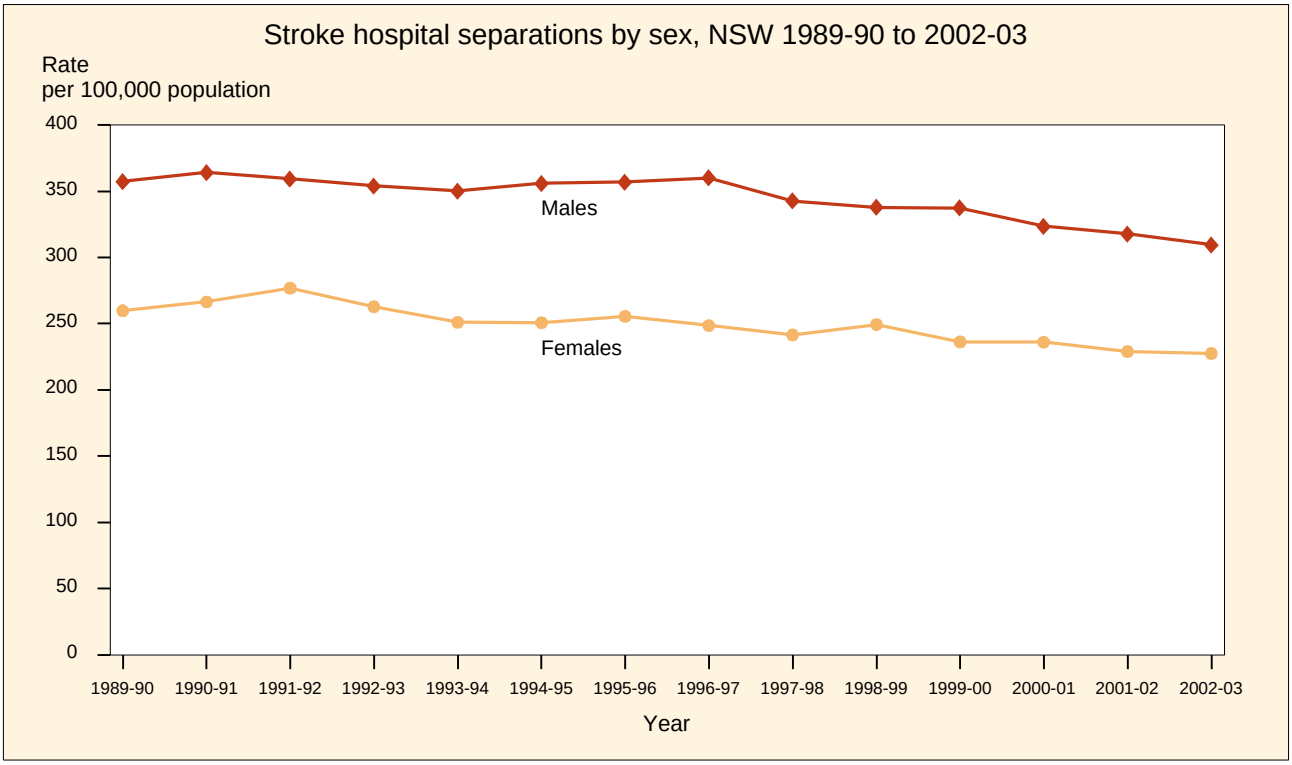
Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Lower and upper limits of the 95% confidence interval are shown. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In the period 1998–2002, death rates from stroke varied across NSW health areas. For both males and females, the lowest age-adjusted death rates were among residents of the Northern Sydney & Central Coast Area Health Service. Higher than average rates were recorded in males and females from Sydney South West and Greater Southern Area Health Services, among males from Western Sydney Area Health Service and females from Hunter & New England, North Coast, and Greater Western Area Health Services.
- While death rates from stroke were higher in outer-regional and remote areas compared to metropolitan and inner-regional areas, less than 10% of the total number of deaths occurred in outer-regional and remote areas. This reflects the concentration of the NSW population in urban areas.
- Geographic variations in death rates from stroke reflect differences in socioeconomic conditions, in the prevalence of risk factors such as smoking and high blood pressure, and possibly differences in access to and use of health services.

For more information:

Australian Institute of Health and Welfare. *Heart, stroke and vascular diseases, Australian Facts: 2004.* AIHW Catalogue no. CVD 27. Canberra: AIHW, Heart Foundation of Australia, 2004. Available at www.aihw.gov.au.



		1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00	2000–01	2001–02	2002–03
Number	Males	8288	8724	8937	9267	9107	9255	9464	9374	9480	9509
	Females	8020	8183	8551	8556	8545	9048	8813	9059	9039	9184
	Persons	16308	16907	17488	17825	17652	18303	18277	18433	18519	18692
Rate	Males	350.1	356.0	356.9	360.2	342.8	337.9	337.5	323.8	317.7	309.7
per 100,000	Females	251.2	250.8	255.6	248.7	241.6	249.4	236.3	236.2	229.0	227.6
population	Persons	294.7	297.1	300.3	297.4	286.6	289.6	281.7	276.0	269.4	265.4

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

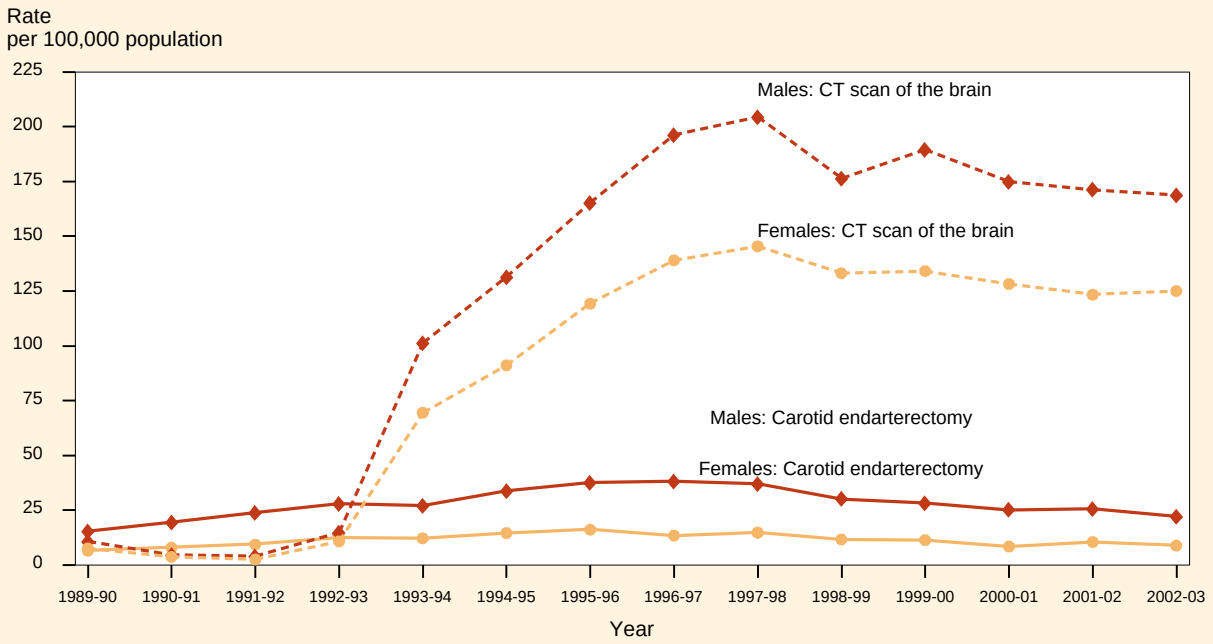
- In the 2001 National Health Survey, 1% of respondents reported that they had had a stroke (AIHW, 2004). In the 1998 Disability, Ageing and Careers Survey, 1.2% of respondents reported being disabled because of a stroke.
- Stroke was the principal reason for 18,692 hospitalisations of NSW residents in the financial year 2002–03 (0.9% of all hospitalisations). Stroke is an important contributor to hospital costs, because the average length of hospital stay among those hospitalised for at least one night is 12 days, around twice that for coronary heart disease (AIHW, 2004).
- The hospitalisation rate for stroke among males is around 1.4 times the rate among females. Hospital use for stroke increases with age, with people aged 70 years and over contributing two-thirds of hospitalisations (AIHW, 2004).
- Between 1989–90 and 2002–03, the hospitalisation rate for stroke has gradually declined. However, because the population is getting older, the number of hospitalisations has risen. Stroke is already among the top 10 causes of years of life lost due to disability in Australia. With improvements in survival after stroke, and more elderly people in the population, its contribution to the burden of disability in NSW will increase.
- Trends in hospitalisations for stroke do not directly reflect the incidence of disease. They are based on episodes rather than people (one person can be hospitalised multiple times). They are influenced by the death rate before reaching hospital, and by hospital admission practices.

For more information:

Australian Institute of Health and Welfare. *Heart, stroke and vascular diseases, Australian Facts: 2004.* AIHW Catalogue no. CVD 27. Canberra: AIHW, Heart Foundation of Australia, 2004. Available at www.aihw.gov.au.

Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004.

Stroke hospital separations for carotid endarterectomy or CT scan of the brain by sex, NSW 1989-90 to 2002-03



			1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00	2000–01	2001–02	2002–03
Number	Carotid endarterectomy	Males	729	910	1039	1065	1057	880	859	771	807	711
		Females	390	472	529	453	507	407	409	309	389	335
		Persons	1119	1382	1568	1518	1564	1287	1268	1080	1196	1046
	CT scan of the brain	Males	2464	3305	4170	5108	5436	4838	5299	5010	5056	5140
		Females	2205	2964	3971	4771	5125	4829	5030	4958	4916	5106
		Persons	4669	6269	8141	9879	10561	9667	10329	9968	9972	10246
Rate per 100,000 population	Carotid endarterectomy	Males	27.0	33.7	37.7	38.1	37.1	30.2	28.4	25.2	25.6	22.2
		Females	12.2	14.7	16.2	13.5	14.8	11.7	11.5	8.5	10.6	8.9
		Persons	18.9	23.1	25.8	24.5	24.8	19.9	19.2	16.1	17.4	15.0
	CT scan of the brain	Males	101.4	131.4	165.4	196.2	204.5	176.4	189.5	175.0	171.2	168.8
		Females	69.6	91.2	119.3	139.0	145.4	133.1	134.2	128.3	123.4	125.0
		Persons	83.3	109.3	139.2	164.3	171.3	152.9	159.2	149.2	144.9	145.1

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations.

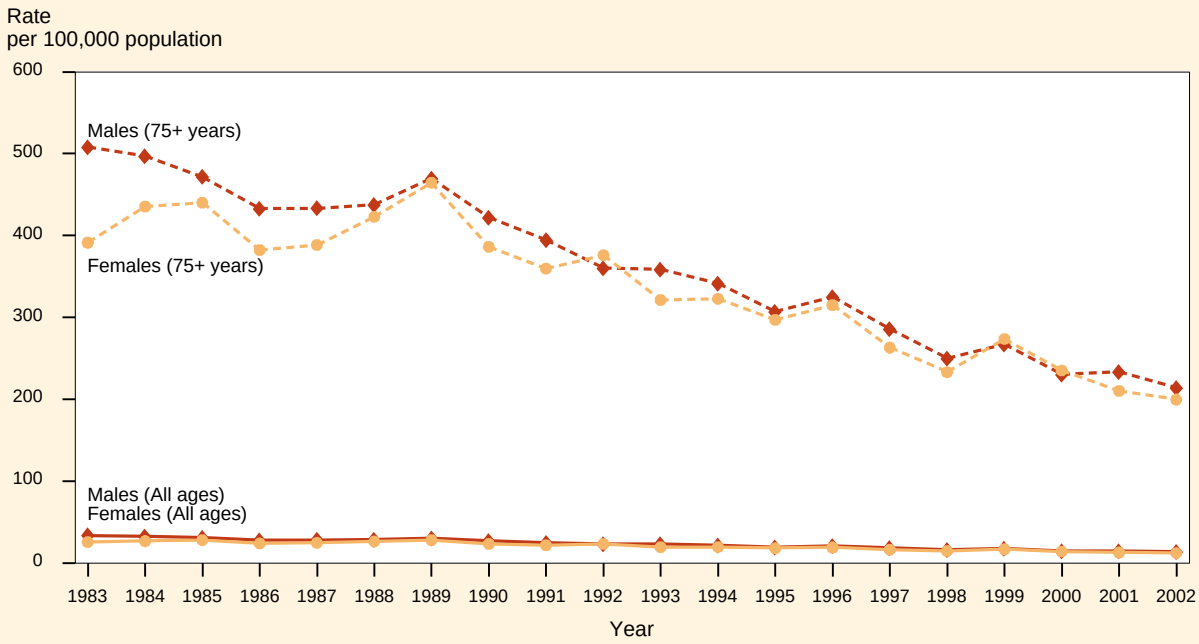
Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Carotid endarterectomy is the surgical removal of plaque caused by atherosclerosis (hardening of the arteries) from the carotid arteries in the neck, which supply blood to the brain. It may help to prevent stroke. A computerised tomographic (CT) scan of the brain is used to diagnose the cause of stroke (a blockage of the blood supply to part of the brain, or bleeding within the brain), and aids treatment decisions.
- There were 1,046 carotid endartectomies carried out in NSW in 2002–03. About two-thirds of these occurred among males, which is consistent with the higher rate of stroke among males. The rate of carotid endartectomies doubled between 1989–90 and 1996–97 and reached a peak at 25.8 procedures per 100,000 persons in 1995–96. The procedure rate declined from 1997–98 to reach a level of 15.0 per 100,000 persons in 2002–03.
- In NSW in 2002–03, there were 10,246 CT scans of the brain among people hospitalised with a principal diagnosis of stroke, with about equal numbers in males and females. In contrast with the pattern for carotid endartectomies, the rate of CT scans of the brain rose rapidly between 1992–93 and 1997–98, where it peaked at 171.3 per 100,000 persons and has remained remained fairly stable since.

For more information:

Australian Institute of Health and Welfare. *Heart, stroke and vascular diseases, Australian Facts: 2004.* AIHW Catalogue no. CVD 27. Canberra: AIHW, Heart Foundation of Australia, 2004. Available at www.aihw.gov.au.

Heart failure, deaths by sex, persons of all ages and aged 75 years and older, NSW 1983 to 2002



			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	75+ years	Males	317	312	305	332	309	282	315	289	308	301
		Females	586	611	588	654	572	527	649	586	546	542
		Persons	903	923	893	986	881	809	964	875	854	844
	All ages	Males	392	383	370	404	376	345	388	345	362	369
		Females	624	658	633	696	626	579	695	620	582	577
		Persons	1016	1041	1003	1100	1002	924	1083	965	944	946
Rate per 100,000 population	75+ years	Males	358.6	341.7	306.9	325.3	286.0	250.0	267.2	230.7	233.9	214.2
		Females	321.6	322.9	297.3	315.2	263.4	233.5	274.0	235.4	210.7	199.9
		Persons	334.2	330.6	304.1	320.9	272.5	239.3	272.4	235.0	218.7	206.3
	All ages	Males	23.2	22.0	19.8	21.0	18.6	16.4	17.6	15.0	15.1	14.3
		Females	19.6	19.9	18.5	19.3	16.7	14.9	17.1	14.5	13.1	12.5
		Persons	21.0	20.8	19.2	20.2	17.5	15.5	17.4	14.8	13.9	13.4

Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production.

Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Heart failure is most commonly caused by coronary heart disease and high blood pressure. It can also be caused by infection, alcohol abuse, diabetes, and diseases of the heart valves.
- Heart failure is the third largest cause of deaths due to cardiovascular diseases in NSW, after coronary heart disease and stroke. In 2002, 946 people died of heart failure in NSW, of whom 844 were over 75 years of age. Overall, the death rate from heart failure has changed little over the last 20 years. However, among people over 75 years of age, death rates due to heart failure have more than halved over the last 20 years.
- Factors that may have contributed to the decreasing death rate from heart failure include: an decrease in coronary heart disease, improved management of high blood pressure, and improved treatment of heart failure. The NSW Clinical Service Framework for Heart Failure emphasises the importance of prevention, best practice in clinical care, and coordination of service provision.

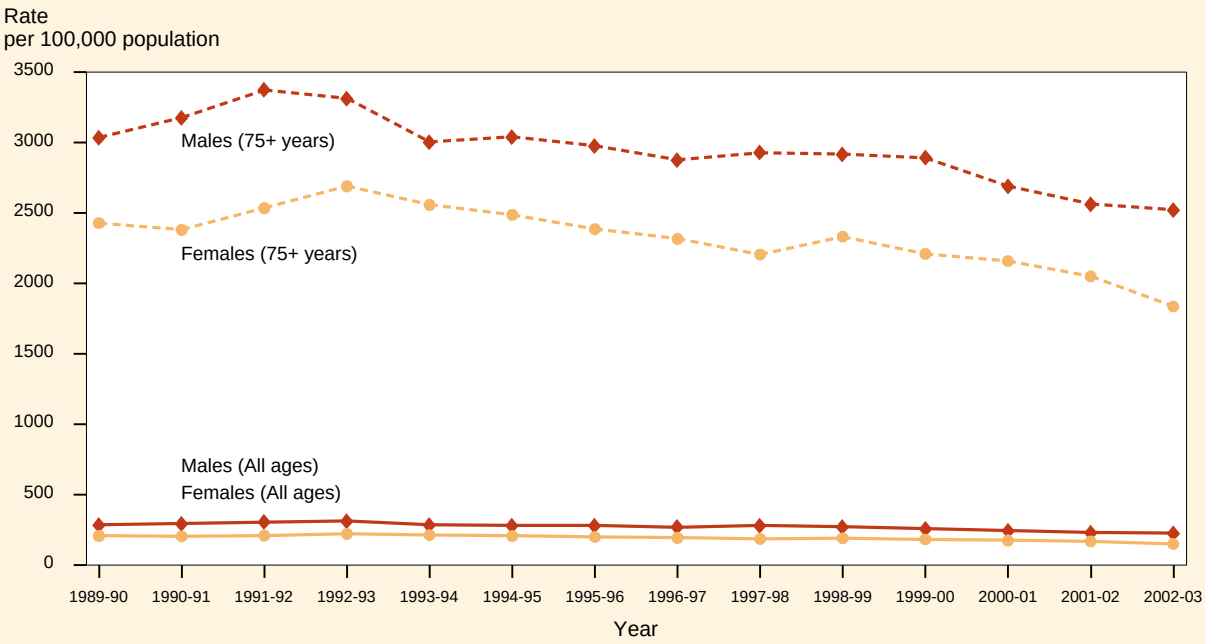
For more information:

Australian Institute of Health and Welfare. *Heart, stroke and vascular diseases, Australian Facts: 2004.* AIHW Catalogue no. CVD 27. Canberra: AIHW, Heart Foundation of Australia 2004. Available at www.aihw.gov.au.

NSW Department of Health. *NSW Clinical Service Framework for Heart Failure: Overview of the framework and its standards, Volume 1.* Sydney: NSW Department of Health, 2003.

NSW Department of Health. *NSW Clinical Service Framework for Heart Failure: A practice guide for the prevention, diagnosis and management of heart failure in NSW, Volume 2.* Sydney: NSW Department of Health, 2003.

Heart failure, hospital separations by sex, persons of all ages and aged 75 years and older, NSW 1989-90 to 2002-03



			1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00	2000–01	2001–02	2002–03
Number	75+ years	Males	3089	3254	3348	3378	3611	3749	3898	3799	3825	3934
		Females	4754	4780	4768	4838	4784	5252	5182	5282	5199	4827
		Persons	7843	8034	8116	8218	8395	9001	9080	9081	9024	8763
	All ages	Males	6340	6360	6707	6562	7071	7082	6889	6789	6668	6625
		Females	6889	6876	6819	6860	6754	7170	7108	7034	6984	6429
		Persons	13229	13236	13526	13424	13825	14252	13997	13823	13651	13055
Rate per 100,000 population	75+ years	Males	3003.2	3040.1	2976.4	2874.6	2927.5	2914.8	2891.3	2689.4	2561.4	2519.2
		Females	2556.2	2486.7	2384.0	2315.3	2205.4	2331.8	2208.0	2157.6	2050.5	1835.0
		Persons	2725.4	2695.4	2614.6	2530.3	2476.8	2554.7	2470.1	2362.9	2250.9	2103.4
	All ages	Males	283.8	279.2	282.4	269.1	279.1	272.5	259.0	246.0	232.6	224.8
		Females	212.8	206.6	199.0	193.4	185.5	190.5	183.3	175.0	169.1	151.1
		Persons	244.1	238.2	236.0	226.9	226.3	226.8	216.2	206.6	197.4	183.4

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

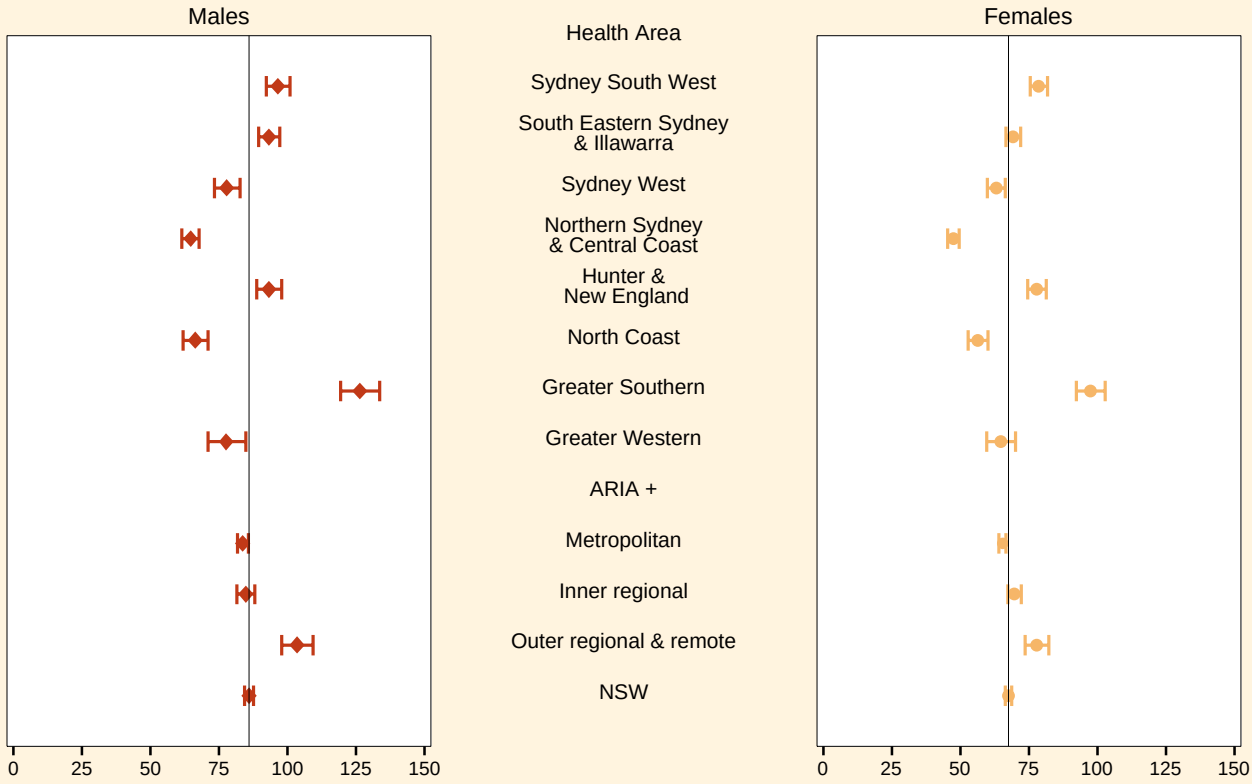
- There is no information on the incidence or prevalence of heart failure in Australia. Based on overseas studies, it is estimated that about 4% of the population aged 45 years and over have some degree of heart failure (AIHW, 2003).
- In 2002–03, there were 13,055 hospitalisations for heart failure in NSW, about half of which were among people aged 75 years and over. While the number of males and females hospitalised was about equal, the hospitalisation rate in males was about 1.4 times that in females.
- Overall, the hospitalisation rate for heart failure has fallen slightly over recent years. Among people over 75 years of age, the decline in hospitalisation rates due to heart failure has been more pronounced, falling by about 20% over the last decade. Reasons for this decline include improved treatment and management of coronary heart disease, including increased implementation of thrombolytic therapy and revascularisation procedures.
- The NSW Clinical Service Framwork for Heart Failure was developed as a key component of the NSW Chronic Care Program to improve the management of heart failure in the community and to reduce hospital admissions.

For more information:

Australian Institute of Health and Welfare. *Heart, stroke and vascular diseases, Australian Facts: 2004.* AIHW Catalogue no. CVD 27. Canberra: AIHW, Heart Foundation of Australia 2004. Available at www.aihw.gov.au.

Australian Institute of Health and Welfare. *Heart Failure ... what of the future?* Bulletin no 6. AIHW Catalogue no. AUS 34. Canberra: AIHW, 2003.

Heart failure hospitalisations by health area and sex, NSW 1998-99 to 2002-03



Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Hospitalisations of NSW residents in interstate hospitals are included for all years up until 2000–01. Numbers for 2001–02 and 2002–03 include an estimate of the small number of interstate hospitalisations, data for which were unavailable at the time of production. Statistical Local Areas were assigned to the Accessibility–Remoteness Index of Australia Plus (ARIA+). Lower and upper limits of the 95% confidence interval are shown. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Heart failure is most commonly caused by coronary heart disease and high blood pressure. It can also be caused by infection, alcohol abuse, diabetes, and diseases of the heart valves.
- In the period 1998–99 to 2002–03, hospitalisation rates due to heart failure varied across NSW area health services. For both males and females, the lowest rates were among residents of the Northern Sydney & Central Coast Area Health Service. The highest rate was in the Greater Southern Area Health Service, with higher than average rates also recorded among both males and females from Sydney South West, South Eastern Sydney & Illawarra, and Hunter & New England Area Health Services.
- While hospitalisation rates for heart failure were higher in outer-regional and remote areas than in metropolitan and inner-regional areas, only about 10% of the total number of hospitalisations occurred in outer-regional and remote areas. This reflects the concentration of the NSW population in urban areas.
- Hospitalisations for heart failure do not directly reflect the incidence of disease. They are based on episodes rather than people (one person can be hospitalised multiple times). They are influenced by the death rate before reaching hospital, and by hospital admission practices.

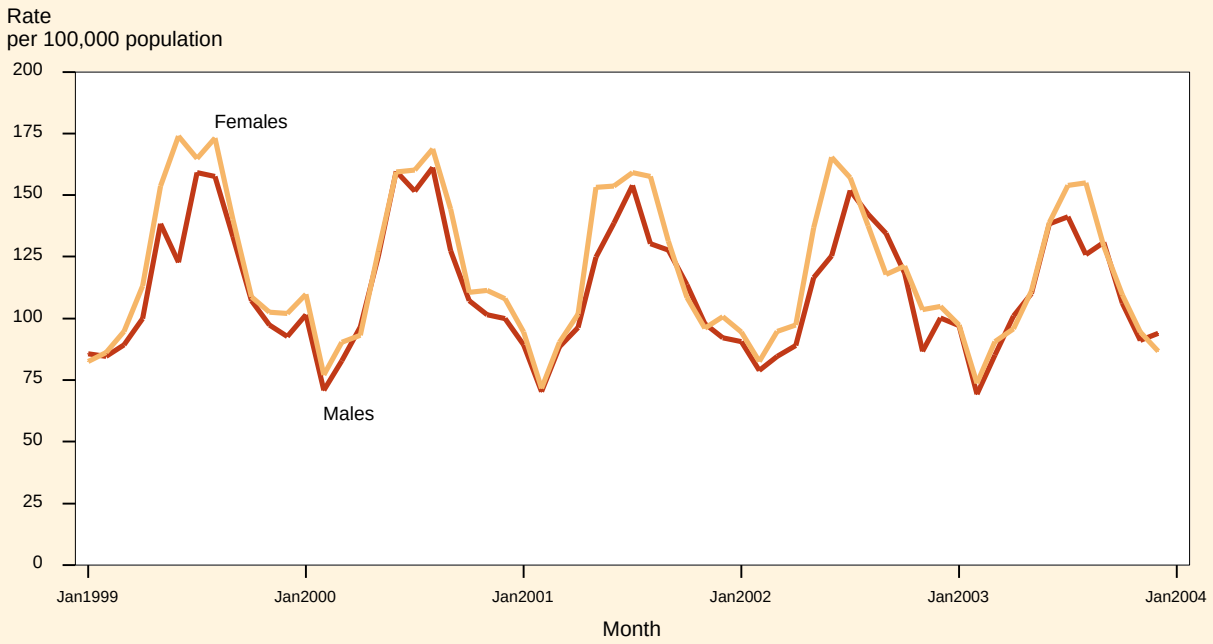
For more information:

Australian Institute of Health and Welfare. *Heart, stroke and vascular diseases, Australian Facts: 2004.* AIHW Catalogue no. CVD 27. Canberra: AIHW, Heart Foundation of Australia, 2004. Available at www.aihw.gov.au.

NSW Department of Health. *NSW Clinical Service Framework for Heart Failure: Overview of the framework and its standards, Volume 1.* Sydney: NSW Department of Health, 2003.

NSW Department of Health. *NSW Clinical Service Framework for Heart Failure: A practice guide for the prevention, diagnosis and management of Heart Failure in NSW, Volume 2.* Sydney: NSW Department of Health, 2003.

Heart failure emergency department attendance by month and sex, NSW 1999 to 2003



		1999	2000	2001	2002	2003
Number	Males	3625	3718	3599	3623	3572
	Females	4027	3977	3912	3932	3747
	Persons	7652	7798	7611	7557	7321
Crude rate	Males	113.9	115.5	110.3	109.9	107.5
per 100,000 population	Females	124.7	121.7	118.2	117.8	111.4
	Persons	119.4	120.2	115.8	113.9	109.5
Age-standardised rate	Males	136.4	136.8	127.7	123.6	118.7
per 100,000 population	Females	106.3	101.3	96.6	94.4	87.7
	Persons	119.8	118.5	111.8	107.8	101.5

Note: The NSW Emergency Department Data Collection is a database of information collected from approximately one-third of NSW emergency departments and represents approximately two-thirds of all NSW emergency patients. Heart failure was coded as a provisional diagnosis assigned by staff when the patient presented to the emergency department.

Source: Emergency Department Data Collection (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Heart failure is most commonly caused by coronary heart disease and high blood pressure. It can also be caused by infection, alcohol abuse, diabetes, and diseases of the heart valves.
- Respiratory infections can cause a deterioration in existing heart failure that has previously been under control. Attendances for heart failure at hospital emergency departments therefore tend to peak in the winter months, when flu-like illnesses and other respiratory infections are common. One of the standards of clinical care developed for the NSW Clinical Service Framework for Heart Failure recommends regular vaccination against influenza and pneumococcal disease as part of the ongoing care of those with heart failure (NSW Department of Health, 2003).
- Emergency department attendances for heart failure do not directly reflect the incidence of disease. They are based on episodes rather than people (one person can attend multiple times). They are influenced by the death rate before reaching hospital.

For more information:

Australian Institute of Health and Welfare. *Heart, stroke and vascular diseases, Australian Facts: 2004.* AIHW Catalogue no. CVD 27. Canberra: AIHW, Heart Foundation of Australia, 2004. Available at www.aihw.gov.au.

NSW Department of Health. *NSW Clinical Service Framework for Heart Failure: Overview of the framework and its standards, Volume 1.* Sydney: NSW Department of Health, 2003.

NSW Department of Health. *NSW Clinical Service Framework for Heart Failure: A practice guide for the prevention, diagnosis and management of Heart Failure in NSW, Volume 2.* Sydney: NSW Department of Health, 2003.

Chapter 4.2

Diabetes

- In NSW in 2002–03, 6.7% of males and 5.6% of females aged 16 years and over reported having diabetes or high blood sugar. It is likely that there are also many people with diabetes in NSW who are not yet aware they have it.
- Diabetes prevalence increases with age and socioeconomic disadvantage and is more prevalent among Aboriginal and Torres Strait Islander people.
- For people with diabetes, careful control of blood sugar levels through diet, exercise, and in some cases medication and insulin injections, is vital to prevent complications. In NSW in 2002–2003, more than two-thirds (69%) of people with diabetes reported following a special diet, 42% reported taking tablets to manage their diabetes, 7.4% required insulin injections, and 9% reported 'not doing anything'.
- Control of risk factors for cardiovascular disease is particularly important for people with diabetes. In NSW in 2002–2003, people with diabetes were less likely to report being a current smoker than those without diabetes (17.2% compared with 22.2%); had similar levels of inadequate physical activity (over 50%); and reported a higher rate of overweight and obesity (64.8% compared with 44.2%).
- Diabetes was the main cause of around 2% of all deaths in NSW in 2002, and was a contributing cause in a further 6.6% of all deaths. Cardiovascular disease is the most common cause of death among people with diabetes.
- Hospitalisations for which diabetes was recorded as a principal diagnosis or a comorbidity increased by 139% between 1989–90 and 2002–03. Hospitalisation rates were highest in the Greater Western Area Health Service and lowest in the Northern Sydney & Central Coast Area Health Service.
- The complications of diabetes include poor blood circulation and nerve function in the limbs, eye problems, and kidney failure. There were 770 hospital admissions for lower extremity amputations and 7,865 hospitalisations for eye complications in people with diabetes in 2002–03. In 2002, 126 people became newly-dependent on dialysis as a result of diabetes complications.

In this chapter

Introduction

Diabetes mellitus is a chronic condition characterised by high blood sugar (glucose) levels; it is caused by either a deficient production of insulin or resistance to its action. Insulin is produced by the pancreas and helps glucose enter cells of the body, where it is converted into energy. In uncontrolled diabetes, the sugar builds up in the bloodstream and can lead to a range of short- and long-term problems, including damage to vital organs (AIHW, 2002).

There are 3 main forms of diabetes mellitus: type 1 diabetes, type 2 diabetes, and gestational diabetes. Type 1, or insulin-dependent diabetes mellitus (IDDM), is characterised by a complete deficiency of insulin and is estimated to be present in 10–15% of people with diabetes. It is the most common form of diabetes in children. There are no known modifiable risk factors for this form of diabetes. Type 2, or non-insulin-dependent diabetes mellitus (NIDDM), is the most common form of diabetes, affecting primarily people aged 40 years and over. Heredity, low birthweight, and older age, are risk factors for type 2 diabetes. Lifestyle factors such as poor diet, physical inactivity, and obesity, also predispose to its development (AIHW, 2002). A person with type 2 diabetes mellitus may have the disease for many years before symptoms become apparent, during which time some damage to organs such as the eyes, nerves, and kidneys may already have begun. Gestational diabetes occurs during pregnancy in about 4% to 6% of females not previously known to have diabetes. Such women are at increased risk of developing other forms of diabetes mellitus later in life.

Diabetes can lead to acute and chronic complications. A large rise or fall in blood sugar levels causes acute metabolic changes that can lead to coma. High blood sugar levels over a longer period of time can lead to serious chronic complications caused by damage to blood vessels, such as kidney damage, loss of vision, peripheral neuropathy (nerve damage), and peripheral vascular disease. Diabetes also increases the risk of heart disease, stroke and lower limb amputations. Fortunately, careful management substantially reduces the risk of complications in people with diabetes.

Routine death and hospital data do not distinguish between the 3 forms of diabetes and also tend to underestimate the true burden of diabetes. Diabetes and its associated complications contribute significantly to mortality, morbidity, poor quality of life, and loss of potential years of life in Australia. In NSW in 1999–2001, diabetes accounted for 1.7% of all years of potential life lost for both males and females, ranking ninth of all causes. Diabetes is also associated with a significant burden of disability—responsible for 3.3% of the total years lived with disability in NSW in 1996 (see the Burden of disease section). Diabetes was made a state priority area in 1995 and is one of the 6 national health priority areas.

The harm caused by diabetes can be reduced by preventing its onset, and by preventing complications in those who have it. The prevention of type 2 diabetes mellitus through the modification of risk factors—particularly through lifestyle changes—is a goal of the National Diabetes Strategy (CDHA, 1999), which was endorsed in 1999 by all State and Commonwealth health ministers. Because type 2 diabetes shares

a number of risk factors with other chronic diseases—such as cardiovascular diseases—the coordination of prevention strategies is essential to ensure consistent messages, pooling of resources, and better health outcomes. To that effect, the National Public Health Partnership has developed a national chronic disease prevention framework (NPHP, 2001), and NSW Health has developed the Chronic Disease Prevention Strategy 2003–2007 (NSW Health, 2003).

The management of diabetes depends on: careful control of blood sugar (glucose) levels through a combination of diet, exercise, insulin injections (for people with type 1 diabetes and some people with type 2 and gestational diabetes) or tablets (people with type 2 diabetes); careful control of blood lipid (fat) levels, especially cholesterol levels; careful control of blood pressure; regular screening for complications; and early or preventive intervention if complications or the early signs of complications are detected. These prevention strategies have been embodied in a number of evidence-based guidelines, including those published in NSW (NSW Department of Health, 1996) and those published nationally (Australian Centre for Diabetes Strategies, 2001).

The NSW Chronic Care Program is a major initiative for improving health care for people with chronic and complex health problems. The aims of the program are to improve the quality of life of people with chronic and complex health conditions and their carers and families, and to prevent the need for unnecessary and avoidable hospital admissions (NSW Department of Health, 2001).

This chapter presents recent data on the prevalence of diabetes; self-reported management of diabetes; selected cardiovascular risk factors among people with diabetes; deaths where diabetes is a principal or contributing cause; total hospitalisations for diabetes; and hospitalisations for lower limb amputations, eye complications, and end-stage renal disease, due to diabetes. The methods used for analysing and presenting death and hospitalisation data are described in more detail in the Methods section.

For more information:

Australian Centre for Diabetes. *National evidence based guidelines for the management of type 2 diabetes mellitus.* Sydney: Prince of Wales Hospital, 2001–2004. Available at www.diabetes.net.au/evidence_based_healthcare/guidelines_development.asp.

Australian Institute of Health and Welfare. *National diabetes register: Statistical profile, December 2001.* AIHW Catalogue no. CVD 249 Diabetes Series No. 4. Canberra: AIHW, 2003. Available at www.aihw.gov.au/publications/index.cfm/title/9166.
Australian Institute of Health and Welfare. *Diabetes: Australian Facts 2002.* AIHW Catalogue no. CVD 20 Diabetes Series no. 3). Canberra: AIHW, 2002. Available at www.aihw.gov.au/publications/cvd/daf02/index.html.

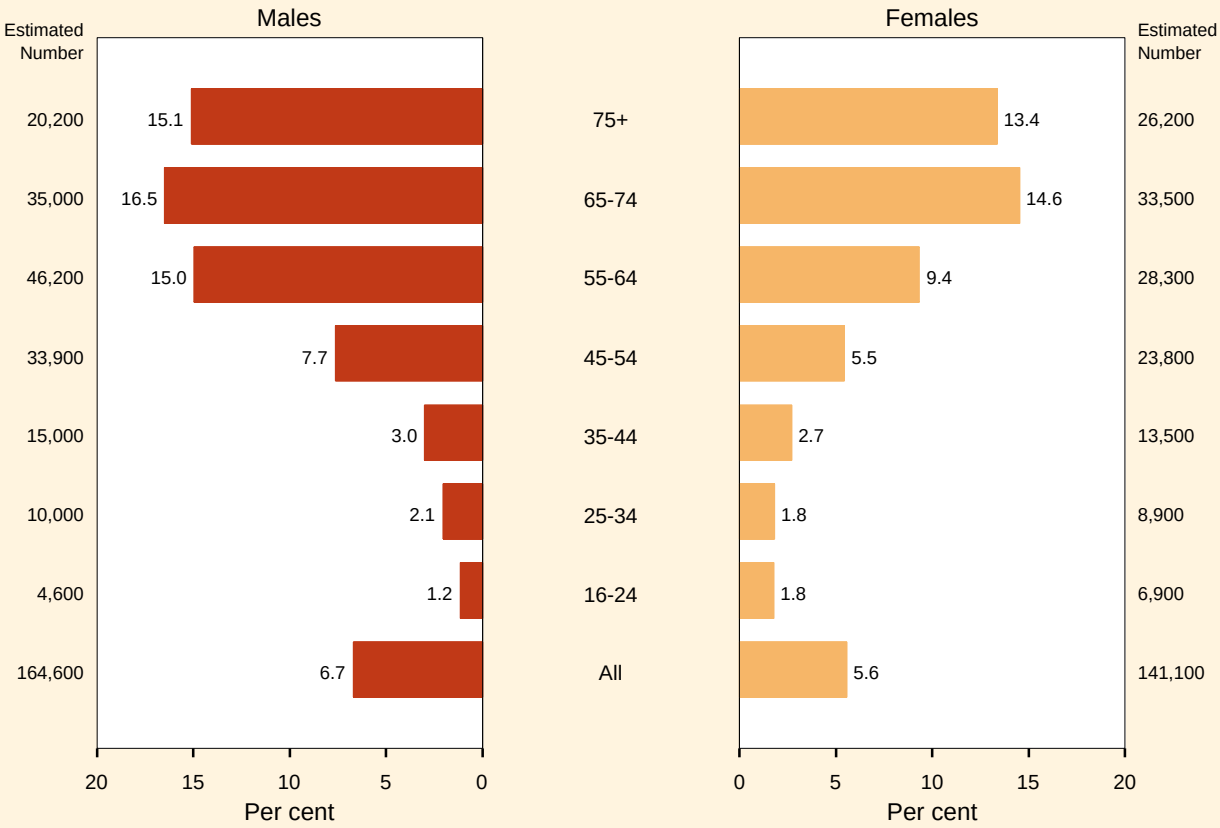
National Public Health Partnership. *Preventing Chronic Disease: A strategic framework: Background paper.* Melbourne: NPHP, 2001. Available at www.nphp.gov.au/publications/strategies/chrondis-bgpaper.pdf.

NSW Department of Health. *Improving Health Care for People with Chronic Illness: A blueprint for change 2001–2003.* Sydney: NSW Department of Health, 2001. Available at www.health.nsw.gov.au/policy/gap/chronic/chronic.pdf.

NSW Department of Health. *NSW Chronic Disease Prevention Strategy 2003–2007.* Sydney: NSW Department of Health, 2003. Available at www.health.nsw.gov.au/pubs/c/pdf/chronic_disease.pdf.

NSW Department of Health. *Improving diabetes care and outcomes: Principles of care and guidelines for the clinical management of diabetes mellitus.* Sydney: NSW Department of Health, 1996. Available at www.health.nsw.gov.au/public-health/diabetes/diabguid.html.

Diabetes or high blood sugar by age and sex,
persons aged 16 years and over, NSW 2002 and 2003



Note: Current diabetes or high blood sugar includes those responding 'Yes' to the question 'Have you ever been told by a doctor or at a hospital that you have diabetes?' or 'Yes' to the question 'Have you ever been told by a doctor or at a hospital that you have high sugar levels in your blood or urine (HBS)?'. This indicator excludes women reporting previous diabetes–HBS during pregnancy. Estimates are based on 25,531 respondents. 6 (0.02%) not stated for having diabetes or high blood sugar.

Source: NSW Health Survey 2002 and 2003 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In NSW in 2002–2003, 6.7% of males and 5.6% of females aged over 16 years reported having doctor-diagnosed diabetes or high blood sugar. This was a significant increase from the 1997 figures of 5.2% for males and 4.3% for females. Australian studies suggest the prevalence of diabetes has more than doubled over the past 20 years (Dunstan et al., 2002).
- The prevalence of self-reported diabetes increases with age. In NSW in 2002–2003, it ranged from 1.2% of males and 1.8% of females aged 16–24 years, to 15.1% of males and 13.4% of females aged 75 years and over. Across Australia, Aboriginal and Torres Strait Islander peoples have a significantly higher prevalence of diabetes than the general population.
- In its early stages, type 2 diabetes often has no obvious symptoms, and so is often present for a number of years before it is diagnosed. The actual number of adults with type 2 diabetes may be one-and-a-half times the number diagnosed (Dunstan et al., 2001).
- Early detection and management can reduce the complications of diabetes. A significant number of people already have some complications at the time their type 2 diabetes is first detected (Dunstan et al., 2001). National guidelines recommend regular screening for diabetes for those at high risk (ACDS, 2001).

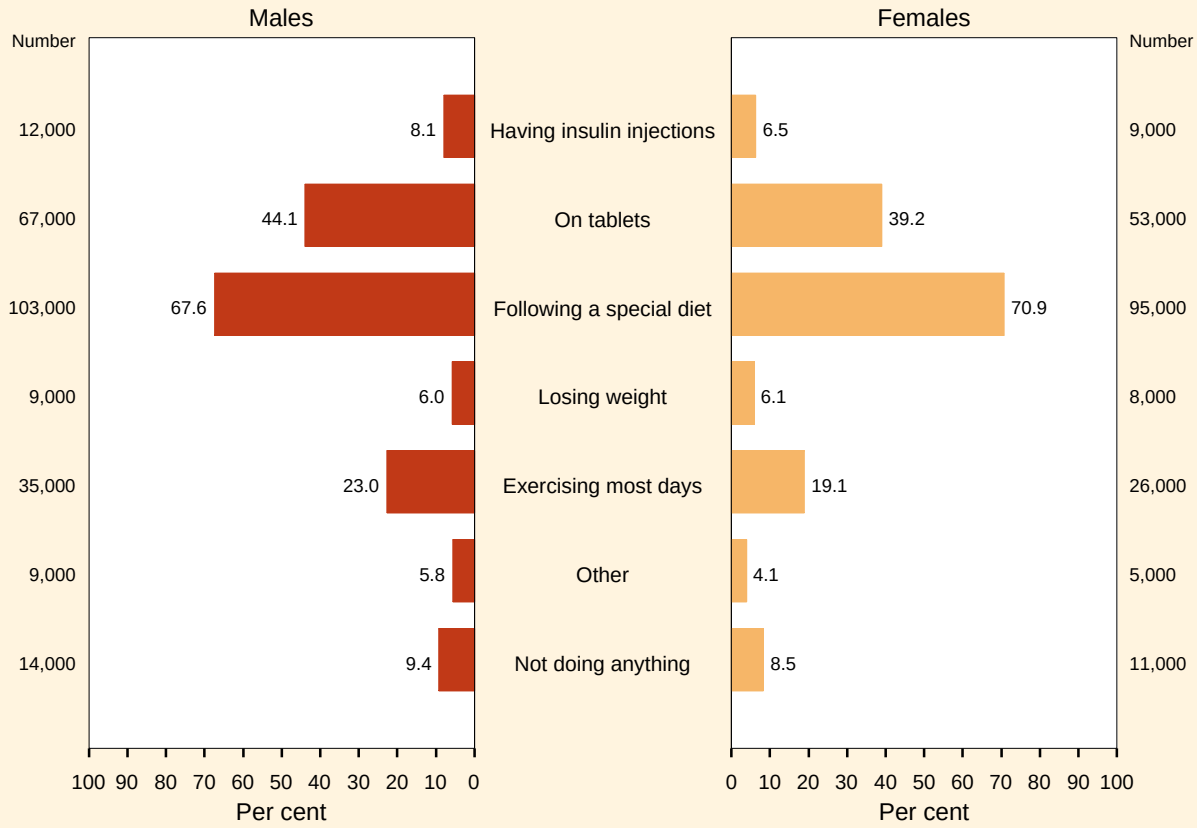
For more information:

Australian Centre for Diabetes Strategies. *National evidence-based guidelines for the management of type 2 diabetes mellitus. Primary prevention, case detection and diagnosis. Endorsed by the NHMRC 14 December 2001.* Sydney: Diabetes Australia Guideline Development Consortium, 2002.

Dunstan D, Zimmet P, Welborn T et al. *Diabesity and associated disorders in Australia, 2000: The accelerating epidemic.* Melbourne: International Diabetes Institute, 2001.

Dunstan DW, Zimmet P, Welborn TA, De Courten MP, Cameron AJ, Sicree RA. The rising prevalence of diabetes and impaired glucose tolerance. The Australian Diabetes, Obesity, and Lifestyle Study. *Diabetes Care* 2002; 25: 1551–1556.

Action taken to manage diabetes or high blood sugar by age and sex, persons aged 16 years and over, NSW 2002 and 2003



Note: Current diabetes or high blood sugar includes those responding 'Yes' to the question 'Have you ever been told by a doctor or at a hospital that you have diabetes?' or 'Yes' to the question 'Have you ever been told by a doctor or at a hospital that you have high sugar levels in your blood or urine (HBS)?' then 'What are you doing now to manage your diabetes or high blood sugar?'. Excludes women reporting previous diabetes–HBS during pregnancy and people reporting type 1 diabetes. Respondents could mention more than one type of management, so percentages may total more than 100%. Estimates are based on 2,329 respondents; 5 (0.04%) not stated for having diabetes or high blood sugar.

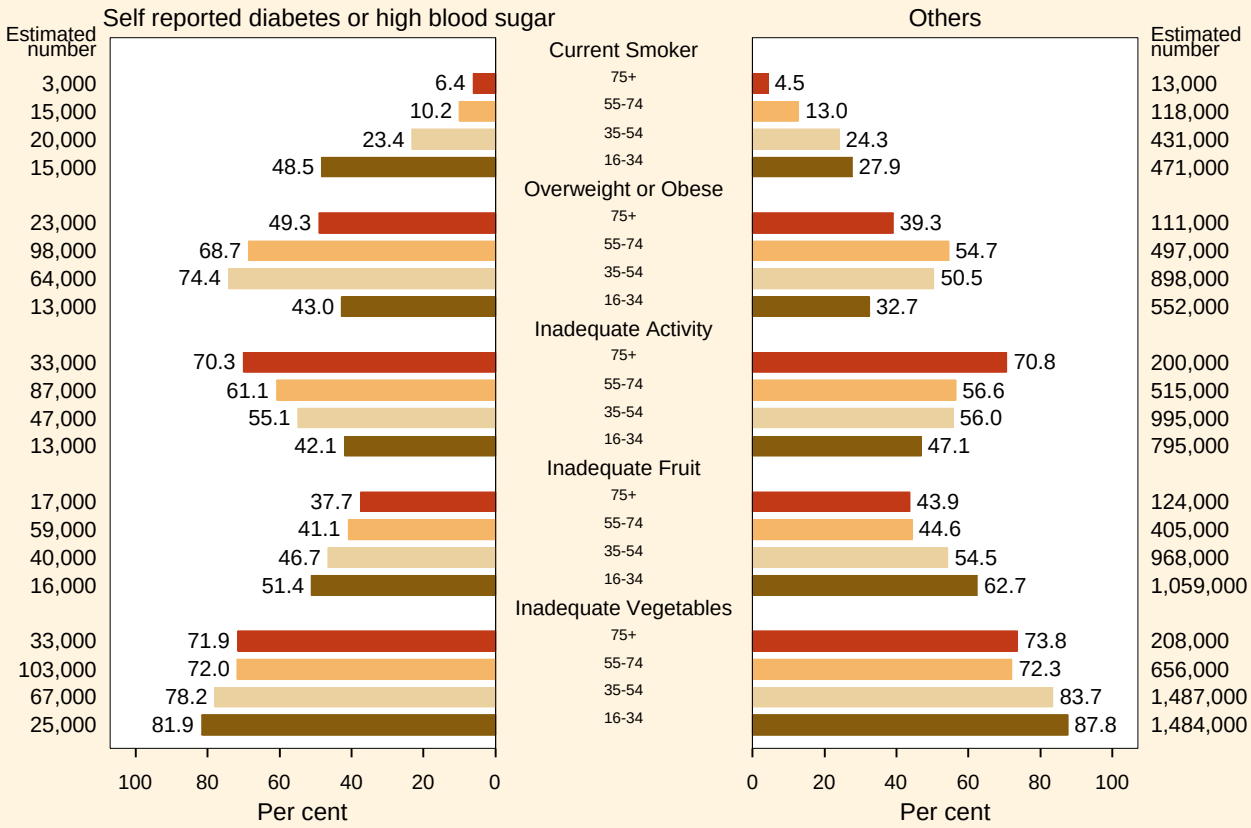
Source: NSW Health Survey 2002 and 2003 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Careful control of blood sugar levels is vital in preventing the complications of diabetes. For some people with type 2 diabetes, blood sugar levels may be controlled with careful diet and exercise alone; however, some also require oral medication and a smaller number need insulin injections. All people with type 1 diabetes require regular injections of insulin for survival.
- In the NSW Health Surveys 2002 and 2003, people reporting doctor-diagnosed diabetes were asked about the actions they take to manage their diabetes. After excluding respondents with type 1 diabetes, the majority (69%) reported following a special diet, 42% reported taking tablets to manage their diabetes, 7.4% required insulin injections, and 9% reported 'not doing anything'. A recent national survey of people with type 2 diabetes found that a similar proportion reported using insulin (6.7%), although a greater proportion reported using oral medication (59.6%), compared with respondents to the NSW Health Survey (Colagiuri et al., 2003).
- Only 21% of respondents to the NSW Health Survey with diabetes (after excluding type 1 diabetes) reported exercising most days. Appropriate diet and exercise not only help the control of blood sugar levels, but also help control body weight and blood pressure and decrease the risk of cardiovascular diseases such as heart attack and stroke.

For more information:

Colagiuri S, Colagiuri R, Conway B, Grainger D, Davey P. *DiabCo$t Australia: Assessing the burden of type 2 Diabetes in Australia.* Canberra: Diabetes Australia, 2003.

Risk factors for cardiovascular disease by diabetes status and age, persons aged 16 years and over, NSW 2002 and 2003



Note: Current diabetes or high blood sugar includes those responding 'Yes' to the question 'Have you ever been told by a doctor or at a hospital that you have diabetes?' or 'Yes' to the question 'Have you ever been told by a doctor or at a hospital that you have high sugar levels in your blood or urine (HBS)?'. Excludes women reporting previous diabetes–HBS during pregnancy and people reporting type 1 diabetes. Estimates are based on 25,531 respondents. 6 (0.04%) not stated for having diabetes or high blood sugar.

Source: NSW Health Survey 2002 and 2003 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- The risk of cardiovascular disease is substantially increased in people with diabetes, due to the effects of high blood sugar levels and also the higher prevalence of other risk factors including high blood pressure, high blood cholesterol, insufficient physical activity, obesity, and smoking (Stratton et al., 2000; Claudi et al., 2000).
- In the 2002 and 2003 NSW Health Surveys, people with diabetes were less likely to report being a current smoker than those without diabetes (17.2% compared to 22.2%); however, those with diabetes aged 16–34 years were more likely to smoke than those without diabetes (48.5% compared to 27.9%). Levels of inadequate physical activity were similar for those with and without diabetes.
- Overall, 64.8% of those with diabetes reported being overweight or obese, compared with 44.2% of those without diabetes. People with diabetes reported a slightly lower rate of inadequate fruit and vegetable intake.
- National guidelines for the care of people with type 2 diabetes recommend regular assessment for the presence of cardiovascular disease or its risk factors (ACDS, 2004).

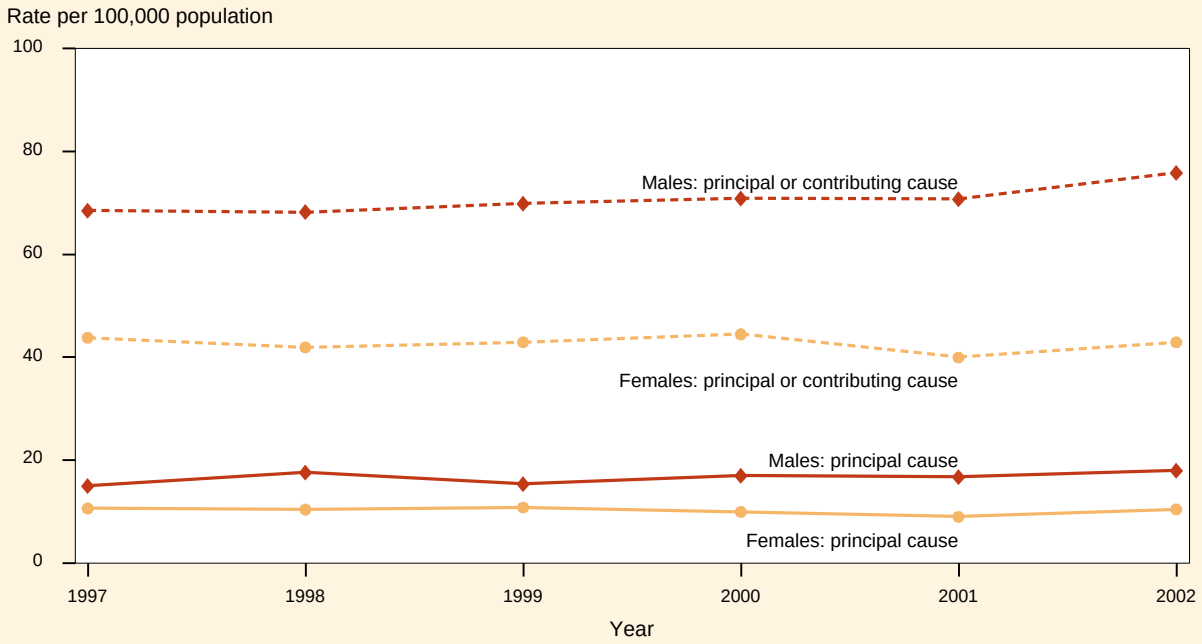
For more information:

Australian Centre for Diabetes Strategies. *National evidence-based guidelines for the management of type 2 diabetes mellitus. Prevention and detection of macrovascular disease. Endorsed by the NHMRC 18 March 2004.* Sydney: Diabetes Australia Guideline Development Consortium, 2004.

Claudi T, Midthjell K, Holman J, Fougner K, Kruger O, Wiseth R. Cardiovascular disease and risk factors in persons with type 2 diabetes diagnosed in a large population screening: The Nord-Trondelag diabetes study, Norway. *J Intern Med* 2000; 248: 492–500.

Stratton IM, Adler AI, Neil AW, Matthews DR, Manley SE, Cull CA et al. Association of glycaemia with microvascular and macrovascular complications of type 2 diabetes (UKPDS 35): Prospective observational study. *BMJ* 2000; 321: 405–412.

Diabetes as a principal and as a principal or contributing cause of death by sex, NSW 1997 to 2002



			1997	1998	1999	2000	2001	2002
Number	Contributing cause	Persons	2498	2462	2666	2824	2780	3028
	Principal cause	Persons	747	834	822	846	844	963
	Principal or contributing cause	Persons	3245	3296	3488	3670	3624	3990
Rate per 100,000 population	Contributing cause	Persons	41.5	39.6	41.7	42.8	40.9	43.2
	Principal cause	Persons	12.5	13.5	12.8	12.8	12.4	13.7
	Principal or contributing cause	Persons	54.0	53.1	54.5	55.7	53.3	57.0

Note: Data includes deaths from diabetes as a principal (underlying) cause and also as a contributing (associated) cause of death. Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production.

Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

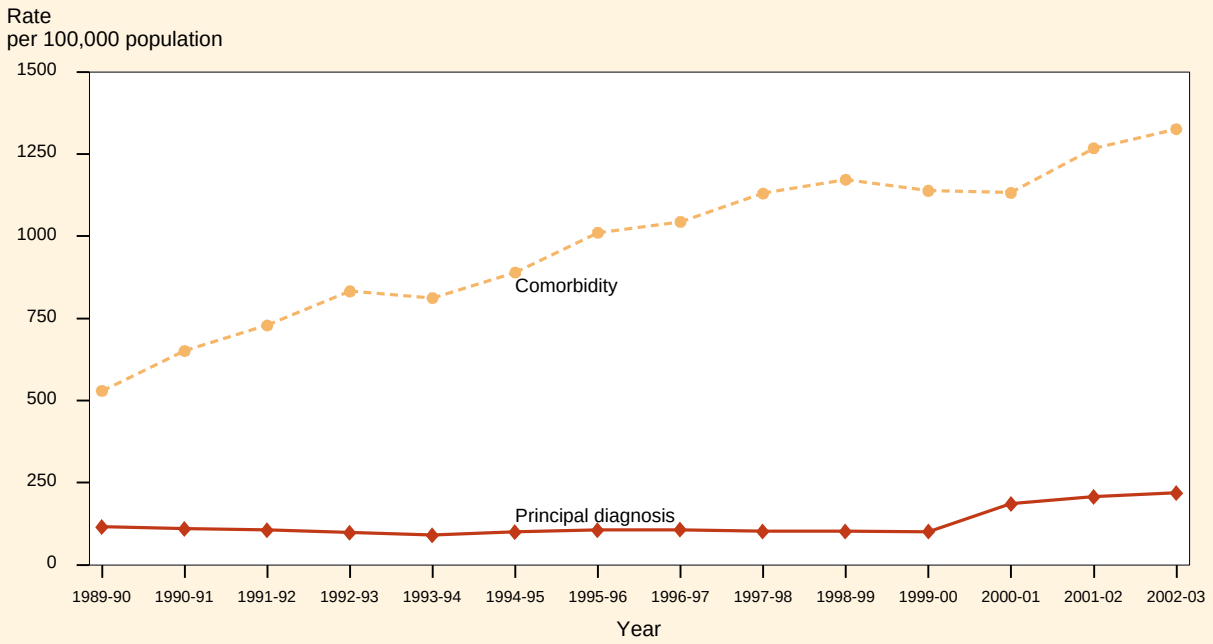
- Diabetes is the sixth most common cause of death in Australia (ABS, 2003). Since 1997, both the principal and contributing causes of death have been recorded on death certificates. Because diabetes is associated with a range of complications such as cardiovascular disease or kidney disease, it may be these complications that are recorded as the principal cause of death with diabetes as a contributing cause.
- In 2002, diabetes was recorded as the principal cause of 963 deaths in NSW (13.7 per 100,000 population) and a contributing cause of a further 3,028 deaths (43.2 per 100,000). These diabetes-related deaths represent 8.7% of all deaths in NSW in that year, an increase from 7.2% in 1997. The proportion of deaths with diabetes as a principal cause is fairly stable; however, the proportion of deaths with diabetes as a contributing factor continues to rise, particularly in males.
- In 2002, males had almost twice the rate of death due to diabetes (principal or contributing cause) as females (75.8 compared to 42.9 per 100,000).
- Where diabetes is a contributing cause of death, cardiovascular disease is by far the most common principal cause of death (54.4% and 57.4% of these deaths for males and females respectively in NSW 2000–2002).
- Aross Australia, diabetes is responsible for more deaths among Aboriginal and Torres Strait Islander peoples, and people living in remote areas and socioeconomically disadvantaged areas (AIHW, 2002).

For more information:

Australian Institute of Health and Welfare. *Diabetes: Australian Facts 2002.* AIHW Catalogue no. CVD 20. Diabetes Series no. 3. Canberra: AIHW, 2002.

Australian Bureau of Statistics. *Causes of Death, Australia 2002.* ABS Catalogue no. 3303.0. Canberra: ABS, 2003.

Diabetes as a principal diagnosis or as a comorbidity, hospital separations, NSW, 1989-90 to 2002-03



			93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	Principal diagnosis	Persons	5275	5948	6442	6598	6461	6526	6586	12410	14099	15173
	Comorbidity	Persons	46271	51639	60026	63452	70310	74541	74044	75345	86399	92122
Rate per 100,000 population	Principal diagnosis	Persons	90.6	101.0	107.5	107.7	103.6	102.8	101.8	187.0	207.9	219.5
	Comorbidity	Persons	812.1	889.6	1011.0	1044.2	1130.3	1172.0	1138.4	1132.3	1268.1	1325.8

Note: Diabetes was the principal reason for hospitalisation when it was coded in the first diagnosis field; it was a comorbidity when it was coded in the second to fifth diagnosis field and was not the principal diagnosis. Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD–10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Diabetes can lead to short- and long-term health problems that require hospitalisation, particularly if it is poorly controlled. Diabetes also contributes to the development of other diseases including heart disease, stroke, and peripheral vascular diseases (AIHW, 2002).
- Complications of diabetes, such as visual and renal impairment, leg and foot ulcers, and amputations, are often responsible for hospitalisation, and hence are recorded as the principal diagnosis instead of diabetes mellitus.
- In NSW in 2002–03, there were 15,173 hospitalisations with diabetes recorded as the principal diagnosis (219.5 per 100,000 population) and 92,122 hospitalisations with diabetes recorded as a comorbidity (1,325.8 per 100,000). Some people may be admitted more than once in a year. In NSW in 2000–01 there was an average of 1.6 hospitalisations per person for those with any diabetes-related hospitalisations.
- The rate of diabetes-related hospitalisations rose from 646.8 per 100,000 in 1989–90 to 1,545.3 per 100,000 in 2002–03: a 139% increase. The sudden increase in hospitalisations with diabetes recorded as a principal diagnosis after 1999–00 is likely to be related to changes in hospital coding (Phillips, 2003).

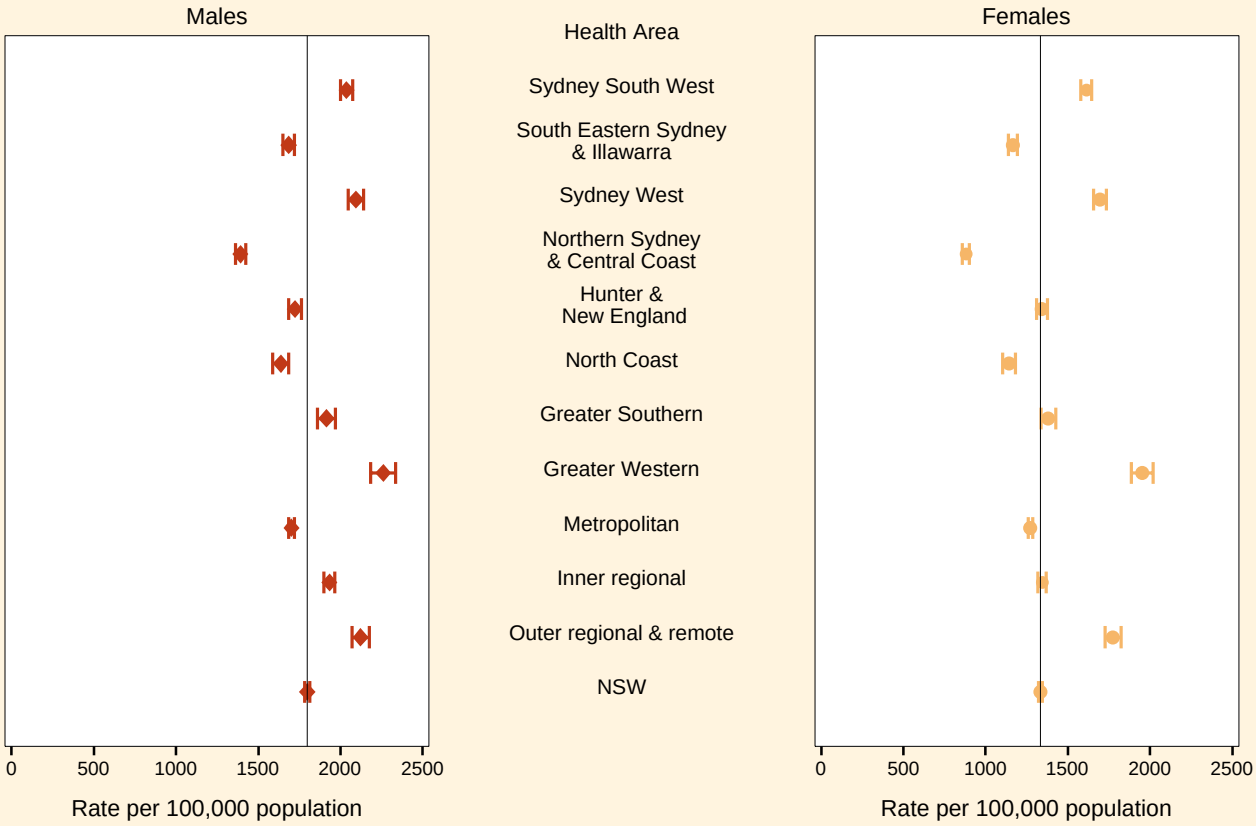
For more information:

Australian Institute of Health and Welfare. *Diabetes: Australian Facts 2002.* AIHW Catalogue no. CVD 20. Diabetes Series no. 3. Canberra: AIHW, 2002.

Australian Institute of Health and Welfare. *Heart, stroke and vascular diseases: Australian facts 2004.* Cardiovascular Disease Series no. 22. AIHW Catalogue no. CVD 27. Canberra: AIHW and National Heart Foundation of Australia, 2004.

Phillips G. *The impact of ICD coding standard changes for diabetes hospital morbidity data.* Catalogue no. CVD26. Canberra: AIHW, 2003.

Diabetes as a principal diagnosis or as a comorbidity, hospital separations, by Health Area and sex, 2002-03, NSW



Note: Diabetes was the principal reason for hospitalisation when it was coded in the first diagnosis field; it was a comorbidity when it was coded in the second to fifth diagnosis field and was not the principal diagnosis. Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations. Statistical Local Areas were assigned to the Accessibility–Remoteness Index of Australia Plus (ARIA+). Lower and upper limits of the 95% confidence interval are shown. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Diabetes can lead to short-and long-term health problems that require hospitalisation, particularly if it is poorly controlled. Complications of diabetes, such as visual and renal impairment, leg and foot ulcers, and amputations, are often responsible for hospitalisation (AIHW, 2004).
- In NSW in 2002–03 there were 107,257 hospitalisations with diabetes recorded as the principal diagnosis or as a comorbidity. The hospitalisation rates for diabetes ranged from 1,105 per 100,000 in the Northern Sydney & Central Coast Area Health Service to 2,091 per 100,000 in the Greater Western Area Health Service. Diabetes hospitalisation rates were higher in outer-regional and remote areas compared with inner-regional and metropolitan areas.
- The prevalence of self-reported diabetes does not vary greatly on a geographic basis but is higher among those from lower socioeconomic backgrounds, among Aboriginal and Torres Strait Islander people, and among certain overseas-born Australians (AIHW, 2004). Geographic variations in hospitalisation rates for diabetes may relate to later diagnosis of diabetes and in some areas; differentials in access to primary health care services; and greater likelihood of being hospitalised, rather than being treated as an ambulatory patient, in more remote areas.

For more information:

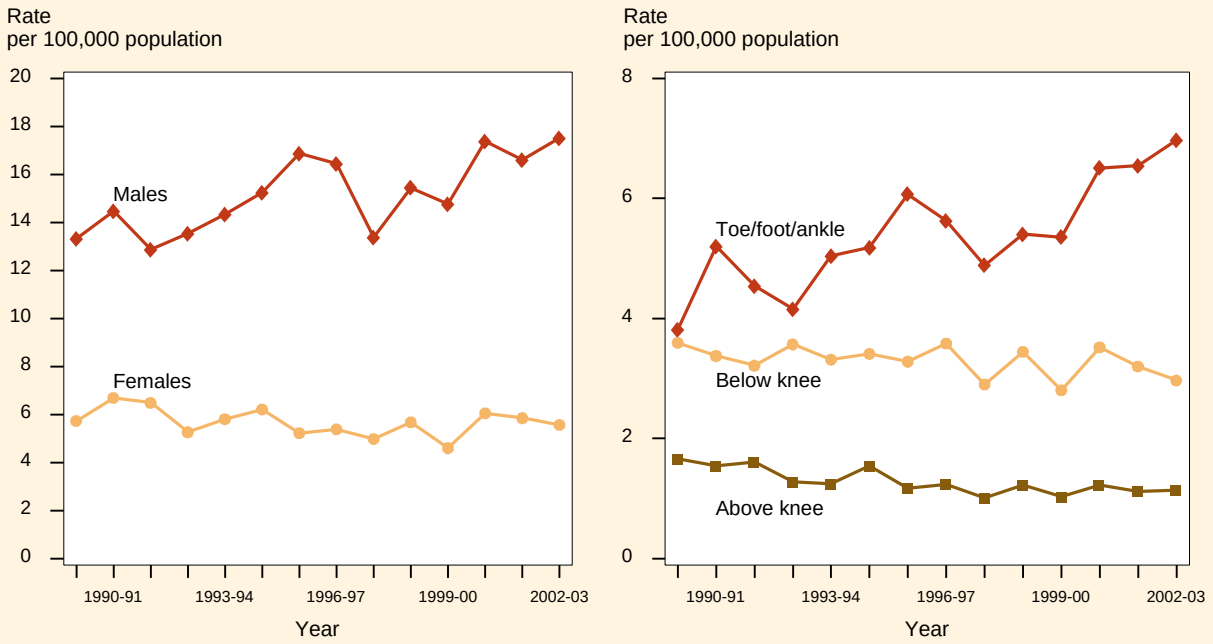
Australian Institute of Health and Welfare. *Heart, stroke and vascular diseases: Australian facts 2004.* Cardiovascular Disease Series no. 22. AIHW Catalogue no. CVD 27. Canberra: AIHW and National Heart Foundation of Australia, 2004.

Area health service	Sex	Hospitalisations	Rate per 100,000 population	LL 95% CI	UL 95% CI
Sydney South West	Males	11018	2036.8	1998.2	2075.9
	Females	10027	1611.5	1580.0	1643.5
	Persons	21044	1804.1	1779.8	1828.7
South Eastern Sydney & Illawarra	Males	9660	1684.0	1650.4	1718.1
	Females	7745	1165.9	1139.8	1192.5
	Persons	17405	1401.2	1380.4	1422.2
Sydney West	Males	8699	2093.0	2047.7	2139.1
	Females	8065	1694.4	1657.4	1732.0
	Persons	16765	1878.7	1850.1	1907.7
Northern Sydney & Central Coast	Males	7699	1391.0	1360.1	1422.5
	Females	6151	879.8	857.4	902.7
	Persons	13850	1104.6	1086.1	1123.3
Hunter & New England	Males	7558	1722.2	1683.3	1761.8
	Females	6662	1341.5	1309.0	1374.6
	Persons	14220	1513.2	1488.3	1538.4
North Coast	Males	4576	1636.2	1588.4	1685.1
	Females	3565	1141.7	1103.3	1181.0
	Persons	8141	1376.3	1346.0	1407.1
Greater Southern	Males	4688	1914.6	1859.6	1970.9
	Females	3745	1381.0	1336.6	1426.5
	Persons	8433	1637.2	1602.3	1672.6
Greater Western	Males	3512	2259.4	2184.4	2336.3
	Females	3324	1951.5	1885.1	2019.7
	Persons	6835	2091.2	2041.8	2141.6
Metropolitan	Males	36826	1701.6	1684.2	1719.2
	Females	32592	1271.3	1257.5	1285.3
	Persons	69417	1464.9	1454.0	1475.9
Inner regional	Males	14188	1932.3	1900.4	1964.7
	Females	11138	1343.7	1318.6	1369.3
	Persons	25326	1619.2	1599.2	1639.3
Outer regional and remote	Males	6472	2122.6	2070.4	2175.7
	Females	5611	1773.7	1726.8	1821.6
	Persons	12083	1939.0	1904.3	1974.3
NSW	Males	57695	1797.0	1782.3	1811.8
	Females	49562	1332.4	1320.6	1344.3
	Persons	107257	1544.7	1535.5	1554.0

Note: Diabetes was the principal reason for hospitalisation when it was coded in the first diagnosis field; it was a comorbidity when it was coded in the second and fifth diagnosis field and was not the principal diagnosis. Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations. Statistical Local Areas were assigned to the Accessibility–Remoteness Index of Australia Plus (ARIA+).

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

Lower extremity amputations with diabetes as a diagnosis
hospital separations by sex and site of amputation, NSW 1989-90 to 2002-03



	Type		93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	Toe–foot–ankle	Persons	290	299	363	342	306	343	349	433	446	484
	Below knee	Persons	190	197	194	217	181	220	183	236	219	207
	Above knee	Persons	66	87	66	76	63	78	67	82	77	80
	NSW	Persons	547	587	626	640	550	641	599	751	743	770
Rate	Toe-foot–ankle	Persons	5.0	5.2	6.1	5.6	4.9	5.4	5.4	6.5	6.5	7.0
per 100,000	Below knee	Persons	3.3	3.4	3.3	3.6	2.9	3.4	2.8	3.5	3.2	3.0
population	Above knee	Persons	1.2	1.5	1.2	1.2	1.0	1.2	1.0	1.2	1.1	1.1
	NSW	Persons	9.6	10.2	10.6	10.5	8.8	10.1	9.2	11.3	10.9	11.1

Note: Hospitalisations were included where diabetes was coded in any of the first 5 diagnosis fields and lower limb amputation was the first procedure listed. Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

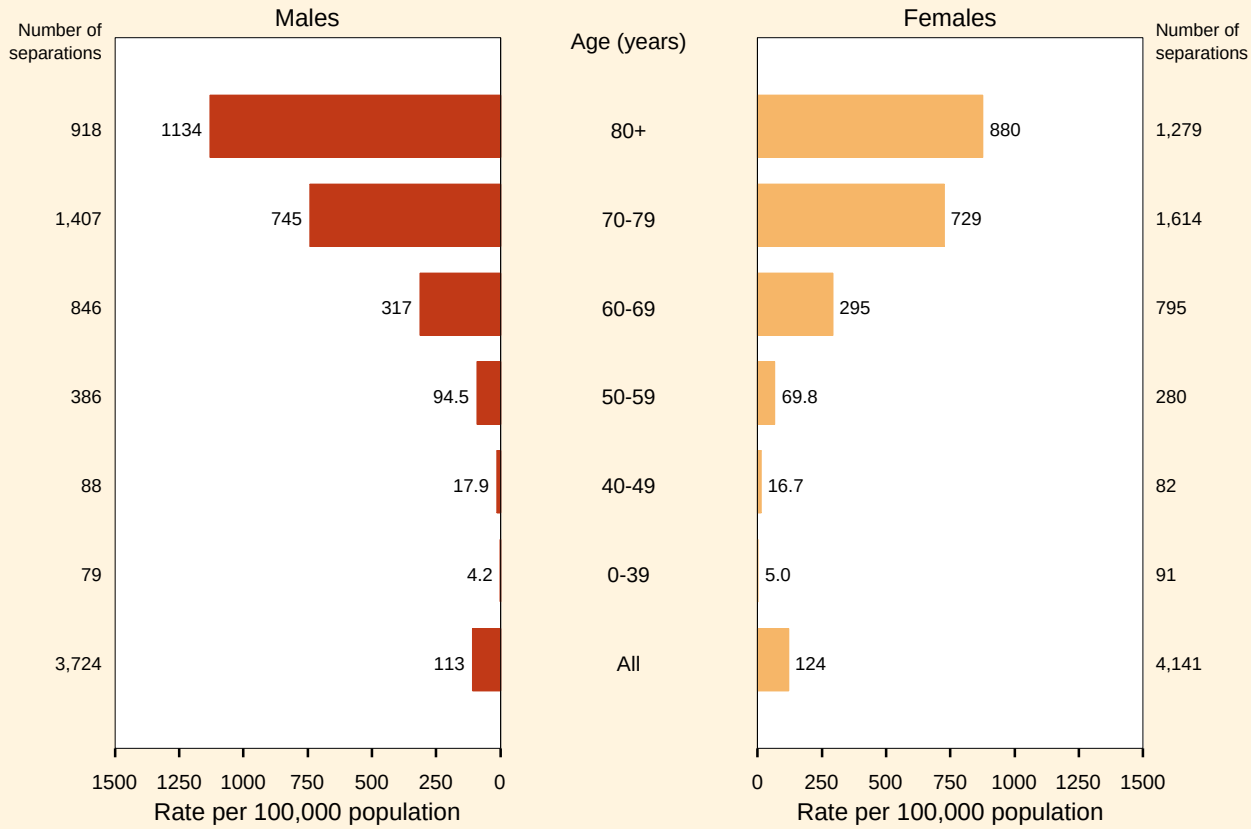
- Diabetes can cause impaired peripheral circulation, impaired peripheral nerve function and sensation, foot deformity, and increased susceptibility to infection. These factors can lead to lower limb ulcers and amputation (ACDS, 2001). Lower limb amputation has a significant impact on a person's mobility and activities of daily living, and often leads to lengthy periods of rehabilitation.
- In NSW in 2002–03, there were 770 lower limb amputations with diabetes as a comorbidity (11.1 per 100,000 population). The male rate was almost twice the female rate. Over the last 12 years, the rate of lower limb amputations with diabetes as a comorbidity has increased in males and remained stable in females. Some fluctuations in the rates may be due to hospital coding changes, particularly since 1999–00 (Phillips, 2003).
- In 2001–02, amputations at the level of the toe accounted for approximately 63% of lower limb amputations, 27% were between the foot and knee ('below knee'), and 10% were above the knee.
- All people with diabetes should have their feet regularly assessed for foot problems, to help prevent amputations (ACDS, 2001).

For more information:

Australian Centre for Diabetes Strategies. *Draft National Evidence Based Guidelines for the Management of Type 2 Diabetes Mellitus: Identification and Management of Diabetic Foot Disease.* Sydney: Australia Guideline Development Consortium, 2001.

Phillips G. *The impact of ICD coding standard changes for diabetes hospital morbidity data.* Catalogue no. CVD26. Canberra: AIHW, 2003.

Diabetes with eye complications as principal diagnosis or comorbidity hospital separations by age and sex, NSW 2002-03



Note: Hospitalisations were included where ophthalmic complications of diabetes were coded in any of the first 5 diagnosis fields. Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Diabetes is a leading cause of blindness in the community. Over time, it can cause damage to the eyes (including retinopathy, glaucoma, and cataracts). However, careful control of blood sugar levels, blood pressure, and regular eye examinations, can reduce the risk of eye damage.
- Due to changes to hospital coding (see Methods section; Phillips, 2003) it is not possible to present consistent data on admissions for eye complications over time. In NSW in 2002–03, there were 7,865 hospital admissions where diabetes with eye complications was a principal diagnosis or comorbidity. Over 65% of these admissions were for procedures for cataracts, and 90% of admissions were in people aged 50 years or older. However, because many ophthalmic complications of diabetes do not lead to hospitalisation, hospital data does not indicate the full burden of eye damage due to diabetes. A 1995 National Health Survey found that 4.9% of people with diabetes reported blindness, which was 5 times more than people without diabetes (AIHW, 2002).
- People with diabetes should have their eyes checked at diagnosis and then at least every 2 years (NHMRC, 1997).

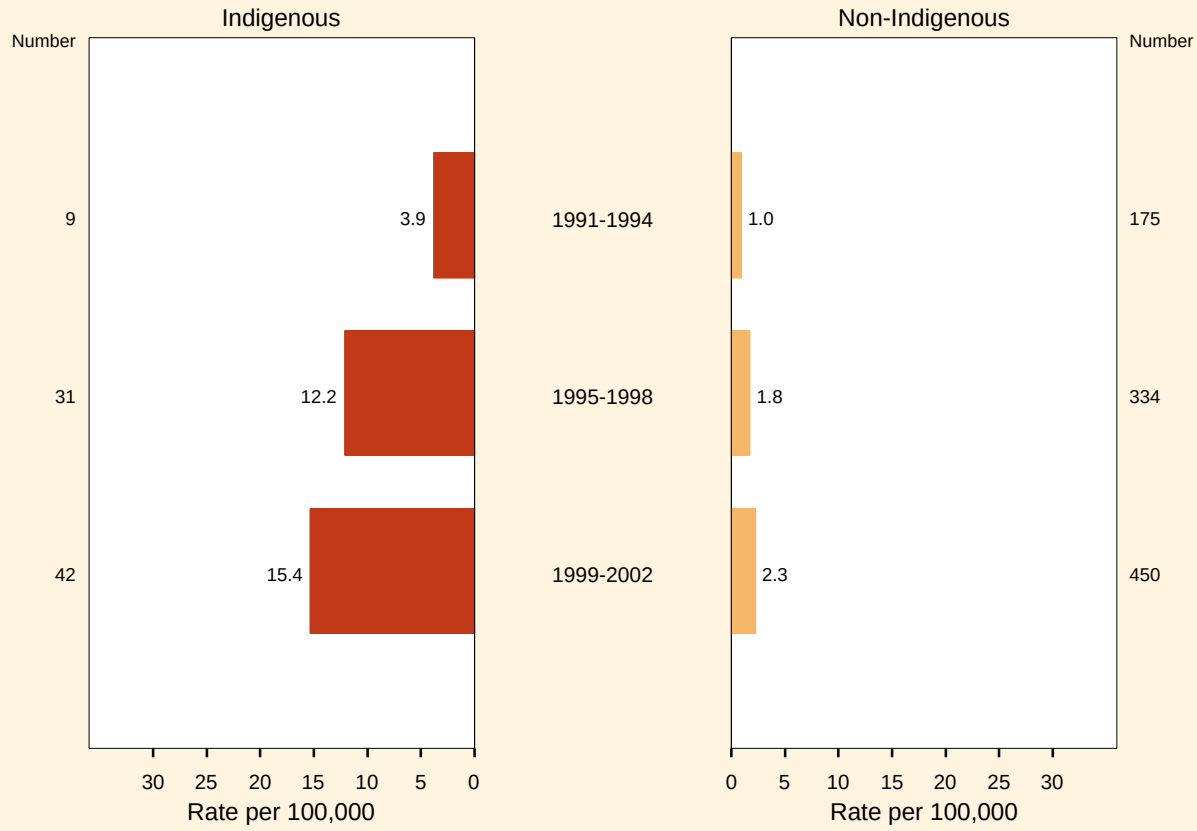
For more information:

Australian Institute of Health and Welfare. *Diabetes: Australian Facts 2002.* AIHW Catalogue no. CVD 20 Diabetes Series no. 3. Canberra: AIHW, 2002.

National Health and Medical Research Council. *Management of diabetic retinopathy: Clinical practice guidelines.* Canberra: NHMRC, 1997.

Phillips, G. *The impact of ICD coding standard changes for diabetes hospital morbidity data.* Catalogue no. CVD26. Canberra: AIHW, 2003.

Diabetes as the cause of renal disease in new dialysis patients, by Indigenous status, NSW 1991 to 2002



Note: Crude rates were calculated using the estimated residential populations for NSW and ABS experimental projections of the Aboriginal and Torres Strait Islander population.

Source: ANZDATA Registry, Australian and New Zealand Dialysis and Transplant Registry. Adelaide, South Australia and population data, Australian Bureau of Statistics, ABS Catalogue no. 3231.0.

- Diabetes is one of the most common causes of renal (kidney) damage. People with severe kidney damage require regular dialysis or a kidney transplant for survival. In Australia in 2002, approximately one-quarter of the people who became dependent on regular dialysis had kidney damage caused by diabetes (diabetic nephropathy) (McDonald and Russ, 2003).
- In NSW in 2002, 126 people became newly-dependent on dialysis because of diabetic nephropathy, a rate of 1.9 per 100,000 population. This compared with 0.6 per 100,000 population in 1990. Aboriginal and Torres Strait Islander people have a much higher rate of diabetic nephropathy requiring dialysis than non-Indigenous people.
- The risk of kidney damage can be reduced by careful control of blood sugar levels and blood pressure (Hostetter, 2003).
- Early detection and management of kidney damage may help prevent further complications. A simple test for the presence of protein in the urine ('microalbuminuria') can detect early kidney damage before symptoms become obvious. People with diabetes should have this test every 12 months (NSW Department of Health, 1996).

For more information:

Hostetter, T. Prevention of the Development and Progression of Renal Disease. *J Am Soc Nephrol* 2003; 14: S144–S147.

McDonald S and Russ RG (editors). *ANZDATA Registry Report 2003.* Adelaide: Australia and New Zealand Dialysis and Transplant Registry, 2003.

NSW Department of Health. *Improving diabetes care and outcomes: Principles of care and guidelines for the clinical management of diabetes mellitus.* Sydney: NSW Department of Health, 1996.

Chapter 4.3

Cancer

- Cancer is the second most important cause of disease burden in both sexes (after cardiovascular diseases) in NSW, accounting for just under one-fifth of years of healthy life lost due to premature death, disease, and injury.
- In 2002, there were 31,075 new cases of cancer (54% in males), and 12,596 deaths from cancer (56% in males). Between 1983 and 2002, the incidence rate for all cancers rose by almost 20% (15% in males and 20% in females).
- Lung cancer was the fifth most commonly diagnosed cause of new cases of cancer in 2002, but was the most common cause of cancer death. Lung cancer incidence decreased by 20% in males but remained steady in females between 1993 and 2002.
- Colorectal cancer was the most commonly diagnosed cause of new cases of cancer in 2002 and the second most common cause of cancer death; incidence rates of colorectal cancer were stable between 1993 and 2002, while death rates decreased by about 19% in both sexes.
- Melanoma was the fourth most commonly diagnosed cause of new cases of cancer in 2002, but the tenth most common cause of cancer death. The incidence of melanoma increased by 19% in males and 7% in females between 1993 and 2002, but mortality remained stable.
- Overall, prostate cancer was the third most commonly diagnosed cause of new cases of cancer in 2002 and the fourth most common cause of cancer death. It was the most common cause of new cases of cancer in males and the second most common cause of cancer death. Its incidence increased dramatically between 1988 and 1994, probably due to increased detection of existing cases though widespread blood testing of men for Prostate Specific Antigen, but then reduced between 1998 and 2002.
- Overall, breast cancer was the second most commonly diagnosed cause of new cases of cancer in 2002, but the fifth most common cause of cancer death. It was the most common cause of both new cases and cancer death in females. Its incidence increased by 15% between 1993 and 2002, but mortality rates fell by 21%, partly due to the 2-yearly breast cancer screening program targeted at women aged 50–69 years.
- Cervical cancer has been decreasing in incidence since 1972 and was the fifteenth most common female cancer in 2002. It can be prevented through the early detection of pre-cancerous lesions by 2-yearly Pap tests of women aged 20–69 years.

In this chapter

Introduction

Cancer is a group of diseases in which abnormal cells proliferate and spread out of control after being affected by a carcinogen, or random gene mutation, and form a mass called a tumour or neoplasm. Tumours may be benign (non-invasive) or malignant (invasive) and spread to other parts of the body (metastasise) (AIHW, 2001). Cancer can develop from most types of cells in different parts of the body, each with its own pattern of growth and spread. Some invade and spread quickly, while others may remain in the body for years without showing any symptoms. A number of cancers share risk factors, but most have a unique set of factors responsible for their onset. These include smoking, dietary influences, infectious agents, radiation (including ultraviolet radiation), as well as genetic factors. Causal factors for many cancers remain unknown. Some cancers can be prevented through the avoidance of known risk factors. Risk of death for many cancers can be reduced by screening, early detection and treatment, and appropriate management and follow-up (AIHW, 2003).

In NSW, cancers are the second most common cause of disease burden in both sexes (after cardiovascular diseases), accounting for just less than one-fifth of years of healthy life lost due to premature death, disease, and injury. Cancer was made a state priority area in 1995 and national health priority area in 1996, as part of an initiative to reduce its effect in Australia.

Cancer registration is an important and fundamental tool in cancer monitoring. Australian states and territories are required by legislation to maintain a cancer registry. This requirement has resulted in cancer being the only major disease for which almost complete coverage of incidence data (that is, data on new cases) is available (AIHW, 2003). In NSW, notification of cancer is a statutory requirement for all public and private hospitals and pathology laboratories.

The NSW Central Cancer Registry has been operating since 1972, based at The Cancer Council NSW until June 2004 and now part of the Cancer Institute NSW. It collects and reports annually on cancer cases and deaths in NSW on behalf of the NSW Department of Health. The registry records all cases of inclusive cancer as well as in situ melanoma of the skin and in situ breast cancer. Basal and sqamous cell carcinomas of the skin are not recorded. The latest published data are for cases diagnosed in 2002. Information presented in this report on relative survival and trends over the past decade are based on

results presented in the annual report *Cancer in NSW Incidence and Mortality 2002* (Tracey et al., 2004). This chapter includes some cases of cancer that were registered after the Incident and Mortality Report 2002 was published.

During the period covered by the Registry, there has been a large increase in the number of new cancers registered, as well as a change in the rankings of individual cancers. In 1972, the 4 most common cancers in males were lung, large bowel, prostate, and stomach; and in females were breast, large bowel, melanoma, and cervix (Coates et al., 2001). By 2002, the rank order had changed to prostate, large bowel, melanoma, and lung cancers in males; and breast, large bowel, melanoma, and lung cancer in females (Tracey et al., 2004). Non-melanocytic skin cancers, which are the most common type of cancer, are not included in the collection.

The NSW Government established the Cancer Institute NSW in 2003, in recognition of the importance of accelerating improvements in cancer control in NSW. The Cancer Institute NSW released the NSW Cancer Plan 2004–2006, which aims to coordinate the strategic activities for cancer control in NSW including prevention, diagnosis, treatment and rehabilitation services as well as cancer information, education and research. (Cancer Institute NSW, 2004). The Cancer Institute NSW is now responsible for operating the NSW Pap Test Registry as well as the Central Cancer Registry.

This chapter contains an analysis of the incidence and mortality of 7 cancers: lung, colorectal (large bowel), prostate, breast, cervix, melanoma of the skin, and oral cancer. Further detail on other cancers can be found in a publication of The Cancer Council NSW (Tracey et al., 2004). The methods used for analysing and presenting data are described in more detail in the Methods section. Death data presented here are from the Australian Bureau of Statistics mortality collection.

For more information:

Australian Institute of Health and Welfare and Australasian Association of Cancer Registries. *Cancer in Australia 1999.* AIHW Catalogue no. CAN 15. Canberra: AIHW, 2001.

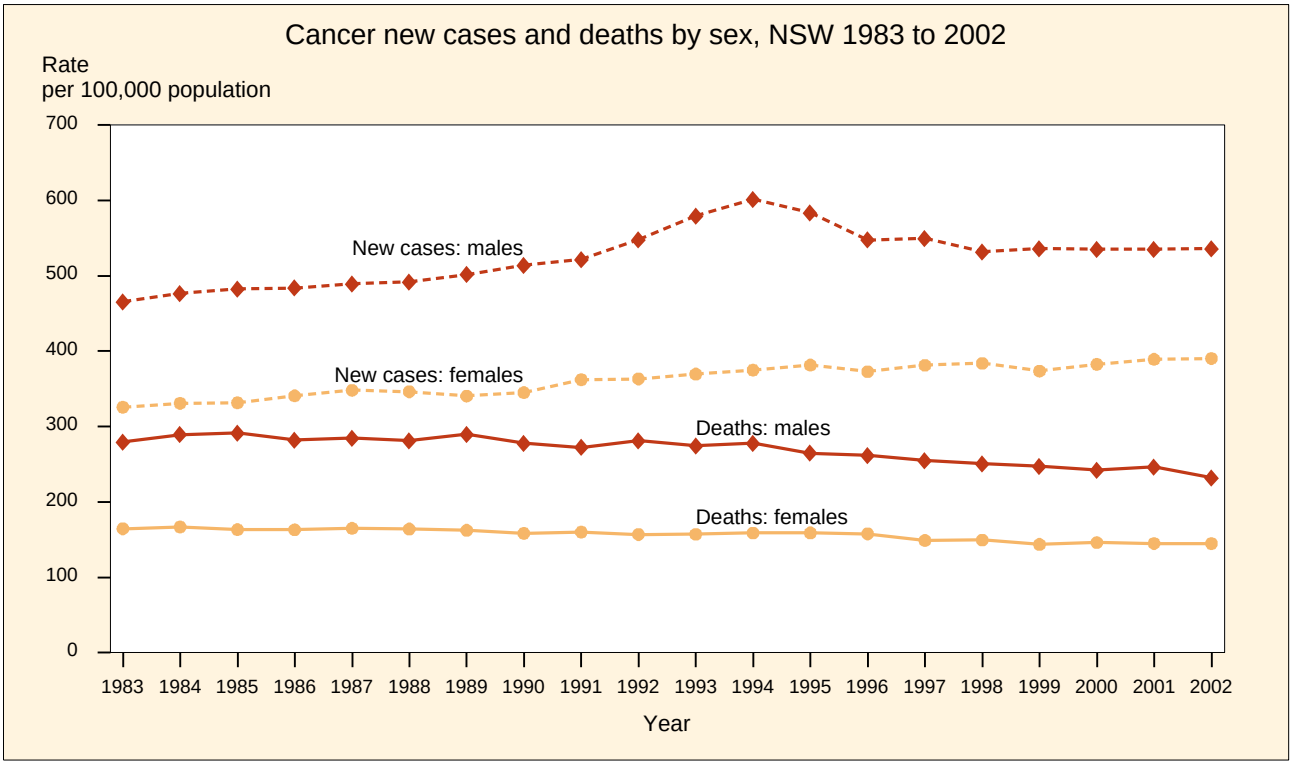
Australian Institute of Health and Welfare. *BreastScreen Australia Monitoring Report 1998–99 and 1999–00 Cancer Series no 26. AIHW Catologue no. CAN-21.* Canberra: AIHW, 2003. Available at www.aihw.gov.au.

Cancer Institute NSW. *The NSW Cancer Plan 2004–2006: A discussion paper.* Sydney: Cancer Institute NSW, 2004.

Coates M, Tracey EA. *Cancer in NSW: Incidence and mortality 1999. Featuring 30 years of cancer registration.* Sydney: The Cancer Council NSW, 2001.

Tracey EA, Supramaniam R. *Cancer in NSW: Incidence and mortality 2000. Featuring projections to 2010 for selected sites.* Sydney: The Cancer Council NSW, 2002. Other publications can be found at www.cancercouncil.com.au.

Tracey EA, Chen W, Sitas F. *Cancer in NSW: Incidence and mortality 2002.* Sydney: The Cancer Council NSW, 2004. Other publications can be found at www.cancercouncil.com.au.



			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	New cases	Males	14473	15386	15344	14744	15198	15095	15581	15970	16412	16887
		Females	11150	11505	11927	11950	12482	12828	12766	13342	13877	14188
		Persons	25623	26891	27271	26694	27680	27923	28347	29312	30289	31075
	Deaths	Males	6464	6728	6538	6625	6691	6771	6841	6909	7231	7035
		Females	4859	5003	5125	5214	5064	5195	5129	5366	5445	5561
		Persons	11323	11731	11663	11839	11755	11966	11970	12275	12676	12596
Rate per 100,000 population	New cases	Males	579.4	601.5	583.7	547.6	549.9	531.7	536.1	535.5	535.5	535.9
		Females	369.8	375.1	381.8	373.0	381.4	384.0	373.7	382.8	389.4	390.5
		Persons	453.7	466.8	464.4	445.2	450.4	444.4	441.4	446.4	450.3	452.2
	Deaths	Males	274.7	278.3	264.9	261.7	255.1	251.1	247.2	242.4	246.6	232.2
		Females	157.4	159.0	159.2	157.9	149.1	149.6	144.0	146.3	145.1	145.0
		Persons	204.3	207.3	201.3	199.7	192.4	191.2	186.6	186.5	187.2	181.4

Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production.

Source: NSW Central Cancer Registry incidence data, ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

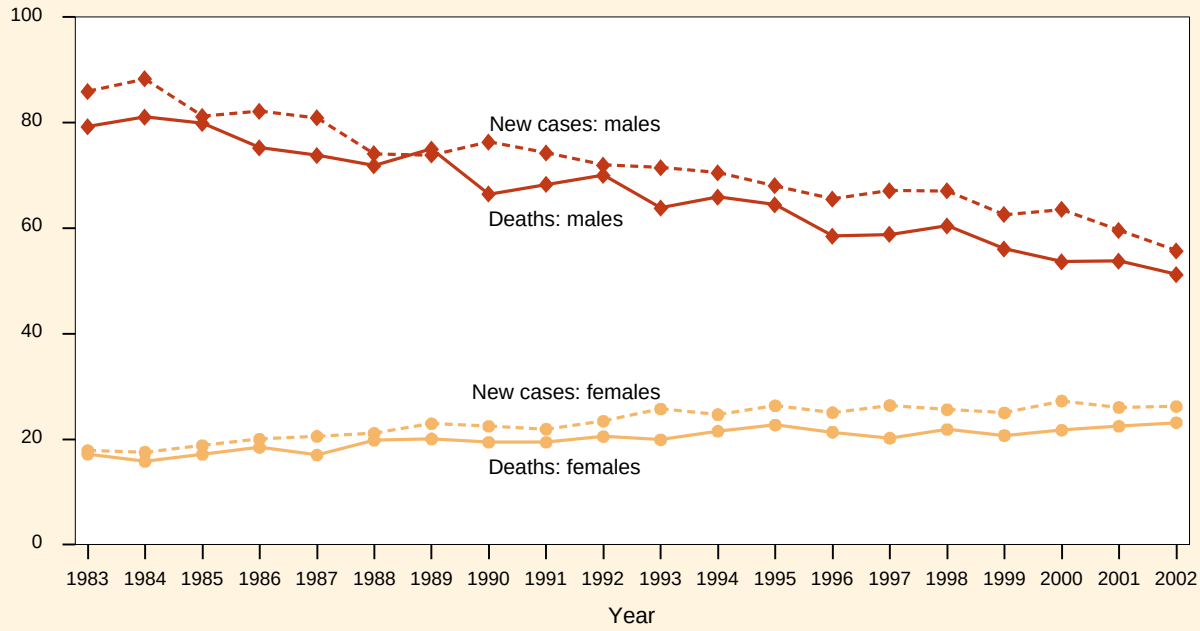
- In NSW in 2002, there were 31,075 new cases of cancer (54% in males) and 12,596 deaths from cancer (56% in males).
- Between 1983 and 2002, the incidence of all cancers combined rose by 15% in males and 19% in females. The peak in male cancer incidence rates in 1994 was due to increased notification of prostate cancer. Cancer death rates over this time declined for both males and females. In the past decade, the incidence of all cancers combined decreased by 7.3% in males and increased by 6.6% in females. Death rates fell by 17% in males and 11% in females.
- The increased incidence rate for cancers overall in NSW is due to earlier diagnosis of some cancers as a result of screening; a real rise in new cases of some cancers; and improved notification of cancer cases. Reduced death rates reflect successful treatment of some cancers and the cumulative effect of small decreases in deaths for other cancers.

For more information:

Tracey EA, Supramaniam R. *Cancer in NSW: Incidence and mortality 2000. Featuring projections to 2010 for selected sites.* Sydney: The Cancer Council NSW, 2002.

Tracey EA, Chen W, Sitas F. *Cancer in NSW: Incidence and mortality 2002.* Sydney: The Cancer Council NSW, 2004. Other publications can be found at www.cancercouncil.com.au.

Lung cancer new cases and deaths by sex, NSW 1983 to 2002



			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	New cases	Males	1798	1801	1781	1769	1834	1906	1815	1882	1827	1750
		Females	792	780	845	816	881	874	868	966	947	970
		Persons	2590	2581	2626	2585	2715	2780	2683	2848	2774	2720
	Deaths	Males	1571	1664	1647	1551	1586	1676	1602	1573	1626	1597
		Females	619	682	728	694	681	756	726	787	826	868
		Persons	2190	2346	2375	2245	2267	2432	2328	2360	2452	2465
Rate per 100,000 population	New cases	Males	71.5	70.5	68.0	65.5	67.2	67.1	62.6	63.5	59.7	55.7
		Females	25.7	24.7	26.4	25.1	26.4	25.6	25.0	27.3	26.1	26.2
		Persons	45.5	44.4	44.3	42.7	43.9	43.8	41.5	43.1	41.0	39.3
	Deaths	Males	63.9	66.0	64.5	58.6	58.8	60.5	56.1	53.7	53.8	51.3
		Females	19.9	21.5	22.7	21.3	20.2	21.9	20.7	21.7	22.5	23.2
		Persons	38.6	40.6	40.3	37.4	36.7	38.4	36.0	35.7	36.2	35.6

Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production.

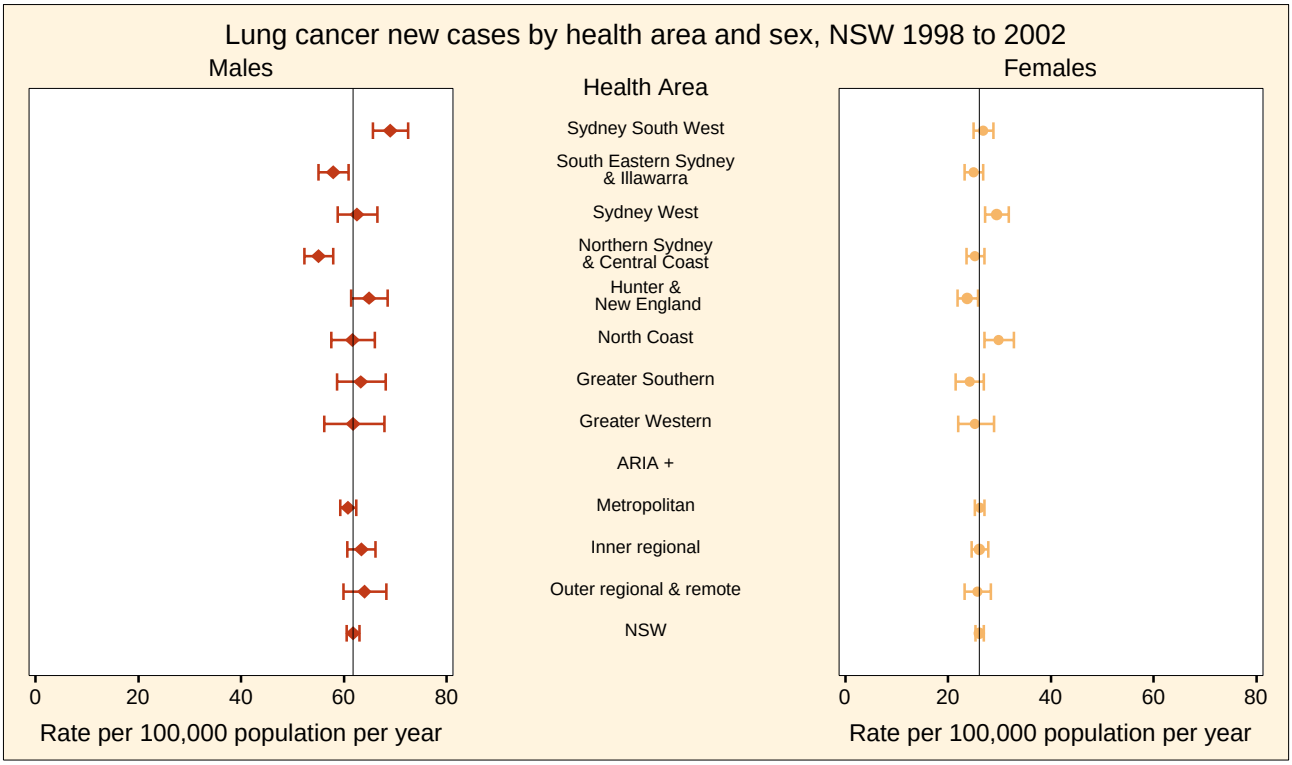
Source: NSW Central Cancer Registry incidence data, ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In NSW in 2002, lung cancer was the third most commonly diagnosed cause of new cases of cancer in men and the fifth most common in women. Lung cancer ranked first among males and second among females as a cause of cancer death (Tracey et al., 2004).
- Between 1983 and 2002, lung cancer incidence and death rates decreased in males but increased in females. In the 10-year period from 1993 to 2002, the trend downward continued in males but there was no significant change in either rate for females. Projections to 2010 indicate that incidence will continue to decline in males but will remain at the 2000 level in females (Tracey et al., 2002).
- The main risk factor for lung cancer is exposure to cigarette smoking. Trends in lung cancer largely reflect changes in smoking habits. Declining incidence in lung cancer rates in males reflect decreasing tobacco smoking among men over the last 50 years, while smoking only began to decline among women in the last 20 years.
- Five-year relative survival for lung cancer is the lowest of any cancer but is improving. For lung cancers diagnosed between 1994 and 2000, 5-year survival was 12% for males and 15% for females (Tracey et al., 2004).

For more information:

Tracey EA, Chen W, Sitas F. *Cancer in NSW: Incidence and mortality 2002.* Sydney: The Cancer Council NSW, 2004.

Tracey EA, Supramaniam R. *Cancer in NSW: Incidence and mortality 2000. Featuring projections to 2010 for selected sites.* Sydney: The Cancer Council NSW, 2002. Other publications can be found at www.cancercouncil.com.au.



Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Lower and upper limits of the 95% confidence interval are shown. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Central Cancer Registry incidence data, ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Lung cancer incidence varies by geographic area. Data combined for the period between 1998 and 2002 show that lung cancer incidence rates were higher in males in the Sydney South West Health Area compared to the whole of NSW. Rates were higher for females living in the North Coast and Sydney West Health Areas. Males had lower rates in the Northern Sydney & Central Coast and South Eastern Sydney & Illawarra Health Areas. Due to low survival rates from lung cancer, mortality patterns are similar to those for incidence.
- While incidence of lung cancer in 1998–2002 did not vary significantly by degree of rurality or remoteness (based on ARIA+), others have reported such an effect. Between 1993 and 1998, the highest lung cancer incidence and mortality rates were found in remote areas, while the lowest rates were in moderately accessible and accessible areas (Goumas et al., 2002). Females living in remote areas and males living in only moderately accessible areas, had the lowest survival rates from lung cancer (Jong et al., 2001).
- Although there is a lag of around 20 years between exposure to tobacco smoking and lung cancer, patterns of current smoking according to health area are similar to those of lung cancer incidence (Centre for Epidemiology and Research, 2004). Higher rates of current smoking prevalence and lung cancer incidence are associated with lower socioeconomic status (Goumas et al., 2002). Higher rates of current smoking also occur in Aboriginal and Torres Strait Islander people.

For more information:

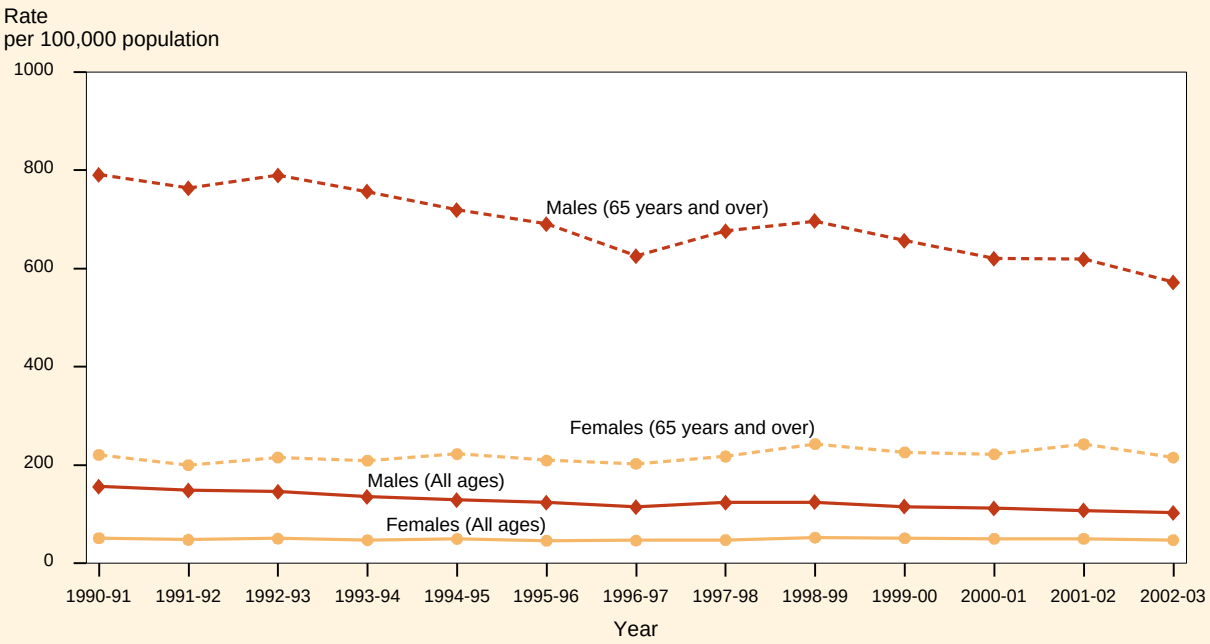
Goumas C, O'Connell D, Smith D, Armstrong BK. *Lung cancer in NSW in 1973 to 1998.* Sydney: The Cancer Council NSW, 2002.

Jong K, Smith DP, Yu XQ, Goumas C, O'Connell D, Armstrong BK. *Remoteness and cancer incidence, mortality and survival in New South Wales 1992 to 1996.* Sydney: The Cancer Council NSW, 2002.

Centre for Epidemiology and Research. New South Wales Adult Health Survey 2003. *N S W Public Health Bull* 2004; 15(S-4). Available at www.health.nsw.gov.au/public-health/phb/phb.html.

Tracey EA, Chen W, Sitas F. *Cancer in NSW: Incidence and mortality 2002.* Sydney: The Cancer Council NSW, 2004. Other publications can be found at www.cancercouncil.com.au.

Lung cancer hospital separations by sex, persons of all ages and 65 years and over, NSW 1990-91 to 2002-03



			93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	65+ years	Males	2379	2337	2288	2144	2377	2498	2386	2311	2373	2216
		Females	883	964	914	903	984	1115	1043	1040	1161	1044
		Persons	3262	3301	3202	3047	3361	3613	3429	3351	3534	3260
	All ages	Males	3498	3431	3323	3185	3534	3635	3433	3417	3378	3300
		Females	1439	1554	1468	1502	1581	1775	1750	1753	1811	1741
		Persons	4937	4985	4791	4687	5115	5410	5183	5170	5189	5041
Rate per 100,000 population	65+ years	Males	756.3	718.9	690.9	625.6	676.6	696.5	656.3	620.1	618.6	571.5
		Females	208.8	222.4	209.2	202.6	217.3	243.0	225.6	221.8	242.2	214.9
		Persons	437.6	430.1	412.2	383.4	415.6	438.8	410.4	394.1	407.5	369.9
	All ages	Males	135.7	129.4	123.3	114.6	123.7	124.4	115.3	111.6	107.4	103.0
		Females	46.9	49.4	46.1	46.4	47.5	52.1	50.9	49.9	50.0	47.4
		Persons	85.7	84.3	79.9	76.6	81.7	84.4	79.3	77.4	75.9	72.3

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Rates were age-adjusted using the Australian population as at 30 June 2001. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations.

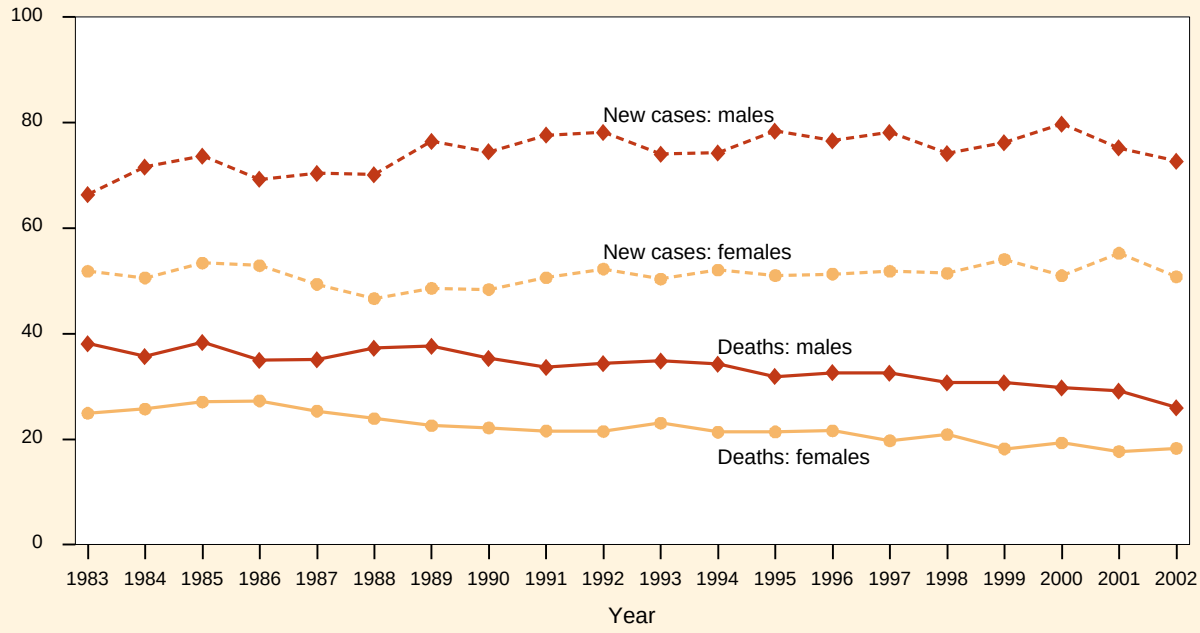
Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In 2002–03, 5,036 hospital separations were attributed to lung cancer. Lung cancer incidence and mortality increase with age, with the median age at diagnosis being 68 years in 2002 (Tracey et al., 2004). Nearly two-thirds of the hospital separations were for people aged 65 years or over.
- Rates of hospital separations for lung cancer fell between 1990–91 and 2002–03 by over 26% overall, and by 19% in those aged 65 years and over. This reflects the reduction in both new cases and deaths from lung cancer over this period. This reduction has been greatest in males, where the rate of hospital separation declined by 34%. This has not been a continual decline: the rate declined steadily until 1996–97, then increased for 2 years before falling again. Again, this reflects the figures for new cases and deaths from lung cancer for males during this period. Rates of hospital separation for females declined more steadily, by 8%. This compares with a slight increase in rates of new cases and deaths from lung cancer in females over this period.

For more information:

Tracey EA, Chen W, Sitas F. *Cancer in NSW: Incidence and mortality 2002.* Sydney: The Cancer Council NSW, 2004. Other publications can be found at www.cancercouncil.com.au.

Colorectal cancer, new cases and deaths by sex, NSW 1983 to 2002



			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	New cases	Males	1855	1888	2040	2045	2161	2098	2205	2377	2306	2288
		Females	1540	1632	1636	1678	1737	1763	1908	1826	2041	1907
		Persons	3395	3520	3676	3723	3898	3861	4113	4203	4347	4195
	Deaths	Males	821	843	779	829	864	836	852	856	860	797
		Females	714	678	697	717	677	730	660	724	678	716
		Persons	1535	1521	1476	1546	1541	1566	1512	1580	1538	1513
Rate per 100,000 population	New cases	Males	74.0	74.3	78.4	76.6	78.2	74.2	76.2	79.7	75.2	72.7
		Females	50.4	52.1	51.0	51.3	51.8	51.4	54.1	51.0	55.3	50.8
		Persons	60.9	61.7	63.2	62.6	63.6	61.6	64.0	63.8	64.3	60.7
	Deaths	Males	34.9	34.3	31.9	32.6	32.5	30.7	30.7	29.8	29.1	26.0
		Females	23.1	21.3	21.4	21.6	19.7	20.9	18.2	19.3	17.7	18.3
		Persons	28.0	27.0	25.7	26.2	25.3	25.1	23.6	24.0	22.7	21.7

Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production.

Source: NSW Central Cancer Registry incidence data, ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- There were 4,195 new cases of colorectal (or large bowel) cancer in NSW in 2002, making up 13.5% of all new cases of cancer. There were 1,513 deaths from colorectal cancer, representing 12% of all cancer deaths.
- In the period between 1993 and 2002, the age-standardised incidence rate of colorectal cancer remained relatively stable. The mortality rate fell by 20% for males and 19% for females (Tracey et al., 2004). Projections to 2010 predict that incidence rates will remain constant in males from 2001 to 2010 but will increase slightly in females (Tracey et al., 2002).
- The 5-year relative survival rate for colorectal cancer between 1994 and 2000 was 60% for both sexes (Tracey et al., 2004).
- The majority of cases (66–75%) of colorectal cancer could be prevented by adjusting diet and exercise regimes. Early detection is also important for improving survival. The NSW Cancer Plan includes a priority of implementing a bowel screening program (Cancer Institute NSW, 2004).

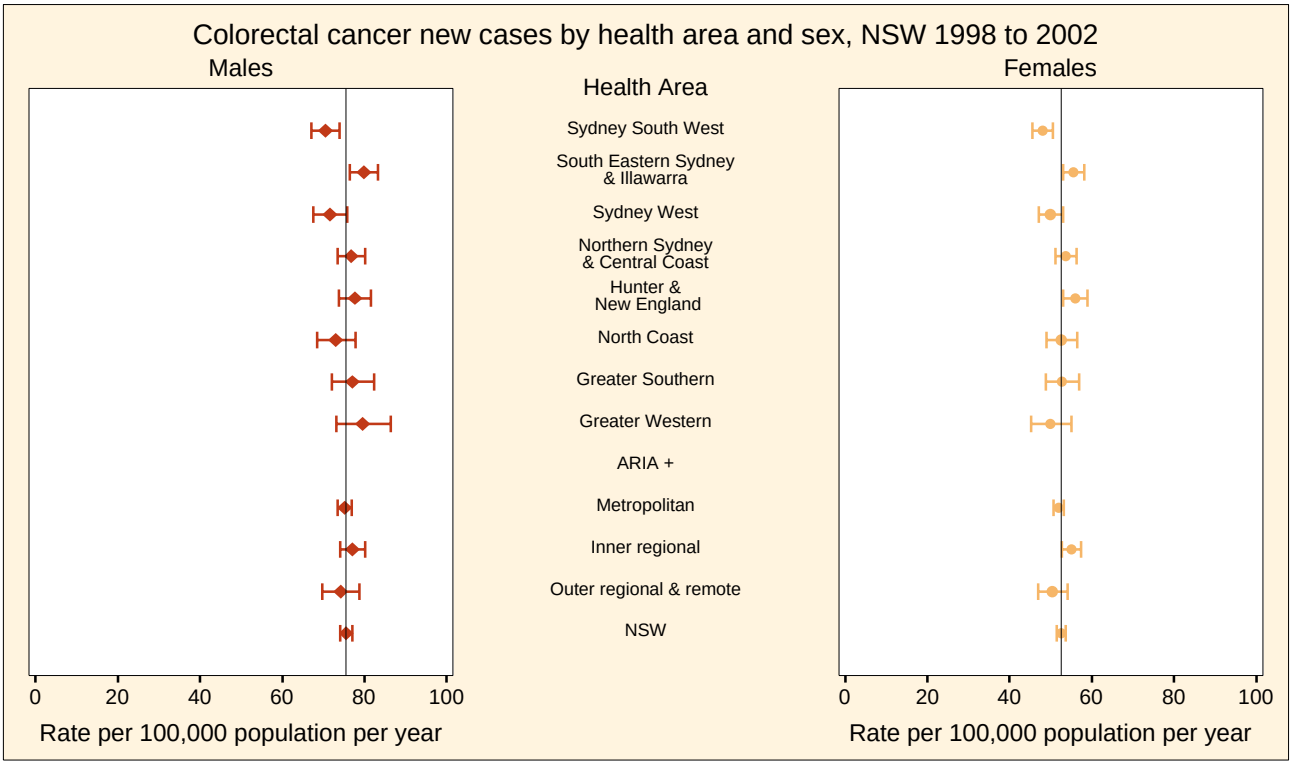
For more information:

Tracey EA, Supramaniam R. *Cancer in NSW: Incidence and mortality 2000. Featuring projections to 2010 for selected sites.* Sydney: The Cancer Council NSW, 2002.

Tracey EA, Chen W, Sitas F. *Cancer in NSW: Incidence and mortality 2002.* Sydney: The Cancer Council NSW, 2004.

National Health and Medical Research Council. *Guidelines for the prevention, early detection, and management of colorectal cancer.* Canberra: NHMRC, 1999.

Cancer Institute NSW. *The NSW Cancer Plan 2004–2006: A discussion paper.* Sydney: Cancer Institute NSW, 2004.



Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Lower and upper limits of the 95% confidence interval are shown. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

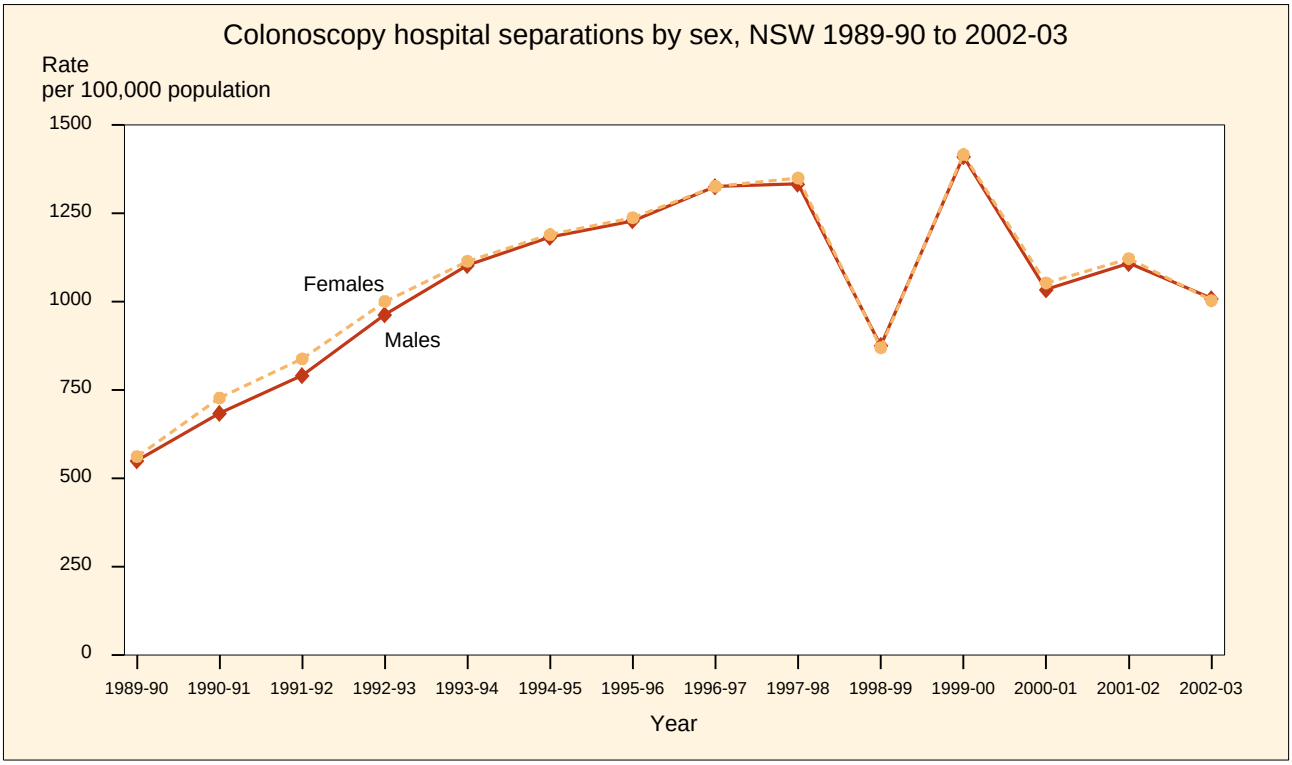
Source: NSW Central Cancer Registry incidence data, ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In the period 1998 to 2002, the age-adjusted incidence rate for colorectal cancer was higher than for NSW overall in the South Eastern Sydney & Illawarra Health Area. Death rates were higher than the State average in the Hunter & New England and Greater Southern Health Areas. Sydney South West Health Area experienced lower incidence and mortality rates than the NSW average for both males and females.
- No difference in colorectal cancer incidence or mortality was observed according to groupings based on the ARIA+ remoteness index. Other evidence indicate that males living in remote areas experienced the lowest 5-year survival rate after a diagnosis of rectal cancer; and females living in only moderately accessible areas had the lowest survival rates from colon cancer (Jong et al., 2001).
- Risk factors for the development of colorectal cancers include a diet high in fat; low in fruit, vegetables and fibre; and low levels of physical activity. Results from the 2003 NSW Health Survey show that people living in rural health areas were more likely to report that they ate the recommended quantities of vegetables than those living in urban health areas. There was no difference in the overall consumption of the recommended quantities of fruit and breads and cereals (Centre for Epidemiology and Research, 2004).

For more information:

Jong K, Smith DP, Yu XQ, Goumas C, O'Connell D, Armstrong BK. *Remoteness and cancer incidence, mortality and survival in New South Wales 1992 to 1996.* Sydney: The Cancer Council NSW, 2002.

Centre for Epidemiology and Research. New South Wales Adult Health Survey 2003. *N S W Public Health Bull* 2004; 15(S-4). Available at www.health.nsw.gov.au/public-health/phb/phb.html.



		1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00	2000–01	2001–02	2002–03
Number	Males	30231	33023	34899	38570	39655	26568	43736	32753	35984	33388
	Females	33125	35925	38011	41527	43184	28374	47111	35548	38570	35041
	Persons	63356	68948	72910	80254	82848	54942	90847	68301	74554	68429
Rate	Males	1103.5	1182.8	1229.2	1326.5	1334.1	875.7	1411.6	1033.6	1108.1	1008.9
per 100,000	Females	1114.6	1190.4	1237.8	1326.5	1350.3	870.0	1416.9	1053.2	1122.1	1003.3
population	Persons	1101.5	1179.7	1226.0	1321.5	1335.6	867.9	1406.6	1037.4	1109.6	1001.0

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Rates were age-adjusted using the Australian population as at 30 June 2001.

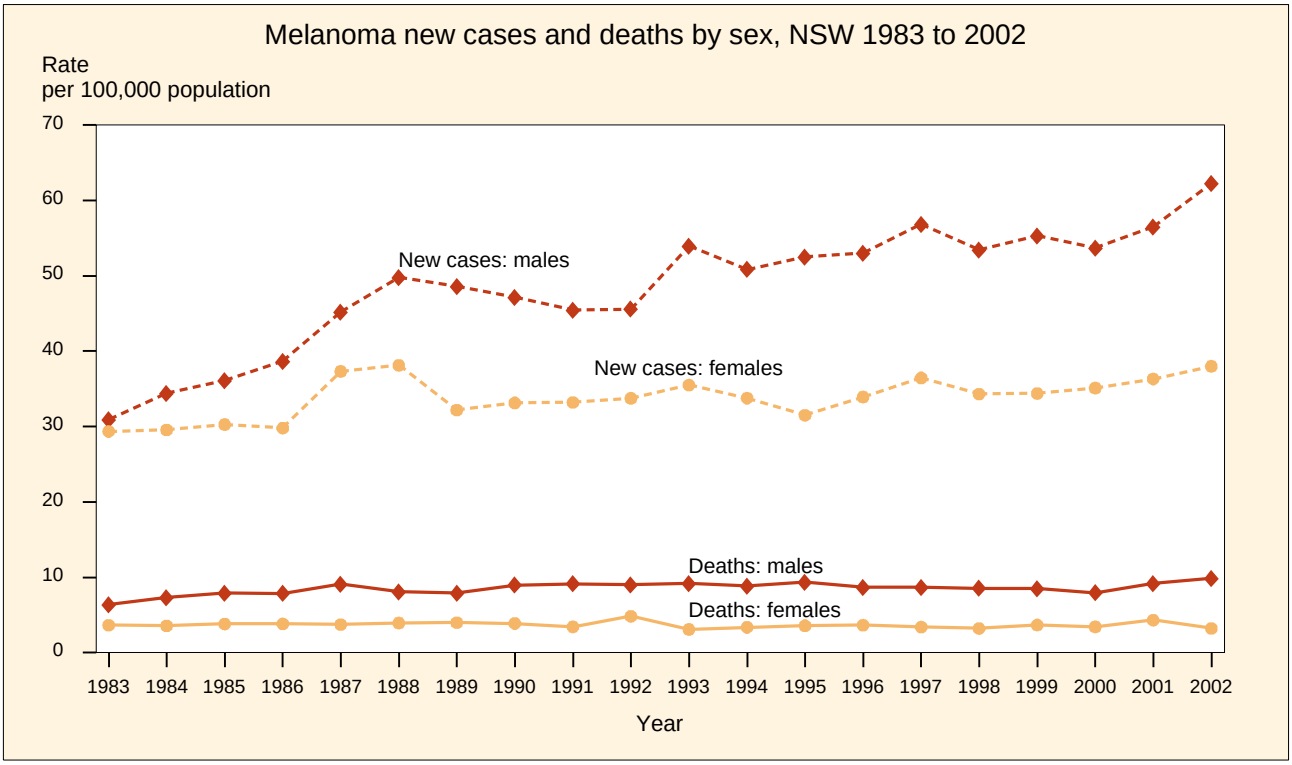
Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Colonoscopy is the preferred option for the investigation of suspected cases of colorectal cancer (NHMRC, 1999). A total of 68,429 hospital separations occurred as a result of colonoscopy procedures in 2002–03, making up just over 3% of all hospital separations.
- The rate of colonoscopy in NSW hospitals has increased rapidly in the past 20 years, from 553 per 100,000 in 1983, to a peak of 1,406 per 100,000 in 1999–2000. There was very little difference between the rates for males and females. The rate of colonoscopy procedures increased steadily to 1997–98, but since then has been rather erratic. The drop recorded in 1998–99 may have been due to the change from the ICD-9 to the ICD-10 disease classification system. Since 2000–01, the rate has been in the vicinity of 1,000 to 1,100 per 100,000.
- The NHMRC guidelines for the prevention, treatment and management of colorectal cancer recommended specific follow-up times for colonoscopy depending on the risk category of the patient (NHMRC, 1999). A study in South Australia showed that the introduction of the guidelines resulted in a 17% to 23% reduction in the number of follow-up colonoscopies (Bampton et al., 2002). In NSW, the average rate of colonoscopies between 2000–01 and 2002–03 was 34% lower than the rate in 1999–2000. This may suggest that the NHMRC recommendations have resulted in a lower demand for colonoscopies.

For more information:

National Health and Medical Research Council. *Guidelines for the prevention, early detection, and management of colorectal cancer.* Canberra: NHMRC, 1999.

Bampton PA, Sandford JJ, Young GP. *Applying evidence-based guidelines improves use of colonoscopy resources in patients with a moderate risk of colorectal neoplasia.* Sydney: The Cancer Council NSW, 2004. Other publications can be found at www.cancercouncil.com.au.



			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	New cases	Males	1429	1358	1426	1468	1634	1557	1654	1639	1758	1987
		Females	1054	1020	973	1070	1170	1122	1146	1197	1261	1343
		Persons	2483	2378	2399	2538	2804	2679	2800	2836	3019	3330
	Deaths	Males	235	219	239	227	237	241	240	232	280	304
		Females	96	105	112	119	115	114	130	122	159	124
		Persons	331	324	351	346	352	355	370	354	439	429
Rate per 100,000 population	New cases	Males	54.0	50.9	52.5	53.0	56.8	53.5	55.3	53.7	56.5	62.3
		Females	35.5	33.8	31.5	33.9	36.5	34.3	34.4	35.1	36.3	38.0
		Persons	43.5	41.1	40.6	42.2	45.6	42.7	43.7	43.4	45.2	48.8
	Deaths	Males	9.2	8.8	9.4	8.7	8.7	8.6	8.5	8.0	9.2	9.9
		Females	3.1	3.4	3.6	3.7	3.4	3.2	3.7	3.5	4.3	3.2
		Persons	5.9	5.7	6.1	5.8	5.7	5.7	5.8	5.4	6.5	6.2

Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production.

Source: NSW Central Cancer Registry incidence data, ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

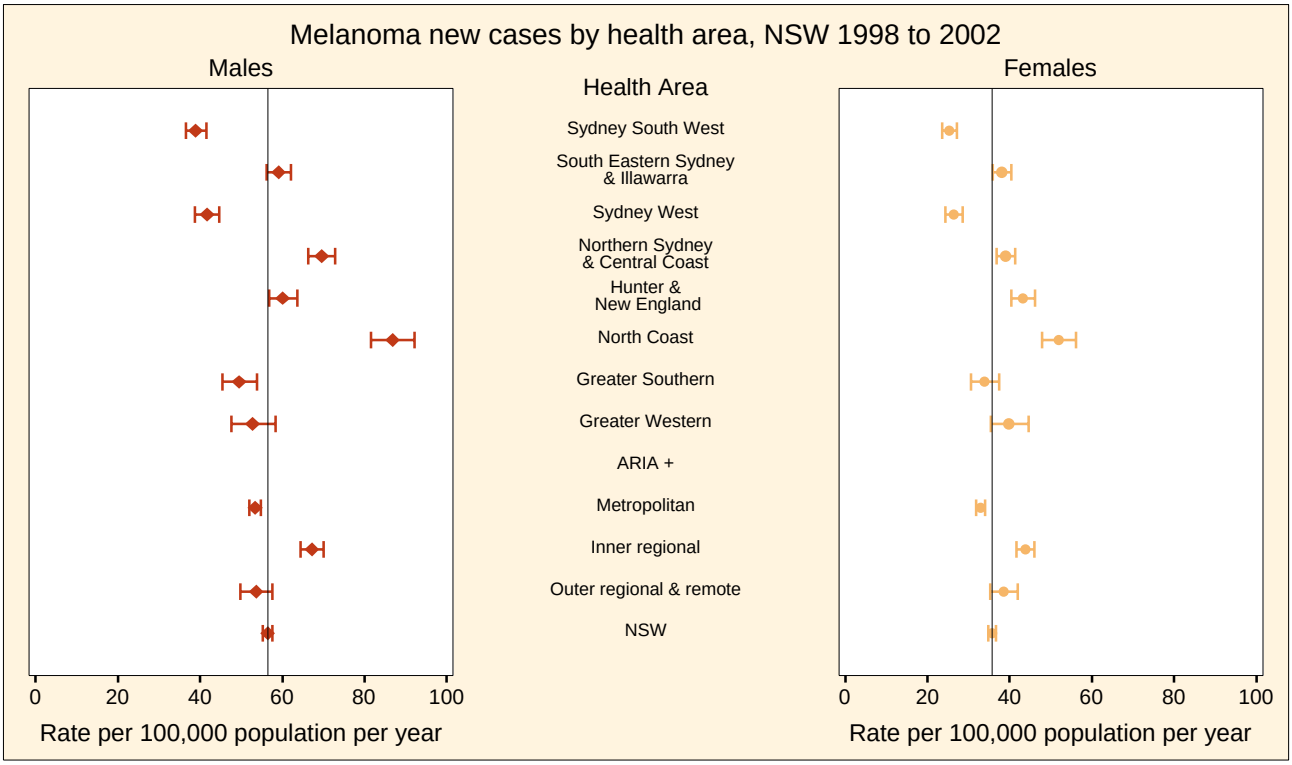
- In NSW in 2002, 3,330 new cases of melanoma of the skin were diagnosed in (60% males), compared with 1,427 in 1983 (49% males). Melanoma was responsible for 429 deaths (71% males). Melanoma was the third most common new cancer in both men and women (Tracey et al., 2004).
- Between 1993 and 2002, the age-standardised incidence rate of melanoma increased by 19% in males but only 7% in females. Mortality has remained stable over this period (Tracey et al., 2004). Peaks in incidence occurred in 1986–1988, 1993, and 1997, possibly as a result of media campaigns. Projections to 2010 suggest that incidence will remain constant in females but increase in males (Tracey et al., 2002).
- Risk factors for melanoma include: exposure to sunlight, especially intermittent exposure and childhood exposure, resulting in development of pigmented moles; sensitivity of the skin to the sun; and family history of melanoma.

For more information:

Tracey EA, Chen W, Sitas F. *Cancer in NSW: Incidence and mortality 2002.* Sydney: The Cancer Council NSW, 2004.

Tracey EA, Supramaniam R. *Cancer in NSW: Incidence and mortality 2000. Featuring projections to 2010 for selected sites.* Sydney: The Cancer Council NSW, 2002. Other publications can be found at www.cancercouncil.com.au.

National Health and Medical Research Council. *Clinical Practice Guidelines: The Management of cutaneous melanoma.* Canberra: NHMRC, 1999.



Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Lower and upper limits of the 95% confidence interval are shown. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Central Cancer Registry incidence data, ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

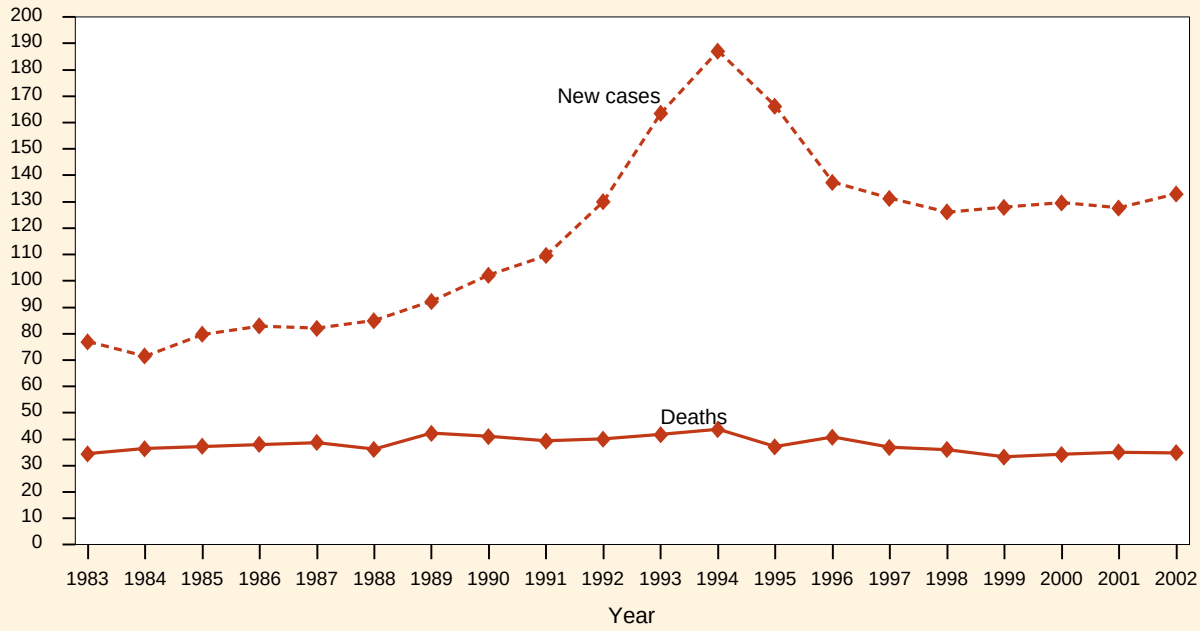
- The incidence rate for melanoma of the skin between 1998 and 2002 was substantially higher in both males and females in the North Coast Health Area, compared to the NSW average. Higher rates in both sexes were also recorded in the Northern Sydney & Central Coast Health Area, and in females in the Hunter & New England Health Area. These health areas include substantial stretches of coast. Incidence was lower in males and females in the Sydney South West and Sydney West Health Areas and males in the Greater Southern Health Area. Death rates were higher than the State average for males in the North Coast Health Area and females in the Hunter & New England Health Area.
- There were higher incidence rates for melanoma in both sexes, and higher death rates from melanoma in males, in inner-regional areas. These include many coastal regions of NSW, particularly on the North Coast, as towns of reasonable size service most of the popular surfing and tourist resort areas. There were lower incidence rates in both sexes, and death rates in males, in metropolitan areas.
- Five-year relative survival for melanoma for cases diagnosed between 1994 and 2000 was 89% for males and 93% for females (Tracey et al., 2004), although there is evidence that survival rates were lower in more remote areas (Jong et al., 2001).
- The higher rates for melanoma in coastal areas are associated with environments and behaviours resulting in greater sun exposure.

For more information:

Jong K, Smith DP, Yu XQ, Goumas C, O'Connell D, Armstrong BK. *Remoteness and cancer incidence, mortality and survival in New South Wales 1992 to 1996.* Sydney: The Cancer Council NSW, 2002.

Tracey EA, Chen W, Sitas F. *Cancer in NSW: Incidence and mortality 2002.* Sydney: The Cancer Council NSW, 2004. Other publications can be found at www.cancercouncil.com.au.

Prostate cancer, new cases and deaths, males, NSW 1983 to 2002



			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	New cases	Males	3905	4693	4319	3624	3572	3518	3679	3837	3895	4177
	Deaths	Males	859	920	818	908	860	876	836	885	943	982
Rate per 100,000 population	New cases	Males	163.5	187.2	166.4	137.4	131.4	126.1	127.9	129.6	127.8	133.0
	Deaths	Males	41.8	43.8	37.2	40.9	36.9	36.1	33.4	34.3	35.1	34.9

Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production.

Source: NSW Central Cancer Registry incidence data, ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- There were 4,177 new cases of prostate cancer in 2002 compared to 1,285 cases in 1983. The increase in cases during the early 1990s occurred at a time when blood testing of men for Prostate Specific Antigen (PSA) became more widespread. Over the 20-year period, the rate increased from 77 per 100,000 men to a peak of 187 per 100,000 men in 1993, but since then has dropped by about 20% (Tracey et al., 2004). Projections to 2010 predict a decine in incidence (Tracey et al., 2002).
- The number of deaths increased relatively steadily over the 20-year period, from 494 in 1983 to 982 in 2002, but the rate per 100,000 population has remained fairly stable over that time.
- Prostate cancer accounted for 24% of new cancers in males in 2002, making it the most common cancer in males. It is ranked second (behind lung cancer) in terms of most common cause of death from cancer for males (Tracey et al., 2004).
- PSA testing has been used since the 1980s to monitor the progression of prostate cancer. More recently, it has been increasingly used as a screening test for men who do not have symptoms of prostate cancer. In 2003 in NSW, 300,000 PSA tests were undertaken. The value of earlier detection in improving outcomes for men remains unclear and there is disagreement about the type and value of treatment for men with early stage localised prostate cancer (Australian Cancer Network, 2000). Prostate cancer screening is not currently recommended in Australia (AHTAC, 1996).

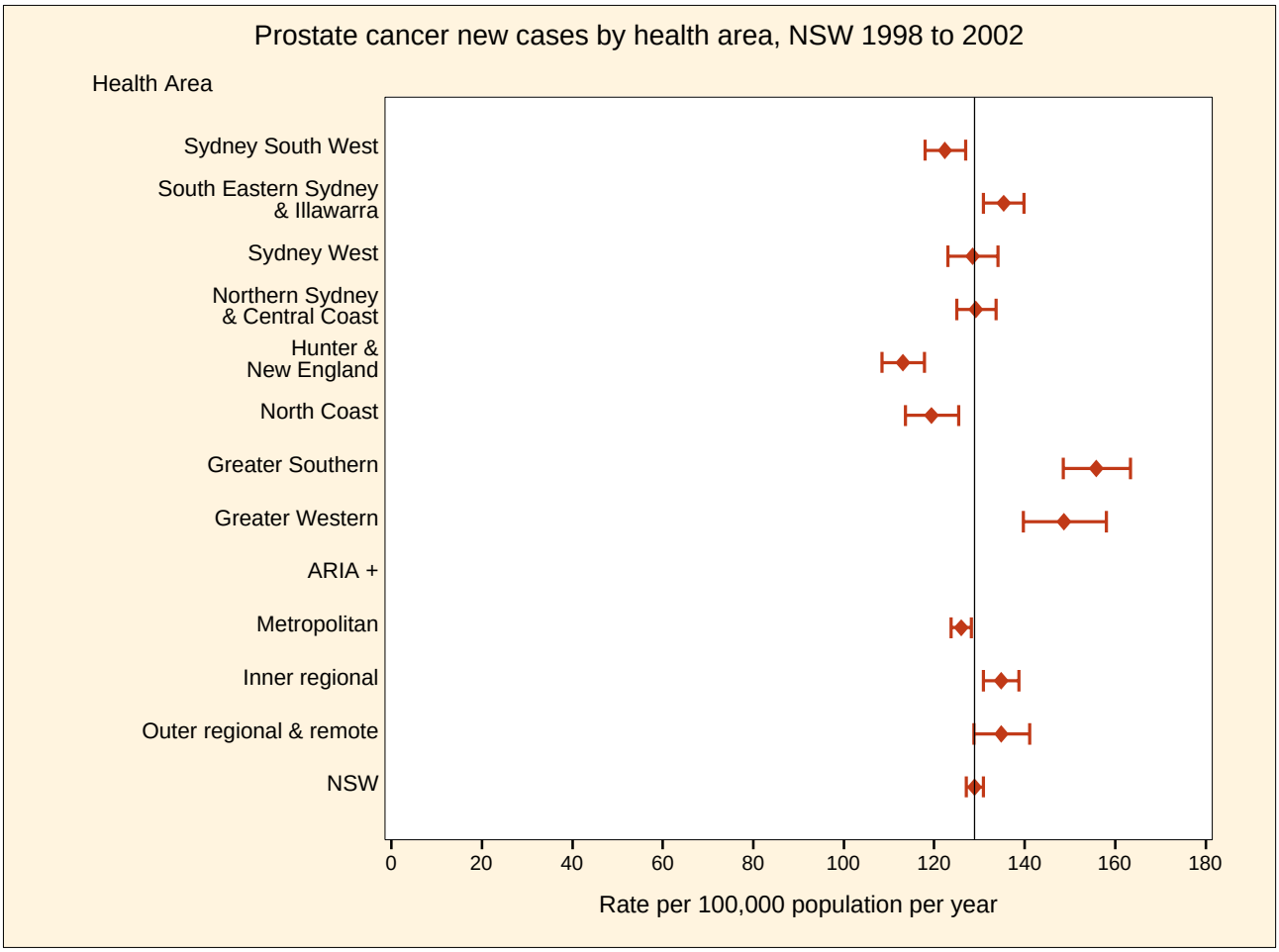
For more information:

Tracey EA, Chen W, Sitas F. *Cancer in NSW: Incidence and mortality 2002.* Sydney: The Cancer Council NSW, 2004. Other publications can be found at www.cancercouncil.com.au.

Tracey EA, Supramaniam R. *Cancer in NSW: Incidence and mortality 2000. Featuring projections to 2010 for selected sites.* Sydney: The Cancer Council NSW, 2002. Other publications can be found at www.cancercouncil.com.au.

Australian Cancer Network. *Evidence-based recommendations for the management of localised prostate cancer.* Canberra: Australian Cancer Network, 2000.

Australian Health Technology Advisory Committee. *Prostate cancer screening.* Canberra: Commonwealth Department of Health and Family Services, 1996.



Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Lower and upper limits of the 95% confidence interval are shown. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Central Cancer Registry incidence data, ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Incidence rates for prostate cancer between 1998 and 2002 were higher in the Greater Southern, Greater Western, and South Eastern Sydney & Illawarra Health Areas than elsewhere in the State. Rates were lower in the Hunter & New England, North Coast and Sydney South West Health Areas. Death rates from prostate cancer were higher than the State average in the Hunter & New England, Greater Southern and Greater Western Health Areas and lower in the Sydney South West and South Eastern Sydney & Illawarra Health Areas.
- When grouped according to the remoteness index (ARIA+), there was a tendency towards higher incidence rates in inner-regional and outer-regional and remote areas. Residents of outer-regional and remote areas had a higher death rate from prostate cancer than the State average. Five-year survival rates from prostate cancer ranged from about 64% in remote areas to 87% in highly accessible areas, compared to 85% for NSW overall (Jong et al., 2001; Tracey et al., 2004).
- The aims of the NSW Cancer Plan (NSW Cancer Institute, 2004) and NSW Health's Clinical Service Framework for Optimising Cancer Care in NSW (NSW Department of Health, 2003) include improving the management of rural cancer patients.

For more information:

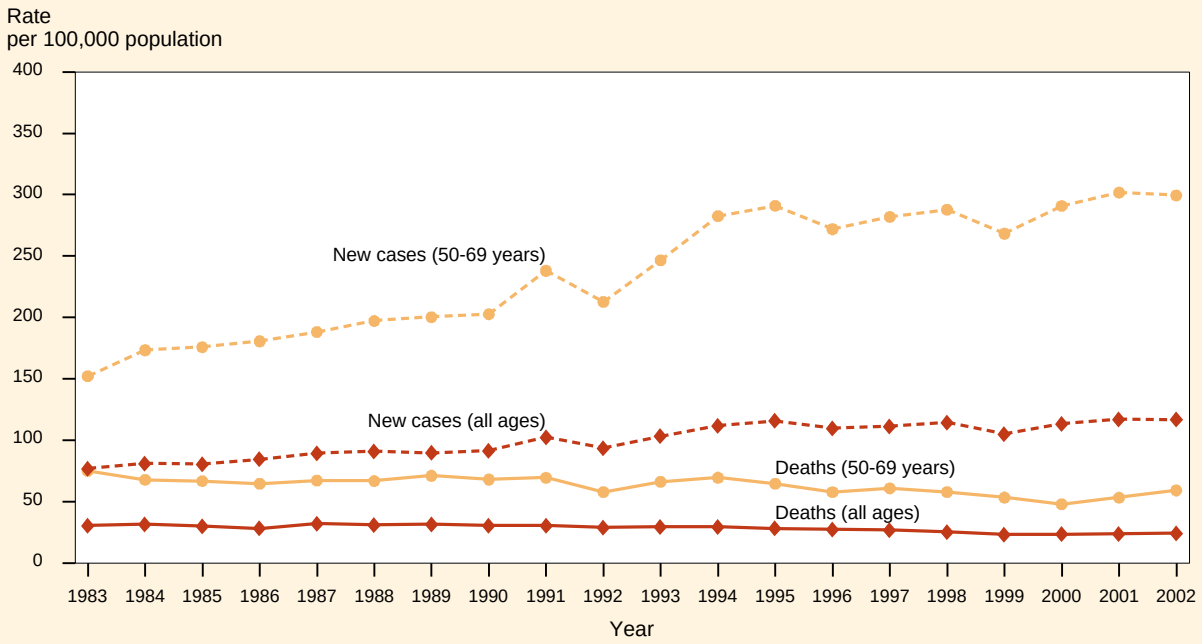
Jong K, Smith DP, Yu XQ, Goumas C, O'Connell D, Armstrong BK. *Remoteness and cancer incidence, mortality and survival in New South Wales 1992 to 1996.* Sydney: The Cancer Council NSW, 2002.

Tracey EA, Chen W, Sitas F. *Cancer in NSW: Incidence and mortality 2002.* Sydney: The Cancer Council NSW, 2004. Other publications can be found at www.cancercouncil.com.au.

Cancer Institute NSW. *The NSW Cancer Plan 2004–2006. A discussion paper.* Sydney: Cancer Institute NSW, 2004.

NSW Department of Health. *A Clinical Service Framework for Optimising Cancer Care in NSW 2003.* Sydney: NSW Department of Health, 2003.

Breast cancer new cases and deaths, females of all ages and 50-69 years, NSW 1983 to 2002



			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	New cases	All ages	3031	3334	3498	3406	3538	3703	3468	3828	4051	4122
		50–69 years	1357	1565	1616	1544	1648	1724	1645	1828	1953	1993
	Deaths	All ages	877	899	885	885	889	856	801	841	873	900
		50–69 years	366	386	369	335	361	352	329	305	348	396
Rate per 100,000 population	New cases	All ages	103.5	112.2	116.0	110.1	111.7	114.4	105.1	113.6	117.4	117.0
		50–69 years	246.6	282.6	291.1	272.0	281.9	287.8	268.3	290.9	301.7	299.5
	Deaths	All ages	29.5	29.8	28.4	27.7	27.3	25.6	23.5	23.7	24.1	24.4
		50–69 years	66.4	69.7	64.8	57.9	60.9	58.1	53.5	48.1	53.5	59.3

Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production.

Source: NSW Central Cancer Registry incidence data, ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

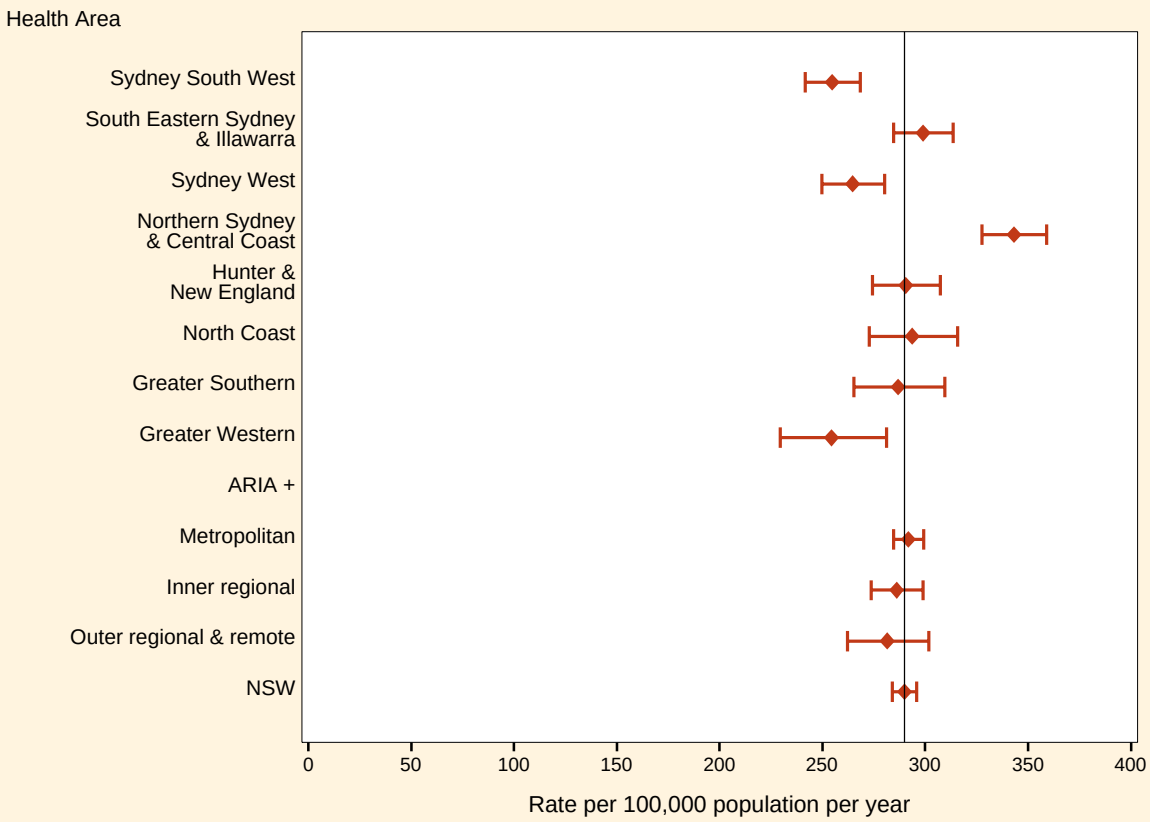
- There were 4,122 cases of breast cancer diagnosed in NSW in 2002, making it the most common cancer in females (29% of all cancers). There were 900 deaths from breast cancer in 2002, making it also the leading cause of cancer deaths in females (16% of cancer deaths) (Tracey et al., 2004).
- In the period between 1993 and 2002, the age-standardised incidence rate of breast cancer increased by 15% (Tracey et al., 2004). Rates in women aged 50–69 years are much higher than the overall rate, and have increased more quickly, especially since 1992.
- The mortality rate in NSW fell by 21% between 1993 and 2002 (Tracey et al., 2004). Projections to 2010 suggest a slight decrease in incidence (Tracey et al., 2002).
- Increases in the number of new cases of breast cancer have largely occured in women aged 50–69 years, the target group for the BreastScreen NSW program. This program began in 1991 and offers mammograms to these women every 2 years to detect breast cancers at an early stage.

For more information:

Tracey EA, Chen W, Sitas F. *Cancer in NSW: Incidence and mortality 2002.* Sydney: The Cancer Council NSW, 2004.

Tracey EA, Supramaniam R. *Cancer in NSW: Incidence and mortality 2000. Featuring projections to 2010 for selected sites.* Sydney: The Cancer Council NSW, 2002. Other publications can be found at www.cancercouncil.com.au.

Breast cancer, new cases, 1998 to 2002,
by health area, females aged 50-69 years, NSW



Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Lower and upper limits of the 95% confidence interval are shown. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Central Cancer Registry incidence data, and ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Incidence rates for breast cancer in women aged 50–69 years were higher in the Northern Sydney & Central Coast Health Area in the period 1998 to 2002 than elsewhere in the State. The age-adjusted rate for new cases of breast cancer was lower than for NSW overall in the Sydney South West, Sydney West, and Greater Western Health Areas. It is encouraging that the death rates from breast cancer were not different from the State average in any part of NSW in the same period.
- Breast cancer incidence rates were the same for all levels of remoteness (based on ARIA+), similar to a previous analysis (Jong et al., 2001).
- Risk factors for breast cancer include family history, early menarche, late menopause, never having a child, and having a child after 30 years of age. There is evidence of large variation in births by maternal age among health areas (Population Health Division, 2003).

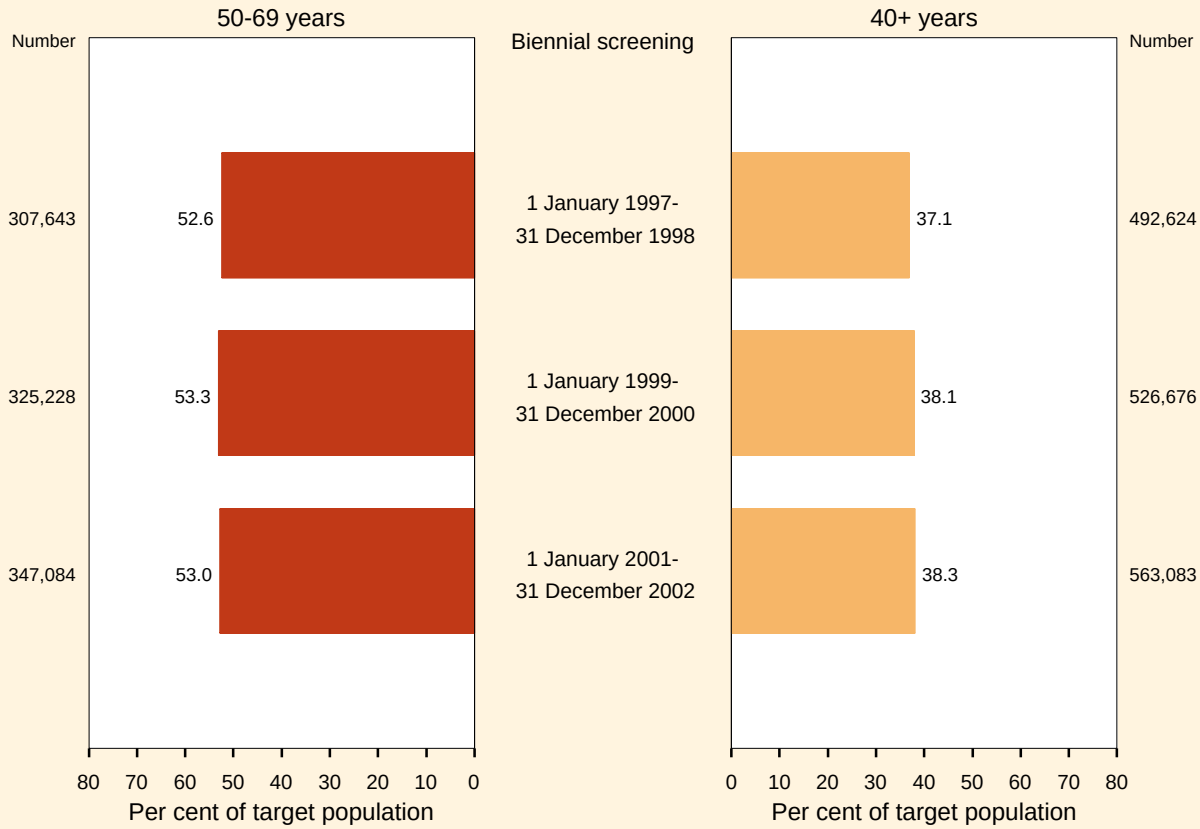
For more information:

Jong K, Smith DP, Yu XQ, Goumas C, O'Connell D, Armstrong BK. *Remoteness and cancer incidence, mortality and survival in New South Wales 1992 to 1996.* Sydney: The Cancer Council NSW, 2002.

Population Health Division. *NSW Health Surveys 1997 and 1998.* Sydney: NSW Department of Health, 2001. Available at www.health.nsw.gov.au/public-health/nswhs.

Centre for Epidemiology and Research, NSW Department of Health. New South Wales Mothers and Babies 2002. *N S W Public Health Bulletin* 2003; 14(S-3). Available at www.health.nsw.gov.au/public-health/phb/phb.html.

Breast cancer screening rates, females aged 50-69 and 40 years and over, NSW 1997 and 1998, 1999 and 2000, and 2001 and 2002



Note: Rates are expressed as the percentage of the eligible female population and age-standardised to the Australian population at 30 June 1991 for 1997–1998 and 1999–2000, and at 30 June 2001 for 2001–2002.

Source: BreastScreen NSW.

- Mammographic screening is seen as the best population-based method to reduce mortality and morbidity attributable to breast cancer, by detecting early-stage breast cancer. The aim is to achieve 70% participation rate in 50–69 year-old women (Breastscreen NSW).
- Two-yearly screening rates for breast cancer in women aged 50–69 years in NSW have remained at around 53% for the 3 biennial periods 1997–1998, 1999–2000 and 2001–2002. This is the target age group of the breast-screening program (Estoesta et al., 2000). Women over 40 can be screened on request. When 40–49 year-olds are included, the rate of breast screening increased from 37.1% of women 40 and over in 1997–1998 to 38.3% in 2001–2002.
- In 2000, Breastscreen NSW found that the participation rate of women aged 50–69 in rural areas was higher than the NSW average, and those who lived in urban and remote areas had a lower participation rate than average (Estoesta et al., 2000).
- Increased mammographic screening, and the implementation in NSW of the clinical practice guidelines for the management of early and advanced breast cancer, should bring a further increase in survival rates in the long-term (National Breast Cancer Centre, 2001).

For more information:

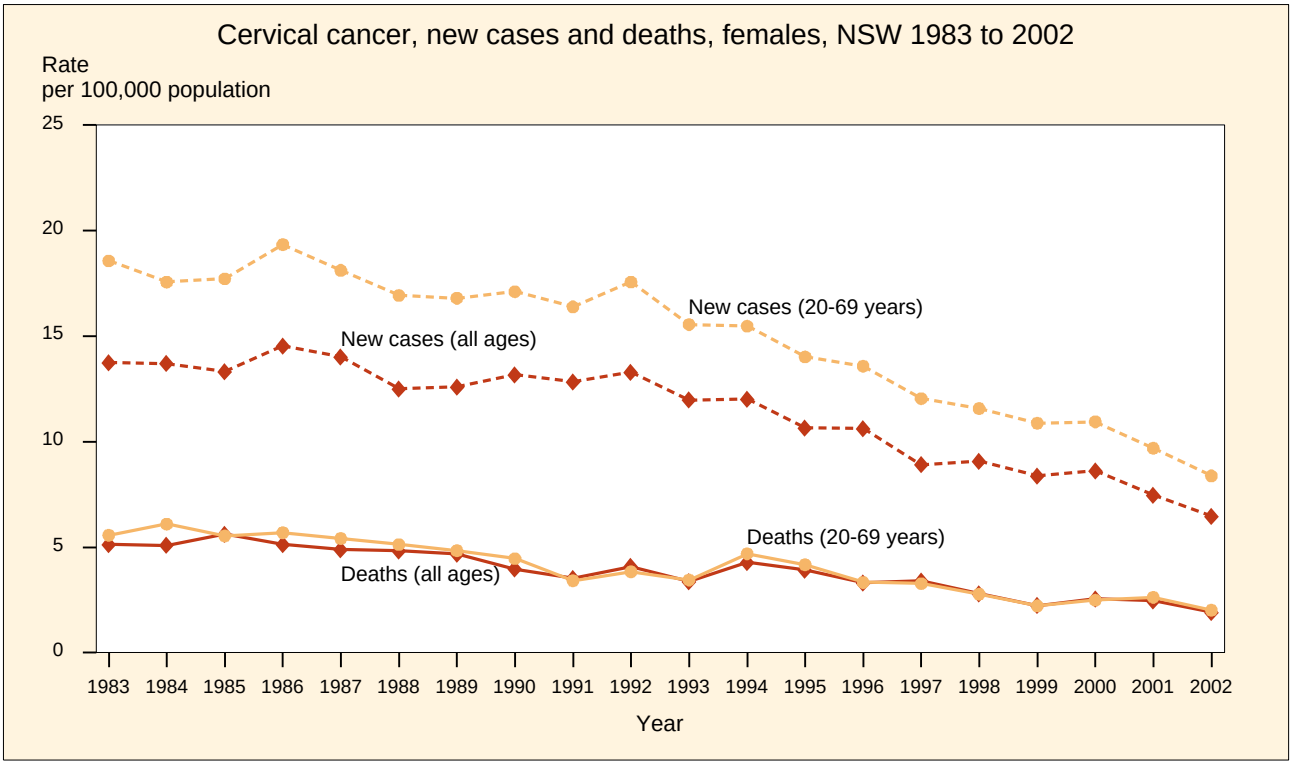
Breastscreen NSW at www.bsnsw.org.au.

Estoesta J, Supramaniam R, Brassil A, Taylor R. *BreastScreen NSW ten year statistical report 1988–98.* Sydney: BreastScreen NSW, 2000.

National Breast Cancer Centre. *Clinical practice guidelines for the management of early breast cancer. Second edition.* Canberra: NHMRC, 2001; and *Clinical practice guidelines for the management of advanced breast cancer.* Canberra: NHMRC, 2001.

Australian Institute of Health and Welfare. *BreastScreen Australia Monitoring Report 1998–99 and 1999–00 Cancer Series no 26. AIHW Catologue no. CAN-21.* Canberra: AIHW, 2003. Available at www.aihw.gov.au.

Australian Institute of Health and Welfare. *BreastScreen Australia Monitoring Report 2001–2002.* Cancer Series no 26. AIHW Catologue no. CAN-21. Canberra: AIHW, 2004. Available at www.aihw.gov.au.



			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	New cases	All ages	354	364	325	331	282	295	277	289	254	224
		20–69 years	286	291	265	261	236	231	221	224	202	177
	Deaths	All ages	99	131	121	106	113	94	77	90	88	69
		20–69 years	61	87	77	64	65	55	45	51	55	43
Rate per 100,000 population	New cases	All ages	12.0	12.0	10.7	10.6	8.9	9.1	8.4	8.6	7.5	6.5
		20–69 years	15.6	15.5	14.0	13.6	12.0	11.6	10.9	10.9	9.7	8.4
	Deaths	All ages	3.4	4.3	3.9	3.3	3.4	2.8	2.2	2.6	2.5	1.9
		20–69 years	3.5	4.7	4.2	3.3	3.3	2.8	2.2	2.5	2.6	2.0

Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production.

Source: NSW Central Cancer Registry incidence data, ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- The number of new cases of cervical cancer in fell from 338 in 1983 to 224 in 2002, with most of the fall occurring after 1992. The age-standardised incidence rate fell by 48% in the last decade (Tracey et al., 2004). The number of deaths from cervical cancer halved, from 125 to 69 over the 20-year period, and the death rate fell from 5.1 to 1.9 per 100,000. The death rate almost halved in the most recent 10 years. Whereas cervical cancer was the fourth most common cancer in women in 1972, it was the sixteenth most common cancer in 2002 (Tracey et al., 2004). Projections to 2010 show that cervical cancer rates are expected to almost halve between 2001 and 2010 (Tracey et al., 2002).
- Most of this fall can be attributed to the introduction of the Pap test, which detects pre-cancerous lesions in the cervix. Regular 2-yearly testing with appropriate follow-up treatment can prevent cervical cancer from developing in most cases. This results in reductions in both incidence and death rates. The target population for 2-yearly screening using the Pap test is all women aged between 18 and 70 years who have ever been sexually active.

For more information:

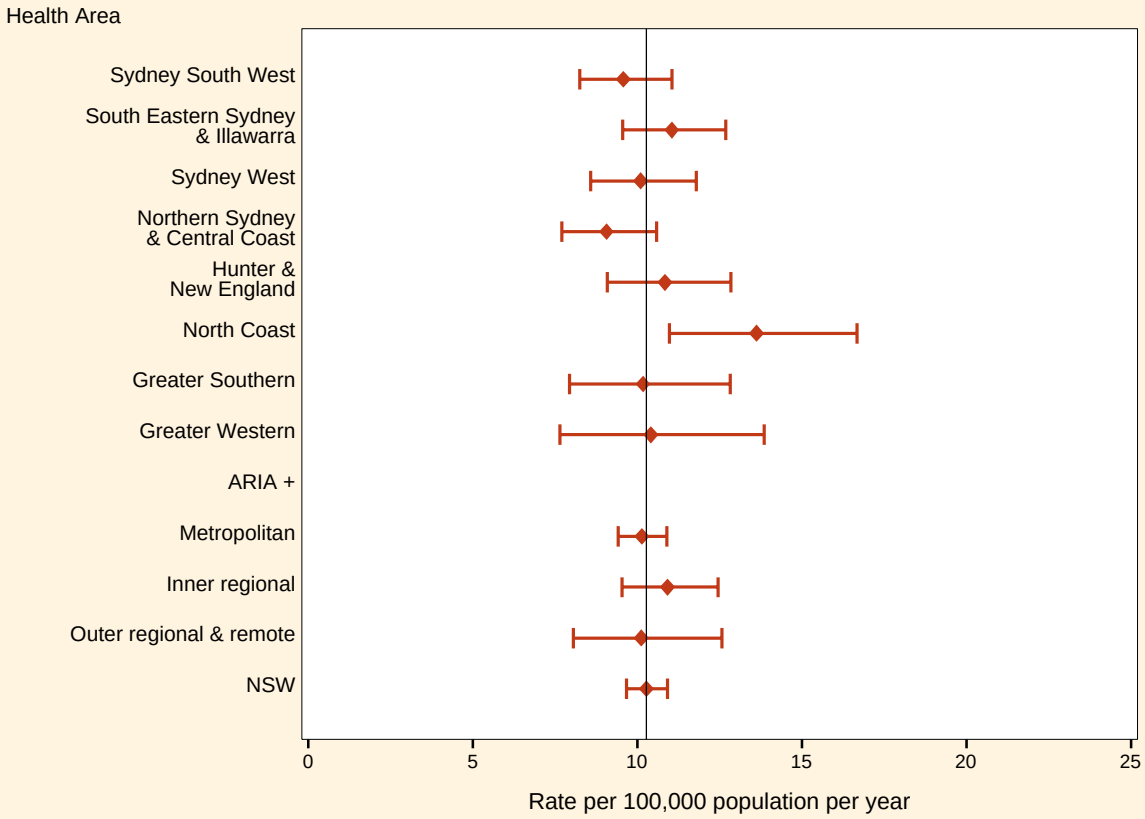
Tracey EA, Chen W, Sitas F. *Cancer in NSW: Incidence and mortality 2002.* Sydney: The Cancer Council NSW, 2004.

NSW Cervical Screening Program at www.csp.nsw.gov.au.

Australian Institute of Health and Welfare and Australasian Association of Cancer Registries. *Cancer in Australia 1999.* AIHW Catalogue no. CAN 15. Canberra: AIHW, 2001.

Tracey EA, Supramaniam R. *Cancer in NSW: Incidence and mortality 2000. Featuring projections to 2010 for selected sites.* Sydney: The Cancer Council NSW, 2002. Other publications can be found at www.cancercouncil.com.au.

Cervical cancer, new cases, 1998 to 2002,
by health area, females aged 20-69 years, NSW



Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Lower and upper limits of the 95% confidence interval are shown. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Central Cancer Registry incidence data, ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Incidence rates for cervical cancer in 20–69 year old females between 1998 and 2002 were higher than the State average in the North Coast Health Area, but death rates were similar to the NSW average rate in all health areas. No difference in cervical cancer incidence or mortality was observed on the basis of remoteness (based on ARIA+ groupings).
- For the period 1991–1995, cervical cancer incidence rates were higher in local government areas of low socioeconomic status (Lewis et al., 1999).
- Data from the 2003 NSW Health Survey indicate that Pap test screening rates were also lower in women in the lowest socioeconomic group (NSW Department of Health, 2003).
- One of the factors contributing to low socioeconomic status is being from non-English speaking background. Cervical cancer incidence rates are higher in women from certain non-English speaking background groups, as well as in Indigenous women (Jong et al., 2001).

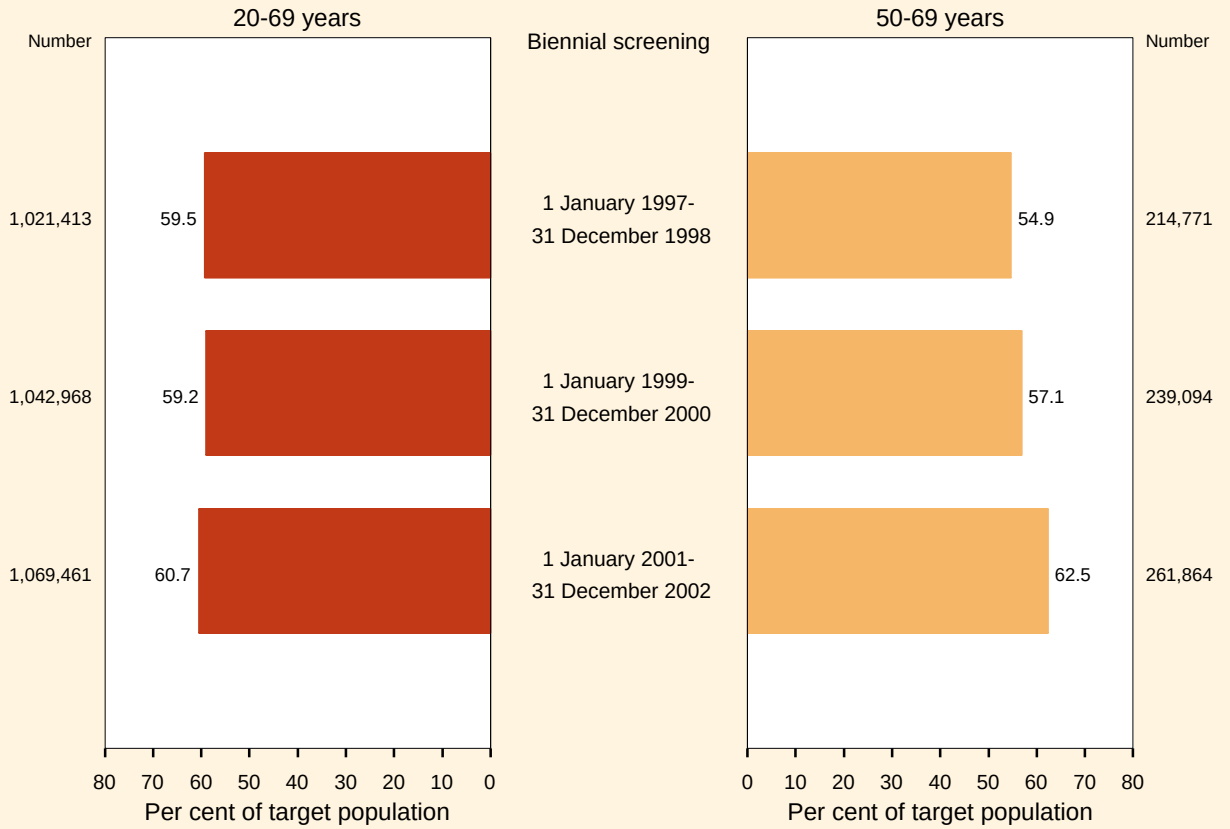
For more information:

Lewis N, Nguyen H, Smith D, Coates M, Armstrong B. *Cancer maps for NSW: Variation by local government area 1991 to 1995.* Sydney: NSW Cancer Council, 1999.

Jong K, Smith DP, Yu XQ, Goumas C, O'Connell D, Armstrong BK. *Remoteness and cancer incidence, mortality and survival in New South Wales 1992 to 1996.* Sydney: The Cancer Council NSW, 2002.

Centre for Epidemiology and Research, NSW Department of Health. NSW Adult Health Survey 2003. *N S W Public Health Bull* 2004; 15(S-4).

Cervical cancer two yearly screening rate, females aged 20-69 and 50-69 years, NSW 1997 and 1998, 1999 and 2000, and 2001 and 2002



Note: The biennial screening rate was calculated by the NSW Cervical Screening Program from the number of women aged 20–69 years who had a Pap test at least once during a 2-year reporting period, as a percentage of the target population of eligible NSW women residents aged 20–69 years. The target population was derived from the Estimated Resident Female Population of NSW for the first year of each 2-year period, obtained from the Australian Bureau of Statistics (ABS), and adjusted for the proportion of women estimated to have undergone a full hysterectomy.

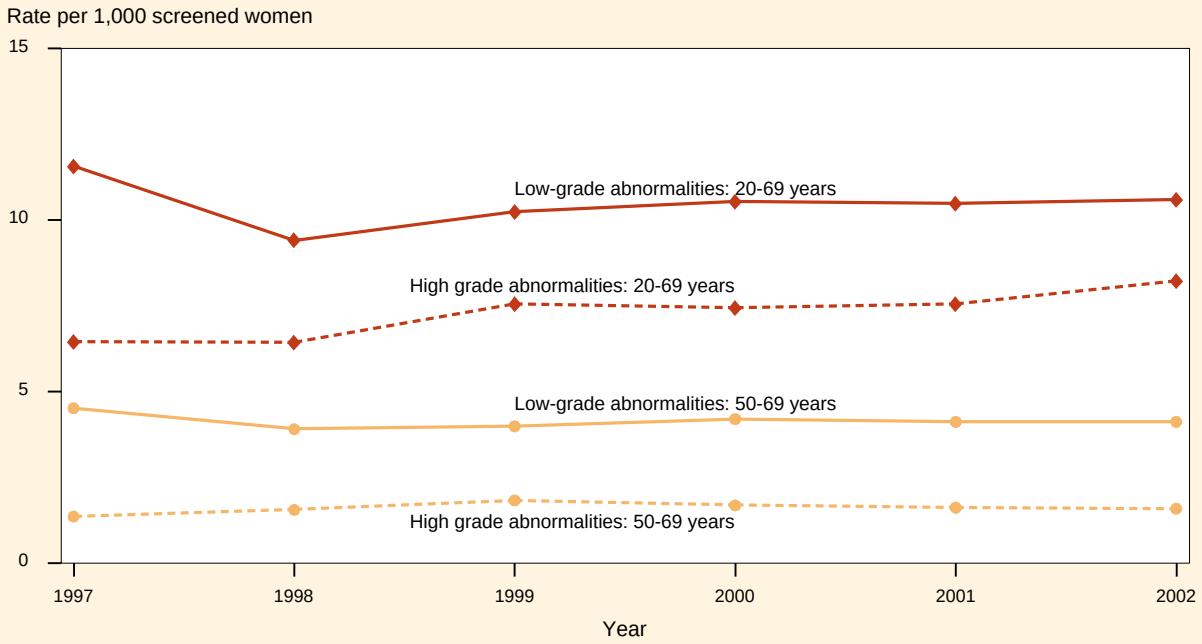
Source: NSW Cervical Screening Program and the NSW Pap Test Register. *Annual Statistical Reports, 1997–2002.*

- A population-based screening program for cervical cancer using 2-yearly Pap tests for women aged 18–70 years, was introduced nationally in 1991. Cervical screening can prevent cancer from developing, as it detects pre-cancerous lesions. Appropriate treatment of these lesions will result in lower incidence and mortality from cervical cancer in the population (National Cervical Screening Program, 2004).
- The target for the NSW Cervical Screening Program is to screen 75% of women at risk every 2 years. All women who are, or have ever been, sexually active are at risk of developing cervical cancer.
- The rate of screening of the target population of 20–69 year-olds was 60.7% in 2001–2002, an increase from 59.2% in 1999–2000. There was a greater increase in the 50–69 year old group, from 55% in 1997–1998 to 62.5% in 2001–2002.

For more information:

National Cervical Screening Program. *Screening to prevent cervical cancer. Guidelines for the management of asymptomatic women with screen-detected abnormalities.* Canberra: NHMRC, 2004.

Cervical cancer screening by result, females aged 50-69 and 20-69 years, NSW 1997 to 2002



			1997	1998	1999	2000	2001	2002
Number	Low grade abnormalities	20–69 years	6447	5746	6076	6317	6374	6434
		50–69 years	545	508	540	590	608	625
	High grade abnormalities	20–69 years	3601	3929	4485	4462	4593	5003
		50–69 years	164	203	248	237	239	241
Per 1,000 screened women	Low grade abnormalities	20–69 years	11.6	9.4	10.2	10.5	10.5	10.6
		50–69 years	4.5	3.9	4.0	4.2	4.1	4.1
	High grade abnormalities	20–69 years	6.5	6.4	7.6	7.4	7.6	8.2
		50–69 years	1.4	1.6	1.8	1.7	1.6	1.6

Note: Low-grade abnormality is defined as a lesion that is warty atpyia (Human Papilloma Virus effect), atypia, equivocal CIN, possible CIN, CIN 1 or endocervical dysplasia not otherwise specified. High-grade abnormality is defined as a lesion that is CIN 1/2, CIN 2, CIN 3 or adenocarcinoma in situ.

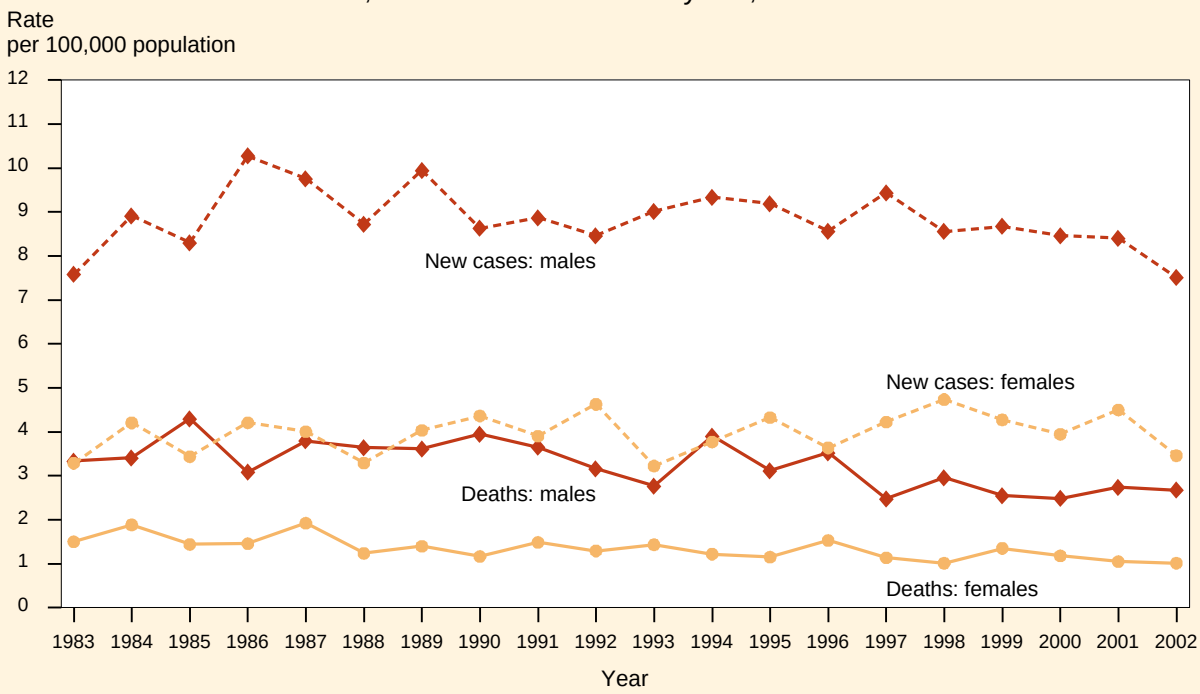
Source: NSW Cervical Screening Program and the NSW Pap Test Register. *Annual Statistical Reports, 1997–2002.*

- The NSW cervical screening program aims to reduce mortality and morbidity due to cervical cancer by early detection of abnormalities that may be precursors to cervical cancer. Guidelines drawn up by the National Health and Medical Research Council (NHMRC, 1995) assist in determining the management of women whose Pap test detects abnormalities. If these abnormalities are low-grade, further Pap tests are recommended at a 6-week to 6-month interval. If the abnormality is considered of greater concern, the patient is referred for further testing. Of those that are referred, the majority have high-grade abnormalities that are not malignant. These patients can be treated for their condition, which reduces the possibility of the abnormalities becoming cancerous.
- Over the past 5 years, the rate of high-grade abnormalities in patients assessed from the further testing has increased from 6.5 to 8.3 per 1,000 women screened in the target age group (20–69 year olds). The rate of histologically-verified low-grade abnormalities has been around 10 per 1,000 women screened overall (NSW Cervical Screening Program, 2003).
- Histological confirmation does not occur for a large proportion of cases where low-grade abnormalities are detected by the screening process, so the proportion of low-grade abnormalities presented here is underestimated (NSW Cervical Screening Program, 2003).

For more information:

National Health and Medical Research Council. *Guidelines for the management of women with screen detected abnormalities.* Canberra: NHMRC, 1995.

NSW Cervical Screening Program and the NSW Pap Test Register. *Annual Statistical Report 2002.* Sydney: Westmead Hospital, 2003. This and previous annual reports are available at www.csp.nsw.gov.au.



			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	New cases	Males	238	251	249	238	274	248	255	259	261	242
		Females	98	117	135	118	142	161	146	142	161	126
		Persons	336	368	384	356	416	409	401	401	422	368
	Deaths	Males	72	103	78	97	72	86	76	75	86	81
		Females	43	40	37	51	39	37	49	44	40	41
		Persons	115	143	115	148	111	123	125	119	126	123
Rate per 100,000 population	New cases	Males	9.0	9.3	9.2	8.6	9.4	8.6	8.7	8.5	8.4	7.5
		Females	3.2	3.8	4.3	3.6	4.2	4.7	4.3	3.9	4.5	3.5
		Persons	6.0	6.5	6.6	5.9	6.8	6.5	6.3	6.1	6.3	5.4
	Deaths	Males	2.8	3.9	3.1	3.5	2.5	3.0	2.6	2.5	2.7	2.7
		Females	1.4	1.2	1.2	1.5	1.1	1.0	1.4	1.2	1.1	1.0
		Persons	2.1	2.5	2.0	2.5	1.8	2.0	1.9	1.8	1.9	1.8

Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production.

Source: NSW Central Cancer Registry incidence data, ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Oral cancers include cancers of the tongue, mouth, and salivary gland. The major risk factors for oral cancers are cigarette smoking, excessive drinking, and poor oral hygiene, but more recently the Human Papilloma virus has been implicated in some cases, particularly in younger people (Rose et al., 2004).
- In 2002, 368 people were diagnosed with oral cancer (66% males) in NSW, compared to 246 in 1983 and 422 in 2001. There were 123 deaths (66% males) in 2002. Oral cancer accounted for 1.1% of new cancers and 1.2% of cancer deaths (Tracey et al., 2004).
- The age-standardised incidence rate for oral cancers in 2002 was 7.5 per 100,000 in males. The rate in females (3.5 per 100,000 in 2002) was less than one-half the male rate and has remained reasonably steady over the past 20 years.
- Between 1983 and 2002, the death rate in males decreased from 3.3 to 2.7 per 100,000, while the death rate in females decreased from 1.5 to 1.0 per 100,000.

For more information:

Rose B, Wei L, and O'Brien C. Human papillomavirus: A cause of some head and neck cancers? *Med J Aust* 2004; 181 (8): 415–416.

Tracey EA, Chen W, Sitas F. *Cancer in NSW: Incidence and mortality 2002.* Sydney: The Cancer Council NSW, 2004.

Other publications can be found at www.cancercouncil.com.au.

Chapter 4.4

Respiratory disease

- Lung cancer and chronic respiratory diseases were together responsible for just over 12% of all deaths in NSW in the period 1998 to 2002, and about 3% of hospital separations in 2002–03.
- Three respiratory diseases—chronic obstructive pulmonary disease, lung cancer, and asthma—were among the 20 leading causes of the overall burden of disease in NSW in 1996.
- In 2002, 70% of all deaths from chronic obstructive pulmonary disease and 87% of all lung cancer deaths were attributable to smoking. In 2002–03, smoking caused 73% of all hospitalisations for chronic obstructive pulmonary disease and lung cancer.
- In 2002 and 2003, around 11% of adult males and 12% of adult females, and 17% of boys and 13% of girls aged 5–15 years, had asthma. Asthma was responsible for around 140 deaths in 2002 and 13,000 hospitalisations in 2002–03.
- Chronic obstructive pulmonary disease (COPD), including chronic bronchitis and emphysema, was responsible for around 2,000 deaths in 2002 and 19,500 hospitalisations in 2002–03.
- Asbestosis is a chronic lung disease that is associated with occupational exposure to asbestos. Deaths and hospitalisations due to asbestosis are increasing, particularly in men aged 65 years and over.
- The rate of malignant mesothelioma (a cancer that is associated with past exposure to asbestos) more than doubled in NSW between 1986 and 2002.
- Death rates from respiratory tuberculosis have declined by one-third in the decade between 1993 and 2002.

In this chapter

Introduction

The respiratory system includes the airways, the lungs, the respiratory centre of the central nervous system, the chest wall, and the pulmonary circulation. This chapter focuses on chronic respiratory diseases, specifically asthma, chronic obstructive pulmonary disease, asbestosis, and respiratory tuberculosis, where preventive measures and better management of conditions can reduce the burden of disease and reduce associated healthcare costs.

Asthma is a chronic inflammatory disorder of the airways that results in obstruction of airflow in response to specific triggers. Along with New Zealand and the United Kingdom, Australia has the highest prevalence of asthma in the world (ISAAC, 1998) with around 11% of adults and 13% of children and teenagers affected (ACAM, 2001). Over the last 1–2 decades, the self-reported prevalence of asthma in Australia has increased in both children and adults (Downs et al., 2001, Wilson et al., 2001, Peat et al., 1994). The reasons for this increasing prevalence are unclear. The consequences of asthma can include loss of lung function, reduced participation in work and other activities, and premature death. In Australia, in 1996, asthma accounted for 2.6 per cent of total Disability Adjusted Life Years (DALY's) (2.1 per cent for males and 3.1 per cent for females) (Mathers et al., 1999).

Chronic obstructive pulmonary disease (COPD) is a permanent and usually progressive disease, which limits the capacity to undertake activities of daily living. Chronic bronchitis and emphysema are the 2 main components of COPD. Each condition can occur on its own, but they usually co-exist in an individual. (AIHW, 2002). In Australia, COPD was the fourth largest cause of death in males and the sixth largest cause of death in females in 2000. COPD is also a major contributor to death from other causes.

Pneumoconioses are diseases originating from accumulation of dust in the lungs. Most pneumoconioses are occupationally acquired. Asbestosis is a fibrosis of the lungs resulting from the long-term inhalation of asbestos dust in the mining, milling, manufacturing, application (for example, of insulation) or removal of asbestos products. Asbestosis is totally preventable, primarily by effective dust suppression in the work environment. People exposed to asbestos who are also smokers, however, do have a higher risk of lung cancer when compared with the risk of either asbestos exposure alone or smoking alone. Advances

in occupational health and safety have already reduced the incidence of asbestosis, and with time are likely to eliminate it. However, due to the time taken to develop chronic respiratory problems, the health impact of historic exposures to asbestos will continue for some time.

Tuberculosis (TB) is caused by the bacterial organism *Mycobacterium tuberculosis*. TB can present in a variety of ways, most commonly as pulmonary disease characterised by a chronic cough, weight loss, fevers, and night sweats. Despite the increasing burden from respiratory tuberculosis globally, mortality and morbidity from all types of tuberculosis in NSW is one of the lowest in the world (Samaan et al., 2002).

Lung cancer was the sixth most common cause of overall disease burden in Australia in 1996, accounting for just under 4% of total years of healthy life lost. Cigarette smoking is the main risk factor for lung cancer and the current incidence rates reflect smoking rates 20 years and more in the past. More information about lung cancer is presented in the Cancer chapter.

Lung cancer, together with other cancers and chronic respiratory diseases—in particular asthma and chronic obstructive pulmonary disease—have been targeted by the NSW Department of Health's Chronic and Complex Care Priority Health Care Program, which is responsible for fostering, monitoring, and evaluating initiatives in a range of system-wide issues affecting the provision of health care to people with chronic conditions in NSW.

The methods used for analysing the data presented in this chapter are described in more detail in the Methods section.

For more information:

Australian Centre for Asthma Monitoring. *Asthma in Australia*. AIHW Catalogue no. ACM1. Canberra, AIHW, 2003.

Australian Bureau of Statistics. *Asthma and other respiratory conditions.* Canberra: ABS 1998.

Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004. Available at www.aihw.gov.au/publications/index.cfm/title/10014.

de Looper M, Bhatia K. *International health: How Australia compares.* Canberra: Australian Institute of Health and Welfare, 1998.

Downs SH, Marks GB, Sporik R, Belosouva EG et al. Continued increase in the prevalence of asthma and atopy. *Arc Dis Child* 2001; 84(1): 20–23.

Global Inititive for Chronic Obstructive Lung Disease. *Global strategy for the diagnosis, management and prevention of chronic obstructive pulmonary disease.* Bethesda: National Heart, Lung and Blood Institute, 2001. Available at www.goldcopd.com.

International Study of Asthma and Allergies in Childhood Steering Committee. Worldwide variation in prevalence of symptoms of asthma, allergic rhinoconjunctivitis, and atopic eczema. *Lancet* 1998; 351: 1225–1232.

Jenkins C. *Asthma.* Canberra: Commonwealth Department of Health and Ageing. Last updated April 2002. Available at www.healthinsite.gov.au.

Mathers C, Vos T, Stevenson C.*The burden of disease and injury in Australia.* AIHW Catalogue no. PHE 17. Canberra: AIHW, 1999. Available at www.aihw.gov.au/bod/index.html.

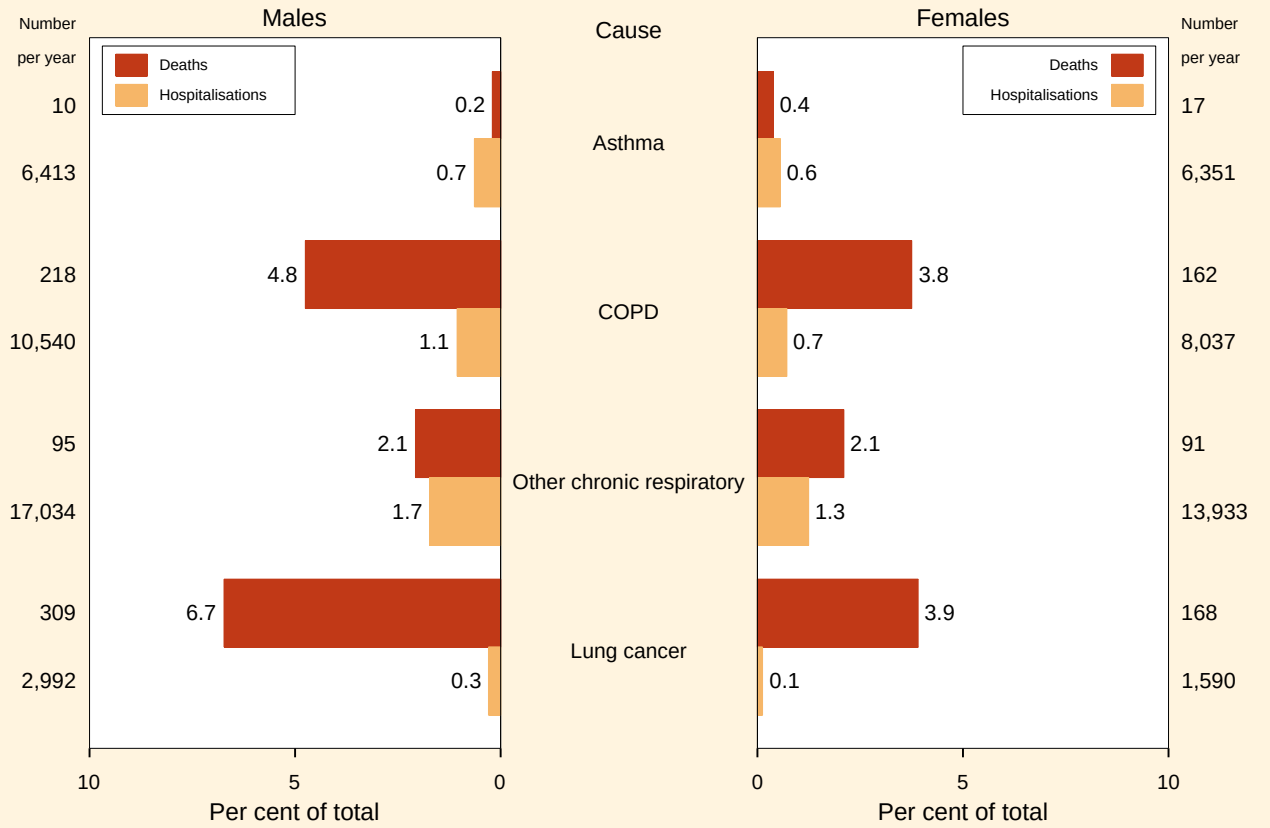
National Asthma Council website at www.nationalasthma.org.au.

NSW Department of Health website at www.health.nsw.gov.au/pubs/subs/sub_asthma.html.

Peat JK, Toelle BG, Gray EJ et al. Prevalence and severity of childhood asthma and allergic sensitisation in seven climactic regions of New South Wales. *Med J Aust* 1995; 163: 22–26.

Samaan G, Roche P, Spencer J et al. Tuberculosis notifications in Australia, 2002. *Comm Dis Intell* 2003; 27, 4: 449–465.

Deaths, 1998 to 2002 combined and hospitalisations, 2002-03
by respiratory disease and sex, NSW



Note: Numbers of deaths for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Hospitalisations include an estimate of the small number of interstate hospitalisations, data for which were unavailable at the time of production.

Source: Inpatient Statistics Collection (ISC) and ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

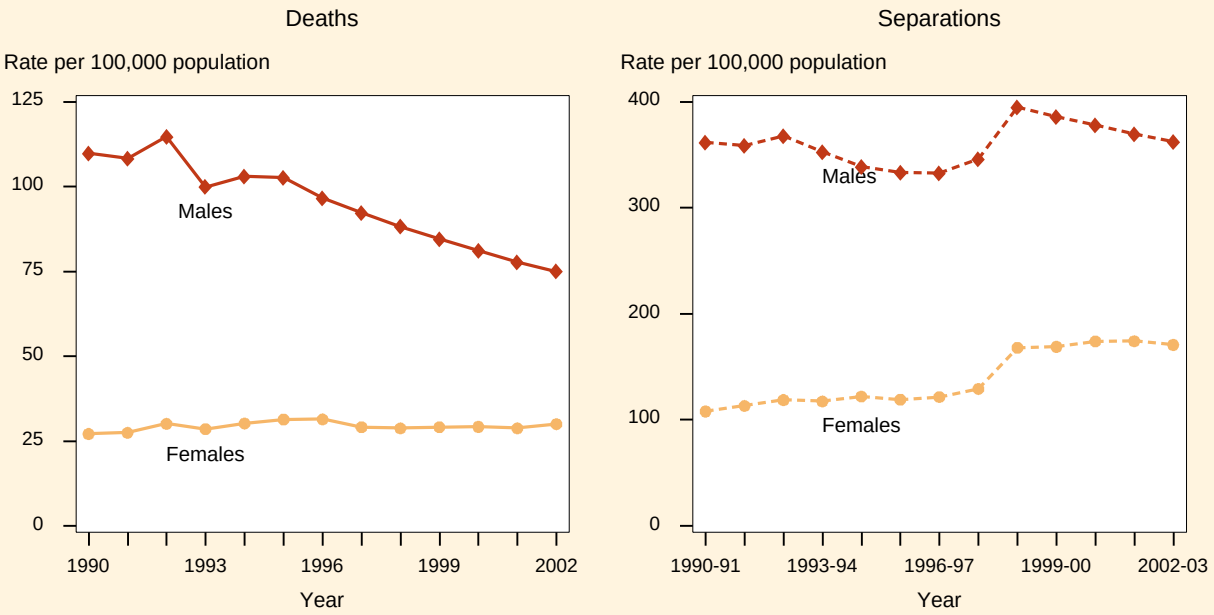
- Between 1998 and 2002, lung cancer caused 5.4% of all deaths in NSW (6.7% in males and 3.9% in females). Lung cancer was responsible for 0.3% of all hospitalisations in males and 0.1% of all hospitalisations in females.
- Deaths from chronic respiratory diseases comprised 6.9% of male deaths and 5.9% of female deaths. The main contributor in this category was chronic obstructive pulmonary disease (COPD), which alone accounted for 4.3% of all deaths (4.8% in males and 3.8% in females).
- Hospital separations for chronic respiratory diseases were responsible for 2.8% of all hospitalisations in males and 2% of all hospitalisations in females. Chronic respiratory diseases other than COPD, such as chronic diseases of tonsils and adenoids, were the main contributor in this category, causing 1.7% of all hospital separations in males and 1.3% in females.
- Tobacco smoking is the main risk factor for both lung cancer and COPD. The differences between the sexes in death and hospitalisation rates for lung cancer and COPD reflect patterns of tobacco smoking 20 years and more in the past.
- Deaths from asthma constitute a much smaller proportion of all deaths (0.2% in males and 0.4% in females) than either lung cancer or COPD. Asthma is responsible for a smaller proportion of all hospital separations than COPD (0.7% in males and 0.6% in females). In contrast to other respiratory diseases, deaths and hospitalisations from asthma are more common in younger age groups.

For more information:

Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004.

Australian Bureau of Statistics website at www.abs.gov.au.

Smoking attributed COPD and lung cancer deaths, 1990 to 2002, and COPD and lung cancer hospital separations, 1990-91 to 2002-03 by sex, NSW



			Persons									
			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
COPD	Number	Deaths	1360	1449	1525	1580	1485	1322	1423	1416	1327	1378
		Separations	8355	8400	8563	9097	9722	12521	12890	13344	13547	13637
	Rate	Deaths	25.0	25.8	26.6	26.8	24.4	21.1	22.2	21.4	19.4	19.6
	population	Separations	146.4	144.1	143.9	149.0	155.1	195.7	196.9	199.0	197.0	194.2
Lung cancer	Number	Deaths	1850	1985	1992	1885	1910	2045	1959	1970	2042	2053
		Separations	4132	4169	3988	3884	4227	4485	4260	4231	4269	4176
	Rate	Deaths	32.5	34.2	33.7	31.3	30.8	32.3	30.3	29.8	30.1	29.6
	population	Separations	71.4	70.3	66.3	63.3	67.3	69.9	65.0	63.3	62.3	59.8
All	Number	Deaths	3211	3434	3517	3465	3395	3367	3382	3386	3368	3431
		Separations	12488	12569	12551	12981	13949	17007	17151	17576	17816	17814
	Rate	Deaths	57.5	60.0	60.3	58.1	55.2	53.4	52.4	51.2	49.5	49.2
	population	Separations	217.9	214.4	210.2	212.3	222.5	265.6	262.0	262.3	259.3	254.0

Note: COPD = chronic obstructive pulmonary disease. Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Deaths are for calendar years. Separations are for financial years. Hospitalisations of NSW residents in interstate hospitals are included for all years up until 2000–01. Numbers for 2001–02 and 2002–03 include an estimate of the small number of interstate hospitalisations, data for which were unavailable at the time of production.

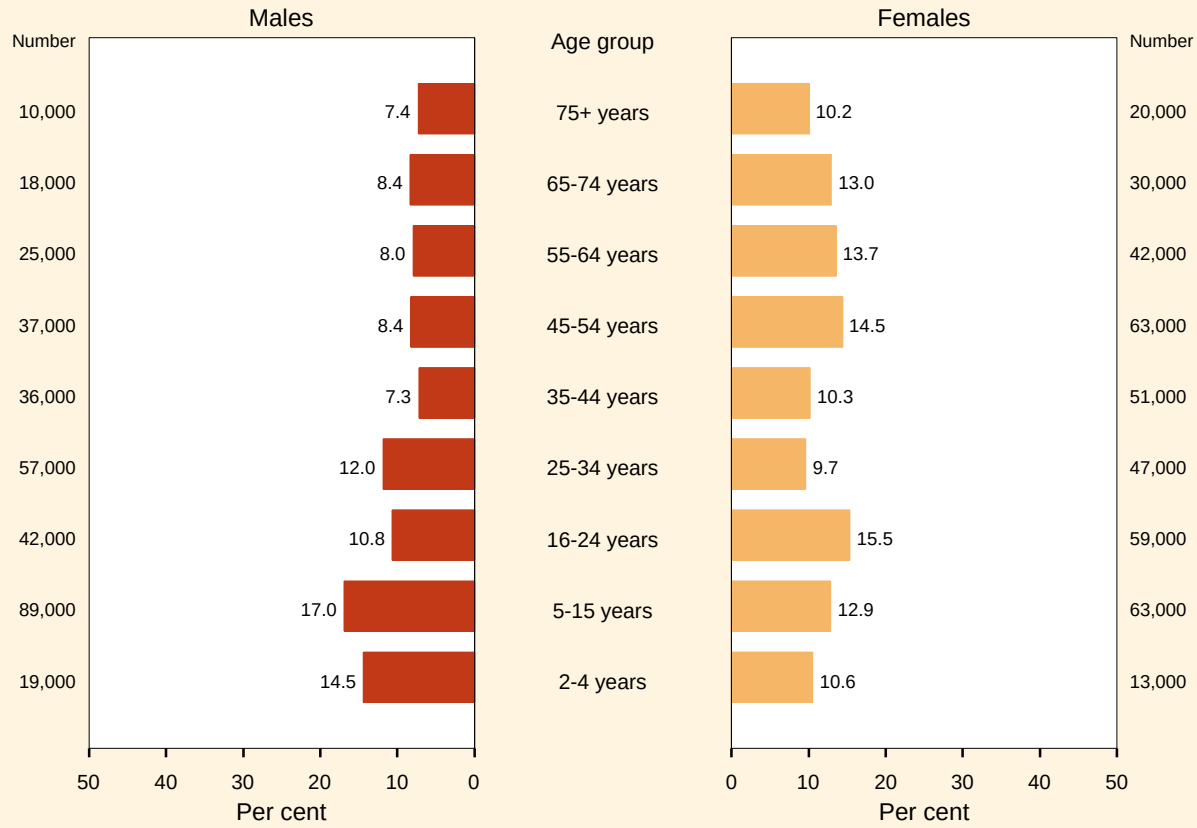
Source: Australian Institute of Health and Welfare (aetiologic fractions), 2001. Inpatient Statistics Collection (ISC) and ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Tobacco smoking is the leading preventable cause of morbidity and premature mortality, particularly from cardiovascular disease, cancers and chronic obstructive pulmonary disease (COPD) (Ridolfo and Stevenson, 1998).
- In 2002 in NSW, there were 3,431 deaths from COPD and lung cancer attributable to smoking (52% of all deaths attributable to smoking and 7% of all deaths in NSW in 2002).
- In 2002–03 in NSW, smoking caused 17,814 hospital separations for COPD and lung cancer, 32% of all hospitalisations caused by smoking, and almost 1% of all hospitalisations.

For more information:

Ridolfo B, Stevenson C. *The quantification of drug-caused mortality and morbidity in Australia, 1998.* Canberra: Australian Institute of Health and Welfare, 2001.

Current asthma by sex and age, persons aged 2 years and over, NSW 2002 and 2003 combined



Note: Current asthma was defined as diagnosed by a doctor and producing symptoms or requiring treatment in previous 12 months. Estimates based on 25,605 respondents in NSW Health Survey 2002 and 2003 (25 not stated for current doctor diagnosed asthma) and 7,915 in the NSW Child Health Survey 2001 (1 not stated).

Source: NSW Health Survey 2002 and 2003 and NSW Child Health Survey 2001(HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Asthma is a chronic inflammatory disorder of the airways that results in obstruction of airflow in response to a range of triggers. Australia, along with New Zealand and the United Kingdom, has one of the highest prevalence rates of asthma in the world (ISAAC, 1998).
- In the 2003 NSW Health Survey, 9.2% of adult males and 13% of adult females reported having current asthma (Centre for Epidemiology and Research, 2004). Among children, aged 2–12 years in 2001, 18% of boys and 13% of girls were reported to have current asthma.
- Higher rates of asthma were reported in children aged 2–12 years (16%) than adults aged 16 years and over (12%). In males, the prevalence of asthma was highest among children aged 5–15 years (17%); in females, prevalence was highest among young adults aged 16–24 years (16%).
- Written asthma management plans are recommended as part of the National Guidelines for the management of asthma (NAC, 2002). They enable people with asthma to recognise a deterioration in their condition and initiate appropriate treatment, thereby reducing the severity of acute episodes. In 2003, 35% of males and 45% of females with symptoms of asthma in the previous 4 weeks stated that they had a written asthma plan (Centre for Epidemiology and Research 2004).

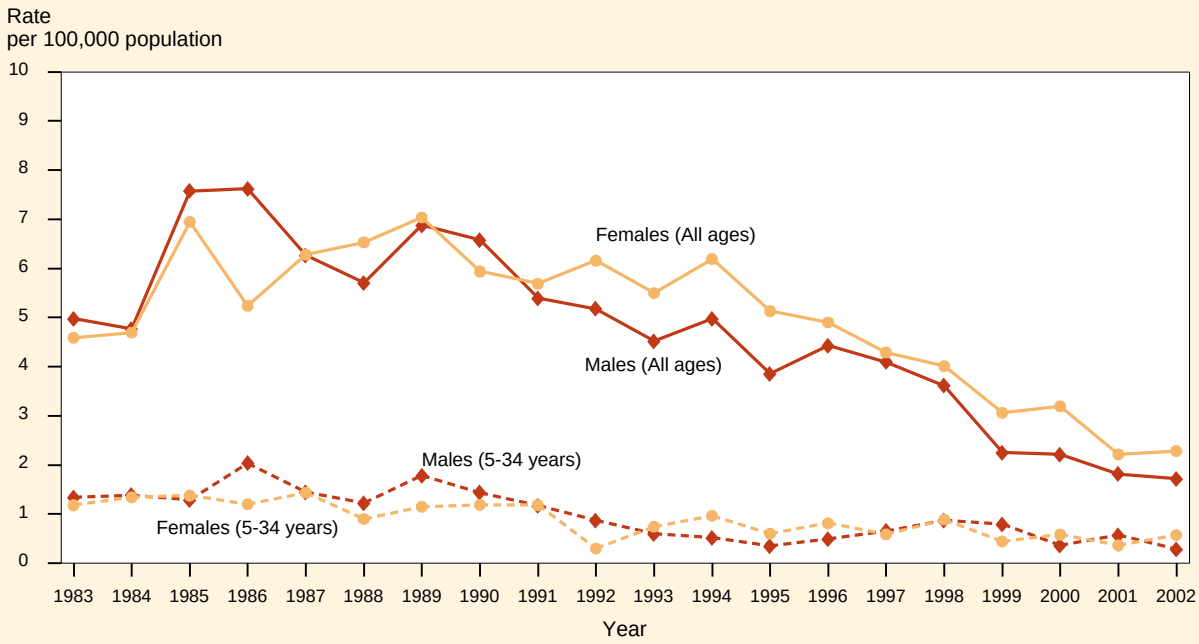
For more information:

The International Study of Asthma and Allergies in Childhood Steering Committee. Worldwide variation in prevalence of symptoms of asthma, allergic rhinoconjunctivitis, and atopic eczema. *Lancet* 1998; 351: 1225–1232.

National Asthma Council. *Asthma Management Handbook 2002.* Melbourne: NAC, 2002.

Centre for Epidemiology and Research, NSW Department of Health. New South Wales Adult Health Survey 2003. *N S W Public Health Bull* 2004; 15(S-4).

Asthma deaths by sex, persons of all ages and 5-34 years, NSW 1983 to 2002



			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	5–34 years	Males	8	7	5	7	9	12	11	5	8	4
		Females	10	13	8	11	8	12	6	8	5	8
		Persons	18	20	13	18	17	24	17	13	13	12
	All ages	Males	111	111	97	110	108	100	58	64	54	50
		Females	172	198	169	164	150	142	110	117	83	88
		Persons	283	309	266	274	258	242	168	181	137	139
Rate per 100,000 population	5–34 years	Males	0.6	0.5	0.4	0.5	0.7	0.9	0.8	0.4	0.6	0.3
		Females	0.7	1.0	0.6	0.8	0.6	0.9	0.4	0.6	0.4	0.6
		Persons	0.7	0.7	0.5	0.7	0.6	0.9	0.6	0.5	0.5	0.4
	All ages	Males	4.5	5.0	3.9	4.4	4.1	3.6	2.3	2.2	1.8	1.7
		Females	5.5	6.2	5.1	4.9	4.3	4.0	3.1	3.2	2.2	2.3
		Persons	5.1	5.5	4.6	4.6	4.3	3.9	2.6	2.8	2.0	2.0

Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001.

Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

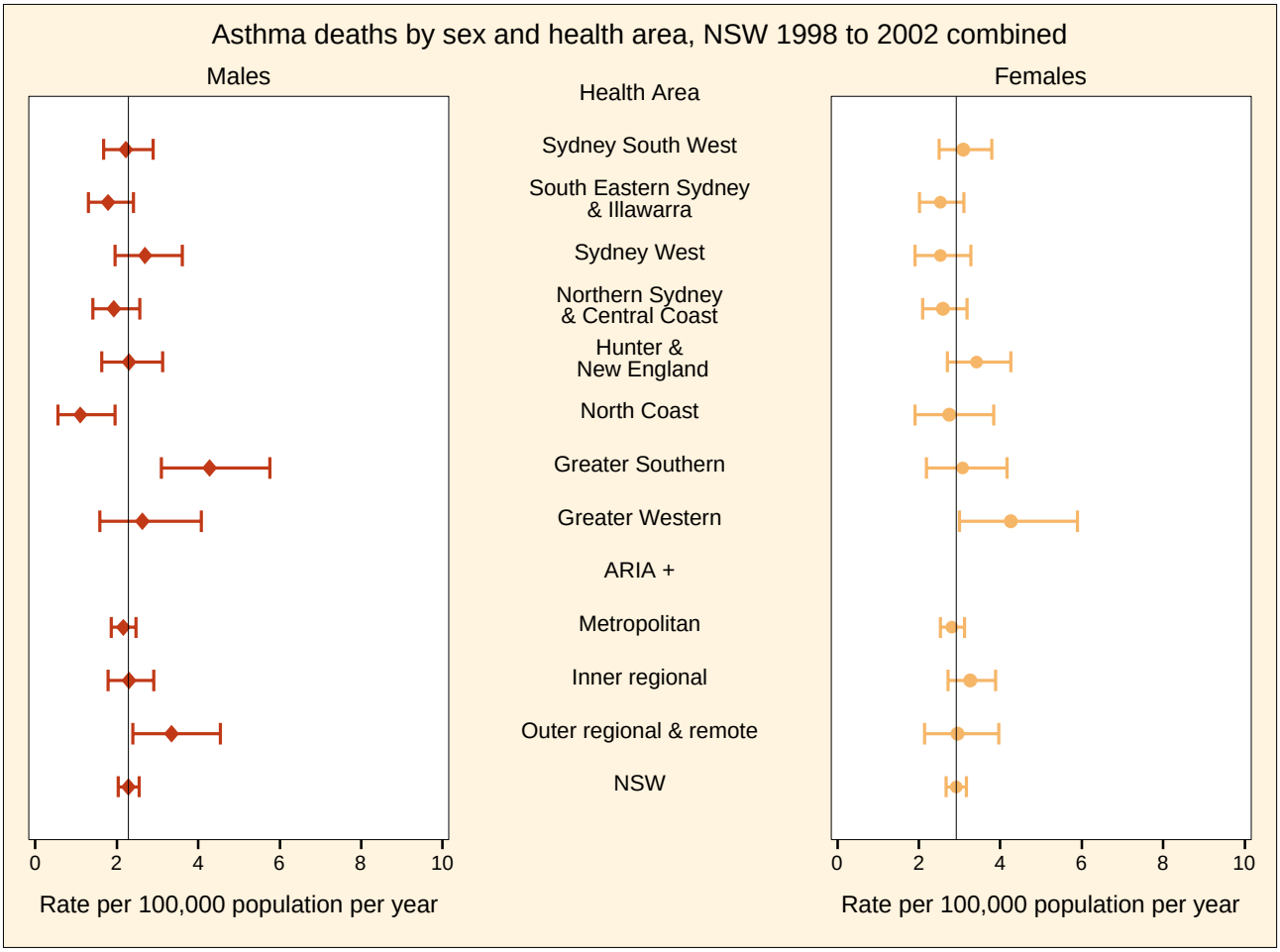
- Asthma death rates in NSW declined by 58% in all ages and 69% in the 5–34 year age group between 1983 and 2002.
- Asthma death rates peaked 1986 in the 5–34 year age group (1.6 deaths per 100,000) and in 1989 for all ages combined (7.0 deaths per 100,000). Rates gradually diminished thereafter. A corresponding reduction has been observed in Australia overall (ACAM, 2003).
- Between 1998 and 1999, death rates for asthma declined sharply, from 3.9 to 2.6 deaths per 100,000. The decline was less in the 5–34 year age group. The decline is most likely attributed to the change in coding from ICD-9 to ICD-10. Asthma was one of the conditions most affected by this change (ABS 2002), but the effect is negligible in people aged under 35 years (Baker et al., 2004).
- Strategies to improve asthma management include more use of preventive medication, use of asthma management plans, more frequent reviews by general practitioners, and improved management in emergency department settings (NAC, 2002).

For more information:

Australian Centre for Asthma Monitoring. *Asthma in Australia*. AIHW Asthma Series no. 1. AIHW Catalogue no. ACM1. Canberra: AIHW, 2003.

Baker DF, Marks GB, Poulos LM and Williamson M. *Review of proposed National Health Priority Area asthma indicators and data sources*. AIHW Catalogue no. ACM 2. Canberra: Australian Institute of Health and Welfare, 2004.

National Asthma Council. *Asthma Management Handbook 2002*. Melbourne: NAC, 2002.



Health area		Deaths	Rate per 100,000 population	LL 95% CI	UL 95% CI
Sydney South West	Persons	152	2.8	2.3	3.2
South Eastern Sydney & Illawarra	Persons	133	2.2	1.8	2.6
Sydney West	Persons	107	2.6	2.1	3.2
Northern Sydney & Central Coast	Persons	144	2.3	1.9	2.7
Hunter & New England	Persons	123	2.8	2.3	3.4
North Coast	Persons	49	1.9	1.4	2.6
Greater Southern	Persons	86	3.6	2.9	4.5
Greater Western	Persons	57	3.6	2.8	4.7
Metropolitan	Persons	572	2.5	2.3	2.7
Inner-regional	Persons	201	2.8	2.4	3.2
Outer-regional and remote	Persons	89	3.1	2.5	3.8
NSW	Persons	862	2.6	2.5	2.8

Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. LL/UL 95%CI = Lower and upper limits of the 95% confidence interval for the point estimate.

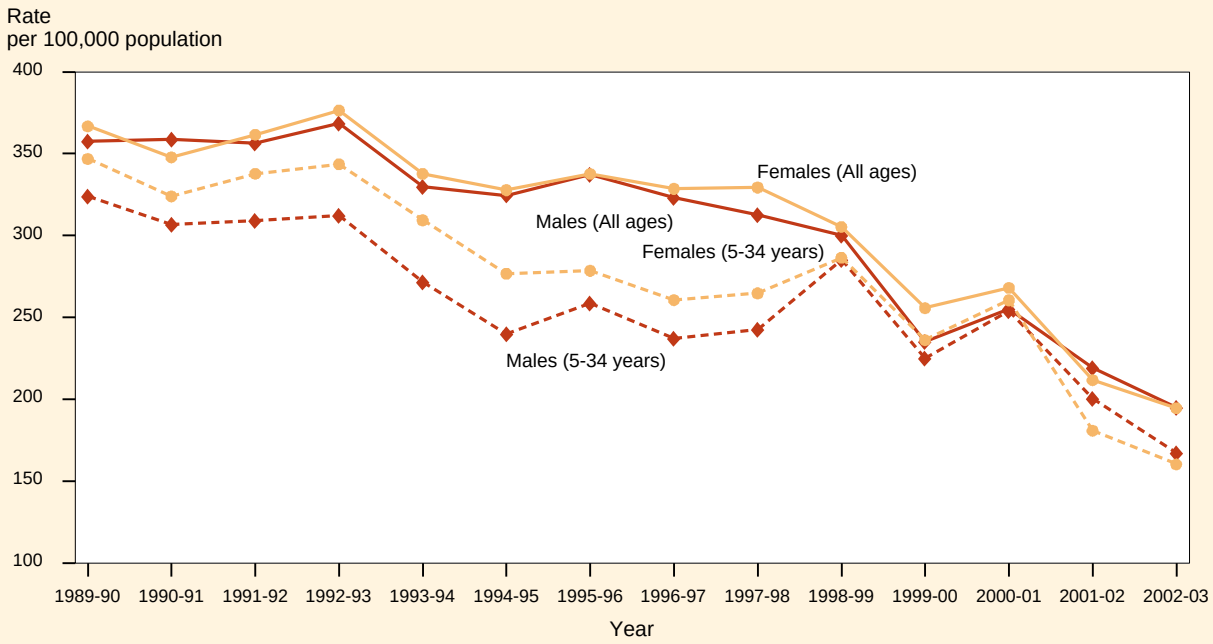
Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Between 1998 and 2002, the average death rate for asthma in NSW was 2.6 per 100,000 population. Asthma death rates were higher in outer-regional and remote NSW and inner-regional NSW than in metropolitan NSW.
- Death rates varied from 1.9 per 100,000 in the North Coast Health Area to 3.6 per 100,000 in the Greater Southern Health Area. Rates were higher among females than males in all health areas except Greater Southern.
- Geographic variations in death rates may reflect variations in the prevalence of asthma, its severity, and how well it is controlled. Regional variation in asthma prevalence may be related to different levels of exposure to allergens such as house dust mites and moulds (Peat et al., 1995).

For more information:

Peat JK, Toelle BG, Gray EJ et al. Prevalence and severity of childhood asthma and allergic sensitisation in seven climactic regions of New South Wales. *Med J Aust* 1995; 163: 22–26.

Asthma hospital separations by sex, persons of all ages and 5-34 years, NSW 1989-90 to 2002-03



			93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	5–34 years	Persons	7715	6893	7212	6724	6869	7784	6305	7088	5283	4538
	All ages	Persons	20688	20368	21275	20695	20540	19628	16010	17236	14297	12963
Rate per 100,000 population	5–34 years	Persons	290.4	258.3	268.8	249.2	254.1	286.5	231.0	257.7	191.2	164.3
	All ages	Persons	334.8	326.8	338.8	326.9	322.2	304.3	246.8	263.0	216.8	196.3

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2001–02 and 2002–03 include an estimate of the small number of interstate hospitalisations, data for which were unavailable at the time of production.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

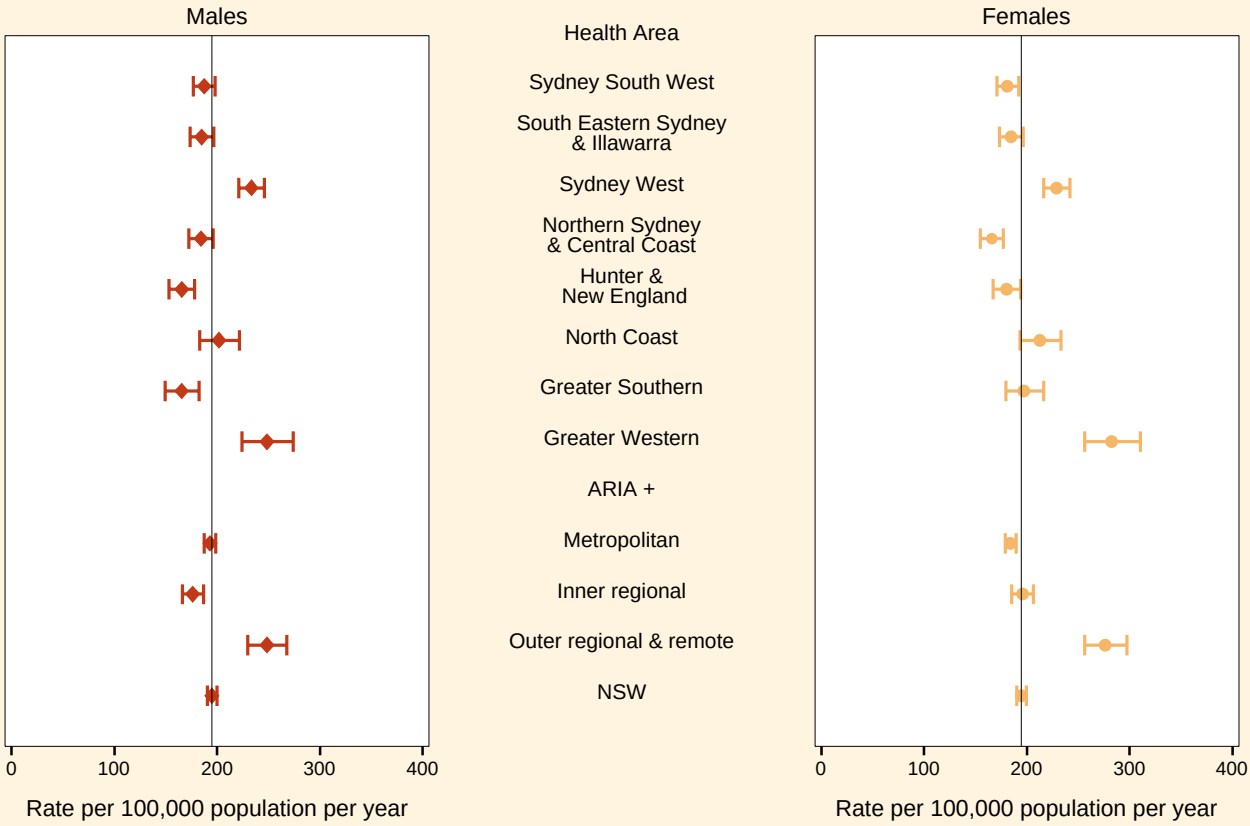
- Hospital separation rates for asthma decreased gradually in NSW between 1989–90 and 2002–03. The separation rate decreased by 46% for all ages and by 51% in people aged from 5–34 years. The self-reported rate of asthma has increased from 9% in 1989–90 to 12% in 2001 (ABS, 2002), and so this decrease may reflect continuing improvements in asthma management as well as changes in coding practices.
- Despite the general decrease in hospitalisation rates, there were fluctuations from year to year. In 1998–99, the rates increased among 5–34 year olds by around 13% over the previous year. A substantial increase in presentations, to emergency departments, with severe asthma symptoms was reported in February that year (Sheppeard et al., 2000). A similar increase occurred in 2000–01.
- In 1999–00, hospital separation rates decreased in all age groups. This decrease may be attributed to the change in coding from ICD-9 to ICD-10 in that year.
- The diagnosis of asthma is more reliable in the 5–34 year age group than it is in younger or older people. Consequently, the hospital separation rate in this age group is likely to be more indicative of underlying asthma prevalence and management practices than the rate for all ages combined.

For more information:

Australian Bureau of Statistics. 2001 National Health Survey: Summary of results. ABS Catalogue no. 4364.0. Canberra: ABS, 2002.

Sheppeard V, Corbett S, Morgan G. A statewide 'outbreak' of asthma in NSW, February 1999. *N S W Public Health Bull* 2000; 11(11): 187–189.

Asthma hospital separations by sex and health area, NSW 2002-03



Health area		Hospitalisations	Rate per 100,000 population	LL 95% CI	UL 95% CI
Sydney South West	Persons	2416	185.9	178.5	193.4
South Eastern Sydney & Illawarra	Persons	2011	186.2	178.1	194.6
Sydney West	Persons	2580	233.0	224.1	242.2
Northern Sydney & Central Coast	Persons	1837	176.1	168.1	184.4
Hunter & New England	Persons	1422	173.7	164.7	183.0
North Coast	Persons	921	208.6	195.1	222.9
Greater Southern	Persons	857	182.1	170.0	194.7
Greater Western	Persons	844	266.1	248.4	284.8
Metropolitan	Persons	8897	190.0	186.1	194.0
Inner-regional	Persons	2564	187.3	180.1	194.8
Outer-regional and remote	Persons	1434	262.6	249.0	276.8
NSW	Persons	12963	196.3	192.9	199.7

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. LL/UL 95%CI = Lower and upper limits of the 95% confidence interval for the point estimate. Numbers for 2001–02 and 2002–03 include an estimate of the small number of interstate hospitalisations, data for which were unavailable at the time of production.

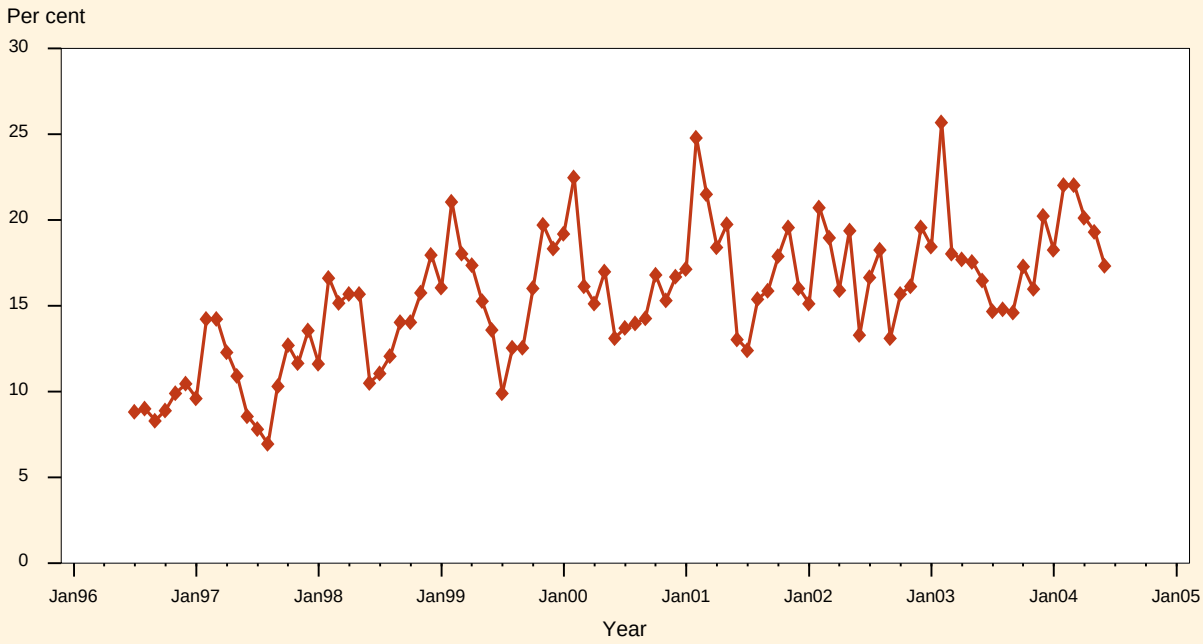
Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In 2002–03, the rate of hospital separations for asthma in NSW varied from 173.7 per 100,000 in the Hunter & New England Health Area to 266.1 per 100,000 in the Greater Western Health Area. Rates were higher in outer-regional and remote areas than in metropolitan and inner-regional areas.
- Geographic variations in hospitalisation rates may reflect variations in the prevalence or severity of asthma, how well it is controlled, hospitalisation policies, and access to services. In rural and remote areas there is an increased likelihood of admission to hospital for care that may be provided on an outpatient basis in an urban area (Peat et al., 1995).

For more information:

Peat JK, Toelle BG, Gray EJ et al. Prevalence and severity of childhood asthma and allergic sensitisation in seven climactic regions of New South Wales. *Med J Aust* 1995; 163: 22–26.

Severe asthma presentations as a proportion of all asthma presentations to emergency departments, children aged 1-14 years, NSW July 1996 to June 2004



Note: Severe asthma = asthma symptoms requiring treatment in less than 10 minutes after arrival to an emergency department.
Source: Emergency Department Data Collection (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Between July 1996 and June 2004, an increasing proportion of people who presented to an emergency department (ED) with asthma had severe asthma that required more urgent treatment. This proportion increased from an average of 11.1% in 1997 to an average of 17.6% in 2003.
- It is likely that the prevalence of asthma in NSW has increased in this period, reflecting the increase in asthma prevalence throughout Australia (ABS, 2002; Downs et al., 2001; Wilson et al., 2001; Peat et al., 1994). However, hospitalisations for asthma decreased in NSW in the same period.
- The shift in the types of presentations to EDs may be an indication of the growing number of people who successfully manage their or their children's asthma, with the assistance of general practitioners. People with unstable or poorly controlled asthma (those who are not appropriately or adequately treated, or who do not take their medications) continue to rely on the assistance of EDs to stabilise their symptoms.
- Information from the Emergency Department Data Collection (EDDC) should be interpreted with caution because it includes data on only two-thirds of the ED presentations in NSW. Coding of the reason for presentation may also be less consistent that the coding of the cause of hospital separations. Unlike hospital separations, EDDC codes are not entered by trained clinical coders and, therefore, the standardisation of coding is difficult to maintain. ED attendances may also be influenced by a number of factors, including the availability of general practitioners (Lincoln and Muscatello, 2002).

For more information:

Australian Bureau of Statistics. 2001 National Health Survey: Summary of results. ABS Catalogue no. 4364.0. Canberra: ABS, 2002.

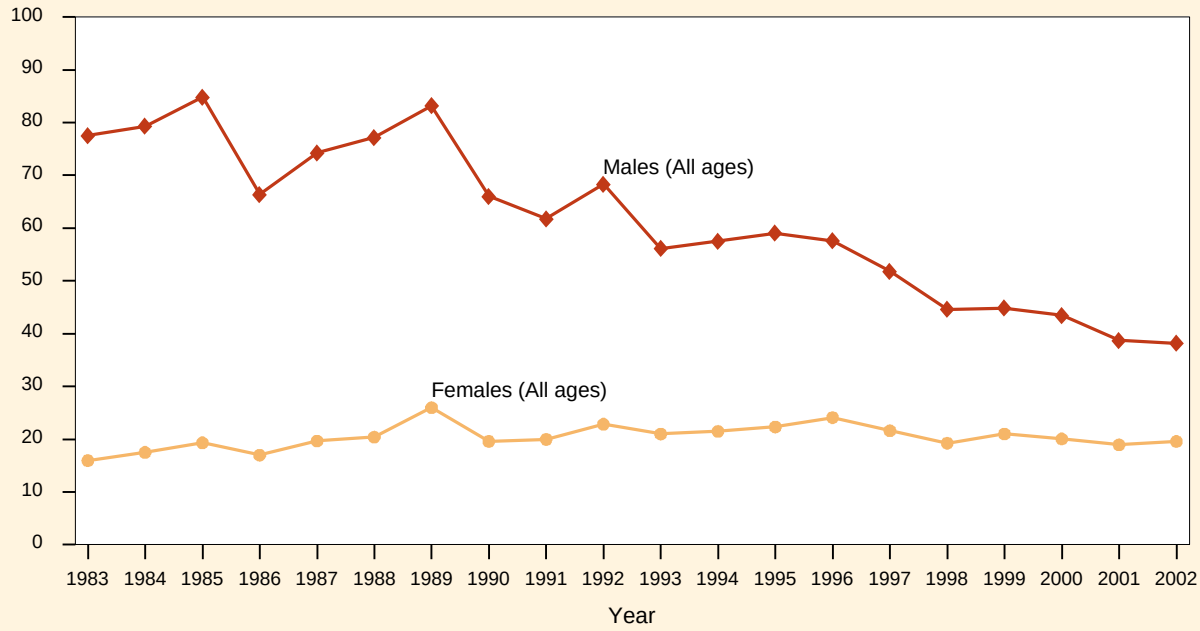
Downs SH, Marks GB, Sporik R, Belosouva EG et al. Continued increase in the prevalence of asthma and atopy. *Arc Dis Child* 2001; 84(1): 20–23.

Wilson DH, Adams RJ, Appleton SL et al. Prevalence of asthma and asthma action plans in South Australia: Population surveys from 1990 to 2001. *Med J Aust* 2001; 178: 483–485.

Peat JK, van den Berg RH, Green WF et al. Changing prevalence of asthma in Australian children. *BMJ* 1994; 308(6944): 1591–1596.

Lincoln D, Muscatello D. Time trends in emergency department presentations of children with acute severe asthma in NSW. *N S W Public Health Bull* 2002; 11(12): 293–295.

Chronic obstructive pulmonary disease deaths by sex, NSW 1983 to 2002



			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	65+ years	Persons	1021	1068	1198	1269	1157	1035	1192	1179	1169	1239
	All ages	Persons	1856	1973	2080	2159	2032	1809	1953	1945	1823	1899
Rate per 100,000 population	65+ years	Persons	358.4	363.3	391.7	398.4	347.4	298.6	330.2	313.0	297.1	303.4
	All ages	Persons	34.2	35.2	36.3	36.7	33.4	28.9	30.4	29.4	26.7	27.1

Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2001–02 and 2002–03 include an estimate of the small number of interstate hospitalisations, data for which were unavailable at the time of production.

Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Chronic obstructive pulmonary disease (COPD) is a permanent and typically progressive disease, where damage to the lungs obstructs oxygen intake and causes shortness of breath. COPD actually refers to several different but related diseases, of which chronic bronchitis and emphysema are the 2 most important. Each condition can occur on its own, but they usually co-exist in an individual (AIHW, 2002). Cigarette smoking is the most important risk factor. Exposure to pollution and chest infections are also risk factors (AIHW, 2004).
- In NSW between 1983 and 2002, the male death rate from COPD decreased by 50.8%. In contrast, the female death rate increased by 22.5%, from 16.0 to 19.6 per 100,000. However, the female rate has remained relatively stable since 1996.
- Reductions in male mortality from COPD follow the decline in smoking rates among males and, to a lesser extent, better management of the disease. The increase in the female death rate could be due to the delayed effect of an increase in the proportion of female smokers from the late-1970s to mid-1980s (AIHW, 2004).
- In Australia in 2002, COPD was the fourth most common cause of death (ABS, 2002). COPD is also a major contributor to death from other causes. It was reported as a contributing cause of death in 11.6% of male and 7.7% of female deaths in 2002 (ABS, 2002).

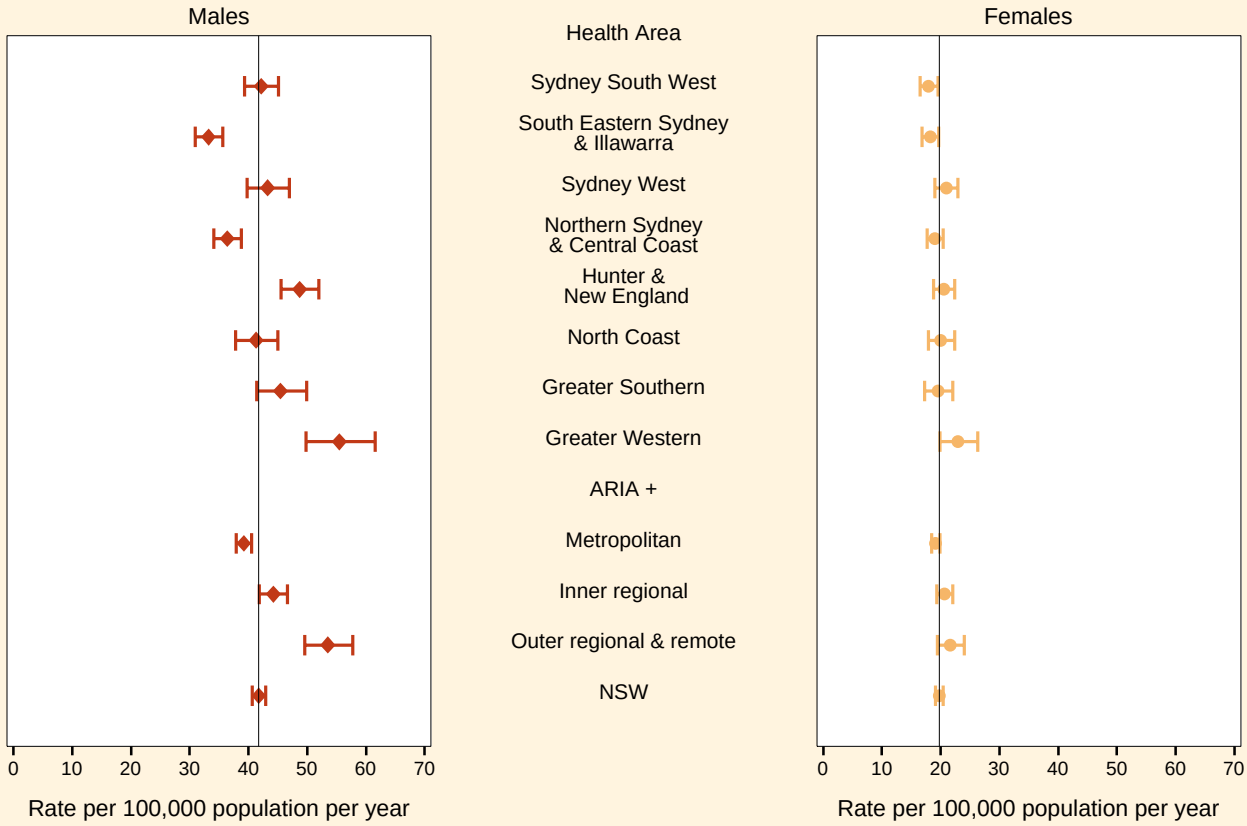
For more information:

Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004.

Australian Bureau of Statistics. *Causes of death: Australia 2002.* ABS Catalogue no. 3303.0. Canberra: 2003.

Australian Institute of Health and Welfare. *Chronic diseases and associated risk factors in Australia, 2001.* Canberra: AIHW, 2002.

Chronic obstructive pulmonary disease deaths by sex and area health service, NSW 1998 to 2002 combined



Health area		Deaths	Rate per 100,000 population	LL 95% CI	UL 95% CI
Sydney South West	Persons	1419	27.4	26.0	28.9
South Eastern Sydney & Illawarra	Persons	1472	24.0	22.8	25.3
Sydney West	Persons	1073	29.2	27.5	31.0
Northern Sydney & Central Coast	Persons	1681	25.5	24.3	26.7
Hunter & New England	Persons	1470	31.9	30.3	33.6
North Coast	Persons	857	28.9	27.0	30.9
Greater Southern	Persons	742	30.2	28.0	32.4
Greater Western	Persons	573	36.3	33.4	39.4
Metropolitan	Persons	6066	26.8	26.1	27.5
Inner-regional	Persons	2266	30.3	29.1	31.6
Outer-regional and remote	Persons	1073	35.1	33.1	37.3
NSW	Persons	9413	28.4	27.9	29.0

Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. LL/UL 95%CI = Lower and upper limits of the 95% confidence interval for the point estimate. Health areas in metropolitan Sydney, Central Coast, Hunter, and Illawarra were classified as urban. Numbers for 2001–02 and 2002–03 include an estimate of the small number of interstate hospitalisations, data for which were unavailable at the time of production.

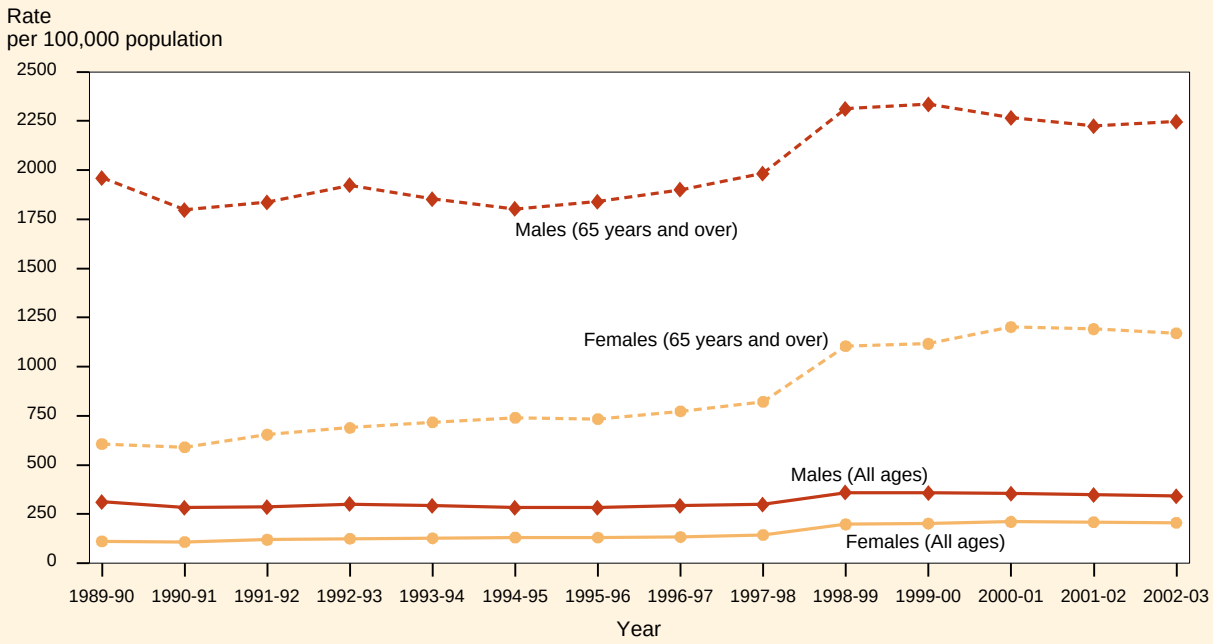
Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Chronic bronchitis and emphysema are the 2 major components of chronic obstructive pulmonary disease (COPD). Smoking is the main risk factor for COPD.
- Between 1998 and 2002 in NSW, the overall death rate from COPD was 28.4 deaths per 100,000 people. Death rates were highest in outer-regional and remote areas (35.1 per 100,000).
- COPD death rates were highest in the Greater Western Health Area (36.3 deaths per 100,000) and lowest in the South Eastern Sydney & Illawarra Health Area (24.0 deaths per 100,000).

For more information:

Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004.

Chronic obstructive pulmonary disease hospital separations by sex, NSW 1989-90 to 2002-03



			93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	65+ years	Persons	8499	8651	8933	9584	10341	12986	13419	13891	14059	14359
	All ages	Persons	11208	11296	11483	12190	13079	16937	17473	18109	18376	18492
Rate per 100,000 population	65+ years	Persons	1172.2	1168.8	1179.6	1232.3	1297.9	1596.4	1617.7	1636.8	1617.1	1620.6
	All ages	Persons	196.5	193.9	193.1	199.7	208.9	264.9	267.2	270.2	267.4	263.5

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

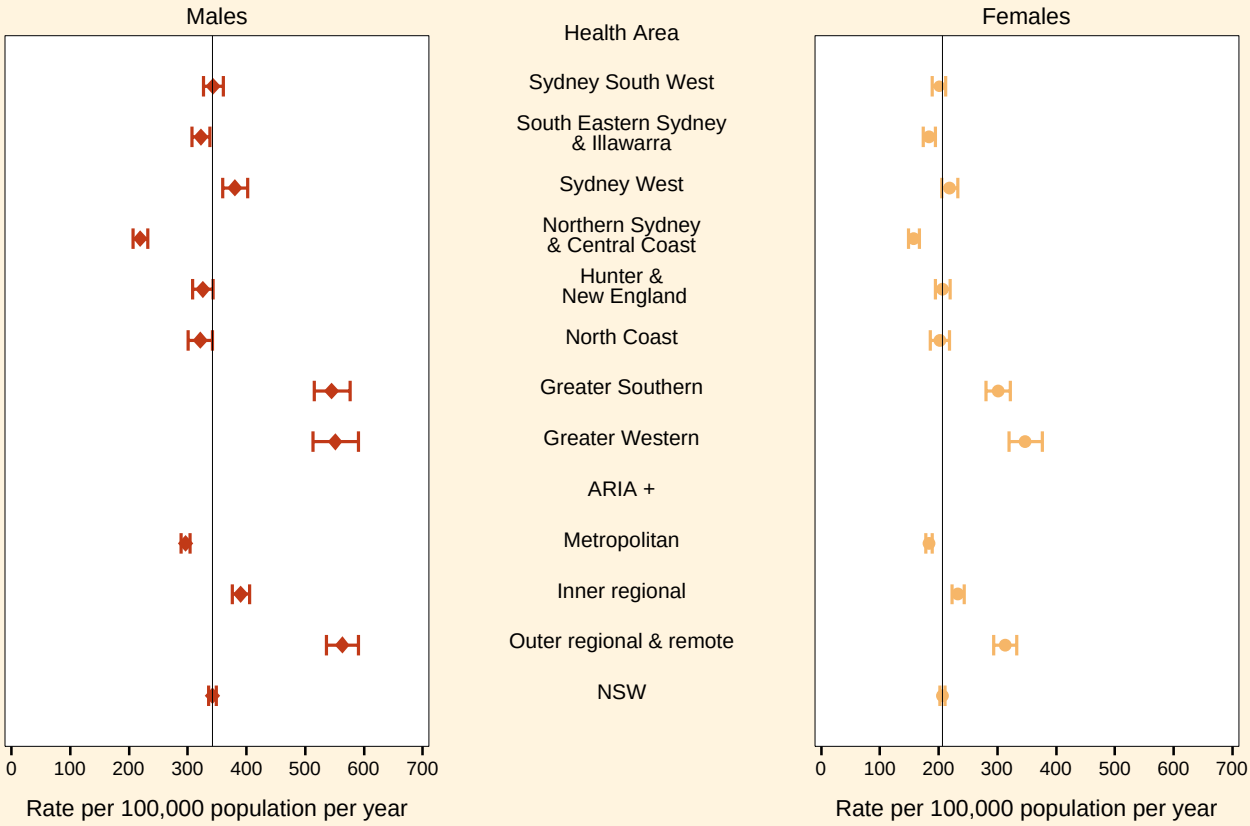
- Chronic obstructive pulmonary disease (COPD) is a term used to refer to several different but related diseases. Chronic bronchitis and emphysema are the 2 main diseases included in this group. Cigarette smoking is the most important risk factor, while exposure to pollution and chest infections have also been identified as risk factors (AIHW, 2004).
- In Australia, in 2002–03, there were over 52,000 hospital separations with the principal diagnosis of COPD, with an average length of stay of 7.5 days (AIHW, 2004).
- In NSW in the financial year 2002–03, there were 18,492 hospital separations, of which 78% were for people aged 65 years and over.
- Between 1989–90 and 2002–03, the rate of hospital separations for COPD in NSW increased by 35.8% for all ages and by 42.4% in people aged 65 years and over.
- This increase in female hospitalisation rates for COPD and the narrowing of the gap between male and female rates can be explained by increasing prevalence of COPD in females, which in turn is probably due to the uptake of smoking among females.

For more information:

Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004.

Australian Institute of Health and Welfare. *Chronic diseases and associated risk factors in Australia, 2001.* Canberra: AIHW, 2002.

Chronic obstructive pulmonary disease hospital separations by sex and health area, NSW 2002-03



Health area		Hospitalisations	Rate per 100,000 population	LL 95% CI	UL 95% CI
Sydney South West	Persons	2973	261.5	252.2	271.1
South Eastern Sydney & Illawarra	Persons	3090	241.6	233.2	250.3
Sydney West	Persons	2382	285.2	273.8	297.0
Northern Sydney & Central Coast	Persons	2353	180.6	173.3	188.2
Hunter & New England	Persons	2500	256.4	246.4	266.6
North Coast	Persons	1589	255.0	242.5	268.0
Greater Southern	Persons	2160	407.1	390.1	424.6
Greater Western	Persons	1439	429.9	408.0	452.8
Metropolitan	Persons	10936	230.1	225.8	234.4
Inner-regional	Persons	4826	299.2	290.8	307.8
Outer-regional and remote	Persons	2753	426.6	410.7	443.0
NSW	Persons	18492	263.5	259.7	267.3

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. LL/UL 95%CI = Lower and upper limits of the 95% confidence interval of the point estimate.

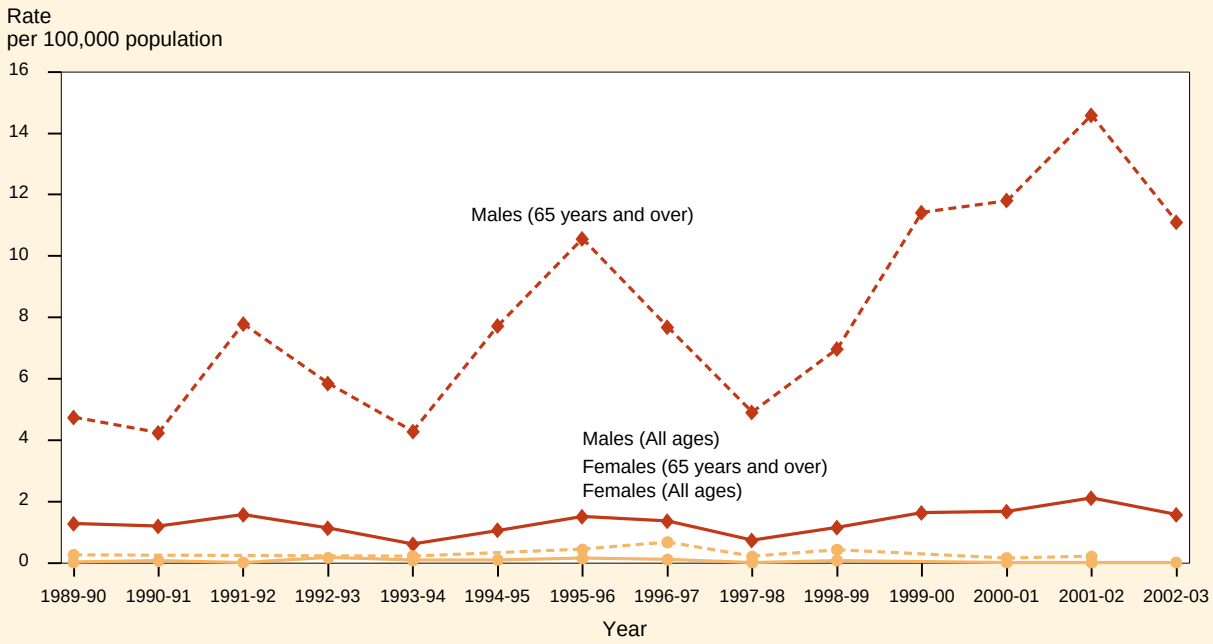
Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In 2002–03 in NSW, the hospitalisation rate from chronic obstructive pulmonary disease (COPD) was 263.5 per 100,000 people. Hospitalisation rates were higher in outer-regional and remote areas (426.6 per 100,000).
- Hospitalisation rates for COPD were the highest in the Greater Western (429.9 per 100,000) and Greater Southern (407.1 per 100,000) Health Areas.
- The distribution of hospitalisation rates, while similar to death rates and smoking patterns, showed greater variation among health areas. This may reflect variations in the severity of COPD, how well it is managed, hospitalisation policies, and access to health services.

For more information:

Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004. Available at www.aihw.gov.au/publications/index.cfm/title/10014.

Asbestosis hospital separations by sex, persons of all ages and 65 years and over, NSW 1989-90 to 2002-03



			93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	65+ years	Males	14	26	32	24	18	24	41	43	54	43
		Females	1	.	2	3	1	2	.	1	1	.
	All ages	Males	16	29	38	36	22	33	48	50	64	49
		Females	3	3	5	4	1	3	.	1	1	1
Rate per 100,000 population	65+ years	Males	4.3	7.7	10.6	7.7	4.9	7.0	11.4	11.8	14.6	11.1
		Females	0.2	.	0.4	0.7	0.2	0.4	.	0.2	0.2	.
	All ages	Males	0.6	1.1	1.5	1.4	0.8	1.2	1.7	1.7	2.1	1.6
		Females	0.1	0.1	0.2	0.1	0.0	0.1	.	0.0	0.0	0.0

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2001–02 and 2002–03 include an estimate of the small number of interstate hospitalisations, data for which were unavailable at the time of production.

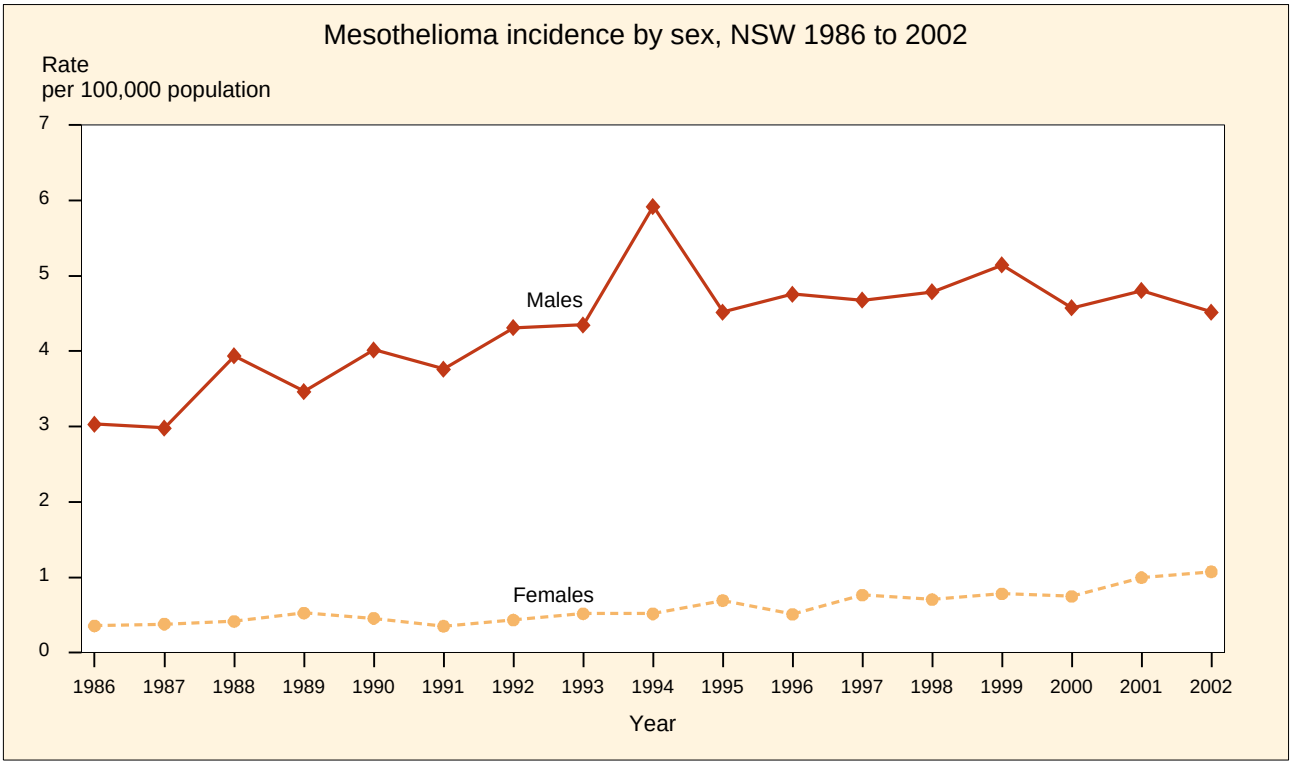
Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Asbestosis is a fibrosis of the lungs resulting from the long-term inhalation of asbestos dust in the mining, milling, manufacturing, application, or removal of asbestos products. It is preventable, primarily by effective dust suppression in the work environment. Advances in occupational health and safety have reduced the incidence of asbestosis in developed countries and, with time, are likely to eliminate it (Beers, 1999). The handling of asbestos is subject to a national code of practice and to regulations in NSW (Leigh, 2001).
- Between 1989–90 and 2002–03, the hospitalisation rate among males was stable; however, the age-distribution has shifted towards older men. The proportion of hospitalisations among males aged 65 years and over increased from 43% to 86% between 1989–and 2002–03. This may indicate a decreasing incidence of asbestosis in NSW.
- There were 2 deaths from asbestosis in NSW in 1981 and 27 deaths in 2002.
- The onset of asbestosis is not always delayed from the time of exposure and depends on massive and long term exposures that were more prevalent in the past. In the majority of cases, asbestosis does not progress after exposure ceases. In contrast, other diseases related to asbestos exposure (such as mesothelioma and lung cancer) cause death in the majority of patients within 5 years from the onset of disease. In these cases, the onset may be delayed for decades following the asbestos exposure.

For more information:

Beers MH, Berkow R. *The Merck manual of diagnosis and therapy.* West Point: Merck and Co, 1999.

Leigh J, Driscoll T, Hendrie L. *The Incidence of Mesothelioma in Australia 1996 to 1998, Australian Mesothelioma Register Report 2001.* Sydney: National Occupational Health and Safety Commission, 2001.



		1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	Males	111	151	118	130	130	136	148	136	148	140
	Females	16	16	22	17	25	24	27	27	37	41
Rate per	Males	4.4	5.9	4.5	4.8	4.7	4.8	5.1	4.6	4.8	4.5
100,000 population	Females	0.5	0.5	0.7	0.5	0.8	0.7	0.8	0.7	1.0	1.1

Note: Incident mesothelioma cases restricted to those reported among persons aged 20 years and over. Rates were age-adjusted using the Australian population as at 30 June 2001.

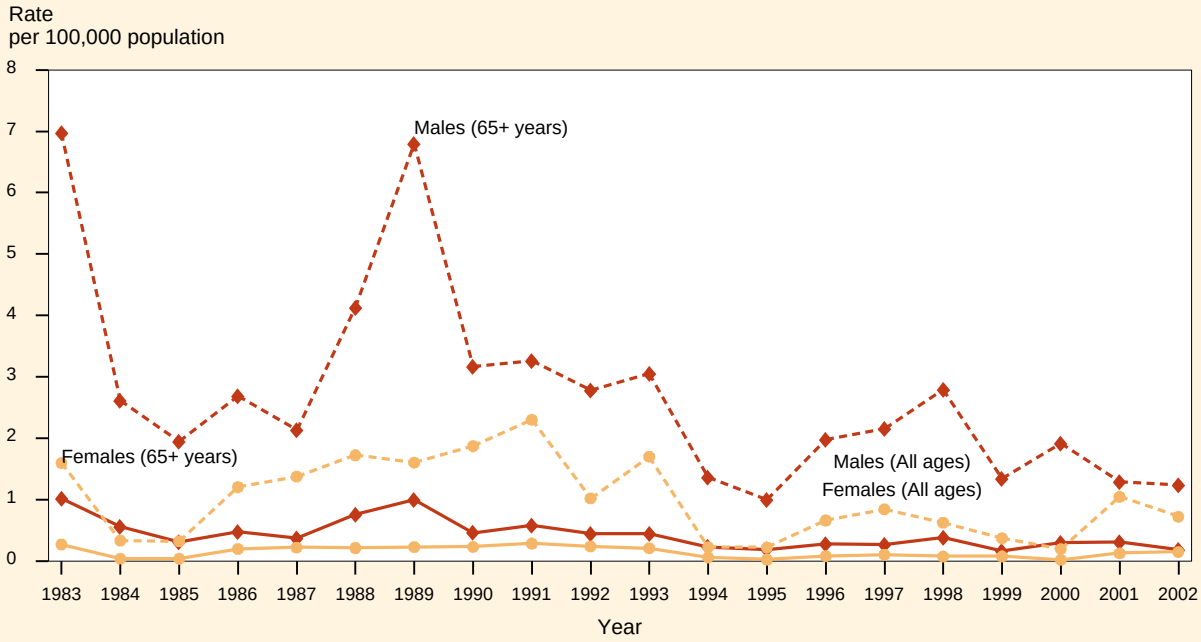
Source: NSW Central Cancer Registry incidence data and ABS population estimates (HOIST).

- Malignant mesothelioma is a cancer of the outer covering of the lung or the abdominal cavity. It is frequently associated with past exposure to asbestos and has no direct relationship to smoking.
- NSW was the first state in Australia to mine asbestos, and produced the largest tonnages of chrysotile (until 1983) as well as smaller quantities of amphibole (until 1949). While Australian consumption of asbestos (including imported fibre) peaked in 1975, asbestos products continue to be an important environmental hazard. In May 2001, the Workplace Relations Ministers' Council agreed to support the phasing out of all new chrysotile use by 2003.
- In 2002, 181 cases of mesothelioma were reported in NSW, with 77.3% of these in males. Mesothelioma rates are much higher in males because of the occupational exposure associated with the disease.
- The age-adjusted incidence rate for mesothelioma almost doubled in NSW over the period 1986–2002, from 1.5 to 2.6 per 100,000 population. This increase reflects the current Australia-wide epidemic of mesothelioma cases. However, despite more males being affected than females, the increase in incidence rate was greater in females than males. In females, the rate almost tripled, from 0.4 to 1.1 per 100,000 population. The rate in males increased by 50%, from 3.0 to 4.5 per 100,000 population.
- The incidence of malignant mesothelioma in Australia appears to be higher than that of any other country (Tossavainen and Takahashi, 2000). The first confirmed case was reported from Wittenoom in Western Australia in 1962. Since then, incidence has increased steadily across the nation.

For more information:

Tossavainen A, Takahashi K. Epidemiological trends for asbestos-related cancers. *People and Work Research Reports*. Helsinki: Finnish Institute of Occupational Health, 2000.

Respiratory tuberculosis deaths by sex, persons of all ages and 65 years and over, NSW 1983 to 2002



			1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	65+ years	Persons	4	4	8	10	10	6	7	9	8
	All ages	Persons	7	6	9	10	11	7	9	14	11
Rate per 100,000 population	65+ years	Persons	0.6	0.5	1.0	1.3	1.3	0.8	0.9	1.0	0.9
	All ages	Persons	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.2

Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production.

Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Tuberculosis (TB) is caused by the bacterial organism *Mycobacterium tuberculosis*. TB can present in a variety of ways, most commonly as pulmonary disease characterised by a chronic cough, weight loss, fevers, and night sweats.
- The morbidity and mortality from TB in NSW is one of the lowest in the world. In the period 1997–2001, 2,144 cases of TB were notified to the NSW Department of Health. Case reports declined rapidly after World War II, but have levelled out since the mid-1980s. Most cases occur in people born in high-prevalence countries and people living in urban areas. The Country of birth chapter provides more information on notifications for TB.
- In the period 1999–2002, 41 people died of respiratory TB in NSW. However there were relatively big fluctuations in the number of deaths from year to year, as expected when total figures are small.
- The annual rate of death from respiratory TB decreased from 0.5 per 100,000 people in 1983 to 0.2 per 100,000 in 2002. Death rates were greater among people aged over 65 years but, nevertheless, the death rate in this age group has declined over the last 2 decades from 3.4 per 100,000 in 1983 to 0.9 per 1000,000 in 2002. In the past, the highest death rates were among young adults aged between 20–30 years (Robbins and Cotran, 1979). The death rate in males is consistently higher than in females.
- A network of chest clinics exists throughout NSW to provide directly supervised therapy for people with disease, and to identify, screen, and treat people at risk of infection.

For more information:

Robbins SL, Cotran RS. *Pathologic basis of disease.* Philadelphia: WB Saunders Company, 1979.

The *NSW Public Health Bulletin* includes monthly reports of notifiable communicable diseases. Available at www.health.nsw.gov.au/public-health/phb/phb.html.

Chapter 4.5

Injury and poisoning

- There are around 2,400 injury-related deaths and 154,000 injury-related hospitalisations each year in NSW.
- Injury, including poisoning, is one of the leading causes of death among people aged under 45 years. The most common causes of injury-related deaths are suicide, motor vehicle crashes, falls, and poisoning.
- In recent years, death rates have declined for:
  - injuries and poisonings overall;
  - motor vehicle crash injuries;
  - drowning;
  - firearm-related deaths.
- Hospitalisation rates have decreased for:
  - pedestrian injury;
  - near-drowning;
  - unintentional poisoning;
  - firearm-related injuries.
- Hospitalisation rates have increased for:
  - injuries to pedal cyclists;
  - fall-related injuries in children, older people, and adults;
  - knife-related injuries;
  - injuries caused by interpersonal violence;
  - injuries associated with sport.
- Males have much higher rates of death and hospitalisation than females for all major injury causes, except for falls among older people.
- Death and hospitalisation rates for many injury causes—including motor vehicle crashes, interpersonal violence, and firearm-related injuries—are higher in rural areas than in urban areas.

In this chapter

Introduction

In 1998, around 5.8 million people died from injury or poisoning-related causes worldwide. This equates to almost 16,000 people dying each day and gives a rate of 97.9 per 100,000 population. For each person who dies of injuries there are several thousand individuals who survive and are left with permanent disabilities (WHO, 1999).

In Australia, injury remains a leading cause of death, illness, and disability. In 2002, injuries accounted for 5.8% of all deaths (AIHW, 2004a). A total of 7,820 deaths (5,271 males and 2,549 females) were registered as being due to an external cause of injury or poisoning, and 31.3% of these deaths were of males aged between 20 and 44 years (AIHW, 2004a). Approximately 403,386 episodes of inpatient hospital care in 1997–98 were attributed to injury (AIHW, 2000).

Nationwide, inpatient health system costs due to injury are $4.1 billion per annum or around 8.3% of total recurrent health expenditure (AIHW, 2004b). In NSW, the total cost of direct morbidity following injuries is estimated to be around $1.16 billion per year (IRMRC, 2003). Injuries are preventable and there are a wide range of effective prevention strategies that have been developed for different types of

potentially injurious incidents. For example, child-resistant packaging has been shown to be an effective measure in combating the poisoning of young children, and stricter gun laws have resulted in fewer firearm-related injuries.

The NSW Department of Health contributed to the development of the National Injury Prevention Plan for 2004 onward, the goal of which is to reduce the incidence and the effect of injuries on the health and wellbeing of the Australian population in the identified priority areas.

This chapter describes trends in deaths and hospitalisations due to injury and poisoning in NSW. The specific injury types chosen reflect injury prevention priorities in NSW.

The hospitalisation rates are calculated from the Inpatients Statistics Collection (ISC). In this chapter, ISC data excludes those records where a patient was transferred from one acute care hospital to another acute care hospital, or where they were a 'statistical discharge' (that is, the patient was still in the same hospital but the type of service being provided had changed). These exclusions were made to eliminate 'double counting' of injury hospitalisations.

In addition to these exclusions, the analysis of hospitalisations for falls also excludes hospital stays for one day only. These records were excluded on the assumption that very brief stay cases are likely to reflect low injury severity. It is more plausible that the increase in the numbers of these day-only stay cases, in recent years, reflects changes in admission policy (that is, patients being admitted now where they were not admitted before), rather than an actual increase in the incidence of injuries related to falls. A new version of the International Classification of Diseases was introduced in NSW hospitals from 1998–99. This version, known as the International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Australian Modification (ICD-10-AM), has altered the way injuries are classified. The main axis of classification of injuries in ICD-10-AM is based on body region, as opposed to the type of injury as emphasised in the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM). This change has not resulted in any major affect on the injury statistics from hospitals. ICD-10-AM has, however, changed the emphasis for the classification of land transport accidents, where the emphasis is now placed on the injured person's mode of transport.

For details of the methods used for analysing death and hospitalisation data, refer to the Methods section.

For more information:

Australian Institute of Health and Welfare. *Australia's Health 2000: The seventh biennial health report of the Australian Institute of Health and Welfare.* Canberra: AIHW, 2000.

Australian Institute of Health and Welfare. *Australian Health Trends 2001.* Canberra: AIHW, 2001.

Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004a. Available at www.aihw.gov.au/publications/index.cfm/title/10014.

Australian Institute of Health and Welfare. *Health system expenditure on disease and injury in Australia, 2000–01.* Canberra: AIHW, 2004b.

Commonwealth Department of Health and Aged Care. *National Injury Prevention Plan: Priorities for 2001–2003.* Canberra: CDHAC, 2001.

Mathers C. Penm R. *Health System Costs of Injury, Poisoning, and Musculoskeletal Disorders in Australia 1993–94.* Canberra: AIHW, 1999.

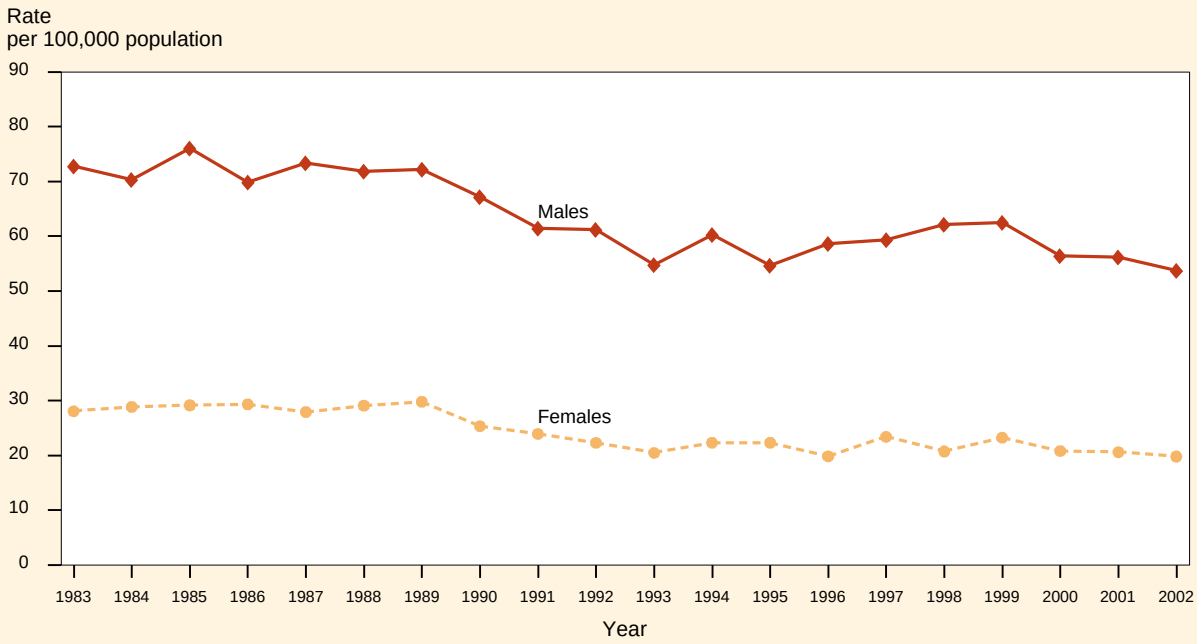
Moller J. *Patterns of Injury Costs NSW, 1995–96.* Adelaide: New Directions in Health and Safety, 2000.

National Injury Surveillance Unit website at www.nisu.flinders.edu.au.

Population Health Division. *The health of the people of New South Wales: Report of the Chief Health Officer 2002.* Sydney: NSW Department of Health, 2002. Available at www.health.nsw.gov.au/public-health/chorep.

World Health Organization. *Injury: A Leading Cause of the Global Burden of Disease.* Geneva: WHO, 1999.

Injury and poisoning deaths by sex,
NSW 1983 to 2002



			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	All ages	Persons	2155	2399	2278	2348	2527	2564	2690	2465	2504	2441
Rate per 100,000 population	All ages	Persons	37.1	40.6	37.9	38.6	40.8	40.7	42.1	37.9	37.8	36.2

Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In 2002, 2,411 people died in NSW due to injury and poisoning, giving a death rate of 36.2 per 100,000 people.
- In NSW between 1983 and 2002, the majority of deaths due to injury and poisoning were of males. The death rate for males during this period was 2–3 times the female rate.
- Death rates from injury and poisoning declined between 1983 and 2002. However, injury and poisoning remains a leading cause of death among people aged 1–44 years (IRMRC, 2004).
- The 4 most common causes of injury-related deaths during 1998 to 2002 were suicide (30%), motor vehicle crashes (22%), falls (9%), and poisoning (9%). These injury mechanisms accounted for almost 70% of injury-related deaths (IRMRC, 2004).
- Compared with other states in Australia, in 2002, NSW had the fourth highest age-adjusted death rate for injury and poisoning in males and the lowest death rate in females (AIHW, 2004).

For more information:

Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004. Available at www.aihw.gov.au/publications/index.cfm/title/10014.

Injury Prevention and Policy Unit website at www.health.nsw.gov.au/public-health/health-promotion/injury-prevention/index.html.

NSW Injury Risk Management Research Centre. *NSW Injury Profile.* Sydney: NSW IRMRC, 2001. Available at www.irmrc.unsw.edu.au.

NSW Child Death Review Team. *Annual Report 2003.* Sydney: NSW Commission for Children and Young People, 2004.

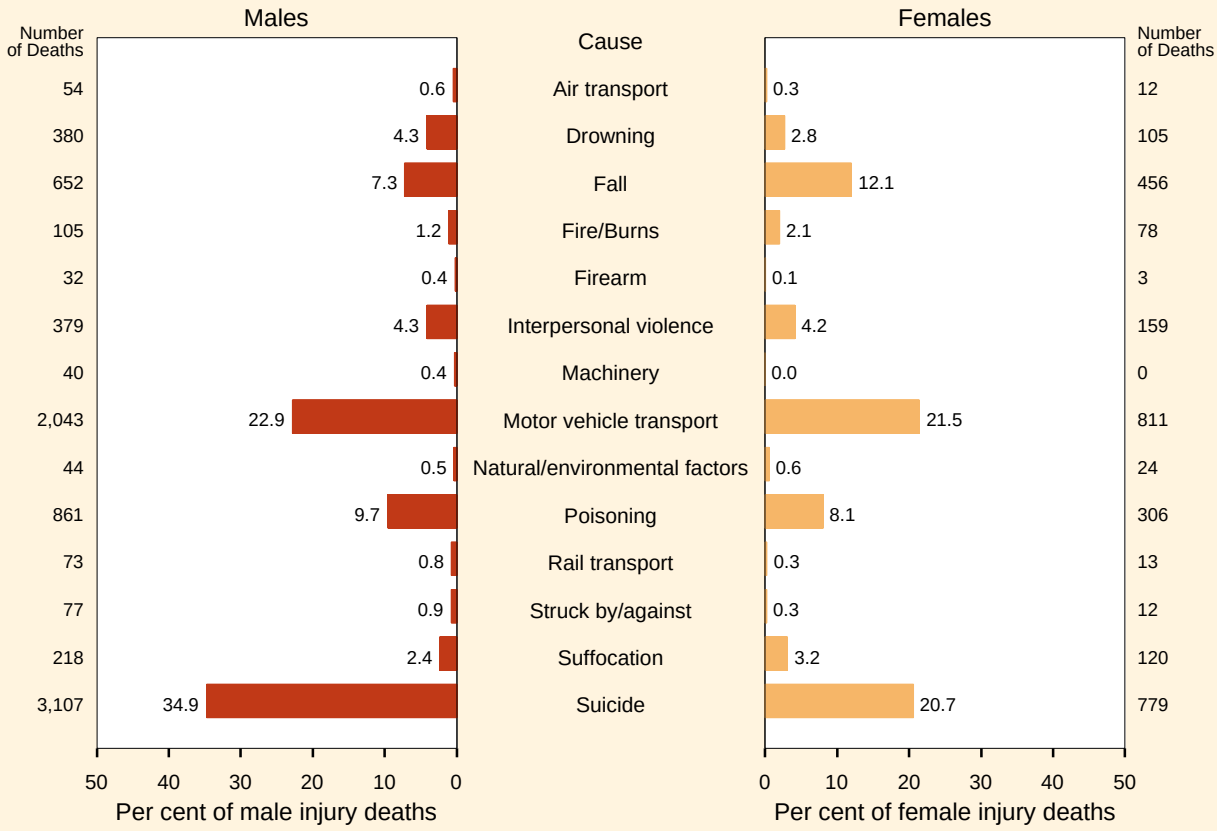
NSW Injury Risk Management Research Centre. *Injury costs! A validation of the burden of injury in NSW 1998–1999.* Sydney: NSW IRMRC, 2003.

NSW Injury Risk Management Research Centre. *NSW injury profile: A review of injury deaths for 1998–2002.* Sydney: NSW IRMRC, 2004.

Pointer S, Harrison J, Bradley C. *National Injury Prevention Plan Priorities for 2004 and beyond: Discussion paper.* Adelaide: AIHW, 2003.

Strategic Injury Prevention Partnership. *The Draft National Injury Prevention Plan: 2004 Onwards.* Canberra: SIPP, 2004.

Leading causes of injury and poisoning deaths in persons of all ages, by sex, NSW 1998 to 2002



Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In NSW in the period 1998–2002, the leading causes of death due to injury and poisoning for both males and females were suicide (30.7%) and motor vehicle crashes (22.5%), followed by other injury–poisoning (13.4%), poisoning (9.2%), and falls (8.7%).
- In the 0–14 year age group, motor vehicle crashes (36.2%), drowning (22%), and suffocation (10.9%), were the leading causes of injury death in both sexes. Motor vehicle crashes and suffocation contributed slightly higher proportions of injury deaths in females than in males in this age group.
- For the 15–44 year age group, suicide (39.2%), motor vehicle crashes (26.9%), and poisonings (14.5%), were the leading causes of injury death in both sexes. In the 45–64 year age group, suicide (39.9%) and motor vehicle crashes (22.0%) were the leading causes of injury death in both sexes.
- Suicides contributed a greater proportion of male injury deaths in both the 15–44 year and 45–64 year age groups.
- Among people aged 65 years and over, other injury–poisoning (36.8%), falls (20.7%), suicide (14.5%), and motor vehicles crashes (14.5%), were the most common causes of injury death. Suicide was responsible for 21.2% of male injury deaths in this age group, compared with only 7% of female deaths.

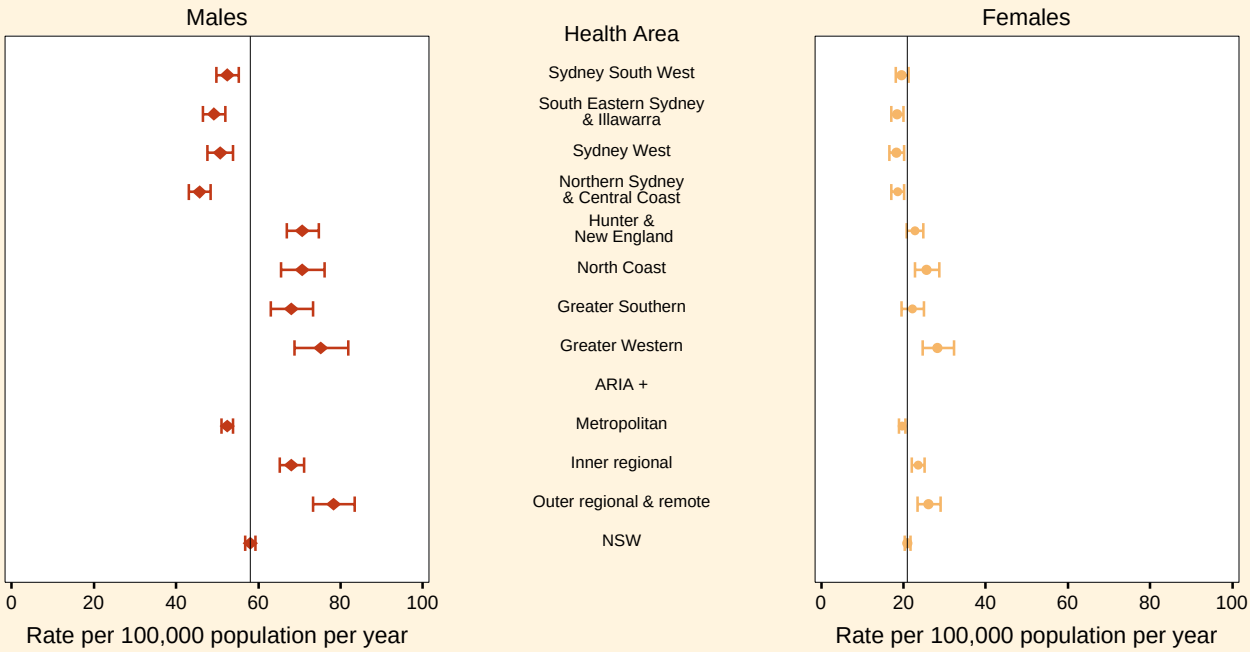
For more information:

Injury Prevention and Policy Unit website at www.health.nsw.gov.au/public-health/health-promotion/injury-prevention/index.html.

NSW Child Death Review Team. *Annual Report 2003.* Sydney: NSW Commission for Children and Young People, 2004.

NSW Injury Risk Management Research Centre. *NSW injury profile: A review of injury deaths for 1998–2002.* Sydney: NSW IRMRC, 2004. Available at www.irmrc.unsw.edu.au.

Injury and poisoning deaths by health area and sex, NSW 1998 to 2002



Health area		Deaths	Rate per 100,000 population	LL 95% CI	UL 95% CI
Sydney South West	Persons	2147	35.2	33.7	36.7
South Eastern Sydney & Illawarra	Persons	1945	33.0	31.6	34.5
Sydney West	Persons	1621	34.1	32.4	35.8
Northern Sydney & Central Coast	Persons	1820	31.4	30.0	32.9
Hunter & New England	Persons	1846	45.9	43.8	48.1
North Coast	Persons	1055	47.7	44.8	50.8
Greater Southern	Persons	977	44.4	41.7	47.3
Greater Western	Persons	757	51.4	47.8	55.2
Metropolitan	Persons	8219	35.3	34.5	36.0
Inner-regional	Persons	2953	45.1	43.5	46.8
Outer-regional and remote	Persons	1334	52.3	49.4	55.2
NSW	Persons	12622	38.8	38.1	39.5

Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. LL/UL 95%CI = Lower and upper limits of the 95% confidence interval for the point estimate. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In the period 1998–2002, death rates due to injury and poisoning in NSW varied by health area, particularly among males.
- For males, death rates per 100,000 ranged from 45.7 in the Northern Sydney & Central Coast Health Area to 75.5 in the Greater Western Health Area. For females, death rates per 100,000 ranged from 18.3 in the Sydney West Health Area to 28.5 in the Greater Western Health Area.
- Higher death rates for injury and poisoning were recorded in the outer-regional and remote and inner-regional areas than in metropolitan areas. Overall, death rates in regional and remote areas were around 1.3 times higher than in metropolitan areas.

For more information:

NSW Child Death Review Team. *Annual Report 2003.* Sydney: NSW Commission for Children and Young People, 2004.

NSW Injury Risk Management Research Centre. *Injury costs! A validation of the burden of injury in NSW 1998–1999.* Sydney: NSW IRMRC, 2003. Available at www.irmrc.unsw.edu.au.

Pointer S, Harrison J, Bradley C. *National Injury Prevention Plan Priorities for 2004 and beyond: Discussion paper.* Adelaide: AIHW, 2003.

Strategic Injury Prevention Partnership. *The Draft National Injury Prevention Plan: 2004 Onwards.* Canberra: SIPP, 2004.

Injury and poisoning hospital separations by sex, NSW 1989-90 to 2002-03

			93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	All ages	Persons	108529	107350	117914	117079	121713	143271	146745	151262	158808	154453
Rate per 100,000 population	All ages	Persons	1811.9	1773.5	1923.7	1885.2	1936.9	2257.2	2276.8	2306.3	2380.7	2284.2

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD–10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Records relating to acute hospital transfer and statistical discharge were excluded. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In 2002–03 there were almost 154,453 hospitalisations of NSW residents following injury or poisoning, giving a hospitalisation rate of around 2,284 per 100,000 people.
- During 1989–90 to 2002–03, the overall hospitalisation rate for injury and poisoning in NSW rose gradually, with a slight decrease during 2001–02 to 2002–03. The hospitalisation rate for males during this period was around 1.5–2 times the female rate.
- People aged 65 years and older were at the greatest risk of being hospitalised as a result of an injury from 1995–1999, and the risk of injury increased with age (IRMRC, 2002).
- Nationally, during 1999–00 there were 413,647 injury-related hospitalisations, giving an age-adjusted hospitalisation rate of 2,559 per 100,000. This was higher than the NSW all-injury hospitalisation rate (Helps et al., 2002).

For more information:

NSW Injury Risk Management Research Centre. *2001 NSW Injury Profile.* Sydney: NSW IRMRC, 2000. Available at www.irmrc.unsw.edu.au.

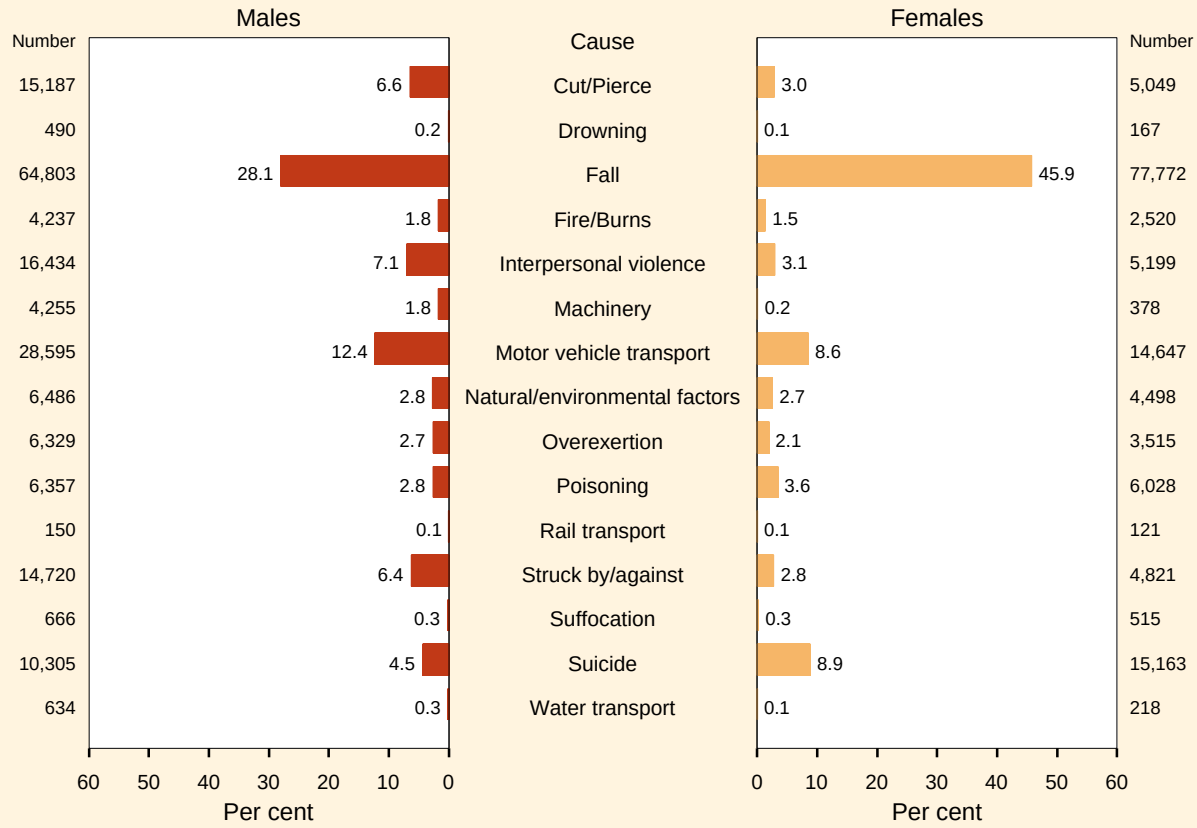
Helps Y, Cripps R, Harrison J. *Hospital separations due to injury and poisoning Australia 1999–00.* Injury Research and Statistics Series no. 15. Adelaide: AIHW, 2002.

NSW Injury Risk Management Research Centre. *Injury costs! A validation of the burden of injury in NSW 1998–1999.* Sydney: NSW IRMRC, 2003. Available at www.irmrc.unsw.edu.au.

Pointer S, Harrison J, Bradley C. *National Injury Prevention Plan Priorities for 2004 and beyond: Discussion paper.* Adelaide: AIHW, 2003.

Strategic Injury Prevention Partnership. *The Draft National Injury Prevention Plan: 2004 Onwards.* Canberra: SIPP, 2004.

Leading causes of injury and poisoning hospital separations in persons of all ages, by sex, NSW 2000-01 to 2002-03



Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD–10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Records relating to acute hospital transfer and statistical discharge were excluded. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- During the period 1998–99 to 2002–03, the most common causes of injury-related hospitalisations for both males and females of all ages were falls (35.4%), other injury–poisoning (20.1%), motor vehicle crashes (10.8%), and suicide (6.2%).
- Over all ages, fall injury contributed a greater proportion of injury-related hospitalisations among females (45.5%) than males (28.0%). Motor vehicle crashes, interpersonal violence, cut–piercing injuries, and struck by–against injuries, caused greater proportions of hospitalisations among males than females.
- In the 0–14 year age group, falls (40.2%) and other injury–poisoning (21.7%), were the leading causes of hospitalisations, with roughly equal distribution of these types of injuries between males and females.
- For the 15–44 year age group, injury–poisonings (21.3%), motor vehicle crashes (15.5%), falls (15.5%), and suicide (11.1%), were the most common causes of hospitalisation. In the 45–64 year age group, falls (30.4%), and other injury–poisoning (24.8%), were most common causes of hospitalisation, followed by motor vehicle crashes (11.3%) and suicide (6.2%).
- In people aged 65 plus, falls (70.4%) and other injury–poisoning (13.6%) were the most common causes of hospitalisations. In this age group, falls contributed a greater proportion of hospitalisations among females (75.2%) than males (61.4%).

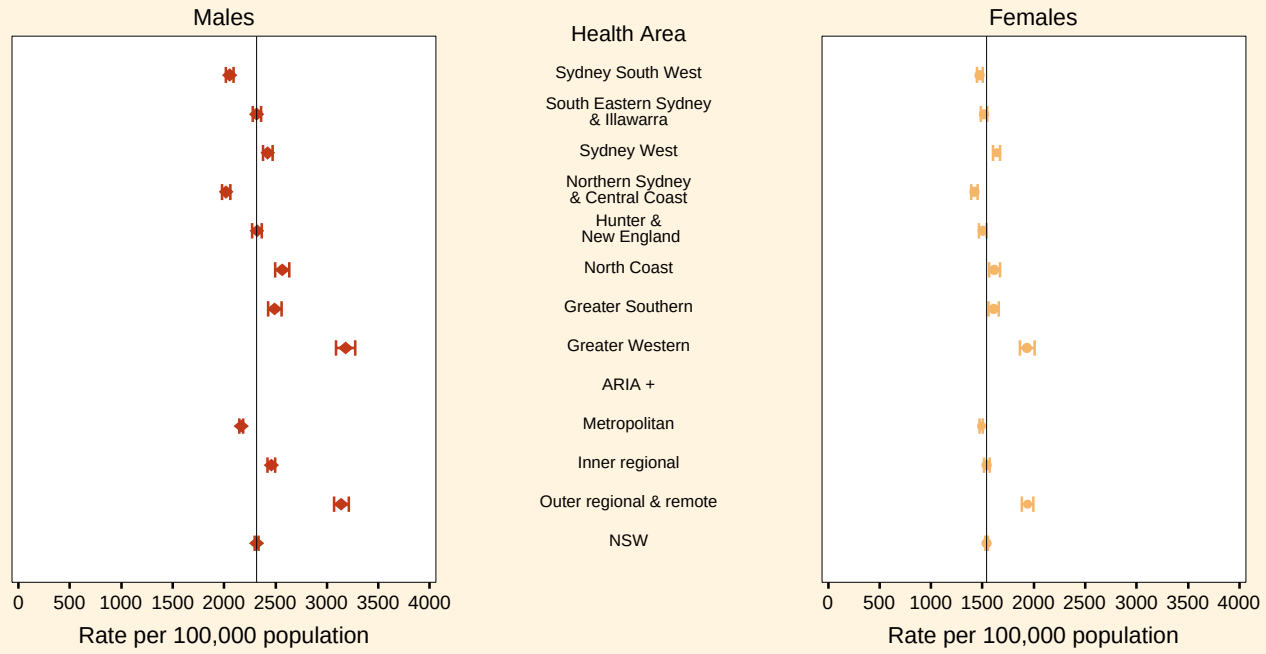
For more information:

NSW Injury Risk Management Research Centre. *2001 NSW Injury Profile.* Sydney: NSW IRMRC, 2000. Available at www.irmrc.unsw.edu.au.

Helps Y, Cripps R, Harrison J. *Hospital separations due to injury and poisoning Australia 1999–00. Injury Research and Statistics Series no. 15.* Adelaide: AIHW, 2002.

NSW Injury Risk Management Research Centre. *Injury costs! A validation of the burden of injury in NSW 1998–1999.* Sydney: NSW IRMRC, 2003. Available at www.irmrc.unsw.edu.au.

Injury and poisoning hospital separations by health area and sex, NSW 2002-03



Health area		Hospitalisations	Rate per 100,000 population	LL 95% CI	UL 95% CI
Sydney South West	Persons	22570	1782.1	1758.8	1805.7
South Eastern Sydney & Illawarra	Persons	22836	1936.4	1911.2	1961.8
Sydney West	Persons	20916	2052.1	2024.0	2080.5
Northern Sydney & Central Coast	Persons	20138	1735.1	1711.0	1759.6
Hunter & New England	Persons	16024	1921.6	1891.7	1951.9
North Coast	Persons	9678	2095.4	2052.3	2139.2
Greater Southern	Persons	9549	2075.1	2033.3	2117.5
Greater Western	Persons	7819	2588.4	2530.9	2646.8
Metropolitan	Persons	88558	1843.8	1831.7	1856.0
Inner-regional	Persons	27693	2016.4	1992.4	2040.6
Outer-regional and remote	Persons	13314	2568.2	2523.8	2613.2
NSW	Persons	130894	1944.4	1933.9	1955.0

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. LL/UL 95%CI = Lower and upper limits of the 95% confidence interval of the point estimate. Records relating to acute hospital transfer and statistical discharge were excluded. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In the financial year 2002–03, hospitalisation rates per 100,000 for injury and poisoning for males ranged from 2,020 in the Northern Sydney & Central Coast Health Area to 3,181 in the Greater Western Health Area. For females, hospitalisation rates per 100,000 ranged from 1,424 in the Northern Sydney & Central Coast Health Area to 1,935 in the Greater Western Health Area.
- Higher hospitalisation rates for injury and poisoning were recorded in outer-regional and remote and inner-regional areas than in metropolitan areas. Overall, death rates in regional and remote areas were around 1.2 times higher than in metropolitan areas.

For more information:

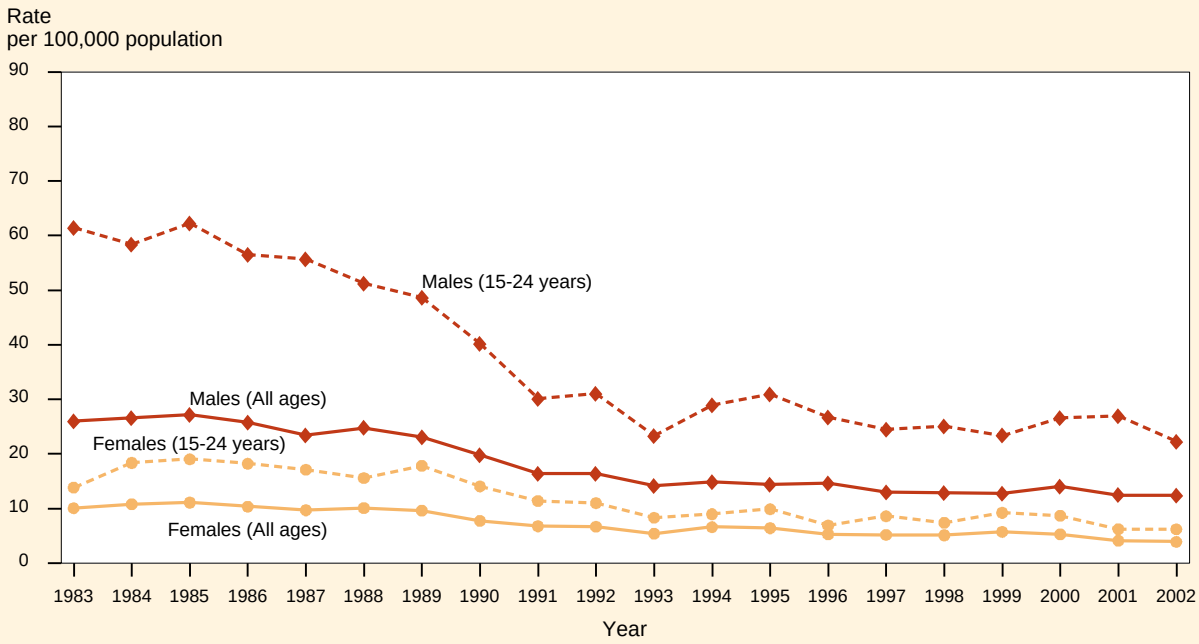
NSW Department of Health Area Health Service Health Status Profiles at www.health.nsw.gov.au/pubs/p/pdf/popindicators_iga_2001.pdf.

Australian Bureau of Statistics website at www.abs.gov.au.

Helps Y, Cripps R, Harrison J. *Hospital separations due to injury and poisoning Australia 1999–00. Injury Research and Statistics Series no. 15.* Adelaide: AIHW, 2002.

Strategic Injury Prevention Partnership. *The Draft National Injury Prevention Plan: 2004 Onwards.* Canberra: SIPP, 2004.

Motor vehicle crash deaths by sex, persons of all ages and 15-24 years, NSW 1983 to 2002



			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	15–24 years	Persons	144	172	185	152	146	143	142	155	148	128
	All ages	Persons	583	639	634	608	563	563	584	621	545	541
Rate per	15–24 years	Persons	16.0	19.2	20.7	17.0	16.7	16.4	16.4	17.9	16.8	14.4
100,000 population	All ages	Persons	9.7	10.6	10.3	9.8	9.0	8.9	9.1	9.6	8.3	8.1

Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In 2002, 541 people died in NSW due to an incident involving a motor vehicle, giving a death rate of 8.1 per 100,000 NSW residents. The majority of deaths involving a motor vehicle were of males, with the male death rate being 2–3 times higher than the female death rate.
- Overall, the death rate from motor vehicle crash injuries in NSW dropped by more than half in the 20 years between 1983 and 2002. However, motor vehicle crashes still cause about 23% of all injury-related deaths. The new ICD-10 coding system for causes of death was introduced in 1998, and this might influence the apparent increases in the death rate from motor vehicle crashes in 1999 and 2000.
- The NSW Roads and Traffic Authority identified that the 2003 road toll was the second lowest in NSW since 1949 (NSW RTA, 2003).
- In 2002, NSW had the fifth highest death rate from motor vehicle crash injuries of all Australian states. Although the NSW rate (8.5 per 100,000) was less than the overall Australian rate (8.7 per 100,000), the rate of motor vehicle crash deaths per 100 million vehicle kilometres travelled in NSW (0.92) was higher than the overall Australian rate (0.89) (ATSB, 2003).

For more information:

Australian Transport Safety Bureau at www.atsb.gov.au.

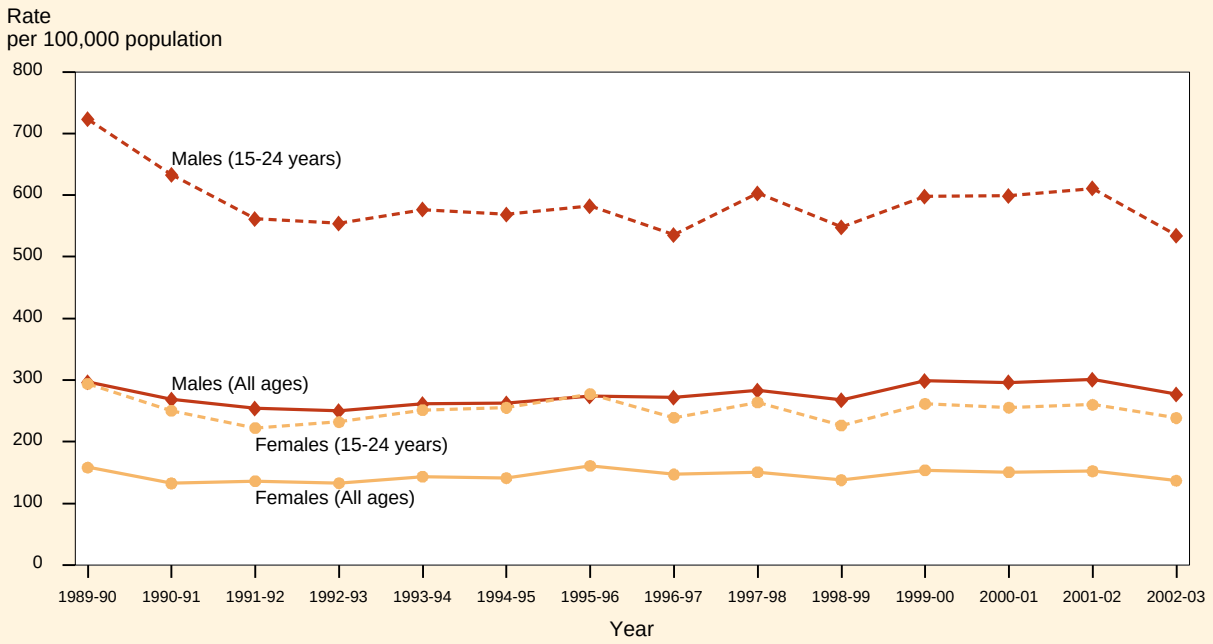
NSW Roads and Traffic Authority. *Road traffic accidents in NSW: 2003.* Sydney: NSW RTA, 2003. Available at www.rta.nsw.gov.au/roadsafety/downloads/accidentstats2003.pdf.

NSW Injury Risk Management Research Centre. *2001 NSW Injury Profile.* Sydney: NSW IRMRC, 2000. Available at www.irmrc.unsw.edu.au.

Australian Transport Safety Bureau. *Road Fatalities Australia 2002 Statistical Summary.* Canberra: ATSB, 2003.

NSW Injury Risk Management Research Centre. *NSW injury profile: A review of injury deaths for 1998–2002.* Sydney: NSW IRMRC, 2004.

Motor vehicle crash injury hospital separations by sex, persons of all ages and 15-24 years, NSW 1989-90 to 2002-03



			93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	15–24 years	Persons	3770	3725	3854	3429	3790	3372	3744	3764	3883	3499
	All ages	Persons	12374	12430	13526	13148	13720	12956	14607	14567	14939	13741
Rate per	15–24 years	Persons	417.2	415.1	432.6	390.0	436.4	390.7	433.3	430.6	439.3	389.9
100,000 population	All ages	Persons	202.4	201.8	217.5	209.5	216.8	203.3	226.9	223.7	226.8	206.9

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Records relating to acute hospital transfer and statistical discharge were excluded. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In the financial year 2002–03, there were 13,741 hospitalisations of NSW residents who were injured in an incident involving a motor vehicle, giving a hospitalisation rate of 207 per 100,000.
- The rate of hospitalisation for these injuries among males aged 15–24 years was nearly twice that for males overall, while the hospitalisation rate for females aged 15–24 years was 1.7 times the all-ages rate. People aged 15–24 years accounted for more than one-quarter of all those hospitalised for motor vehicle accident injuries.
- The NSW Roads and Traffic Authority identified that there were around 27,208 injuries overall from motor vehicle incidents in NSW in 2003 (RTA, 2003).
- Overall, the rate of hospitalisation for motor vehicle crash injuries declined slightly among both sexes from 1989–90 to 1997–98. Larger declines were seen in the 15–24 years age group. The introduction of the ICD-10-AM coding system for causes of hospitalisation in 1998–99 saw an apparent drop in hospitalisation rates for motor vehicle accident injuries compared with the previous year, but rates increased slightly again in 1999–00. The period 2000–01 to 2002–03 has seen the rates begin to decline.
- Drivers of vehicles were the people most often hospitalised as a result of an injury sustained in a motor vehicle incident during 1995 to 1999, comprising almost one-third (29%) of those hospitalised. The remainder comprised other vehicle occupants (18%), motorcyclists (18%), pedestrians (12%), pedal cyclists (2%) and other and unspecified people (21%) (IRMRC, 2001).

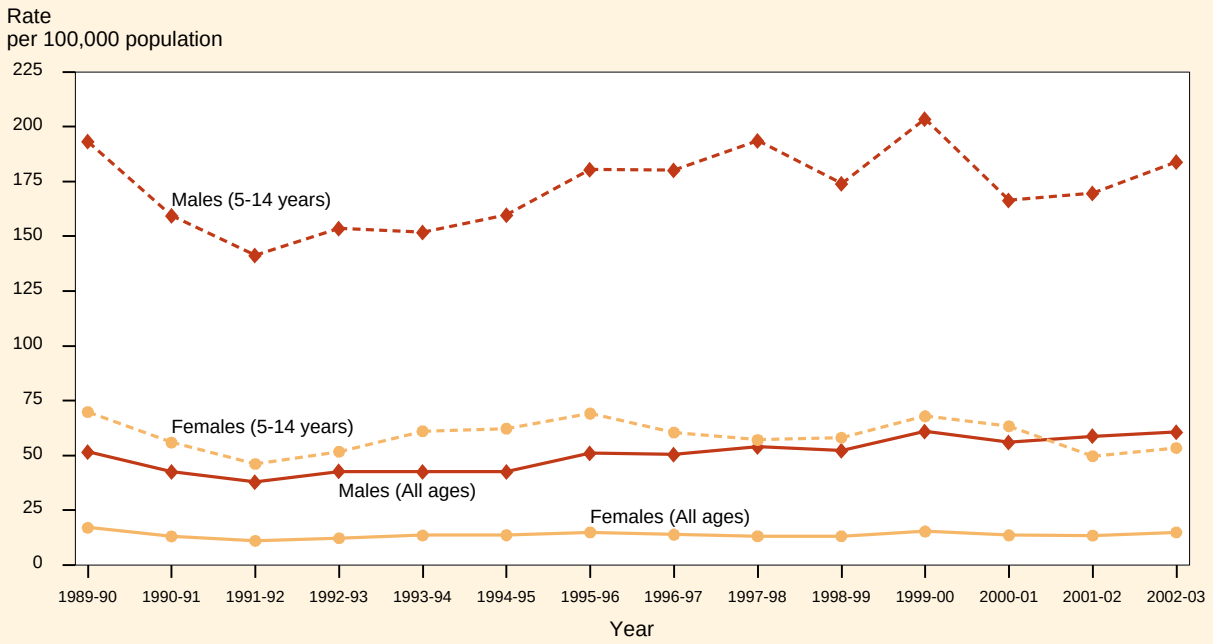
For more information:

Australian Transport Safety Bureau at www.atsb.gov.au.

NSW Roads and Traffic Authority. *Road traffic accidents in NSW: 2003.* Sydney: NSW RTA, 2001. Available at www.rta.nsw.gov.au/roadsafety/downloads/accidentstats2003.pdf.

NSW Injury Risk Management Risk Centre. *2001 NSW Injury Profile.* Sydney: NSW IRMRC, 2000. Available at www.irmrc.unsw.edu.au.

Pedal cycle injury hospital separations by sex, persons of all ages and 5-14 years, NSW 1989-90 to 2002-03



			93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	5–14 years	Persons	917	964	1094	1065	1118	1043	1229	1048	1009	1092
	All ages	Persons	1747	1748	2084	2043	2146	2102	2473	2275	2380	2493
Rate per 100,000 population	5–14 years	Persons	107.7	112.2	126.1	121.7	127.0	117.4	137.4	116.1	111.2	120.4
	All ages	Persons	28.3	28.3	33.3	32.5	33.9	33.0	38.5	35.1	36.4	38.0

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Records relating to acute hospital transfer and statistical discharge were excluded. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In the financial year 2002–03, there were 2,493 hospital admissions in NSW of people who received an injury while pedal cycling, giving a hospitalisation rate of 38.0 per 100,000. Around 40% of these hospitalisations were of people aged 5–14 years.
- The rate of hospitalisation for pedal cycle injuries among males aged 5–14 years was 184.1 per 100,000, more than 3.5 times the female rate in the same age group.
- Overall, the rate of hospitalisations for injuries to pedal cyclists declined between 1989–90 and 1994–95, but has continued to increase gradually since then. The level of bicycle ownership and use appears not to have changed substantially since 1988 (Katz, 1998).
- The NSW Roads and Traffic Authority (RTA) identified that there were 9 deaths and around 1,000 injuries of pedal cyclists on NSW roads in 2003 (RTA, 2003). This number of injuries appears to be a considerable underestimate, given that more than 2,000 hospital separations for pedal cycle injuries have been recorded in each of the 5 most recent financial year periods.
- The RTA has released an action plan for motorcyclist and bicyclist safety, as part of the Road Safety 2010 strategy (RTA, 2002).

For more information:

Australian Transport Safety Bureau at www.atsb.gov.au.

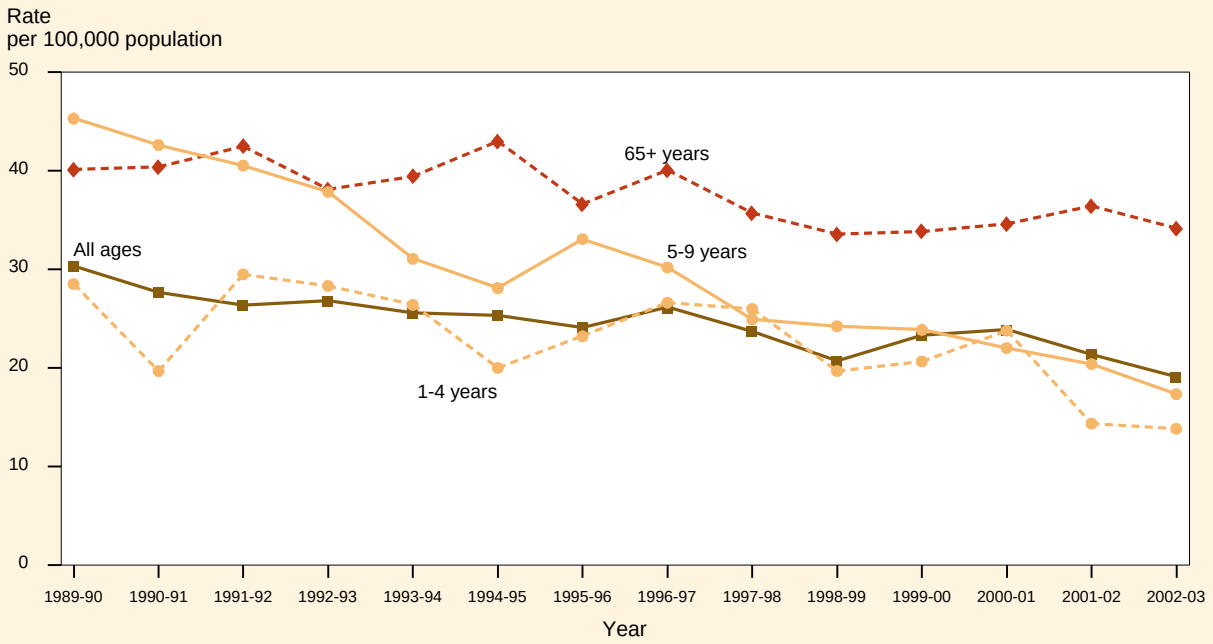
NSW Injury Risk Management Risk Centre. *2001 NSW Injury Profile.* Sydney: NSW IRMRC, 2000. Available at www.irmrc.unsw.edu.au.

Katz R. *Bikeplan 2010. The state of cycling: A review of data and research.* Sydney: RTA, 1998.

NSW Roads and Traffic Authority. *Road traffic accidents in NSW: 2003.* Sydney: NSW RTA, 2003. Available at www.rta.nsw.gov.au/roadsafety/downloads/accidentstats2003.pdf.

NSW Roads and Traffic Authority. *Motorcyclist and bicyclist safety action plan 2002–2004.* Sydney: NSW RTA, 2002.

Pedestrian injury hospital separations, persons of all ages, aged 1-4 years, 5-9 years and 65 years and over, NSW 1989-90 to 2002-03



			93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	1–4 years	Persons	116	88	102	117	114	86	90	104	62	59
	5–9 years	Persons	133	121	144	133	111	109	108	100	92	78
	65+ years	Persons	280	318	276	308	282	272	281	293	316	304
	All ages	Persons	1540	1542	1488	1628	1494	1318	1505	1560	1417	1282
Rate per 100,000 population	1–4 years	Persons	26.4	20.0	23.2	26.6	26.0	19.7	20.7	23.8	14.3	13.8
	5–9 years	Persons	31.1	28.1	33.1	30.2	24.9	24.2	23.9	22.0	20.4	17.3
	65+ years	Persons	39.4	42.9	36.6	40.0	35.7	33.6	33.8	34.6	36.4	34.1
	All ages	Persons	25.6	25.3	24.1	26.1	23.7	20.7	23.3	23.9	21.4	19.1

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Records relating to acute hospital transfer and statistical discharge were excluded. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In the financial year 2002–03, there were 1,282 hospital admissions in NSW of people who received an injury while involved as a pedestrian in a road traffic crash, giving a hospitalisation rate of 19.1 per 100,000. Children aged 1–9 years accounted for 10.7% and people aged 65 years or older accounted for 23.7% of pedestrian injury hospitalisations.
- In that year, the rate of hospitalisation for pedestrian injuries among people aged 65 years or older (34.1 per 100,000) was higher than that for all ages.
- The overall rate of pedestrian injury hospitalisations has declined gradually since 1989–90. The introduction of ICD-10-AM in 1998–99 saw a drop in the rate, presumably due to differences between ICD-10-AM and the previous ICD-9-CM coding system.
- The NSW Roads and Traffic Authority (RTA) identified that there were 94 deaths and around 2,490 injuries of pedestrians in NSW in 2003 (RTA, 2003).
- The RTA has released an action plan for pedestrian safety, as part of the Road Safety 2010 strategy (RTA, 2002).

For more information:

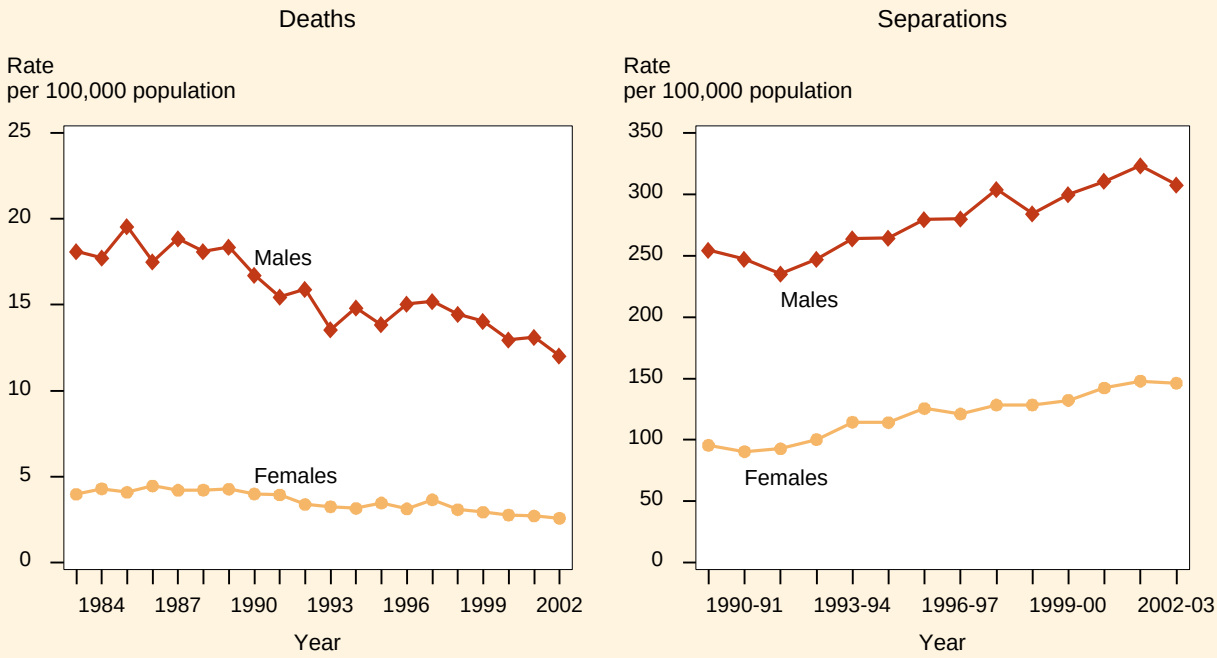
Australian Transport Safety Bureau at www.atsb.gov.au.

NSW Roads and Traffic Authority. *Pedestrian safety action plan 2002–2004.* Sydney: NSW RTA, 2002. Available at www.rta.nsw.gov.au/trafficinformation/downloads/pedestriansafety.pdf.

NSW Roads and Traffic Authority. *Road traffic accidents in NSW: 2003.* Sydney: NSW RTA, 2003. Available at www.rta.nsw.gov.au/roadsafety/downloads/accidentstats2003.pdf.

NSW Injury Risk Management Risk Centre. *2001 NSW Injury Profile.* Sydney: NSW IRMRC, 2000. Available at www.irmrc.unsw.edu.au.

Alcohol attributed injury deaths and hospital separations by age and sex, NSW 1983 to 2002



			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	Deaths	Persons	490	530	520	551	577	543	533	503	513	480
	Separations	Persons	11321	11462	12382	12392	13478	12973	13747	14613	15427	15056
Rate per	Deaths	Persons	8.3	8.8	8.5	8.9	9.2	8.6	8.3	7.8	7.8	7.2
100,000 population	Separations	Persons	187.4	187.7	200.7	198.7	214.1	204.1	213.6	223.8	232.8	224.4

Note: Deaths and hospital separations attributable to alcohol were calculated using age- and sex-specific aetiologic fractions from AIHW, 2001. Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Deaths are for calendar years. Separations are for financial years. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: Australian Institute of Health and Welfare (aetiologic fractions), 2001. NSW Department of Health Inpatient Statistics Collection (ISC) data and ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Alcohol slows down functioning of the brain, causing loss of balance, reduced ability to judge speed and distance, impaired decision-making, and increased aggression. Alcohol use is associated with injuries including motor vehicle and motorcycle crashes, falls, interpersonal violence, and water-related injury (Pointer et al., 2003). The data presented here were derived by applying aetiologic fractions (the probability that a particular injury was caused by alcohol consumption) to death and hospital morbidity data for NSW. More information on alcohol-related motor vehicle crashes is given in the Health Related Behaviours chapter.
- There has been a steady decline in the rate of deaths attributed to alcohol in NSW from 1983 to 2002. In 2002, there were 480 deaths attributed to alcohol, with 81.3% of these in males. The rate of alcohol-related injury death in males was around 4 times higher than the female rate.
- There has been a steady increase in injury-related hospitalisations attributed to alcohol in NSW over the period 1999–00 to 2002–03. In 2002–03, there were 15,056 alcohol-related injury hospitalisations. The rate of alcohol-related injury hospitalisations was 224.4 per 100,000, with males averaging a rate of hospitalisation 2.1 times greater than females.

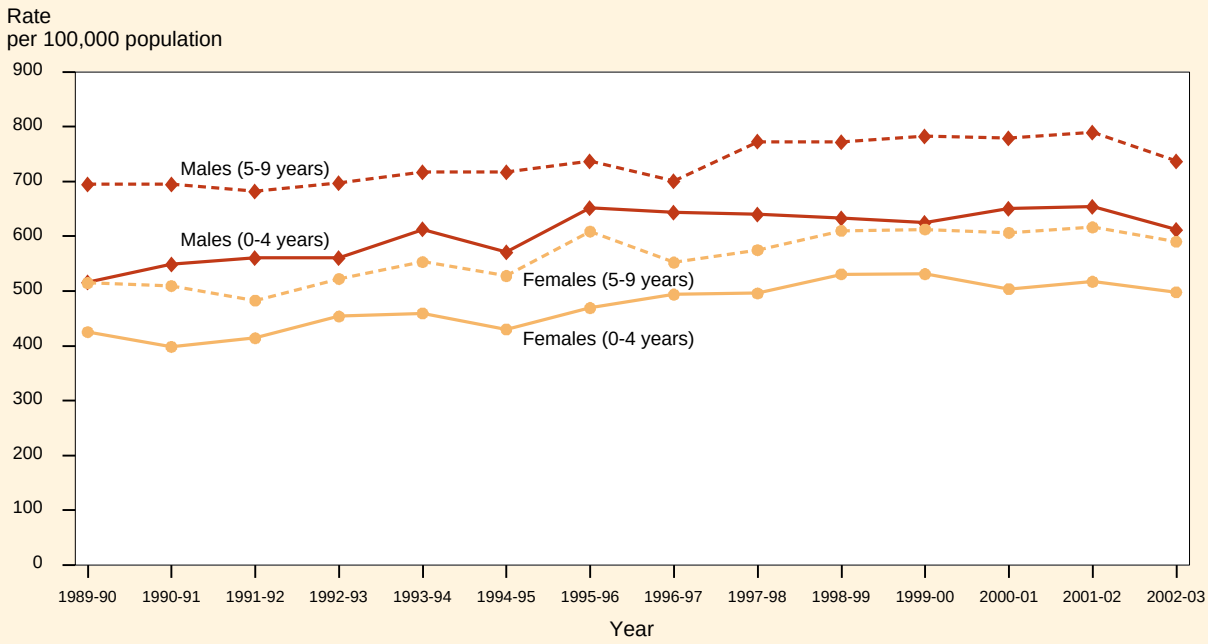
For more information:

Ridolfo B, Stevenson C. *The quantification of drug-caused mortality and morbidity in Australia, 1998.* Canberra: Australian Institute of Health and Welfare, 2001. Available at www.aihw.gov.au.

Driscoll T, Steenkamp M, Harrison J. *Alcohol and water safety.* Canberra: Commonwealth of Australia, 2003.

Pointer S, Harrison J, Bradley C. *National Injury Prevention Plan Priorities for 2004 and beyond: Discussion paper.* Adelaide: AIHW, 2003.

Fall-related injury hospital separations by sex, children aged 0-4 and 5-9 years, NSW 1989-90 to 2002-03



			93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	0–4 years	Persons	2365	2213	2474	2509	2503	2548	2522	2532	2556	2396
	5–9 years	Persons	2728	2691	2936	2770	3013	3119	3169	3156	3195	2982
Rate per	0–4 years	Persons	538.0	502.4	562.8	570.4	570.0	583.0	579.0	578.9	587.2	556.5
100,000 population	5–9 years	Persons	637.1	624.5	674.1	628.4	676.1	693.3	700.0	695.1	705.4	665.6

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Records relating to acute hospital transfer and statistical discharge were excluded. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In the financial year 2002–03, there were 5,378 hospitalisations in NSW of children aged 9 years or less following a fall, giving a hospitalisation rate of 556.5 per 100,000 for 0–4 year olds and 665.6 per 100,000 for 5–9 year olds.
- Between 1989–90 and 2001–02, the hospitalisation rate for fall-related injuries in both 0–4 and 5–9 year olds increased gradually, but decreased slightly in 2002–03. The hospitalisation rate for males in these age groups was around 1.2 times that for females.
- The NSW fall-related injury hospitalisation rates for both 0–4 year olds and 5–9 year olds were less than the national rates (593.0 and 781.8 per 100,000, respectively) (Helps et al., 2002). Australia-wide in 1997–98, the most common locations of falls resulting in injury among children aged 0–4 years were the home (49.9%), 'other' locations (38.3%), public buildings (5.2%), and places of recreation or sport (4.8%). For children aged 5–9 years the most frequent locations were 'other' locations (48.2%), the home (21.9%), places of recreation–sport (14.7%), and public buildings (13.6%) (Steenkamp and Cripps, 2001).
- The NSW Department of Health contributed to the development of the National Injury Prevention Plan 2004 onwards. One of the key objectives of the plan is to decrease the incidence, severity, mortality, and morbidity associated with falls in children aged 0–14 years.

For more information:

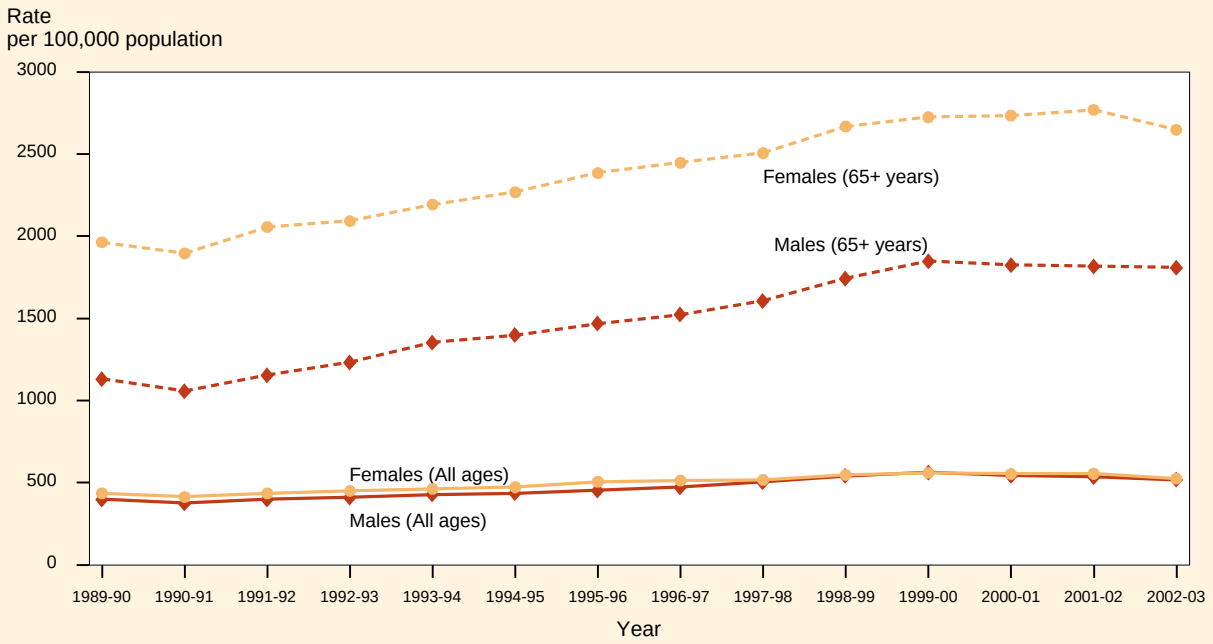
Commonwealth Department of Health and Aged Care. *National Injury Prevention Plan: Priorities for 2001–2003.* Canberra: CDHAC, 2001.

Steenkamp M, Cripps R. *Child Injuries Due to Falls.* Injury Research and Statistics Series. Adelaide: AIHW, 2001.

Helps Y, Cripps R, Harrison J. *Hospital separations due to injury and poisoning Australia 1999–00. Injury Research and Statistics Series no. 15.* Adelaide: AIHW, 2002.

Strategic Injury Prevention Partnership. *The Draft National Injury Prevention Plan: 2004 Onwards.* Canberra: SIPP, 2004.

Fall-related injury hospital separations by sex, persons of all ages and 65 years and over, NSW 1989-90 to 2002-03



			93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	65+ years	Persons	12575	13373	14507	15452	16508	18184	19402	20020	20929	20835
	All ages	Persons	26001	27019	29148	30614	32442	35267	37095	37228	38015	36976
Rate per	65+ years	Persons	1878.4	1938.4	2033.4	2092.4	2165.4	2311.4	2388.0	2378.2	2399.3	2315.5
100,000 population	All ages	Persons	460.3	469.3	495.2	507.8	526.1	559.5	575.6	563.2	560.9	534.3

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Records relating to acute hospital transfer, statistical discharge, and same day stays were excluded. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Falls were the leading cause of hospitalisations due to injury in NSW between 1998–99 and 2002–03, accounting for about 35% of all hospitalisations. In 2002–03, there were 36,976 hospitalisations of NSW residents following a fall, giving a hospitalisation rate of 534 per 100,000 people.
- More than half of those hospitalised following a fall (56.3%) were aged 65 years or more. The hospitalisation rate for fall-related injuries among females aged 65 years or older was almost 1.5 times that for males of the same age.
- In NSW, no other single cause of injury, including road trauma, costs the health system more than fall-related injury. The total lifetime cost of falls in 1998–99 in NSW was estimated at $644 million (IRMRC, 2003). This figure includes direct costs to the health system of $333 million and mortality and morbidity costs of $311 million.
- The NSW Department of Health has released a management policy to reduce fall-related injury among older people. A Rural Falls Injury Prevention Program and a metropolitan-based falls prevention program, 'Make a Move', operate in NSW. These programs aim to coordinate best practice health promotion for the prevention of falls in older people, with a primary focus on increasing the access of older people to fall-safe activities designed to improve muscle strength, flexibility, balance, and fitness.

For more information:

NSW Fall Injury Indicators at www.health.nsw.gov.au/public-health/health-promotion/injury-prevention/types-of-injury/fall-indicators.html.

Moller J. *Projected costs of fall related injury to older persons due to demographic change in Australia.* Canberra: Commonwealth of Australia, 2003.

NSW Department of Health. *Management policy to reduce fall injury among older people.* Sydney: NSW Department of Health, 2003. Available at www.health.nsw.gov.au/pubs/m/pdf/fallsinjury.pdf.

NSW Injury Risk Management Research Centre. *Injury costs! A validation of the burden of injury in NSW 1998–1999.* Sydney: NSW IRMRC, 2003.

Fall-related injury hospital separations in persons aged 65 years and over by health area and sex, NSW 2002-03

Health area		Hospitalisations	Rate per 100,000 population	LL 95% CI	UL 95% CI
Sydney South West	Persons	3484	2534.4	2450.9	2620.0
South Eastern Sydney & Illawarra	Persons	3705	2220.6	2149.6	2293.4
Sydney West	Persons	2415	2496.8	2398.1	2598.6
Northern Sydney & Central Coast	Persons	4268	2348.1	2277.6	2420.2
Hunter & New England	Persons	2590	2056.1	1977.6	2136.8
North Coast	Persons	1703	2038.9	1943.2	2138.2
Greater Southern	Persons	1519	2287.1	2173.5	2405.1
Greater Western	Persons	1103	2610.8	2458.9	2769.6
Metropolitan	Persons	14399	2348.7	2310.4	2387.4
Inner regional	Persons	4437	2160.4	2097.3	2225.0
Outer regional and remote	Persons	1956	2393.4	2288.4	2501.9
NSW	Persons	20835	2315.5	2284.1	2347.2

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Records relating to acute hospital transfer, statistical discharge and same day stays were excluded. LL/UL 95%CI = Lower and upper limits of the 95% confidence interval for the point estimate. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In NSW in 2002–03, hospitalisation rates due to falls in people aged 65 and over varied by health area. For males, hospitalisation rates per 100,000 ranged from 1,589 in the North Coast Health Area to 1,975 in the Greater Western Health Area. For females aged 65 years and over, hospitalisation rates per 100,000 ranged from 2,251 in the Hunter & New England Health Area to 3,060 in the Greater Western Health Area. Higher hospitalisation rates were recorded in outer-regional and remote areas than in metropolitan or inner-regional areas.
- The NSW Department of Health has released a management policy to reduce fall-related injury among older people that aims to establish a long-term coordinated approach to falls prevention.

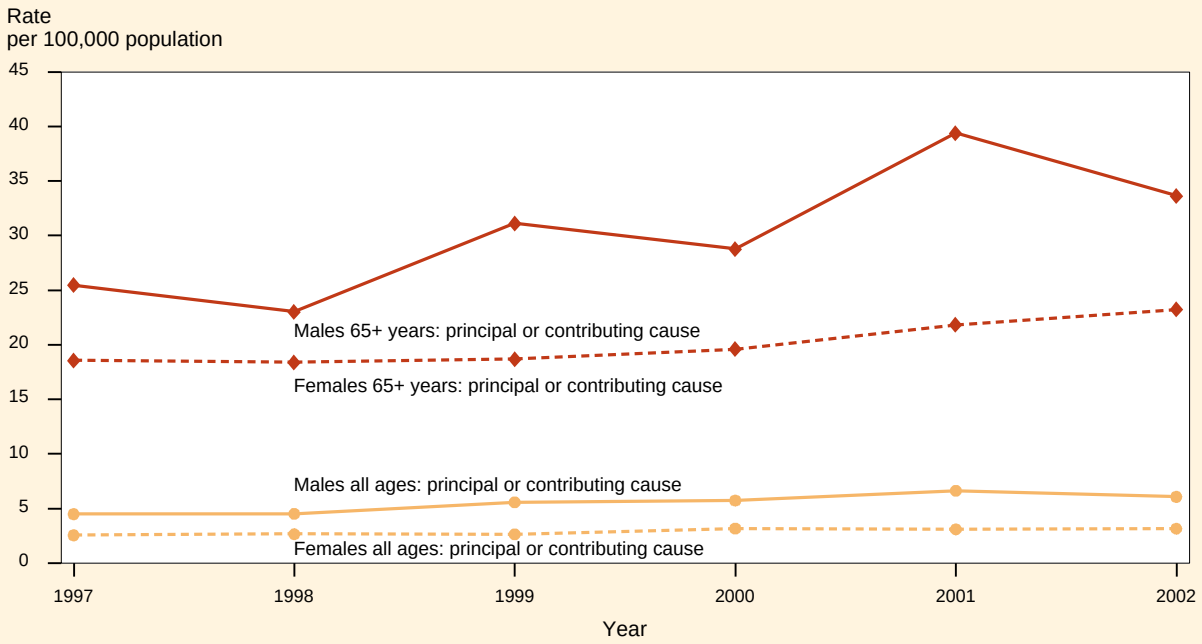
For more information:

Helps Y, Cripps R, Harrison J. *Hospital separations due to injury and poisoning Australia 1999–00. Injury Research and Statistics Series no. 15.* Adelaide: AIHW, 2002.

NSW Department of Health. *Management policy to reduce fall injury among older people.* Sydney: NSW Department of Health, 2003. Available at www.health.nsw.gov.au/pubs/m/pdf/fallsinjury.pdf.

Strategic Injury Prevention Partnership. *The Draft National Injury Prevention Plan: 2004 Onwards.* Canberra: SIPP, 2004.

Falls as principal or contributing cause of death by sex, persons of all ages and 65 years and over, NSW 1997 to 2002



			1997	1998	1999	2000	2001	2002
Number	Persons: principal cause	65+ years	123	127	147	147	191	176
		All ages	166	185	204	230	250	240
	Persons: contributing cause	65+ years	35	29	40	42	53	68
		All ages	39	33	46	51	62	75
	Persons: principal or contributing cause	65+ years	158	156	187	189	244	244
		All ages	205	218	250	281	312	314
Rate per 100,000 population	Persons: principal cause	65+ years	16.6	16.4	18.5	17.8	22.3	19.8
		All ages	2.8	3.0	3.2	3.5	3.7	3.4
	Persons: contributing cause	65+ years	4.8	3.8	5.1	5.1	6.2	7.6
		All ages	0.7	0.5	0.7	0.8	0.9	1.1
	Persons: principal or contributing cause	65+ years	21.3	20.2	23.5	23.0	28.5	27.4
		All ages	3.5	3.5	3.9	4.3	4.6	4.5

Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In 2002, 314 people died in NSW with falls as a principal or contributing cause of death, giving a death rate of 4.5 per 100,000 residents. In the period 1998–2002, fall-related deaths accounted for 8.7% of all-injury related deaths in NSW (see 'Leading causes of injury deaths' in this chapter).
- Overall, the rate of fall-related deaths in NSW has been increasing, particularly for males, in the period 1997–2001. However, there was a slight decrease in fall-related deaths for both sexes in 2002.
- Just over half (55.4%) of the fall-related deaths in 2002 were of males, giving an overall male rate of 6.1 per 100,000 residents.
- In 2002, people aged 65 years and over accounted for 77.7% of all fall-related deaths, with a fall-related death rate of 27.4 per 100,000 residents. In this age group, males had a higher fall-related death rate (33.7 per 100,000) than females (23.2 per 100,000). Individuals aged 70 years or older had the highest rates of fall-related deaths. As a principal cause, fall-related deaths in this age group accounted for 66% of all fall-related deaths over the period 1998–2002 (IRMRC, 2004).

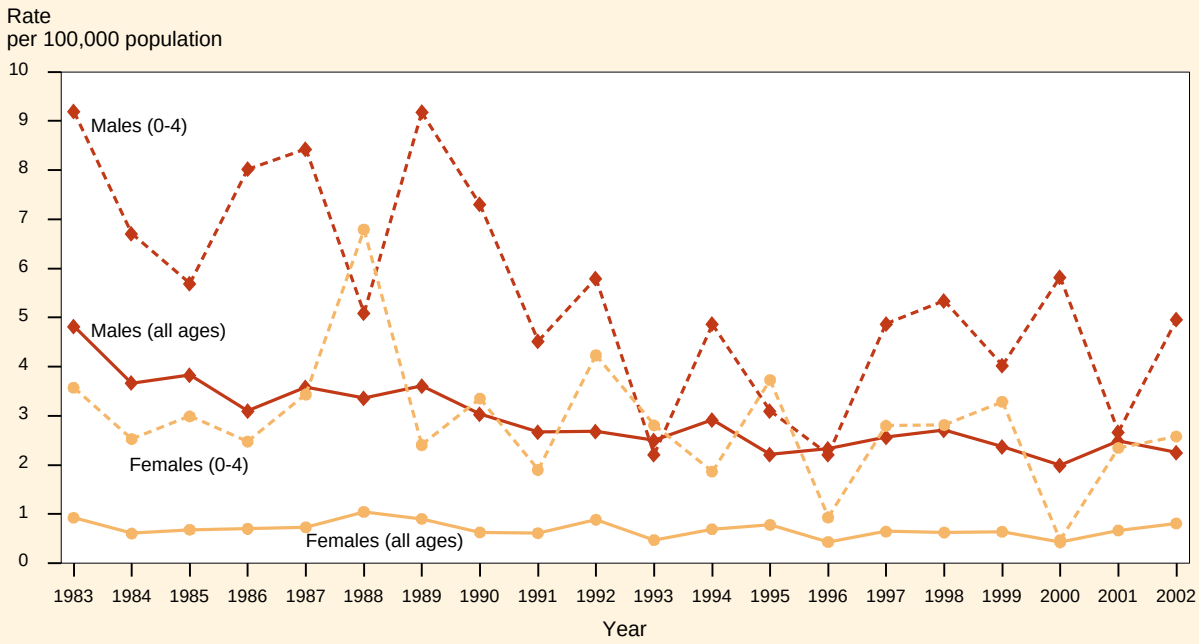
For more information:

NSW Injury Risk Management Research Centre. *NSW injury profile: A review of injury deaths for 1998–2002.* Sydney: NSW IRMRC, 2004. Available at www.irmrc.unsw.edu.au.

NSW Injury Risk Management Risk Centre. *NSW Injury Profile.* Sydney: NSW IRMRC, 2004. Available at www.irmrc.unsw.edu.au.

NSW Department of Health. *Management Policy to Reduce Fall Injury Among Older People.* Sydney: NSW Department of Health, 2003. Available at www.health.nsw.gov.au/pubs/m/pdf/fallsinjury.pdf.

Unintentional drowning by sex, persons of all ages and 0-4 years, NSW 1983 to 2002



			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	0–4 years	Persons	11	15	15	7	17	18	16	14	11	16
	All ages	Persons	89	112	93	83	102	104	96	79	105	101
Rate per	0–4 years	Persons	2.5	3.4	3.4	1.6	3.9	4.1	3.7	3.2	2.5	3.8
100,000 population	All ages	Persons	1.5	1.8	1.5	1.4	1.6	1.6	1.5	1.2	1.6	1.5

Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In 2002, there were 101 deaths caused by drowning in NSW. This was a slight increase compared to the average number of drownings over the previous 5 years. In 2002, around one in 5 drownings were of children aged 0–4 years.
- Between 1983 and 2002, the overall rate of drowning in NSW halved, from 2.8 to 1.5 per 100,000. Males had a death rate from drowning 2–3 times higher than the female rate.
- The most common locations for drownings of children aged 0–4 years in NSW during the period January 1995 to April 2001 were swimming pools (42%), bathtubs (20%), dams (16%), and lakes or rivers (15%) (IRMRC, 2002).
- The NSW Department of Health is a member of the NSW Water Safety Taskforce. The Taskforce consists of 16 member agencies who work together to ensure that there is a strategic and coordinated management of water safety in NSW.

For more information:

Commonwealth Department of Health and Aged Care. *National Injury Prevention Plan: Priorities for 2001–2003.* Canberra: CDHAC, 2001.

NSW Injury Risk Management Research Centre. *Analysis of Drowning in Australia and Pilot Analysis of Near-drowning in NSW.* Sydney: NSW IRMRC, 2000.

NSW Water Safety Taskforce. *NSW Water Safety Framework: 2001–2003.* Sydney: NSW Water Safety Taskforce, 2001.

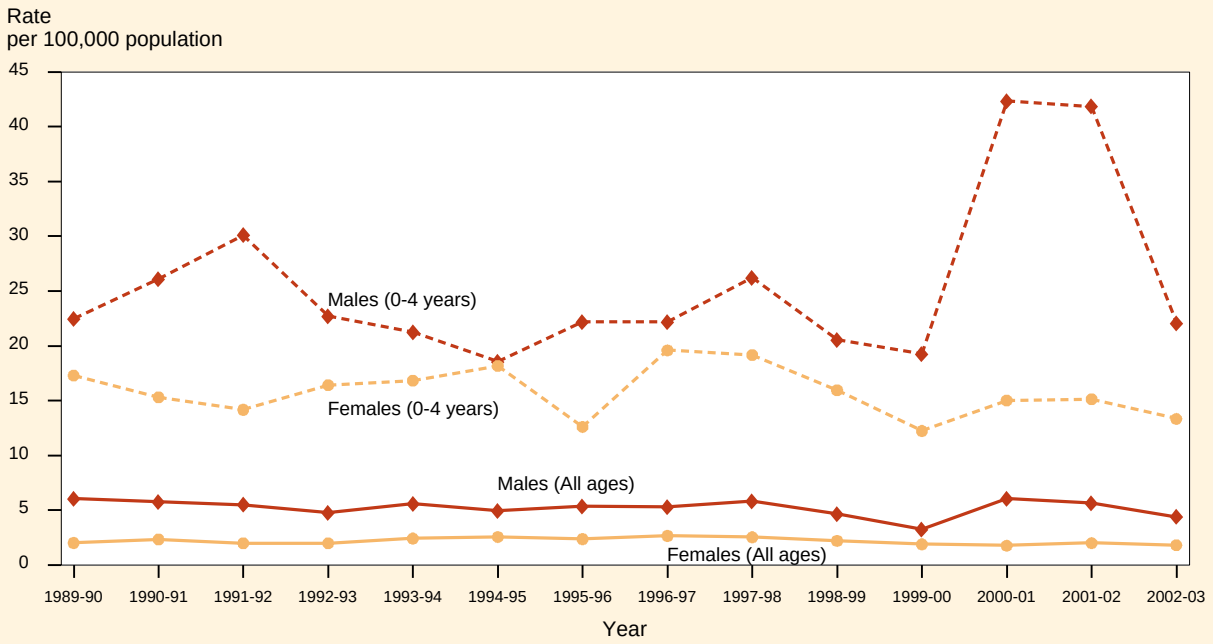
SafeWaters website at www.safewaters.nsw.gov.au.

Australian Water Safety Council. *National Water Safety Plan 2004–07.* Sydney: AWSC, 2004.

NSW Injury Risk Management Research Centre. *Analysis of drownings involving children aged five years and under in NSW.* Sydney: NSW IRMRC, 2002.

NSW Child Death Review Team. *Annual Report 2003.* Sydney: NSW Commission for Children and Young People, 2004.

Near-drowning hospital separations by sex, persons of all ages and 0-4 years, NSW 1989-90 to 2002-03



			93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	0–4 years	Persons	84	81	77	92	100	80	69	127	126	77
	All ages	Persons	250	235	246	257	269	222	168	260	254	206
Rate per	0–4 years	Persons	19.1	18.4	17.5	20.9	22.8	18.3	15.8	29.0	28.9	17.8
100,000 population	All ages	Persons	4.0	3.7	3.9	4.0	4.2	3.4	2.6	4.0	3.9	3.1

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Records relating to acute hospital transfer and statistical discharge were excluded. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In 2002–03, 206 NSW residents were hospitalised following an episode of near-drowning. Of these, over one-third (37.4%) were children aged 0–4 years.
- Between 1989–90 and 2002–03, the rate of hospitalisation for near-drowning in NSW decreased from 4.1 to 3.1 per 100,000. The male rate was generally around twice the female rate, and the rate among children aged 0–4 years was generally around 5 times the rate for all ages.
- The location of near-drownings of children aged 0–4 years in NSW during 1992–1998 were similar to the location of drownings in this age group, with swimming pools and bathtubs being the most common location for both sexes (IRMRC, 2000).
- In the 2001 NSW Child Health Survey, all respondents were asked whether their child had ever been rescued from drowning in any body of water. Overall, one in 8 (12.4%) children aged 0–12 years were reported to have been rescued from drowning. This proportion was slightly higher among children from rural areas (13.3%), compared with those from urban areas (12.1%). By far the most common places from which children had been rescued were swimming pools (62.5%), followed by beaches (17.3%) and rivers (7.2%).

For more information:

NSW Injury Risk Management Research Centre. *Analysis of Drowning in Australia and Pilot Analysis of Near-drowning in NSW*. Sydney: NSW IRMRC, 2000.

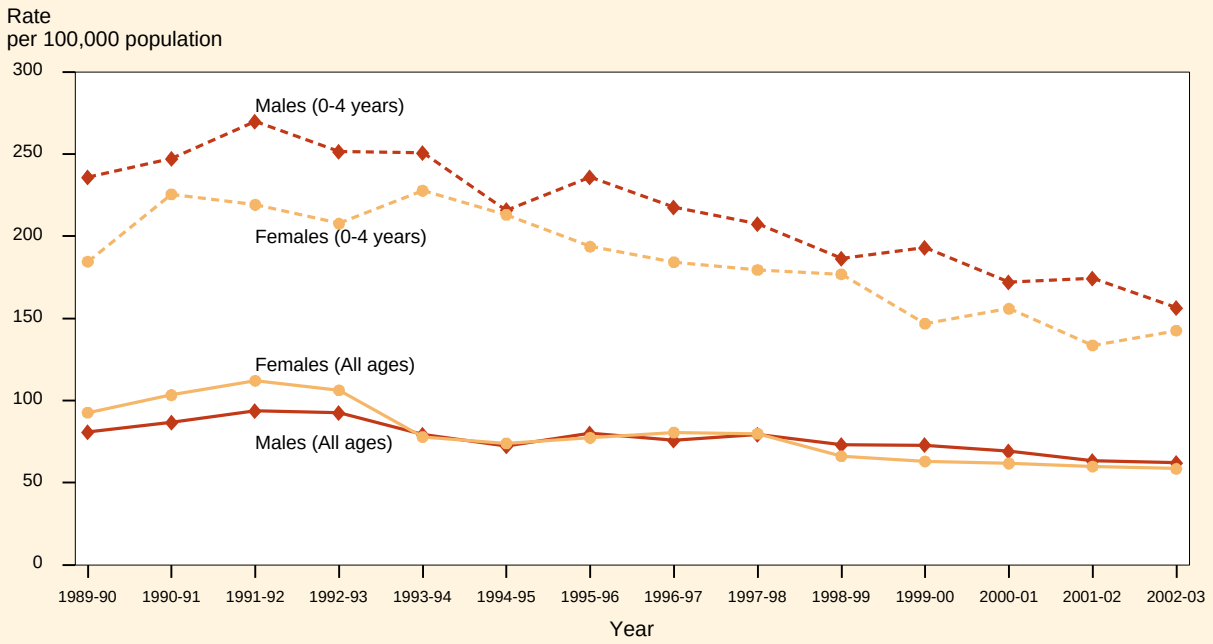
NSW Water Safety Taskforce. *NSW Water Safety Framework: 2001–2003*. Sydney: NSW Water Safety Taskforce, 2001.

SafeWaters website at www.safewaters.nsw.gov.au.

Australian Water Safety Council. *National Water Safety Plan 2004–07*. Sydney: AWSC, 2004.

Pointer S. Harrison J, Bradley C. *National Injury Prevention Plan Priorities for 2004 and beyond: Discussion paper*. Adelaide: AIHW, 2003.

Unintentional poisoning hospital separations by sex, persons of all ages and 0-4 years, NSW 1989-90 to 2002-03



			93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	0–4 years	Persons	1053	945	947	886	851	795	743	718	673	644
	15–24 years	Persons	1008	895	1045	1013	1090	897	862	774	780	705
	65+ years	Persons	549	481	538	552	497	493	496	502	569	591
	All ages	Persons	4836	4541	4939	4951	5062	4473	4395	4288	4072	4026
Rate per 100,000 population	0–4 years	Persons	239.5	214.5	215.4	201.4	193.8	181.9	170.6	164.2	154.5	149.7
	15–24 years	Persons	112.3	99.9	117.5	114.8	125.6	103.7	99.6	88.5	88.2	78.4
	65+ years	Persons	76.9	65.2	71.6	72.1	62.8	61.1	60.1	59.3	65.4	66.4
	All ages	Persons	78.2	72.9	78.6	78.2	79.3	69.6	67.9	65.5	61.6	60.5

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Records relating to acute hospital transfer and statistical discharge were excluded. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

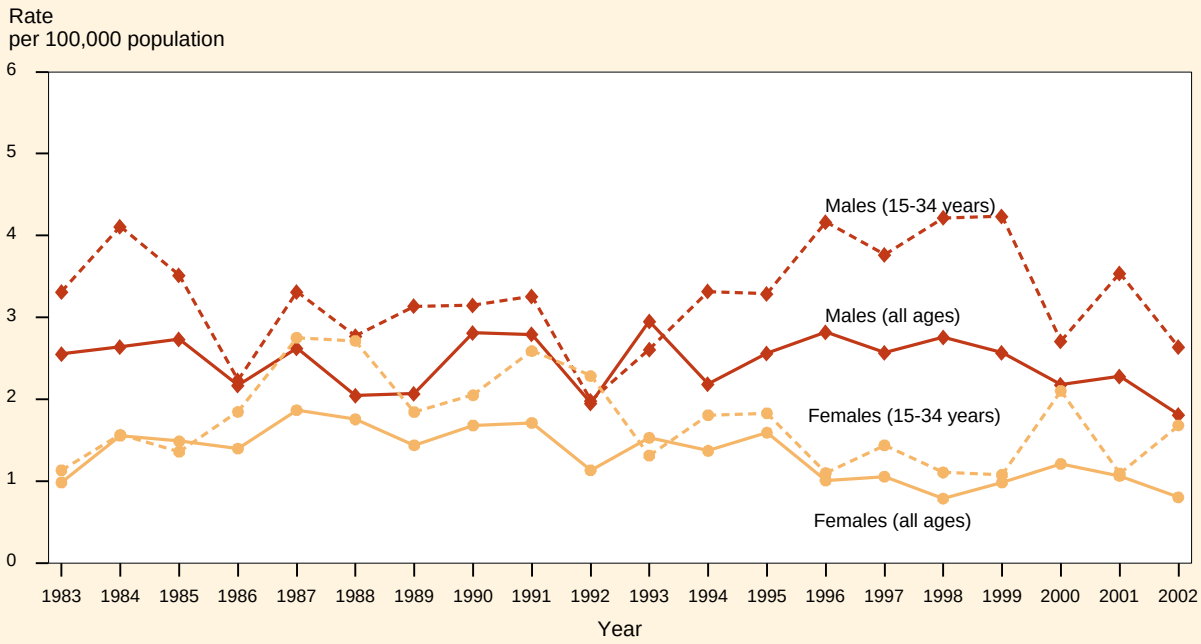
Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In 2002–03, there were 4,026 hospitalisations of NSW residents for the effects of unintentional poisoning. The rate of hospitalisation for poisoning in the 0–4 years age group was 2.5 times the rate for all ages, and in the 15–24 years age group was 1.5 times the rate for all ages.
- The agent responsible for poisonings is poorly recorded in hospital data. During the financial years 1998–99 to 2002–03, the agent recorded for almost half of poisoning hospitalisations in children aged 0–4 years was classified as a drug, chemical, or noxious substance. The most common specific agents recorded were sedative–hypnotic drugs (17.9%) and non-opioid analgesics (16.2%). In young adults aged 15–24 years, common specific agents recorded were sedative–hypnotic drugs (32.4%) and narcotics and hallucinogens (18.1%).
- More specific information about causes of poisoning is collected by the NSW Poisons Information Centre (PIC). In 1996, 413 calls to PIC regarding children aged less than 5 years resulted in advice to attend hospital. Among these, paracetamol (13.7%), cough–cold preparations containing no paracetamol or aspirin (6.1%), antihistamines (3.8%), iron supplements (2.9%), tricyclic antidepressants (2.5%), eucalyptus oil (2.4%), disc–button type batteries (2.3%), and paracetamol–narcotic combination analgesics (2.1%), were the most common products recorded (Muscatello and Saville, 2000).

For more information:

Muscatello D, Saville G. The potential of the NSW Poisons Information Centre for surveillance of unintentional poisoning in young children. *N S W Public Health Bull* 2000; 11: 181–183. Available at www.health.nsw.gov.au/public-health/phb/phb.html.

Homicide by sex, persons of all ages and 15-34 years, NSW 1983 to 2002



			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	15–34 years	Persons	37	48	48	49	48	49	49	44	43	41
	All ages	Persons	130	110	128	118	114	113	115	109	110	86
Rate per 100,000 population	15–34 years	Persons	2.0	2.6	2.6	2.6	2.6	2.7	2.7	2.4	2.3	2.2
	All ages	Persons	2.2	1.8	2.1	1.9	1.8	1.8	1.8	1.7	1.7	1.3

Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Between 1983 and 2002, there were an average of 112 homicide deaths each year in NSW. The number of homicide deaths fluctuated considerably from year to year. Overall, around half of all victims were aged 15–34 years, and males were twice as likely as females to be victims of homicide.
- Nationally, in 2000–01, there were 308 homicide incidents perpetrated by 260 identified offenders. The most common primary weapons used in homicides in NSW, where males were the victim, were knives and other sharp instruments (32.9%), firearms (27.4%), and hands and feet (20.6%). For female victims, the most common primary weapons were hands and feet (40.9%), knives and other sharp instruments (31.8%), and firearms (18.2%) (Mouzos, 2002).

For more information:

Australian Institute of Criminology at www.aic.gov.au.

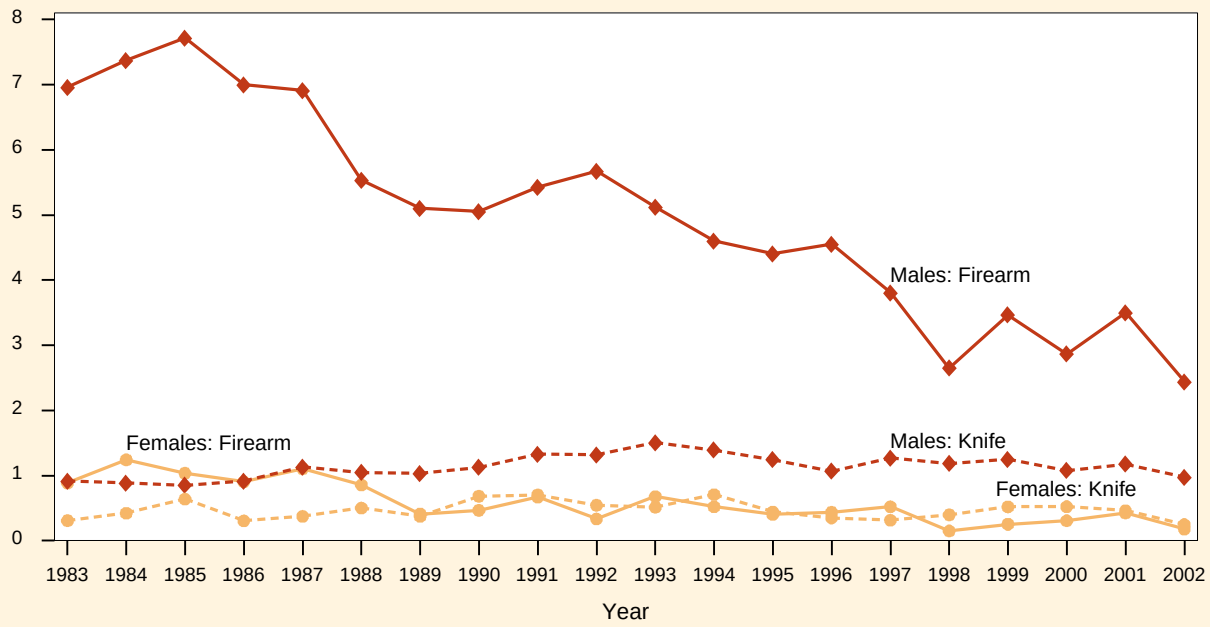
Gallagher P, Nguyen Da Huong M, Bonney R. *Trends in homicide 1968 to 1992. Crime and Justice Bulletin no. 21.* Sydney: NSW Bureau of Crime Statistics and Research, 1994.

Mouzos J. *Homicide in Australia 1999–2000. Trends and Issues in Crime and Criminal Justice no. 187.* Canberra: Australian Institute of Criminology, 2001.

NSW Bureau of Crime Statistics and Research at www.lawlink.nsw.gov.au/bocsar.

Mouzos J. Homicide in Australia, 2000–2001.*National Homicide Monitoring Program Annual Report.* Canberra: Australian Institute of Criminology, 2002.

Firearm and knife injury deaths by sex, NSW 1983 to 2002



			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	Firearm	Persons	165	149	141	147	133	88	115	99	126	86
	Knife	Persons	60	63	52	44	50	50	57	51	53	40
Rate per 100,000 population	Firearm	Persons	2.8	2.5	2.3	2.4	2.1	1.4	1.8	1.5	1.9	1.3
	Knife	Persons	1.0	1.0	0.8	0.7	0.8	0.8	0.9	0.8	0.8	0.6

Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In the last 3 years, there has been an average of 104 deaths from firearm injuries and an average of 48 deaths from knife injuries in NSW each year. The death rate due to firearm injury decreased by more than half over the period 1983 to 2002, from 3.9 to 1.3 per 100,000. The death rate associated with a knife injury was fairly constant over the 20-year period, with the rate being 2–3 times higher in males than in females.
- In NSW in the period 1998–2002, around half the deaths from firearm injuries were of people aged 25–54 years, and males were at least 9 times more likely than females to be killed by a firearm. Just over two-thirds (69.6%) of gun-related deaths were recorded as suicides, around one in 5 (21.3%) as homicides, and the remainder as unintentional or undetermined intent (8.0%), or legal (1.2%).
- In the same period, three-quarters of deaths from knife injuries were of people aged between 20–54 years, and males were at least twice as likely as females to be killed by a knife wound. Two-thirds (66.5%) of knife-related deaths were recorded as homicides, around one in 3 (32.0%) as homicides, and the remainder as unintentional (1.5%).
- Although the number of homicides involving firearms fell between 1995 and 2000, the number of shooting offences recorded increased, particularly in parts of southwestern Sydney (Fitzgerald et al., 2001).

For more information:

Australian Institute of Criminology at www.aic.gov.au.

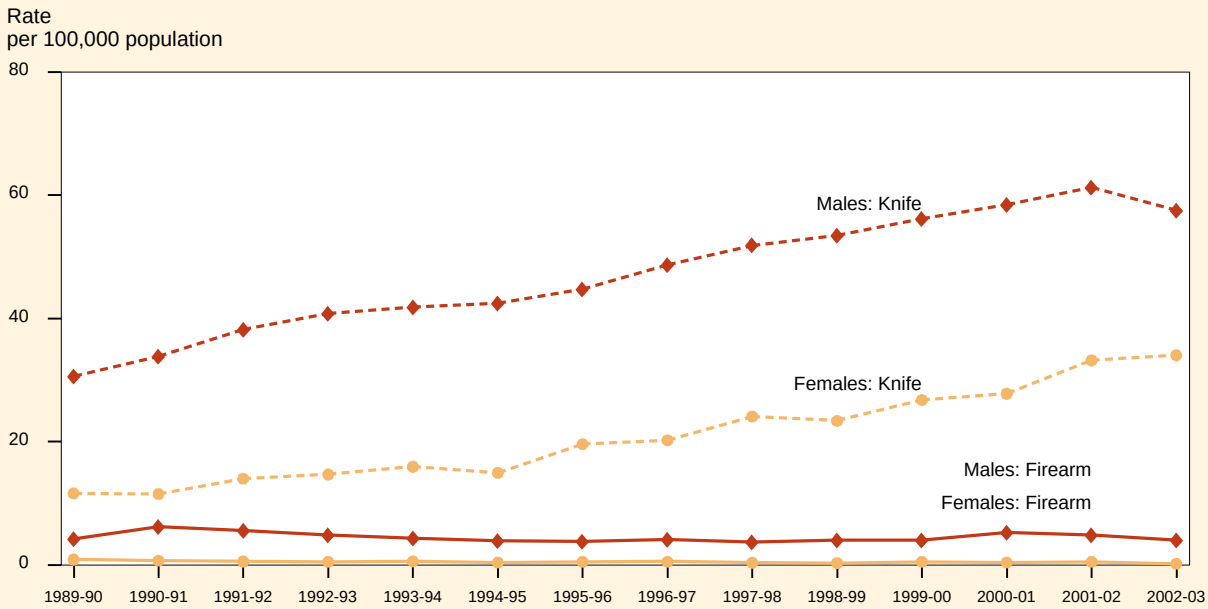
Fitzgerald J, Briscoe S, Weatherburn D. Firearms and Violent Crime in NSW. *Crime and Justice Bulletin no. 57.* Sydney: NSW Bureau of Crime Statistics and Research, 2001.

Mouzos J. Firearm-related deaths in Australia 1998. *Trends and Issues in Crime and Criminal Justice no. 161.* Canberra: Australian Institute of Criminology, 2000.

NSW Bureau of Crime Statistics and Research at www.lawlink.nsw.gov.au/bocsar.

Mouzos J. Rushforth C. *Firearm-related deaths in Australia, 1991–2001. Trends and Issues in Crime and Criminal Justice no. 269.* Canberra: Australian Institute of Criminology, 2003.

Firearm and knife injury hospital separations by sex, NSW 1989-90 to 2002-03



			93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	001–02	02–03
Number	Firearm	Persons	151	135	140	144	131	138	148	186	176	140
	Knife	Persons	1811	1802	2040	2202	2424	2465	2674	2804	3097	3018
Rate per	Firearm	Persons	2.5	2.2	2.2	2.3	2.1	2.2	2.3	2.9	2.7	2.1
100,000 populaton	Knife	Persons	28.0	28.7	32.3	34.5	38	38.5	41.5	43.1	47.2	45.8

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Records relating to acute hospital transfer and statistical discharge were excluded. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- There are around 150 hospitalisations of NSW residents for firearm injuries, and an average of 2,172 hospitalisations for knife-related injuries each year. The hospitalisation rate for firearm injuries decreased over the period 1989–90 to 2002–03, from 2.6 to 2.1 per 100,000, while the rate for knife injuries doubled over the same period, from 21.2 to 45.8 per 100,000.
- In the period 1998–99 to 2002–03 in NSW, well over half (60.9%) of hospitalisations for firearm injuries were of people aged 15–34 years, and males were around 5–6 times more likely than females to be the hospitalised for these injuries. The hospitalisation rate associated with a knife injury has risen constantly over the 14-year period, with the rate being 2–3 times higher in males than in females.
- During the period 1998–99 to 2002–03, assaults (41.0%) and intended self-harm (10.2%) accounted for half of the firearm-related hospitalisations of males. For females, assaults (32.4%) and intended self-harm (17.7%) together accounted for more than half of firearm-related hospitalisations. During this same period, intended self-harm (30.1%) and assaults (30.0%) accounted for almost two-thirds of the knife-related hospitalisations of males. For females, intended self-harm (57.1%) and assaults (9.6%) together accounted for more two-thirds of knife-related hospitalisations.
- Nationally, from 1994–95 to 1998–99, the rate of firearm-related hospitalisations fell from 3.44 to 2.51 per 100,000. Of the 2,801 firearm-related hospitalisations in this period, 29.7% occurred in NSW. Where the type of weapon was known, shotguns (36.1%), hunting rifles (32.6%), and handguns (28.5%), were most commonly implicated (Mouzos, 2001).

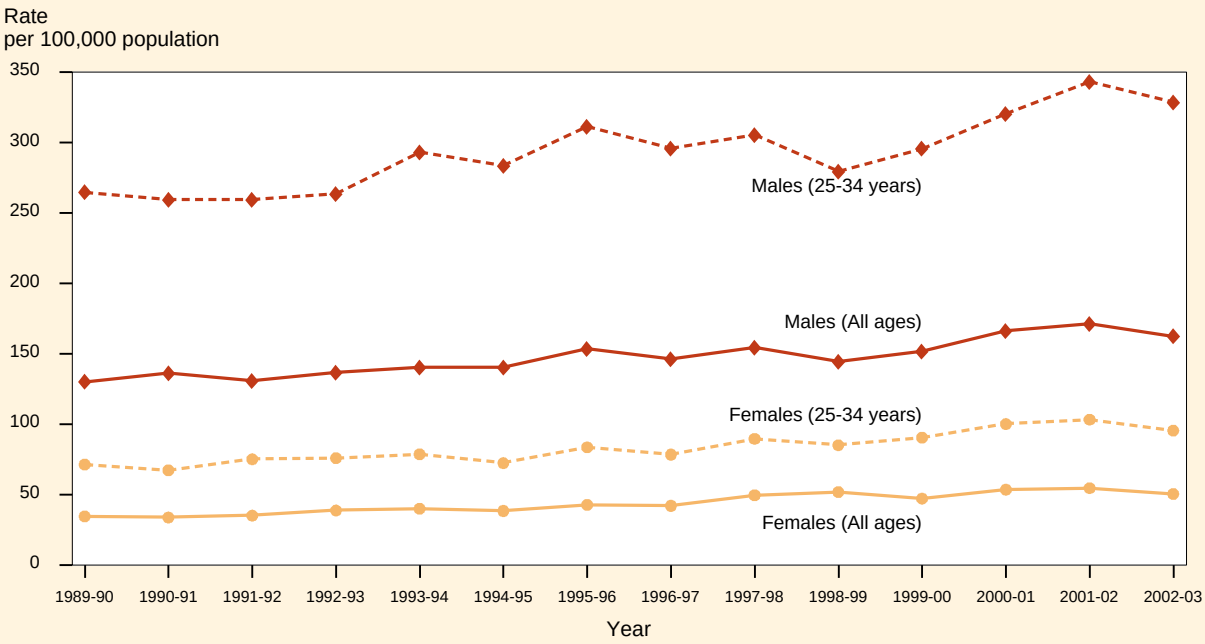
For more information:

Australian Institute of Criminology at www.aic.gov.au.

NSW Bureau of Crime Statistics and Research at www.lawlink.nsw.gov.au/bocsar.

Mouzos J. *Firearm-related morbidity in Australia 1994–95 to 1998–99. Trends and Issues in Crime and Criminal Justice, no. 198.* Canberra: Australian Institute of Criminology, 2001.

Interpersonal violence-related hospital separations by sex, persons of all ages and 25-34 years, NSW 1989-90 to 2002-03



			93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	15–24 years	Persons	2077	2098	2184	1989	2054	1931	2007	2361	2291	2213
	25–34 years	Persons	1770	1698	1894	1812	1915	1765	1871	2043	2169	2059
	All ages	Persons	5689	5680	6255	6026	6526	6296	6425	7159	7432	7042
Rate per 100,000 population	15–24 years	Persons	227.3	230.3	241.3	223.5	235.7	223.4	232.0	270.0	259.1	246.3
	25–34 years	Persons	186.2	178.3	197.6	187.0	197.1	181.7	192.5	209.6	222.6	211.5
	All ages	Persons	90.5	89.9	98.6	94.5	102.2	98.2	99.7	110.1	113.4	106.8

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Records relating to acute hospital transfer and statistical discharge were excluded. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In 2002–03, there were 7,042 hospitalisations of NSW residents for injuries resulting from interpersonal violence, giving a rate of 106.8 per 100,000. Almost two-thirds (60.7%) of these were of people aged 15–34 years.
- The overall rate of hospitalisation of NSW residents following interpersonal violence increased from 82.9 to 106.8 per 100,000 over the period 1989–90 to 2002–03. The male hospitalisation rate for these injuries was consistently 3–4 times the female rate. In 2002–03, males aged 25–34 years had the highest hospitalisation rate at 389.4 per 100,000, compared to the total male hospitalisation rate of 162.4 per 100,000.
- The NSW Department of Health Policy for Identifying and Responding to Domestic Violence includes a 'statement of principles' that underpin all Departmental policies, programs, and procedures on domestic violence (NSW Department of Health, 2003). The Policy aims to reduce the incidence of domestic violence through primary and secondary prevention approaches, and to minimise the trauma experienced by people living with domestic violence.

For more information:

Australian Institute of Criminology at www.aic.gov.au.

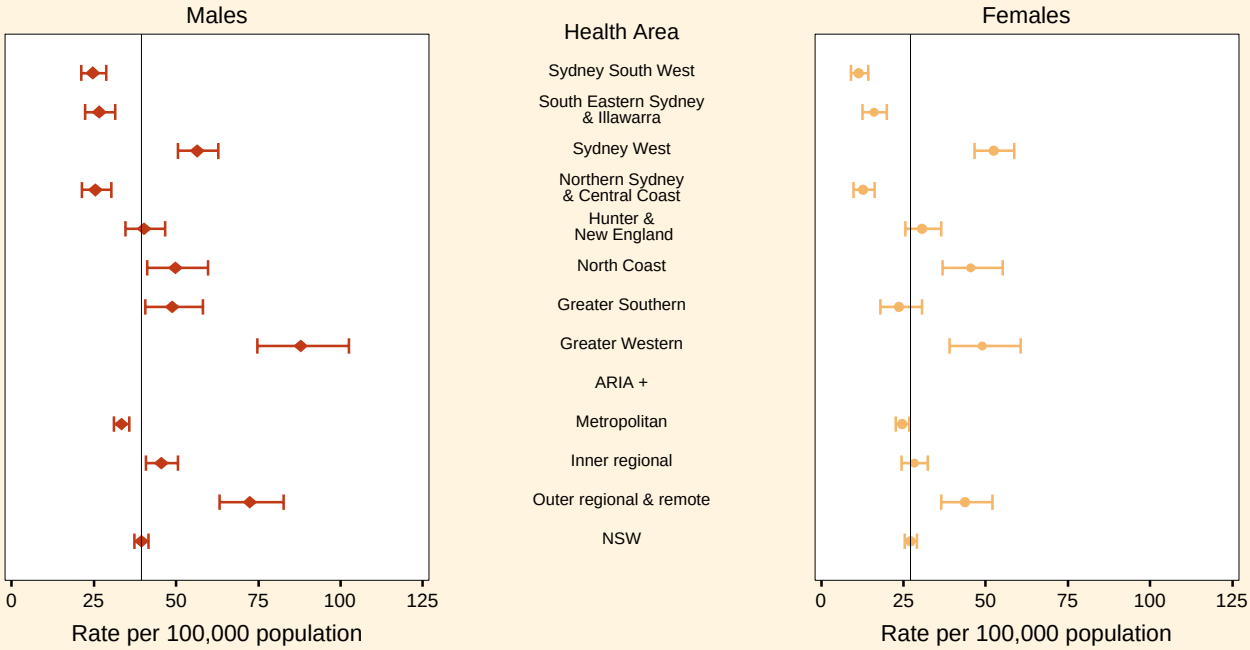
Attorney-General's Department. *Young People and Domestic Violence*. Canberra: Attorney-General's Department, 2001.

McDonald D. *Violence as a Public Health Issue. Trends and Issues in Crime and Criminal Justice no. 163*. Canberra: Australian Institute of Criminology, 2000.

NSW Bureau of Crime Statistics and Research at www.lawlink.nsw.gov.au/bocsar.

NSW Department of Health. *Policy for identifying and responding to domestic violence.* Sydney: NSW Department of Health, 2003. Available at www.health.nsw.gov.au/pubs/p/pdf/policy_dom_violence.pdf.

Interpersonal violence-related hospital separations by health area and sex, children aged 0-14 years, NSW 1998-99 to 2002-03



Health area		Hospitalisations	Rate per 100,000 population	LL 95% CI	UL 95% CI
Sydney South West	Persons	242	18.2	16.0	20.7
South Eastern Sydney & Illawarra	Persons	214	21.4	18.6	24.4
Sydney West	Persons	633	54.5	50.3	58.9
Northern Sydney & Central Coast	Persons	194	19.3	16.7	22.2
Hunter & New England	Persons	303	35.6	31.7	39.8
North Coast	Persons	220	47.7	41.5	54.4
Greater Southern	Persons	183	36.6	31.5	42.3
Greater Western	Persons	242	69.0	60.6	78.3
Metropolitan	Persons	1338	29.1	27.6	30.7
Inner-regional	Persons	544	37.1	34.0	40.3
Outer-regional and remote	Persons	347	58.5	52.5	65.0
NSW	Persons	2232	33.4	32.0	34.8

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Records relating to acute hospital transfer and statistical discharge were excluded. LL/UL 95%CI = Lower and upper limits of the 95% confidence interval for the point estimate. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

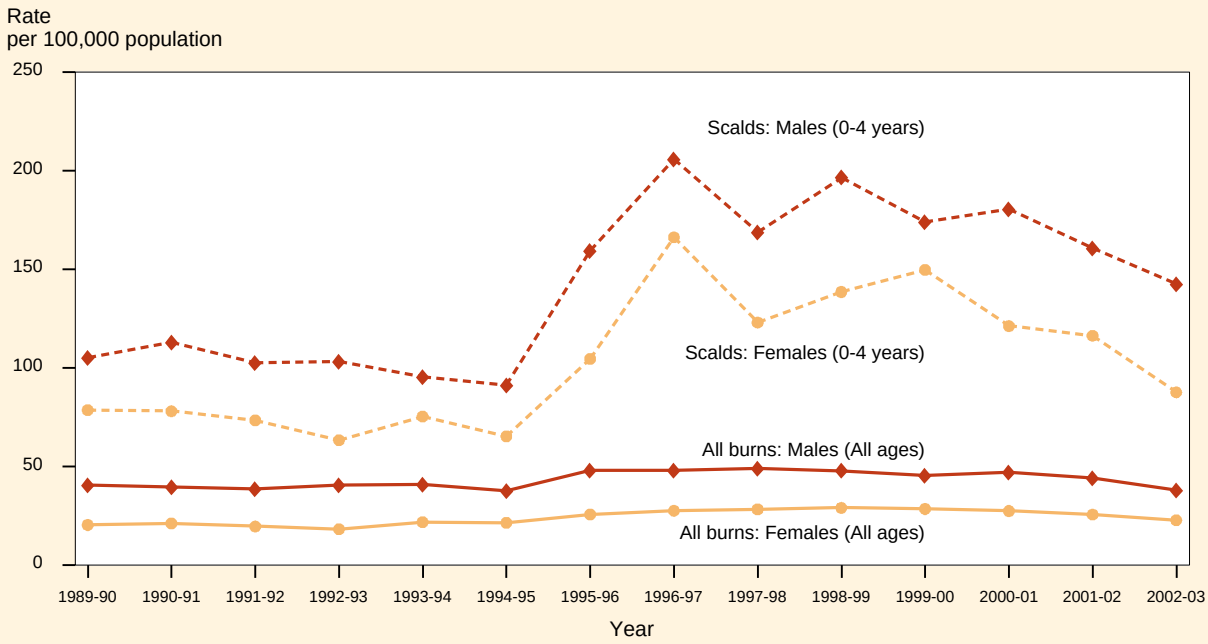
- In NSW between 1998–99 and 2002–03, the hospitalisation rate for injuries due to interpersonal violence among 0–14 year olds varied by health area. Generally, outer-regional and remote health areas had a higher hospitalisation rate than inner-regional and metropolitan areas. Hospitalisation rates were around 1.5 times higher for males than females.
- The highest hospitalisation rates for injuries due to interpersonal violence among 0–14 year olds were recorded in the Greater Western, Sydney West and North Coast Health Areas. The lowest rates were recorded in the Sydney South West, North Sydney & Central Coast, and South Eastern Sydney & Illawarra Health Areas.
- In NSW during the period 1999–00 to 2001–02, 75 children and young people aged 17 years or less died as a result of assault or neglect. Of these, 80% of families had prior contact with government agencies (NSW Child Death Review Team, 2003).

For more information:

NSW Department of Health. *Policy for identifying and responding to domestic violence.* Sydney: NSW Department of Health, 2003. Available at www.health.nsw.gov.au/pubs/p/pdf/policy_dom_violence.pdf.

NSW Child Death Review Team. *Fatal assault and neglect of children and young people.* Sydney: NSW Commission for Children and Young People, 2003.

Burn and scald injury hospital separations by sex, persons of all ages and children 0-4 years, NSW 1989-90 to 2002-03



				93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	Scalds	0–4 years	Persons	376	346	583	820	643	735	706	663	605	498
	All burns	All ages	Persons	1907	1849	2340	2428	2478	2481	2400	2446	2296	2015
Rate per	Scalds	0–4 years	Persons	85.5	78.6	132.6	186.4	146.4	168.2	162.1	151.6	139.1	115.7
100,000 population	All burns	All ages	Persons	31.3	29.7	36.8	37.8	38.6	38.4	37.0	37.3	34.8	30.4

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Records relating to acute hospital transfer and statistical discharge were excluded. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

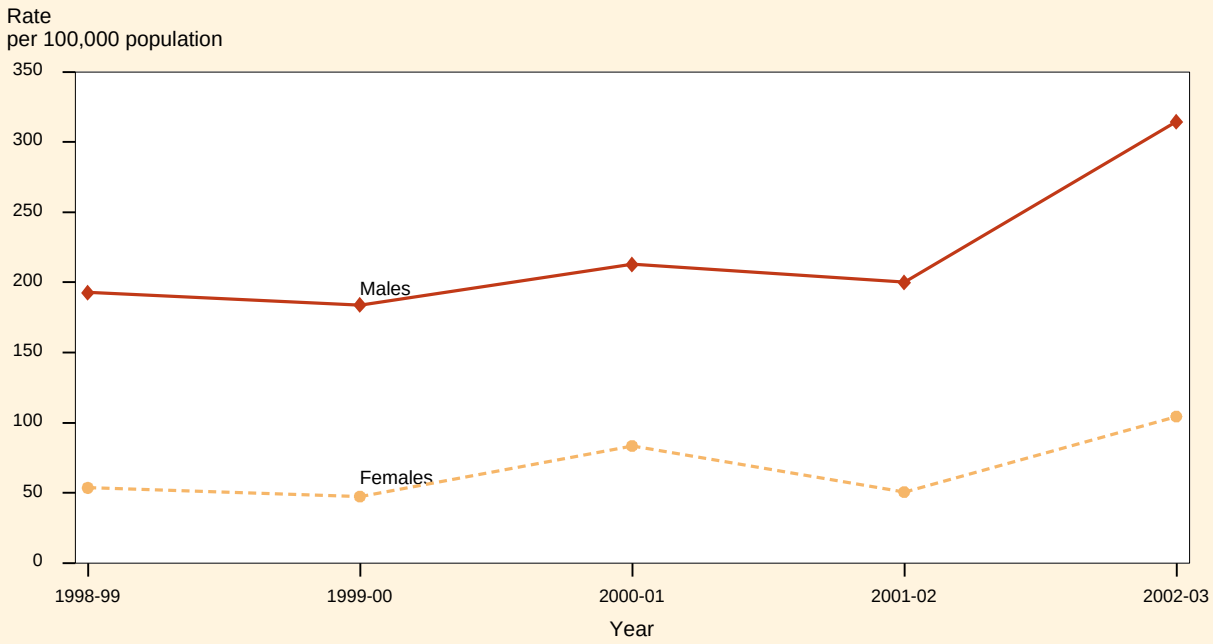
- In 2002–03, there were 2,015 hospitalisations of NSW residents for injuries resulting from burns and scalds. One-quarter of these (24.7%) were among children aged 0–4 years and the male hospitalisation rate was around 1.5 times the female rate.
- The rate of hospitalisation following a scald rose between 1989–90 and 2002–03, from 92.1 to 115.7 per 100,000. Among children aged 0–4 years, the hospitalisation rate following scalds dropped slightly between 1989–90 and 1994–95, but then rose sharply. This apparent rise was largely due to an increase in the number of reported day-only admissions for scalds treatment.
- Burns and scalds in young children often occur in the home and are usually caused by hot beverages, hot tap water, saucepans of hot liquids, and boiling water in kettles (NIPAC, 1999).
- Over the period 1992–1994, the NSW Department of Health conducted a campaign that, along with new standards requiring hot water delivered to bathing areas to be at a temperature less than 50°C, was associated with a 25% reduction in serious scalds (NSW Department of Health, 1999).

For more information:

National Injury Prevention Advisory Council. *Directions in Injury Prevention. Report 1: Research Needs.* Canberra: Commonwealth Department of Health and Aged Care, 1999.

NSW Department of Health. *Hot Water Burns Like Fire: The NSW Scalds Prevention Campaign.* Sydney: NSW Department of Health, 1999.

Sports injury hospital separations by sex, NSW 1998-99 to 2002-03



		1998–99	1999–00	2000–01	2001–02	2002–03
Number	Persons	7927	7493	9681	8252	13875
Rate per 100,000 population	Persons	124.3	116.7	148.9	126.4	211.1

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Records relating to acute hospital transfer and statistical discharge were excluded. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In 2002–03, there were 13,875 hospitalisations of NSW residents for sporting injuries. The hospitalisation rate for these injuries among males was around 3 times the female rate. The rate of hospitalisation following a sporting injury gradually rose between 1989–99 and 2001–02, but then rose sharply in 2002–03. This apparent rise was largely due to a change in the coding of sporting injuries.
- Hospitalisation rates for sporting injuries increased with age up to around 20 years of age, but then declined in older age groups. For males, the highest rates of hospitalisation following a sporting injury were among those aged 10–19 years. For females, the highest rate was in 10–14 year olds.
- Because hospitalisation rates for sporting injury were calculated using the total population of NSW, they underestimate the rates of injury among people who actually participate in sports. In 2002, around two-thirds (62.4%) of Australians aged 18 years and over reported taking part in some form of sport or physical activity during the previous 12 months (ABS, 2003).
- In 2002, 34% of NSW secondary school students reported that they had experienced an injury in the last 6 months that required medial attention. The most common place of injury was at a sports facility. The sports with the most injuries were soccer, rugby league and cricket for males and netball and dancing for females, reflecting the high rates of participation in these sports (NSW Department of Health, 2004).

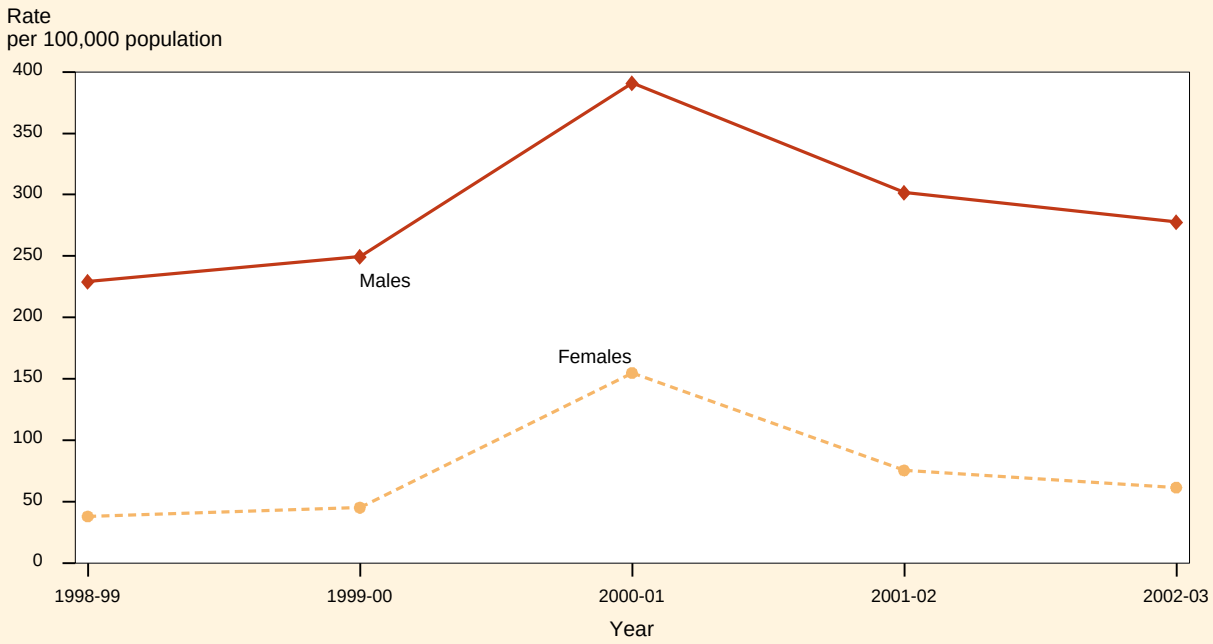
For more information:

NSW Department of Health. The health behaviours of secondary school students in New South Wales 2002. *N S W Public Health Bulletin* 2004; 15(S-2). Available at www.health nsw.gov.au/public-health/phb.phb.html.

Australian Bureau of Statistics. *Participation in sport and physical activities, Australia.* ABS Catalogue no. 4177.0. Canberra: ABS, 2003.

Boufous S. Finch C. Bauman A. Parental safety concerns: A barrier to sport and physical activity in children? *Aust N Z J Public Health.* 2004; 28(5): 482–486.

Workplace injury hospital separations by sex,
NSW 1998-99 to 2002-03



			1998–99	1999–00	2000–01	2001–02	2002–03
Number	All ages	Persons	8521	9484	17765	12418	11281
Rate per 100,000 population	All ages	Persons	134.0	147.7	272.2	188.5	169.7

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Records relating to acute hospital transfer and statistical discharge were excluded. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Between 1998–99 and 2002–03 there were, on average, 11,894 hospitalisations of NSW residents for injuries sustained in the workplace. The male hospitalisation rate for these injuries was over 4 times the female rate.
- For males, the highest rates of hospitalisation following a workplace injury were among those aged 25–44 years. For females, the highest rates occurred in those aged 40–54 years. The most common principal diagnoses among hospitalisations identified as being work-related were: open wounds, fractures and muscular or tendon injuries of the wrist or hand; and back pain (Muscatello and Mitchell, 2001).
- Hospitalisation rates for workplace injury were calculated using the total population of NSW. The rate of injury in the working population is therefore underestimated as only around 63% of people aged 15 years and over in NSW are in paid employment (ABS, 2002).
- In NSW during 1989–1992, the death rate from workplace injuries was 5.3 per 100,000 workers per year, which was marginally lower than the national rate of 5.5 deaths per 100,000 workers per year. In the same period, industries in NSW that had high rates of death from workplace injuries, compared to the State average, were forestry and logging (113.9), fishing and hunting (59.8), mining (32.3), agriculture (23.5), transport and storage (23.4), and construction (10.4) (Driscoll and Mitchell, 2002).

For more information:

Muscatello D, Mitchell R. Identifying work-related injury and disease in routinely collected NSW hospitalisation data. *N S W Public Health Bull* 2001; 12(7): 195–198. Available at www.health.nsw.gov.au/public-health/phb/phb.html.

Australian Bureau of Statistics. *1996 and 2001 Census Community Basic Profile.* Canberra: ABS, 2002. Available at www.abs.gov.au.

Driscoll T. Mitchell R. Fatal work injuries in New South Wales. *N S W Public Health Bull* 2002; 13 (5); 95–99.

WorkCover NSW at www.workcover.nsw.gov.au.

Chapter 4.6

Mental health

- As a result of psychological distress in NSW, around 8% of adults are totally unable to perform their usual activities for one or more days each month; and around 2.7 million person-days of usual activities per month, or just over 32 million person-days per year, are lost.
- Suicide rates have been dropping in NSW since 1997 but, still, 673 people died by suicide in 2002. This was almost 15% fewer than in the previous year. Males accounted for almost 80% of suicides in 2002.
- In 2002–03, there were more than 9,500 hospitalisations of NSW residents for attempted suicide. Females accounted for 60% of these hospitalisations.
- In 2003, around 1.0% of NSW children aged 17 years or less were prescribed stimulant medication for attention deficit hyperactivity disorder (ADHD). This was well below the estimated prevalence of ADHD.
- In 2002, one in 6 (17.5%) high school students reported high levels of psychological distress. Overall, 7% experienced high psychological distress both at home and at school and either talked to no-one about it or talked to someone but found it ‘not at all helpful’.

In this chapter

Introduction

Mental ill health is one of the leading causes of burden of disease and injury in Australia, and is associated with higher rates of health risk factors, poorer physical health, and higher rates of deaths from many causes including suicide (AIHW, 2004). In NSW, depression is the leading cause of years lost due to disability and ranks fourth in terms of total disease burden (years of healthy life lost due to premature death, disease and injury).

This chapter uses data from the NSW Health Survey Program to describe the burden of psychological distress in the community. It provides information on the effect of these disorders on the ability of people to work, study, and manage their day-to-day activities.

The chapter provides information from the NSW part of the Australian Secondary Schools' Alcohol and Drugs Survey 2002 on psychological distress among young people. It also updates information on the prescribing of stimulants for attention deficit hyperactivity disorder (ADHD) in children. The chapter also presents updated information on trends in suicide and attempted suicide.

Mental health initiatives in NSW focus on promotion, prevention, and early intervention strategies, alongside clinical care. By using epidemiological information and evidence of effective mental health care, it is possible to identify who needs mental health services in NSW and what mental health interventions are appropriate for each age group (NSW Health, 2003).

The *Integrated Perinatal and Infant Care Program* is a new and important initiative of NSW Health, in partnership with a diversity of health care sectors. It focuses on the antenatal and postnatal periods. Another initiative is the *NSW Parenting Program for Mental Health*, which will contribute to preventing the development of mental health problems and disorders in children. *School-Link* aims to improve the understanding, recognition, treatment, and prevention of mental health problems in children and adolescents, with an initial focus on depression and related disorders (NSW Department of Health, 2003a). Suicide prevention programs for children and young people who have a parent affected by mental health problems and disorders, and an early psychosis program for young people, are some of the several other programs that are currently underway in NSW (NSW Department of Health, 2003b).

For more information:

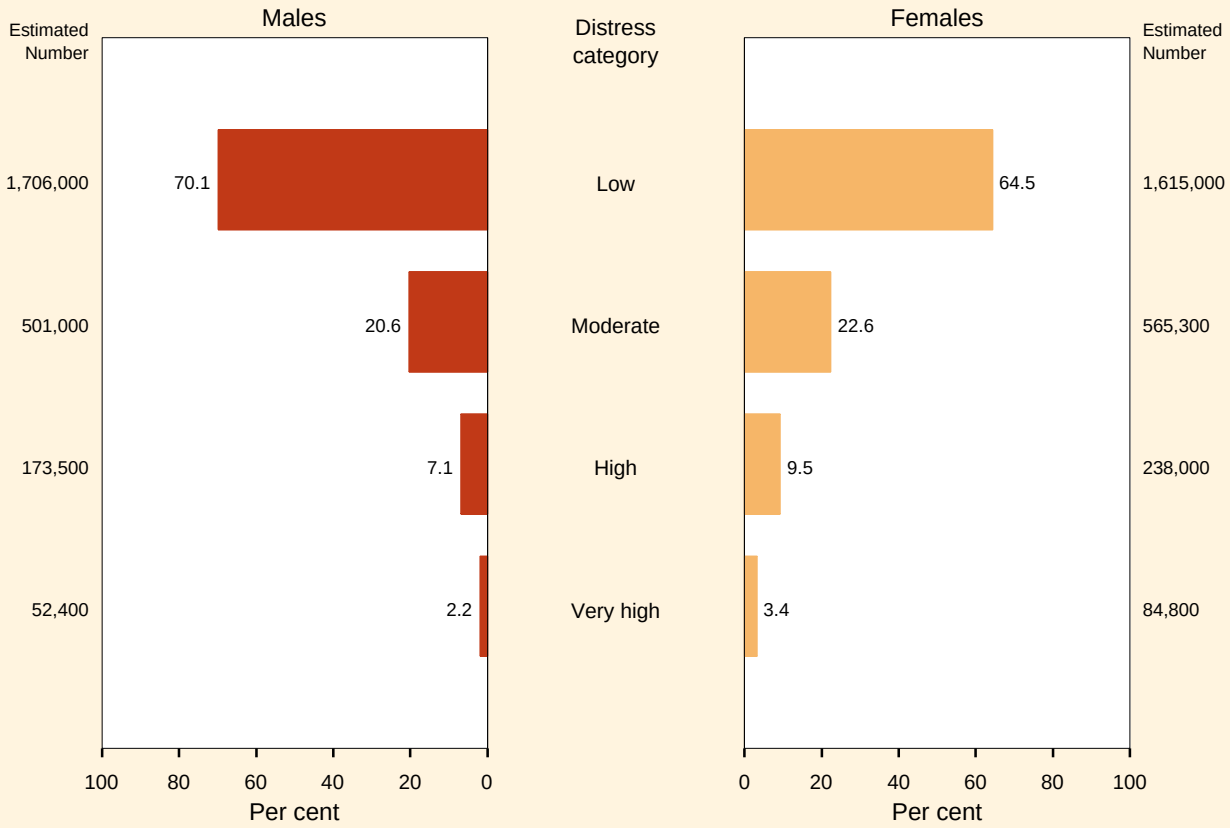
Australian Institute of Health and Welfare. *Australia's Health 2004.* Canberra: AIHW, 2004. Available at www.aihw.gov.au/publications/aus/ah04/index.html.

NSW Department of Health. *Improving mental health and wellbeing in NSW.* Sydney: NSW Department of Health, 2003. Available at www.health.nsw.gov.au/pubs/i/pdf/well_improve.pdf.

NSW Department of Health. *NSW School-Link initiative.* Sydney: NSW Department of Health, 2003a. Available at www.health.nsw.gov.au/pubs/s/pdf/well_school-link.pdf.

NSW Department of Health. *Suicide prevention in NSW.* Sydney: NSW Department of Health, 2003b. Available at www.health.nsw.gov.au/pubs/s/pdf/well_suicide.pdf.

Psychological distress by category, persons aged 16 years and over, NSW 2003



Note: Estimates based on 13,003 respondents in NSW. 94 (0.75%) were not stated for psychological distress. Psychological distress was measured using the Kessler 10 (or K10) questionnaire, which is a 10-item questionnaire about the level of anxiety and depressive symptoms in the most recent 4-week period. The categories are K10 scores: low =10–15, moderate = 16–21, high = 22–29, and very high = 30+.

Source: NSW Health Survey 2003 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

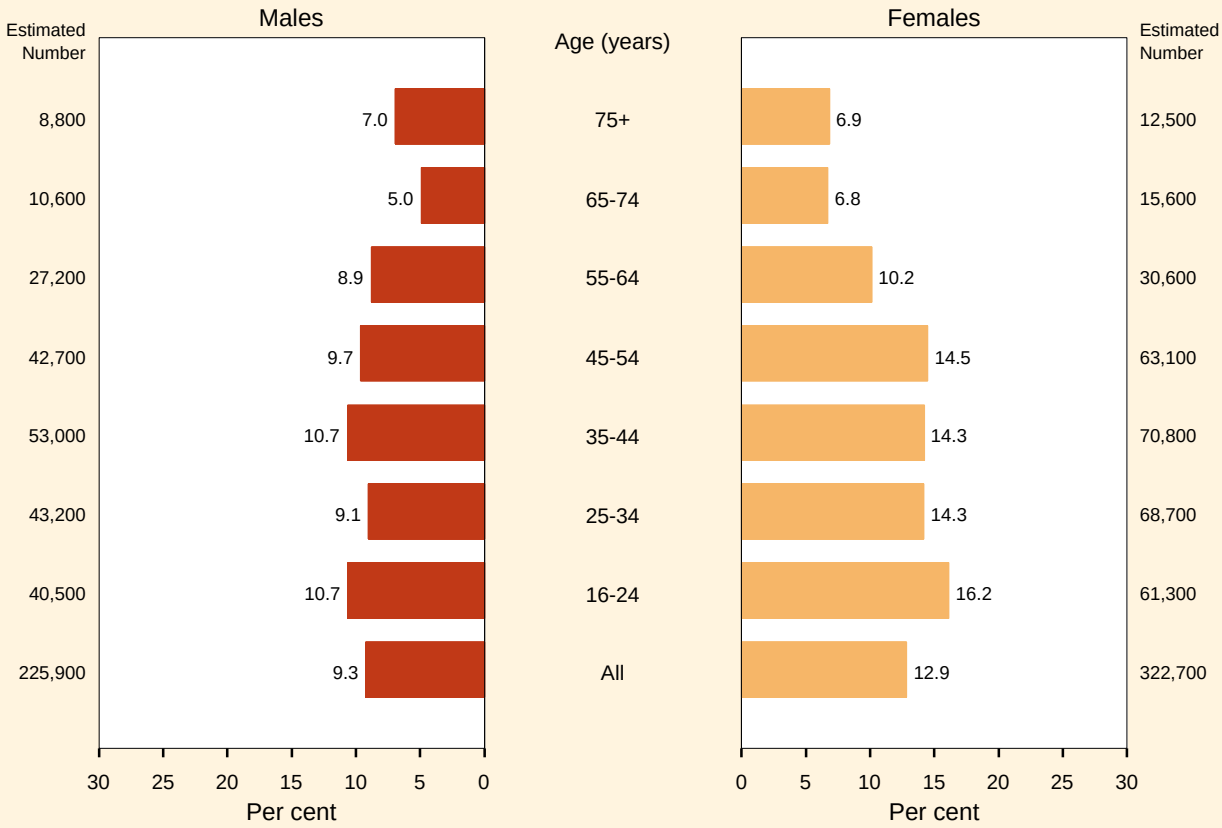
- Psychological distress has a major effect on the ability of people to work, study, and manage their day-to-day activities. In Australia in 2001, the most common mental and behavioural problems reported in the National Health Survey were mood (affective) problems and anxiety-related problems, which were each reported by 4.5% of respondents (ABS, 2003).
- The NSW Health Survey uses a 10-item questionnaire, the Kessler 10 (or K10), to yield a measure of psychological distress, based on questions about negative emotional states experienced by respondents in the 4 weeks prior to interview, producing results that can be compared with national figures. There is a strong association between K10 scores and the diagnosis of anxiety and depression based on the Composite International Diagnostic Interview (CIDI) used by medical services (ABS, 2003a).
- In 2003, around two-thirds of the NSW population aged 16 years and over reported low levels of psychological distress (70.1% of males and 64.5% of females). High or very high levels of psychological distress were more commonly reported in NSW by females (12.9%) than by males (9.3%). This pattern is consistent with the findings of national surveys (ABS, 2003). Physical problems were the cause of psychological distress all or most of the time in 18.4% of males and 20.2% of females reporting moderate, high, and very high levels of psychological distress.

For more information:

Australian Bureau of Statistics. *National Health Survey 2001: Mental health*. ABS Catalogue no. 4811.0. Canberra: ABS 2003.

Australian Bureau of Statistics. *Information Paper: Use of the Kessler Psychological Distress Scale in ABS Health Surveys*. Catalogue no. 4817.0.55.001. Canberra: ABS, 2003a. Available at www.abs.gov.au.

High and very high psychological distress by age and sex, persons aged 16 years and over, NSW 2003



Note: Estimates based on 13,003 respondents in NSW. 94 (0.75%) were not stated for psychological distress. Psychological distress was measured using the Kessler 10 (K10) questionnaire, which is a 10-item questionnaire about the level of anxiety and depressive symptoms in the most recent 4-week period. The categories are K10 scores: low =10–15, moderate =16–21, high = 22–29, and very high = 30+.

Source: NSW Health Survey 2003 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Both the National Health Survey in 2001 and NSW Health Survey in 2003 used a 10-item questionnaire, Kessler 10 (or K10), to yield a measure of psychological distress. A very high level of psychological distress, as shown by the K10, may indicate a need for professional help (ABS, 2003a). However, not all individuals scoring high in the K10 questionnaire have diagnostic levels of anxiety and depressive disorders.
- In NSW in 2003, 9.3% of males and 12.9% of females reported high or very high levels of psychological distress.
- High or very high levels were most common among those aged 16–24 years (13.4%), with females reporting higher levels than males in every age group, except those aged over 75 years.
- High and very high levels of psychological distress were more common in those living in areas of greatest socioeconomic disadvantage (13.1%) compared to least disadvantaged areas (8.3%) (Centre for Epidemiology and Research, 2004).
- The National Health Survey, 2001 also showed a very high level of psychological distress in those with no post-school qualifications; who were unemployed or not in the labour force; or who were living in the most socioeconomically disadvantaged areas (ABS, 2003b).

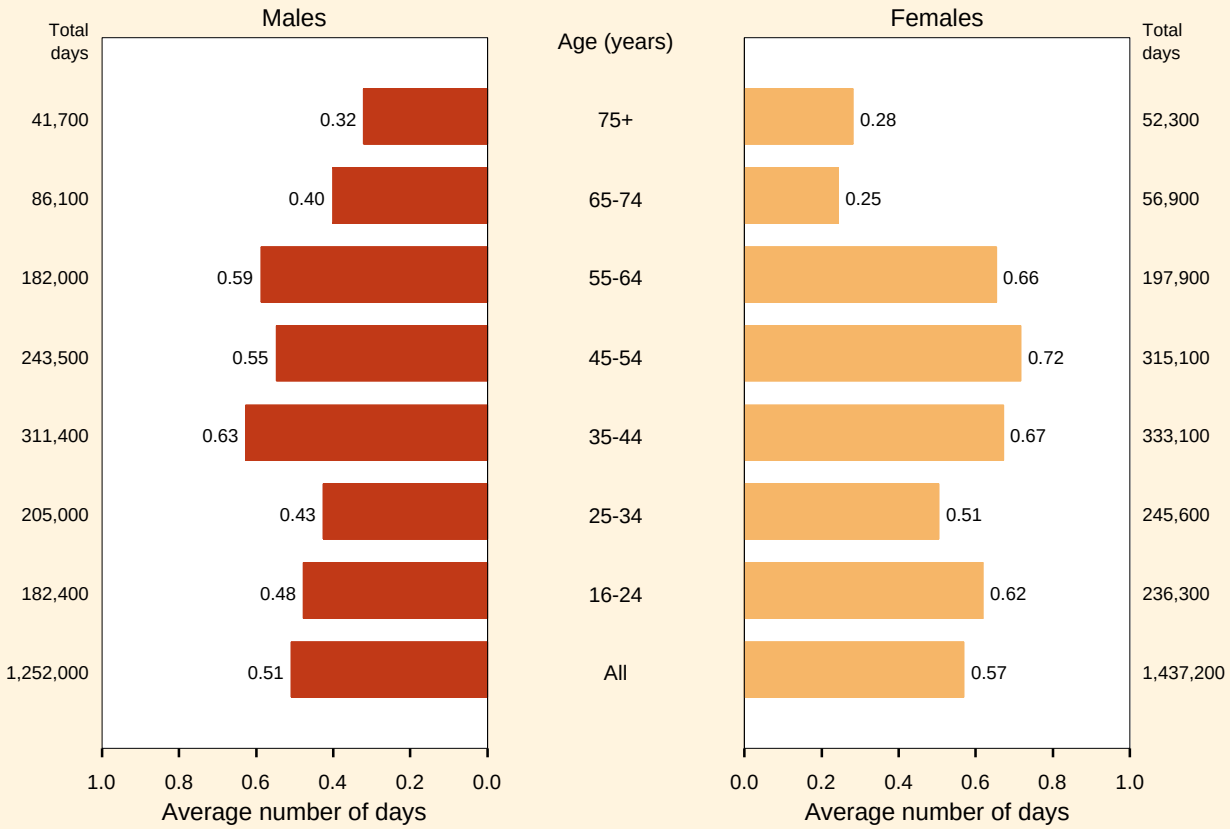
For more information:

Australian Bureau of Statistics. *Information Paper: Use of the Kessler Psychological Distress Scale in ABS Health Surveys.* Catalogue no. 4817.0.55.001. Canberra: ABS, 2003a. Available at www.abs.gov.au.

Australian Bureau of Statistics. *National Health Survey 2001: Mental health.* ABS Catalogue no. 4811.0. Canberra: ABS 2003b.

Centre for Epidemiology and Research, NSW Department of Health. New South Wales Adult Health Survey 2003. *N S W Public Health Bull* 2004; 15(S-4).

Days unable to manage daily activities due to psychological distress in previous 4 weeks by age and sex, persons aged 16 years and over, NSW 2003



Note: Estimates based on 13,003 respondents, of whom 3,546 experienced moderate, high and very high levels of psychological distress. 94 (0.75%) not stated for psychological distress.

Source: NSW Health Survey 2003 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

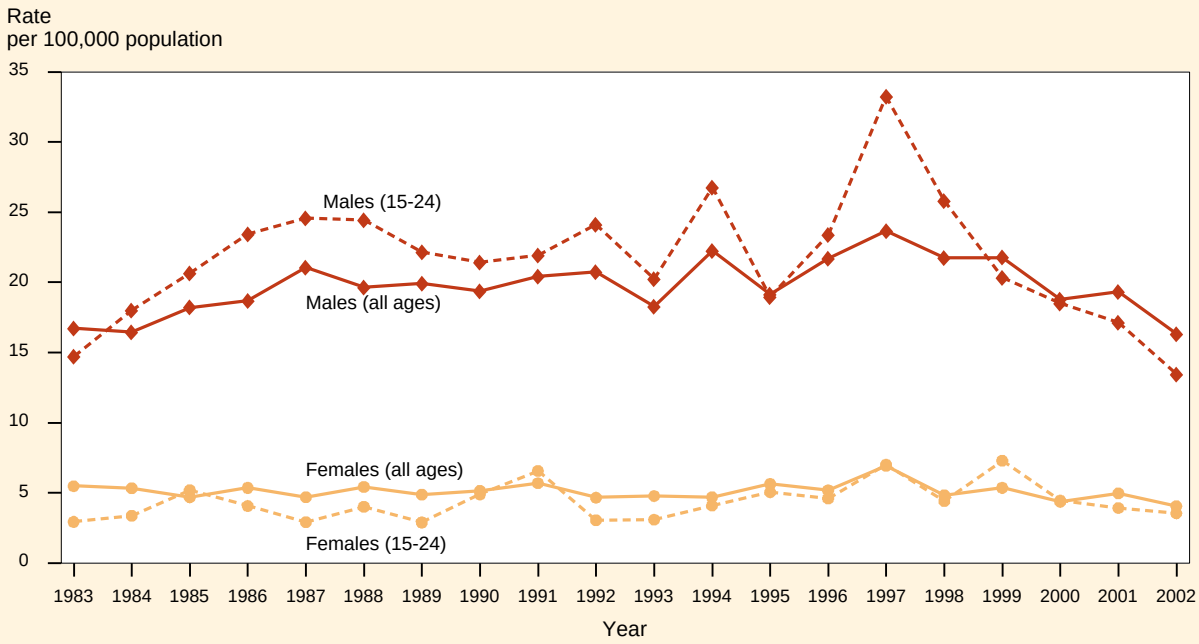
- The NSW Health Survey uses a measure (the Kessler 10 or K10) of psychological distress experienced in the previous 4 weeks. Respondents who indicated more than minimal distress were asked supplementary questions about 'how these feelings may have affected you in the last 4 weeks'.
- The first of these supplementary questions was: 'In the last 4 weeks, how many days were you totally unable to work, study, or manage your day-to-day activities, because of these feelings?' This provides the measure of 'total disability days' shown in the figure.
- Overall, 7.6% of respondents reported one or more days when they were unable to manage daily activities due to psychological distress in the last 4 weeks. The mean number of such 'total disability days' reported by males (0.51) was slightly lower than reported by females (0.57), consistent with higher levels of psychological distress reported by females (ABS, 2003).
- The NSW population burden of psychological distress among people aged 16 years and over, in terms of days when people were totally unable to perform their usual functions, was just over 2.7 million days per 4 weeks, or just over 32 million days per year.

For more information:

Australian Bureau of Statistics. *National Health Survey 2001: Mental health.* ABS Catalogue no. 4811.0. Canberra: ABS 2003.

Centre for Epidemiology and Research, NSW Department of Health. New South Wales Adult Health Survey 2003. *N S W Public Health Bull* 2004; 15(S-4).

Suicide and self-inflicted injury deaths by sex, persons of all ages and 15-24 years, NSW 1983 to 2002



			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	15–24 years	Males	96	125	90	107	150	115	90	82	77	61
		Females	14	18	23	20	30	19	31	19	17	15
	All ages	Males	535	656	572	656	732	677	681	593	622	534
		Females	143	143	176	161	218	155	173	145	167	139
Rate per 100,000 population	15–24 years	Males	20.3	26.8	19.0	23.4	33.2	25.8	20.3	18.5	17.2	13.4
		Females	3.1	4.1	5.1	4.6	7.0	4.4	7.3	4.5	3.9	3.6
	All ages	Males	18.3	22.3	19.2	21.7	23.7	21.7	21.8	18.8	19.3	16.3
		Females	4.8	4.7	5.6	5.2	6.9	4.8	5.4	4.4	5.0	4.1

Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Numbers for 2002 include an estimate of the small numbers of deaths that were registered in 2003, data for which were unavailable at the time of production. Full data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: ABS mortality data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Suicide rates in Australian were ranked eleventh among the rates of 26 OECD countries in 2000 (OECD, 2003).
- The figure shows the most recent available data on deaths by suicide in NSW, by year of occurrence. This differs from reports based on year of registration of death, such as the annual reports by the Australian Bureau of Statistics.
- The rate of suicide can fluctuate considerably from year to year, especially in small population groups.
- In NSW in 2002, the death rate from suicide was 10.1 per 100,000 population (16.3 deaths per 100,000 in males and 4.1 in females), the lowest in 20 years. The death rate from suicide has decreased gradually from the high rates recorded in 1997 of 15.1 per 100,000 population (23.7 deaths per 100,000 in males and 6.6 in females). The suicide death rate in males aged 15–24 years dropped by more than half, from 33.2 deaths per 100,000 in 1997 to 13.4 in 2002. In general, death rates from suicide are about 3–4 times greater in males than in females. This difference is thought to be due mostly to males using more lethal methods than females, as there is less difference in suicide attempts between sexes (OECD, 2003).

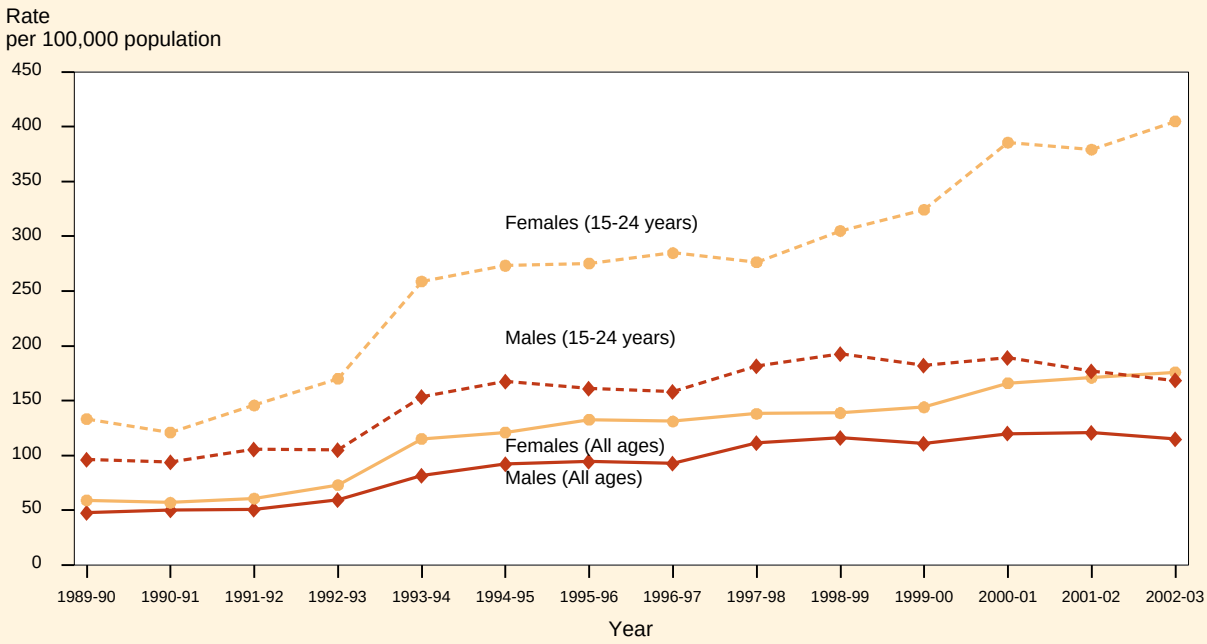
For more information:

NSW Department of Health. *Suicide prevention in NSW.* Sydney: NSW Department of Health, 2003.

Organization for Economic Cooperation and Development. *Health at a glance. OECD indicators 2003.* Paris: OECD, 2003.

Steenkamp M, Harrison J. *Suicide and hospitalised self-harm in Australia. Injury Research and Statistics Series.* AIHW Catalogue no. INJCAT 30. Adelaide: Australian Institute of Health and Welfare, 2000.

Attempted suicide hospital separations by sex, persons of all ages and 15-24 years, NSW 1989-90 to 2002-03



			93–94	94–95	95–96	96–-97	97–98	98–99	99–00	00–01	01–02	02–03
Number	15–24 years	Males	718	782	744	716	808	850	805	844	799	774
		Females	1125	1193	1201	1232	1174	1286	1370	1650	1638	1772
	All ages	Males	2510	2876	2960	2934	3533	3694	3563	3889	3957	3801
		Females	3513	3723	4123	4117	4373	4422	4622	5373	5587	5785
Rate per 100,000 population	15–24 years	Males	153.5	167.5	161.2	158.1	181.6	192.6	182.3	189.3	177.0	168.4
		Females	258.7	273.2	275.3	284.8	276.4	304.8	324.2	385.4	379.0	404.9
	All ages	Males	81.5	92.4	94.7	93.0	111.6	116.0	110.7	119.9	121.0	115.2
		Females	115.1	120.9	132.6	131.1	138.1	138.8	144.0	165.9	171.0	175.9

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Full data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In the 1997 National Survey of Mental Health and Wellbeing, 3.5% of respondents aged 18 and over reported suicidal thoughts in the previous 12 months, and about 12% of that group reported having made a suicide attempt (Pirkis et al., 2000). This corresponds to about 18,000 attempts in NSW in a year by people aged 18 and over.
- Most people who contact health services after a suicide attempt are seen by emergency departments. They may or may not be admitted as hospital inpatients, and the injury may or may not be recorded as intentional. In recent years, there have been more than 9,000 recorded hospitalisations per year following suicide attempts.
- The increases in hospitalisation rates due to suicide attempts recorded since 1989–90 are likely to be influenced by admission or classification factors. For example, the increase recorded after 1996–97 may reflect revised protocols for management of suicide risk that were issued in 1998.
- Hospitalisation rates for suicide attempts are consistently higher in females than in males, while death rates from suicide are about 3–4 times greater in males. This is mostly due to males using more lethal methods than females.

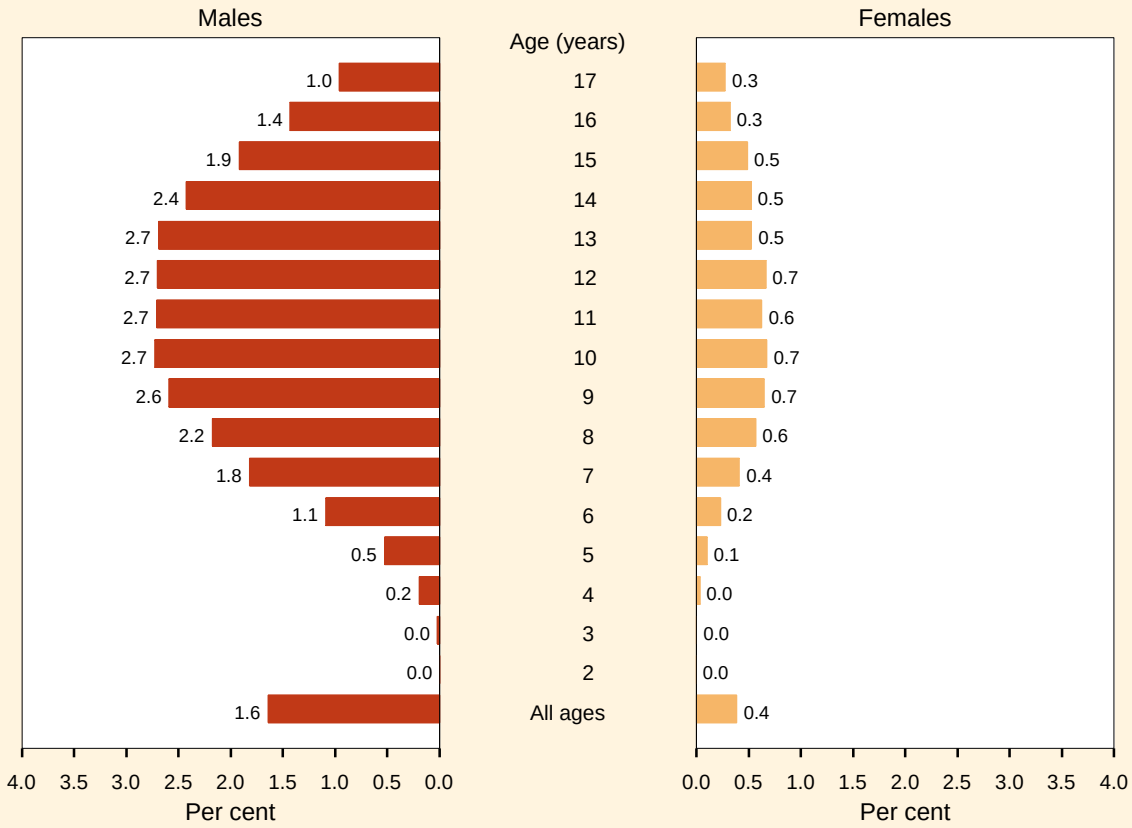
For more information:

NSW Department of Health. *Suicide prevention in NSW.* Sydney: NSW Department of Health, 2003.

NSW Department of Health. *Policy guidelines for the management of patients with possible suicidal behaviour for NSW Health staff and staff in private health facilities.* Sydney: NSW Department of Health Circular 92/31, 1998.

Pirkis J, Burgess P, Dunt D. Suicidal ideation and suicide attempts among Australian adults. *Crisis* 2000; 21: 16–25.

Attention deficit hyperactivity disorder treatment with stimulant medication by age and sex, children aged 2-17 years, NSW 1 December 2003



Note: Data are based on prescriptions issued by doctors granted an authority for individual patients and by specialist doctors granted a general authority to prescribe to patients who meet specified criteria. Full data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: Pharmaceutical Drugs of Addiction System, Pharmaceutical Service Branch, NSW Department of Health, and ABS population estimates (HOIST), Centre for Epidemiology and Research, NSW Department of Health.

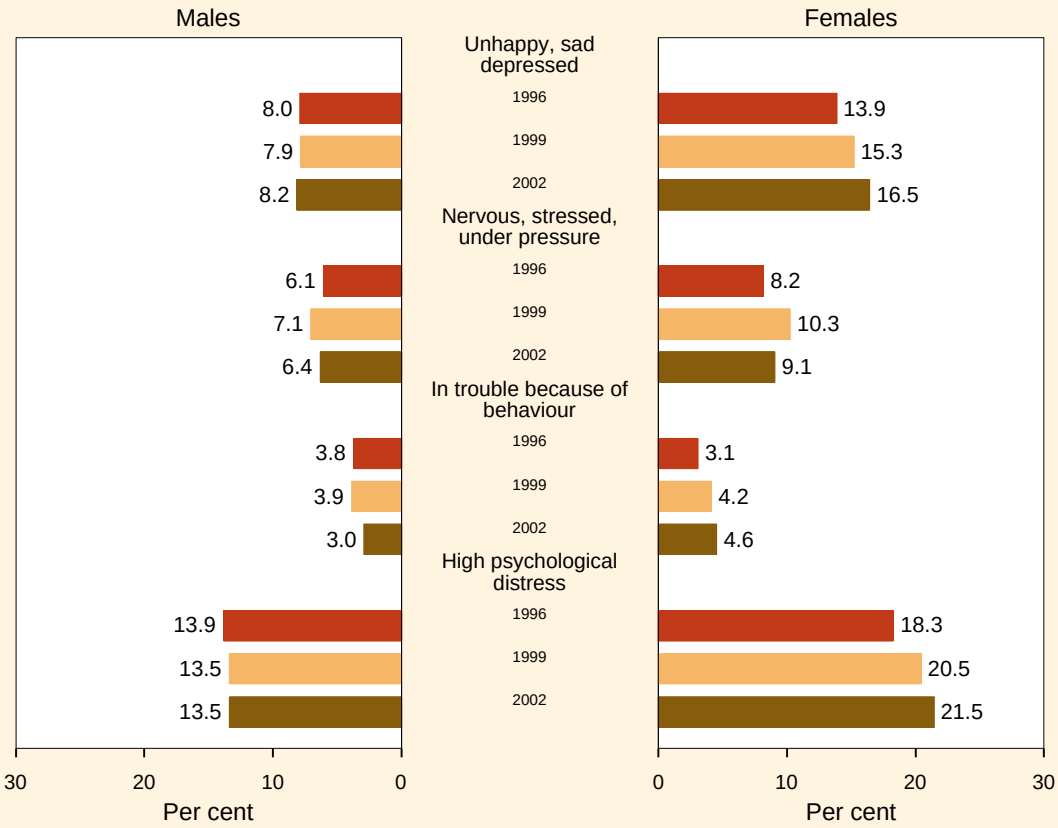
- Attention deficit hyperactivity disorder (ADHD) is a chronic condition, characterised by the symptoms of inattention, hyperactivity, and impulsivity. As these behaviours can be seen to some degree in most children at some time, diagnosis of ADHD requires assessment by an experienced clinician. Children with ADHD may experience difficulties at school, social problems, and long-term consequences such as poor academic achievement and antisocial behaviour (Salmelainen, 2002). ADHD may affect up to 11% of Australian children aged 6–17 years, and boys are affected at least twice as frequently as girls (Sawyer et al., 2000).
- Up to 90% of children who are treated with stimulant medication experience a reduction in symptoms. In NSW, the prescribing of stimulant medication for treatment of ADHD is restricted to specialist prescribers.
- Over the period 1990–2000, there was a marked increase in the number of children and adolescents who were commenced on stimulant medication for ADHD for the first time, with most of the increase occurring early in the decade.
- The treatment rate in 2000 was 1.1% of all children aged 2–17 years and in 2003 it was 1.0% of all children. These rates were well below the estimated treatment rate of 3% in the United States. The highest rates of treatment occurred in children aged 7–15 years, and the treatment rate for boys was about 4 times that for girls (Salmelainen, 2002). Reasons for the increase include increased awareness about ADHD, better knowledge about the effectiveness of stimulant medication, and greater availability of ADHD-specific services (Salmelainen, 2002).

For more information:

Salmelainen P. Trends in the prescribing of stimulant medication for the treatment of Attention Deficit Hyperactivity Disorder in children and adolescents in NSW. *N S W Public Health Bull* 2002; 13(S-1).

Sawyer M, Arney FM, Baghurst PA et al. *Mental health of young people in Australia.* Canberra: Commonwealth Department of Health and Aged Care, 2000.

High psychological distress by category and sex, secondary school students aged 12-16 years, NSW 1996, 1999 and 2002



Note: Estimates based on 4847 respondents in 1996, 3651 in 1999, and 3506 in 2002. High psychological distress defined as response of 'almost more than I can take' to one or more of the following 3 questions: 'How bad was it for you, when you were feeling unhappy, sad or depressed / nervous, stressed or under pressure / in trouble because of your behaviour?'.

Source: NSW Department of Health. The health behaviours of secondary school students in New South Wales 2002. *N S W Public Health Bull* 2004; 15(S-2).

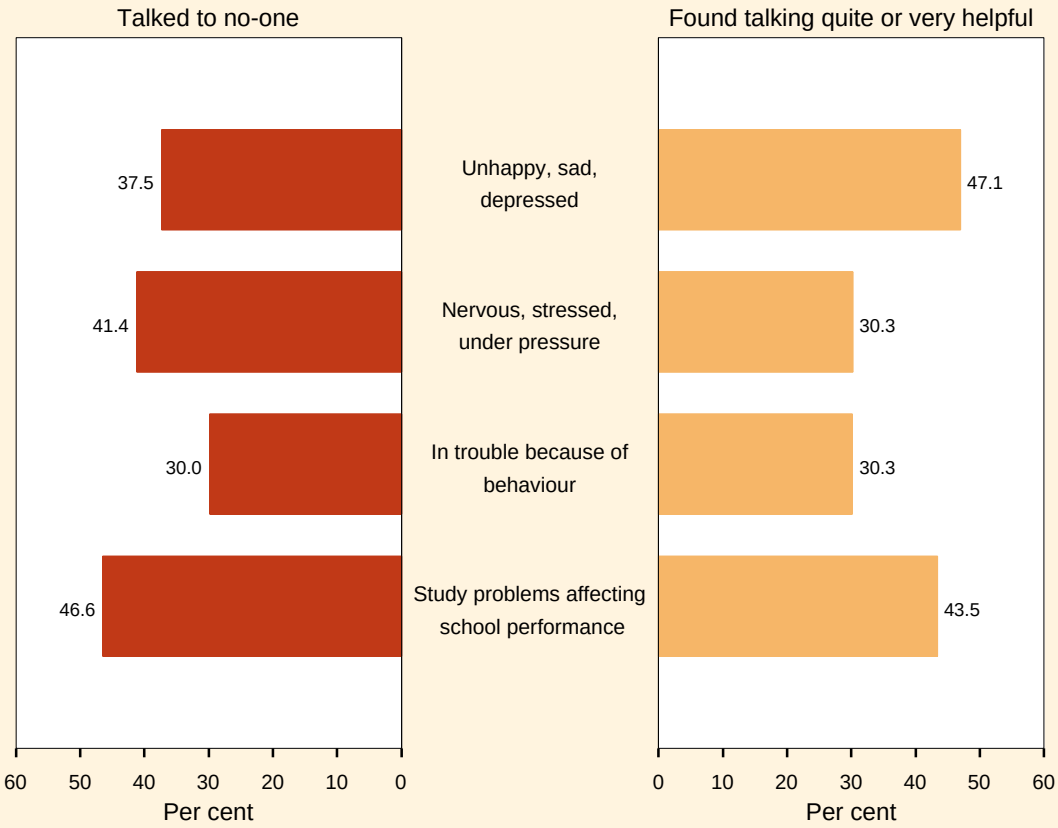
- Psychological distress refers to a range of feelings experienced by people who may have identifiable mental health problems such as anxiety or mood disorders, or who may be highly stressed for situational reasons. High psychological distress has been shown to be associated with increased rates of substance use and poor school performance.
- Psychological distress in the Australian Secondary Schools' Alcohol and Drugs Surveys was identified by questions that asked if the student had experienced feelings of depression, anxiety, or stress from being in trouble about their behaviour in the last 6 months. Those who had experienced a problem were asked 'how bad' it was for them at the time. A student who responded 'almost more than I can take' to any of the 3 problems was considered to have experienced high psychological distress (NSW Health, 2004).
- Using this definition, high psychological distress was reported by about one in 6 (17.5%) secondary school students in 2002 and was reported more commonly by females than males (21.5% versus 13.5%). The proportion of females reporting high psychological distress increased from 18.3% in 1996 to 21.5% in 2002. There was a slight decrease, by 0.4%, in males over the same period (NSW Health, 2004).
- These results are comparable with previous Australian studies that used other methods of measuring psychological distress in young people.

For more information:

NSW Department of Health. The health behaviours of secondary school students in New South Wales 2002. *N S W Public Health Bull* 2004; 15(S-2).

NSW Department of Health. *NSW School-LInk initiative*. Sydney: NSW Department of Health, 2003. Available at www.health.nsw.gov.au/pubs/s/pdf/well_school-link.pdf.

High psychological distress by category and action taken, secondary school students aged 12-16 years, NSW 2002



Note: Estimates based on 613 respondents who reported high psychological distress. Respondents choose from the following categories, 'talked to: no-one, family, friend/s, teachers or school counsellors, doctors or other health professionals', and from 'taking was found to be: not at all helpful, somewhat helpful, quite helpful, very helpful'. Respondents could choose more than one answer, so the total may be more than 100%.

Source: NSW Department of Health. The health behaviours of secondary school students in New South Wales 2002. *N S W Public Health Bull* 2004; 15(S-2).

- Psychological distress refers to a range of feelings experienced by people who may have identifiable mental health problems such as anxiety or mood disorders, or who may be highly stressed for situational reasons.
- High psychological distress was reported by 17.5% of students in the Australian Secondary Schools' Alcohol and Drugs Survey in 2002. Secondary school students who experience distressing problems at a level they describe as 'almost more than I can take' are, by their own account, near the end of their own coping resources. They are likely to be at greater risk of mental ill health if there is no relief from this experience either at home or at school.
- Talking about problems may help to relieve psychological distress, or may lead to contact with services that can assist the young person. However, 37% of students experiencing high psychological distress due to feelings of depression talked to no-one. Of those who did talk to someone, 47.1% found this quite or very helpful. Overall, 7% of students experienced high psychological distress at home and at school and either talked to no-one, or talked to someone but found it 'not at all helpful'. These are a particularly vulnerable group of young people (NSW Department of Health, 2004).

For more information:

NSW Department of Health. The health behaviours of secondary school students in New South Wales 2002. *N S W Public Health Bull* 2004; 15(S-2).

NSW Department of Health. *NSW School -Link initiative*. Sydney: NSW Department of Health, 2003. Available at www.health.nsw.gov.au/pubs/s/pdf/well_school-link.pdf.

Chapter 4.7

Oral Health

- Overall, oral health in NSW is good by world standards. However, oral health varies with age, and among population subgroups.
- Among children:
  - around one-third have evidence of tooth decay;
  - less than one-half have a dental check-up each year;
  - fewer than one in 5 have a filling each year;
  - hospitalisations for the removal or restoration of teeth have increased in recent years.
- Among adults:
  - just over one-third have all of their natural teeth;
  - just under one in 10 have no natural teeth, increasing to more than one-third among people aged 75 years or more;
  - around one in 10 have a dental check-up each year;
  - more than one-quarter have a filling each year;
  - hospitalisations for the removal or restoration of teeth have increased in recent years.
- Oral health is worse in rural or remote areas. Compared with residents of urban areas, residents of rural areas:
  - have more tooth decay (children);
  - are more likely to have no natural teeth (adults);
  - have less frequent dental check-ups;
  - have fewer preventive dental treatments.

In this chapter

Introduction

Dental caries is the most prevalent health problem, and periodontal diseases are the fifth most prevalent health problem, in Australia. About 90% of all tooth loss can be attributed to these 2 health problems and, because they are preventable and treatable, most tooth loss is avoidable (AHMAC, 2001). In recent decades, factors such as changes in diet, reduced sugar consumption, exposure to fluoride, and changes in disease management, have contributed to significant improvements in oral health. Australians in all states and territories enjoy a relatively high standard of oral health. However, this high standard is not equally distributed among different age and social groups.

Oral health is affected by a complex interplay of social, environmental, and economic factors. Specific population groups, such as refugees and prison inmates, continue to experience extensive oral disease. People living in disadvantaged circumstances experience more oral disease, and more barriers in accessing care, than people living in more advantaged circumstances (AHMAC, 2001).

Currently, public health effort is focused on identifying disadvantaged populations that require special attention and, in the NSW population as a whole, on oral health promotion, disease prevention, and improving access to services. Information on the oral health of Aboriginal and Torres Strait Islander people is presented in Chapter 3.1. This chapter presents an overall picture of the oral health of the people of NSW.

Data presented in this chapter come from 4 main sources. The New South Wales Adult Health Survey 2003 supplied data on dental status and ambulatory treatment patterns in adults, while the New South Wales Child Health Survey 2001 provided data on treatment patterns in children. Data on hospitalisations for the removal or restoration of teeth and dental ambulatory care sensitive conditions came from the NSW Inpatient Statistics Collection.

More information on the methods used for analysing data is given in the Methods section.

For more information:

Australian Health Ministers' Advisory Committee. *Oral health of Australians: National planning for oral health improvement: Final report*. Adelaide: South Australian Department of Human Services, 2001.

Australian Institute of Health and Welfare Dental Statistics and Research Unit. *National Dental Telephone Interview Survey 2002. AIHW Catalogue no. DEN 128.* Adelaide: AIHW, 2003.

Australian Institute of Health and Welfare Dental Statistics and Research Unit. *Child Dental Health Survey, New South Wales, 2000*. Adelaide: AIHW, 2003.

Centre for Epidemiology and Research, NSW Department of Health. New South Wales Adult Health Survey 2003. *N S W Public Health Bull* 2004; 15(S-4).

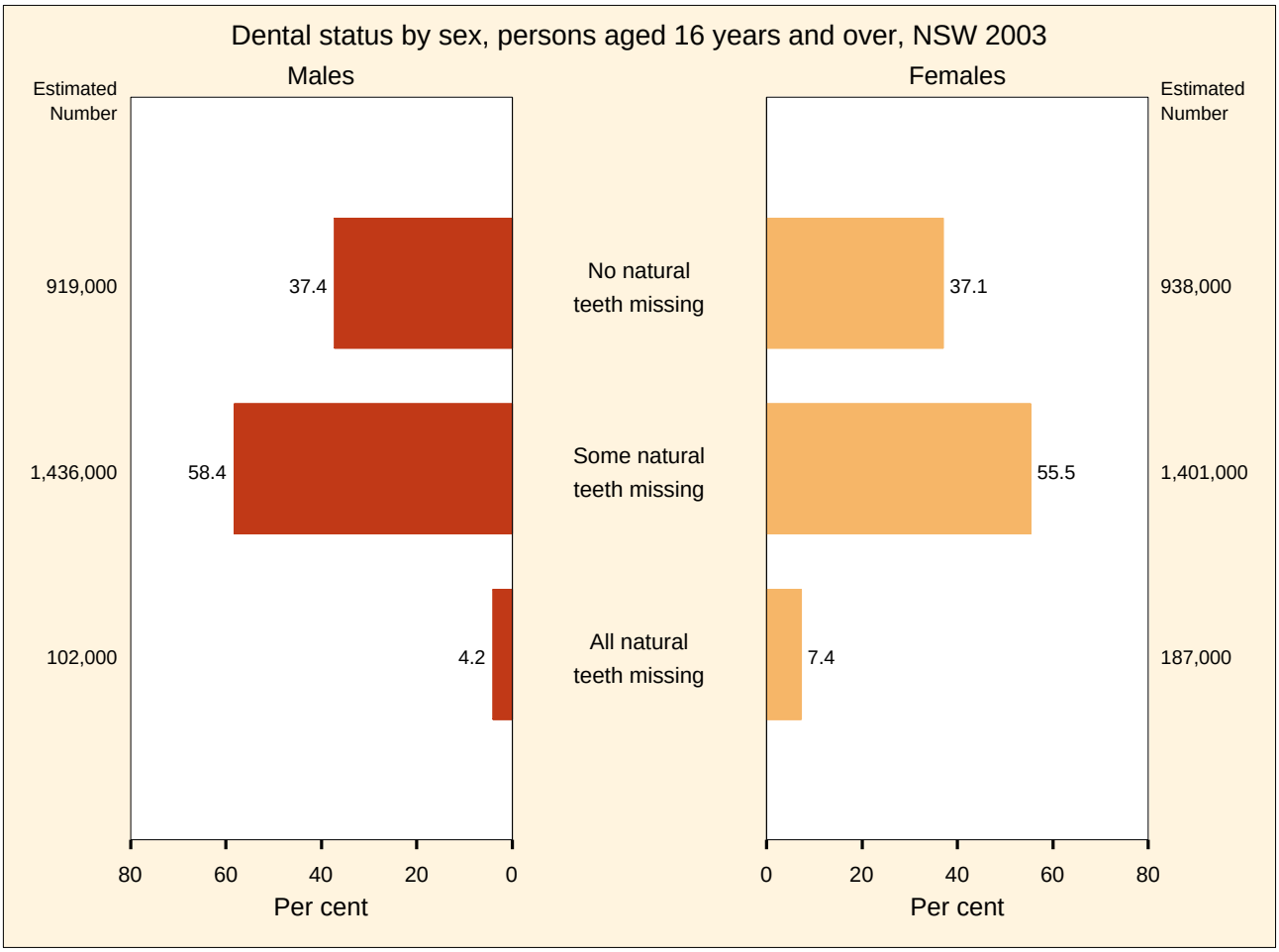
Centre for Epidemiology and Research, NSW Department of Health. New South Wales Child Health Survey 2001. *N S W Public Health Bull* 2002; 13(S-4).

Australian Institute of Health and Welfare. Dental Statistics and Research Unit website at www.adelaide.edu.au/spdent/dsru.

Australian Dental Association website at www.ada.org.au.

Australian Institute of Health and Welfare Dental Statistics and Research Unit. *Oral health and access to dental care: 1994–96 and 1999. Research report.* Adelaide: AIHW, March 2001.

Australian Institute of Health and Welfare Dental Statistics and Research Unit. *Oral health of public dental patients in rural areas. Research Report no. 12*. Adelaide: AIHW, 2002.



Note: Estimates based on 13,003 respondents. 5 (0.04%) not stated for natural teeth missing.

Source: NSW Health Survey 2003 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Dental caries (tooth decay) and periodontal diseases (gum diseases) are the most common oral health problems. Both are preventable and if not treated early will result in tooth loss. About 90% of all tooth loss can be attributed to these 2 oral health conditions (AHMAC, 2001). The loss of a tooth indicates failure of all preventive and restorative efforts (AIHW, 2003).
- In 2003, among NSW residents aged 16 years and over, 37.3% reported that they had all of their natural teeth, 56.9% reported that they had some teeth missing, and 5.8% reported that they had all teeth missing (edentulism). A significantly higher proportion of females (7.4%) than males (4.2%) had all their natural teeth missing. As expected, rates of edentulism increased with age from 6.6% and 12% in males and females aged 55–64 years, to 26.2% and 36.3% in males and females aged over 75 years. A small proportion of males aged 16–44 years (0% to 0.3%) and females aged 16–44 years (0.1% to 3.8%) had all their natural teeth missing (Centre for Epidemiology and Research, 2004).
- Over the years, the proportion of people who had all their natural teeth missing decreased significantly (8.3% in 1998, 6.9% in 2002, and 5.8% in 2003).
- Results from the National Dental Telephone Interview Survey 2002 showed that the rate of edentulism was lower in major cities (6.8%) and higher in regional areas (12.3% in inner-regional areas and 10.3% in outer-regional areas) (AIHW, 2003).

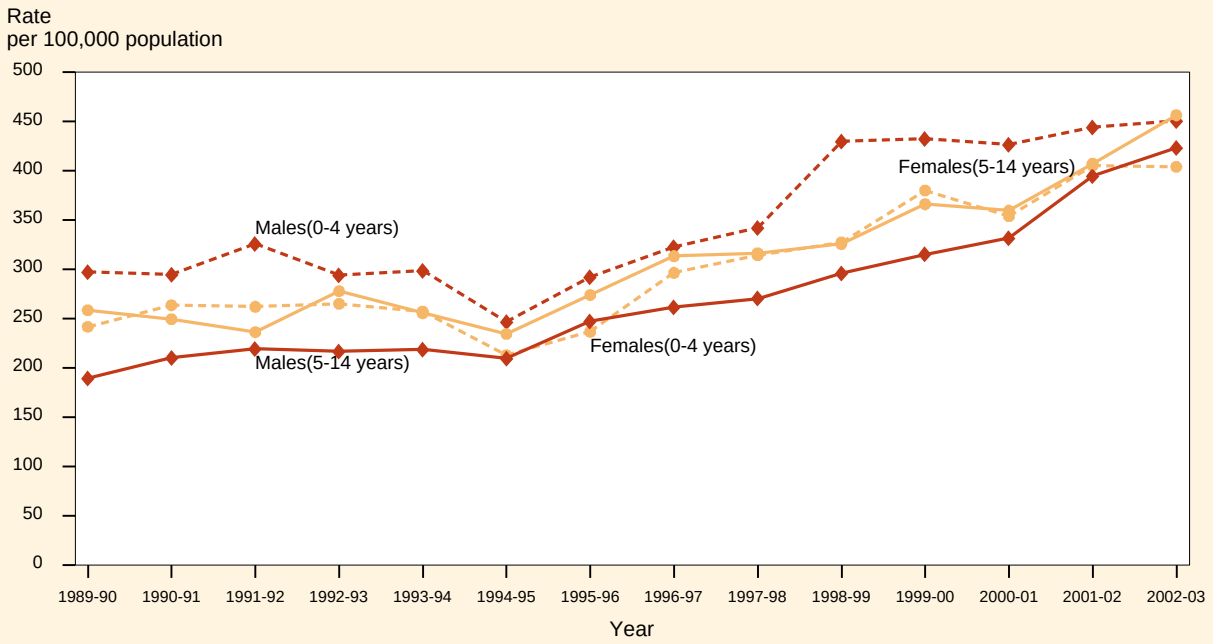
For more information:

Centre for Epidemiology and Research, NSW Department of Health. New South Wales Adult Health Survey 2003. *N S W Public Health Bull* 2004; 15(S-4).

Australian Institute of Health and Welfare Dental Statistics and Research Unit. *National Dental Telephone Interview Survey 2002.* AIHW Catalogue no. DEN 128. Adelaide: AIHW, 2003.

Australian Institute of Health and Welfare Dental Statistics and Research Unit. *Oral health and access to dental care: 1994–96 and 1999. Research report.* Adelaide: AIHW, March 2001.

Hospital separations for removal and restoration of teeth by sex, children aged 0-4 and 5-14 years, NSW 1989-90 to 2002-03



			93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	0-4 years	Persons	1224	1013	1165	1362	1442	1659	1771	1710	1850	1841
	5-14 years	Persons	2016	1905	2259	2514	2585	2765	3052	3120	3636	3968
	All ages	Persons	19168	18164	19691	20428	20345	21200	22202	22362	26899	27655
Rate per	0-4 years	Persons	278.4	230	265	309.7	328.4	379.6	406.6	391	424.9	427.8
100,000	5-14 years	Persons	236.5	221.6	260.1	286.8	292.6	310.4	339.9	345	400.8	439.2
population	All ages	Persons	302	286	309.3	320.2	319	331.5	345.1	344.5	411.6	420.9

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

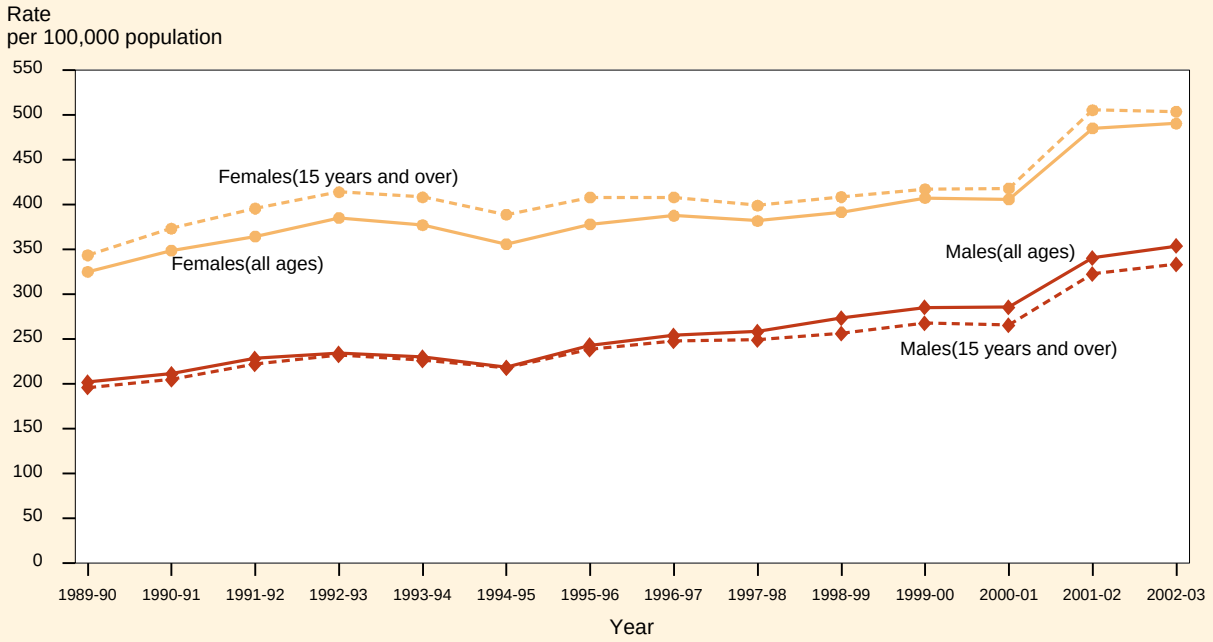
- Hospitalisation rates for the removal or restoration of teeth among children under the age of 5 years increased by 58.4% between 1989–90 and 2002–03. The rates for both males and females remained fairly steady until 1994–95 and then increased each year.
- In the last 5 years, the main dental procedure performed in infants and young children aged 0–4 years was extraction of a tooth using forceps and non-surgical removal of a tooth (45.1%), followed by restoration of a tooth by filling (12.8%) and surgical removal of tooth (24.1%). The need for extractions and fillings is dictated by dental caries. In this age group, prolonged daily use of nursing bottles contributes to dental caries.
- Hospitalisation rates for the removal or restoration of teeth among children aged 5–14 years increased by 80% over the period 1989–90 to 2002–03. The main procedures performed in older children in the last 5 years were surgical extraction of teeth (43.2%), extraction of tooth using forceps and non-surgical removal of tooth (36.0%), and restoration of tooth by filling (12.1%). Poor dietary and oral hygiene practices are likely to be major contributing factors to dental caries at this age. Some children may be admitted because their behaviour makes dental procedures difficult to perform in outpatient settings.

For more information:

Australian Institute of Health and Welfare Dental Statistics and Research Unit. *Child Dental Health Survey, New South Wales, 2000.* Adelaide: AIHW, 2003.

Australian Institute of Health and Welfare Dental Statistics and Research Unit. Dental health differences between boys and girls. *The Child Dental Health Survey, Australia 2000.* AIHW Catalogue no. DEN 131 Canberra: AIHW, 2004.

Hospital separations for removal and restoration of teeth by sex, persons of all ages and 15 years and over, NSW 1989-90 to 2002-03



			93–94	94–95	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03
Number	15 years and over	Persons	15928	15246	16267	16552	16318	16776	17379	17532	21413	21846
	All ages	Persons	19168	18164	19691	20428	20345	21200	22202	22362	26899	27655
Rate per	15 years and over	Persons	315.5	301.9	321.6	327.0	322.8	331.2	340.9	340.5	412.4	417.1
100,000 population	All ages	Persons	302.0	286.0	309.3	320.2	319.0	331.5	345.1	344.5	411.6	420.9

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

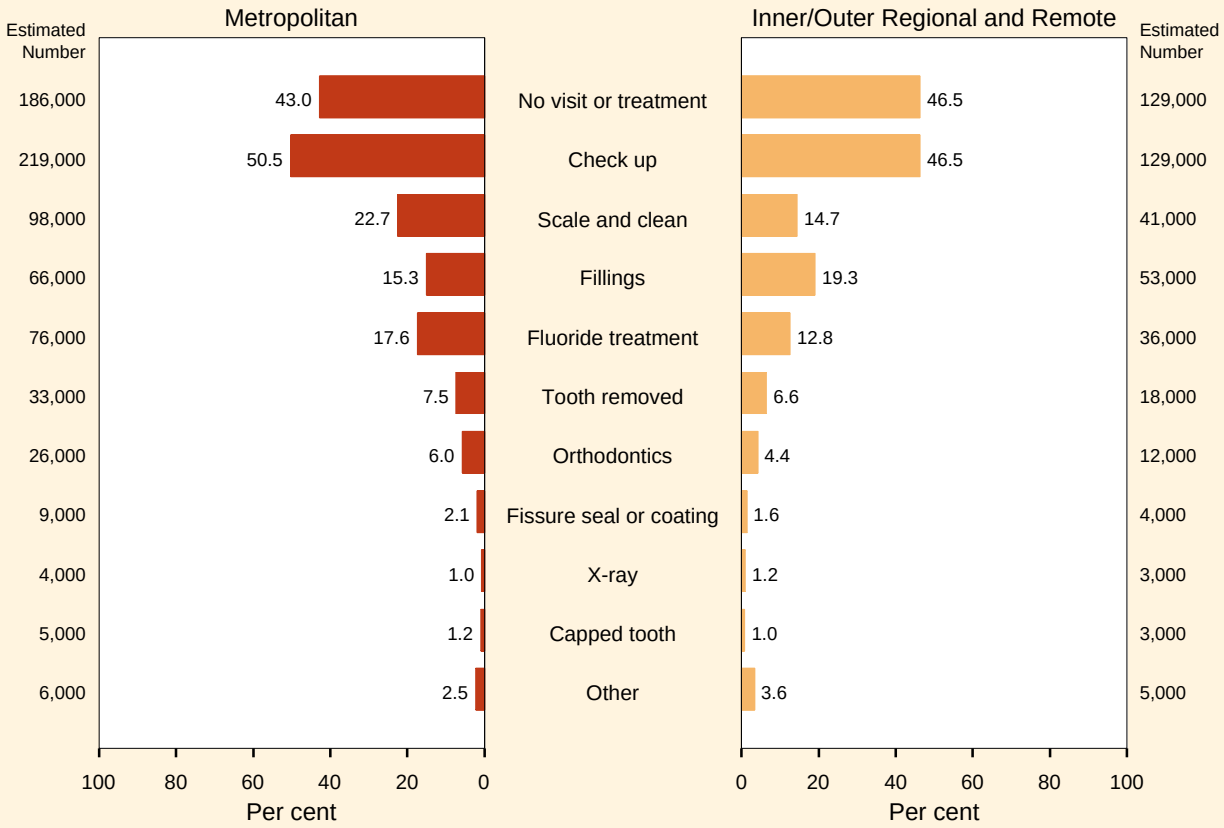
- Between 1989–90 and 2002–03, the rate of hospitalisation for the removal or restoration of teeth in persons aged 15 years and over increased by more than one-half (55.6%). Removal of wisdom teeth, classified as 'unerupted or partially-erupted tooth with removal of bone or tooth division' accounted for about one-half the increase from 2000–01 to 2001–02. However, coding changes in the same period may also have contributed to the increase. The hospitalisation rate for females in this age group was consistently around 80% higher than the rate for males.

- The majority of hospitalisations among adults were for surgical removal of teeth. Close to three-quarters (72.8%) of all admissions for surgical removal of teeth in the last 5 years were among people between 15 and 34 years old. Most of these were for removal of wisdom teeth.

For more information:

Australian Health Ministers' Advisory Committee. *Oral health of Australians: National planning for oral health improvement: Final report.* Adelaide: South Australian Department of Human Services, 2001.

Dental visits and treatment in previous 12 months by type and region, children aged 5-12 years, NSW 2001



Note: Estimates based on 5,887 respondents. Respondents could name more than one treatment type. Percentages will total more than 100. ARIA+ category of major cities was classified as metropolitan.

Source: NSW Child Health Survey 2001 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- The oral health of NSW children has improved over recent decades, with a dramatic decline in dental caries (decay) experience. However, inequalities persist, and there is evidence of differential access to dental services according to country of birth, language spoken at home, insurance status, and mother's educational status (AIHW, 2000). School dental services are utilised more by children who are less advantaged (AIHW, 2000).
- In the New South Wales Child Health Survey 2001, more than one-half of children aged 5–12 years (55.8%) were reported to have had a dental visit or treatment in the previous 12 months. The most frequent dental treatments reported were check-up (48.9%), scale and clean (19.4%), fillings (17.2%), fluoride treatment (15.4%), removal of teeth (7.3%), and orthodontics (5.6%). Fillings were more commonly reported among children resident in inner-regional, outer-regional and remote areas, while preventive treatments (scale and clean and fluoride treatment) were more frequently reported among children resident in metropolitan areas. Children resident in metropolitan areas were also more likely to receive orthodontic treatment.

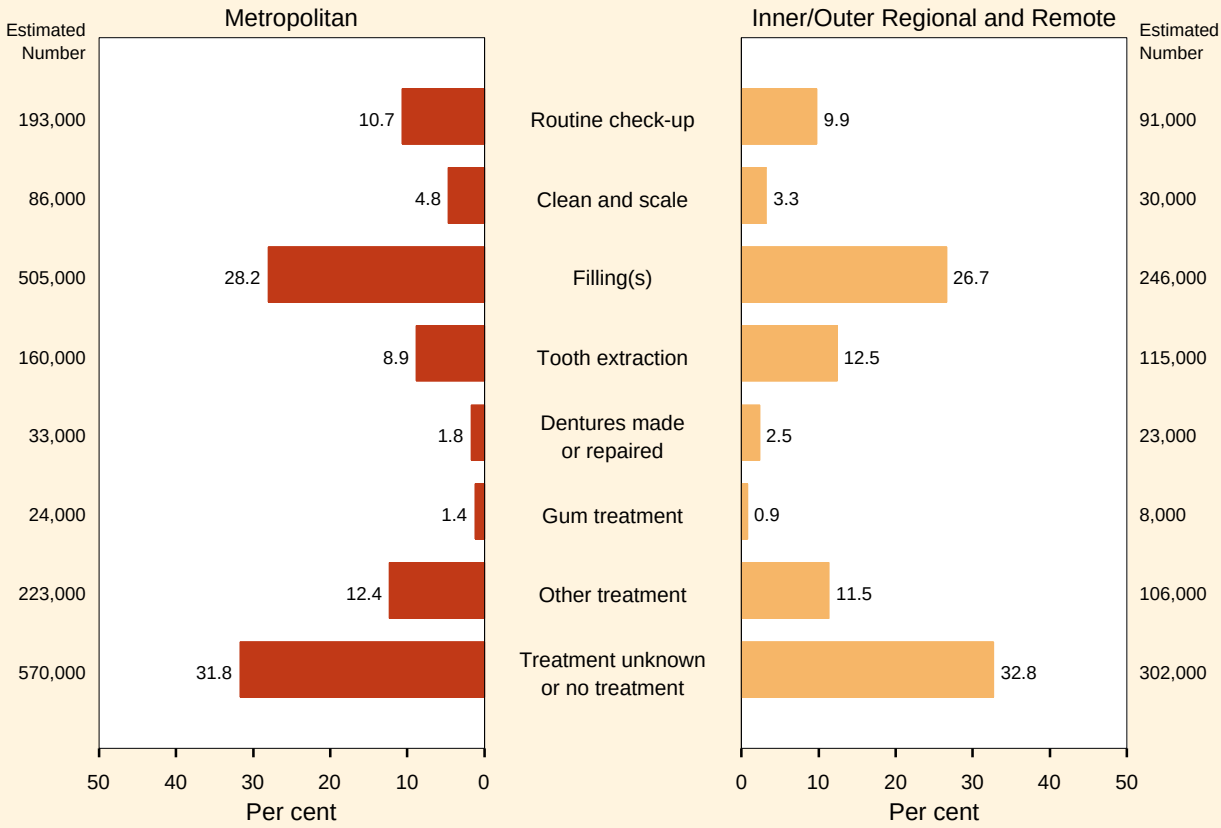
For more information:

Centre for Epidemiology and Research, NSW Department of Health. New South Wales Child Health Survey 2001. *N S W Public Health Bull* 2002; 13(S-4).

Australian Institute of Health and Welfare Dental Statistics and Research Unit. *Child Dental Health Survey, New South Wales, 2000.* Adelaide: AIHW, 2003.

Australian Institute of Health and Welfare Dental Statistics and Research Unit. *Access to Dental Services of Australian Children and Adolescents. Research Report.* Adelaide: AIHW, 2000.

Dental treatment in previous 12 months by type and region, persons aged 16 years and over, NSW 2003



Note: Estimates based on 15,557 dentate respondents (with at least one natural tooth). 61 (0.4%) not stated for time since last visit to a dental professional or type of dental treatment in the previous 12 months. Respondents could name more than one treatment type. Percentages will total more than 100. ARIA+ category of major cities was classified as metropolitan.

Source: NSW Health Survey 2003 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

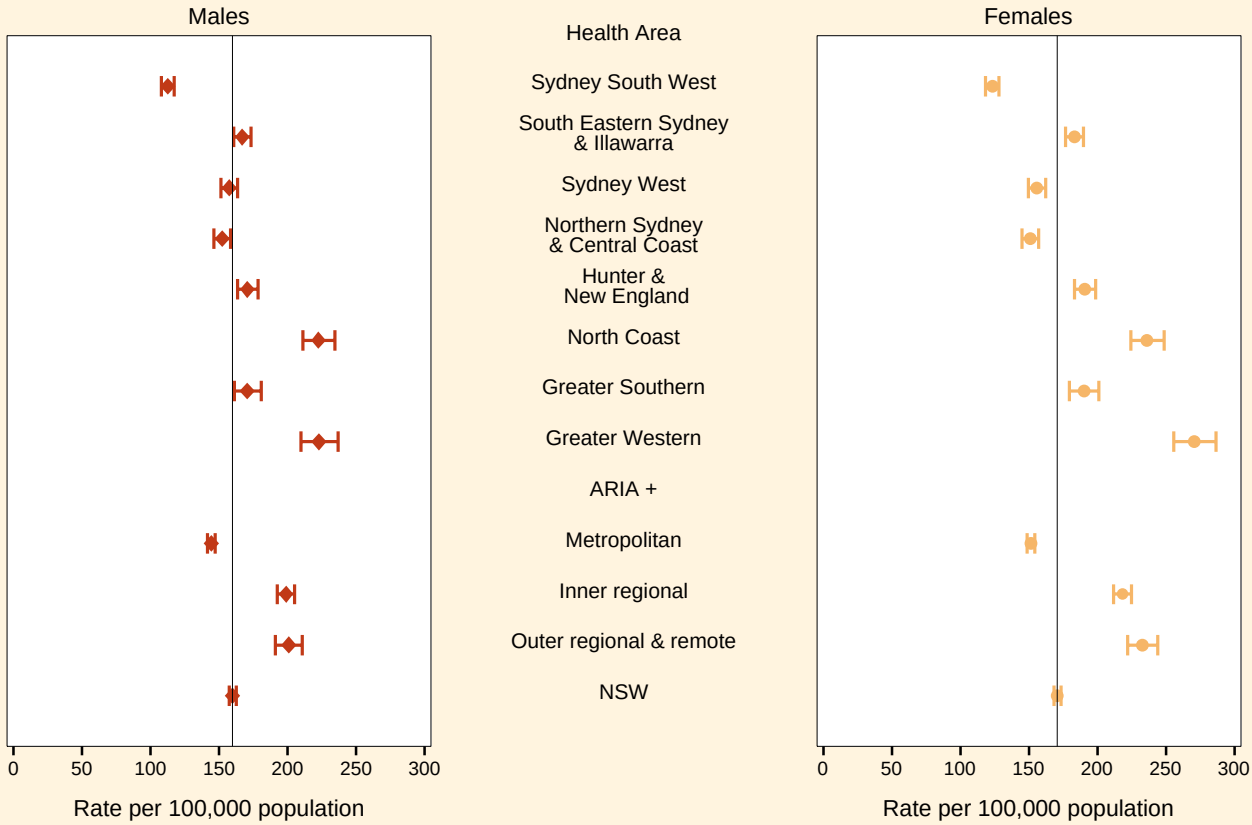
- Individuals who see a dentist for the purpose of a dental check-up are more likely to benefit from early detection and timely treatment of oral disease, and ongoing preventive care. In contrast, those who see a dentist when they are experiencing a dental problem are more likely to receive unfavourable outcomes such as extractions (AIHW, 2003).
- Overall, in 2003, 39.6% of NSW residents aged 16 years and over reported that they had seen a dentist less than 12 months ago, 23.1% had seen a dentist one to less than 2 years ago and 36.2% had seen a dentist 2 years ago or more. A small proportion (1.1%) reported that they had never seen a dentist.
- Respondents reported fillings (27.7%) as the most common type of dental treatment. Residents of inner-regional, outer-regional, and remote areas (12.5%) reported more tooth extraction than residents of metropolitan areas (8.9%).
- In the 2002 National Dental Telephone Survey, the majority of residents from major cities (74.9%), inner-regional areas (65.6%), outer-regional areas (69.3%) and remote–very remote areas (69.8%) received scale and clean treatments. The proportion of residents from these locations who received fillings varied from 37.6% to 46.7%. Residents from outer-regional areas received more extractions (21.6% compared to 17.0% for major cities, 17.8% for inner regional and 17.7% for remote–very remote areas) (AIHW, 2003).

For more information:

Centre for Epidemiology and Research, NSW Department of Health. New South Wales Adult Health Survey 2003. *N S W Public Health Bull* 2004; 15(S-4).

Australian Institute of Health and Welfare Dental Statistics and Research Unit. *National Dental Telephone Interview Survey 2002.* AIHW Catalogue no. DEN 128. Adelaide: AIHW, 2003.

Ambulatory care sensitive conditions: hospital separations for dental conditions by sex and health area, NSW 2000-01 to 2002-03 combined



Health area		Hospitalisations	Rate per 100,000 population	LL 95% CI	UL 95% CI
Sydney South West	Persons	4602	117.8	114.4	121.2
South Eastern Sydney & Illawarra	Persons	5793	175.1	170.6	179.7
Sydney West	Persons	5111	156.3	152.1	160.7
Northern Sydney & Central Coast	Persons	4851	151.2	147.0	155.6
Hunter & New England	Persons	4393	180.6	175.3	186.1
North Coast	Persons	2992	229.2	220.8	237.7
Greater Southern	Persons	2467	180.2	173.1	187.5
Greater Western	Persons	2284	246.0	236.0	256.4
Metropolitan	Persons	20681	147.7	145.7	149.7
Inner-regional	Persons	8392	208.1	203.7	212.7
Outer-regional and remote	Persons	3410	216.3	209.0	223.8
NSW	Persons	32598	165.1	163.3	166.9

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. LL/UL 95% CI = Lower and Upper limits of the 95%confidence interval. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST), ambulatory care sensitive hospitalisation definitions modified from Victorian Department of Human Services 2002.

- Ambulatory care sensitive (ACS) conditions are those for which hospitalisation is considered potentially avoidable through preventive care and early management, usually delivered through primary health care (VDHS, 2004). A range of dental conditions are defined as ambulatory care sensitive, including dental caries and periodontal diseases.
- In NSW during the period 2000–01 to 2002–03, dental conditions were ranked eighth among all ACS conditions. Hospitalisation rates ranged from 117.8 per 100,000 population in Sydney South West to 246.0 per 100,000 population in the Greater Western Health Area.
- Hospitalisation rates for ACS dental conditions were almost twice as high in inner- and outer-regional, remote, and very remote areas in NSW, compared with metropolitan areas.

For more information:

Victorian Department of Human Services. *The Victorian ambulatory care sensitive conditions study, 2001–02.* Melbourne: VDHS, July 2004.

Chapter 4.8

Pregnancy and the newborn

- Overall, NSW mothers and babies enjoy very good health, though Aboriginal and Torres Strait Islander mothers and babies, and those from socioeconomically disadvantaged areas, continue to have poorer health.
- Around 87,000 births are registered each year.
- The birth rate in NSW is declining, but not as steeply as in Australia as a whole. The average woman in NSW can currently expect to give birth to 1.8 babies in her lifetime. The trend toward delayed childbirth continues.
- The teenage pregnancy rate is gradually declining, although it has remained consistently higher in rural areas.
- Among NSW mothers:
  - about half take folate supplements, both one month before and in the first trimester of pregnancy, as recommended to prevent neural tube defects;
  - there are around 8 deaths due to pregnancy or its management each year, representing less than one in 10,000 pregnancies;
  - the majority (81.3%) place their babies on their back to sleep from birth, the preferred position for prevention of sudden infant death syndrome (SIDS);
  - there is an increasing trend towards commencing antenatal care before 20 weeks gestation.
- Among NSW babies:
  - about one-third of those born to mothers aged 35 years and over undergo prenatal cytogenetic tests for birth defects;
  - around 7% are born prematurely, and 6% are of low birthweight;
  - around 15% are admitted to a neonatal special care nursery and 2.6% are admitted to neonatal intensive care;
  - about 2% are reported to have a congenital abnormality;
  - the rate of perinatal deaths has slowly declined, although rates remain higher in rural areas;
  - SIDS deaths have decreased from 131 in 1991 to 45 in 2002.

In this chapter

Introduction

The health of NSW mothers and babies is generally good by world standards. Maternal deaths are rare, and perinatal mortality rates continue to decline. This chapter presents information on the main indicators of maternal and perinatal health, including trends in fertility rates, teenage pregnancy, prenatal diagnosis, low birthweight, prematurity, neonatal morbidity, and perinatal mortality; and, in addition, information on periconceptional folate supplementation.

Aboriginal and Torres Strait Islander mothers and babies, and those from socioeconomically disadvantaged areas, continue to experience worse outcomes than other NSW mothers and babies. More information on these health differentials is given in the chapters on Aboriginal and Torres Strait Islander peoples and on socioeconomic status.

As well as data on births and deaths obtained from the Australian Bureau of Statistics, this chapter uses data from the NSW Midwives Data Collection, the NSW Birth Defects Register, NSW Inpatient Statistics Collection, NSW Cytogenetic Laboratories, and the NSW Health Survey 2003. More information on these data collections and the analytic methods used is given in the Methods section.

For more information:

Australian Bureau of Statistics. *Births, Australia 2002.* ABS Catalogue no. 3301.0. Canberra: ABS, 2003.

Australian Bureau of Statistics. *Deaths, Australia 2001.* ABS Catalogue no. 3302.0. Canberra: ABS, 2002.

Australian Bureau of Statistics. *Deaths, Australia 2002.* ABS Catalogue no. 3302.0. Canberra: ABS, 2003.

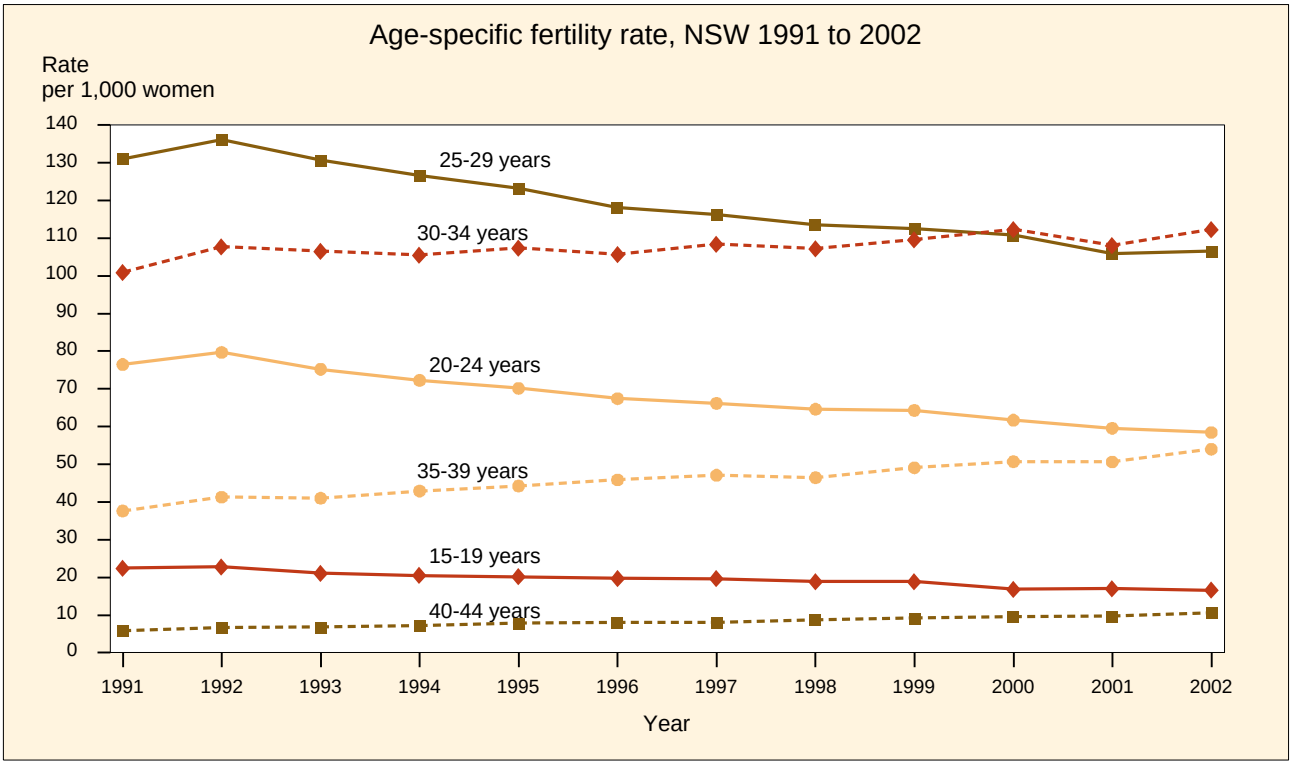
Australian Bureau of Statistics. *Causes of Death, Australia 2002.* ABS Catalogue no. 3303.0. Canberra: ABS, 2003.

Slaytor EK, Sullivan EA and King JF. *Maternal deaths in Australia 1997–1999*. Maternal Deaths Series no. 1, AIHW Catalogue no. PER 24. Sydney: AIHW National Perinatal Statistics Unit, 2004.

World Health Organization. *Maternal mortality in 2000: Estimates developed by WHO, UNICEF and UNFPA*. Compiled by AbouZahr C and Wardlaw T. Geneva: WHO. Available at www.who.int/reproductive-health/publications/maternal_mortality_2000/maternal_mortality_2000.pdf.

Centre for Epidemiology and Research. New South Wales Mothers and Babies 2002. *N S W Public Health Bull* 2003; 14(S-3). Available at www.health.nsw.gov.au/public-health/phb/phb.html.

Centre for Epidemiology and Research. New South Wales Mothers and Babies 2003. *N S W Public Health Bull* 2004; 15(S-5). Available at www.health.nsw.gov.au/public-health/phb/phb.html.



	Age	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number of births	15–19 years	4971	4879	4422	4233	4129	4085	4069	3929	3984	3620	3720	3638
	20–24 years	17364	18510	17621	16957	16408	15423	14692	13945	13649	13031	12676	12598
	25–29 years	30916	31697	29825	28718	28245	27944	28303	27982	27878	27410	25581	25076
	30–34 years	24377	26533	26395	26303	26611	25891	26236	25605	26108	26966	26856	28617
	35–39 years	8416	9417	9500	10086	10623	11321	11852	11846	12604	12974	12823	13436
	40–44 years	1275	1448	1497	1584	1743	1845	1873	2049	2235	2334	2448	2717
	45–49 years	48	54	61	56	60	46	62	67	91	101	114	103
	Total	87367	92585	89354	87977	87849	86595	87156	85499	86784	86752	84578	86583
Rate per 1,000 women	15–19 years	22.5	22.8	21.1	20.5	20.2	19.8	19.7	18.9	18.9	16.9	17.0	16.6
	20–24 years	76.5	79.7	75.2	72.3	70.2	67.4	66.2	64.6	64.3	61.7	59.6	58.5
	25–29 years	131.0	136.1	130.7	126.6	123.2	118.1	116.3	113.6	112.4	110.8	105.9	106.6
	30–34 years	101.0	107.7	106.6	105.6	107.5	105.6	108.4	107.3	109.6	112.4	108.1	112.3
	35–39 years	37.6	41.3	41.0	42.9	44.3	45.9	47.1	46.5	49.1	50.7	50.7	54.0
	40–44 years	5.9	6.7	6.9	7.2	7.8	8.1	8.1	8.7	9.3	9.5	9.8	10.6
	45–49 years	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.4	0.4	0.5	0.4
Total fertility rate		1.9	2.0	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8

Note: Births to mothers aged less than 15 years were included in the 15–19 years age group and births to mothers aged 50 years and over were included in the 45–49 years age group. Total births and total fertility rates include births for which mother's age was not stated.

Source: Australian Bureau of Statistics. *Births, Australia 2002*. Catalogue no. 3301.0. Canberra: ABS, 2003. ABS births data and population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

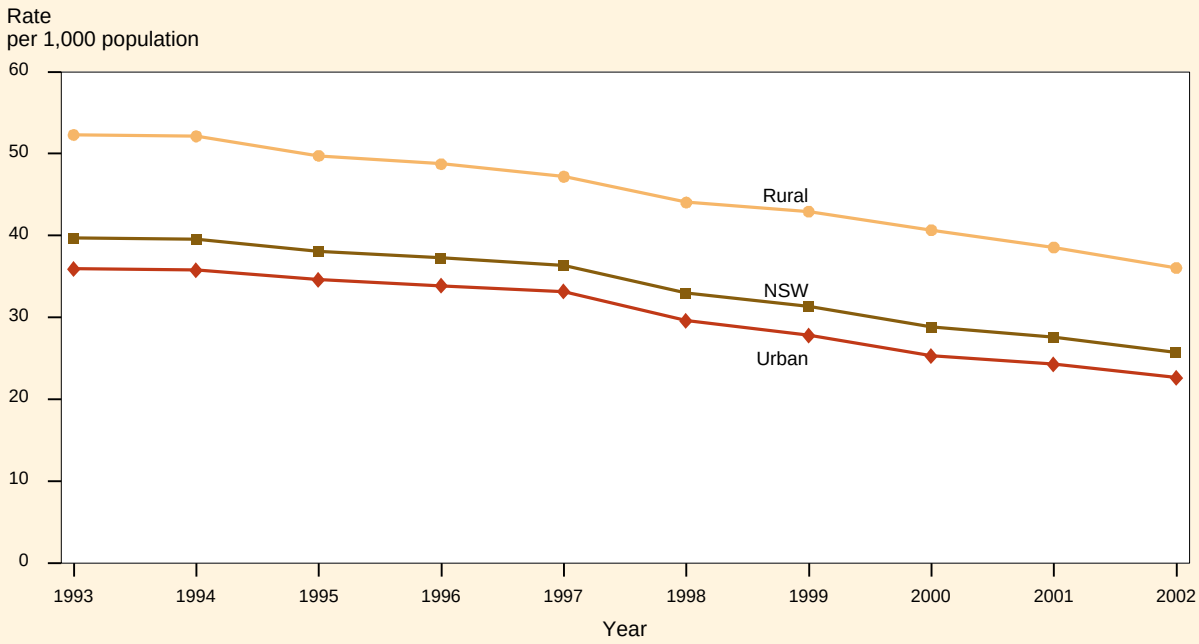
- Since 1991, fertility rates have increased in older women while decreasing in younger women. Between 1991 and 2002, fertility increased by 44% for women aged 35–39 years and 80% for women aged 40–44 years. Teenage fertility decreased by 26% over this period, while fertility decreased by 23% for women aged 20–24 years and 19% for women aged 25–29 years.
- The total fertility rate (TFR) is the average number of babies that a woman can expect to bear during her reproductive life. The TFR in Australia peaked at 3.5 babies per woman in 1961, but declined to 1.75 babies per woman in 2002.
- Replacement level fertility is the level that needs to be sustained to ensure that a population replaces itself. Since 1976, Australia has had fertility rates below replacement level (which is about 2.1 babies per woman) (ABS, 2002).

For more information:

Australian Bureau of Statistics. *Births, Australia 2002*. Catalogue no. 3301.0. Canberra: ABS, 2003.

Australian Bureau of Statistics. *Australian Social Trends 2002. Population—Population Projections: Fertility futures*. Available at www.abs.gov.au/Ausstats/abs@.nsf/0/d57dc522cdacb011ca256bcd008272ed?OpenDocument.

Lower extremity amputations with diabetes as a diagnosis
hospital separations by sex and site of amputation, NSW &date1 to &date2



	Region	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number	Urban	5814	5695	5463	5403	5346	4821	4578	4217	4079	3822
	Rural	2485	2453	2321	2288	2253	2157	2138	2048	1918	1794
	NSW	8299	8148	7784	7691	7599	6978	6716	6265	5997	5616
Rate per 1,000 women	Urban	36.0	35.8	34.6	33.9	33.5	30.1	28.3	25.6	24.2	22.7
	Rural	52.3	52.1	49.8	48.7	47.6	45.1	44.2	41.7	38.5	35.4
	NSW	39.7	39.5	38.1	37.3	36.8	33.6	31.9	29.3	27.5	25.6

Note: The teenage pregnancy rate is the number of miscarriages, terminations of pregnancy, stillbirths, and livebirths among women aged less than 20 years that were reported from NSW public and private hospitals per 1,000 female population aged 15–19 years. Health areas in Greater Sydney, Hunter, and Illawarra were classified as urban. Pregnant teenagers from interstate were excluded from the analysis.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Teenage pregnancy continues to be a problem in Australia, because of the increased risk of adverse perinatal outcomes. For the mother, there is a higher risk of medical complications such as hypertension (high blood pressure); and for the baby, there is a greater risk of low birthweight, prematurity, and stillbirth (Skinner et al., 2003).
- Between 1993 and 2002, the teenage pregnancy rate in NSW declined from 39.7 to 25.6 per 1,000 teenage women. The teenage pregnancy rate remained consistently higher in rural areas than in urban areas over this period.
- The teenage fertility rate (the number of live-births per 1,000 female population) in Australia in 2002 was 17.1 per 1,000. This is the lowest since 1921.
- In NSW, the proportion of births (including still-births and livebirths) to teenage mothers has declined from 5.6 per cent to 4.3 per cent over the period 1990–2002 (Centre for Epidemiology and Research, 2003).

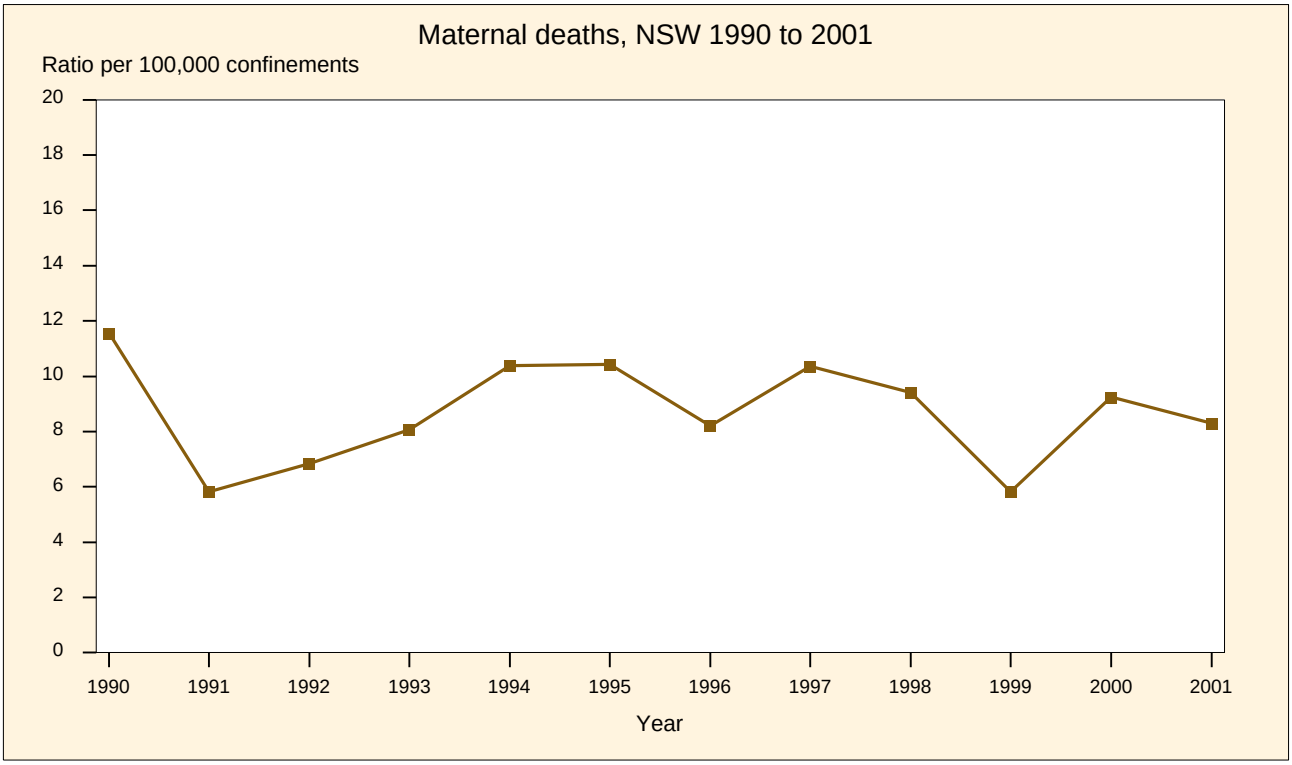
For more information:

Van der Klis KAM, Westernberg L, Chan A, Dekker G, Keane R. Teenage pregnancy: Trends, characteristics and outcomes in South Australia and Australia. *Aust N Z J Public Health* 2002; 26: 125–131.

Skinner SR, Hickey M. Current priorities for adolescent sexual and reproductive health in Australia. *MJA* 2003; 179: 158–161.

Centre for Epidemiology and Research. New South Wales Mothers and Babies 2002. *N S W Public Health Bull* 2003; 14: (S-3). Available at www.health.nsw.gov.au/public-health/phb/phb.html.

Centre for Epidemiology and Research. New South Wales Mothers and Babies 2003. *N S W Public Health Bull* 2004; 15(S-5). Available at www.health.nsw.gov.au/public-health/phb/phb.html.



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Direct	4	4	5	6	8	7	6	7	4	4	4	5
Indirect	6	1	1	1	1	2	1	2	4	1	4	2
Incidental	2	1	5	6	3	6	5	5	3	6	1	2
Total	12	6	11	13	12	15	12	14	11	11	9	9
Direct + indirect	10	5	6	7	9	9	7	9	8	5	8	7
	11.6	5.8	6.8	8.1	10.4	10.4	8.2	10.4	9.4	5.8	9.3	8.3

Note: Includes all deaths of women who were pregnant at the time of death, or who died within 42 days of childbirth. The maternal mortality ratio is the total number of direct and indirect maternal deaths per 100,000 pregnancies resulting in a livebirth or stillbirth (confinements).

Source: NSW Maternal and Perinatal Committee, NSW Department of Health.

- Maternal deaths are classified as direct, indirect, or incidental. Direct deaths result from obstetric complications of the pregnant state. Examples include eclampsia, amniotic fluid embolism, rupture of the uterus, and postpartum haemorrhage. Indirect deaths result from pre-existing disease or disease that developed during pregnancy and was not due to direct obstetric causes. Examples include heart disease, diabetes, and renal disease. Incidental deaths are those due to conditions where the pregnancy is unlikely to have contributed significantly to the death. Examples include road accidents and malignancies.
- In NSW, in the period 1990–2001, 135 deaths were reported among pregnant women or women who gave birth less than 6 weeks previously. Of these, 64 (47.4%) were direct maternal deaths, 26 (19.3%) were indirect maternal deaths, and 45 (34.8%) were incidental deaths. The maternal death rate per 100,000 confinements varied from 11.6 to 8.3 over this period.
- As maternal deaths are rare, information on causes is compiled nationally on a 3-yearly basis. In the triennium 1997–1999, the maternal death rate was 8.2 in Australia (90 maternal deaths). This compares with 11.4 in the United Kingdom for the same period. Thirty-four deaths were classified as direct, with the most common causes being obstetric haemorrhage and amniotic fluid embolism. There were 28 indirect maternal deaths, most commonly from psychiatric causes and cardiovascular disease (Slaytor et al., 2004).

For more information:

Slaytor EK, Sullivan EA and King JF. *Maternal deaths in Australia 1997–1999.* Maternal Deaths Series no. 1, AIHW Catalogue no. PER 24. Sydney: AIHW National Perinatal Statistics Unit, 2004.

World Health Organization. *Maternal mortality in 2000: Estimates developed by WHO, UNICEF and UNFPA.* Compiled by AbouZahr C and Wardlaw T. Geneva: WHO, 2001.

Folate tablets-capsules taken before or during pregnancy, mothers with babies aged 0-12 months, NSW 2003

Note: Estimates based on 154 respondents.

Source: NSW Health Survey 2003 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Folate (also known as folic acid) is a B group vitamin and is found naturally in foods such as fresh vegetables and fruit, legumes, nuts, liver, and yeast. It is also present in fortified products such as breads and breakfast cereals, and can be taken in supplement (tablet or capsule) form.
- An adequate intake of folate around the time of conception reduces the risk of neural tube defects such as spina bifida, anencephaly, and encephalocoele. In NSW, neural tube defects were reported in 53 pregnancies in 2002. Periconceptional (before pregnancy and in the first 3 months of pregnancy) folate supplementation reduces the incidence of neural tube defects by almost three-quarters (Lumley et al., 2004).
- In the NSW Health Survey of 2003, about one-half (46.4%) of mothers of infants aged less than 12 months reported taking folate supplements both one month before and in the first 3 months of pregnancy. A further 38.5% of mothers reported that they took folate supplements in the first 3 months of pregnancy, while 11.5% of mothers reported that they had not taken folate supplements.
- Of mothers of infants aged less than 12 months, 14.7% reported that they had changed their diet to increase folate intake both in the month before and in the first 3 months of pregnancy. A further 22.3% of mothers increased their folate intake in the first 3 months of pregnancy.

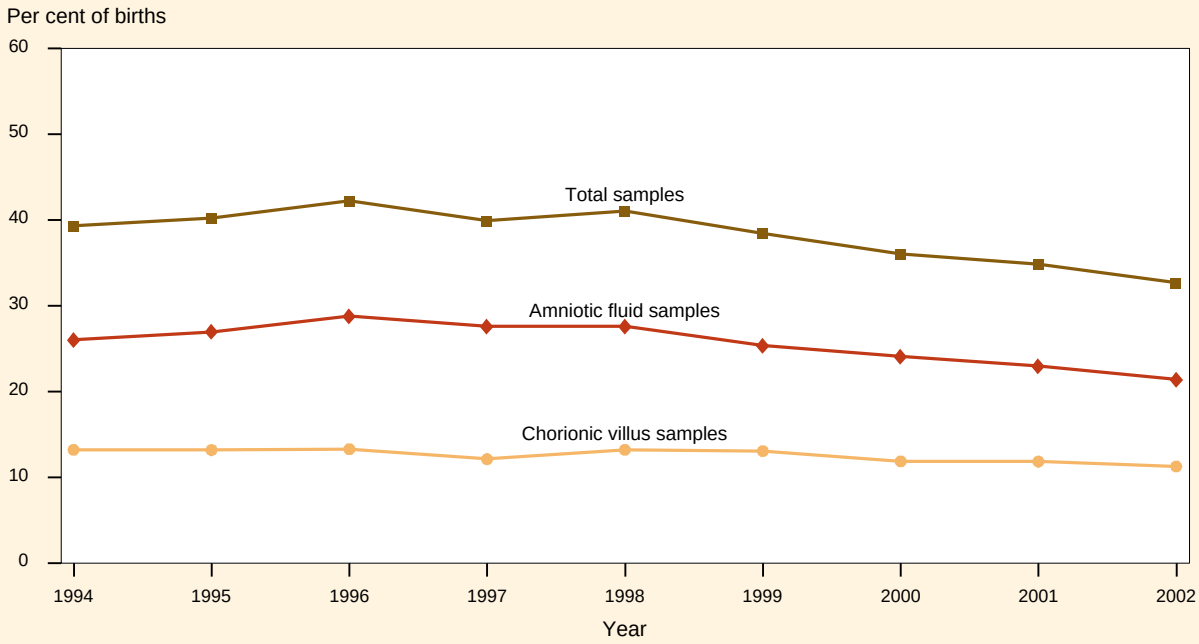
For more information:

Centre for Epidemiology and Research. New South Wales Mothers and Babies 2002. *N S W Public Health Bull* 2003; 14: (S-3). Available at www.health.nsw.gov.au/public-health/phb/phb.html.

Centre for Epidemiology and Research. New South Wales Mothers and Babies 2003. *N S W Public Health Bull* 2004; 15(S-5). Available at www.health.nsw.gov.au/public-health/phb/phb.html.

Lumley J, Watson L, Watson M, Bower C. *Periconceptual supplementation with folate and/or multivitamins to prevent neural tube defects and other congenital malformations (Cochrane review).* The Cochrane Library 1998. Issue 4. Oxford: Update Software.

Prenatal diagnosis tests, women aged 35 years and over, NSW 1994 to 2002



	1994	1995	1996	1997	1998	1999	2000	2001	2002
Amniotic fluid samples	3007	3264	3722	3781	3903	3797	3781	3588	3470
	26.0	27.0	28.8	27.6	27.6	25.4	24.1	23.0	21.4
Chorionic villus samples	1528	1597	1720	1664	1867	1958	1865	1853	1831
	13.2	13.2	13.3	12.1	13.2	13.1	11.9	11.9	11.3
Other samples	14	6	11	21	25	4	2	4	1
	0.1	0.0	0.1	0.2	0.2	0.0	0.0	0.0	0.0
Total samples	4549	4867	5453	5466	5795	5759	5648	5445	5302
	39.3	40.2	42.2	39.9	41.0	38.5	36.0	34.8	32.7

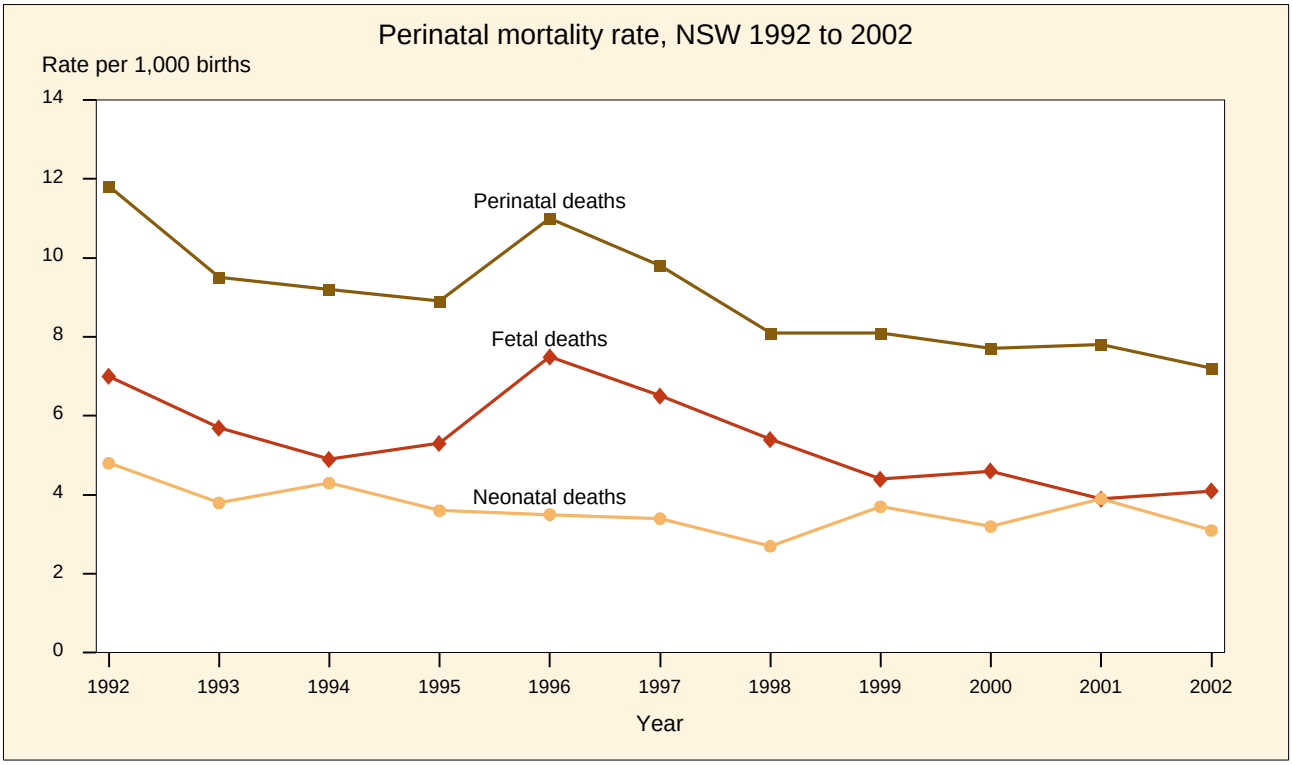
Note: The total number of tests is greater than the number of women tested, as some women may have more than one test. 'Other samples' include fetal blood and placental tissue. Tests carried out in other states were excluded.

Source: NSW cytogenetic laboratories data, Statewide Services Development Branch, and NSW Midwives Data Collection (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- The risk of some chromosomal abnormalities in babies, particularly Down syndrome, increases with maternal age. In NSW over the period 1994 to 2002, the rate of chromosomal abnormalities was 7.8 per 1,000 births for mothers aged 40–44 years, compared to 1.5 per 1,000 births for mothers aged 20–24 years.
- Prenatal diagnostic services should be made available to women with an increased risk of a genetic or chromosomal disorder, including women aged 35 years and over (HGSA, 2004). The most common procedures carried out for cytogenetic testing are amniocentesis and chorionic villus sampling (CVS). Amniocentesis involves sampling the amniotic fluid surrounding the baby. CVS involves taking a sample from the placenta.
- The number of cytogenetic tests carried out for prenatal diagnosis among women aged 35 years and over in NSW rose from 4,549 in 1994 to 5,795 in 1998, but declined to 5,302 in 2002. Similarly, the number of cytogenetic tests as a percentage of babies born rose to a high of 42% in 1996 and declined to 33% in 2002. This recent decline is probably due to greater use of less invasive procedures such as ultrasound examination of 'nuchal translucency', which is a screening test for Down syndrome.

For more information:

Human Genetics Society of Australasia. *Joint HGSA–RANZCOG Prenatal diagnosis policy*. Statement no. C-Obs 5. Available at www.hgsa.com.au/PDF/Prenatal%20diagnosis%20policy%20C-Obs%205%20Mar2004.pdf.



		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
NSW	Fetal death rate	7.0	5.7	4.9	5.3	7.5	6.5	5.4	4.4	4.6	3.9	4.1
	Neonatal mortality rate	4.8	3.8	4.3	3.6	3.5	3.4	2.7	3.7	3.2	3.9	3.1
	Perinatal mortality rate	11.8	9.5	9.2	8.9	11.0	9.8	8.1	8.1	7.7	7.8	7.2
Australia	Perinatal mortality rate	10.7	9.2	9.1	9.4	10.0	9.2	8.3	8.5	8.3	8.4	8.0

Note: Perinatal deaths include infants and fetuses weighing at least 400 grams or, if birthweight is not available, at least 20 weeks gestation. Rates are per 1,000 births including both stillbirths and livebirths. Data are by year of death registration.

Source: Australian Bureau of Statistics. *Deaths, Australia, 2001 and 2002*. Catalogue no. 3302.0. Canberra: ABS, 2002 and 2003 respectively; Australian Bureau of Statistics. *Causes of Death, Australia, 2002*. Catalogue no. 3303.0. Canberra: ABS, 2003.

- Improved survival of babies in Australia in the last century has led to increases in life expectancy at birth. Perinatal deaths include stillbirths (also termed 'fetal deaths') and deaths in the first 4 weeks of life.
- In NSW, between 1992 and 2002, the number of perinatal deaths declined from 1097 to 626. Of the 626 deaths in 2002, 354 (56.6%) were stillbirths and 272 (43.4%) were neonatal deaths. Fetal death rates have declined more steeply (from 7.0 per 1,000 births in 1992 to 4.1 per 1,000 births in 2002) than neonatal death rates (from 4.8 per 1000 births in 1992 to 3.1 per 1,000 births in 2002).
- Perinatal deaths among infants of at least 22 weeks gestation or 500 grams birthweight are reviewed by the NSW Maternal and Perinatal Committee. Of 613 perinatal deaths reported to the Committee in 2002, 26.3% of perinatal deaths (39.2% of stillbirths) were unexplained antepartum deaths. Other common causes of perinatal deaths included: spontaneous preterm labour (less than 37 weeks gestation) (20.6%), congenital abnormality (16.8%), and antepartum haemorrhage (8.5%). For neonatal deaths, extreme prematurity was found to be the most common cause of death (39.6%), followed by congenital abnormality (19.3%), neurological disease (13.4%), cardiorespiratory conditions (11.9%), and infection (8.4%).
- Survival of babies admitted to neonatal intensive care units has improved. The six-month survival rate increased from 87.8% in 1992 to 91.4% in 2002 for babies who did not have a major congenital abnormality registered in the NSW Neonatal Intensive Care Units' Data Collection.

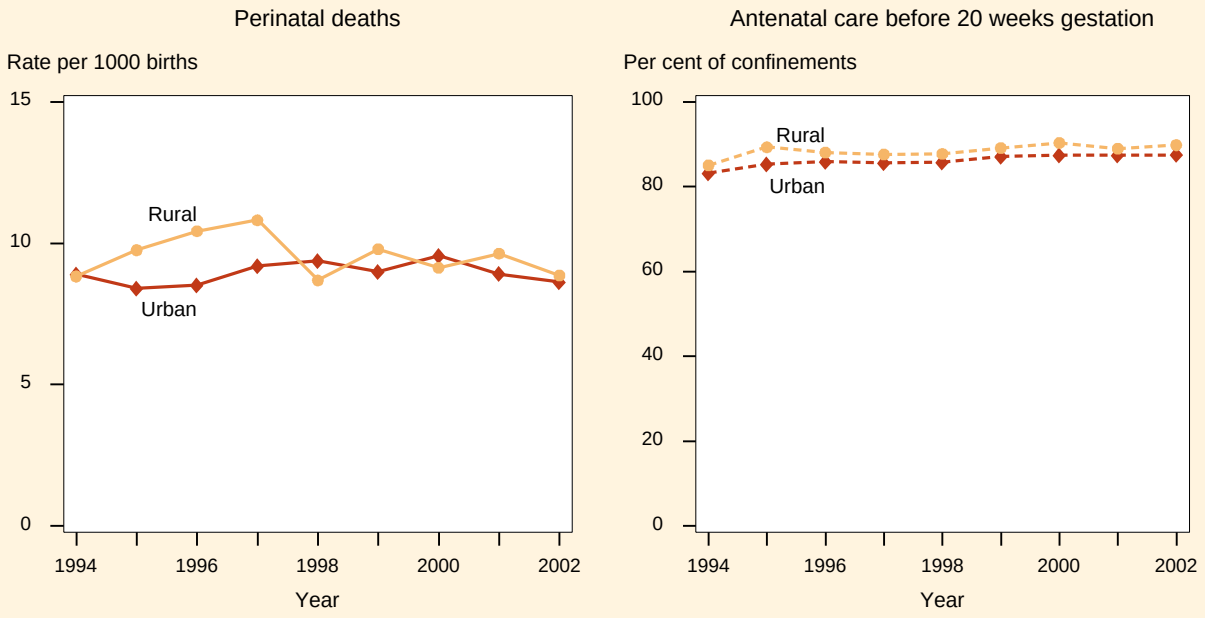
For more information:

Centre for Epidemiology and Research. New South Wales Mothers and Babies 2002. *N S W Public Health Bull* 2003; 14: (S-3).

Centre for Epidemiology and Research. New South Wales Mothers and Babies 2003. *N S W Public Health Bull* 2004; 15(S-5). Available at www.health.nsw.gov.au/public-health/phb/phb.html.

Australian Institute of Health and Welfare. *Australia's mothers and babies 2000.* Perinatal Statistics Series no. 12, AIHW Catalogue no. PER 21. Sydney: AIHW National Perinatal Statistics Unit, 2003.

Perinatal mortality and first antenatal visit before 20 weeks of gestation by area of residence, NSW 1994 to 2002



			1994	1995	1996	1997	1998	1999	2000	2001	2002
Perinatal mortality	Number	Urban	605	568	572	634	637	622	674	612	598
		Rural	170	186	194	200	154	169	153	160	142
		NSW	775	754	766	834	791	791	827	772	740
	Rate per 1,000 births	Urban	8.9	8.4	8.5	9.2	9.4	9.0	9.6	8.9	8.6
		Rural	8.8	9.8	10.4	10.8	8.7	9.8	9.1	9.6	8.9
		NSW	8.9	8.7	8.9	9.5	9.2	9.1	9.5	9.1	8.7
Antenatal care before 20 weeks gestation	Number	Urban	55748	56880	56899	58130	57417	59325	60636	58949	59668
		Rural	16181	16812	16189	15999	15345	15185	14905	14570	14186
		NSW	71929	73692	73088	74129	72762	74510	75541	73519	73854
	Per cent of confinements	Urban	83.2	85.3	85.9	85.6	85.8	87.1	87.5	87.4	87.5
		Rural	85.0	89.3	88.1	87.6	87.7	89.2	90.3	89.0	89.8
		NSW	83.6	86.2	86.4	86.0	86.2	87.5	88.0	87.7	87.9

Note: Perinatal deaths include deaths reported to the NSW Midwives Data Collection (MDC) only. As the MDC form is completed at discharge or transfer of the baby, deaths occurring after this time may not be reported to the MDC. Health areas in Greater Sydney, Hunter, and Illawarra were classified as urban. Babies from interstate born in NSW were excluded from the analysis.

Source: NSW Midwives Data Collection (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Between 1995 and 1997, the perinatal mortality rate (PMR) was higher in rural than urban areas of NSW. In 1998, the PMR in rural areas fell to a level similar to that of urban areas, and there has been little difference in the PMRs of urban and rural areas since that time. The reduction in PMR in rural areas during the 1990s is associated with a change in the way mothers and babies are transferred between hospitals when problems arise. Emergency evacuation of premature or other sick babies born in rural hospitals has been largely replaced by transfer of the mother prior to giving birth to a hospital with appropriate facilities for care of the baby.
- Between 1994 and 2002, the proportion of mothers commencing antenatal care before 20 weeks gestation increased from 83.6% to 87.9%, and was slightly higher in rural areas compared to urban areas.

For more information:

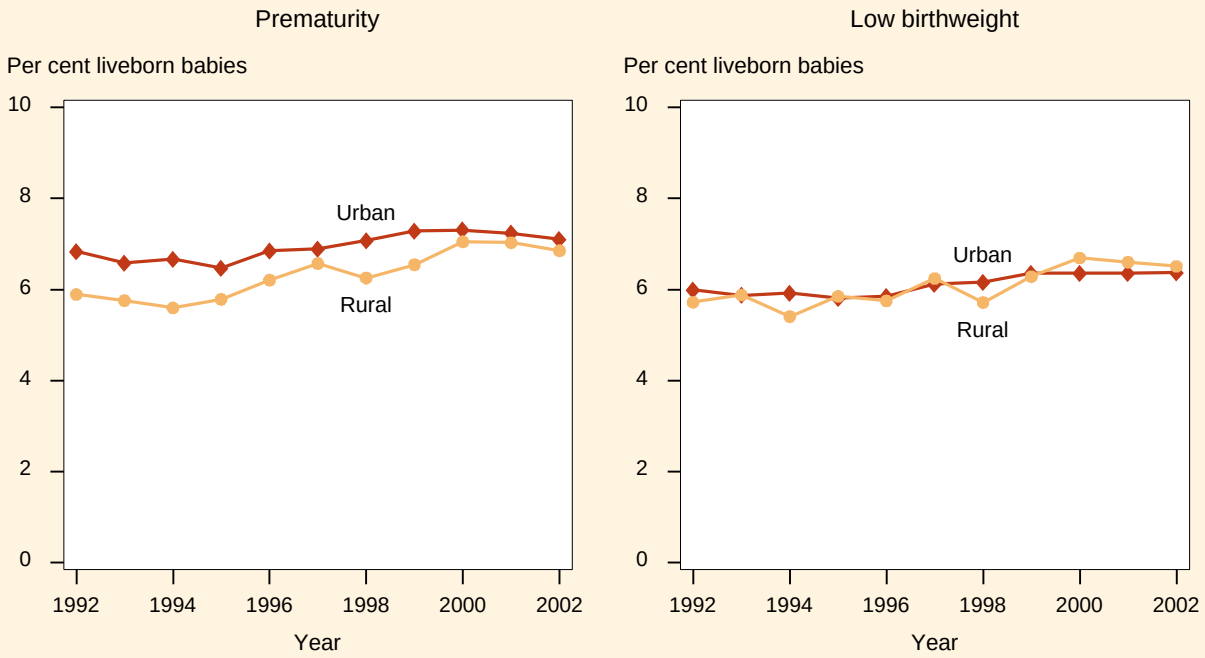
Roberts, CL, Algert CS. The urban and rural divide for women giving birth in NSW, 1990–1997. *Aust N Z J Public Health* 2000; 24: 291–7.

Centre for Epidemiology and Research. New South Wales Mothers and Babies 2002. *N S W Public Health Bull* 2003; 14: (S-3). Available at www.health.nsw.gov.au/public-health/phb/phb.html.

Centre for Epidemiology and Research. New South Wales Mothers and Babies 2003. *N S W Public Health Bull* 2004; 15(S-5). Available at www.health.nsw.gov.au/public-health/phb/phb.html.

Australian Institute of Health and Welfare. *Health in rural and remote Australia.* AIHW Catalogue no. PHE6. Canberra: AIHW, 1998.

Prematurity and low birthweight by area of residence, 1992 to 2002



			1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Premature	Number	Urban	4653	4451	4538	4377	4595	4751	4809	5045	5154	4972	4931
		Rural	1184	1122	1080	1097	1155	1216	1109	1125	1180	1165	1101
		NSW	5837	5573	5618	5474	5750	5967	5918	6170	6334	6137	6032
	Per cent	Urban	6.8	6.6	6.7	6.5	6.8	6.9	7.1	7.3	7.3	7.2	7.1
		Rural	5.9	5.7	5.6	5.8	6.2	6.6	6.3	6.5	7.0	7.0	6.9
		NSW	6.6	6.4	6.4	6.3	6.7	6.8	6.9	7.1	7.3	7.2	7.1
Low birthweight	Number	Urban	4084	3973	4030	3929	3931	4221	4186	4405	4489	4371	4419
		Rural	1148	1147	1042	1113	1070	1154	1015	1078	1121	1095	1044
		NSW	5232	5120	5072	5042	5001	5375	5201	5483	5610	5466	5463
	Per cent	Urban	6.0	5.9	5.9	5.8	5.9	6.1	6.2	6.4	6.4	6.4	6.4
		Rural	5.7	5.9	5.4	5.8	5.8	6.2	5.7	6.2	6.7	6.6	6.5
		NSW	5.9	5.9	5.8	5.8	5.8	6.1	6.1	6.3	6.4	6.4	6.4

Note: Low birthweight: less than 2,500 grams. Premature birth: less than 37 weeks gestation. Rates of prematurity and low birthweight include stillbirths and livebirths of at least 20 weeks gestation or 400 grams birthweight. Health areas in Greater Sydney, Hunter, and Illawarra were classified as urban. Babies from interstate born in NSW were excluded from the analysis.

Source: NSW Midwives Data Collection (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- A premature or preterm birth is a birth occurring before 37 weeks gestation. Preterm infants have higher rates of mortality and morbidity than infants born at term. Over the period 1992 to 2002, rates of prematurity varied between 6.6% and 7.1%. Of births in 2002, 594 (0.7%) were born at 20–27 weeks gestation, 612 (0.7%) at 28–31 weeks, and 4,865 (5.7%) at 32–36 weeks.
- Low birthweight is defined as less than 2,500 grams. In NSW, rates of low birthweight have remained steady, ranging from 5.9% in 1992 to 6.4% in 2002. Of all babies born in 2002, 611 (0.7%) weighed less than 1,000 grams, 469 (0.5%) weighed between 1,000 grams and 1,499 grams, and 4,427 (5.1%) weighed between 1,500 grams and 2,499 grams.
- Since 1992, rates of prematurity have been consistently lower in babies born to mothers resident in rural areas compared to urban areas. This may be related to the transfer interstate of high risk pregnancies in mothers living in areas bordering other states.

For more information:

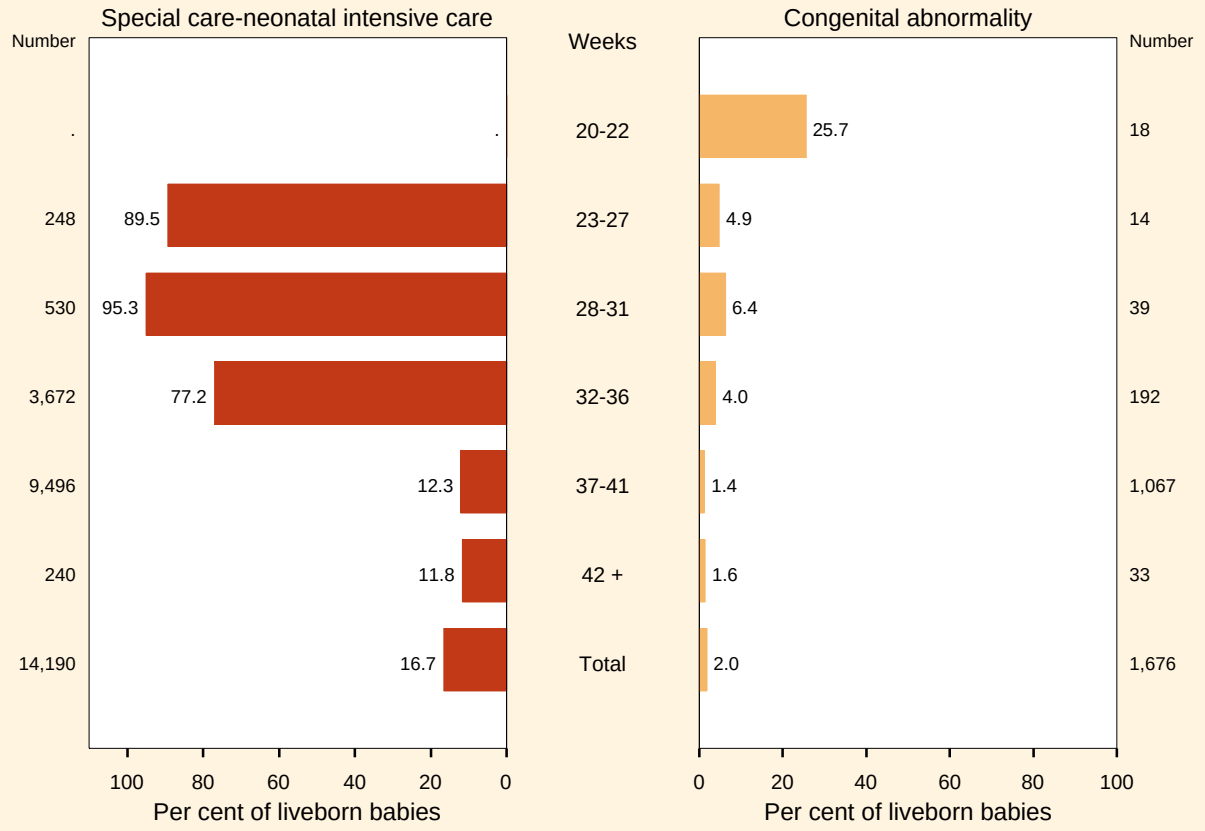
Centre for Epidemiology and Research. New South Wales Mothers and Babies 2002. *N S W Public Health Bull* 2003; 14: (S-3).

Centre for Epidemiology and Research. New South Wales Mothers and Babies 2003. *N S W Public Health Bull* 2004; 15(S-5).

National Health and Medical Research Council. *Clinical Practice Guidelines: Care around Preterm Birth*. Canberra: NHMRC, 2000.

Australian Institute of Health and Welfare. *Australia's mothers and babies 2000*. Perinatal Statistics Series no. 12, AIHW Catalogue no. PER 21. Sydney: AIHW National Perinatal Statistics Unit, 2003.

Special care or neonatal intensive care admissions, 2002 and congenital abnormalities, 2001 by gestational age in liveborn babies, NSW



Note: Information on admissions to special care nursery or neonatal intensive care is for 2002. Information on congenital abnormalities is for 2001. Ten per cent of babies 23–27 weeks died before admission to neonatal intensive care. Babies from interstate born in NSW were excluded from the analysis.

Source: NSW Midwives Data Collection and NSW Birth Defects Register (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In 2002, 14.8% of newborn infants were admitted to a neonatal special care nursery and 2.6% were admitted to neonatal intensive care. Overall, 31% of infants admitted to a special care nursery or neonatal intensive care were premature (less than 37 weeks gestation), and the highest rate of admission was among babies born at 28–31 weeks gestation (95.4%).
- The Neonatal Intensive Care Units' (NICUS) Data Collection provides information on newborn infants admitted to a neonatal intensive care unit in NSW or ACT for one of the following reasons: gestational age less than 32 weeks; birthweight less than or equal to 1,500 grams; mechanical ventilation or continuous positive airways pressure for 4 hours or more; or major surgery. In 2002, there were 2003 infants registered in NICUS. The majority of mothers (89.8%) of babies registered in NICUS had an antenatal complication, most com-monly: preterm labour (49.4%), antepartum haemorrhage (19.2%), fetal distress (18.9%), pregnancy induced hypertension (16.2%) and intrauterine growth restriction (10.8%). Three-quarters of the infants (75.9%) were premature (less than 37 weeks gestation). Of premature infants, 44.0% were very premature (less than 32 weeks gestation) and 13.9% were extremely premature (less than 28 weeks gestation). More than one-sixth (16.5%) of infants had a major congenital abnormality, a decrease from 1992 (20.9%).
- In 2001, 2.0% of liveborn babies were reported to have a congenital abnormality, most commonly: abnormalities of the cardiovascular system (such as ventricular and atrial septal defects and heart valve defects), followed by musculoskeletal abnormalities (such as congenital dislocation of the hips and polydactyly) and genitourinary abnormalities (such as hypospadias and un-descended testis).

For more information:

Centre for Epidemiology and Research. New South Wales Mothers and Babies 2002. *N S W Public Health Bull* 2003; 14: (S-3).

Chapter 4.9

Communicable diseases

- At the end of June 2004, 90% of children aged 12–15 months were fully immunised, similar to the national figure of 91%.
- In 2003, 75.8% of people aged 65 years and over reported that they had been immunised for influenza in the past year, compared with 71.2% in 1999.
- In 2003, 46.8% of people aged 65 years and over reported that they had been immunised for pneumococcal pneumonia in the past 5 years, compared with 39.4% in 1992.
- Notifications for some vaccine-preventable diseases have declined in recent years. In 2003:
  - 24 cases of rubella were recorded, compared with 35 cases in 2002 and 190 cases in 2000;
  - 2,765 cases of pertussis (whooping cough) were reported, down from a peak of 4,438 cases in 2001.
- However, 18 cases of measles were notified in 2003, up from the historic low of 7 cases in 2002.
- Trends in sexually transmissible infections have varied. In 2003:
  - 7,562 cases of chlamydiosis were reported, representing a 34% increase over the 5,649 cases reported in 2002;
  - 838 cases of syphilis were notified, a 29% increase over the 648 cases reported in 2002;
  - 1,271 cases of gonorrhoea were reported, down from 1,449 in 2002 and 1,354 in 2001.
- Improvements in antiviral therapy for Human Immunodeficiency Virus (HIV) infection have lead to a substantial decline in progression to Acquired Immunodeficiency Syndrome (AIDS) since the mid-1990s. However, notifications of HIV infection have increased since 2001. In 2003:
  - 414 cases of HIV infection were reported, compared with 390 in 2002 and 338 in 2001;
  - 116 cases of AIDS were notified, compared with 95 in 2002 and 93 in 2001.
- The prevalence of hepatitis C among injecting drug users in 2003 was 68%, compared with 85% in 1995.
- In 2003, 1,835 cases of salmonellosis were reported, slightly down from a peak of 2,095 cases in 2002.

In this chapter

Introduction

In NSW, communicable diseases are monitored using information supplied by doctors, hospitals and laboratories, as well as through routinely collected hospital admissions data (NSW Inpatient Statistics Collection) and deaths data (Australian Bureau of Statistics mortality collection).

Under the *NSW Public Health Act 1991*, laboratories, hospitals, medical practitioners, schools, and child care centres must notify the NSW Department of Health or their local public health unit of diagnoses of certain diseases. For some diseases, a notification triggers a public health response by the public health unit, such as immunisation or treatment of contacts. Notifications also provide valuable information that is used for the planning and evaluation of prevention programs.

The number of notifications received is almost always an underestimate of the number of cases that actually occur. For a condition to be notified, a patient must seek medical help; be diagnosed with the condition; in some cases, must have the appropriate laboratory tests done; and then the diagnosis must be reported to the local public health unit or the NSW Department of Health. Nonetheless, communicable disease notifications provide valuable information on disease patterns in NSW.

Hospital admissions are indicative of, but do not accurately represent, communicable disease activity in the population. People will be counted more than once if they were admitted more than once for the same condition; a communicable disease may appear on the admission record even though it occurred in the past or was not the primary reason for admission; and only a proportion of disease cases result in hospital admission.

Causes of death in the ABS mortality data are coded from death certificates. While rigorous standards are applied in coding, accuracy of the underlying cause of death depends on the accuracy of the death certification.

Doctors, hospital staff, and laboratory staff, reported more than 40,000 cases of notifiable communicable diseases among NSW residents in 2003. Among the most frequently reported notifiable conditions were:

- Chlamydiosis: 7,562 cases (114 per 100,000 population);
- Hepatitis C: 5,277 cases (79.5 per 100,000 population);
- Gastroenteritis in an institution: 3,583 cases (54.0 per 100,000 population);
- Hepatitis B: 2,949 cases (44.5 per 100,000 population);
- Pertussis: 2,768 cases (41.7 per 100,000 population);
- *Salmonella* infections: 1,843 cases (27.8 per 100,000 population).

Conditions with the most important declines over previous years included:

- Hepatitis C: 5,277 cases (down from 6,711 in 2002 and 8,704 in 2001);
- Hepatitis A: 124 cases (down from 146 in 2002, and just under 200 in both 2000 and 2001);
- Hepatitis B: 2,949 cases (down from 3,551 in 2002 and 4,573 in 2001);
- Rubella: 24 cases (down from 35 in 2002 and 190 in 2000).

Conditions with the most important increases over previous years included:

- Chlamydiosis: 7,562 cases (up from 5,649 in 2002), probably related to both better detection of cases through improved screening and a real increase in disease transmission;
- Foodborne illness: 1,071 cases (up from 41 in 2002), probably due largely to improved detection and reporting;
- New HIV diagnoses: 414 cases (up from 390 in 2002), a continuation of the increase that emerged in 2002, mainly among men who have sex with men;
- Outbreaks of gastroenteritis in institutional settings: 3,583 cases (up from 1,752 in 2002), probably due largely to improved detection and reporting;
- Syphilis: 838 cases (up from 648 in 2002), with new infections mainly among inner-city men who have sex with men.

Several notable disease outbreaks and threats were reported in 2003 in NSW. These included:

- In early 2003, NSW Health investigated 56 reports of suspected and probable cases of Severe Acute Respiratory Syndrome (SARS). Only one confirmed case of SARS was identified in NSW: a tourist who was diagnosed in July 2003 as part of a worldwide study of people who had been exposed to a source case in a Hong Kong hotel (Jauncey et al., 2004);
- In May, an outbreak of *Salmonella* Typhimurium phage type 99 affected more than 60 people who attended a birthday party at a restaurant. This outbreak was ultimately linked to contaminated pigeon meat (NSW Department of Health, 2003);
- In the same month, an outbreak of pertussis (whooping cough) affected 31 students at a Sydney boarding school;
- Beginning in June, an outbreak of 8 cases of measles was linked to a person who was infected while travelling in Nepal;
- In September, outbreaks of gastroenteritis occurred in 8 nursing homes, 5 childcare centres, one hospital ward, and 2 residential colleges. Most of these were probably due to norovirus infections.
- In November, a food handler with hepatitis A, who served ready-to-eat foods at a Central Sydney restaurant while infectious, was identified. To prevent further cases, NSW Health staff administered immunogobulin to 768 patrons of the restaurant. Four secondary cases (who did not receive immunoglobulin) were subsequently identified.

For more information:

Jauncey ME, Armstrong PK, Morgan EL, McAnulty JM. Australia was indeed the lucky country in the recent worldwide SARS epidemic [letter]. *Med J Aust* 2004; 181: 229–230.

NSW Department of Health. Communicable Diseases Reports. *N S W Public Health Bull* 2003; 14. Available at www.health.nsw.gov.au/public-health/phb/phb.html.

NSW Department of Health. Communicable Diseases Reports. *N S W Public Health Bull* 2004; 15. Available at www.health.nsw.gov.au/public-health/phb/phb.html.

NSW Department of Health. Communicable diseases in New South Wales web page at www.health.nsw.gov.au/living/infect.html.

Communicable diseases notifications, NSW, 1999 to 2003

Disease	Number of notifications					Rate per 100,000 population				
	1999	2000	2001	2002	2003	1999	2000	2001	2002	2003
Adverse event after immunisation	16	42	111	176	217	0.2	0.6	1.7	2.7	3.3
Anthrax	-	-	0	0	0	-	-	0.0	0.0	0.0
Arboviral infection: Ross River	952	749	716	181	494	14.9	11.6	10.9	2.7	7.3
Arboviral infection: Barmah Forest	249	195	402	393	451	3.9	3.0	6.1	5.9	6.7
Arboviral infection: other–not specified	16	30	67	76	72	0.2	0.5	1.0	1.2	1.1
Botulism	1	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Brucellosis	2	1	1	2	2	0.0	0.0	0.0	0.0	0.0
Chancroid	1	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Chlamydia trachomatis: congenital pneumonia	14	18	16	15	21	0.2	0.3	0.2	0.2	0.3
Chlamydia trachomatis: lymphogranuloma venereum	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Chlamydia trachomatis: other sexually transmitted	2429	3461	4456	5750	7694	37.7	53.4	68.4	87.9	116.6
Cholera	2	0	1	1	0	0.0	0.0	0.0	0.0	0.0
Cryptosporidiosis	121	133	194	306	202	1.9	2.0	2.9	4.7	3.1
Diphtheria	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Foodborne illness in 2 or more related cases	151	129	56	41	27	2.4	2.0	0.9	0.6	0.4
Gastroenteritis in an institution	673	697	775	1752	6	10.5	10.7	11.6	25.7	0.1
Giardiasis	1091	976	966	860	1025	16.8	15.0	14.7	13.0	15.5
Gonorrhoea	1281	1045	1355	1501	1282	19.8	16.1	20.7	22.8	19.4
Granuloma inguinale (Donovanosis)	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Haemolytic uraemic syndrome	11	9	2	7	5	0.2	0.1	0.0	0.1	0.1
Haemophilus influenzae type b	13	8	7	10	6	0.2	0.1	0.1	0.2	0.1
Hepatitis A	419	195	196	146	124	6.5	3.0	3.0	2.2	1.9
Hepatitis B	3512	3976	4573	3551	2951	54.7	61.4	69.8	53.8	44.4
Hepatitis C	8599	8296	8704	6712	5270	133.2	127.8	132.9	101.8	79.4
Hepatitis D	14	12	11	9	12	0.2	0.2	0.2	0.1	0.2
Hepatitis E	7	9	6	6	5	0.1	0.1	0.1	0.1	0.1
Hepatitis: viral (type not specified)	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
HIV–Human immunodeficiency virus	373	352	338	390	414	5.8	5.3	5.1	5.9	6.2
HIV–AIDS	122	133	-	95	116	1.9	2.1	-	1.4	1.7
Influenza	-	-	244	1009	855	-	-	3.7	15.2	12.9
Legionnaires' disease	41	41	68	44	59	0.6	0.6	1.0	0.6	0.9
Leprosy	1	2	4	0	2	0.0	0.0	0.1	0.0	0.0
Leptospirosis	55	53	65	39	39	0.9	0.8	1.0	0.6	0.6
Listeriosis	22	18	12	11	28	0.3	0.3	0.2	0.2	0.4
Malaria	173	228	154	103	118	2.7	3.5	2.4	1.6	1.8
Measles	32	32	30	7	18	0.5	0.5	0.5	0.1	0.3
Meningococcal disease	218	252	231	216	199	3.4	3.9	3.5	3.3	3.0
Mumps	32	92	28	29	35	0.5	1.4	0.4	0.4	0.5
Pertussis (whooping cough)	1415	3684	4438	2011	2768	22.1	57.1	67.9	30.5	41.7
Plague	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Pneumococcal infection (invasive)	-	-	444	861	796	-	-	6.7	12.8	11.7
Poliomyelitis	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Psittacosis	-	-	38	155	87	-	-	0.6	2.3	1.3
Q fever	164	131	143	309	281	2.6	2.0	2.2	4.7	4.2
Rabies (*Lyssavirus*)	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Rubella: congenital	1	0	0	0	1	0.0	0.0	0.0	0.0	0.0
Rubella: other	45	190	58	35	23	0.7	3.0	0.9	0.5	0.3
Salmonella infection (non-typhoid)	1424	1389	1642	2096	1835	22.0	21.3	25.0	31.8	27.7
Shigellosis	-	-	133	82	57	-	-	2.0	1.2	0.9
Syphilis: congenital	3	3	3	3	7	0.0	0.0	0.0	0.0	0.1
Syphilis: other	580	574	539	641	828	9.0	8.8	8.2	9.6	12.3
Tetanus	1	2	0	0	1	0.0	0.0	0.0	0.0	0.0
Tuberculosis	481	446	416	447	376	7.5	6.8	6.3	6.7	5.6
Typhoid and paratyphoid	36	39	42	32	31	0.6	0.6	0.6	0.5	0.5
Typhus (epidemic)	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Verotoxin-producing *Eschirichia coli* (*E. coli*)	0	1	1	5	2	0.0	0.0	0.0	0.1	0.0
Viral haemorrhagic fever	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Yellow fever	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0

Note: Laboratory confirmed cases only. Anthrax, influenza, invasive pneumococcal infection, psittacosis and shigellosis became notifiable in 2001. Chancroid, chlamydia trachomatis, giardiasis, and granuloma inguinale became notifiable in late 1998. Botulism, cryptosporidiosis, haemolytic uraemic syndrome and verotoxin producing *E. coli* became notifiable in late 1997. HIV–AIDS data were not available for 2001. Rates were age-adjusted using the Australian population as at 30 June 2001.

Source: ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health. HIV data: NSW HIV Database. Communicable Diseases Branch, NSW Department of Health. AIDS data: AIDS Data Registry. National Centre in HIV Epidemiology and Clinical Research, University of New South Wales, Sydney.

Notifiable communicable conditions hospital admissions, NSW, 1998–99 to 2002–03

Disease	Number of admissions					Rate per 100,000 population				
	98–99	99–00	00–01	01–02	02–03	98–99	99–00	00–01	01–02	02–03
Adverse event after immunisation	127	67	51	71	52	1.9	1.0	0.8	1.1	0.8
Arboviral infection: Ross River	68	41	38	19	23	1.1	0.6	0.6	0.3	0.3
Arboviral infection: other–not specified	46	21	30	33	36	0.7	0.3	0.5	0.5	0.5
Botulism	0	4	1	0	0	0.0	0.1	0.0	0.0	0.0
Brucellosis	11	7	5	11	6	0.2	0.1	0.1	0.2	0.1
Chancroid	0	0	0	0	1	0.0	0.0	0.0	0.0	0.0
Chickenpox	686	585	561	604	450	10.5	9.0	8.5	9.2	6.8
Chlamydia trachomatis: congenital pneumonia	0	1	0	0	0	0.0	0.0	0.0	0.0	0.0
Chlamydia trachomatis: lymphogranuloma venereum	3	4	0	2	1	0.0	0.1	0.0	0.0	0.0
Chlamydia trachomatis: other sexually transmitted	122	105	93	72	78	1.9	1.6	1.4	1.1	1.2
Cholera	4	5	0	1	5	0.1	0.1	0.0	0.0	0.1
Cryptosporidiosis	70	48	68	70	52	1.1	0.7	1.0	1.1	0.8
Giardiasis	209	187	183	194	156	3.2	2.9	2.8	2.9	2.4
Gonorrhoea	65	51	61	97	86	1.0	0.8	0.9	1.5	1.3
Haemolytic uraemic syndrome	90	116	128	164	339	1.4	1.8	1.9	2.5	5.2
Haemophilus influenzae meningitis	10	10	5	11	4	0.2	0.2	0.1	0.2	0.1
Hepatitis A	258	180	124	145	114	4.0	2.8	1.9	2.2	1.7
Hepatitis B	2056	2076	1429	1090	1010	32.2	32.2	21.8	16.5	15.1
Hepatitis C	7220	7230	5211	4428	4270	112.5	111.7	79.7	67.1	64.3
Hepatitis D	26	17	6	10	5	0.4	0.3	0.1	0.2	0.1
Hepatitis E	9	10	2	4	10	0.1	0.2	0.0	0.1	0.2
Hepatitis: viral (type not specified)	711	806	473	533	374	11.0	12.4	7.2	8.1	5.7
HIV–AIDS	2258	1932	1646	1434	1649	35.5	30.0	25.3	21.8	24.9
Influenza	1519	1160	1198	864	1071	23.7	17.9	18.2	13.0	16.1
Legionnaires' disease	52	41	28	48	38	0.8	0.6	0.4	0.7	0.5
Leprosy	14	10	14	14	12	0.2	0.2	0.2	0.2	0.2
Leptospirosis	27	17	16	21	20	0.4	0.3	0.2	0.3	0.3
Listeriosis	27	21	27	13	20	0.4	0.3	0.4	0.2	0.3
Malaria	127	134	125	135	104	2.0	2.1	1.9	2.0	1.6
Measles	17	9	14	10	11	0.3	0.1	0.2	0.2	0.2
Meningococcal disease	308	319	333	250	294	4.8	4.9	5.1	3.8	4.5
Mumps	36	22	15	17	19	0.6	0.3	0.2	0.3	0.3
Pertussis (whooping cough)	171	114	267	265	116	2.6	1.7	4.1	4.0	1.8
Pneumococcal infection	1896	1861	2031	2016	1935	29.6	28.6	30.7	29.9	28.4
Psittacosis	15	24	22	23	17	0.2	0.4	0.3	0.3	0.3
Q fever	74	56	62	71	115	1.2	0.9	1.0	1.1	1.7
Rubella: congenital	13	10	13	11	13	0.2	0.2	0.2	0.2	0.2
Rubella: other	17	9	24	15	8	0.3	0.1	0.4	0.2	0.1
Salmonella infection (non-typhoid)	357	317	315	366	413	5.5	4.9	4.8	5.5	6.2
Shigellosis	33	40	35	21	18	0.5	0.6	0.5	0.3	0.3
Syphilis: congenital	15	17	9	19	15	0.2	0.3	0.1	0.3	0.2
Syphilis: other	217	205	192	229	244	3.4	3.2	2.9	3.4	3.6
Tetanus	16	8	16	6	7	0.2	0.1	0.2	0.1	0.1
Tuberculosis	877	848	753	766	611	13.8	13.0	11.4	11.4	9.0
Typhoid and paratyphoid	21	35	23	35	34	0.3	0.5	0.4	0.5	0.5
Eschirichia coli (*E. coli*): enterohaemorrhagic	1	3	1	1	6	0.0	0.0	0.0	0.0	0.1

Note: Date of admission rather than separation was used to best approximate date of onset. Data consists of hospital admissions with the condition or organism as a principal or additional diagnosis. Additional diagnoses may reflect coexisting or historical conditions and may therefore not reflect new incident cases and may not be the primary reason for admission. Multiple hospitalisatons of the same person result in multiple counts. Hospitalisations were not reported for conditions that had no notifications during 1998–2003. Ross River virus was not available in ICD-9-CM or ICD-10-AM. Chickenpox was not notifiable but was included for completeness. Rates were age-adjusted using the Australian population as at 30 June 2001. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

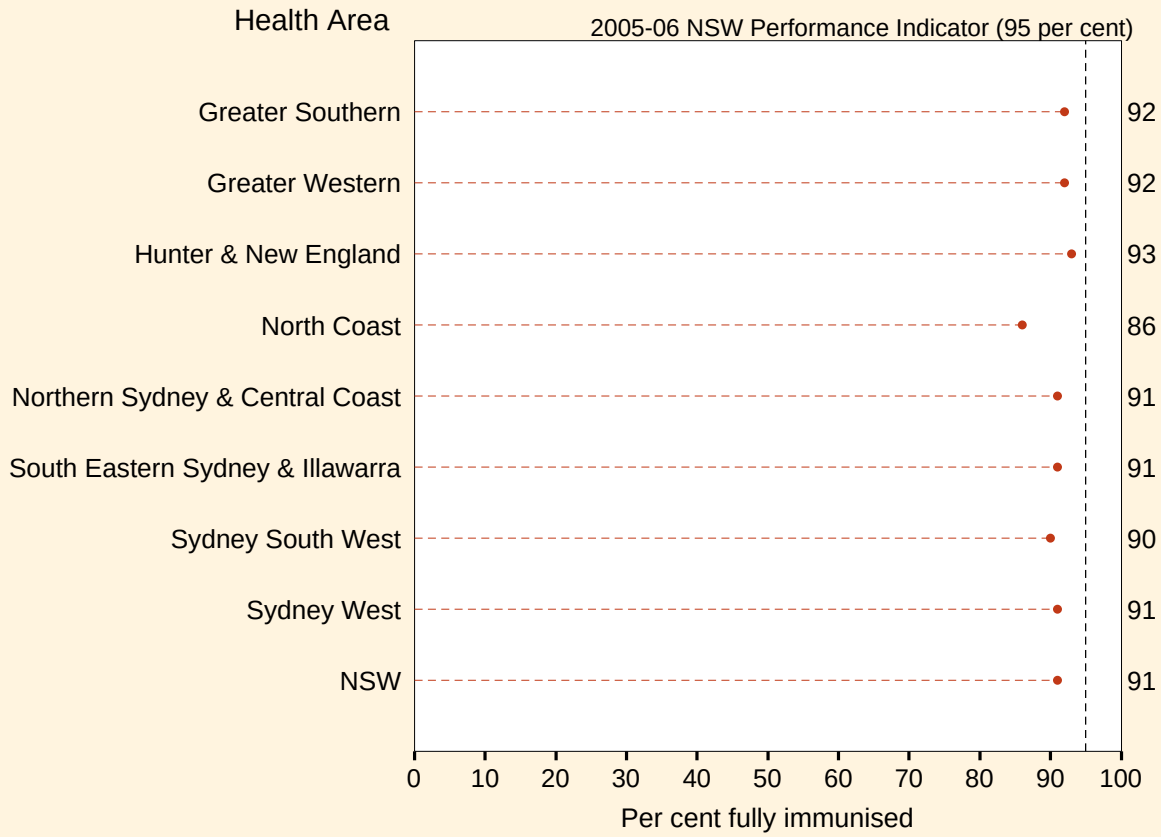
Notifiable communicable diseases deaths, NSW, 1998 to 2002

Disease	Number of deaths					Rate per 100,000 population				
	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
Adverse event after immunisation	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Anthrax	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Arboviral infection: Ross River	0	0	0	1	0	0.0	0.0	0.0	0.0	0.0
Arboviral infection: Barmah Forest	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Arboviral infection: other–not specified	0	0	0	1	0	0.0	0.0	0.0	0.0	0.0
Botulism	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Brucellosis	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Chancroid	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Chickenpox	3	4	1	7	3	0.0	0.1	0.0	0.1	0.0
Chlamydia trachomatis: congenital pneumonia	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Chlamydia trachomatis: lymphogranuloma venereum	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Chlamydia trachomatis: other sexually transmitted	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Cholera	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Cryptosporidiosis	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Diphtheria	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Foodborne illness	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Gastro in institution	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Giardiasis	0	0	0	0	1	0.0	0.0	0.0	0.0	0.0
Gonorrhoea	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Granuloma inguinale (Donovanosis)	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Haemolytic uraemic syndrome	0	2	0	1	0	0.0	0.0	0.0	0.0	0.0
Haemophilus influenzae meningitis	0	0	0	0	1	0.0	0.0	0.0	0.0	0.0
Hepatitis A	1	1	0	0	0	0.0	0.0	0.0	0.0	0.0
Hepatitis B	10	6	2	4	5	0.2	0.1	0.0	0.1	0.1
Hepatitis C	20	12	3	8	7	0.3	0.2	0.0	0.1	0.1
Hepatitis D	0	1	0	0	0	0.0	0.0	0.0	0.0	0.0
Hepatitis E	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Hepatitis: viral (type not specified)	33	20	60	60	41	0.5	0.3	0.9	0.9	0.6
HIV–AIDS	67	60	68	62	53	1.1	0.9	1.0	0.9	0.8
Influenza	43	39	31	16	24	0.7	0.6	0.5	0.2	0.3
Legionnaires' disease	1	2	2	0	0	0.0	0.0	0.0	0.0	0.0
Leprosy	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Leptospirosis	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Listeriosis	5	1	0	2	1	0.1	0.0	0.0	0.0	0.0
Malaria	0	2	0	0	0	0.0	0.0	0.0	0.0	0.0
Measles	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Meningococcal disease	15	13	11	7	22	0.2	0.2	0.2	0.1	0.3
Mumps	0	0	1	1	0	0.0	0.0	0.0	0.0	0.0
Pertussis (whooping cough)	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Plague	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Pneumococcal infection	8	18	26	14	15	0.1	0.3	0.4	0.2	0.2
Poliomyelitis (late effects)	3	4	6	10	6	0.0	0.1	0.1	0.1	0.1
Psittacosis	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Q fever	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Rabies (*Lyssavirus*)	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Rubella: congenital	0	1	1	1	0	0.0	0.0	0.0	0.0	0.0
Rubella: other	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Salmonella infection (non-typhoid)	0	1	0	2	1	0.0	0.0	0.0	0.0	0.0
Shigellosis	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Syphilis: congenital	0	0	1	0	0	0.0	0.0	0.0	0.0	0.0
Syphilis: other	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Tetanus	0	0	1	0	0	0.0	0.0	0.0	0.0	0.0
Tuberculosis	25	15	24	31	23	0.4	0.2	0.4	0.5	0.3
Typhoid and paratyphoid	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Typhus	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Eschirichia coli (*E. coli*): enterohaemorrhagic	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Viral haemorrhagic fever	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Yellow fever	0	0	0	1	0	0.0	0.0	0.0	0.0	0.0

Note: Deaths due to diseases that had no notifications during 1997–2000 were excluded. Chickenpox was not notifiable but was included for completeness. Ross River virus, cryptosporidiosis, haemolytic uraemic syndrome, hepatitis C, D and E, Legionnaires' disease, and enterohaemorrhagic *E. coli* infection were not available in ICD-9. Of the chlamydial diseases, only lymphogranuloma venereum was available in ICD-9. Barmah Forest virus was not available in ICD-9 or ICD-10. Hospital separations were classified using ICD-9-CM up to 1997-98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Rates were age-adjusted using the Australian population as at 30 June 2001.

Source: AIDS deaths were obtained from the HIV–AIDS enhanced surveillance system. Communicable Disease Surveillance and Control Unit. ABS mortality data (except AIDS) and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

Immunisation coverage by health area, children aged 12 to 15 months, NSW 31 December 2003



Note: These figures may not reflect actual coverage due to under-reporting. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: Australian Childhood Immunisation Register. Health Insurance Commission, Perth (unpublished data).

- Despite substantial progress in reducing the incidence of vaccine-preventable diseases in NSW, increases in immunisation levels are needed to further reduce and finally eliminate these causes of illness and death.
- Safe and effective vaccines are now freely available. However, the growing number of vaccines, and the complexity of immunisation schedules, make delivering appropriate immunisations on time increasingly difficult for service providers and parents.
- For these reasons, the Commonwealth Government established the Australian Childhood Immunisation Register (ACIR) in 1996. Data from the Register provide information on the immunisation status of all children under 7 years of age.
- ACIR data for NSW indicate that at the end of June 2004, 90% of children aged 12 to less than 15 months were fully immunised. Among children aged 24–27 months at the end of June 2004, 91% were fully immunised. This compares with national figures of 91% for children aged 12 to less than 15 months and 92% for those aged 24–26 months.

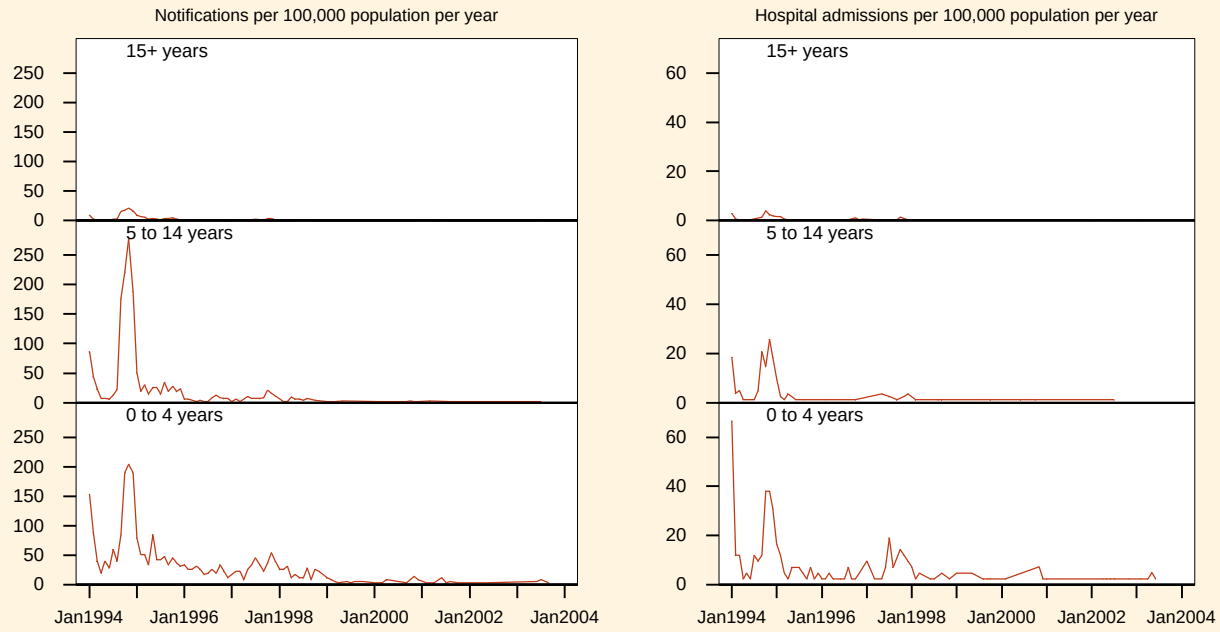
For more information:

National Health and Medical Research Council. *The Australian Immunisation Handbook. 8th edition.* Canberra: NHMRC, 2003.

The *NSW Public Health Bulletin* includes monthly reports of notifiable communicable diseases. Available at www.health.nsw.gov.au/public-health/phb/phb.html.

National communicable disease data are published in *Communicable Diseases Intelligence* available at www.health.gov.au/internet/wcms/publishing.nsf/content/cda-pubs-cdipubs.htm.

Measles notifications, 1994 to 2003 and hospital admissions, 1994 to 2003 by month and age, NSW



Note: These figures may not reflect actual coverage due to under-reporting. Hospital admissions with measles as a principal or additional diagnosis were included. Date of admission rather than separation was used to best approximate date of onset. Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Hospital data were only available up to June 2003. Rates were age-adjusted using the Australian population as at 30 June 2001. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: Communicable Diseases Branch. Notifiable Diseases Database and NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Measles is a highly infectious disease characterised by fever, rash, runny nose, sore eyes, and cough. Serious complications, including pneumonia, encephalitis and death, can follow infection. All doctors, laboratories, hospitals, schools, and childcare centres are required by law to notify cases of measles.
- The Australian Standard Vaccination Schedule currently recommends 2 doses of measles, mumps and rubella (MMR) vaccine, at one and 4 years of age.
- NSW experienced its last major epidemic of measles in 1993–94, with 2,348 notifications. Most cases were in children aged less than 15 years.
- In 1998, the National Health and Medical Research Council recommended that the age for the second dose of MMR vaccine be lowered from 10–16 years to 4 years. The National Measles Control Campaign was conducted in all primary schools in 1998. Over 75% of NSW primary school children who would otherwise have missed out on their second dose of MMR vaccine were vaccinated.
- Since 1998, the incidence of measles in NSW has been at historically low levels. September 1999 was the first month, since laboratory notifications began in 1991, in which no cases of measles were reported. For all of 2003, there were only 18 cases notified.
- The small number of measles cases notified in recent years have often been in travellers returning from overseas, particularly young adults. Encouraging vaccination of young adults, especially those who are travelling and maintaining high levels of childhood vaccination, is central to eliminating measles in Australia.

For more information:

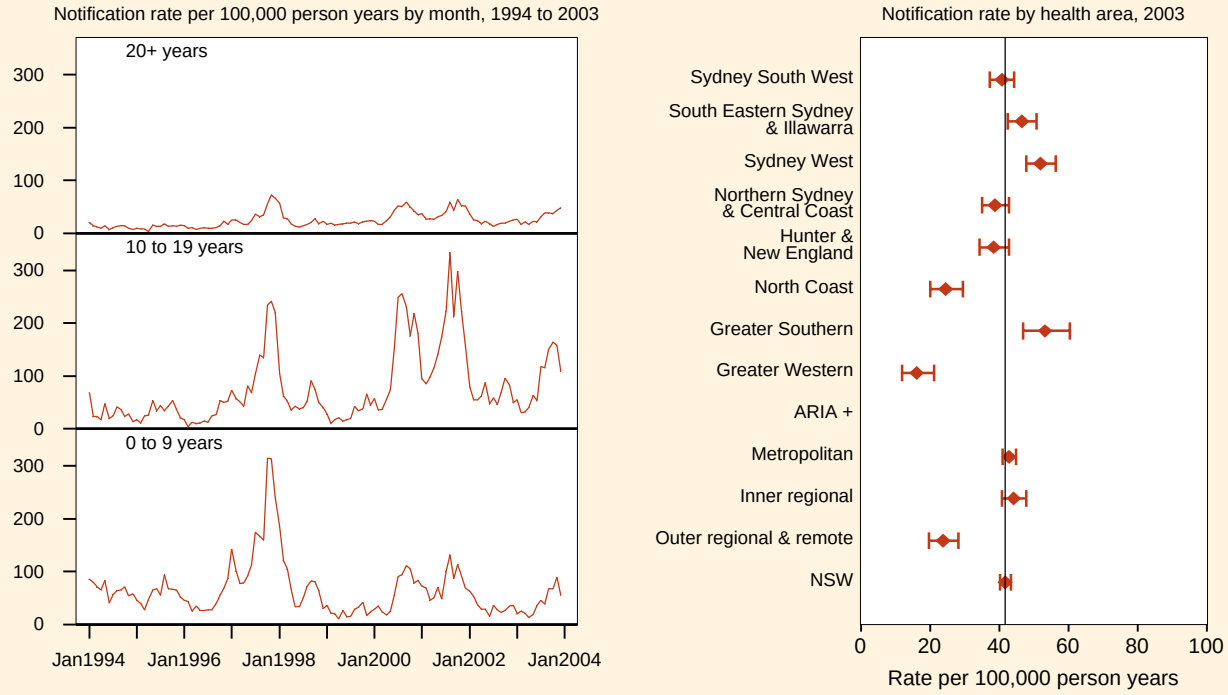
NSW Health Infectious Diseases web page. Available at www.health.nsw.gov.au/living/infect.html.

National Health and Medical Research Council. *The Australian Immunisation Handbook. 8th edition.* Canberra: NHMRC, 2003.

The *NSW Public Health Bulletin* includes monthly reports of notifiable communicable diseases. Available at www.health.nsw.gov.au/public-health/phb/phb.html.

EpiReview: Measles in NSW 1991–2000. *N S W Public Health Bull* 2001; 12(7): 200–204.

Pertussis: notifications, persons of all ages, NSW



Note: Rates were age-adjusted using the Australian population as at 30 June 2001. Lower and upper limits of the 95% confidence interval are shown. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: Communicable Diseases Branch, Notifiable Diseases Database, and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Pertussis, or whooping cough, is caused by infection with *Bordetella pertussis* bacteria and can cause serious illness in both children and adults. Illness in children is characterised by fits of violent coughing, followed by a whooping sound as the child gasps for breath. The cough may last several months. The illness can be life-threatening, particularly in young babies. Cases of pertussis are notifiable by doctors, hospitals, laboratories, schools, and child care centres.
- Vaccination is currently recommended at 2, 4 and 6 months, and at 4 years of age, but protection wanes over time. There is now a pertussis-containing vaccine suitable for use in teenagers and adults. A booster dose of pertussis vaccine is now recommended for all 15–17 year olds, and this vaccine is currently being given to students in all high schools in NSW. Adults who are in contact with small children, including childcare workers, health care workers, and parents, should also have the pertussis vaccine.
- Epidemics of pertussis tend to occur every 3–4 years. A large and sustained outbreak occurred across NSW in 2000 and 2001, during which one infant died of the disease. The previous large outbreak in 1996–1997 claimed the lives of 6 NSW infants. Compared with earlier outbreaks, the 2000–2001 outbreak was most prominent in older children. In 2001, the rate in 10–19 year olds was 188 per 100,000, compared with 84 per 100,000 in 0–9 year olds. Protection of younger children by the introduction in 1995 of the fifth dose of the vaccine, at age 4 years, may explain this. The notification rate in people aged 20 years or more increased from one to 43 per 100,000 between 1992 and 2001.
- In 2003 in NSW, an age-adjusted rate of 42 cases of pertussis per 100,000 population was reported. The lowest rates were seen in outer-regional and remote areas of NSW (24 cases per 100,000 population). However, the geographic distribution of cases changes over time, with rural areas having the highest rates in 2001.

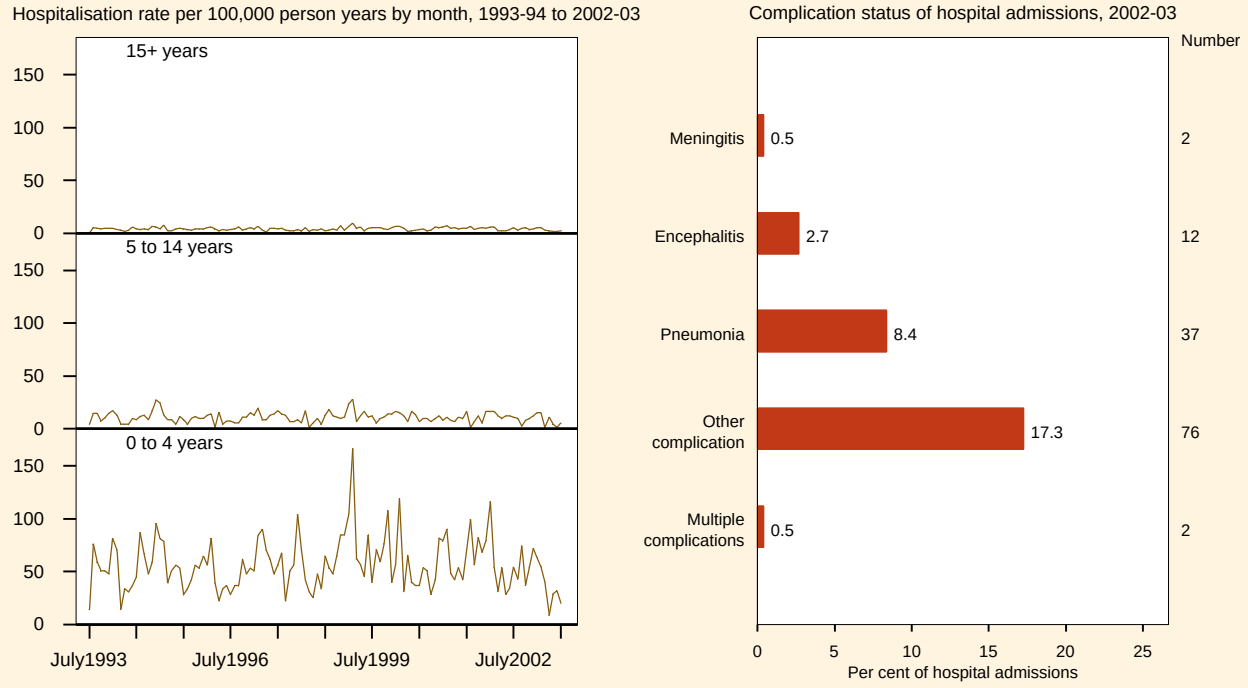
For more information:

NSW Health Infectious Diseases web page. Available at www.health.nsw.gov.au/living/infect.html.

National Health and Medical Research Council. *The Australian Immunisation Handbook. 8th edition.* Canberra: NHMRC, 2003.

The *NSW Public Health Bulletin* includes monthly reports of notifiable communicable diseases. Available at www.health.nsw.gov.au/public-health/phb/phb.html.

Chickenpox: hospital separations, persons of all ages, NSW



Note: These figures may not reflect actual coverage due to under-reporting. Hospital admissions with chickenpox as a principal or additional diagnosis were included. Date of admission rather than separation was used to best approximate date of onset. Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Data for 2001–2002 and 2002–2003 include an estimate of the small number of interstate hospitalisations. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

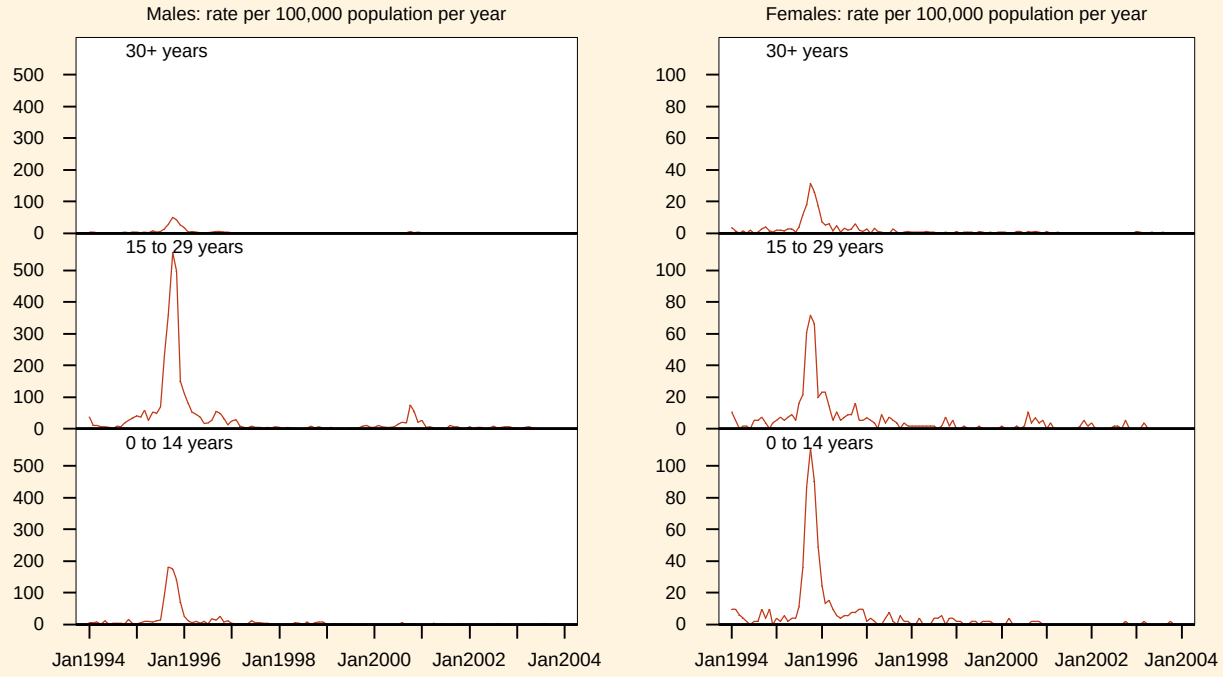
Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Chickenpox is a common infectious disease caused by the varicella-zoster virus. About three-quarters of children will have been infected by the time they are 12 years old. In most children the infection is mild, causing a slight fever and a rash that forms blisters and then scabs. In adults, the infection can be more severe and is more likely to be complicated by pneumonia and encephalitis. The virus can re-emerge years later as shingles in some people. In the 1990s, a chickenpox vaccine was introduced into Australia for commercial use but is not part of the Australian Standard Vaccination Schedule.
- Chickenpox is not notifiable in NSW. However, data on admissions are available from the NSW Inpatients Statistics Collection. Only a small proportion of all infected people will be admitted to hospital, and these cases will represent those with complicated infections. In the financial year 2002–03, the age-adjusted rate of admission was 6.7 per 100,000 population. The highest rate of admission was among young children (43 per 100,000 aged 0–4 years), reflecting the age group most at risk of infection. Males (53 per 100,000) had a higher rate of hospital admission than females (33 per 100,000) in this age group.
- Between 1993 and 2003, admission for chickenpox generally peaked in the late spring and summer months. The highest rate of admission (annualised rate 163 per 100,000 per year in 0–4 year-olds) occurred in January 1999.
- In 2002–03, 1% of chickenpox-related hospital admissions had a single complication of meningitis recorded, 3% had encephalitis, and 8% had pneumonia. One per cent had multiple complications recorded.

For more information:

National Health and Medical Research Council. *The Australian Immunisation Handbook. 8th edition.* Canberra: NHMRC, 2003.

Rubella notifications by month, age and sex, NSW 1994 to 2003



Note: Rates were age-adjusted using the Australian population as at 30 June 2001. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Rubella, caused by the rubella virus, is generally a mild illness, characterised by a fever and rash. However, it is of major public health concern because foetal infection (resulting from infection in non-immune pregnant women) can cause birth defects. Laboratories, schools, and child care centres are required by law to notify cases of rubella. The Australian Standard Vaccination Schedule currently recommends 2 doses of measles, mumps, and rubella (MMR) vaccine, at one and 4 years of age.
- Major epidemics of rubella occurred in NSW in 1993 and 1995. The 1995 outbreak was fuelled largely by infections among adolescent boys and young men, many of whom would have missed out on rubella immunisation early in life. Among 15–29 year-olds in 1995, the rate per 100,000 in males was 166 laboratory-confirmed cases, compared with 25 in females. A smaller epidemic occurred in 2000, also mainly affecting adolescent boys and young men. Among 15–29 year-olds in 2000, the rate per 100,000 population in males was 18 per 100,000 compared with 3 in females. Among all people in 2003, the age-adjusted rate per 100,000 of laboratory-confirmed disease in NSW was 0.4, down from 41 in 1995.
- From 1971, rubella vaccination was routinely offered to teenage girls in early high school in an attempt to minimise the risk of foetal infections. In 1989, to more completely control rubella transmission, MMR vaccination was recommended for all children at age 12 months, and the vaccine was introduced for high school girls. In 1994, the high school dose of MMR vaccine was extended to boys as well. Then in 1998, the National Health and Medical Research Council recommended that a second dose of MMR be administered at age 4 years, meaning the high-school dose was no longer necessary. The National Measles Control Campaign conducted in that year in all primary schools in NSW offered MMR vaccination to those children who would otherwise have missed out on their second dose.

For more information:

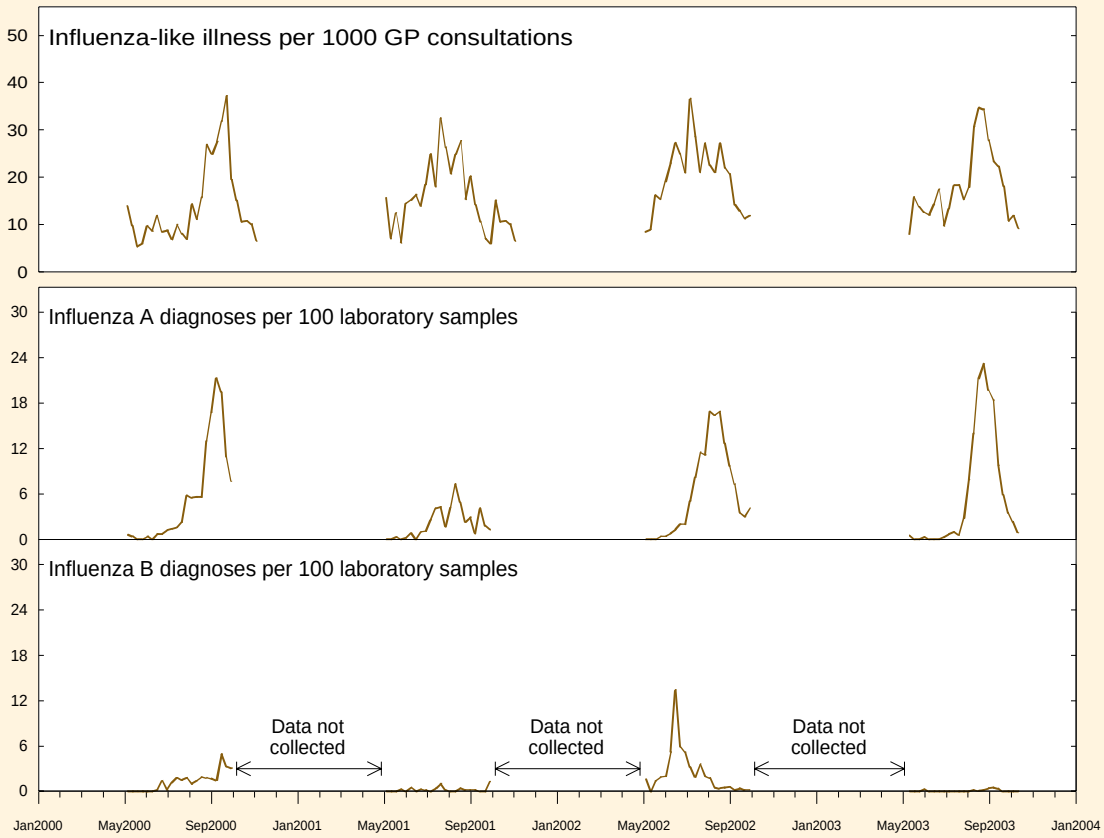
NSW Health Infectious Diseases web page. Available at www.health.nsw.gov.au/living/infect.html.

National Health and Medical Research Council. *The Australian Immunisation Handbook. 8th edition.* Canberra: NHMRC, 2003.

The *NSW Public Health Bulletin* includes monthly reports of notifiable communicable diseases. Available at www.health.nsw.gov.au/public-health/phb/phb.html.

National communicable disease data are published in *Communicable Diseases Intelligence* available at www.health.gov.au/internet/wcms/publishing.nsf/content/cda-pubs-cdipubs.htm.

Influenza consultations and laboratory diagnoses by week, NSW 2000 to 2003



Note: Data were only collected during the influenza season May–September each year. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Sentinel General Practitioner Network and all major public health laboratories. Communicable Diseases Branch, NSW Department of Health.

- The influenza virus causes illness characterised by abrupt onset of fever, myalgia, headache, sore throat, and acute cough, and can cause extreme malaise lasting several days. Secondary bacterial pneumonia and decompensation (physiological dysfunction that can lead to organ failure) can complicate influenza, especially in the elderly and in people with underlying medical conditions. Influenza epidemics occur every year in Australia. Influenza viruses mutate from time to time, potentially resulting in a substantial increase in morbidity and mortality.
- Influenza became notifiable by all laboratories in NSW in 2001. Surveillance is enhanced during the winter months when the NSW Department of Health collects and reports weekly on additional data on general practitioner consultations for influenza-like illnesses and confirmed laboratory diagnoses of influenza virus.
- The enhanced surveillance data show that in 2003, the influenza A virus was more commonly diagnosed by laboratories (5.8 per 100,000 samples) than the influenza B virus (0.1 per 100,000 samples).

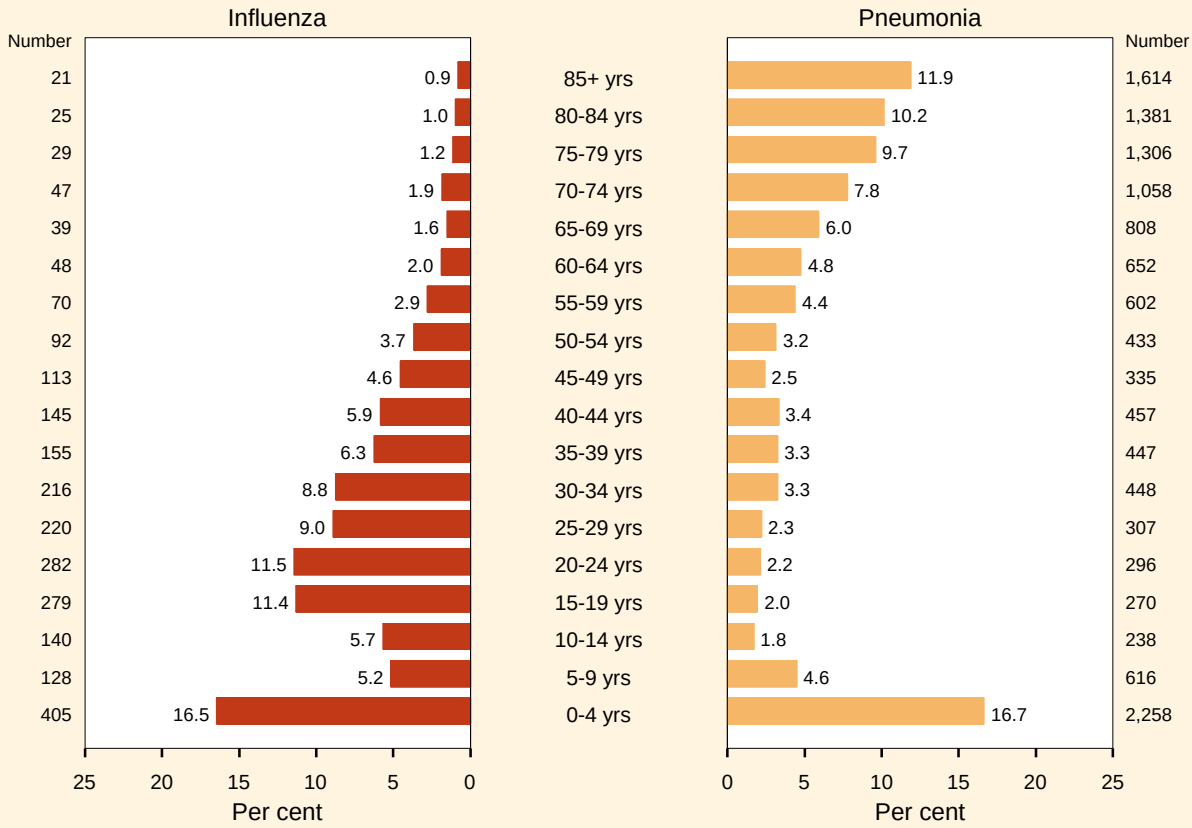
For more information:

National Health and Medical Research Council. *The Australian Immunisation Handbook. 8th edition.* Canberra: NHMRC, 2003.

The *NSW Public Health Bulletin* includes monthly reports of notifiable communicable diseases. Available at www.health.nsw.gov.au/public-health/phb/phb.html.

National communicable disease data are published in *Communicable Diseases Intelligence* available at www.health.gov.au/internet/wcms/publishing.nsf/content/cda-pubs-cdipubs.htm.

Influenza and pneumonia emergency department attendances by age and sex, NSW Jan 2003 to Dec 2003



Note: The NSW Emergency Department Data Collection is a database of information collected from approximately one-third of NSW emergency departments and represents approximately two-thirds of all NSW emergency patients. Influenza and pneumonia were coded as provisional diagnoses assigned by staff when the patient presented to the emergency department. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

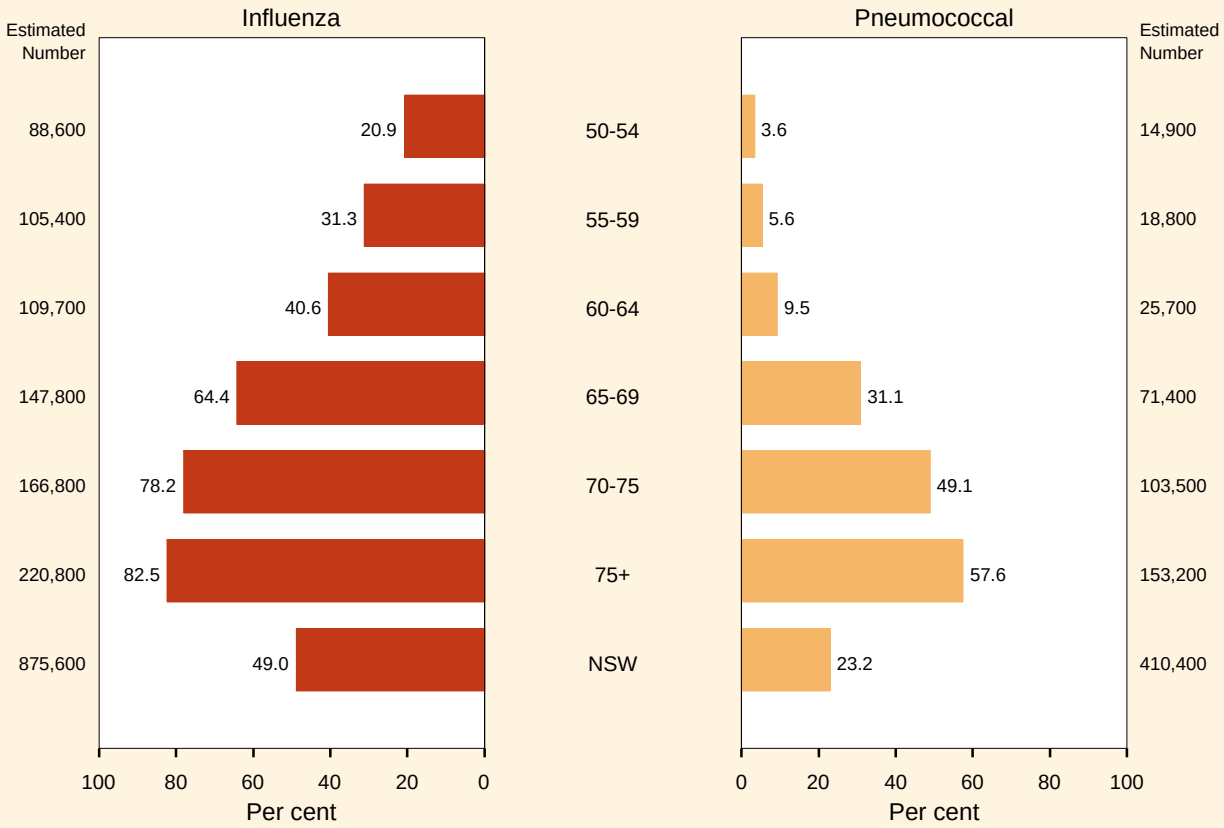
Source: NSW Emergency Department Data Collection, NSW Inpatients Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- While the severity of influenza seasons, in terms of numbers of people affected, tends to be quite variable, the age-distribution of hospital emergency department attendances is usually quite consistent. Although influenza affects all age groups, children under the age of 5 years, given their young age and lack of immunity, are most likely to require medical assessment and perhaps a hospital visit.
- The most common complication of influenza is pneumonia, either primary viral pneumonia or secondary bacterial infection; for example, from pneumococcal infection.
- In 2003, 45.6% of emergency department presentations for pneumonia were in people aged 65 years and older and 16.7% in children under 5 years.
- Influenza vaccination of children has recently been recommended in the United States of America. In Australia, vaccination is currently only recommended for: adults aged 65 years and over, all Aboriginal and Torres Strait Islander people aged 50 years and over, and people with chronic medical conditions.

For more information:

National Health and Medical Research Council. *The Australian Immunisation Handbook. 8th edition.* Canberra: NHMRC, 2003.

Influenza and pneumococcal disease immunisation by age, persons aged 50 years and over, NSW 2003



Note: Influenza estimates are based on 7,135 respondents in NSW, including those aged 50 years and over who were vaccinated or immunised against influenza in the last 12 months. 10 not stated (Don't Know or Refused). Pneumococcal estimates are based on 6,999 respondents in NSW. 146 not stated (Don't Know or Refused) and includes those aged 50 years and over who were vaccinated or immunised against pneumococcal disease in the last 5 years. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Health Survey 2003 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Influenza and pneumococcal vaccination, for those at risk of serious complications, has been shown to be among the most cost-effective preventive interventions, especially in the older population. The Australian Immunisation Handbook recommends pneumococcal vaccine and influenza vaccine for all people aged 65 years and over, all Aboriginal and Torres Strait Islander people aged 50 years and over, and those who are immunocompromised or have a chronic illness predisposing them to infection.
- The NSW Health Survey collects self-reported data on vaccination for influenza and pneumococcal disease. In 2003, 75.8% of people aged 65 years and older reported that they had been vaccinated against influenza in the past year, compared with 57.1% in 1997. Vaccination rates increased with age to 82.7% among people aged 75 years and over.
- In 2003, just under half (46.8%) of people aged 65 years and over reported that they had been vaccinated for pneumococcal pneumonia in the past 5 years, an increase from 39.4% in the previous year. Again, vaccination rates increased with age to 57.6% among people aged 75 years and over.

For more information:

National Health and Medical Research Council. *The Australian Immunisation Handbook. 8th edition.* Canberra: NHMRC, 2003.

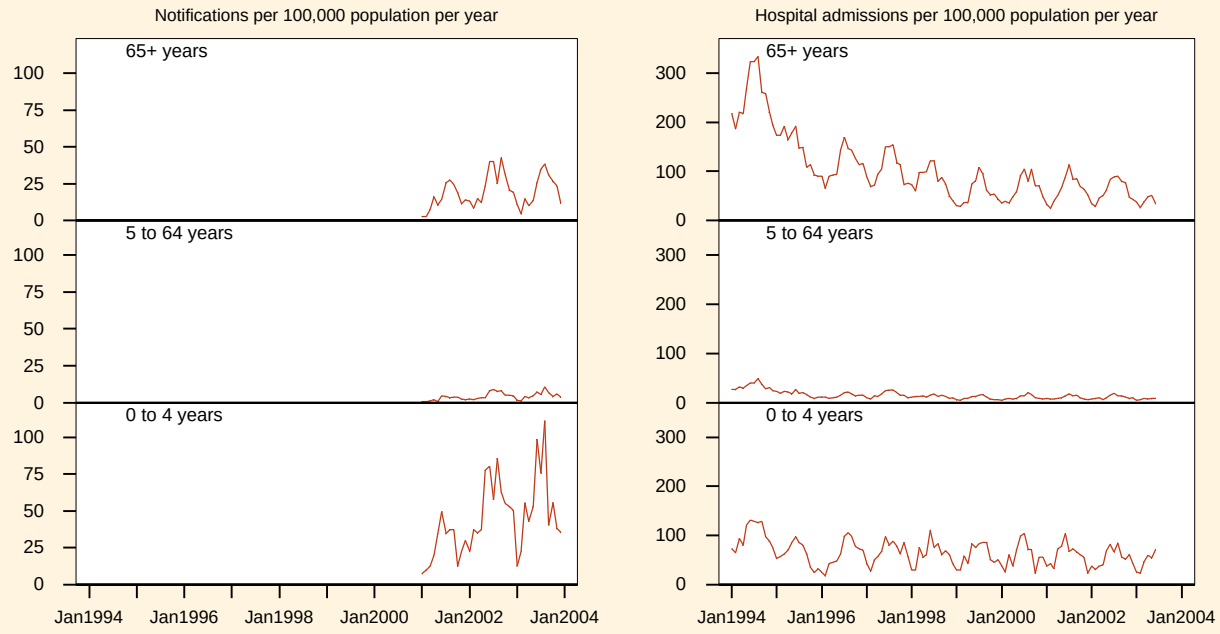
Communicable Disease Network of Australia and New Zealand. *A framework for an Australian Influenza pandemic plan.* Canberra: CDI, 1999.

National Influenza Surveillance Scheme and Annual Reports at www.health.gov.au/internet/wcms/publishing.nsf/content/cda-pubs-annlrpt-fluannrep.htm-copy3.

The *NSW Public Health Bulletin* includes monthly reports of notifiable communicable diseases. Available at www.health.nsw.gov.au/public-health/phb/phb.html.

Centre for Epidemiology and Research, NSW Department of Health. New South Wales Adult Health Survey 2003. *N S W Public Health Bull* 2004; 15(S-4).

Pneumococcal disease notifications and hospital admissions by month and age, NSW 1994 to 2003



Note: Invasive pneumococcal disease became notifiable in January 2001. Date of admission to hospital was used to best approximate date of onset. Hospital admissions with a principal or additional diagnosis of pneumococcal septicaemia, pneumococcal meningitis, pneumococcal pneumonia, pneumococcal arthritis, or *Streptococcus pneumoniae* organism, were included. Hospital data were only available up to June 2003. Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: Communicable Diseases Branch. Notifiable Diseases Database and NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- *Streptococcus pneumoniae* (pneumococcus), a bacterial inhabitant of the upper respiratory tract, is a major cause of pneumonia, meningitis, and middle ear infection, particularly in young children, the elderly, and Aboriginal and Torres Strait Islander people.
- Invasive pneumococcal disease (infection in parts of the body not normally exposed to organisms) became notifiable in NSW in 2001. Notification data from that year should be interpreted with caution because of the likelihood of under-reporting. In 2003, the age-adjusted notification rate was 11.9 per 100,000 population. Rates were highest among small children (58.9 per 100,000 in children aged under 5 years) and the elderly (22.7 per 100,000 in people aged 65 years or more).
- The hospitalisation data shown here includes all admissions with a diagnosis of pneumococcal infection and are therefore not restricted to invasive infections. Changes in coding procedures may explain the apparent decline in admissions after 1995. The data demonstrate a clear seasonal pattern with winter peaks. In 2002, the age-adjusted admission rate was 24.0 per 100,000 population. The age pattern of admissions was similar to notifications for invasive infection, with the highest admission rates occurring in young children (60 per 100,000 in children aged under 5 years) and in the elderly (66.1 per 100,000 in those aged 65 years or more).

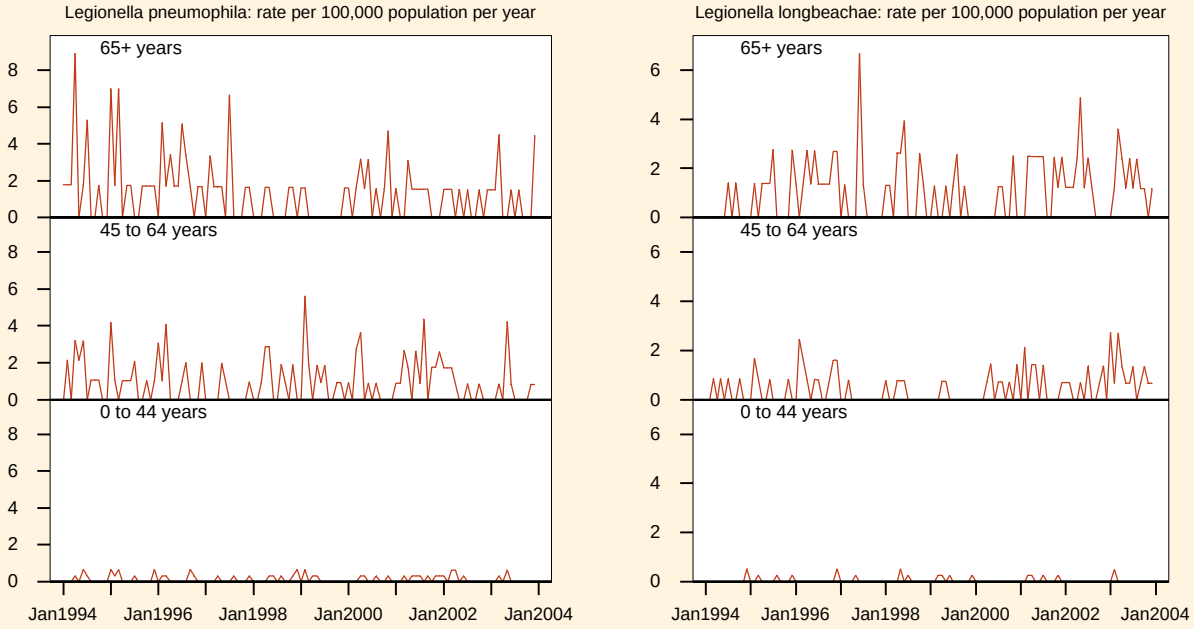
For more information:

National Health and Medical Research Council. *The Australian Immunisation Handbook. 8th edition.* Canberra: NHMRC, 2003.

The *NSW Public Health Bulletin* includes monthly reports of notifiable communicable diseases. Available at www.health.nsw.gov.au/public-health/phb/phb.html.

National communicable disease data are published in *Communicable Diseases Intelligence* available at www.health.gov.au/internet/wcms/publishing.nsf/content/cda-pubs-cdipubs.htm.

Legionnaires' disease notifications by month, age and species, NSW 1994 to 2003



Note: Rates were age-adjusted using the Australian population as at 30 June 2001. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Legionnaires' disease is characterised by pneumonia, and is caused by infection with *Legionella* bacteria. The most common disease-causing species in NSW are *L. pneumophila* and *L. longbeachae*. *L. pneumophila* is known to live in water and outbreaks have been linked to exposure to aerosols of contaminated water, most notably from air-conditioner cooling towers. *L. longbeachae* is known to live in soils, and some human infections have been linked to potting mix. Individual risk factors for Legionnaires' disease include older age, male-to-male sex, smoking, and underlying medical conditions.
- In 2003, the age-adjusted notification rate for all Legionnaires' disease in NSW was 0.9 per 100,000 population. For *L. pneumophila*, the age-adjusted rate was 0.3 per 100,000 and for *L. longbeachae*, 0.5 per 100,000. Between 1987 and 2003, 9 outbreaks were identified in NSW, most linked to cooling towers; 6 in the western part of Sydney; one in the city of Sydney; and 2 in the Illawarra region.
- In NSW, the highest rates of Legionnaires' disease are seen in urban areas, probably because of the association with cooling towers in modern buildings. The disease is more common in males (69% of cases were male in the 10 years to 2003), and among people over 45 years (81% of cases were 45 years or older).
- Prevention of Legionnaires' disease focuses on keeping potential sources such as cooling towers free from contamination. In addition, any one using potting mix should avoid exposure to its dust, especially people who have risk factors for the disease.

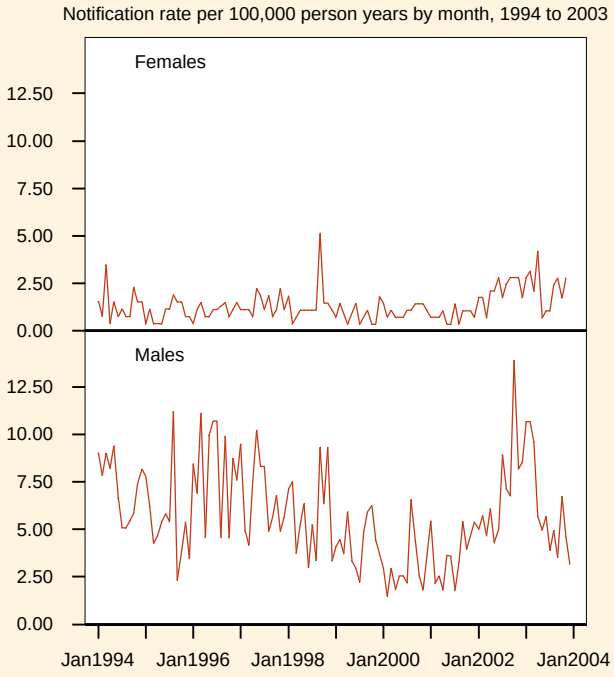
For more information:

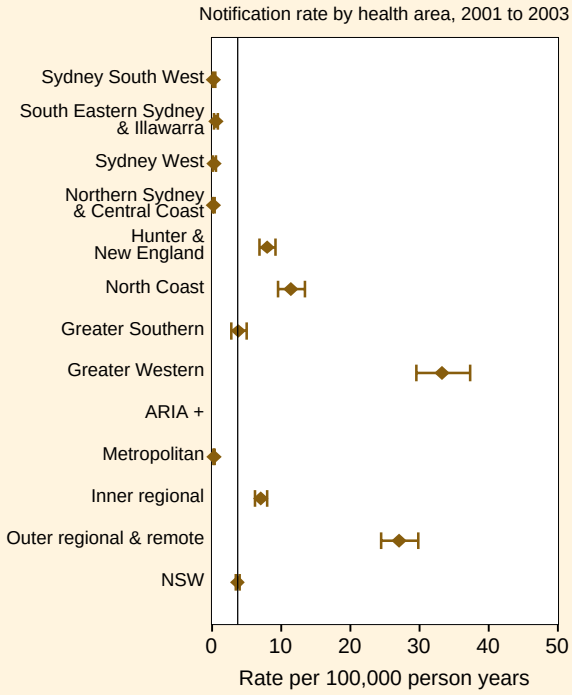
The *NSW Public Health Bulletin* includes monthly reports of notifiable communicable diseases. Available at www.health.nsw.gov.au/public-health/ph/phb.html.

EpiReview: Legionnaires' disease, NSW, 1991–2000. *N S W Public Health Bull* 2001; 12(10): 282–285.

NSW Government. *NSW Public Health Act 1991: Regulation (Public Health Regulation) 1991, NSW: Part 6, Microbial Control 2000.* Available at www.austlii.edu.au/au/legis/nsw/consol-reg/phcc2000380.

Q fever: notifications, persons of all ages, NSW





Note: Rates were age-adjusted using the Australian population as at 30 June 2001. Lower and upper limits of the 95% confidence interval are shown. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

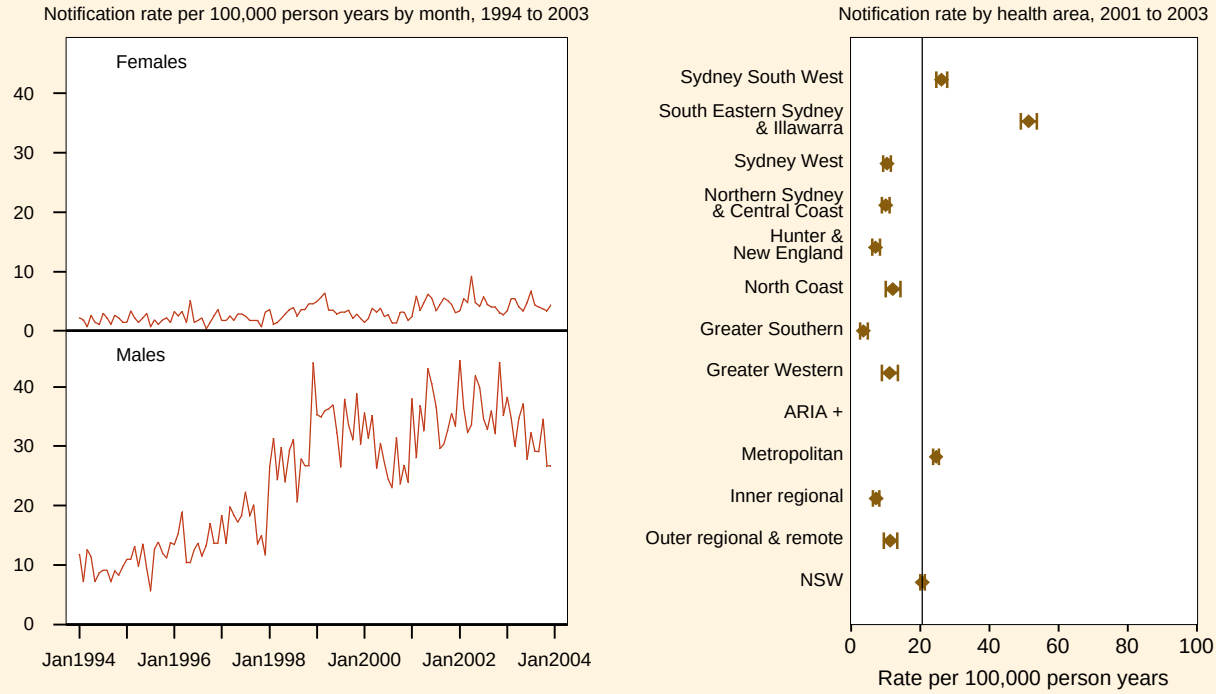
- Q fever is a zoonotic disease caused by infection with the organism *Coxiella burnetti*. It is usually transmitted by inhalation of dust contaminated by birth products or faeces of certain animals (including sheep, cattle, and goats), and is especially frequent among abattoir workers. Symptoms include sudden onset of chills, headache, weakness, malaise, and sweats. Q fever may be complicated by endocarditis (inflammation of the internal lining of the heart) in a minority of patients.
- Laboratories are required by law to notify cases of Q fever to the NSW Department of Health. In 2003, the age-standardised overall notification rate was 4 per 100,000. The age-standardised rate in males was more than 6 per 100,000 compared with 2 per 100,000 in females. Overall, rates were higher in rural areas of NSW. For 2001 to 2003 combined, the highest rates were reported from the Greater Western Health Area (age-standardised rate 33 per 100,000 per year), and the North Coast (11 per 100,000) and Hunter & New England (8 per 100,000) Health Areas. Following a decline in the overall rate of notifications in NSW during the 1990s, the rate began to increase again in 2000, reaching a 9-year peak in 2002.
- Despite the availability of a highly-effective vaccine, notification data indicate that cases of Q fever are still occurring among certain occupational groups including (mainly male) abattoir workers and farmers. Several abattoir-associated outbreaks were reported in rural areas of the State in the 1990s.

For more information:

The *NSW Public Health Bulletin* includes monthly reports of notifiable communicable diseases. Available at www.health.nsw.gov.au/public-health/phb/phb.html.

EpiReview: Notifications of Q fever, New South Wales 1991–1999. *N S W Public Health Bull* 2001; 12(6): 172–175.

Gonorrhoea: notifications, persons of all ages, NSW



Note: Rates were age-adjusted using the Australian population as at 30 June 2001. Lower and upper limits of the 95% confidence interval are shown. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: Communicable Diseases Branch. Notifiable Diseases Database and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Gonorrhoea is a sexually transmissible infection caused by the bacterium *Neisseria gonorrhoea*. Infection usually causes a purulent (pus-containing) discharge, with difficulty in urinating in males, and inflammation of the urethra or cervix, and later pelvic inflammatory disease and infertility in females. Throat and ano–rectal infections are also reported.
- Case reports of gonorrhoea declined sharply in the 1980s, probably because of safe-sex campaigns. In the 1990s, rates of disease stabilised and then began to increase in the second half of the decade. Rates again appear to have stabilised and the age-adjusted rate of notifications in 2003 was 31.0 per 100,000 in males, and 4.8 per 100,000 in females. Of the 1,182 cases notified in NSW in 2003, 87% were male.
- For the period 2001–2003, notification rates were highest in the South Eastern Sydney & Illawarra (age-adjusted rate 49.0 per 100,000 population) and Sydney South West (26.2 per 100,000) Health Areas.
- Safe-sex practices, early case identification and treatment, and contact tracing, are the most effective methods for controlling gonorrhoea.

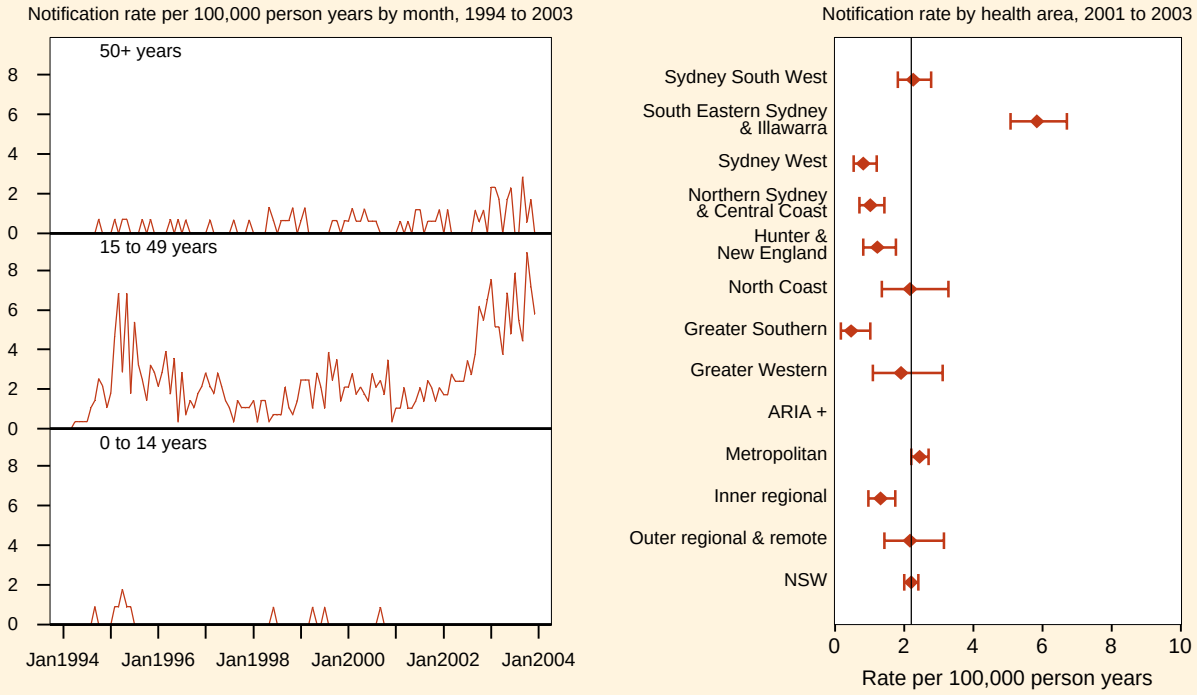
For more information:

National Centre in HIV Epidemiology and Clinical Research. *HIV–AIDS, viral hepatitis and sexually transmissible infections in Australia. Annual surveillance report 2001.* Sydney: National Centre in HIV Epidemiology and Clinical Research, 2001. Available at www.med.unsw.edu.au/nchecr.

National communicable disease data are published in *Communicable Disease Intelligence*. Available at www.health.gov.au/pubhlth/cdi/cdihtml.htm.

EpiReview: Notifiable sexually transmitted diseases, NSW, 1991–1999. *N S W Public Health Bull* 2001; 12(1): 16–18.

Syphilis: notifications, persons of all ages, NSW



Note: Rates were age-adjusted using the Australian population as at 30 June 2001. Health areas in metropolitan Sydney, Central Coast, Hunter and Illawarra were classified as urban. Lower and upper limits of the 95% confidence interval are shown. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: Communicable Diseases Branch. Notifiable Diseases Database and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

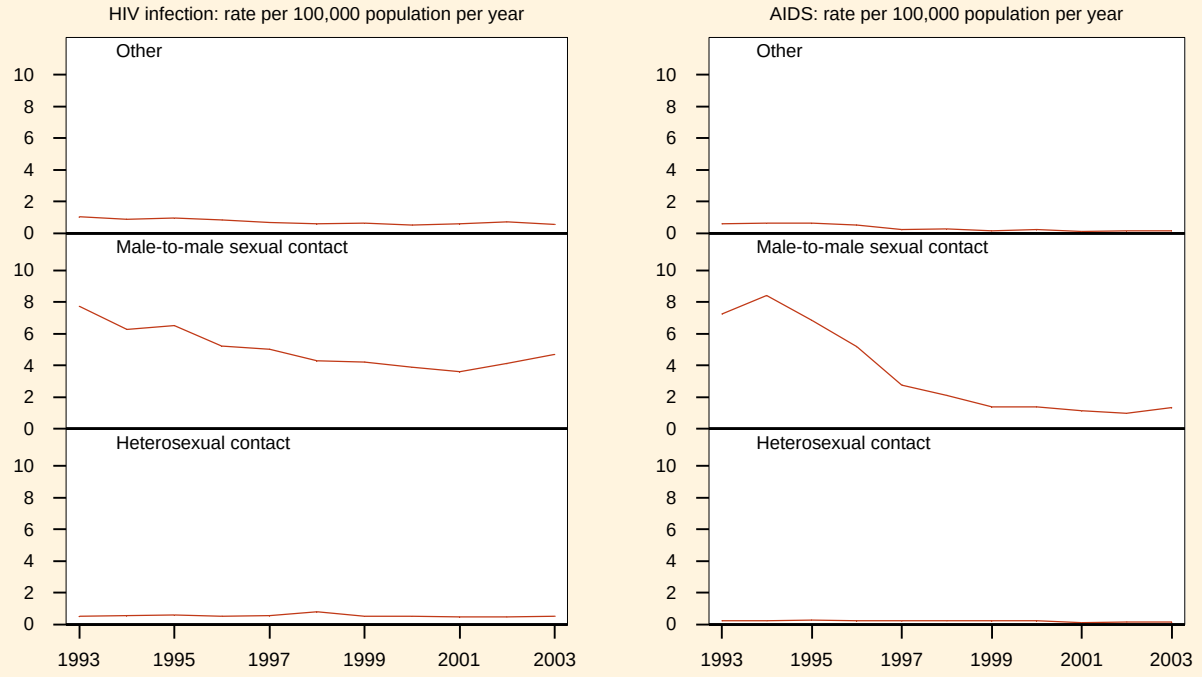
- Syphilis is a serious sexually transmissible infection caused by the organism *Treponema pallidum*. Infection causes a primary lesion (chancre) that appears about 3 weeks after exposure. A generalised rash and lymphadenopathy can follow. Cardiovascular or neurosyphilis may develop many years later. Many cases have no signs or symptoms at diagnosis and are detected by serological testing. Syphilis can be treated with antibiotics such as penicillin. If untreated, pregnant woman can pass the infection onto their foetuses resulting in congenital syphilis.
- Syphilis is notifiable by doctors, hospitals, and laboratories in NSW. Many notified cases, particularly those among older people, are likely to represent old, treated infections. Public health units follow-up all cases to verify the likely date of infection, thereby ensuring that reported disease rates reflect new infections only.
- Rates of syphilis notifications rose sharply in 2002, the increase most noticeable in the 'infectious syphilis' (new infections) category. The age-adjusted rate for infectious syphilis in 2003 was 3.6 per 100,000.
- For the period 2001 to 2003, notification rates for infectious syphilis were highest in the South Eastern Sydney & Illawarra Health Area (age-adjusted rate 5.8 per 100,000 population).
- Safe-sex practices, early case identification and treatment, and contact tracing, are the most effective methods for controlling syphilis.

For more information:

The *NSW Public Health Bulletin* includes monthly reports of notifiable communicable diseases. Available at www.health.nsw.gov.au/public-health/phb/phb.html.

EpiReview: Notifiable sexually transmitted diseases, NSW, 1991–1999. *N S W Public Health Bull* 2001; 12(1): 16–18.

HIV and AIDS notifications by exposure category, NSW 1993 to 2003



Note: HIV = human immunodeficiency virus. AIDS = acquired immune deficiency syndrome. 'Male-to-male sexual contact' includes males who report bisexual contact. 'Other' includes blood transfusion, haemophilia, injecting drug use with or without other risk factors, mother-to-baby transmission (vertical), and unknown. Rates were age-adjusted using the Australian population as at 30 June 2001. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: HIV data: NSW HIV Database. ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Human immunodeficiency virus (HIV) was first identified as the cause of acquired immune deficiency syndrome (AIDS) in 1984. People infected with HIV may develop a brief non-specific illness. Eventually, in most cases, a progressive immune system dysfunction develops, predisposing infected people to communicable diseases, tumours, and other conditions.
- NSW HIV Reference Laboratories are required by law to notify cases of new diagnoses of HIV, and all doctors and hospitals are required to report cases of AIDS to the NSW Department of Health.
- HIV diagnoses declined steadily through the 1990s and to 2001. In 2002, an increase in HIV notifications was observed. Three-hundred-and-ninety cases were notified in 2002, a 15% increase on 2001, and 414 cases were notified in 2003, a 6% increase over 2002.
- Among the 414 cases notified in 2003, 90% were males; 69 per cent reported male-to-male sex as a primary risk factor; and 40% were aged 30–39 years.
- Similarly, there were 117 notifications of AIDS in NSW in 2003. This is a 22% increase over 2002 when 96 residents were diagnosed, and a 27% increase over 2001 (92 cases).
- A substantial decline in progression to AIDS has, however, been achieved since the mid-1990s, attributable to improvements in antiviral therapy for people with HIV infection. In 2003, the age-adjusted rate of AIDS cases was 1.7 per 100,000, compared with 9.1 per 100,000 in 1994.
- Community education, safe-sex practices, and early case identification and treatment, all contribute to the control of HIV in the community.

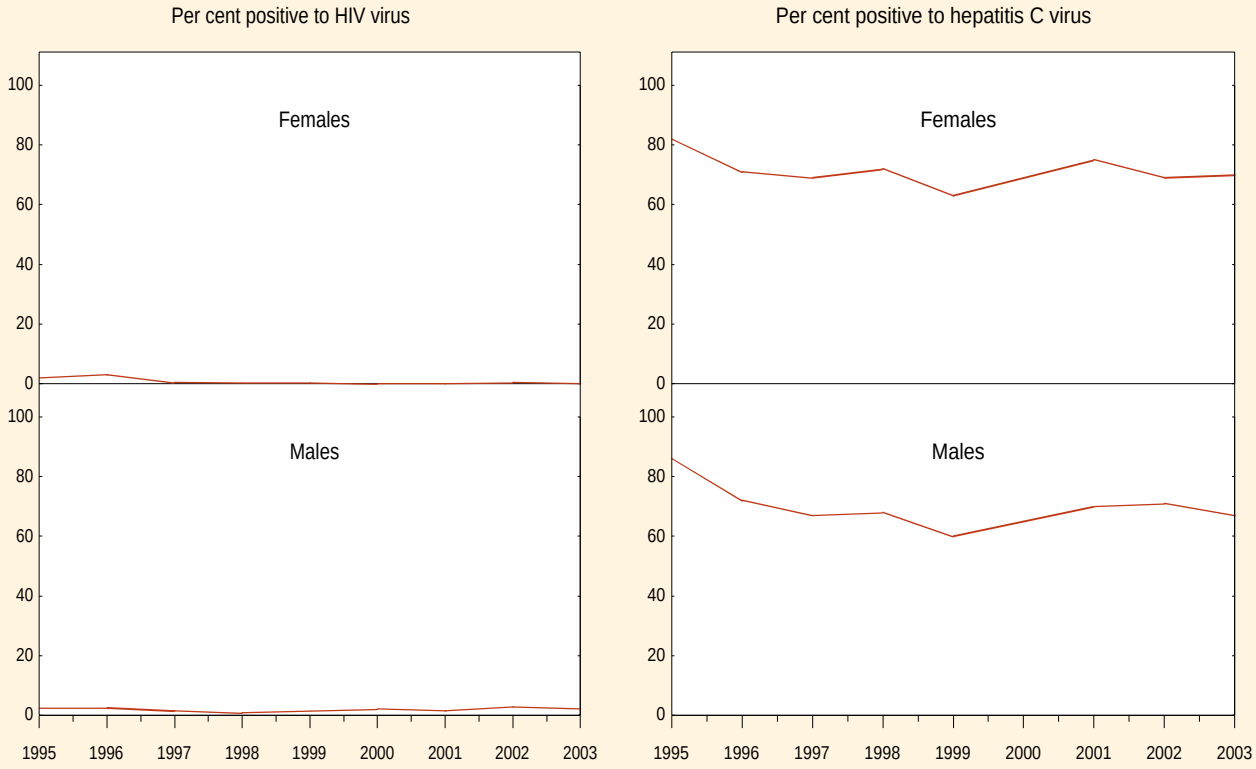
For more information:

The *NSW Public Health Bulletin* includes quarterly reports of HIV–AIDS. Available at www.health.nsw.gov.au/public-health/phb/phb.html.

National Centre in HIV Epidemiology and Clinical Research. *HIV–AIDS, viral hepatitis and sexually transmissible infections in Australia. Annual surveillance report 2001.* Sydney: National Centre in HIV Epidemiology and Clinical Research, 2001. Available at www.med.unsw.edu.au/nchecr.

EpiReview: HIV infection and AIDS in NSW, 1981–1999. *N S W Public Health Bull* 2000; 11(12): 217–219.

HIV and hepatitis C prevalence, clients of needle and syringe programs, NSW 1995 to 2003



Note: HIV = human immunodeficiency virus. Prevalence was based on the presence of antibodies to HIV or hepatitis C in a blood sample. Participating services: Albury Base Hospital and Community Health Centre, Albury; Drug Intervention Services and ICON Street Youth Program, Cabramatta; Kirketon Road Centre and K2, Kings Cross; Northern Rivers Health Service; Port Kembla First Program; Resource and Education Program for Injecting Drug Use, Canterbury and Redfern; Royal Newcastle Hospital; St George Needle and Syringe Program, Kogarah; Sydney Sexual Health Service NSW, Sydney; The Exchange, Manly and Ryde; Wentworth HIV and Sexual Health Service; Western Sydney AIDS Prevention, Auburn, Blacktown, Mt Druitt and Parramatta. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: HIV–AIDS, viral hepatitis and sexually transmissible infections in Australia, Annual Surveillance Report 2003. National Centre in HIV Epidemiology and Clinical Research, University of New South Wales, Sydney. Australian Institute of Health and Welfare, Canberra, 2004. Australian Needle and Syringe Program Survey, National Data Report 1999–2003, National Centre in HIV Epidemiology and Clinical Research, University of New South Wales, Sydney; Australian Institute of Health and Welfare, Canberra, 2004.

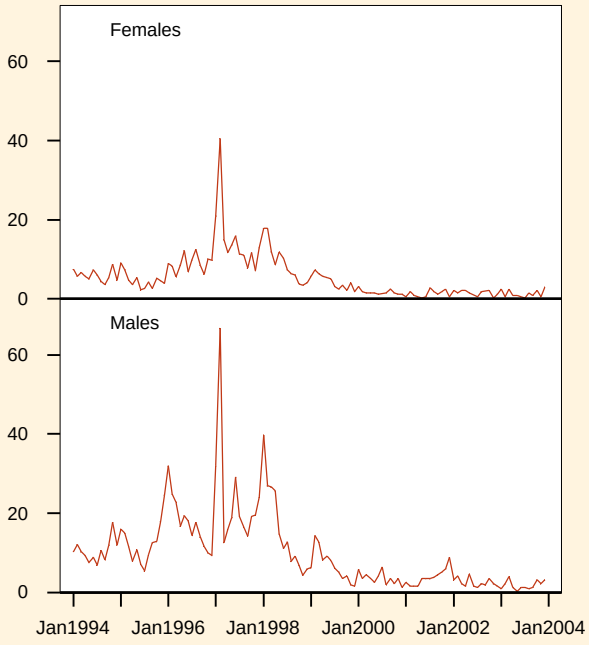
- Injecting drug use is an important risk behaviour for viruses transmitted via body fluids, such as human immunodeficiency virus (HIV), hepatitis B virus, and hepatitis C virus.
- From 1995, clients attending selected NSW needle and syringe programs have been asked to complete a questionnaire and provide a finger-prick blood sample for testing for HIV and hepatitis C. Response rates range from 37% to 66% and therefore data from these surveys should be interpreted with caution.
- These surveys have found that HIV prevalence among injecting drug users is low (2.3% prevalence in males and 0% in females in 2003), except in men reporting male-to-male sexual contact. The prevalence of HIV infection among male drug users who have sex with men increased from around 20% in 1999 and 2000 to 35% in 2003.
- The prevalence of hepatitis C among injecting drug users was highest (85%) in 1995. Prevalence declined to 61% in 1999, but increased to 72% in 2001, and was 68% in 2003.

For more information:

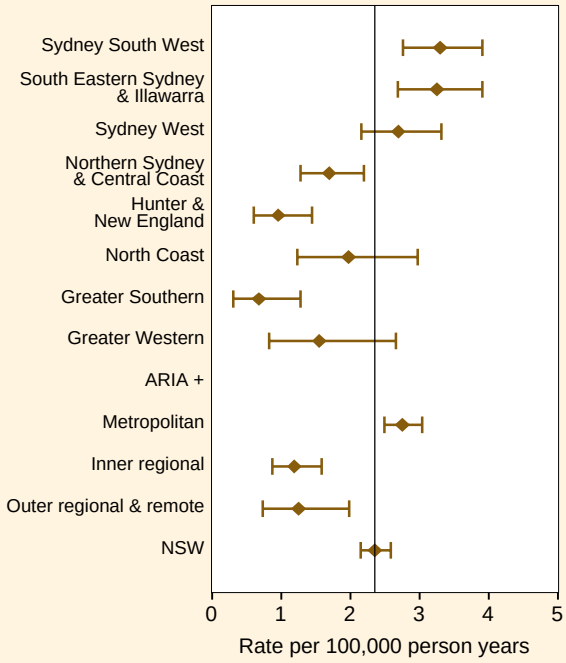
National Centre in HIV Epidemiology and Clinical Research. *HIV–AIDS, viral hepatitis and sexually transmissible infections in Australia. Annual surveillance report 2003.* Sydney: National Centre in HIV Epidemiology and Clinical Research, 2004. Available at www.med.unsw.edu.au/nchecr.

Hepatitis A: notifications, persons of all ages, NSW

Notification rate per 100,000 person years by month, 1994 to 2003



Notification rate by health area, 2001 to 2003



Note: Rates were age-adjusted using the Australian population as at 30 June 2001. Lower and upper limits of the 95% confidence interval are shown. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Hepatitis A is caused by infection with the hepatitis A virus, and is transmitted by the faecal–oral route, most often in food or from person-to-person. Infections are usually without symptoms in small children, but commonly cause an unpleasant illness in adults characterised by general malaise, fever, abdominal discomfort, dark urine, pale stools, and jaundice.
- In 1996 and 1998, epidemics of hepatitis A occurred in South Eastern Sydney, mainly among men who reported male-to-male sexual contact. A large epidemic of hepatitis A notifications in 1997 was traced to eating contaminated oysters.
- Low levels of hepatitis A have been reported since 2000 across NSW. The age-adjusted rate in 2003 was 1.9 per 100,000 population. The rate in males is consistently higher than in females.
- For the period 2001 to 2003, age-adjusted rates were highest in Sydney South West (3.5 per 100,000) and South Eastern Sydney & Illawarra (3.3 per 100,000) Health Areas.
- Prevention of hepatitis A in the community includes monitoring safe-food production and handling practices and promoting safe-sex practices. Cases should be educated about hand washing and should avoid handling food. Close contacts of cases should have immunoglobulin administered.
- A hepatitis A vaccine was licensed in Australia in the early 1990s. It is recommended by the National Health and Medical Research Council for people at increased risk, including travellers to countries where hepatitis A is endemic, certain occupational groups, men who have sex with men, injecting drug users, and people with chronic liver disease.

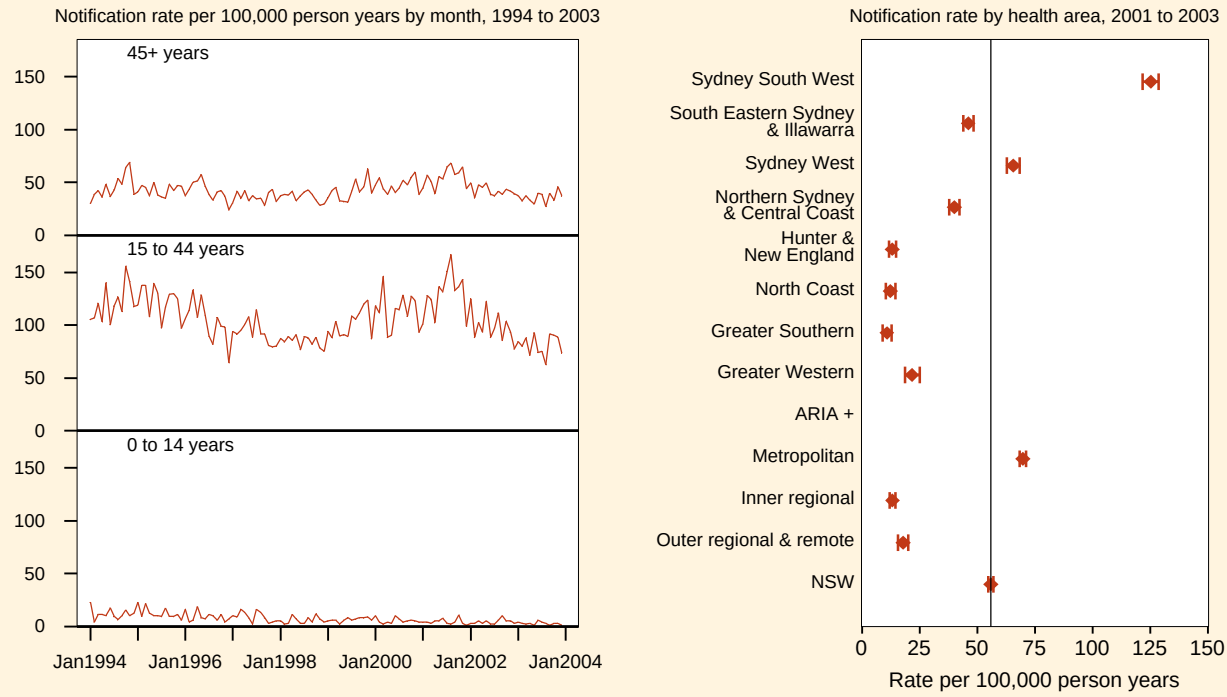
For more information:

The *NSW Public Health Bulletin* includes monthly reports of notifiable communicable diseases. Available at www.health.nsw.gov.au/public-health/phb/phb.html.

National communicable disease data are published in *Communicable Diseases Intelligence* available at www.health.gov.au/internet/wcms/publishing.nsf/content/cda-pubs-cdipubs.htm.

EpiReview: Hepatitis A in New South Wales 1991–2000. *N S W Public Health Bull* 2001; 12(9): 255–258.

Hepatitis B: notifications, persons of all ages, NSW



Note: Rates were age-adjusted using the Australian population as at 30 June 2001. Lower and upper limits of the 95% confidence interval are shown. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: Communicable Diseases Branch. Notifiable Diseases Database and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

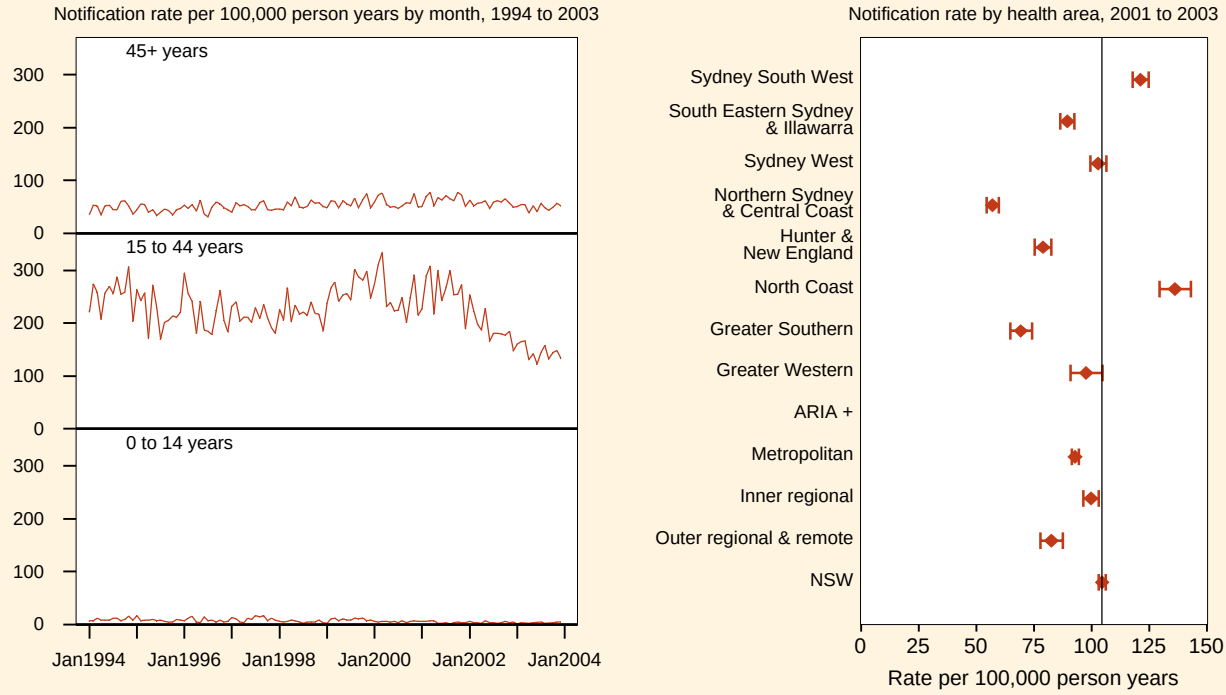
- Hepatitis B is caused by infection with hepatitis B virus, and is transmitted mainly by contact with an infected person's blood or sexual fluids, or from an infected woman to her baby. Many people have no symptoms when first infected, but some experience anorexia, malaise, abdominal discomfort, and jaundice. Laboratory notifications do not distinguish between people who were newly infected and those who were infected in the past but who still carry the virus. New or active infections are notified by doctors and hospitals. For these reasons, the notification data presented here represent a mix of recent and past hepatitis B infection.
- In 2003, the age-adjusted rate of hepatitis B notifications was 44.3 per 100,000 population, the lowest rate reported in the last 10 years. The highest rates were in people aged 15–44 years (73.1 per 100,000).
- For 2001 to 2003 combined, the highest rates were in the Sydney South West (125.2 per 100,000 population) and Sydney West (65.5 per 100,000) Health Areas, most likely reflecting larger numbers of people born in countries where hepatitis B is endemic.
- Prevention of hepatitis B infection depends on immunisation of all children and immunisation of household contacts of infectious cases. Infectious people should avoid exposing others to their blood or sexual fluids. Hepatitis B immunoglobulin given with vaccine to babies born to infectious mothers is also effective.

For more information:

The *NSW Public Health Bulletin* includes monthly reports of notifiable communicable diseases. Available at www.health.nsw.gov.au/public-health/phb/phb.html.

National communicable disease data are published in *Communicable Diseases Intelligence* available at www.health.gov.au/internet/wcms/publishing.nsf/content/cda-pubs-cdipubs.htm.

Hepatitis C: notifications, persons of all ages, NSW



Note: Rates were age-adjusted using the Australian population as at 30 June 2001. Lower and upper limits of the 95% confidence interval are shown. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: Communicable Diseases Branch. Notifiable Diseases Database and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Hepatitis C is caused by infection with hepatitis C virus. The virus was first identified in 1989, and is transmitted mainly by contact with an infected person's blood. Until a screening test was introduced in 1990, many people were infected through blood transfusions. Today, most new infections are acquired through sharing contaminated needles and syringes. Most people have no symptoms when first infected, but some experience anorexia, malaise, abdominal discomfort, and jaundice.
- Laboratory notifications do not distinguish between people who were newly infected, and those who were infected in the past but who still carry the virus. For these reasons, the notification data presented here represent a mix of recent and past hepatitis C infection patterns.
- Hepatitis C notifications have been in decline since 2001. In 2003 5,266 cases were notified in 2003 (age-adjusted rate 79.5 per 100,000 population). The highest rates were among young men (174.5 per 100,000 in males aged 15–44 years).
- For 2001 to 2003 combined, the highest rates were in the Sydney South West (121.3 per 100,000 population) and North Coast (136.2 per 100,000) Health Areas.
- There is no vaccine against hepatitis C. Prevention depends on educating injecting drug users to avoid sharing needles and syringes, supported by the provision of sterile needles through needle and syringe programs.

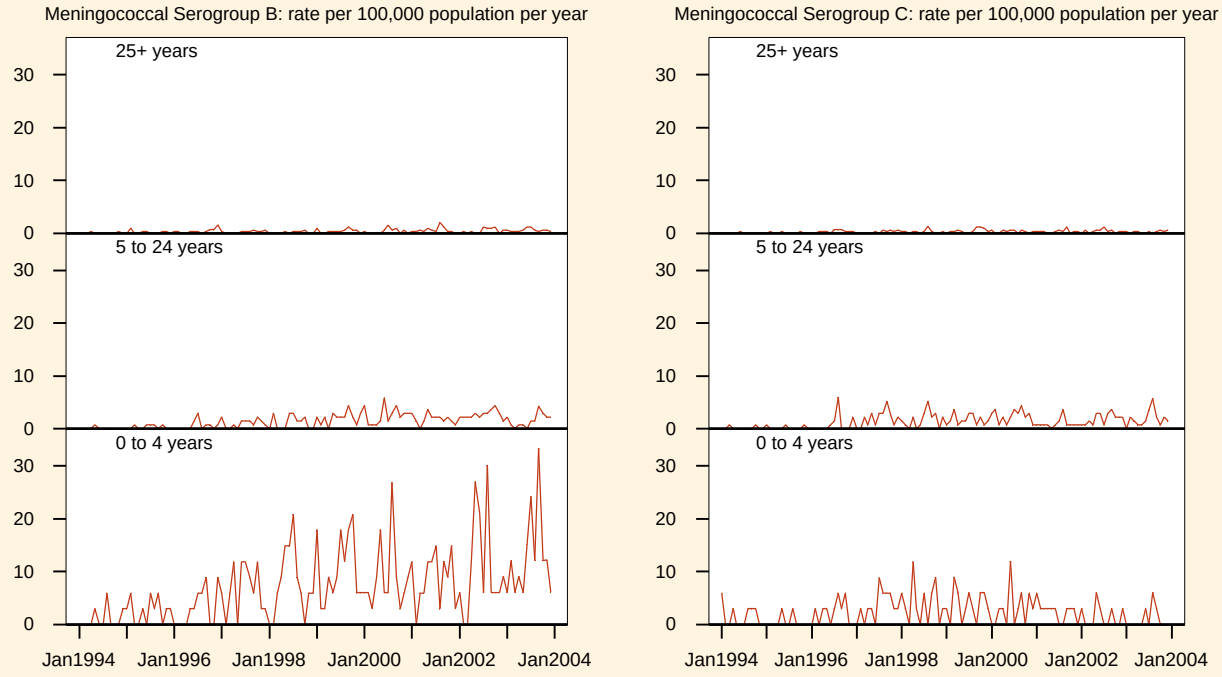
For more information:

The *NSW Public Health Bulletin* includes monthly reports of notifiable communicable diseases. Available at www.health.nsw.gov.au/public-health/phb/phb.html.

National Centre in HIV Epidemiology and Clinical Research. *HIV–AIDS, viral hepatitis and sexually transmissible infections in Australia. Annual surveillance report 2002.* Sydney: National Centre in HIV Epidemiology and Clinical Research, 2002. Available at www.med.unsw.edu.au/nchecr.

EpiReview: Hepatitis C in NSW, 1991–1999. *N S W Public Health Bull* 2001; 12(9): 139–141.

Meningococcal disease notifications by age and serogroup, NSW 1994 to 2003



Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Rates were age-adjusted using the Australian population as at 30 June 2001. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: Communicable Diseases Branch. Notifiable Diseases Database and NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

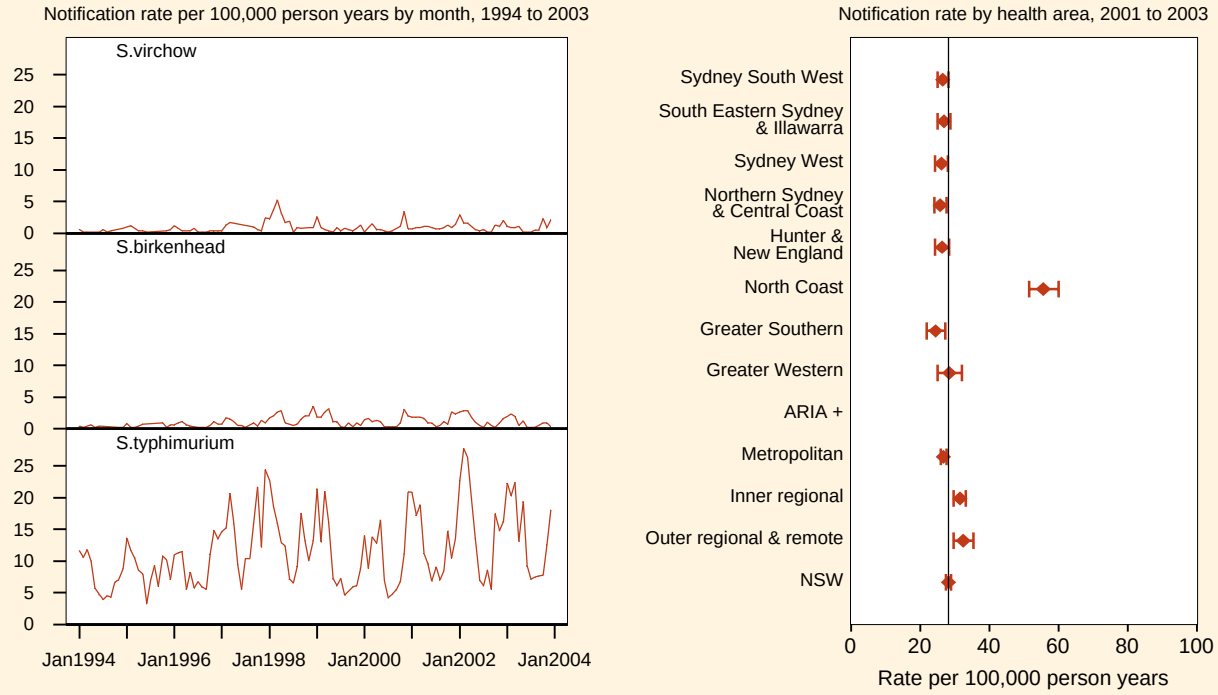
- Meningococcal disease is caused by the bacterium *Neisseria meningitidis*. Population studies have found that around 10% of people carry the bacteria in their throat but invasive disease is rare. Symptoms vary according to site of infection but may include rapid onset of high fever, headache, nausea and vomiting, neck stiffness, drowsiness, coma, and a characteristic rash. Treatment involves antibiotics and supportive care.
- Meningococcal disease is notifiable by laboratories and hospitals in NSW. Notifications and admissions follow a seasonal pattern, peaking each year in winter and spring. There were 232 cases notified in 2001, 296 admissions in 1999, and 10 deaths registered in 2000. In 2001, the highest notification rates were in 0–5 year-olds, and adolescents and young adults. In NSW, age-adjusted notification rates increased from 2 to 4 per 100,000 between 1995 and 2001. The reasons are unclear, but possibly relate to new meningococcal strains, better recognition, or new diagnostic tests.
- Between January 2001 and May 2002, the highest age-adjusted notification rates were in the Macquarie and Illawarra Health Areas.
- Of the 1,099 notifications in NSW between 1997 and 2001, almost two-thirds (64%) had the meningococcal strain identified. Of these, group B strain accounted for 55% and group C strain for 38%. Of 59 cases notified during the same period that resulted in death, 48 (81%) had a strain identified. Of these, group C was identified in 52% and group B in 42%.
- Prevention is difficult. Early recognition and treatment are vital. Notification allows close contacts to be identified and given information about signs of illness and, in some cases, prophylactic antibiotics. A short-acting (2–3 years) vaccine is available that protects against the meningococcal group A, C, W135, and Y strains, but it is not suitable for use in children under 2 years of age. A long-lasting meningococcal vaccine is available for use in all ages, but it is effective against group C only.

For more information:

The *NSW Public Health Bulletin* includes monthly reports of notifiable communicable diseases. Available at www.health.nsw.gov.au/public-health/phb/phb.html.

EpiReview: Meningococcal disease in NSW 1991–1999. *N S W Public Health Bull* 2000; 11(7): 128–130.

Salmonella: notifications, persons of all ages, NSW



Note: Rates were age-adjusted using the Australian population as at 30 June 2001. Lower and upper limits of the 95% confidence interval are shown. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

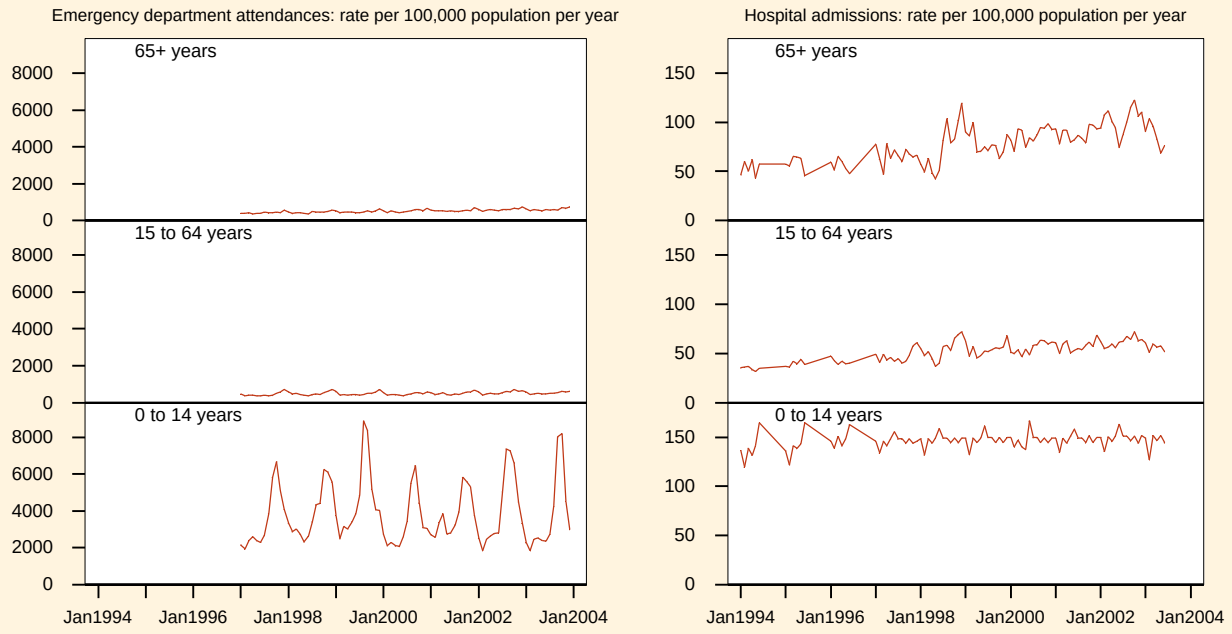
- Numerous species of *Salmonella* bacteria cause disease in both humans and animals. Salmonellosis is mainly a foodborne disease with symptoms of abdominal pain, fever, headache, diarrhoea, nausea and sometimes vomiting. Infants and young children are the most vulnerable to infection. Typhoid and paratyphoid—more serious forms of salmonellosis—are uncommon in Australia and are not included in these data.
- Annual seasonal peaks of salmonellosis occur in the summer months. Notification rates in the last 10 years were highest in 2002 (age-adjusted rate 31.8 per 100,000 population). The age-adjusted rate in 2003 was 27.7 per 100,000. For the period 2001–2003, the highest rates were seen among residents in the rural north of the State (North Coast 52.3 notifications per 100,000 per year). The most common species notified in NSW was *Salmonella* Typhimurium.
- Only a small proportion of people with *Salmonella* infections see a doctor and have a stool test, so the true rate of infection is likely to be much higher than these data suggest.

For more information:

The *NSW Public Health Bulletin* includes monthly reports of notifiable communicable diseases. Available at www.health.nsw.gov.au/public-health/phb/phb.html.

Microbiological Diagnostic Unit. *National Enteric Pathogens Surveillance Scheme (NEPSS) human annual report 1998.* Parkville: University of Melbourne, 1999.

Diarrhoea and vomiting emergency department attendances 1997 to 2003 and hospitalisations for dehydration 1994 to 2003, by month and age, NSW



Note: The NSW Emergency Department Data Collection is a database of information collected from approximately one-third of NSW Emergency Departments and represents approximately two-thirds of all NSW emergency patients. Gastroenteritis was coded as a provisional diagnosis assigned by staff when the patient presented to the emergency department. Date of admission to hospital was used to best approximate date of onset. Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 2001. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

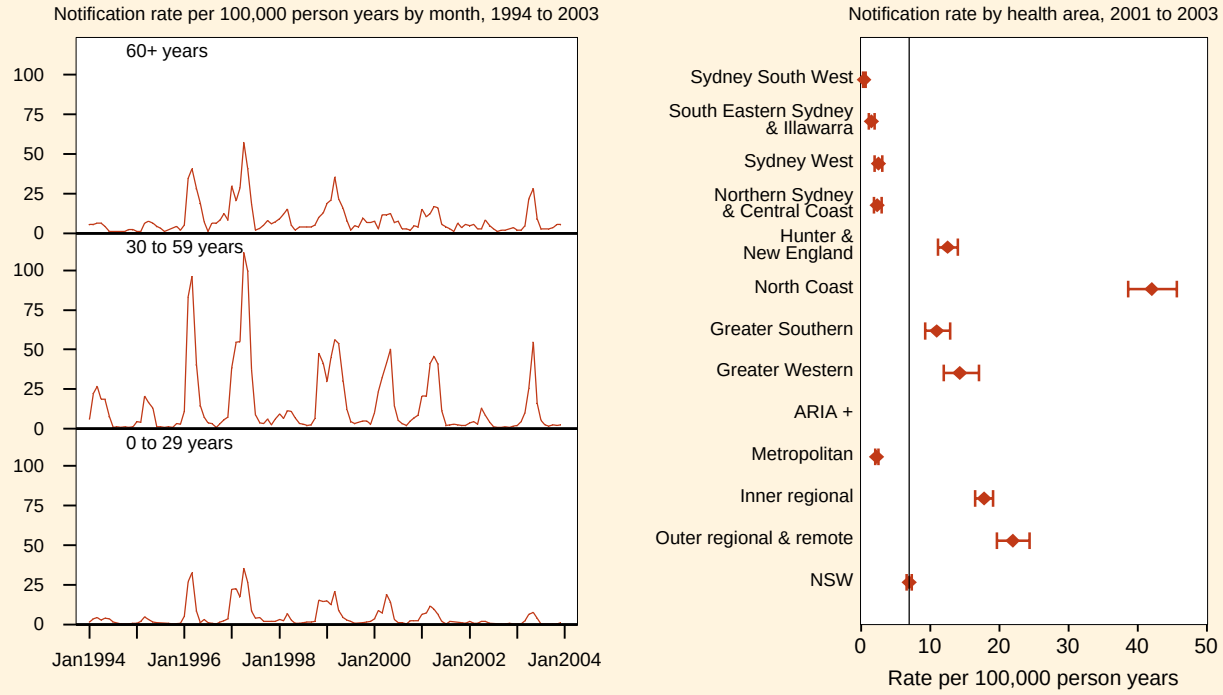
Source: Emergency Department Data Collection, NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- Routine surveillance of gastroenteritis caused by infections is incomplete because most affected people do not seek medical attention. There are several indirect methods by which trends in infectious gastroenteritis can be observed. They include monitoring pharmacy sales of anti-emetic and anti-diarrhoeal medications, and monitoring emergency department presentations for non-specific diarrhoea and vomiting.
- Such syndromic surveillance has its limitations, because it does not provide information about the infectious agents involved, but it is an effective way of observing community trends and unusual occurrences in gastroenteritis.
- In the period 1994–2003, a seasonal pattern in emergency department presentations for diarrhoea and vomiting was observed in the 0–14 years age group, with peaks in the spring and summer period of each year. This is most likely due to rotavirus infections in children. Similarly, the highest rates of hospital admission for diarrhoea and vomiting were observed in the 0–14 years age group.

For more information:

NSW Health Infectious Diseases web page. Available at www.health.nsw.gov.au/living/infect.html

Arboviral infection: Ross River Virus notifications by month, age and health area



Note: Rates were age-adjusted using the Australian population as at 30 June 2001. Lower and upper limits of the 95% confidence interval are shown. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: ABS population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

- In NSW, the most common notifiable arboviral infections in humans are caused by the Ross River (RRV) and Barmah Forest viruses (BFV). Both are transmitted by mosquitoes and occur in many areas of the state. Outbreaks of RRV and BFV occur quite regularly along the coastal region of northern NSW.
- Notification patterns of RRV and BFV are, as would be predicted, seasonal, with the peak notifications typically occurring around May each year.
- The age-adjusted rate of RRV notifications for 2003 was 7.3 per 100,000 population and for BFV 6.7 per 100,000 population.
- Notifications of RRV and BFV are most common in rural NSW. For the period 2001–2003, the age-adjusted rates of RRV and BFV for the North Coast Health Area were 42.0 and 58.9 per 100,000, respectively.
- No vaccine has been developed for RRV or BFV infections. Prevention depends on the reduction of exposure to mosquitos through environmental control and personal protection.

For more information:

NSW Arbovirus Surveillance and Vector Monitoring Program website at www.arbovirus.health.nsw.gov.au.

NSW Department of Health. *Notification of diseases under the Public Health Act 1991*. Sydney: NSW Department of Health, 1998.

Appendices

- Methods
- Disease and procedure codes
- Glossary
- List of local government areas by health area
- List of local government areas by ARIA+ score
- Index

Methods

1. Introduction

This report brings together data from a wide range of sources. It focuses on trends, and hence uses mainly data from routine collections rather than ad hoc studies. This chapter gives a brief description of the major data sources used and the statistical methods employed in their analysis and interpretation. SAS for Windows Version 8.02 (SAS, 2001) was used for all data analysis and for production of data tables and charts.

2. Data sets

2.1 Health Outcomes Information Statistical Toolkit

The Health Outcomes Information Statistical Toolkit (HOIST) is a SAS-based 'data warehouse' operated by the Centre for Epidemiology and Research of the NSW Department of Health. It brings together most of the data collections often used in population health surveillance in NSW, and contains all the available historical data for each collection. HOIST data are in one format—SAS datasets—and HOIST code values are, as far as possible, consistent across time and among datasets. HOIST provides a common data analysis environment across the public health network in NSW.

2.2 Population data

Population estimates as at 30 June were used for calendar years, while estimates as at 30 December were used for financial years. Age- and sex-specific estimated resident populations (ERPs) for NSW Statistical Local Areas (SLAs) at 30 June were obtained from the Australian Bureau of Statistics (ABS) for use with calendar year data. A cubic spline interpolation between mid-year ERPs was used to derive 30 December age- and sex-specific population estimates for use with financial year data. Populations of NSW area health services were derived by aggregating the appropriate SLA-level ERPs, except in the case of Sydney South West and South Eastern & Illawarra Area Health Services, the border between which transects 2 SLAs. ERPs for these SLAs were apportioned according to the proportions derived from the usual resident counts from the 2001 Census at the collection district level.

The 2001 Australian mid-year ERP, shown in Table 1, was used as the standard population for age-adjustment.

Country-of-birth (COB)-specific populations used for the Country of birth chapter were derived from annual age-, sex-, and COB-specific ERPs for all of Australia supplied by the ABS. Equivalent populations for NSW were derived from these national populations by estimating the proportion of immigrants in each age, sex, and COB stratum who reside in NSW, based on cubic splines fitted to age-, sex-, COB-, and specific state–territory counts from the 1981, 1986, 1991, 1996, and 2001 ABS Censuses of Population and Housing, and then applying these proportions to the national age-, sex-, and COB-specific ERPs

Table 1 Australian standard population (30 June 2001)

Age	Persons	Age	Persons
0–4 yrs	1,282,357	50–54 yrs	1,300,777
5–9 yrs	1,351,664	55–59 yrs	1,008,799
10–14 yrs	1,353,177	60–64 yrs	822,024
15–19 yrs	1,352,745	65–69 yrs	682,513
20–24 yrs	1,302,412	70–74 yrs	638,380
25–29 yrs	1,407,081	75–79 yrs	519,356
30–34 yrs	1,466,615	80–84 yrs	330,050
35–39 yrs	1,492,204	85+ yrs	265,235
40–44 yrs	1,479,257		
45–49 yrs	1,358,594	All ages	19,413,240

Source: ABS population estimates (HOIST), Centre for Epidemiology and Research, NSW Department of Health.

for each year. This was done to ensure that the COB-specific populations for NSW were based on estimated residential populations; and that the non-linear, and often dramatic, changes in immigrant populations in inter-Censal periods were accurately reflected in the NSW population estimates used.

2.3 Australian Bureau of Statistics Mortality Collection

For this report, ABS mortality data for deaths of NSW residents registered anywhere in Australia were accessed via HOIST. Deaths are presented by calendar year of death.

All deaths for which a coronial inquiry is not required must be certified by a registered medical practitioner as to cause and date; the certificate is registered by the registrar of births, deaths and marriages in each state or territory. Most deaths due to accidental causes, deaths occurring under suspicious circumstances (in which foul play cannot be excluded), deaths occurring shortly after anaesthesia or surgery, and deaths of persons who had not been seen by a medical practitioner in the year preceding their death, automatically become coronial cases and are registered by a coroner at the conclusion of an inquiry into the circumstances of the death.

Most non-coronial deaths are registered with the relevant registrar of births, deaths and marriages within 4 weeks of the date of death. However, coronial inquiries can take months, and in some cases years, to conclude. Mortality data are supplied by the ABS by year of registration. Therefore, deaths occurring in the last few weeks of each calendar year (or the last few months for coronial cases) may not be registered until January in the subsequent year. Delays in registering deaths tend to be greater for some causes of death, and for people resident in rural areas.

At the time of preparation of this report, the most recent mortality data available from ABS included only those deaths registered in 2002. The 2002 numbers were adjusted to include an estimate of the number of deaths due to that cause that occurred in 2002 but were not registered until 2003. A pro rata adjustment was made, based on registrations for the preceding 3 years (1999 to 2001). The first step was to determine the proportion of total deaths in the preceding 3 years that were not registered until the following year. That proportion was used to multiply the number of deaths registered in 2002, to obtain the estimate of the number of deaths still to be registered. The estimates were calculated for each age–sex stratum. Where deaths were further categorised (for example, by geographical place of residence or country of birth) the imputation procedure was carried out separately for each category.

For deaths registered during or before 1996, a single code for the principal underlying cause of death (based on the information recorded on the death certificate by a medical practitioner or coroner) was selected for each death. For deaths registered since 1997, the ABS has used computer-assisted cause-of-death coding that yields up to 20 contributing causes of death in addition to the principal underlying cause of death.

From 1999 onwards, causes of death have been classified according to the 10th Revision of the International Classification of Diseases (ICD-10, World Health Organization, 1992). Deaths registered before 1999 were coded according to the 9th Revision of the International Classification of Diseases (ICD-9, World Health Organization, 1977).

The ICD-10 and ICD-9 codes used for each indicator are included in the disease and procedure codes appendix.

2.4 NSW Inpatient Statistics Collection

The NSW Inpatient Statistics Collection (ISC) is a census of all services for admitted patients provided by public hospitals, public psychiatric hospitals, public multi-purpose services, private hospitals, and private day procedure centres in NSW. The ISC is a financial year collection from 1 July through to 30 June of the following year. The information it contains is provided by patients, health service providers, and the hospital's administration. The information reported includes patient demographics, source of referral to the service, service referred to on separation, diagnoses, procedures, and external causes.

The ISC includes data on hospital admissions of NSW residents that occurred in hospitals interstate. The only exception to this is that data from interstate hospitals for the years 2001–02 and 2002–03 are not yet available. This may affect analyses involving uncommon diagnoses or procedures, particularly health area analyses, and has a greater effect on rates for areas closer to an interstate boundary. The number of interstate admissions has been estimated for those 2 years, based on admissions for the preceding 3 years (1998–99 to 2000–01). The first step was to determine the proportion of total admissions for NSW residents in the preceding 3 years that were at interstate hospitals. That proportion was used to multiply the number of admissions at hospitals in NSW, to obtain the estimate of the number of admissions expected to have occurred at interstate hospitals. The estimates were calculated for each age–sex stratum. Where hospitalisations were further categorised (for example, by geographical place of residence or country of birth), this imputation procedure was carried out separately for each category, thus accounting for the uneven distribution of interstate hospital admissions.

For this report, the ISC was accessed via HOIST. From 1 July 1998, ISC data on HOIST have been for episodes of care in hospital. Episodes of care end with the discharge, transfer, or death of a patient. A new episode of care may also start when the service category for an admitted patient is altered, as a result of a change in the ongoing clinical care requirements for that patient during the one episode of accommodation in a single facility. ISC data on HOIST up to 30 June 1998 were for periods of stay in hospital. A period of stay in hospital ends with the discharge, transfer, or death of a patient, and may consist of multiple episodes of care. The change from 'period of stay' to 'episode of care' causes a small increase in the apparent number of admissions.

From 1 July 1998, the reason for a hospital admission has been coded at the time of separation (discharge, transfer, or death), according to the 10th Revision of the International Classification of Diseases, Australian Modification ICD-10-AM (National Centre for Classification in Health, 2000). Prior to this, it was coded according to the 9th Revision of the International Classification of Diseases, Clinical Modification (ICD-9-CM), using the Australian version (National Coding Centre, 1996) from July 1995 and the United States version prior to that.

From 1 July 1998, procedures carried out during a patient's stay have been coded according to the MBS–Extended Procedure Classification, published as Volume 3 and Volume 4 of the 10th Revision of the International Classification of Diseases, Australian Modification ICD-

10-AM (National Centre for Classification in Health, 2000). Prior to this, procedures were coded according to the 9th Revision of the International Classification of Diseases, Clinical Modification (ICD-9-CM), using the Australian version (National Coding Centre, 1996) from July 1995 and the United States version prior to that.

The numbers of diagnosis and procedure codes recorded, at the time of separation, have varied over time (Muscatello and Travis, 2001), and are currently as follows:

- principal diagnosis (the principal reason for admission);
- up to 40 other diagnoses;
- up to 31 procedures;
- up to 3 external cause codes for injury and poisoning;
- up to 3 codes for place of occurrence injury or poisoning;
- up to 3 codes for activity at time of injury or poisoning.

Extensive use of mapping tables between ICD-9-CM and ICD-10-AM disease codes, produced by the National Centre for Classification in Health, was made to obtain the most appropriate match for individual codes between the 2 classification systems. The ICD-10-AM and ICD-9-CM codes used for each indicator are included in the disease and procedure codes appendix.

2.5 NSW Midwives Data Collection (MDC)

The New South Wales Midwives Data Collection (MDC) is a population-based collection covering all births in NSW public and private hospitals, as well as home births. It does not receive notifications of interstate births where the mother is resident in NSW.

The data collection has operated continuously since 1990. It encompasses all livebirths and stillbirths of at least 20 weeks gestation or at least 400 grams birthweight. The MDC relies on the attending midwife to complete a notification form when a birth occurs. The form includes demographic items, and items on maternal health, the pregnancy, labour, delivery, and perinatal outcomes. It has undergone 3 revisions over the years. The Midwives Data Collection database is compiled in the Information Management and Support Branch of the NSW Department of Health.

For this report, the MDC was accessed via HOIST. Data are presented for calendar years. Data for mothers who gave birth in NSW but reside in other states were excluded. The MDC does not include data for mothers who live in NSW but give birth outside the state.

The key indicator of perinatal deaths in the report uses data derived from the ABS. Perinatal deaths among infants of at least 22 weeks gestation or 500 grams birthweight are reviewed by the NSW Maternal and Perinatal Committee. Both stillbirths and neonatal deaths are classified according to an obstetric cause-specific classification, Perinatal Society of Australia and New Zealand Perinatal Death Classification (PSANZ-PDC). Neonatal deaths are also classified by neonatal cause according to the Perinatal Society of Australia and New Zealand Neonatal Death Classification (PSANZ-NDC).

2.6 NSW Birth Defects Register

The NSW Birth Defects Register (BDR) was established in 1990. Legislation to mandate the notification of birth defects recognised at up to one year of age has been in effect since 1 January 1998. Prior to that, the BDR operated on a voluntary reporting basis. For this report, the BDR was accessed via HOIST. Data are presented for calendar years.

2.7 NSW Health Promotion Survey 1994

The NSW Health Promotion Survey 1994 (HPS) measured the prevalence of health behaviours and personal and environmental health risk factors in the NSW population. It used a geographically stratified random sample of approximately 16,000 NSW residents aged 18 years and over, and collected information via telephone interview (Graham-Clarke et al., 1995).

For this report, HPS data were accessed via HOIST. The area health service boundaries used for presenting HPS data were those current in 1994.

2.8 NSW Health Surveys 1997 and 1998

In 1997 and 1998, the NSW Department of Health—in conjunction with the 17 area health services at that time—conducted 2 population health surveys using computer-assisted telephone interviewing (CATI) (Williamson et al., 2001). The main aims of the surveys were to provide local and statewide information to inform health service planning and policy development. The survey questions focused on the 6 NSW health priority areas: cardiovascular disease, cancer, mental health, injury, diabetes, and asthma.

The target sample for each year comprised 1,000 NSW residents aged 16 years and over from each of the 17 health areas at that time (total sample 17,000 people each year). A stratified 2-stage cluster sample design was used, with simple random sampling of all potentially active telephone numbers within each health area, and simple random sampling of one household resident for interview.

Interviews were conducted in 6 languages (English, Arabic, Chinese, Greek, Italian, and Vietnamese) by trained interviewers at the NSW Department of Health's CATI facility.

The total sample size was 35,027 respondents (17,531 in 1997; 17,496 in 1998). The overall response rate for both surveys was 70%.

For this report, data from the NSW Health Surveys 1997 and 1998 were accessed via HOIST.

2.9 NSW Older People's Health Survey 1999

In 1999, the NSW Department of Health—in conjunction with the 17 area health services at that time—conducted a survey of the health of older people in NSW using CATI (NSW Department of Health, 2000).

The survey questionnaire focused on lifestyle; home and social environment; self-reported health status; older people as carers; physical activity and physical functioning; and the health priority areas of diabetes, falls, and mental health. It also included question modules on the use of health and community services, and on oral health. A brief version of the questionnaire was developed for administration to main carers (proxy interviews) of selected respondents who were unable to answer the interview on their own behalf.

The target sample comprised at least 500 NSW residents aged 65 years and over from each of the 17 NSW health areas at that time. Households were sampled using electronic telephone listings, which were geo-coded and assigned to health areas. One eligible respondent was selected from each household, using random numbers generated by the CATI system.

Interviews were conducted in 5 languages (English, Arabic, Chinese, Greek, and Italian) by trained interviewers at the NSW Department of Health's CATI facility. A total of 9,418 interviews were completed (including proxy interviews), while 3,906 households or selected

respondents refused to participate. This yielded a response rate of 70.7%.

For this report, data from the NSW Older People's Health Survey 1999 were accessed via HOIST.

2.10 NSW Child Health Survey 2001

In 2001, the NSW Department of Health—in conjunction with the 17 area health services at that time—conducted a survey of the health of children in NSW using CATI.

Development of the survey instrument was overseen by a technical reference group. The final questionnaire covered topics including use of health services, nutrition, food security, asthma, oral health, parent support services, social support, sun protection, sight, hearing, speech, family functioning, social capital, smoking, sports and other organised activities, and physical activity.

The target sample comprised at least 500 NSW children aged 0–12 years from each of the then 17 NSW health areas. Households were sampled using a method similar to the 1998 NSW Health Survey (Williamson et al., 2001). One eligible child was selected from each household, using random numbers generated by the CATI system. A parent or carer of the selected child was interviewed.

Interviews were conducted in 4 languages (English, Arabic, Chinese and Vietnamese) by trained interviewers at the NSW Department of Health's CATI facility. A total of 9,933 interviews were completed, while 1,770 households or selected respondents refused to participate. This yielded a response rate of 84.9%.

For this report, data from the NSW Child Health Survey 2001 were accessed via HOIST.

2.11 NSW Continuous Health Survey

In 2003, the NSW Department of Health, in conjunction with the 17 area health services at that time, completed the second year of the NSW Continuous Health Survey, an ongoing survey of the health of people in NSW using CATI. The main aims of the NSW Continuous Health Survey are to provide detailed information on the health of the people of NSW, and to support the planning, implementation, and evaluation of health services and programs in NSW.

The target population for the NSW Continuous Health Survey is all NSW residents living in households with private telephones. The target sample comprised approximately 1,000 people in each of the 17 area health services at that time (total sample of 17,000). When households were contacted, one person was selected using random numbers generated by the CATI system.

Interviews were carried out continuously between March and December 2002 (2002 survey) and between February and December 2003 (2003 survey). Trained interviewers at the NSW Health Survey facility carried out interviews. When a child under the age of 16 years was selected, the main carer, known as the 'proxy respondent', was interviewed on behalf of the child. Most respondents (99%) were interviewed in English. The remaining interviews were conducted in Arabic, Chinese, Greek, Italian, and Vietnamese.

In 2002, 15,442 interviews were conducted, with 12,622 with people aged 16 years or over. The overall response rate was 67.6 per cent (completed interviews divided by completed interviews and refusals).

In 2003, 15,837 interviews were conducted, with at least 837 interviews in each area health service and 13,088 with people aged 16 years or over. The overall response rate was 68.3 per cent (completed interviews divided by completed interviews and refusals).

For this report, data from the NSW Health Survey were accessed via HOIST.

2.12 ABS National Health Survey

The National Health Surveys (NHS), conducted by the ABS, collect information on illness and injury, health care use, and health risk factors. Data from both the 1989–90, 1995, and 2001 National Health Surveys are presented in this report. Data were accessed via HOIST, or were obtained as special tabulations from the ABS, or from published reports.

2.13 School Surveys

Since 984, the NSW Department of Health and The Cancer Council NSW has carried out surveys of the health of secondary school students, as part of the triennial Australian School Students' Alcohol and Drug (ASSAD) survey.

In its earlier years, the ASSAD Survey questions targeted drug and alcohol use. The topics covered by the Survey have gradually extended to include other issues that are important to the health of adolescents. The NSW survey now includes questions on physical activity and injuries, sun protection behaviours, eating behaviours, and mental health and wellbeing, in addition to smoking, alcohol and other drug use.

The information presented in this report may differ from information presented in previous Reports of the Chief Health Officer, which used a variety of published reports to collate information on trends. These published reports used data obtained from different surveys, which were then analysed using a variety of methods. For this report, all recent and historical ASSAD data were available for analysis for the first time. ASSAD data has been collected in a consistent way over time and is the most reliable current source of information on trends in secondary school students' health.

2.14 NSW Central Cancer Registry data

The NSW Central Cancer Registry was established by the NSW Department of Health in 1971 under the *NSW Public Health Act*. It was administered by the NSW Cancer Council, under contract, from 1986 until June 2004. The Registry has been managed by the Cancer Institute NSW since June 2004.

Notification of all newly-diagnosed cases of, and deaths due to, malignant neoplasms by hospitals and the Registrar of Births, Deaths and Marriages has been compulsory since the registry began. In 1991, the Act was amended to make notification by pathology laboratories compulsory as well. Notification has traditionally been via a printed notification form, although in recent years electronic notification by hospitals (but not pathology laboratories) has been introduced.

A case of cancer is the occurrence of a malignant neoplasm in one organ of a particular person. Therefore, a case of malignant melanoma in a particular person counts as one case. If the same person subsequently develops leukaemia, the leukaemia counts as a second case.

Incident cases and deaths registered before July 1999 were classified according to the 9th Revision of the International Classification of Diseases (ICD-9, World Health Organization, 1977). Cases registered from July 1999 onwards have been classified according to the 2nd

Edition of the International Classification of Diseases for Oncology (ICD-O-2, World Health Organization, 1990). ICD-O-2 codes were translated back to ICD-10 codes by the Registry and used in this report.

For this report, cancer incidence data were accessed via HOIST. The cancer mortality data presented come from ABS mortality data.

2.15 NSW Notifiable Diseases Database

The NSW Notifiable Diseases Database (NDD), formerly called the NSW Infectious Diseases Surveillance system (IDSS), is a networked database used by 17 public health units located across NSW to register communicable disease notifications. Under authority of the *NSW Public Health Act 1991*, the NSW Department of Health receives notifications of communicable disease via public health units from general practitioners, hospitals, and pathology laboratories. Data are transferred weekly from public health units to the Department for compilation of statewide data. The Department, in turn, transfers a limited dataset to the Communicable Diseases Network of Australia and New Zealand (maintained by the Commonwealth Department of Health and Aging).

For this report, the NDD collection was accessed via HOIST.

2.16 Australian Childhood Immunisation Register

The Australian Childhood Immunisation Register (ACIR), which is managed by the Health Insurance Commission and commenced operation on 1 January 1996, is a register of the immunisation status of all children less than 7 years of age. A Commonwealth–State cost-shared payment is made to service providers for data. Broadly, the functions of the ACIR are: to collect immunisation information from immunisation providers, and to administer a payments system to providers for reporting information; to provide immunisation status information to parents and providers and to administer a national recall-reminder service to parents; and to provide immunisation coverage data.

The ACIR supplies the NSW Department of Health with monthly coverage data that identify children 'overdue' for immunisation, which are forwarded to public health units for follow up, and quarterly coverage data by local government area. These latter data form the basis for the information presented in this report.

2.17 Prisoner Health Survey 1996

Between May and August 1996, 789 male and female inmates at 27 NSW correctional centres participated in a cross-sectional health survey developed by the NSW Corrections Health Service and the NSW Department of Health.

The overall aims of the study were to describe the health of adult inmates, to identify factors associated with poor health, to develop indicators allowing comparisons to be made with the health of the general population, and to develop health goals and targets for the inmate population based on the findings. Special emphasis was placed on determining the health of Aboriginal and elderly inmates.

Approximately 6,000 males and 300 females were held in full-time custody at the time of the survey. The sample was stratified by sex, age (under 25 years, 25–40 years, and over 40 years), and Aboriginality. Several days prior to screening at each jail, a list of names was provided of all inmates residing at the jail. To minimise losing inmates due to transfers or release, the sample was drawn as close as was feasible to arrival at the jail. Those selected were provided with a full explanation

of the project and were required to give written consent to participate. A $10 participation fee was provided to each inmate to compensate for time lost at work.

Interviewers were all Corrections Health nurses who were familiar with the prison environment. An Aboriginal nurse working in the correctional health system assisted with recruiting and interviewing Indigenous inmates and liaising with the Aboriginal elders in the prisons. The survey covered a wide range of areas including physical health, mental health, behavioural risks, physical measurements, communicable diseases, and dental health. The following physical measurements and tests were recorded for each inmate: height, weight, peak expiratory flow, blood pressure, eyesight, hearing, blood sugar level, Mantoux tuberculin skin test, and Pap test. Shortly after the main survey, prison dentists completed a dental assessment based on the protocol used in the Australian National Oral Health Survey (Barnard, 1993).

The overall response rate was 90%. Non-responders were classified as 'refusers' (those who flatly refused to participate) or 'unavailable' (those who were engaged in an activity preventing participation). Some of the reasons cited by the 'refusers' included dislike of needles and imminent release therefore no point taking part. For the 'unavailable' group, reasons for non-participation included court appearances, security classification interviews, transferred to another jail, and considered by custodial staff as 'too dangerous'.

2.18 Prisoner Health Survey 2001

The methodology for the 2001 survey was similar to that used in 1996, to ensure consistency across the surveys. The design represented a cross-sectional random sample of inmates stratified by sex, age, and Aboriginality. The sample included approximately 10% of male and 34% of female inmates in full-time custody. The survey was conducted between July and November 2001. All 29 correctional facilities in NSW were included in the survey. According to the 2001 Inmate Census, there were 514 female and 7,160 male prisoners in full-time custody on 30 June 2001. Aboriginal people are over represented in the correctional system, comprising 16% and 25% of male and female prisoners, compared with approximately 1% in the general community. Given this over-representation, and variations in health status between Indigenous and non-Indigenous Australians, it was decided to stratify by Aboriginality. The sample was also stratified into 3 age groups: under 25 years, 25–40 years, and over 40 years. The stratification ensured that there were sufficient numbers of both Indigenous and non-Indigenous inmates to enable the health status of each sub-group to be described separately. The overall response rate was 85% (700 males and 154 females). The response rates were 84% for women and 85% for men; and 83% for Aboriginal people compared with 85% for non-Aboriginal people.

2.19 2003 NSW Young People in Custody Health Survey

Between January and March 2003, all young people remanded to a period of control in any of the 9 juvenile detention centres in NSW were eligible for inclusion in a health survey similar to that conducted on adults. The survey was conducted by the NSW Department of Juvenile Justice in collaboration with the Corrections Health Service (now Justice Health) and the University of Sydney. Parental consent for young people aged under 14 years was required. Young people aged 14 years or older were able to give consent, and a $10 participation

fee was given to participants. Medical problems detected during the survey were referred to health professionals for follow-up. Assessments were conducted by registered psychologists and nurses from the Department of Juvenile Justice and Corrections Health Service.

The survey covered a wide range of areas including physical health, mental health, behavioural risks, physical measurements, cognitive ability, and experience of trauma and abuse. The following physical measurements and tests were recorded for each participant: blood and urine tests; blood pressure; hip and weight measurement; height and weight; visual acuity; hearing assessment; and dental assessment. Participants also completed a health questionnaire, which covered the following areas: physical health; nutrition, dental health, physical illnesses, physical activity, head injury, disability and self-rated health; risk behaviour; sexual behaviour; tobacco, alcohol, and other drug use; tattooing and body piercing; gambling; psychosocial health; health service appraisal; community and in-custody experience; and questions about friends and family background, including parental incarceration. Participants also undertook psychometric testing through the Wechsler Abbreviated Scale of Intelligence (WASI). Reading, spelling and numeracy were assessed using the Wechsler Achievement Test II-Abbreviated. Psychopathology was assessed using the Adolescent Pathology Scale, and experience of trauma, abuse and neglect was assessed using the Childhood Trauma Questionnaire.

The overall response rate was 76%. Interviews were conducted with 242 young people (223 young men and 19 young women). Twenty-seven young people refused to participate, and 50 were excluded from the study. Reasons for exclusion were: mental health problems; substance withdrawal; being considered to be violent or disruptive by centre management; having to appear at court; being released from custody on the day of the survey; and being under 14 years of age but not having parental consent. The sample included 101 young Aboriginal people. The mean age for males was 17 years and for females was 16 years. The age range of participants was 14–21 years.

2.20 Emergency Department Data Collection

The NSW Emergency Department Data Collection is a database of information collected from approximately one-third of NSW emergency departments. It represents approximately two-thirds of all NSW emergency patients. Analyses presented in this report are based on a provisional diagnosis assigned by staff when a patient presented to the emergency department.

For this report, data from the Emergency Department Data Collection were accessed via HOIST.

3. Statistical methods

3.1 Crude death rates

The crude death rate is an estimate of the proportion of a population that dies in a specified period. It is calculated by dividing the number of deaths in a specified period by the number at risk during that period (typically per year). It does not take into account the age structure of the population studied, and can be misleading when long-term trends are examined—or geographic areas are compared—because age structures of populations may vary over time or among areas. Crude death rates presented in this report used ABS estimated resident populations (ERPs) as at 30 June each year, and are expressed per 100,000 population per year.

3.2 Age-adjusted rates

Age-adjustment of rates used direct age-standardisation. This method adjusts for effects of differences in the age composition of populations across time or geographic regions. The directly age-standardised rate is the weighted sum of age-specific (5-year age group) rates, where the weighting factor is the corresponding age-specific standard population. For this report, the Australian estimated residential population (persons) as at 30 June 2001 was used as the standard population (this is given in Table 1). The same population was used for males and females to allow valid comparison of age-standardised rates between the sexes.

Ninety-five per cent confidence limits around the directly standardised rates were calculated using the method described by Dobson et al. (1991). This method gives more accurate confidence limits than the usual normal approximation for rarer conditions. Where the number of events is larger, the limits are equivalent to those calculated in the conventional fashion (Armitage, Berry and Matthews, 2002).

3.3 Life expectancy at birth

Life expectancy at birth is an estimate of the average length of time (in years) a person can expect to live, assuming that the currently prevailing rates of death for each age group will remain the same for the lifetime of that person. In fact, death rates will almost certainly change over the lifetime of a person born now, owing to changes in social and economic conditions, changes in lifestyle, advances in health care, and possibly the emergence of new diseases. However, because no-one knows what the death rates for each age group and sex will be in the future, the usual practice is to use the current rates of death to calculate life expectancy.

For this report, estimates and confidence intervals for life expectancy were calculated using abridged current life tables based on 5-year age groups, except for the first 5 years of life, which were split into 2 age groups: 0–<1 years and 1–4 years. The methods used are described in detail by Chiang (1984).

3.4 Life expectancy at age 65

The average number of additional years a person who has reached the age of 65 would expect to live if current mortality trends continue to apply is based on the age-specific death rates for a given year. This measure assumes that death rates will remain constant for the next 20–30 years, a much more conservative assumption than the one used to calculate life expectancy at birth. For this report, life expectancy was calculated using abridged current life tables based on 5-year age groups.

3.5 Analysis of NSW Health Surveys

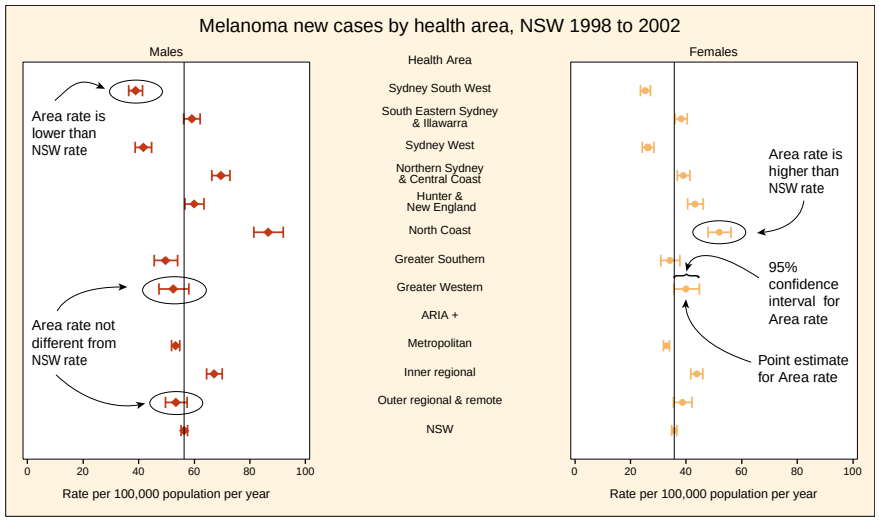
The survey samples were weighted to adjust for differences in the probabilities of selection among respondents, according to the number of eligible respondents in the household, and the number of residential telephone connections for the household (except in 1997, where telephone connection information was not collected). Post-stratification weights were used to adjust for differences between the age and sex structure of the survey samples and the relevant ABS mid-year population estimates (adjusted to exclude people resident in institutions) (Williamson et al., 2001).

The ‘Surveymeans’ procedure in SAS for Windows Version 8.02 was used to calculate point estimates and 95% confidence intervals. This procedure uses the Taylor expansion method to estimate sampling errors of estimators based on a stratified random sample (SAS, 2001).

3.6 Graphical presentation

Figure 1 below demonstrates the method used for graphical presentation of point estimates with their 95% confidence intervals. It shows age-adjusted incidence for melanoma for the years 1998–2002 for each of the NSW health areas. The standardised rate for NSW as a whole is indicated by the vertical reference line. The standardised rate, with its 95% confidence limits for each health area, is shown as a horizontal line with a central box indicating the point estimate.

Figure 1 Sample graph demonstrating point estimates and 95% confidence intervals.



4. Methods used for specific chapters and topics

4.1 Health-related behaviours: Deaths and hospitalisations attributable to use of drugs and alcohol

Estimates of the numbers and rates of deaths and hospitalisations attributable to the use of tobacco, alcohol, and illicit drugs used aetiologic fractions developed by Ridolfo and Stevenson (2001). These fractions represent a revision of those originally published by Holman (1990) and later revised by English et al. (1995). They were derived from meta-analysis of published scientific literature on the adverse health effects (and in a small number of instances, protective effects) of these substances to estimate the proportions of cases of specific diseases and injuries that could be attributed to each substance.

For this report, an electronic file of the aetiologic fractions developed by Ridolfo and Stevenson was obtained from the Australian Institute of Health and Welfare. The disease and injury groupings used in this file were defined using ICD-9 and ICD-9-CM. The appropriate groupings of ICD-10 and ICD-10-AM codes were developed for this report. The codes used can be found in the disease and procedure codes appendix.

Aetiologic fractions were applied to ABS mortality data for NSW for the period 1989–2002, and NSW Inpatient Statistics data for the period 1989–90 to 2002–03.

4.2 Rural and remote populations

The chapter on rural and remote populations presents a range of health indicators for NSW according to ARIA+, the new enhanced Accessibility–Remoteness Index of Australia Plus classification. This enhanced classification differs from the ARIA classification used in the previous report in several ways. In the ARIA classification, an ARIA category was allocated on the basis of an average index score from 0–12 within each statistical local area (SLA). This index score was based on the road distance from the closest service centre in each of 4 classes.

Under ARIA, the smallest service centre had a population of 5,000 people. Remoteness for each locality was then classified based on a score from 0 (high accessibility) to 12 (high remoteness) and grouped into 5 categories: 'highly accessible', 'accessible', 'moderately accessible', 'remote', and 'very remote' services (AIHW, 2004).

In ARIA+, the remoteness index value was based on distance to 5 categories of 'service centre' that includes centres with populations from 1,000–4,999. Localities with populations of greater than 1,000 people were considered to contain at least some basic level of services (for example: health, education, or retail) (GISCA, 1999). Those 'service centres' with larger populations were assumed to contain a greater level of service provision. Australian Standard Geographical Remoteness Area classification categories were then assigned to Census Collection Districts (CDs) based on the average ARIA+ score within the CD. This was done at the level of the SLA with ARIA. As CDs are generally smaller than SLAs this provides a greater level of precision in the measure of remoteness. SLAs under ARIA+ were then classified by the proportion of the population living in CDs by the Australian Standard Geographical Remoteness Area classification categories (AIHW, 2004). The names of the first 3 classes of remoteness—metropolitan, inner-regional, and outer-regional—have changed also from those used by ARIA. The names for remote and very remote classes remain the same, although they are assigned slightly differently under ARIA+. This has resulted in some change in the proportions of the population classified under the new ARIA+ categories compared to the previous ARIA categories. However, the effect on rural and remote areas appears small. It has also meant that some SLAs have been reclassified. The proportion of the population of each local government area in each ARIA+ category is shown in a separate appendix to this report.

4.3 Country of birth

Where possible, indicators for the 5 countries that comprise the Former Yugolsavia are presented separately. However, in many datasets these countries are not identified separately, in which case indicators are presented for the Former Yugoslavia. The 5 countries that comprise the Former Yugolsavia are: Croatia, Slovenia, Bosnia–Herzegovina, the Former Yugoslav Republic of Macedonia, and the Former Yugoslav Republic of Serbia and Montenegro.

4.4 Avoidable mortality

The method used to calculate avoidable mortality was based on a revision of the original set of conditions published in 2001 (Tobias and Jackson, 2001), which were used in the 2002 report. This review, by the Public Health Information Development Unit (PHIDU) in Australia and the Ministry of Health in New Zealand, aims to develop an Australasian standard list of potentially avoidable conditions.

Avoidable deaths are those attributed to conditions that are considered preventable or otherwise avoidable through earlier intervention or action. These were further sub-categorised into 3 levels of intervention. Primary level interventions are those that can prevent the condition developing, such as promotions of lifestyle modification. Secondary level interventions are those that detect or respond to the condition early in its progression, such as cancer screening and chronic disease management. Tertiary level interventions are those that treat the condition and prevent premature death. For each condition, the number of deaths that could have been avoided at each level was calculated by applying weights to

the total deaths from the condition. These data were summed to determine the rates of primary, secondary, and tertiary avoidable mortality. The weights were based on the work of Tobias and Jackson (2001).

The codes used to define avoidable mortality groups, along with the weights for defining the proportion avoidable by primary, secondary and tertiary interventions can be found in Table 3 of this report.

4.5 Avoidable hospitalisations

The method used to calculate avoidable hospitalisations used the concept of 'ambulatory care sensitive conditions'. These are hospitalisations that could potentially have been avoided through the use of preventive healthcare or early disease management given in an ambulatory setting such as by a general practitioner or community health centre.

The categories used for the ambulatory care sensitive conditions were based on those used by the Victorian Department of Human Services (VDHS, 2001), which have been reviewed by the Public Health Information Development Unit (PHIDU). The VDHS list was defined according to ICD-9-CM; appropriate groupings of ICD-10-AM codes were developed by the Centre for Epidemiology and Research for the previous report, and have undergone review by PHIDU. The codes used can be found in Table 4.

4.6 Socioeconomic status measures

Socioeconomic (SES) groups used in this report were constructed using the index of relative socioeconomic disadvantage (IRSD), which is one of the Socio-Economic Indices for Areas (SEIFA) produced by the ABS (ABS, 1998, 2003). Non-overlapping geographical areas covering all of NSW are assigned an IRSD score calculated from ABS census data on various socioeconomic characteristics of the people living in the areas. These characteristics relate to occupation, education, non-English speaking background, Indigenous origin, and the economic resources of the household.

The ABS has released IRSD scores after the last 4 censuses. The methods used for calculation of the IRSD index were similar in 1986, 1991 and 1996 but changed for 2001. The IRSD score is an ordinal measure based on a standard score of 1,000 and standard deviation of 100 for Australia, based on the index scores of all collector districts (CDs) in Australia. The areas can be ranked by IRSD score but other arithmetic comparisons using the score are not valid. Only ranks, and not the scores calculated using data from different censuses, can be compared. For instance, the score for NSW was 1,006 using 1996 Census data, which means that the SES of NSW was slightly better than Australia as a whole. The score for NSW in 1991 was 1,002; however, that does not mean that NSW in 1996 was better off than NSW in 1991 because the scores were calculated based on a socioeconomically different Australian population. Calculations of the IRSD scores for a local government area involves the weighting of the indexes based on the population for the particular year.

The NSW population was divided into 3 groups for the analyses in this chapter. Statistical local areas were sorted by IRSD score and assigned to quintiles, each containing as close as possible to one-fifth of the total population. The data are presented for the lowest SES population quintile, the highest SES population quintile, and a group comprising the remaining 3 SES quintiles, which is referred to as the 'rest' or 'balance of NSW population'.

Poisson regression models (Armitage et al., 2002) were used to study the effect of time and SES on death rates. For each indicator (except life expectancy and ACS hospitalisations) and each sex, the trend for SES group by time was modelled to obtain fitted values for the relative health gaps and to ascertain the significance of any observed changes in the health gaps over time. Raw ratios were used to assess changes in the relative position of the SES groups for life expectancy or the rate of hospitalisations for ACS conditions due to difficulties in fitting the Poisson model in these cases.

The models included age, SES group, and year, and the interaction of year and SES group. The interaction term assessed change in death rates by SES group over time, after adjusting for age differences. The relative rate of change was determined by exponentiating the coefficient for the appropriate SES*time variable in the model. The significance of the change was assessed by testing the difference between the slopes of these trends using the CONTRAST option in the GENMOD procedure in SAS (SAS, 2001).

4.7 Psychological distress

The K10 (Kessler and Mroczek, 1992, 1994; Kessler et al., unpublished) was included in the 1997, 1998, 2002 and 2003 NSW Health Surveys as a relatively short measure of psychological distress, which allows comparison against international survey data and validation against concurrent diagnostic data in the Australian National Survey of Mental Health and Wellbeing (ABS, 1997; Andrews and Slade, 2001). The K10 (and a briefer K6 measure) were specifically designed for use in the 'core' of the annual United States National Health Interview Survey (N = 50,000 aged 15+) when it was redesigned for use from 1997 onwards. The K6 has also been used in the biennial Canadian National Population Health Survey (panel survey, N >17,000 aged 12+; 1994–95; 1996–97; 1998–99; 2000–01) and has been replaced by the K10 in the Canadian Community Health Survey from September 2000 (Statistics Canada, 2002).

The K10 is currently being used in a series of surveys similar to the Australian National Survey of Mental Health and Wellbeing, in 20 countries, under the auspices of the World Health Organization. These surveys have a total sample size of about 200,000. The World Health Organization regions surveyed include North America (Canada and the United States); Latin America (Brazil, Colombia, Mexico and Peru); Europe (Belgium, France, Germany, Italy, The Netherlands, Spain, and The Ukraine); the Middle East (Israel); Africa (South Africa); and Asia (China, India, Indonesia, Japan, and New Zealand) (Kessler et al., 2000).

The K10 measure is a 10-item self-report questionnaire intended to yield a global measure of 'psychological distress' based on questions about the level of restlessness, anxiety, and depressive symptoms in the most recent 4-week period. It is designed to span the range from few or minimal symptoms through to extreme levels of distress, which is an essential feature of an instrument for use in population studies. Thus the K10 contains both low-threshold items, which many people may endorse, through to high-threshold items that very few will endorse. Overall, the item-response scale is designed to yield most precision around the 90th to 99th percentile of the general population.

For each item there is a 5-level response scale based on the amount of time (from none through to all) during a 4-week period when the person experienced the particular problem. In NSW, there are also 4 follow-up questions, which aim to quantify the level of disability resulting from the feelings of distress; the health service usage resulting from the distress; and the extent to which the distress is believed to be mainly due to physical health problems.

Scoring of the raw questionnaire assigns between 1 to 5 points to each symptom in the direction of increasing problem frequency. Thus, the raw score range is from 10 (all responses to all questions are 'none of the time') through to 50 (all responses to all questions are 'all of the time'). Low scores indicate low levels of psychological distress and high scores indicate high levels of psychological distress (ABS, 2003).

The creators of the K10 have not yet published details on scoring the scale and there has been no international standard for determining cut off points for low, medium and high levels of psychological distress (ABS, 2003). Various interpretations of scoring were used in the past in Australia and worldwide. Recently, and following the advice of the K10 originators, NSW adopted a 4-level approach to illustrate prevalence and severity. The 4 levels are given in Table 2.

These cut-off scores were previously used in the 2000 Health and Wellbeing Survey (conducted in Western Australia) and the ABS 2001 National Health Survey Summary of Results Publication (ABS, 2003). The adoption of the above scores in NSW ensures comparability of the NSW results with national and, increasingly, international data.

Table 2 K10 score and level of psychological distress

K10 score	Level of psychological distress
10–15	Low
16–21	Moderate
22–29	High
30–50	Very high

5. Quality assurance process

The preparation of this report involved a great deal of complex data processing and manipulation. The following steps were taken to minimise errors:

- most analyses used a single, shared suite of datasets, contained on the HOIST system. The datasets on HOIST are carefully checked against the original source data to ensure their fidelity. Sources for all data used are described in the footnotes;
- all graphs and tables were produced using SAS programs that can be audited, rather than using interactive data manipulation facilities such as spreadsheets that are much more difficult to check;
- the SAS programs directly created the Web pages for the online version of the report as well as tables and graphs, which were directly imported into Adobe PageMaker for typesetting the printed version. This minimised the possibility of transcription and typographical errors;

- every SAS program used in the production of this report was checked by someone other than the person who originally wrote it. Items such as the correct specification of ICD codes and correct selection of numerator and denominator data were systematically checked as part of this audit process;
- complex parts of the SAS programs were abstracted as a common, shared set of SAS 'macros' (callable sub-routines). These macros—which were employed for operations such as imputation, direct standardisation and production of custom graph formats—were subject to rigorous testing before they were used;
- all results were checked against other, comparable sources wherever possible.

6. Area health service boundaries

In July 2004, the NSW Minister for Health announced a new area health structure. The restructure is largely a merger of the 17 area health services into 8 new area health services. The new administrative structure will be in place by 1 January 2005. A list of the mergers is given in Table 3.

In this report, the 2005 area health service boundaries have been used. A list of local government areas by 2005 health area is given in a separate appendix to this report.

Table 3 1996 and 2005 area health services

1996 area health service names	2005 area health service names
Central Sydney South Western Sydney	Sydney South West
South Eastern Sydney Illawarra	South Eastern Sydney & Illawarra
Wentworth Western Sydney	Sydney West
Northern Sydney Central Coast	Northern Sydney & Central Coast
Hunter New England	Hunter & New England
Mid North Coast Northern Rivers	North Coast
Greater Murray Southern	Greater Southern
Far West Macquarie Mid Western	Greater Western

Note: Some localities within the Statistical Local Areas of Greater Taree, Greater Lakes, Gloucester and Lithgow moved to the new area health services independently of the main mergers.

For more information:

AIHW Dental Statistics and Research Unit. *Child Dental Health Survey, New South Wales, 1999*. Adelaide: DSRU, 2001.

Andrews G, Slade T. Interpreting scores on the Kessler psychological distress scale (K10). *Aust N Z J Public Health* 2001; 25: 494–497.

Armitage P, Berry G, Matthews J. *Statistical Methods in Medical Research, 4th edition*. Oxford: Blackwell Science, 2002.

Australian Bureau of Statistics. *Information paper: 1996 Census Socio-Economic Indices for Areas*. Catalogue no. 29120. Canberra: ABS, 1998.

Australian Bureau of Statistics. *Information paper: 2001 Socio-Economic Indexes for Areas*. Catalogue no. 2039.0. Canberra: ABS, 2003.

Australian Bureau of Statistics. *Mental health and wellbeing of adults, Australia 1997*. Catalogue no. 4360.0. Canberra: ABS, 1997.

Australian Institute of Health and Welfare, *Rural, Regional and Remote Health: A guide to remoteness classifications.* AIHW Catalogue no. PHE 53. Canberra: AIHW, 2004. Available at www.aihw.gov.au.

Chiang CL. *The life table and its applications*. Malabar: Krieger, 1984.

Commonwealth Department of Health and Aged Care and the National Key Centre for Social Applications of Geographical Information Systems. *Accessibility–Remoteness Index of Australia.* Occasional Papers Series no 5. Canberra: CDHAC, 1999.

Dobson A, Kuulasmaa K, Eberle E, Schere J. Confidence intervals for weighted sums of Poisson parameters. *Stat Med* 1991; 10: 457–62.

English DR, Holman CDJ, Milne MG et al. *The quantification of drug-caused morbidity and mortality in Australia*. Canberra: Commonwealth Department of Human Services and Health, 1995.

Graham-Clarke P, Howell S, Bauman A, Nathan S. *NSW Health Promotion Survey 1994 Technical Report*. Sydney: National Centre for Health Promotion and NSW Department of Health, 1995.

Holman CDJ, Armstrong BK, Arias LN et al. *The quantification of drug-caused morbidity and mortality in Australia, 1988*. Canberra: Commonwealth Department of Human Services and Health, 1990.

Kessler RC, Andrews G, Colpe LJ, Hiripi E, Mroczec DK, Normand S, Walters EE. Short screening scales to monitor population prevalences and trends in nonspecific psychological distress (unpublished).

Kessler RC, Costello EJ, Merikangas KR, Ustun TB. Psychiatric Epidemiology: Recent Advances and Future Directions. *Mental Health, United States, 2000*. Manderscheid RW, Henderson MJ (editors). Rockville, Maryland: US Department of Health and Human Services, 2000.

Kessler R, Mroczek D. An update of the development of mental health screening scales for the US National Health Interview Survey. Ann Arbor, Michigan: Survey Research Centre of the Institute for Social Research, University of Michigan, Memo dated December 22, 1992.

Kessler R, Mroczek D. Final versions of our Non-Specific Psychological Distress Scale. Ann Arbor, Michigan: Survey Research Centre of the Institute for Social Research, University of Michigan, Memo dated March 10, 1994.

Last JM. *A Dictionary of Epidemiology, 4th edition*. New York: Oxford University Press, 2001.

Muscatello D, Travis S. Using the International Classification of Diseases with HOIST. *N S W Public Health Bull* 2001; 12 (11): 289–293.

National Centre for Classification in Health. *ICD-10-AM, 2nd edition*. Sydney: National Centre for Classification in Health, 2000.

National Coding Centre. *The Australian version of the International Classification of Diseases, 9th Revision, Clinical Modification* (ICD-9-CM). Sydney: University of Sydney, 1996.

NSW Department of Health. The health behaviours of secondary school students in New South Wales 2002. *N S W Public Health Bull 2004*; 15(S-2).

NSW Health Survey Program website at www.health.nsw.gov.au/public-health/survey/hsurvey.html.

Planning Better Health, NSW Department of Health website at www.health.nsw.gov.au/pbh/index.html.

Population Health Division. New South Wales Older People's Health Survey 1999. *N S W Public Health Bull* 2000; 11(S-2).

Population Health Division. *Review of the Save Our Kids Smiles (SOKS) Program. Volume I: Report* and *Volume II*: *Technical Report*. Sydney: NSW Department of Health, 2001.

Ridolfo B, Stevenson C. *The quantification of drug-caused morbidity and mortality in Australia, 1998*. AIHW Catalogue no. PHE 29. Canberra: AIHW, 2001.

SAS Institute. *The SAS System for Windows version 8.02*. Cary, North Carolina: SAS Institute, 2001.

Tobias M, Jackson G. Avoidable mortality in New Zealand, 1981–97. *Aust N Z J Public Health* 2001; 25: 12–20.

Victorian Department of Human Services. *The Victorian ambulatory care-sensitive conditions study: Preliminary analyses*. Melbourne: VDHS, 2001.

Williamson M, Baker D, Jorm L. *The NSW Health Survey Program: Overview and methods 1996–2000. N S W Public Health Bull* 2001; 12(S-2).

World Health Organization. *International Classification of Diseases, 9th Revision*. Geneva: WHO, 1977.

World Health Organization. *International Statistical Classification of Diseases and Related Health Problems, 10th Revision*. Geneva: WHO, 1992.

Disease and procedure codes

This appendix details the codes from the International Statistical Classification of Diseases (ICD) used to prepare some of the data included in this report.

The 10th Revision of the ICD (ICD-10) was generally implemented in Australia from 1998 onwards. It was a major update of the 9th Revision (ICD-9). For some diseases or disease groups, it is not possible to construct a one-to-one mapping between the 2 revisions, and as a result there may be a small distortion of trend lines. Where there was a major change in the cases that would be selected, no trends have been shown.

For some disease groupings, codes differ between the modifications of ICD-9 used for the various data sources. These differences are shown in the table.

Disease codes

ICD codes used for diseases or disease groups in this report are shown in Table 1.

ABS Deaths Register

Causes of deaths registered before 1999 were coded according to the 9th Revision of the International Classification of Diseases (ICD-9). From 1 January 1999 onwards, causes of death have been classified according to the 10th Revision of the International Classification of Diseases (ICD-10).

Inpatient Statistics Collection

The reasons for admission to hospital were coded according to the 9th Revision of the International Classification of Diseases, Clinical Modification (ICD-9-CM) for years up to and including 1997–98. From 1 July 1998, the reasons for admission have been coded according to the 10th Revision of the International Classification of Diseases, Australian Modification (ICD-10-AM).

Central Cancer Registry

Cases of cancer registered before July 1999 were classified according to ICD-9. Cases registered from 1 July 1999 onwards have been classified according to the 2nd edition of the International Classification of Diseases for Oncology (ICD-O-2). ICD-O-2 codes were translated by the Registry to ICD-10 codes, which were used to prepare this report.

Procedure codes

ICD codes used for diseases or disease groups in this report are shown in Table 2.

Inpatient Statistics Collection

Procedures carried out while patients were admitted to hospital were coded according to the 9th Revision of the International Classification of Diseases, Clinical Modification (ICD-9-CM) for years up to and including 1997–98. From 1 July 1998, the procedures have been coded according the MBS–Extended procedure classifications in ICD-10-AM. These codes are based on the Commonwealth Medicare Benefits scheme (MBS) and are relevant to Australian data only.

Deaths and hospitalisations attributable to smoking, alcohol or illicit drugs

ICD codes for diseases and disease groups used to calculate deaths and hospitalisations attributable to alcohol, smoking, or illicit drugs are shown in Table 3. An electronic file of the aetiologic fractions developed by Ridolfo and Stevenson (2001) was obtained from the Australian Institute of Health and Welfare. The disease and injury groupings used in this file were defined using ICD-9 and ICD-9-CM. The appropriate groupings of ICD-10 and ICD-10-AM codes were developed for this report.

Potentially avoidable mortality

ICD codes for diseases and disease groups used to calculate potentially avoidable mortality are shown in Table 4. Tobias and Jackson (2001) defined conditions using ICD-9 codes only. The appropriate groupings of ICD-10 codes were developed for this report.

Potentially avoidable hospitalisations

ICD codes for diseases and disease groups used to calculate potentially avoidable (ACS) hospitalisations are shown in Table 5. The categories used for the ambulatory care sensitive conditions are based on those used by the Victorian Department of Human Services (VDHS, 2001), which were defined according to ICD-9-CM codes. The appropriate groupings of ICD-10-AM codes were developed for this report.

Burden of disease

Diseases were grouped into condition groups, as shown in Table 6. These groups were used to show leading causes of years of life lost (YLL), years of life lived with disability (YLD), and disability adjusted life years (DALY). These indicators use deaths data from 1996, so ICD-9 codes only are shown. The condition groups were further grouped into categories, as shown in Table 7, for YLL, YLD, DALY, and causes of death and hospitalisations.

For more information:

National Centre for Classification in Health. *ICD-10-AM, 3rd edition*. Sydney: National Centre for Classification in Health, 2002.

National Coding Centre. *The Australian version of the International Classification of Diseases, 9th Revision, Clinical Modification* (ICD-9-CM). Sydney: University of Sydney, 1996.

World Health Organization. *International Classification of Diseases, 9th Revision*. Geneva: WHO, 1977.

World Health Organization. *International Statistical Classification of Diseases and Related Health Problems, 10th Revision*. Geneva: WHO, 1992.

World Health Organization. *International Classification of Diseases for Oncology (ICD-O), 2nd edition*. Geneva: WHO, 1990.

Ridolfo B, Stevenson C. *The quantification of drug-caused mortality and morbidity in Australia, 1998.* Canberra: Australian Institute of Health and Welfare, 2001. Available at www.aihw.gov.au.

Tobias M, Jackson G. Avoidable mortality in New Zealand, 1981–97. *Aust N Z J Public Health* 2001; 25: 12–20.

Victorian Government Department of Human Services. *The Victorian ambulatory care sensitive conditions study: Preliminary analyses.* Melbourne: VDHS, 2001.

Victorian Department of Human Services. *Workshop on Practical Aspects of Conducting a Burden of Disease and Injury Study*. Melbourne: VDHS, 2001.

Table 1 Disease codes

Group	ICD-9 and ICD-9-CM	ICD-10 and ICD-10-AM
Adverse event after immunisation	E948,E949.0–E949.7	Y58,Y59.0–Y59.2
Acute respiratory infection	460–487	
Adverse event after immunisation	E948,E949.0–E949.7	Y58,Y59.0–Y59.2
Air transport	E840–E845	V95–V97
Ambulatory care sensitive conditions	see Table 4	see Table 4
Anthrax	022,484.5	A22
Arboviral infection: Ross River	no separate code	B33.1
Arboviral infection: other–not specified	061–064,066	A83,A84,A85.2,A90,A92–A94
Asbestosis	501	J61
Asthma	493	J45,J46
Benzodiazepine deaths		combination of any of F13, F19, X41, X44 with T42.4.
Botulism	005.1	A05.1
Brucellosis	023	A23
Burns and scalds	E890–E899, E924, E929.4	X00–X19
Cancer: all	140–208	C00–C97
Cancer: breast	174	C50
Cancer: cervical	180	C53
Cancer: colorectal	153–154	C18–C21
Cancer: lung	162	C33–C34
Cancer: melanoma	172	C43
Cancer: oral	141–145	C01–C08
Cancer: prostate	185	C61
Cardiovascular disease (all)	390–459	I00–I99, G45, G46
Chancroid	099.0	A57
Chickenpox	052	B01
Chickenpox complications		Meningitis: B01.0; Encephalitis: B01.1; Pneumonia: B01.2; Other: B01.8; None: B01.9
Chlamydia trachomatis: congenital pneumonia	no separate code	P23.1
Chlamydia trachomatis: lymphogranuloma venereum	099.1	A55
Chlamydia trachomatis: other sexually transmitted	ICD-9: no separate code ICD-9C-M 099.41, 099.5	A56, A74.8, K67.0, N74.4
Cholera	001	A00
Chronic obstructive pulmonary disease	491–492, 496	J41–J44
Chronic respiratory disease	491, 492, 493, 496	J41–J46
Coronary heart disease	410–414	I20–I25
Cryptosporidiosis	ICD-9: no separate code: ICD-9-CM: 007.4	A07.2
Cutting or piercing injury (unintentional)	E920	W25–W29,W45
Cycling (pedal) injury	E800–E807 with fourth digit = 3 E810–E825 with fourth digit = 6 E826–E829 with fourth digit = 1	V10–V19
Diabetes	250	E10–E14
Diabetes: ophthalmic complications		E10.3, E11.3, E12.3, E13.3, E14.3
Diarrhoea and vomiting (presenting symptoms at emergency department)	001–009, 558, 564.5, 787.91, 078.82, 536.2, 578.0, 787.0	not used in this report
Diphtheria	032	A36
Drowning (death)	E910, E830, E832	W65–W74, V90, V92
Eschirichia coli: enterohaemorrhagic	ICD-9: no separate code ICD-9-CM: 008.04	A04.3
Falls	E880–E886,E888, E929.3	W00–W19
Firearm injury (unintentional)	E922	W32–W34
Firearm injury	E922, E955.0–E955.4, E955.9, E965.0–E965.4, E970, E985.0–E985.4	W32–W34, X72–X74, X93–X95, Y35.0, Y22–Y24
Gastrointestinal infections	001–009	A00–A09
Giardiasis	007.1	A07.1
Gonorrhoea	098, 647.1	A54, K67.1, M73.0, N74.3, O98.2
Granuloma inguinale (Donovanosis)	099.2	A58
Haemolytic uraemic syndrome	ICD-9: no separate code ICD-9-CM: 283.11	D59.3
Haemophilus influenzae meningitis	320.0	G00.0
Heart failure	428	I50
Hepatitis A	070.0, 070.1	B15
Hepatitis B (including hepatitis D)	070.2, 070.3	B16, B17.0, B18.0, B18.1
Hepatitis C	ICD-9: no separate code ICD-9-CM: 070.41,070.44,070.51,070.54	B17.1,B18.2

Table 1 Disease codes (continued)

Group	ICD-9 and ICD-9-CM	ICD-10 and ICD-10-AM
Hepatitis D	ICD-9: no separate code ICD-9-CM: 070.2, 070.23, 070.31, 070.33, 070.42, 070.52	B16.0,B16.1,B17.0,B18.0
Hepatitis E	ICD-9: no separate code ICD-9-CM: 070.43, 070.53	B17.2
Hepatitis: viral (type not specified)	ICD-9: 070.4, 070.5, 070.6, 070.9 ICD-9-CM: 070.49, 070.59, 070.6, 070.9	B17.8, B18.8, B18.9, B19.0, B19.9, B94.2, O98.4, P35.3
HIV–AIDS	042	B20–B24
Homicide	E960–E969	X85–Y09, X87.1
Influenza	487	J10, J11
Influenza and pneuomonia (presentations at emergency departments)	480–487	not used in this report
Injury and poisoning	E800–E869, E880–E929, E950–E999	V00–X99, Y00–Y39, Y85–Y87, Y89
Interpersonal violence	E960–E969	X85–Y09, Y87.1
Interpersonal violence (children)	E960–E969, E980–E989, V61.21	X85–Y09, Y10–Y34, Y87.1, Z61.6
Knife injury	E920.3, E956, E966, E986, E974	W26, X78, X99, Y28, Y35.4
Legionnaires' disease	no separate code	A48.1, A48.2
Leprosy	030	A30, B92
Leptospirosis	100	A27
Listeriosis	027.0	A32, P37.2
Machinery injury	E919	W24, W30. W31
Malaria	084, 647.4	B50–B54, P37.3, P37.4
Measles	ICD-9: 055, 484.0, ICD-9-CM: 055	B05
Meningococcal disease	036, 320.5	A39, M01.0, M03.0
Mesothelioma	no separate code	C45
Motor vehicle crash injury	E810–E825, E929.0	V20–V79, V02–V04, V09 (not .9), V12–V14, V19.0–V19.6, V80.3–V80.5, V81.0, V81.1, V82.0, V82.1, V84–V88, V89.0 (not .1), Y85.0
Mumps	ICD-9: 072, 321.5,ICD-9-CM: 072	B26
Natural–environmental factors injury	E900–E909, E928.0–E928.2	W42–43, W53–64, W92–99, X20–X39, X51–57
Near-drowning (hospitalisations)	994.1, E910, E830, E832	T75.1, V90, V92, W65–W74
Opiate deaths	304.0, 304.7, 305.5, E850.0	F11, combination of any of F19, X42, X44 with any of T40.0–T40.4,T40.6
Otitis media	381.01, 381.02, 381.10, 381.2, 382	H65.1, H65.2, H65.3, H66, H67.0, H67.8
Overexertion injury	E927	X50
Pedestrian injury	E810–E825 with fifth digit = 7	V02–V04, V09 with fourth digit not 9
Pertussis (whooping cough)	033, 484.3	A37
Plague	020	A20
Pneumococcal infection	ICD-9: 038.2, 041.2, 320.1, 481, 567.1 ICD-9-CM: 038.2, 041.06(from July 1995), 041.2(to June 1995), 320.1, 481, 567.1	A40.3, G00.1, M00.1, J13, B95.3
Poliomyelitis	045, 138, 323.2, 730.7	A80, B91, M89.6
Poisoning (unintentional)	E850–E869, E929.2	X40–X49
Potentially avoidable deaths	see Table 3	see Table 3
Psittacosis	073	A70
Psychostimulant deaths		F14, combination of any of F15, F19, X41, X42, X44 with any of T40.5,T43.6
Q fever	083.0	A78
Rabies, lyssavirus	071	A82
Rail transport	E800–E807	V05, V15, V80.6, V81.2–V81.9
Respiratory tuberculosis	010–012	A15–A16
Rubella: congenital	771.0	P35.0
Rubella: other	056, 647.5	B06, M01.4
Salmonella infection (non-typhoid)	003	A02
Shigellosis	004	A03
Skin infections	680–687	L00–L08
Sports injury	no equivalent	1999–00: (in any external cause code) V00–V99 with fifth character = 02000-02: (in any activity code Y93.02002 on: (in any activity code) U50–U72

Table 1 Disease codes (continued)

Group	ICD-9 and ICD-9-CM	ICD-10 and ICD-10-AM
Stroke	430–438	I60–I69, G45,G46
Struck by–against injury	E916–E917	W20–W22, W50–W52
Syphilis: congenital	090	A50
Syphilis: other	ICD-9: 091, 092, 093, 094, 095, 096, 097, 104.0, 441.7, 647.0,ICD-9-CM: 091, 092, 093, 094, 095, 096, 097, 104.0, 647.0	A51–A53, I98.0, K67.2, M03.1, M73.1, N74.2, O98.1
Suicide	E950–E959	X60–X84, Y87.0
Suffocation	E911–E913.9	W75–W84
Tetanus	037, 771.3	A33–A35
Tuberculosis	ICD-9: 010–018, 137, 320.4, 647.3, 730.4, 730.5, 730.6,ICD-9-CM: 010–018, 137, 647.3	A15–A19, B90, J65, K23.0, K67.3, K93.0, M01.1, M49.0, M90.0, N33.0, N74.0, N74.1, 098.0, P37.0
Typhoid and paratyphoid	002	A01
Typhus(epidemic)	080	A75.0
Viral haemorrhagic fevers	065, 078.6, 078.7	A91, A96, A98, A99
Water transport	E831, E833–E838	V91, V93, V94
Workplace injury	no equivalent	1998–99: (in principal external cause code) V00–Y99 with fifth character = 2; 2000–02: (in any external cause code) Z04.2, Z57, Y93.2, Y962002 on: (in any external cause code) Z04.2, Z57, Y93.2, U73.0, Y96
Yellow fever	060	A95

Table 2 Procedure codes

Procedure	ICD-9 and ICD-9-CM	ICD-10 and ICD-10-AM
Carotid endarterectomy	38.12	33500–00
Colonscopy	45.23, 45.24, 45.25, 45.26, 45.42, 48.23, 48.24, 48.25, 48.26, 48.35, 49.21, 49.22, 49.23, 89.34	procedure block 0904, 0905, 0909, 0910, 0911, 0931, 0938, 0942
Coronary artery bypass graft	36.1	38497, 38500, 38503, 90201
Coronary artery bypass angioplasty–stent	36.01, 36.02, 36.05, 36.06, 36.07	35310, 35304–00, 30305-00
CT scan of the brain	87.03 with diagnosis code 430–438	56001–00, 56007–00, 56010–02, 56010–03 with diagnosis code I60–I69
Dental: Removal or restoration of teeth (procedures)	23	97311–97327, 97411–97679, 97386–00, 97387–00, 9738–00 or procedure block 457–458, 462–473
Lower limb amputation with diabetes as co-morbidity	84.1 with comorbidity diagnosis code 250	44370–00, 44367–00, 44367–02, 44361–00, 44361–01, 44358–00, 44364–00, 44364–01, 44338–00 with comorbidity diagnosis code E14
Miscarriage or termination of pregnancy	69.01, 69.02, 69.51, 69.52	35643
Myringotomy	19.5, 19.6, 20.0 in any procedure code	41626–00, 41626–01, 41632–00, 41632–01 in any procedure code
Revascularisation procedures	36.01, 36.02, 36.05, 36.06, 36.07, 36.1	38497, 38500, 38503, 90201, 35310, 35304–00, 30305–00

Table 3 Potentially avoidable mortality

Group	Conditions included	ICD-9	ICD-10	Primary avoidable mortality	Secondary avoidable mortality	Tertiary avoidable mortality
Enteritis and other diarrhoeal diseases	Diarrhoeal diseases	001–009	A00–A09	0.7	0.1	0.2
Infection	Tuberculosis	010–018,137	A15–A19, B90	0.6	0.35	0.05
Childhood vaccine-preventable disease	Diphtheria, whooping cough, tetanus, polio, Hib, measles, rubella	032–033, 036.0, 037, 041.2, 041.5, 045, 052, 055–056	A35–A37, A49.1, A49.2, A80, B01, B05–B06, J11	0.9	0.05	0.05
Infection	Selected Invasive Bacterial and Protozoal infection	034–035, 038, 084, 320, 481–482, 485, 681–682	A38–A41, A46, A48.1, B50–B54, G00,G03, J13-J15, J18, L03	0.3	0.4	0.3
Sexually transmitted diseases except HIV–AIDS		090–099, 614.0–614.5, 614.7–616.9, 633	A50–A64, M02.3, N34.1, N70–N73, N75.0, N75.1, N76.4, N76.6, O00	0.8	0.1	0.1
Infection	HIV–AIDS	042, 279.10	B20–B24	0.9	0.05	0.05
Infection	Hepatitis	070	B15–B19	0.7	0.1	0.2
Infection	Viral Pneumonia and Influenza	480, 487	J10, J12, J17.1, J21	0.4	0.5	0.1
Neoplasms	Lip, Oral Cavity and Pharynx	140–149	C00–C14	0.8	0.1	0.1
Neoplasms	Oesophagus	150	C15	0.95	0	0.05
Neoplasms	Stomach	151	C16	0.4	0.2	0.4
Neoplasms	Colorectal	153, 154	C18–C21	0.4	0.5	0.1
Neoplasms	Liver	155	C22	0.7	0.1	0.2
Neoplasms	Lung	162	C33–C34	0.95	0	0.05
Neoplasms	Melanoma of skin	172	C43	0.6	0.1	0.3
Neoplasms	Nonmelanotic skin	173	C44	0.6	0.1	0.3
Neoplasms	Breast (female only)	174	C50	0.15	0.35	0.5
Neoplasms	Uterus	179, 182	C54–C55	0.1	0.4	0.5
Neoplasms	Cervix	180	C53	0.3	0.5	0.2
Neoplasms	Bladder	188	C67	0.5	0.25	0.25
Cancer of testis	Cancer of testis	186	C62	0	0.3	0.7
Eye cancer	Eye cancer	190	C69	0	0	1
Neoplasms	Thyroid	193	C73	0.1	0.2	0.7
Neoplasms	Hodgkins disease	201	C81	0	0.1	0.9
Neoplasms	Leukemia (age <44 only)	204–208	C91.0, C91.1	0.05	0.05	0.9
Neoplasms	Benign	210–229	D10–D36	0	0	1
Nutritional deficiency anaemia		280–281	D50–D53	1	0	0
Nutritional, endocrine and metabolic	Thyroid disorders	240–246	E00–E07	0.1	0.7	0.2
Nutritional, endocrine and metabolic	Diabetes	250	E10–E14	0.3	0.6	0.1
Adrenal disorders		255.0, 255.4	E24, E27			
Newborn screening conditions	Congenital hypothyroidism, CAH, PKU, galatosaemia	255.2, 270.1, 271.1	E25, E70.0, E74.2	0	0.8	0.2
Drug use disorders	Alcohol related disease	291, 303, 305.0, 425.5, 535.3, 571.0–571.3	F10, I42.6, K29.2, K70	0.9	0	0.1
Drug use disorders	Illicit drug use disorders	292, 304, 305.2–305.9	F11–F16, F18–F19	0.9	0	0.1
Neurological disorders	Epilepsy	345	G40–G41	0	0.9	0.1
Cardiovascular diseases	Rheumatic and other valvular heart disease	390–398	I01–I09	0.3	0.6	0.1
Cardiovascular diseases	Hypertensive heart disease	402	I11	0.3	0.65	0.05
Cardiovascular diseases	Ischaemic heart disease	410–414	I20–I25	0.5	0.25	0.25
Cardiovascular diseases	Cerebrovascular diseases	430–438	I60–I69	0.3	0.5	0.2
Cardiovascular diseases	Aortic aneurysm	441	I71	0.3	0.3	0.3
Genitourinary Disorders	Nephritis and Nephrosis	403, 580–589, 591	I12–I13, N00–N09, N17–N19	0.1	0.2	0.7
Genitourinary Disorders	Obstructive uropathy & Prostatic Hyperplasia	592, 593.7, 594, 598, 599.6, 600	N13, N20–N21, N35, N40, N99.1	0.3	0.3	0.3
Respiratory diseases	DVT with pulmonary embolism	415.1, 451.1	I26, I80.2	0.3	0.3	0.3
Respiratory diseases	COPD	490–492, 496	J40–J44	0.8	0.1	0.1
Respiratory diseases	Asthma	493	J45–J46	0.1	0.7	0.2
Upper respiratory tract infection	382–383, 460–465	J00–J06, H66, H70	0.4	0.5	0.1	
Digestive disorders	Peptic ulcer disease	531–534	K25–K28	0.05	0.75	0.2

Table 3 Potentially avoidable mortality (continued)

Group	Conditions included	ICD-9	ICD-10	Primary avoidable mortality	Secondary avoidable mortality	Tertiary avoidable mortality
Digestive disorders	Acute abdomen, appendicitis, intestinal obstruction, cholecystitis–lithiasis, pancreatitis, hernia	540–543, 550–553, 574–577	K35–K38, K40–K46, K80–K83, K85–K86, K91.5	0	0	1
Digestive disorders	Chronic liver disease (excluding alcohol related disease)	571.4–571.9	K73, K74	0.7	0.1	0.2
Osteomyelitis and other osteopathies of bone	Skin, bone and joint infections	730	M86, M89–M90	0.2	0.5	0.3
Maternal and infant	Birth defect	237.70, 740–760	H31.1, P00, P04, Q00–Q99	0.1	0.2	0.7
Complication of pregnancy, labor or the puerperium,	Complications of pregnancy	630–632, 634–676	O01–O99	0.2	0.5	0.3
Maternal and infant	Complications of perinatal period	764–779	P03, P05–P95	0.3	0.2	0.5
Sudden Infant Death Syndrome	SIDS	798.0	R95	1	0	0
Unintentional injuries	Road traffic injuries, other transport injuries	E810–E819	V01–V04, V06, V09–V80, V87, V89, V99	0.6	0	0.4
Unintentional injuries	Accidental Poisonings	E850–E869	X40–X49	0.6	0	0.4
Unintentional injuries	Falls	E880–E886, E888	W00–W19	0.6	0	0.4
Unintentional injuries	Fires, burns	E890–E899	X00–X09	0.8	0	0.2
Unintentional injuries	Drownings (Swimming)	E910	W65–W74	0.8	0	0.2
Intentional injuries	Suicide and self inflicted injuries	E950–E959, E980–E989	X60–X84, Y87.0, Y10–Y34	0.6	0.3	0.1
Intentional injuries	Violence	E960–E969	X85–Y09, Y87.1	1	0	0
War		E990–E999	Y36	1	0	0
Iatrogenic conditions	Complications of treatment	E870–E879	Y60–Y84	0	0.2	0.8

Table 4 Ambulatory care sensitive conditions

Category	ICD-9-CM codes (NSW Health)	ICD-10-AM codes (NSW Health)	Further selection information
Vaccine-preventable			
Influenza and pneumonia	481, 482.2, 482.3, 482.9, 483, 487.0, 487.1, 487.8	J10, J11, J13, J14, J15.3, J15.4, J15.7, J15.9, J16.8, J18.1, J18.8	In any diagnosis field;exclude people under 2 months; ICD-9-CM: exclude cases with secondary diagnosis of 282.6; ICD-10-AM: exclude cases with secondary diagnosis of D57
Other vaccine preventable	032, 033.0, 033.1, 033.8, 033.9, 037, 045, 055, 056, 070.3, 072, 320.0	A35, A36, A37, A80, B05, B06, B16.1, B16.9, B18.0, B18.1, B26, G00.0, M01.4	In any diagnosis field
Chronic			
Diabetes complications	250.1–250.9	E10.0–E10.8, E11.0–E11.8, E12.0–E12.8, E13.0–E13.8, E14.0–E14.8	In any diagnosis field
Nutritional deficiencies	260, 261, 262, 268.0, 268.1	E40–E43, E55.0, E64.3	Principal diagnosis only
Iron deficiency anaemia	280.1, 280.8, 280.9	D50.1–D50.9	Principal diagnosis only
Hypertension	401.0, 401.9, 402.00,	I10, I11.9 402.10, 402.90	Principal diagnosis only; ICD-9-CM: exclude cases with procedure code of 35, 36, 37.5, 37.6, 37.7, 37.8; ICD-10-AM: exclude cases with procedures in blocks 600–693, 705–707, 717 and procedure codes 38721–00, 38721–01, 90226–00
Congestive heart failure	402.01, 402.11, 402.91, 428, 518.4	I11.0, I50, J81	Principal diagnosis only;ICD-9-CM: exclude cases with procedure code of 35, 36, 37.5, 37.6, 37.7, 37.8;ICD-10-AM: exclude cases with procedures in blocks 600–693, 705–707, 717 and procedure codes 38721–00, 38721–01, 90226–00
Angina	411.1, 411.8, 413	I20, I24.0, I24.8, I24.9	Principal diagnosis only;ICD-9-CM: exclude cases with procedure codes 01 to 86.99;ICD-10-AM: exclude cases with procedure codes in blocks 1–1779
Chronic obstructive pulmonary disease	491, 492, 494, 496, (466.0)	J41–J44, J47, (J20)	Principal diagnosis only;ICD-9-CM: 466.0 only with second diagnosis of 491, 492, 494, 496; ICD-10-AM: J20 only with second diagnosis of J41, J42, J43, J44, J47
Asthma	493	J45, J46	Principal diagnosis only
Acute			
Dehydration and gastroenteritis	276.5, 558.9	E86, K52.2, K52.8, K52.9	Principal diagnosis only
Convulsions and epilepsy	345, 642.6, 780.3	G40, G41, O15, R56	Principal diagnosis only
Ear, nose and throat infections	382, 462, 463, 465, 472.1	H66, H67, J02, J03, J06, J31.2	Principal diagnosis only
Dental conditions	521, 522, 523, 525, 528	A69.0, K02–K06, K08, K09.8, K09.9, K12, K13	Principal diagnosis only
Perforated–bleeding ulcer	531.0–531.2, 531.4–531.6, 532.0–532.2, 532.4–532.6, 533.0–533.2, 533.4–533.6, 534.0–534.2, 534.4–534.6	K25.0–K25.2, K25.4–K25.6, K26.0–K26.2, K26.4–K26.6, K27.0–K27.2, K27.4–K27.6, K28.0–K28.2, K28.4–K28.6	Principal diagnosis only
Ruptured appendix	540	K35.0	In any diagnosis field
Pyelonephritis	590.0, 590.1, 590.8	N10, N11, N12, N13.6	Principal diagnosis only
Pelvic inflammatory disease	614	N70.0, N70.1, N70.9, N73, N74.0–N74.1, N74.2–N74.8	Principal diagnosis only
Cellulitis	681, 682, 683, 686	L03, L04, L08.0, L08.8, L08.9, L88, L98.0, L98.3 (not for CHO2004 however)	Principal diagnosis only;ICD-9-CM: exclude cases with procedure codes 01 to 86.99 except 86.0 where it is the only listed procedure;ICD-10-AM: exclude cases when any procedure performed from blocks 1–1779 except when the following procedures done as the only ones: blocks: 1604–1606, 1608 and procedures: 90660–00, 30207–00, 30676–00, 30679–00, 34530–01 and 47912–00
Gangrene	785.4	R02	In any diagnosis field

Glossary

Admission	The formal process, using registration procedures, under which a person is accepted by a hospital or an area or district health service facility as an inpatient.
Aetiologic fraction	A measure of the amount of disease associated with an exposure within a population. In a situation in which exposure to a given factor is believed to be a cause of a given disease, the population attributable fraction (or population aetiologic fraction) is the proportion of the disease in the total population that can be attributed to exposure to the factor.
Age-adjusted rate	Rate adjusted to take account of differences in age composition when rates for different populations are compared.
Age-specific rate	Rate for a specified age group. Both numerator and denominator refer to the same age group.
Ambulance attendance	A response by the ambulance staff to a particular request for provision of care. Attendances are classified in several categories such as: cardiac, medical, surgical, trauma, and routine attendance. Ambulance services mean services relating to the work of rendering first aid to, and the transport of, sick and injured persons.
Contact	A person who has been in association with an infected person or a contaminated environment that may provide an opportunity to acquire the infection.
Confidence interval	The computed interval with a given probability (for example, 95%) that the true value of a variable such as a rate, mean or proportion, is contained within the interval.
Crude death rate	An estimate of the proportion of a population that dies in a specified period. It is calculated by dividing the number of deaths in a specified period by the number at risk during that period (typically per year).
Day-only admission	A person who is admitted to hospital and leaves on the same calendar day.
Employed persons	All civilians aged 15 years and over who worked for pay or profit or worked without pay in a family business or farm.
Fertility rate	Number of live births in an area during a year divided by the mid-year female population aged 15-44 in the same area in the same year.
Fetal death	Delivery of a child who did not, at any time after delivery, breathe or show any other evidence of life, such as a heartbeat.
Hospital separation	See SEPARATION
Illicit drugs	The following drugs used for non-medicinal purposes: speed, cocaine, sleeping pills or tranquilisers, marijuana, analgesics, heroin, petrol sniffing, other inhalants, hallucinogens, designer drugs, and injecting of any illegal drug.
Incidence	The rate at which new cases of a disorder occur in the population: that is, the number of new cases in a specified period, divided by the population at risk of the disorder in that period.
Infant death	The death of a child before its first birthday.
Labour force	All persons aged 15 years and over who are employed and unemployed.
Participation rate	The labour force expressed as a percentage of the civilian population aged 15 years and over.
Life expectancy	The average number of years of life remaining to a person at a particular age.

Live birth	The birth of a child who after delivery, breathes or shows any other evidence of life, such as heartbeat. For calculation of perinatal death rates, includes only infants weighing at least 400 grams at birth or, where birthweight is unknown, of at least 20 weeks gestation.
Neonatal death	Death within 28 days of birth of any child who after delivery, breathed or showed any other evidence of life, such as a heartbeat.
Notification	Certification in an approved form of a disease listed in the Schedule 3 of Notifiable Diseases of the *NSW Public Health Act 1991*. In this report, notifications concern cases of communicable diseases reported by general practitioners, hospitals and pathology laboratories to the Director-General of the NSW Department of Health.
Patient presentation at emergency department	Occurs following the arrival of the patient at the emergency department and is the earliest occasion of the patient being registered clerically or triaged. The patient may be subsequently provided with a service by a treating medical officer or nurse, and a provisional diagnosis is recorded. A 'presentation' is equal to a 'visit' or an 'attendance' at the emergency department.
Perinatal death	A fetal or neonatal death.
Prevalence	The number of people with a disease at a given time (point prevalence) or in a specified period (period prevalence), divided by the number of people at risk from that disease.
Principal diagnosis	The first ICD-9 or ICD-10 coding variable reported on the hospital separation form. It means the final diagnosis that best accounts for inpatient care.
Rate ratio	The ratio of 2 rates: for example, the rate of disease in one population group divided by the rate in another population group.
Scheduled medical condition	Medical conditions to be notified under the provisions of the *NSW Public Health Act 1991*.
Separation	The formal process whereby an inpatient leaves a hospital or other area health service facility after completing an episode of care. For example, a discharge to home, discharge to another hospital or nursing home, or death.
Standardised rate	see AGE-ADJUSTED RATE
Unemployed	Persons aged 15 years and over who were not employed and who were actively seeking work, or waiting to be called back to a job from which they had been stood down.
Unemployment rate	The number of unemployed expressed as a percentage of the labour force (that is, employed and unemployed).

NSW local government areas by health area

Sydney South West Area Health Service			
Ashfield	Campbelltown	Leichhardt	Sydney (part)
Bankstown	Canterbury	Liverpool	Wingecarribee
Burwood	Canada Bay	Marrickville	Wollondilly
Camden	Fairfield	Strathfield	
South Eastern Sydney & Illawarra Area Health Service			
Botany Bay	Randwick	Shoalhaven	Waverley
Hurstville	Rockdale	Sutherland	Wollongong
Kiama	Shellharbour	Sydney (part)	Woollahra
Kogarah			
Sydney West Area Health Service			
Auburn	Blue Mountains	Holroyd	Parramatta
Baulkham Hills	Hawkesbury	Lithgow	Penrith
Blacktown			
Northern Sydney & Central Coast Area Health Service			
Gosford	Lane Cove	North Sydney	Warringah
Hornsby	Manly	Pittwater	Willoughby
Hunters Hill	Mosman	Ryde	Wyong
Ku-ring-gai			
Hunter & New England Area Health Service			
Armidale Dumaresq	Guyra	Muswellbrook	Tamworth Regional
Cessnock	Gwydir	Narrabri	Greater Taree
Dungog	Inverell	Newcastle	Tenterfield
Glen Innes	Lake Macquarie	Port Stephens	Upper Hunter
Gloucester	Liverpool Plains	Scone	Uralla
Great Lakes	Maitland	Severn	Walcha
Gunnedah	Moree Plains	Singleton	
North Coast Area Health Service			
Ballina	Clarence Valley	Kempsey	Nambucca
Bellingen	Coffs Harbour	Kyogle	Richmond Valley
Byron	Hastings	Lismore	Tweed
Greater Southern Area Health Service			
Albury	Cootamundra	Harden	Temora
Bega Valley	Corowa	Hay	Tumbarumba
Berrigan	Deniliquin	Jerilderie	Tumut
Bland	Eastern Capital City	Junee	Upper Lachlan
Bombala	Eurobodalla	Leeton	Urana
Boorowa	Greater Argyle	Lockhart	Wagga Wagga
Carrathool	Greater Hume	Mulwaree	Wakool
Conargo	Greater Queanbeyan	Murrumbidgee	
Coolamon	Griffith	Narrandera	
Cooma–Monaro	Gundagai	Snowy River	
Greater Western Area Health Service			
Balranald	Central Darling	Lachlan	Warren
Bathurst Regional	Cobar	Mid-Western Regional	Warrumbungle
Blayney	Coolah	Narromine	Weddin
Bogan	Coonamble	Oberon	Wellington
Bourke	Cowra	Orange	Wentworth
Brewarrina	Dubbo	Parkes	
Broken Hill	Forbes	Unincorporated Far West	
Cabonne	Gilgandra	Walgett	

NSW local government areas by ARIA+ score

LGA	% of population in ARIA+ category				
	Metropolitan	Inner-regional	Outer-regional	Remote	Very remote
Ashfield	100.00	.	.	.	.
Auburn	100.00	.	.	.	.
Bankstown	100.00	.	.	.	.
Blacktown	100.00	.	.	.	.
Botany Bay	100.00	.	.	.	.
Burwood	100.00	.	.	.	.
Canterbury	100.00	.	.	.	.
Concord	100.00	.	.	.	.
Drummoyne	100.00	.	.	.	.
Fairfield	100.00	.	.	.	.
Holroyd	100.00	.	.	.	.
Hunters Hill	100.00	.	.	.	.
Hurstville	100.00	.	.	.	.
Kogarah	100.00	.	.	.	.
Ku-ring-gai	100.00	.	.	.	.
Lane Cove	100.00	.	.	.	.
Leichhardt	100.00	.	.	.	.
Manly	100.00	.	.	.	.
Marrickville	100.00	.	.	.	.
Mosman	100.00	.	.	.	.
Newcastle	100.00	.	.	.	.
North Sydney	100.00	.	.	.	.
Parramatta	100.00	.	.	.	.
Queanbeyan	100.00	.	.	.	.
Randwick	100.00	.	.	.	.
Rockdale	100.00	.	.	.	.
Ryde	100.00	.	.	.	.
South Sydney	100.00	.	.	.	.
Strathfield	100.00	.	.	.	.
Sydney	100.00	.	.	.	.
Warringah	100.00	.	.	.	.
Waverley	100.00	.	.	.	.
Willoughby	100.00	.	.	.	.
Woollahra	100.00	.	.	.	.
Campbelltown	99.80	0.20	.	.	.
Pittwater	99.35	0.65	.	.	.
Shellharbour	98.58	1.42	.	.	.
Sutherland Shire	98.48	1.52	.	.	.
Liverpool	96.63	3.37	.	.	.
Wollongong	95.94	4.06	.	.	.
Hornsby	95.86	4.14	.	.	.
Camden	95.65	4.35	.	.	.
Penrith	95.61	4.39	.	.	.
Gosford	94.82	5.18	.	.	.
Maitland	94.67	5.33	.	.	.
Baulkham Hills	92.42	7.58	.	.	.
Lake Macquarie	90.28	9.72	.	.	.
Wyong	88.88	11.12	.	.	.
Blue Mountains	67.17	32.83	.	.	.
Tweed	65.45	34.55	.	.	.
Hawkesbury	56.21	42.71	1.08	.	.
Cessnock	30.33	69.22	0.45	.	.
Port Stephens	24.36	75.64	.	.	.
Yarrowlumla	10.12	89.88	.	.	.
Wollondilly	0.84	99.16	.	.	.
Albury	.	100.00	.	.	.
Ballina	.	100.00	.	.	.
Bathurst	.	100.00	.	.	.
Byron	.	100.00	.	.	.
Deniliquin	.	100.00	.	.	.
Goulburn	.	100.00	.	.	.
Grafton	.	100.00	.	.	.
Hume	.	100.00	.	.	.
Kiama	.	100.00	.	.	.
Lismore	.	100.00	.	.	.
Orange	.	100.00	.	.	.

LGA	% of population in ARIA+ category				
	Metropolitan	Inner-regional	Outer-regional	Remote	Very remote
Junee	.	88.16	11.84	.	.
Harden	.	87.74	12.26	.	.
Culcairn	.	87.45	12.55	.	.
Blayney	.	87.31	12.69	.	.
Evans	.	83.72	16.28	.	.
Cooma–Monaro	.	82.77	17.23	..	
Cowra	.	80.37	19.63	.	.
Parry	.	78.90	21.10	.	.
Young	.	76.38	23.62	.	.
Scone	.	72.90	27.10	.	.
Kyogle	.	71.26	28.74	.	.
Crookwell	.	68.43	31.57	.	.
Murray	.	68.04	31.96	.	.
Eurobodalla	.	65.67	34.33	.	.
Holbrook	.	64.70	35.30	.	.
Gundagai	.	63.02	36.98	.	.
Boorowa	.	58.47	41.53	.	.
Cabonne	.	57.21	42.79	.	.
Gloucester	.	52.66	47.34	.	.
Mudgee	.	51.16	48.84	.	.
Coolamon	.	50.04	49.96	.	.
Kempsey	.	43.82	56.18	.	.
Berrigan	.	42.02	57.98	.	.
Copmanhurst	.	41.69	58.31	.	.
Uralla	.	40.18	59.82	.	.
Rylstone	.	39.85	60.15	.	.
Lockhart	.	25.67	74.33	.	.
Maclean	.	20.13	79.87	.	.
Pristine Waters	.	17.13	82.87	.	.
Snowy River	.	8.38	91.62	.	.
Tallaganda	.	5.92	94.08	.	.
Barraba	.	.	100.00	.	.
Bellingen	.	.	100.00	.	.
Bingara	.	.	100.00	.	.
Bombala	.	.	100.00	.	.
Broken Hill	.	.	100.00	.	.
Conargo	.	.	100.00	.	.
Coolah	.	.	100.00	.	.
Forbes	.	.	100.00	.	.
Glen Innes	.	.	100.00	.	.
Griffith	.	.	100.00	.	.
Gunnedah	.	.	100.00	.	.
Guyra	.	.	100.00	.	.
Jerilderie	.	.	100.00	.	.
Leeton	.	.	100.00	.	.
Manilla	.	.	100.00	.	.
Merriwa	.	.	100.00	.	.
Murrurundi	.	.	100.00	.	.
Nambucca	.	.	100.00	.	.
Narrandera	.	.	100.00	.	.
Narromine	.	.	100.00	.	.
Nundle	.	.	100.00	.	.
Quirindi	.	.	100.00	.	.
Severn	.	.	100.00	.	.
Temora	.	.	100.00	.	.
Tenterfield	.	.	100.00	.	.
Tumbarumba	.	.	100.00	.	.
Urana	.	.	100.00	.	.
Wakool	.	.	100.00	.	.
Walcha	.	.	100.00	.	.
Weddin	.	.	100.00	.	.
Wellington	.	.	100.00	.	.
Windouran	.	.	100.00	.	.
Bega Valley	.	.	98.38	1.62	.
Parkes	.	.	98.38	1.62	.
Gilgandra	.	.	96.88	3.12	.

NSW local government areas by ARIA+ score

LGA	% of population in ARIA+ category					LGA	% of population in ARIA+ category				
	Metropolitan	Inner-regional	Outer-regional	Remote	Very remote		Metropolitan	Inner-regional	Outer-regional	Remote	Very remote
Tamworth	.	100.00	.	.	.	Inverell	.	.	96.66	3.34	.
Wingecarribee	.	100.00	.	.	.	Murrumbidgee	.	.	96.39	3.61	.
Greater Lithgow	.	99.22	0.78	.	.	Yallaroi	.	.	95.33	4.67	.
Singleton	.	98.90	1.10	.	.	Bland	.	.	94.30	5.70	.
Shoalhaven	.	98.83	1.17	.	.	Wentworth	.	.	91.14	8.86	.
Richmond Valley	.	98.33	1.67	.	.	Narrabri	.	.	90.90	9.10	.
Wagga Wagga	.	97.86	2.14	.	.	Balranald	.	.	83.86	16.14	.
Gunning	.	96.36	3.64	.	.	Coonabarabran	.	.	81.97	18.03	.
Muswellbrook	.	95.85	4.15	.	.	Moree Plains	.	.	81.82	18.18	.
Coffs Harbour	.	95.85	4.15	.	.	Hay	.	.	78.88	21.12	.
Corowa	.	95.52	4.48	.	.	Warren	.	.	70.24	29.76	.
Dungog	.	95.52	4.48	.	.	Lachlan	.	.	51.95	48.05	.
Cootamundra	.	94.53	5.47	.	.	Carrathool	.	.	33.16	66.84	.
Hastings	.	94.09	5.91	.	.	Unincorporated NSW.		.	15.85	18.92	65.23
Mulwaree	.	92.98	7.02	.	.	Bogan	.	.	.	100.00	.
Armidale Dumaresq	.	91.98	8.02	.	.	Coonamble	.	.	.	100.00	.
Yass	.	91.91	8.09	.	.	Walgett	.	.	.	95.26	4.74
Tumut	.	90.80	9.20	.	.	Cobar	.	.	.	91.01	8.99
Greater Taree	.	90.22	9.78	.	.	Brewarrina	.	.	.	58.30	41.70
Oberon	.	89.46	10.54	.	.	Central Darling	.	.	.	32.01	67.99
Dubbo	.	88.72	11.28	.	.	Bourke	.	.	.	.	100.00
Great Lakes	.	88.36	11.64	.	.						

INDEX

A

B

C

D

E

F

G

H

O

P

Q

R

S

T

U

V

W

Y