The health of the people of New South Wales

Report of the Chief Health Officer, 2002

NSW HEALTH
Working as a Team

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Contents

Foreword

This is the fourth edition of the report *Health of the people of New South Wales—Report of the Chief Health Officer*. The Chief Health Officer is responsible for the public health activities of the NSW Department of Health. These are the activities that focus on health at a population level. They aim to protect and promote health and to prevent injury, illness and disability.

The Department's vision for public health is 'Better health for all people in New South Wales through effective public health action to maintain, protect and promote health'. Monitoring to identify and act on differences in health, and in exposure to health risks, is key to achieving this vision.

The Chief Health Officer's Report is a product of the population health monitoring infrastructure that has been established in NSW over the last 10 years or so. This includes a population health datamart (the Health Outcomes Information and Statistical Toolkit, or HOIST), the NSW Health Survey Program, the *NSW Public Health Bulletin*, and training programs to build workforce capacity in this area.

The HOIST datamart provides a set of standardised datasets for monitoring population health. It includes the key datasets for hospital admissions, emergency department visits, deaths, health risk factors and communicable diseases. Public health practitioners from across the NSW health system access health data through HOIST. Most of the information in this report was produced using HOIST.

The NSW Health Survey Program is the only source of routinely collected data that provides representative information on the whole population of NSW, whether or not it has used health services. The program has been operating since 1997, and has been collecting data on a continuous basis since the beginning of 2002. This report includes many indicators based on data from the NSW Health Survey Program, including information about older people, children, Aboriginal and Torres Strait Islander people, and people living in rural and remote areas.

The NSW Public Health Officer Training Program is a 3-year vocational training program leading to the award of Graduate Diploma in Applied Epidemiology, which has been operating since 1990. A new 3-year training program, the NSW Biostatistical Officer Training Program, commenced in 2001. Current trainees from both training programs made a major contribution to this report, and graduates will boost the skilled workforce for monitoring health into the future.

The Chief Health Officer's Report is a timely and flexible vehicle for presenting health information to a wide range of potential users, and for highlighting new issues or different ways of looking at old issues. For this edition, particular efforts have been made to emphasise the strategic issue of health inequalities, with a focus on changes in socioeconomic inequalities in health over time, and health inequalities associated with living in rural or remote areas.

The Chief Health Officer's Report is again accompanied by an interactive Web version. Over time, new, more detailed or updated content will be added to the Web version to ensure that readers always have access to the most current information in the interval between hard copy editions.

I would like to thank the staff of the Centre for Epidemiology and Research for the excellent job they have done in putting the report together, and to acknowledge also the contributions made by numerous colleagues from within and outside NSW Health. The involvement of content experts in the development of the report is critical to ensuring that its content is relevant and accurate. Feedback from readers has also greatly assisted us in improving the report's content and presentation. I welcome your comments on this fourth edition.

Dr Gregory Stewart
Deputy Director-General Public Health and Chief Health Officer
September, 2002

About this report

This report is the fourth in a series that began in 1996. It provides an overview of the health of the people of NSW, 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 200 population health indicators. Many of these have been retained and updated from the 2000 Report. Other indicators from 2000 have been dropped, to allow the addition of new content on emerging priorities, while keeping the size of the report manageable.

The latest available data are presented wherever possible, including some preliminary data from the 2001 Census of Population and Housing, some previously unpublished data from the 2001 NSW Child Health Survey, and deaths data from 2000. Errors found in this printed version will be fixed in the electronic version, and errata will be listed at the Web site www.health.nsw.gov.au/public-health/chorep.

Content

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

Section One, 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, unemployment, social welfare benefits, school retention and crime rates. The chapter on the environment updates indicators of air and water quality and includes data on mosquito-borne infections. The health-related behaviours chapter presents previously unpublished data from the 2001 NSW Child Health Survey, and includes new information on smoking, alcohol and cannabis use in secondary school students.

Section Two, Burden of disease: presents information about the major causes of disease burden currently in NSW based on national estimates of disability-adjusted life years applied to the NSW population, life expectancy, death rates, causes of death and causes of hospitalisation.

Section Three, Health inequalities: examines differentials in health among population groups. This includes chapters examining inequalities among Aboriginal and Torres Strait Islander people living in rural and urban areas, overseas-born people, rural and remote populations and trends in the burden of mortality by socioeconomic group. This Section also includes a new chapter on prisoner health in NSW.

Section Four, Health priority areas: presents recent information on key health issues including cardiovascular diseases, diabetes mellitus, cancer, injury and poisoning, mental health, oral health, and communicable diseases. New chapters are presented on respiratory disease and pregnancy and the newborn period.

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 chapter.

Web (HTML) 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. Some of the data tables are not included in this report, but are available from the Web version. Further, many data tables in this report are provided in a more detailed form in the Web version. 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 fourth edition of the *Health of the people of New South Wales—Report of the Chief Health Officer* was a team effort. This effort involved most people within the Centre for Epidemiology and Research in the indicator definition, data cleaning, data analysis and presentation, and text writing for the report. It also involved many other people from within the Department, particularly the Public Health Division, as well as other organisations. The following list indicates the broad roles played by the many contributors to this report.

FROM THE CENTRE FOR EPIDEMIOLOGY AND RESEARCH

Project management:

Helen Moore and Jill Kaldor.

Editors:

Helen Moore, Michael Giffin, and Louisa Jorm.

Programming infrastructure:

Jill Kaldor.

Data analysis and/or biostatistical advice:

Jill Kaldor, Hanna Noworytko, Alan Willmore, David Muscatello, Tim Churches, Kim Lim, Lee Taylor, Doug Lincoln, Sharyn Lymer, Andrew Hayen, Michael Ryan, Elayne Mitchell, and Clare Ringland.

Text:

Louisa Jorm, Helen Moore, Lee Taylor, Hanna Noworytko, Elayne Mitchell, David Muscatello, Tim Churches, Andrew Hayen, and Doug Lincoln.

Administrative support:

Leanne Erkes, Allana Sullivan, and Suri Rezaee.

FROM OTHER PARTS OF NSW HEALTH, AND OTHER ORGANISATIONS

Text and/or content advice:

Pam Albany, Janet Anderson, Margaret Banks, Adrian Bauman, Bill Bellew, Alan Betts, Jennnifer Blackwell, Philip Broad, Tony Butler, Paul Byleveld, Sue Campbell-Lloyd, Michael Collins, Stephen Corbett, Liz Develin, Adrian Ferrant, Mary Fien, Karen Fogarty, Jennifer Gray, Elizabeth Harris, Rod Higgins, Devon Indig, Michael Kakakios, Sandy Leask, Marcia Lively, Glenis Lloyd, Guy Marks, Darlene Mathen, Richard Matthews, Jeremy McAnulty, Peter McCarthy, Margaret McDonald, Rebecca Mitchell, Lis Murphy, Catriona O'Neill, Alan Patterson, Lina Persson, Kaye Power, Beverley Raphael, Geoff Richards, Gay Rixon, John Sanders, Margaret Scott, Neil Shaw, Vicky Sheppeard, Stephanie Short, Sarah Simpson, Shanti Sivaneswaran, Mitchell Smith, Gavin Stewart, Margaret Thomas, Alan Thornton, Daniel Stokes, Philip Vita and Karen Webb.

Cover design:

Amanda Holt.

Executive Summary

NSW population

There were 6,609,304 people counted in NSW on the 2001 Census night, excluding overseas visitors. This represents an increase of approximately 5.5% since 1996 and 11% since 1991. Approximately half the NSW population is aged 35 years or more. Females slightly outnumber males. The proportion of females increases with age, with women making up 56% of the population aged 65 years or more, and 65% of the population aged 80 years or more. Approximately 78% of the NSW population live in urban health areas, and 22% in rural health areas.

Social determinants

Since 1985, total average weekly earnings have almost doubled, from $356 to $690. Over the same period, the consumer price index (CPI) has also almost doubled. Female average earnings are around two-thirds those of males. Of those in the eligible age groups, just over 65% receive the age pension and around 8% receive disability or sickness benefits. The unemployment rate has declined steadily since 1994, and is currently just over 6% for both sexes. However, unemployment rates vary by area and age group. In rural areas, almost 1 in 5 young people aged 15–24 years is unemployed. The Year 12 retention rate has declined since 1994, and is currently just over 67%. NSW has one of the lowest school retention rates of any Australian state or territory.

The environment

In the last 10 years in Sydney, there have been fewer days each year on which levels of nitrogen dioxide in the air have exceeded those recommended. Levels of particulate air pollution have peaked at the time of bushfires.

Drinking water supplied by the Sydney and Hunter Water Corporations is of consistently good quality. The overall quality of rural water supplies is also high, but individual supplies may vary substantially. Less than half of Sydney beaches always comply with standards for levels of faecal contamination.

Along with sales of leaded petrol, the mean blood lead level of NSW children has dropped significantly. Blood lead levels among preschool children living in Broken Hill (formerly a major site for lead mining) have continued to decline steadily.

Arboviruses are transmitted to humans through the bite of mosquitoes. In 2001, the largest recorded epidemic (307 cases) of Barmah Forest virus occurred on the mid north coast. In the same year, Murray Valley Encephalitis virus was detected for the first time since 1974, among sentinel chickens in the west and northwest of the state.

Health-related behaviours

Smoking causes more than 6500 deaths and more than 50,000 hospitalisations each year in NSW. More than 1 in 4 men and 1 in 5 women are smokers. Adult smoking rates have declined among both sexes over the past decade, and just over half of smokers say that they intend to quit in the next 6 months. Just under 1 in 5 secondary school students are current smokers, representing a decline over the past 5 years. One in 10 NSW children live in households with smokers who sometimes smoke inside.

Along with the rest of Australia, NSW is facing an epidemic of obesity. At least half of men and one-third of women are overweight or obese, and only

two-thirds of men and less than two-thirds of women report adequate levels of physical activity. Only a minority of adults eat the recommended quantities of fruit and vegetables. Dietary patterns among children are also sub-optimal. Well under two-thirds of babies are breastfed at three months of age, and well under half are breastfed at 6 months of age. Most children eat recommended quantities of fruit, but only a minority eat adequate quantities of vegetables.

Harmful use of alcohol causes around 1500 deaths and more than 27,000 hospitalisations each year in NSW. Alcohol use among secondary school students has remained constant over the past 5 years, with about one-third of students reporting that they have recently consumed alcohol.

Use of illicit drugs causes more than 300 deaths (mostly from heroin overdose) and 6000 hospitalisations each year in NSW. Deaths from heroin overdose, and the number of ambulance attendances for overdose, declined in 2000. Cannabis use among secondary school students has also declined, with around one-quarter of students aged 12–16 years reporting that they have used cannabis at least once.

Burden of disease

Life expectancy in NSW continues to increase. Newborn males can expect to live for 77.2 years, while newborn females can expect to live for 82.6 years. Men who have reached age 65 years can expect to live to 82.3 years of age, while women who have reached age 65 can expect to live to 85.8 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 has almost halved in the last 20 years, but the male rate has remained about 1.6 to 1.7 times greater than the female rate.

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 of living with disability. In terms of DALYs, the major causes of disease burden in males are ischaemic heart disease, stroke, and lung cancer; the major causes in females are ischaemic heart disease, stroke, and dementia. Males suffer a relatively greater disease burden from suicide and self-harm, road traffic injuries, alcohol dependency and abuse, heroin dependency and abuse, HIV–AIDS, and cirrhosis of the liver; females suffer a relatively greater disease burden from breast cancer, generalised anxiety disorder, and age-related vision disorders.

Aboriginal and Torres Strait Islander peoples

Around 120,000 indigenous people live in NSW, making up just under 2% of the total population. Newborn indigenous males can expect to live 56 years, and newborn indigenous females can expect to live 64 years. This is about 20 years less than the life expectancy for the general population.

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 in ways that are a risk to health. Indigenous people have higher hospitalisation rates than non-indigenous people, for many health conditions. Also, indigenous people who live in rural areas have higher hospitalisation rates, for many conditions, than those who live in urban areas.

Country of birth

About one-third of NSW residents were born overseas and around one-quarter speak a language other than English at home. 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 (Fiji, Laos, and the Philippines); have high rates of hospitalisation for coronary heart disease (countries of Eastern Europe, the Middle East, Melanesia, Micronesia, and Polynesia); have low rates of two-yearly Pap smears (countries of Eastern Asia) and high rates of cervical cancer (countries of Eastern and South Eastern Asia, New Zealand, Melanesia, Polynesia, and Micronesia); and have high rates of tuberculosis (countries of South Eastern and South Asia).

Refugees suffer higher rates of health conditions including poor oral health and minor mental health disorders.

Rural and remote populations

Less than 1% of the NSW population lives in areas classified as 'remote' or 'very remote' according to the Accessibility–Remoteness Index of Australia (ARIA). Aboriginal people comprise almost half of the population of 'very remote' areas. Across Australia, people living in rural and remote areas generally have worse health than those living in metropolitan areas.

Compared with people who live in 'highly accessible' areas, people who live in 'remote' or 'very remote' areas can expect to live 6 years less (males) or 4 years less (females); are more likely to die from causes classified as 'avoidable'; and are more likely to be hospitalised for conditions for which hospitalisation can be avoided through prevention and early management.

Socioeconomic status

Rates of mortality, morbidity and health behaviours and risk factors in NSW vary according to socioeconomic group. Rates of premature death have declined among all socioeconomic groups over the past 20 years. 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. Conversely, the relative 'gap' between the lowest socioeconomic group and the middle two-thirds of the population appears to be narrowing.

Similar patterns are seen for deaths from conditions classified as 'avoidable' through primary, secondary, and tertiary interventions; all other deaths; and teenage pregnancies.

Prisoners

There are around 7800 prison inmates in NSW. Prisoner populations are mainly male and young, with a median age of around 30 years.

A history of drug use is common among prisoners, as is infection with hepatitis C virus. Health conditions which are relatively common among prisoners, compared with the general population, include: back problems, heart problems, asthma, poor eyesight, poor oral health, and mental illnesses.

Cardiovascular diseases

Coronary heart disease caused almost 9500 deaths in NSW in 2000, or around 26 deaths every day. It is the single largest cause of years of life lost due to premature death. In that year, stroke caused almost 5000 deaths, or about 14 deaths each day, and was the second largest cause of years of life lost due to premature death. Death rates from both coronary heart disease and stroke have more than halved since 1980. This is due to both decreased incidence,

associated with reductions in some risk factors, and 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, while stroke causes almost 18,000 hospitalisations each year in NSW. Approaching 6000 coronary artery bypass graft procedures and 6000 coronary angioplasty procedures are performed each year. 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.

Diabetes mellitus

Around 8% of males and 7% of females aged 25 years or more have diabetes, and up to half of these may be undiagnosed. Diabetes is the main cause of around 2% of all deaths, and is a contributing cause in around 8% of all deaths. Cardiovascular disease is the most common cause of death among people with diabetes.

Hospitalisations due to diabetes have declined over the past 10 years, both in terms of total hospitalisations, and persons hospitalised, per head of population. This may indicate improved management of diabetes in primary health care settings.

Cancer

Cancer is the second most common cause (after cardiovascular diseases) of disease burden in NSW, accounting for just under one-fifth of years of healthy life lost due to premature death, disease, and injury. In 2000, there were almost 24,000 new cases of cancer and just over 12,000 deaths from cancer. The incidence rate for all cancers has risen by almost 25% over the past 20 years.

Lung cancer is the most common cause of cancer death. Reflecting changing patterns of smoking, its incidence has declined by almost 20% in males in the last decade, but has increased by a similar percentage in females. Colorectal cancer is the most common cause of new cases of cancer and the second most common cause of cancer death. Among both sexes, death rates from this cancer have decreased in the last decade, and 5-year survival rates have increased. Melanoma is associated with sun exposure and is more common in coastal areas of NSW; both new cases and deaths from this cancer have increased in males, but not in females, in the past 10 years. New cases of prostate cancer increased dramatically between 1988 and 1994, but then dropped again. The big rise was probably due to increased detection of existing cases, through widespread blood testing of men for Prostate Specific Antigen. The incidence of breast cancer increased by almost 20% in the last 10 years, but mortality rates from this cancer fell by almost 25%. This reflects the success of the 2-yearly breast cancer screening program, targeted at women aged 50–69 years. The incidence of cervical cancer has been decreasing since the 1970s, as a result of the 2-yearly Pap test screening program for women aged 20–69 years.

Respiratory diseases

Asthma affects around 10% of NSW adults and around 15% of children aged 2–12 years. Asthma is responsible for around 180 deaths and 16,000 hospitalisations each year. In recent years, there have been indications that management of asthma is improving: rates of death and hospitalisation have declined, and 44% of children and 36% of adults with asthma report having a written asthma management plan.

Chronic obstructive pulmonary diseases (COPD), including chronic bronchitis and emphysema, are responsible for around 2000 deaths and 18,000 hospitalisations each year. Smoking is the main risk factor for COPD. In recent years, the male death rate from COPD has decreased steeply, while the female death rate has gradually increased. The rate of hospitalisations for COPD has increased in both sexes, but much more steeply in females.

Injury and poisoning

Injuries and poisoning cause around 2400 deaths and 123,000 hospitalisations each year in NSW. Injury and poisoning is the leading cause of death among people aged under 45 years. 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 are higher in rural areas than in urban areas.

In recent years, death rates have declined for motor vehicle crash injuries, drowning, and firearm-related deaths; hospitalisation rates have decreased for pedestrian injury, near-drowning, unintentional poisoning, and firearm-related injuries. However, hospitalisation rates have increased for injuries to pedal cyclists, injuries caused by interpersonal violence, and fall-related injuries. There are around 37,000 hospitalisations each year for fall-related injuries, and these cost the health system more than any other single injury cause. There are around 27,000 hospitalisations each year for work-related injuries and 8000 hospitalisations for sporting injuries.

Mental health

Psychological distress has a major effect on the ability of people to work, study, and manage their day-to-day activities. In NSW, as a result of psychological distress, around 7% of adults are totally unable to perform their usual activities for 1 or more days each month, and 26 million person-days of usual activities are lost each year.

Although more than 700 people in NSW died by suicide every year since 1991, suicide rates have been dropping since 1997. In 1999–00 there were around 8000 hospitalisations for attempted suicide. The rate of hospitalisation following a suicide attempt has increased each year over the last 10 years. This may reflect the operation of NSW Health protocols for the management of suicide risk.

Oral health

Overall, oral health in NSW is good by world standards. Among children, around one-third have evidence of tooth decay, half have a dental check-up each year, and fewer than 1 in 5 have a filling each year. Among adults, just over one-third have all of their natural teeth, just under 1 in 10 have no natural teeth, around one-third have a dental check-up each year, and around 1 in 5 have a filling each year.

Oral health is worse in rural 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, and have fewer preventive dental treatments.

Pregnancy and the newborn period

Around 87,000 births are registered each year in NSW. The birth rate in NSW is declining, and on average a woman can currently expect to give birth to 1.7 babies in her lifetime. The teenage pregnancy rate is gradually declining. Around 3% of teenagers fall pregnant each year.

Three-quarters of mothers take folate supplements prior to and/or in early pregnancy to prevent neural tube defects and just under two-thirds place their babies on their back to sleep from birth (the preferred position for prevention of sudden infant death syndrome or SIDS). Around 7% of babies are born prematurely, 6% are of low birthweight, and 2.5% are admitted to neonatal intensive care. The rate of perinatal deaths has declined by more than one-third in the last 10 years.

Communicable diseases

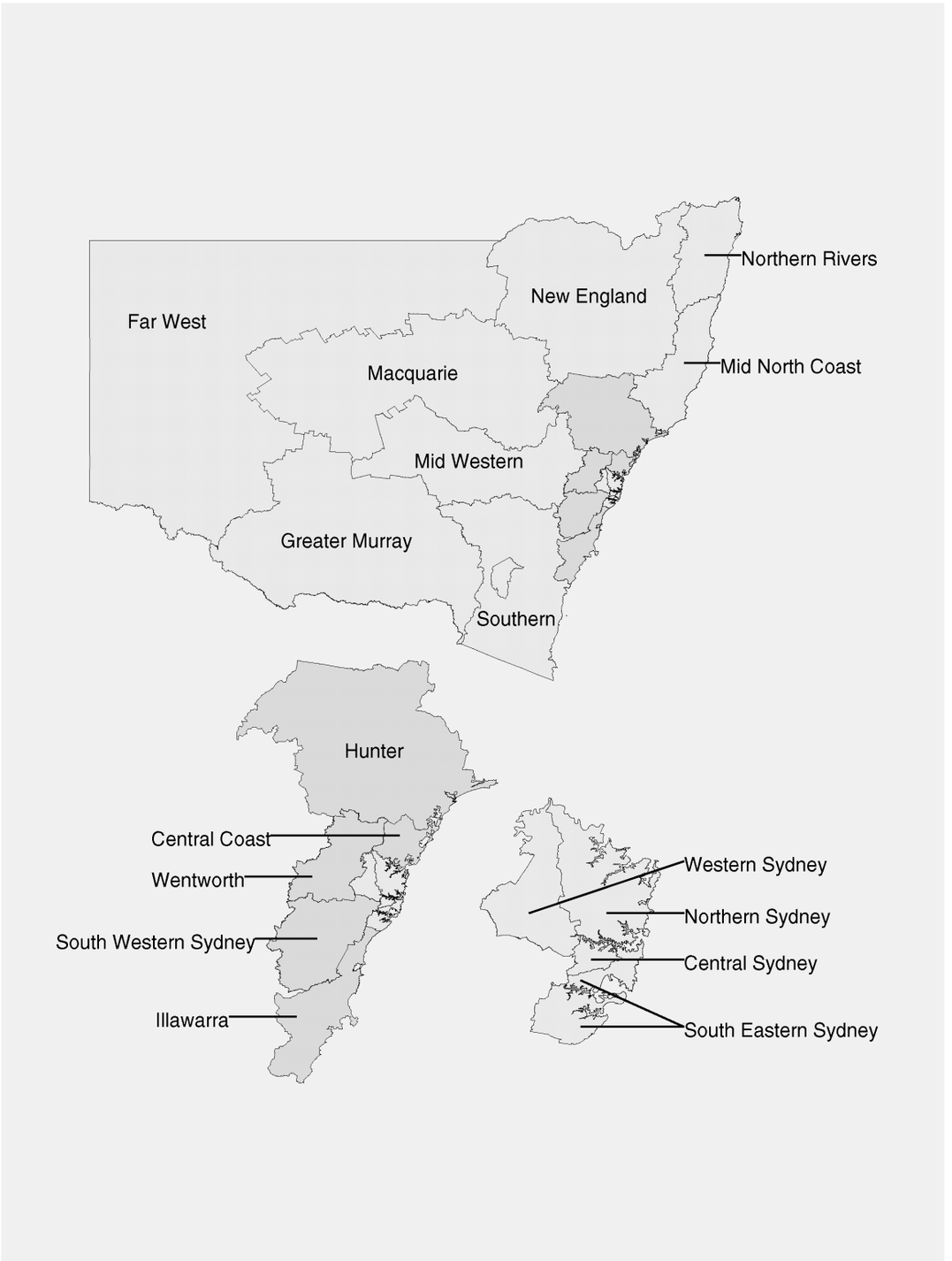
Immunisation rates in NSW have increased, with 90% of children aged 12 months and 86% of children aged 24 months being fully immunised in 2001. Only 30 cases of measles were recorded in 2001, continuing the historically low rates recorded since 1998. However, 4435 cases of pertussis (whooping cough) were recorded, continuing a major epidemic that began in 2000.

Hepatitis C remains the most commonly reported communicable disease, with 8072 cases notified in 2001, though some of these represent past infections that were only recently identified. Most new infections are acquired through sharing contaminated needles and syringes.

In 2000, 359 cases of HIV infection and 68 cases of AIDS were reported. Improvements in antiviral therapy for HIV infection have lead to a substantial decline in progression to AIDS since the mid-1990s. However, notifications of HIV infection appear to have levelled out in the last 2 years.

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 343.



List of abbreviations

ABS	Australian Bureau of Statistics
ACS	Ambulatory care sensitive conditions
AGPS	Australian Government Printing Service
AHS	NSW area health service or health area
AHR	Airway hyper-responsiveness
AIDS	Acquired Immunodeficiency Syndrome
AIHW	Australian Institute of Health and Welfare
ANZECC	Australian and New Zealand Environment Conservation Council
ARIA	Accessibility–Remoteness Index for Australia
ARMCANZ	Agricultural and Resource Management Council of Australia and New Zealand
BFV	Barmah Forest virus
BMI	Body mass index
BSP	Back-scattering coefficient for particles
CI	Confidence interval
DLWC	Department of Land and Water Conservation
DMFT	The number of deciduous (infant) or permanent (adult) teeth that are decayed, missing, or have been filled due to caries (that is, tooth decay)
DTP	Diphtheria–tetanus–pertussis combined vaccine (also called triple antigen vaccine)
EPA	Environment Protection Authority
ESRD	End-stage renal disease
F	Female
FEV1	Forced expiratory volume
HARP	Health and Air Research Program
HIV	Human immunodeficiency virus
HOIST	Health Outcomes Information and Statistical Toolkit (see Methods section)
HPS	NSW Health Promotion Survey 1994 (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 Disease, 10th revision
ICD-10-AM	International Classificaiton of Diseases, 10th revision, Australian Modification
IDDM	Insulin-dependent diabetes mellitus
IRSD	Index of Relative Socioeconomic Disadvantage (see Methods section)
ISC	NSW Inpatient Statistics Collection (see Methods section)
LGA	Local government area
LL 95% CI	Lower limit of 95% confidence interval for rate
M	Male

mg/L	milligrams per litre
MVE	Murray Valley Encephalitis
MMR	Measles–mumps–rubella combined vaccine
NAC	National Asthma Campaign
NATSEM	National Centre for Social and Economic Modelling
NDD	NSW Notifiable Diseases Database (see Methods section)
NEPC	National Environment Protection Council
NHMRC	National Health and Medical Research Council
NHS	Australian Bureau of Statistics National Health Survey (see Methods section)
NIDDM	Non-insulin-dependent diabetes mellitus
No.	Number
NO_2	Nitrogen dioxide
NSW	New South Wales
NSWHS	NSW Health Surveys 1997 and 1998
PAM	Primary Avoidable Mortality
PCP	Pentachlorophenol
PM10	Particulate matter <10 microns in diameter
PM2.5	Particulate matter <2.5 microns in diameter
ppm	parts per million
RRV	Ross River virus
SAM	Secondary Avoidable Mortality
SCA	Sydney Catchment Authority
SEIFA	Australian Bureau of Statistics Socioeconomic Indices for Areas
SES	Socioeconomic status
SLA	Statistical local area
SPCC	State Pollution Control Commission
SIDS	Sudden Infant Death Syndrome
TAM	Tertiary Avoidable Mortality
UL 95% CI	Upper limit of 95% confidence interval for rate

1 Determinants of health

Section 1

Chapter 1.1

NSW population

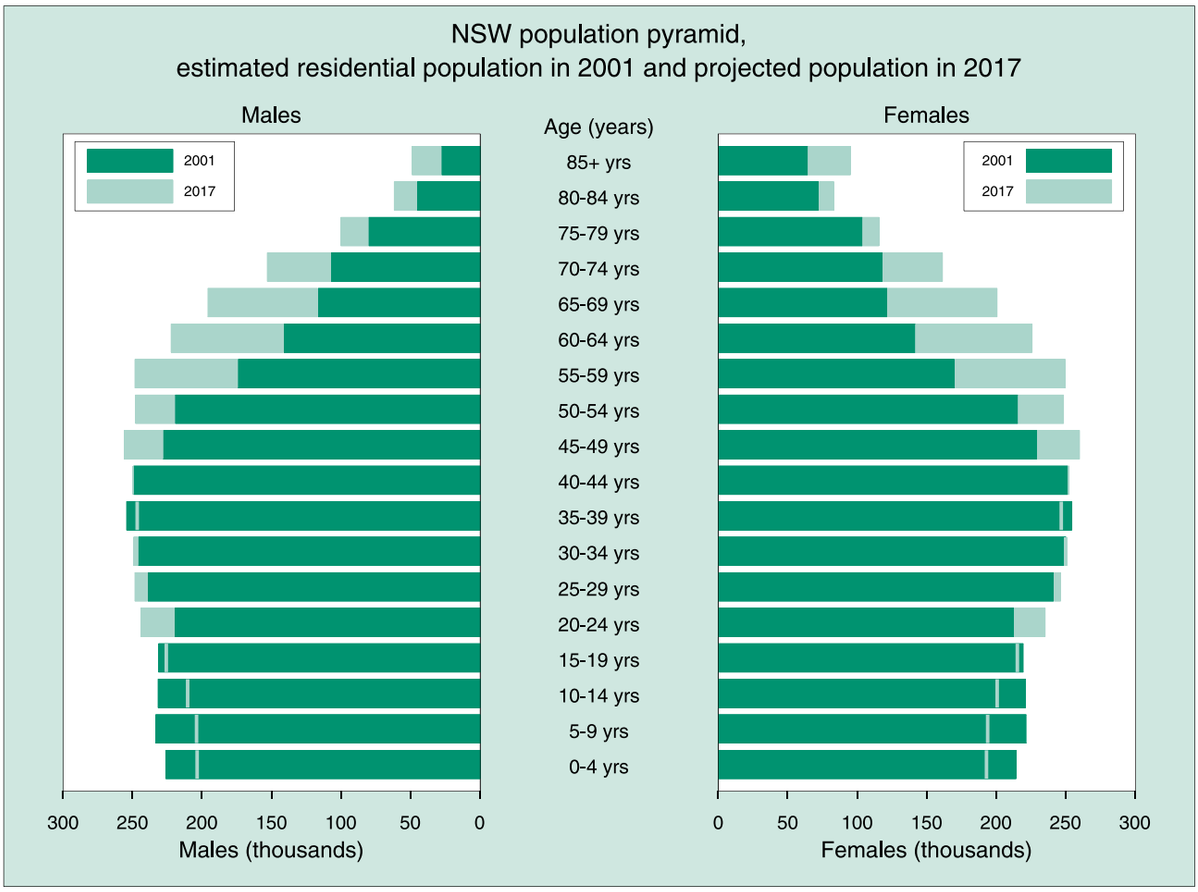
- There were 6,609,304 people counted in NSW on the 2001 Census night, excluding overseas visitors. This represents an increase of approximately 5.5% since 1996 and 11% since 1991.
- By 2017, it is estimated that the population of NSW will be approximately 7,300,000, a 16% increase on the 2001 population.
- In 2001, half the NSW population was aged 35 years or more (the median age was 35 years for males and 36 years for females).
- In 2001, the female population slightly outnumbered the male population. Due to lower death rates in women, the proportion of females in the population increases with age, with women making up 56% of the NSW population age 65 years or more, and 65% of the population aged 80 years or more.
- In 2001, approximately 78% of the NSW population lived in urban health areas, and 22% lived in rural health 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 at the time of the 2001 Census, and gives population projections for NSW to 2017.

Indigenous status and country of birth are also important demographic determinants of health. More information on these population groups can be found in Chapters 3.1 and 3.2 respectively.



Note: Where a bar does not have a segment for 2017, the number of people in that category is predicted to decrease by 2017. The predicted number is shown as a lighter coloured line on the overlying 2001 bar.

Source: ABS, 2001 Census counts (excluding overseas vistors) and mid-series experimental population projections (unpublished).

- The population pyramid above shows the age and sex distribution of people who were present in NSW on the 2001 Census night (excluding overseas visitors), and the projected distribution of the population in 2017. Detailed tables of estimated residential populations for each health area in NSW are available in the online version of this report accessible at the Web location shown below.
- Excluding overseas visitors, there were 6,609,304 people counted in NSW on the 2001 Census night. This represents an increase of approximately 5.5% since 1996 and 11% since 1991. By 2017, it is estimated that the population of NSW will be approximately 7,300,000, a 10% increase on the 2001 population.
- In 2001, approximately half the NSW population was aged 35 years or more (the median age, 35 years for males; 36 years for females). In 1996, the median age was 34 years (33 years for males and 35 years for females); while in 1991 it was 32 years (32 years for males and 33 years for females).
- In 2001, the female population slightly outnumbered the male population. Due to lower death rates in women, the proportion of females in the population increases with age, with women making up 56% of the NSW population age 65 years or more, and 65% of the population aged 80 years or more.
- In 2001, of people age 15 years or more, 52% were married, 3.3% were separated, 7.2% were divorced, 6.5% were widowed (64,065 males and 258,594 females) and 31% had never been married.
- In 2001, approximately 78% of the NSW population lived in urban health areas, and 22% lived in rural health areas.

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

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.
- Since 1985, total average weekly earnings have almost doubled, from $356 to $690. Over the same period, the consumer price index (CPI) has also almost doubled. Female average earnings are around two-thirds those of males.
- The proportion of the population receiving income support varies widely among areas. Overall, of those in the eligible age groups:
  - —just over 65% receive the age pension;
  - —around 8% receive disability or sickness benefits;
  - —just over 7% receive unemployment benefits;
  - —just over 30% of families receive family assistance benefits.
- The unemployment rate has declined steadily since 1994, and is currently just over 6% for both sexes. However, unemployment rates vary by area and age group. Around 17% of young people aged 15–24 years in rural areas are unemployed.
- The Year 12 retention rate has declined since 1994, and is currently just over 67%. NSW has one of the lowest school retention rates of any Australian state or territory.
- Almost 70,000 assaults and 500,000 thefts and robberies are recorded each year. Rural areas have higher rates of assault, but lower rates of thefts and robberies, than urban areas.
- Rural areas are more socioeconomically disadvantaged than urban 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

- Average total weekly earnings
- Age pension, disability, and sickness benefits
- Unemployment and family assistance benefits
- Unemployment rate
- Unemployment rate by region and age
- Year 12 retention rate
- Crime rates
- Socioeconomic indexes

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: Evans et al., 1994; Marmot and Wilkinson, 1999; Turrell and Mathers, 2000). These inequalities are important 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 a Health and Equity Statement (NSW Department of Health, unpublished). 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 it provides guidance on how to build these partnerships.

This chapter presents population-based data on social and economic factors that are associated with health. Some indicators from the 2000 edition of this report, which used data from the 1996 Census, are not repeated here. These indicators will be updated in the electronic version of this report (www.health.nsw.gov.au/public-health/chorep). Trends in a range of health indicators according to a summary measure of socioeconomic status (the Australian Bureau of Statistics Index of Relative Socioeconomic Disadvantage) are explored in Chapter 3.4.

For more information:

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

Australian Bureau of Statistics Web site at www.abs.gov.au.

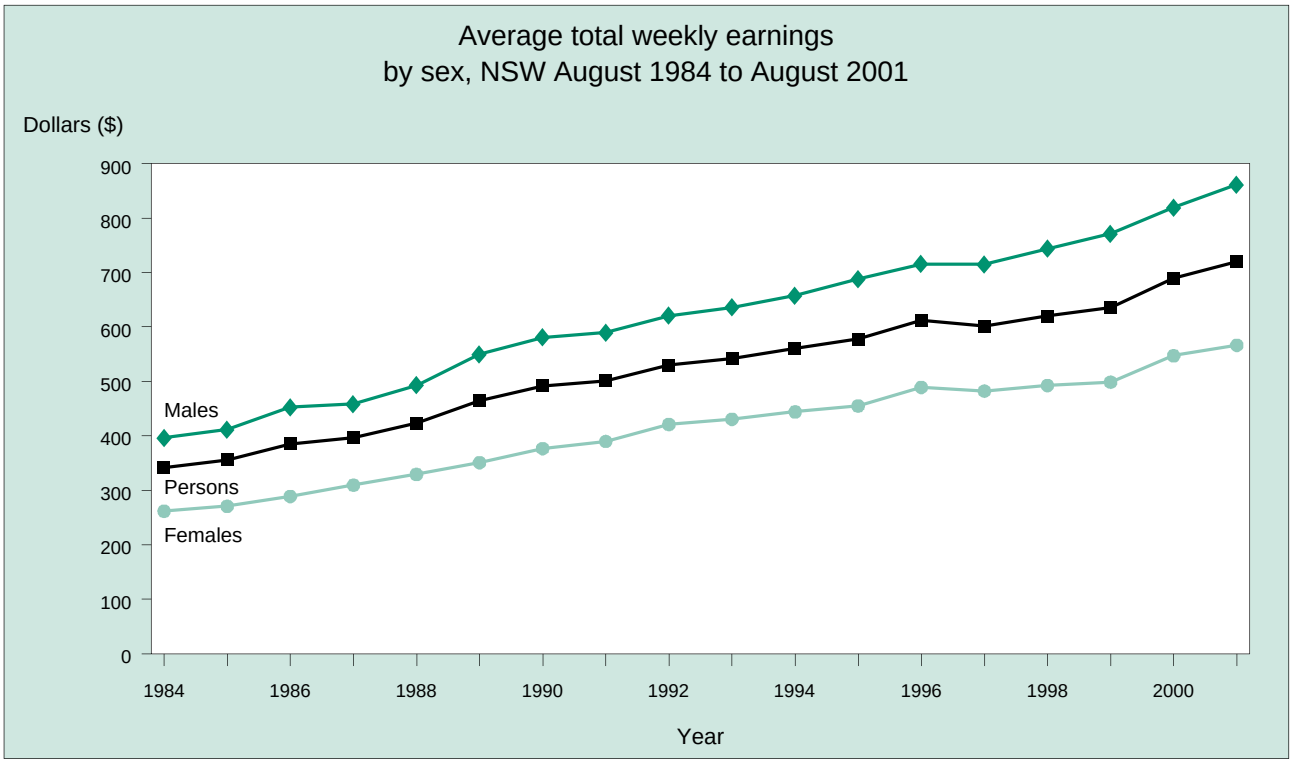
Evans RG, Barer ML and Marmot TR (editors). *Why are some people healthy and others are not?: The determinants of the health of populations*. New York: De Gruyter, 1994.

Marmot MG, Wilkinson RG (editors). *Social determinants of health*. Oxford: Oxford University Press, 1999.

NSW Department of Health. *NSW Health and Equity Statement*. Sydney: NSW Department of Health, unpublished.

Turrell G, Mathers CD. Socioeconomic status and health in Australia. *Med J Aust* 2000; 172: 434–8.

Sainsbury P, Harris L. Health inequalities: something old, something new. *N S W Public Health Bull* 2001; 12: 117–119. www.health.nsw.gov.au/public-health/phb/phb.html.



	Average weekly earnings in dollars																	
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Males	396	412	453	459	493	550	581	590	621	636	658	688	716	715	744	772	820	862
Females	262	271	289	310	330	351	377	390	421	431	444	455	489	483	493	499	547	567
Persons	342	356	385	396	424	465	492	502	531	542	561	579	612	602	621	636	690	720

Note: Average Weekly Earnings statistics represent average gross (before tax) earnings of employees and do not relate to average award rates nor to the earnings of the 'average person'.

Estimates of average weekly earnings are derived by dividing estimates of weekly total earnings by estimates of number of employees.

Source: ABS Survey of Average Weekly Earnings (unpublished data).

- Income is one of the main determinants of poverty, which is closely linked to poor health. Average total weekly earnings figures, which are published by the Australian Bureau of Statistics each quarter, provide one measure of income. The averages are calculated on the total number of employees, not the total population of working age. Changes in the averages may be affected not only by changes in the level of earnings of employees but also by changes in the overall composition of the wage and salary earner segment of the labour force. For example, an increase in the number of part-time employees will generally lower the average.
- Over the period to 1985 to 2000, total average weekly earnings in NSW almost doubled, from $356 to $690. Similar trends were seen for both male and female earnings. However, female average earnings were consistently around two-thirds those of males. Even when full-time employees only were considered, average female earnings were around 80% of male earnings (ABS, 2000).
- Over the same period, the Australian consumer price index (CPI) also almost doubled (ABS, 2002). The CPI reflects changes over time in the cost of a 'basket' of goods and services of the kind acquired by Australian households, including food, alcohol and tobacco, clothing, housing, transportation, communication, and education.

For more information:

Australian Bureau of Statistics. *2000 New South Wales Year Book*. ABS Catalogue no. 1300.1. Sydney: ABS, 2000.

Australian Bureau of Statistics. *Consumer Price Index*. ABS Catalogue no. 6401.0. Canberra: ABS, 2002.

Australian Bureau of Statistics Web site at www.abs.gov.au.

Recipients of age pension or disability and sickness benefits by health area, NSW March 2001

Note: The eligible population for the age pension comprised females aged 61.5 and over and males aged 65 and over and for disability or sickness benefits comprised females aged between 15 and 61.5 and males aged between 15 and 64. Disability and sickness benefits included disability support pension, sickness allowance, mobility allowance, and carer allowance. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: Centrelink, Canberra (unpublished data).

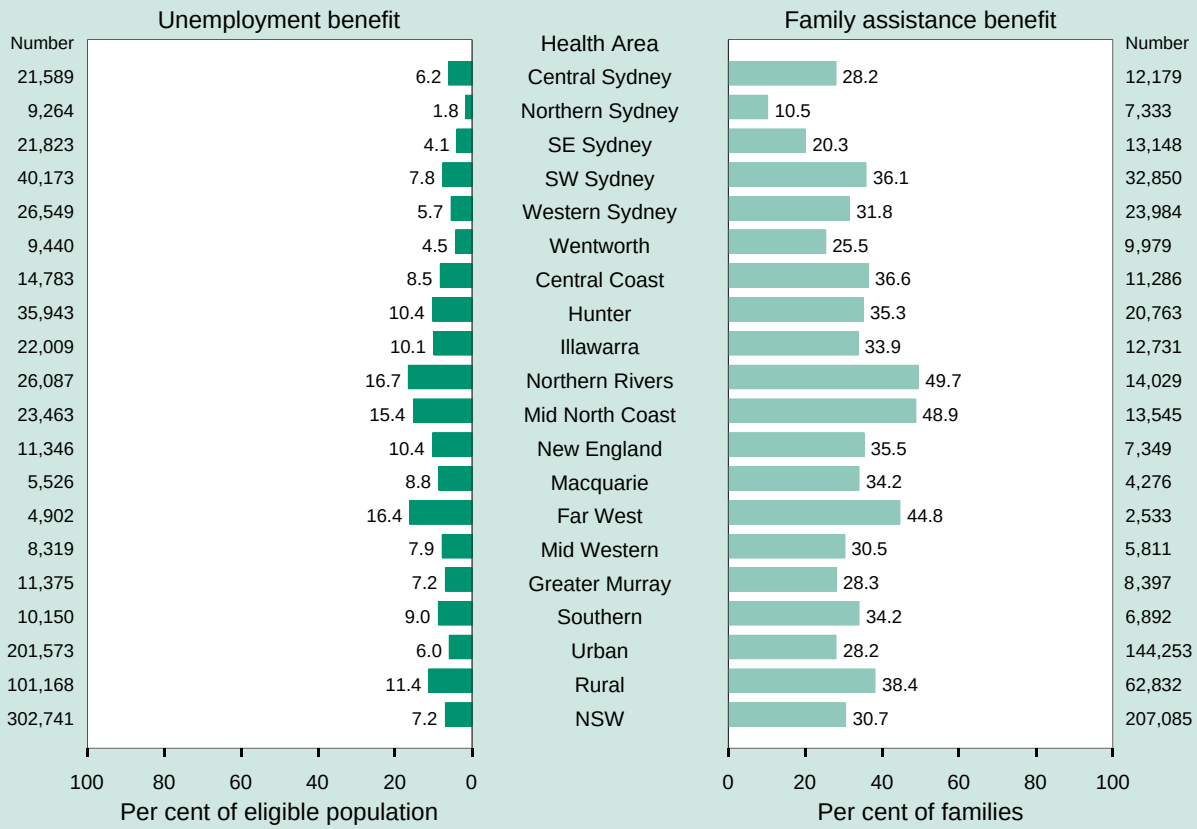
- The level of income support in a community is a measure of poverty. People who rely mainly on the government for their income make up around 70% of the lowest-income quintile (Walker and Abello, 2000). The level of receipt of benefits such as age pension or sickness or disability benefits provides 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 to men at age 65 years and women at age 62 years. The pensionable age for women is being slowly increased and will reach 65 years in July 2013. Currently women outnumber men by almost 2 to 1 among age pension recipients (AIHW, 1997). In 2001, 603,280 people in NSW received the age pension. This is 65.5% of the total population in the eligible age group. Far West Health Area had the largest proportion of older people receiving the age pension (78.0%) while Northern Sydney Health Area had the smallest (43.1%).
- 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 2001, 338,474 people in NSW received disability or sickness benefits. This comprised 8.0% of people in the eligible age group. Again, the Far West Health Area had the largest proportion of residents receiving this benefit (15.8%) and the Northern Sydney Health Area had the smallest proportion (3.2%).

For more information:

Australian Institute of Health and Welfare. *Older Australia at a Glance*. AIHW Catalogue no. AGE-4. Canberra: AIHW, 1997.

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

Recipients of unemployment or family assistance benefits by Health Area, NSW March 2001



Note: The eligible population for unemployment benefits includes females aged 15 to 61.5 years and males aged 15 to 64 years. Unemployment rates as at 30 June 2001. Unemployment benefits include Youth Allowance, Newstart Allowance and Mature Age Allowance. Family assistance includes Family Tax Benefit parts A and B, Double Orphan Pension, and Parenting Payments (single and partnered). Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

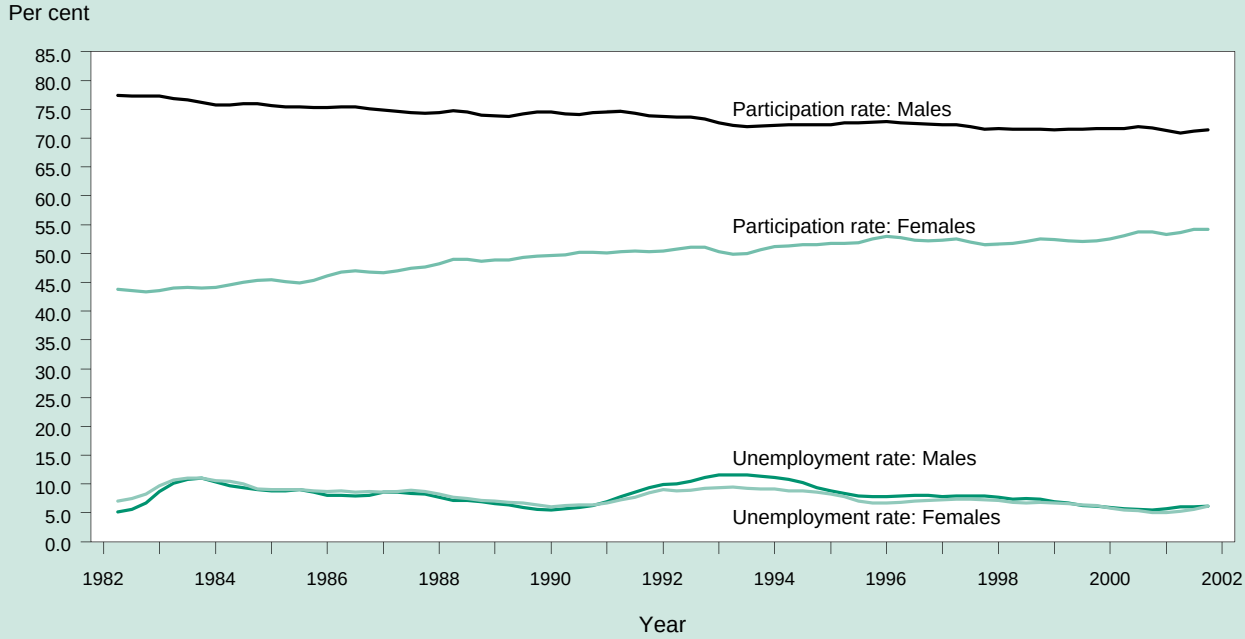
Source: Centrelink, Canberra (unpublished data).

- The level of receipt of income support in a community is a measure of poverty. People who rely mainly on the government for their income make up around 70% of the lowest-income quintile (Walker and Abello, 2000).
- Benefits paid to unemployed people include Youth Allowance (for people aged under 21 years who are unemployed or under 25 years and 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 2001, 302,741 people in NSW received unemployment benefits. This constituted 7.2% of the total population in the eligible age group. More than 1 in 6 working age adults in the Far West and Northern Rivers Health Areas received unemployment benefits (16.4% and 16.7%, respectively), compared with less than 1 in 50 residents of Northern Sydney Health Area (1.8%).
- Family assistance benefits are paid to help with the cost of raising children. They include Family Tax Benefits, which are income tested, and Parenting Payments, which are paid to primary carers of children and are subject to more stringent income and assets tests. In 2001, 207,085 families in NSW received family assistance benefits. This comprised almost one-third (30.7%) of all families. Almost half of families in the Mid North Coast and Northern Rivers Health Areas received family assistance (48.9% and 49.7%, respectively), compared with 1 in 10 families in the Northern Sydney Health Area (10.5%).

For more information:

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

Unemployment and labour force participation rates
by sex, NSW 1982 to 2001



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. Participation rate = the labour force expressed as a percentage of the civilian population aged 15 years and over. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: Australian Bureau of Statistics Monthly Labour Force Data.

- People who are unemployed have poorer physical and mental health than people who are employed. 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. These health differentials are the result of several mechanisms. 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; Morrell, Taylor and Kerr, 1998). The impact of unemployment on health is thought to increase with the length of unemployment, with many chronic physical and mental health problems acting as barriers to re-employment (Harris et al., 1998).
- Official statistics on employment are published by the Australian Bureau of Statistics each month. Over the last 20 years, the unemployment rate in NSW has fluctuated, peaking in 1992 at 11.6% of males and 9.5% of females, but declining steadily from 1994 to 2000. It stood at 6.1% for both males and females in September 2001. 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 4.4% for males and 3.3% for females in September 2001, down from a high of 8.4% of males and 4.7% of females in 1993.
- The male labour force participation rate declined slowly over the last 20 years, from more than 77% in 1982 to around 71% in 2001. In the same period, the female participation rate rose, from less than 44% to around 54%.

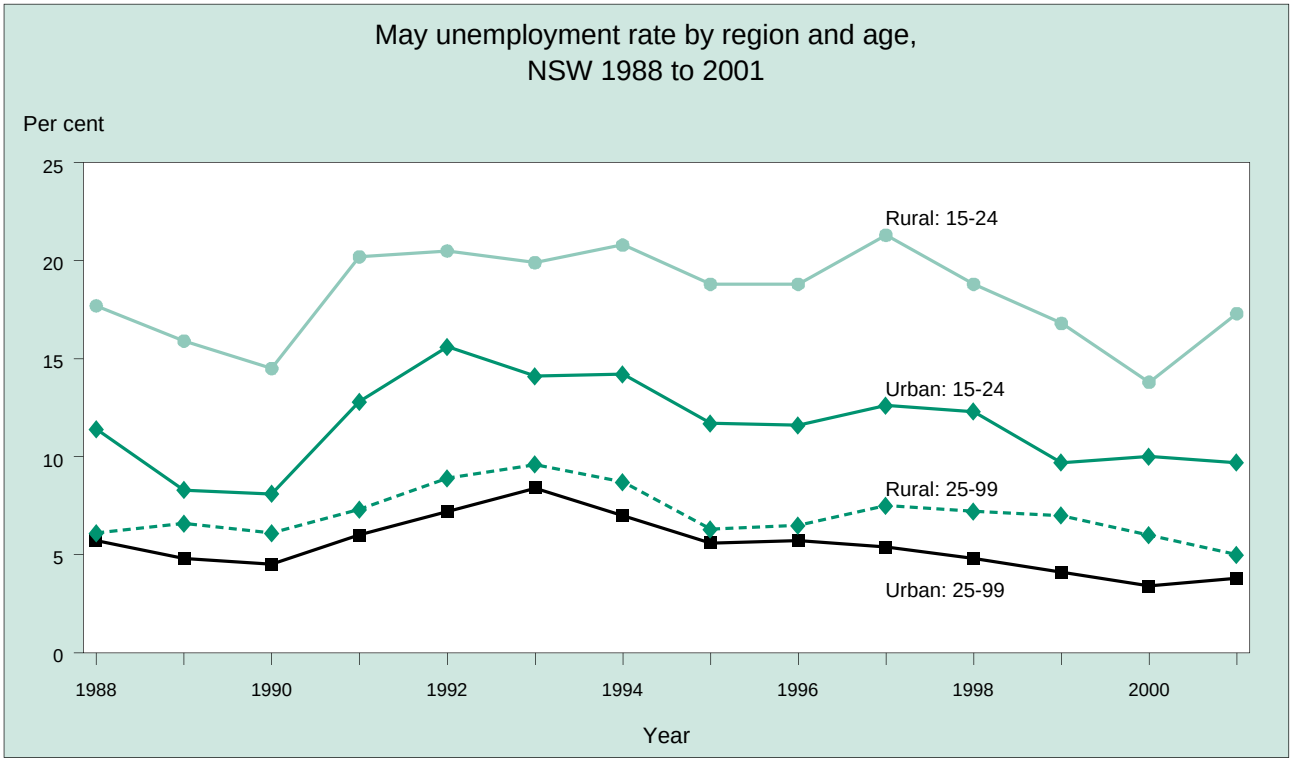
For more information:

Harris E, Webster I, Harris M, Lee P. Unemployment and health: The healthcare system's role. *Med J Aust* 1998; 168: 168–70.

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

Morrell SL, Taylor RJ, Kerr CB. Unemployment and young people's health. *Med J Aust* 1998; 168: 236–240.

Australian Bureau of Statistics Web site at www.abs.gov.au.



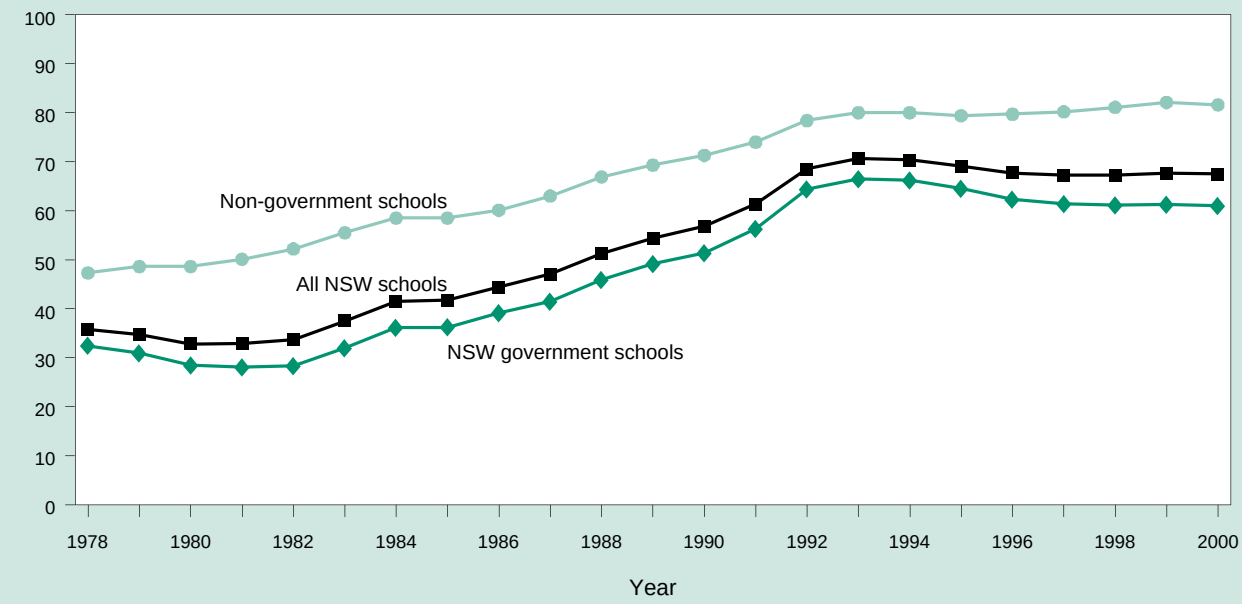
Note: Unemployed people = people aged 15 years and over who were not employed but were actively looking, and available, for work. Unemployment rate = the number of unemployed people expressed as a percentage of the labour force. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: Australian Bureau of Statistics Monthly Labour Force Data.

- Unemployment and its accompanying health effects are not distributed evenly throughout the population. Unemployment rates in NSW are highest among people aged less than 25 years, and are higher in rural than in urban areas.
- Over the period 1998 to 2001, in both urban and rural areas, unemployment rates among people aged less than 25 years were more than double those among older people. Up to 1 in 5 young people in rural NSW were unemployed. The yearly average unemployment rate for 15–24 year olds in rural areas peaked at 21.3% in 1997, before declining to 13.8% in 2000 and rising to 17.3% in 2001. Unemployment rates among young people in urban areas followed a fairly similar pattern, but were consistently less than two-thirds of the rate in rural areas.
- Unemployment rates were also consistently higher in rural than in urban areas among people aged 25 years and over. The yearly average unemployment rate in this age group peaked in 1993, at 8.4% in urban areas and 9.6% in rural areas. It has declined fairly steadily from then, and stood at 3.8% in urban areas and 5.0% in rural areas in 2001.

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

Retention of students to Year 12 by school type, NSW 1978 to 2000



	Retention rate per cent										
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
NSW government schools	51.4	56.3	64.4	66.5	66.2	64.5	62.3	61.4	61.1	61.2	61
Non-government schools	71.3	74	78.4	80	80	79.4	79.7	80.2	81.1	82.1	81.6
All NSW schools	56.8	61.4	68.5	70.6	70.4	69.1	67.7	67.2	67.2	67.6	67.5

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, borne by the school-leaver and by government. The remaining half is a social cost, which is carried by the individual, government, and the community. Costs borne largely by the individual early school-leaver include reduced chances of employment, fewer opportunities for job mobility and training, and decreased financial security. Examples of the costs to government and the community of early school-leaving 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 70.4% in 1994. It decreased to 67.7% in 1996, and has remained at around this level since. NSW has the third lowest school retention rate of Australian states and territories, behind the Northern Territory and Tasmania (ABS, 2002).
- The retention rate in non-government schools was consistently higher than in government schools, and in 2000 was 81.6%, compared with 61.0% in government schools. 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 2000, the retention rate for females was 73.5%, compared with 61.7% for males.

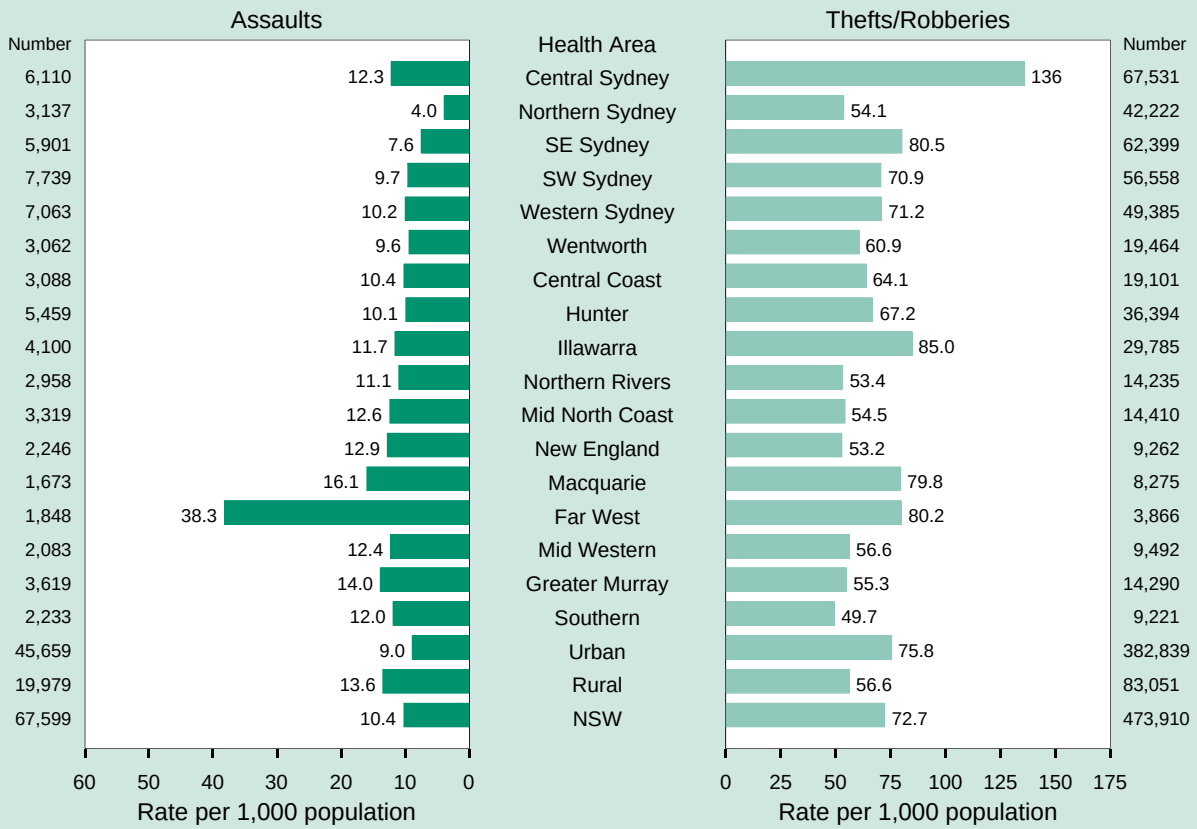
For more information:

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

Australian Bureau of Statistics. *Schools Australia*. ABS Catalogue no. 4221.0. Canberra: ABS, 2002.

Australian Bureau of Statistics Web site at www.abs.gov.au.

Reported crime rates: assaults and thefts/robberies by health area, NSW 2001



Note: The counting units are recorded criminal incidents. A large number of assaults, sexual assaults, and robberies, are not reported to the police. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Recorded Crime Statistics 2000, NSW Bureau of Crime Statistics and Research, 2002 (available at www.agd.nsw.gov.au/bocsar1.nsf/pages/crimestatsindex).

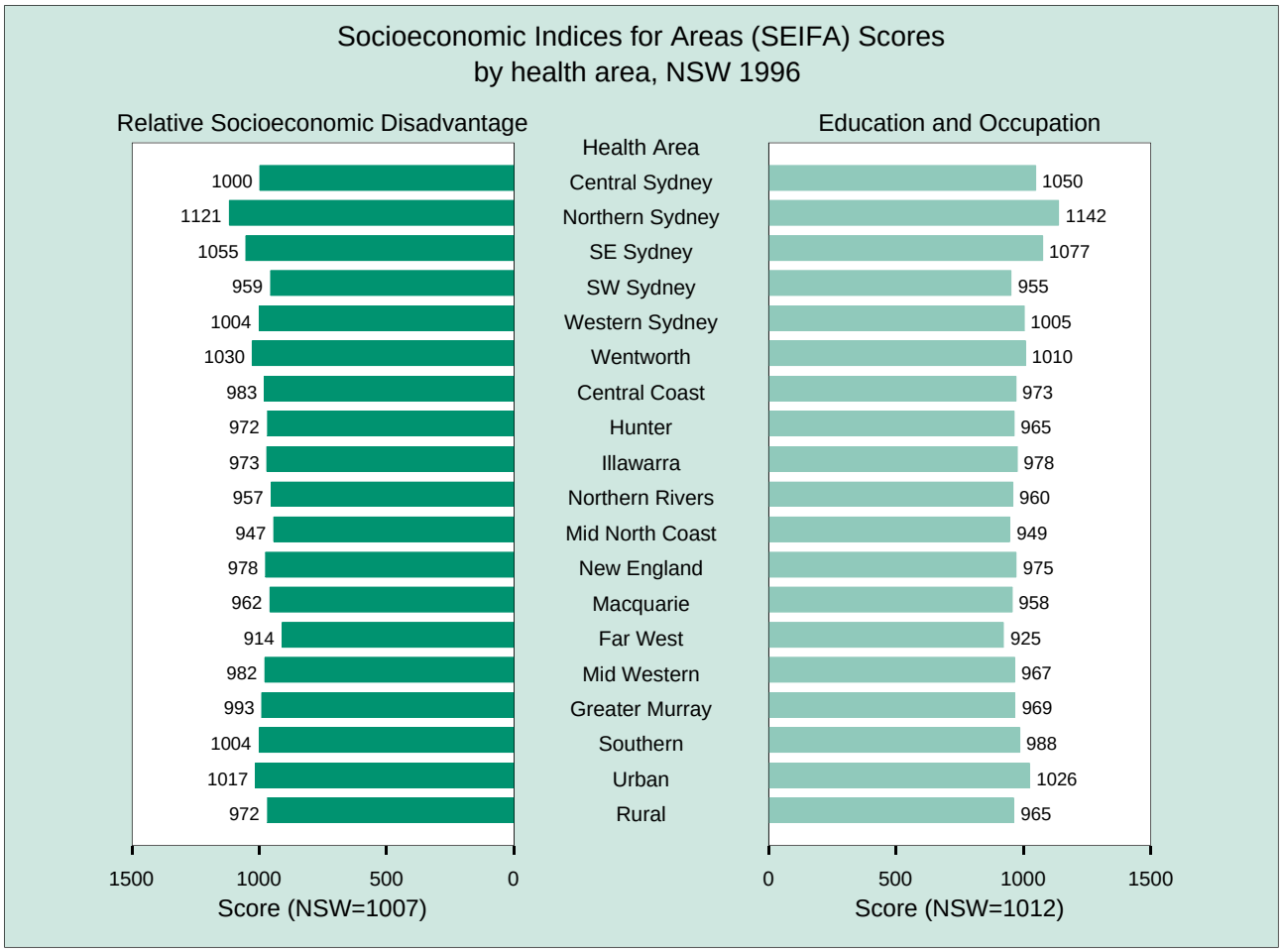
- Crime influences health. Personal violence and assault has direct effects on the physical and mental health of victims and witnesses. Victims of property crime may suffer psychological harm. Fear of crime may be a factor that limits enjoyment of life (Crime Concern, 1999). Crime and ill-health also 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 causes of ill-health (Kawachi et al., 1999).
- In 2001, 67,599 assaults were reported in NSW, giving a rate of 10.4 per 1000 residents. In the same year, there were 473,910 reported thefts and robberies (72.7 per 1000). These figures underestimate the true rate because a large number of assaults, sexual assaults, and robberies, are not reported (NSW Bureau of Crime Statistics and Research, 2002).
- Overall, rural areas had higher rates of assault than urban areas. The rate of assaults ranged from 4.0 per 1000 in the Northern Sydney Health Area to 38.3 per 1000 in the Far West Health Area.
- Rural areas had lower rates of thefts and robberies than urban areas, with the lowest rate recorded in the Southern Health Area (49.7 per 1000). The highest rate was recorded in the Central Sydney Health Area (136.1 per 1000). Criminal incidents are recorded according to the location of occurrence rather than the address of the perpetrator or victim. High rates in inner city areas reflect the large numbers of non-residents who visit these areas for work or leisure.

For more information:

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

Crime Concern. *Crime and Disorder. Review to support the development of the London Health Strategy.* London: Crime Concern, 1999. Available at www.lho.org.uk/hil/crime.htm.

Allen J, Chilvers M, Doak P, Goh D, Painting T, Ramsay M. *New South Wales recorded crime statistics 2001.* Sydney, NSW Bureau of Crime Statistics and Research, 2002.



Note: Australian scores are the reference point and are set to 1000 for each index. Scores for area health services are population-weighted means of the scores of their constituent census collector districts. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: ABS 1996 Socioeconomic Indexes for Areas (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- The Socioeconomic Indexes for Areas (SEIFA) were constructed by the Australian Bureau of Statistics, using data from the 1996 Census of Population and Housing, to summarise the social and economic conditions of Australia. SEIFA scores are derived from multiple weighted variables, with the reference score for the whole of Australia set to 1000. Lower scores indicate lower socioeconomic status.
- The graph presents scores for 2 of the SEIFA indexes, the Index of Relative Socioeconomic Disadvantage (IRSD) and the Index of Education and Occupation (EDUCOCC) for NSW health areas. The IRSD relates to education, occupation, non-English speaking background, indigenous origin, and the economic resources of households. The EDUCOCC relates to occupational classification, unemployment, early school leaving, and lack of educational qualifications (ABS, 1998).
- On both indexes there was a considerable difference between rural and urban areas. For urban areas combined, IRSD was 1017 and EDUCOCC was 1026; while the corresponding scores for rural areas combined were IRSD 972 and EDUCOCC 965. Northern Sydney had the highest scores for both indexes (IRSD 1121; EDUCOCC 1142), followed by South Eastern Sydney (IRSD 1055; EDUCOCC 1077). The most disadvantaged area was Far West (IRSD 914; EDUCOCC 925), followed by Mid North Coast (IRSD 947; EDUCOCC 949).
- Trends in a range of health indicators according to IRSD score are presented in Chapter 3.4.

For more information:

Australian Bureau of Statistics. *1996 Census of population and housing. Socioeconomic indexes for areas.* ABS Catalogue no. 2039.0. Canberra: ABS, 1998.

Australian Bureau of Statistics Web site at www.abs.gov.au.

Chapter 1.3

The environment

- The main contributors to air pollution in cities are industry, motor vehicles, and wood-burning heaters. In the last 10 years in Sydney:
  - —the number of days on which levels of nitrogen dioxide in the air have exceeded recommended levels has decreased;
  - —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, individual supplies vary substantially;
  - —less than half of beaches tested under the *Beachwatch* and *Harbourwatch* programs comply at all times with standards for levels of faecal contamination.
- 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.
- Arthropod-borne viruses (or 'arboviruses') are transmitted to humans through the bite of mosquitoes. In 2001:
  - —the largest recorded epidemic (307 cases) of Barmah Forest virus occurred on the mid north coast, revolving around Kempsey;
  - —for the first time since 1974, Murray Valley Encephalitis virus was detected in NSW.
- The rate of malignant mesothelioma (a cancer that is associated with past exposure to asbestos) has almost doubled in NSW since 1986. Most cases are in males and are related to past occupational exposure to asbestos.

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, housing, town planning, and environmental health infrastructure, underpin the health status of people in the urban and other 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 government has broad responsibilities for the setting of environmental standards for drinking water and air quality. In NSW, the NSW Environment Protection Authority (EPA) 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, such as legionella in 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.

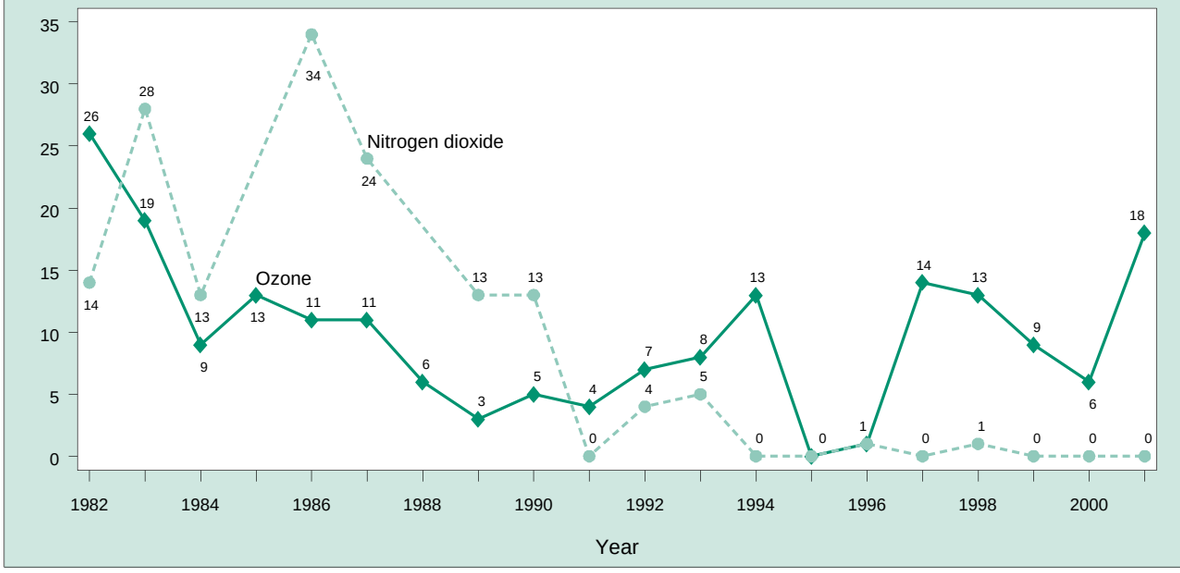
This chapter presents an overview of some important indicators of environmental health in NSW, including air and water quality, arboviral infections, mesothelioma incidence, and blood lead levels. It has been designed to complement rather than duplicate the comprehensive information presented in the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

For more information:

NSW Environmental Protection Authority. *New South Wales State of the Environment 2000.* Sydney: EPA, 2000. NSW Environmental Protection Authority Web site at www.epa.nsw.gov.au.

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

Number of days and year in which one-hour ozone and nitrogen dioxide goals exceeded, Sydney 1982 to 2001



Note: The current NSW standard for ozone is 0.10 parts per million for a 1-hour average. The current NSW standard for NO_2 is 0.12 parts per million for a one-hour average. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Environmental Protection Authority. *New South Wales State of the Environment.* Sydney: NSW EPA, 2000.

- Nitrogen dioxide (NO_2) and ozone are photochemical air pollutants that can affect human health. High levels of NO_2 in the air are associated with increased rates of deaths and hospital admissions, particularly for asthma and bronchitis. Ozone causes irritation of the eyes and respiratory tract, and has been associated with increased deaths from, and rates of, episodes of asthma.
- Outdoor NO_2 comes mainly from motor vehicle emissions. 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 and NO_2 contribute to the brown haze of photochemical pollution. Ozone also occurs naturally in the upper atmosphere, where it absorbs ultraviolet radiation.
- In Sydney, the number of days when NO_2 concentrations exceed the standard has decreased. This has happened on only 2 days since 1993. In contrast, the number of days on which the ozone standard was exceeded has fluctuated in recent years, from 0 in 1995 to 18 in 2001.
- Weather conditions and events such as bushfires cause much of the annual variability in the number of days on which NO_2 and ozone standards are exceeded. Average NO_2 and ozone levels are stable, due to stricter emission controls on vehicles in the past decade. However, increasing motor vehicle use is likely to increase average levels of both NO_2 and ozone in the longer term. Exposure to NO_2 is likely to be higher in homes near busy roads, or where gas appliances—particularly unflued heaters—are used.
- The National Environment Protection Council introduced the health-based standards used in this graph in 1998.

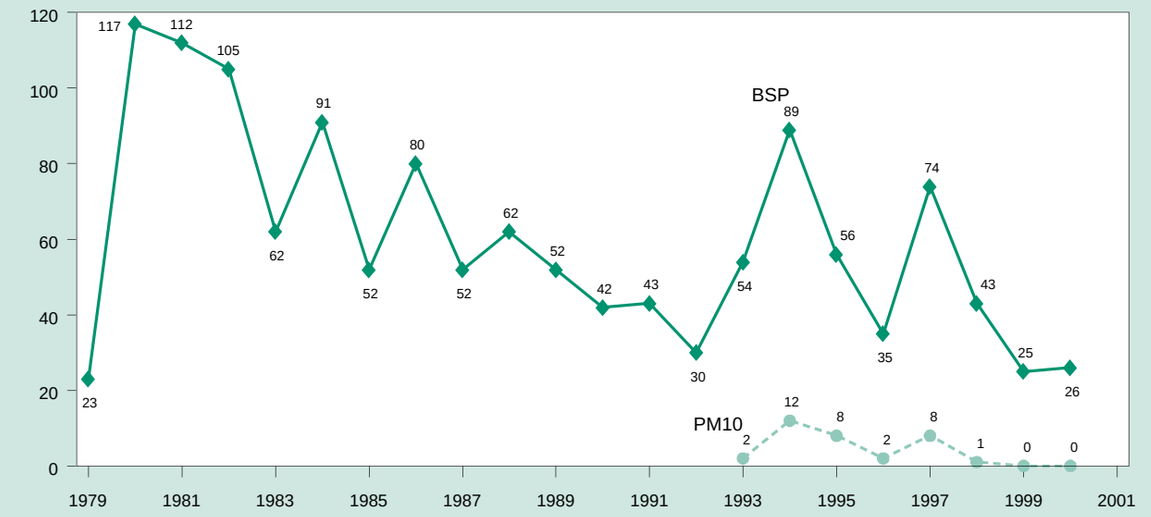
For more information:

NSW Environmental Protection Authority. *New South Wales State of the Environment.* Sydney: NSW EPA, 2000. www.epa.nsw.gov.au/SOE/soe2000/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 Epi* 2000; 29: 549–57.

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

Number of days and year in which visibility and atmospheric fine particle goals exceeded in Sydney region, NSW 1979 to 2000



Note: The NSW goal for visibility was <2.1 BSP/104 metres averaged over 1 hour. The new NEPC goal for fine particles (PM_{10}) of 50 micrograms per cubic metre averaged over 24 hours, was used to define days on which the atmospheric fine particle goal was exceeded. BSP = particles which back-scatter light; PM_{10} = particulate material less than 10 microns in diameter. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Sources: State Pollution Control Commission. Air Quality Measurement in NSW: Annual Review 1979–1990. Sydney: SPCC, 1991 and NSW Environmental Protection Authority. New South Wales State of the Environment. Sydney: EPA, 1997 and 2000.

- Health and Air Research Program (HARP) studies funded by NSW Department of Health from 1993 to 1996 found associations between levels of atmospheric particles, daily mortality, hospital admissions for cardiac disease in the elderly, and respiratory symptoms. 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.
- 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.
- The major sources of particle pollution in urban areas are wood combustion for domestic heating and motor vehicles, particularly diesel-powered. Initial improvements in particle levels were seen in the 1980s, due to the elimination of backyard burning and emission controls on vehicles. However, levels have not shown any particular trend over the last 10 years. The peaks seen in the 1990s were in years of major bushfires.
- Rural areas may experience high particle levels in winter due to wood heater use. Wood heater use also increases fine particle levels inside homes. The NSW Environment Protection Authority (EPA) is trialing a wood heater buy back program in some rural towns.
- Atmospheric particles can be measured in terms of visibility (expressed as BSP, due to back-scattering of light by fine particles) or by measuring the actual ambient concentration of particles, expressed as concentration of PM_{10} (particulate matter of less than 10 microns in diameter). The National Environment Protection Council (NEPC) set the PM_{10} standard in 1998. NEPC is considering introducing a standard for a finer fraction of atmospheric particles ($PM_{2.5}$) that is thought to be more closely associated with health effects.

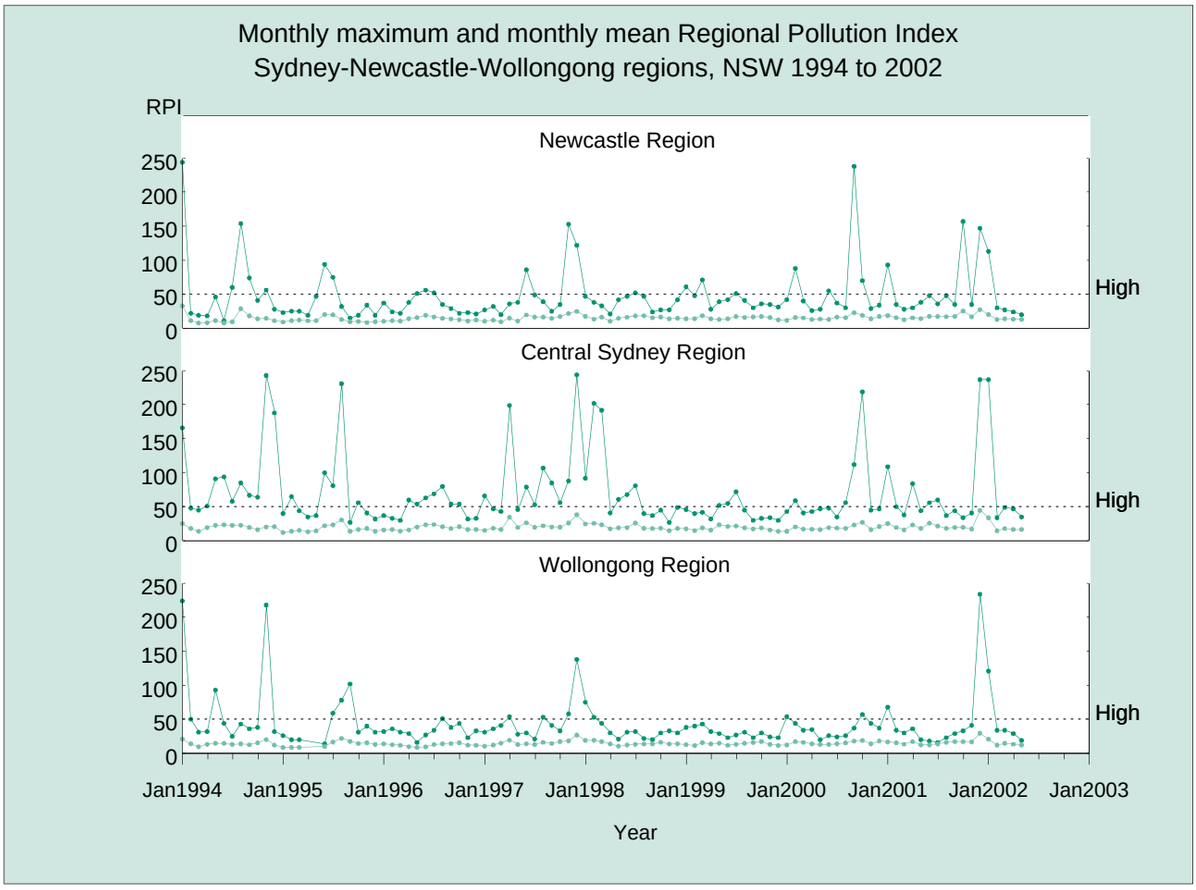
For more information:

NSW Environment Protection Authority. www.epa.nsw.gov.au/SOE/soe2000/index.htm.

National Environment Protection Council. www.nepc.gov.au.

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.

Lewis P, Hensley M, Wlodarczyk J et al. Outdoor air pollution and children's respiratory symptoms in the steel cities of New South Wales. *Med J Aust* 1998; 169: 459–63.



Note: RPI data is reported twice daily on the EPA Web site. 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.

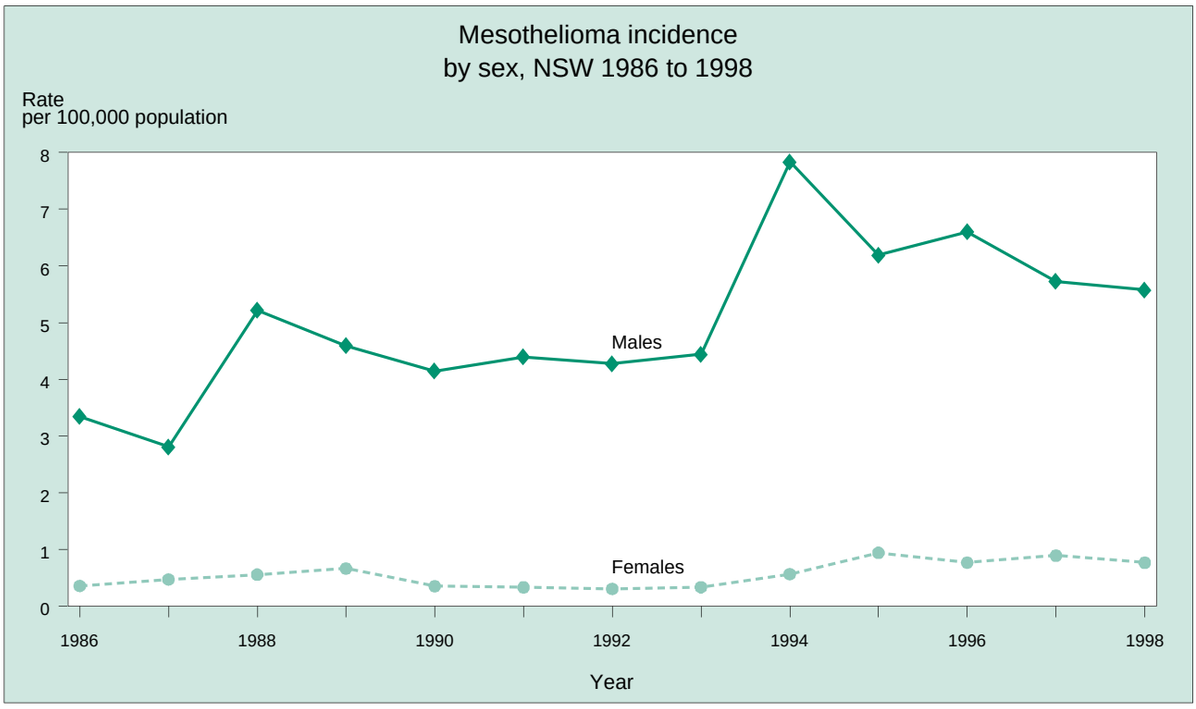
Source: NSW Environment Protection Authority. Web site at www.epa.nsw.gov.au.

- The regional pollution index (RPI) has been developed by the NSW Environment Protection Authority (EPA) to provide twice daily reporting of pollutant levels in Sydney, Wollongong, and Newcastle. 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 compared to its standard. A high RPI indicates that at least 1 of the 3 pollutants has exceeded its goal in the previous 12 hours. Using weather conditions and information on likely generation of pollutants for the next day, the EPA also predicts the likely level of RPI.
- The very high levels shown on the graphs are in the main associated with bushfires. The usual contributors to air pollution in these 3 regions 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 physical activity. Further information about physical activity can be found in the chapter on health-related behaviours (chapter 1.4).

For more information:

NSW Environment Protection Authority Web site at www.epa.nsw.gov.au/SOE/soe2000/index.htm.

NSW Environment Protection Authority. *Action for Air.* Sydney: NSW Environment Protection Authority, 1998.



		1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Number	Males	59	53	93	84	77	84	86	91	160	129	143	127	125
	Females	7	10	12	14	8	8	7	8	14	23	20	23	20
	Persons	66	63	105	98	85	92	93	99	174	152	163	150	145
Rate	Males	3.3	2.8	5.2	4.6	4.1	4.4	4.3	4.4	7.8	6.2	6.6	5.7	5.6
per 100,000	Females	0.4	0.5	0.6	0.7	0.3	0.3	0.3	0.3	0.6	0.9	0.8	0.9	0.8
population	Persons	1.7	1.6	2.6	2.4	2.0	2.1	2.1	2.2	3.8	3.3	3.5	3.1	2.9

Note: New mesothelioma cases are restricted to those reported among persons aged 20 years and over. NSW population estimates as at 30 June each year. Rates were age-adjusted using the Australian population as at 30 June 1991.

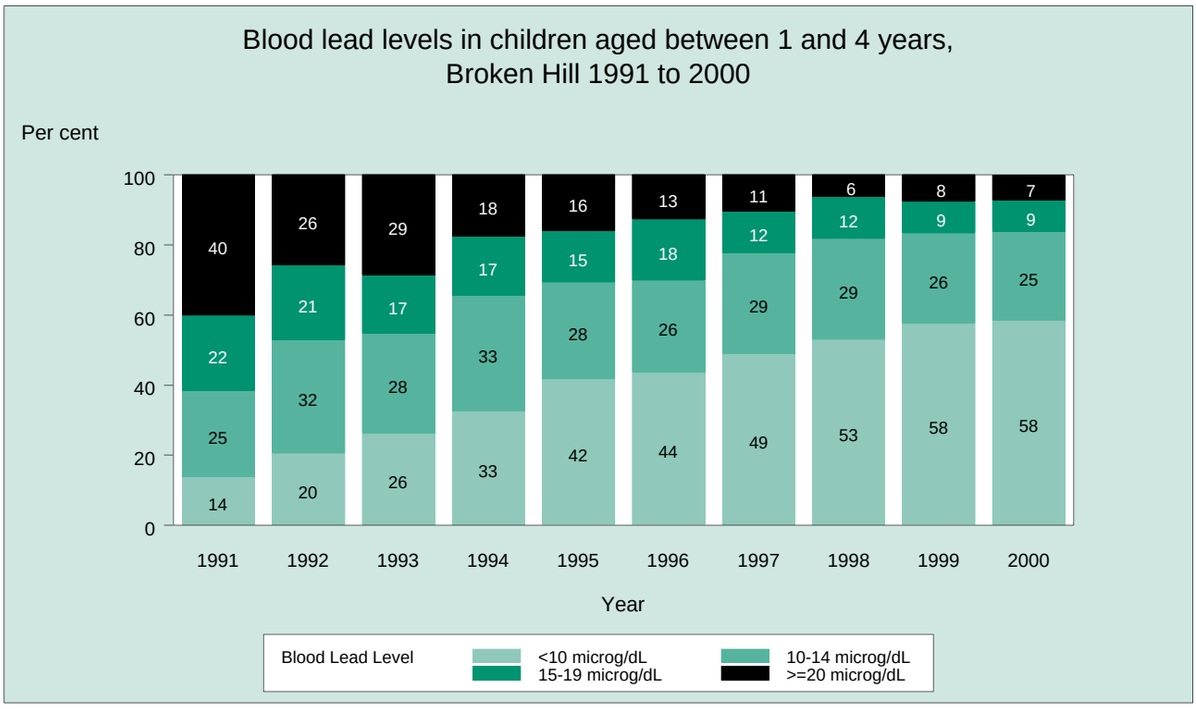
Source: National Occupational Health and Safety Commission, Mesothelioma Register Reports, 1990 to 2001.

- 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 tobacco 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 chrysotile use by 2003.
- In 1998, 145 cases of mesothelioma were reported in NSW, with 86% 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 1986–1998, from 1.7 to 2.9 per 100,000 population. This increase reflects the current Australia-wide epidemic of mesothelioma cases. The incidence of malignant mesothelioma in Australia appears to be higher than that of any other country. 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:

Ferguson DA, Berry G, Jelihovsky T, Andreas SB, Rogers AJ, Fung SC, Grimwood A, Thompson R. The Australian Mesothelioma Surveillance Program 1979–1985. *Med J Aust* 1987; 147: 166–172.

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.



Note: NHMRC goal: 10 micrograms per decilitre (microg/dL) or less. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: Broken Hill Environmental Lead Centre. *Blood Lead Levels of Broken Hill Children from 1991 to 2000*. Broken Hill: Broken Hill Environmental Lead Centre (unpublished).

- 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, are known sources of lead. The removal of lead from petrol has been associated with major 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 a legacy of widespread lead contamination throughout the city.
- 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, for all Australians, a blood lead level of less than 10 micrograms per decilitre (microg/dL).
- 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 Environment Protection Authority 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 average blood lead level decreased by about 50% between 1991 and 2000, from 16.7 to 8.4 microg/dL. Over the same period, the proportion of children with levels greater than 10 microg/dL fell from 86% to 42%, and the proportion of children with very high levels (greater than 20 microg/dL) fell from 40% to 7%.
- Elevated blood lead levels became a notifiable condition in NSW in 1997. Most notifications in children are from known contaminated areas (Far West and Hunter Health Areas), or are associated with home renovations in inner Sydney.

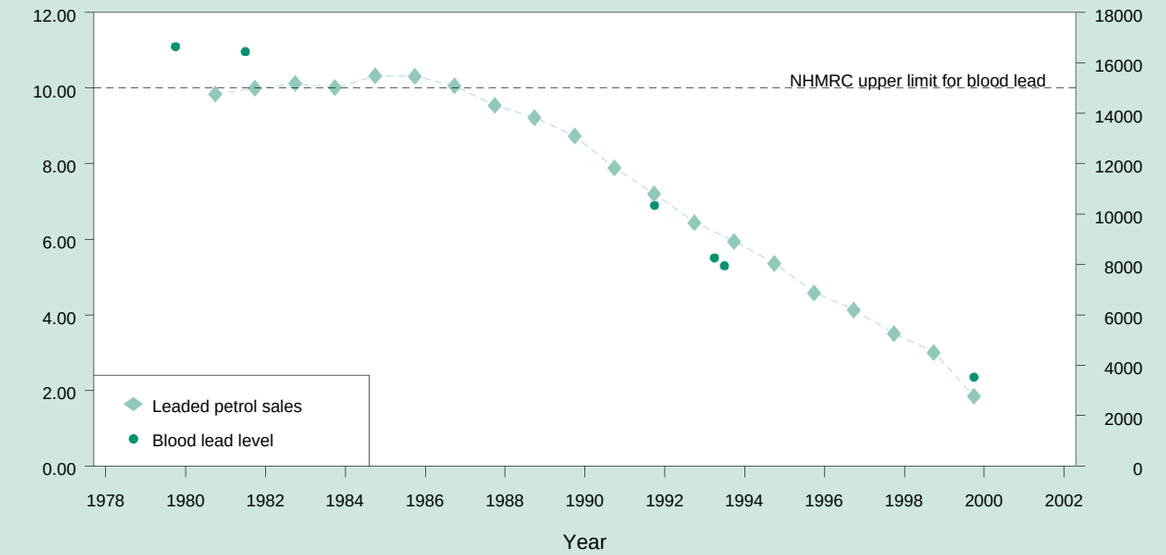
For more information:

National Health and Medical Research Council. *Lead in Australians.* Canberra: NHMRC, 1993.

Interdepartmental Lead Taskforce. *New South Wales Lead Management Action Plan.* Sydney: NSW Environment Protection Authority, 1994.

The NSW Environmental Protection Authority Lead Reference Centre Web site at www.epa.nsw.gov.au/leadsafe/ and State of the Environment 2000 at www.epa.nsw.gov.au/SOE/soe2000/index.htm.

Blood lead levels in children
and leaded petrol sales, Australia 1979 to 1999



Note: NHMRC goal: 10 micrograms per decilitre (microg/dL) or less. ML = megalitres of petrol. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: Balding B et al. (unpublished).

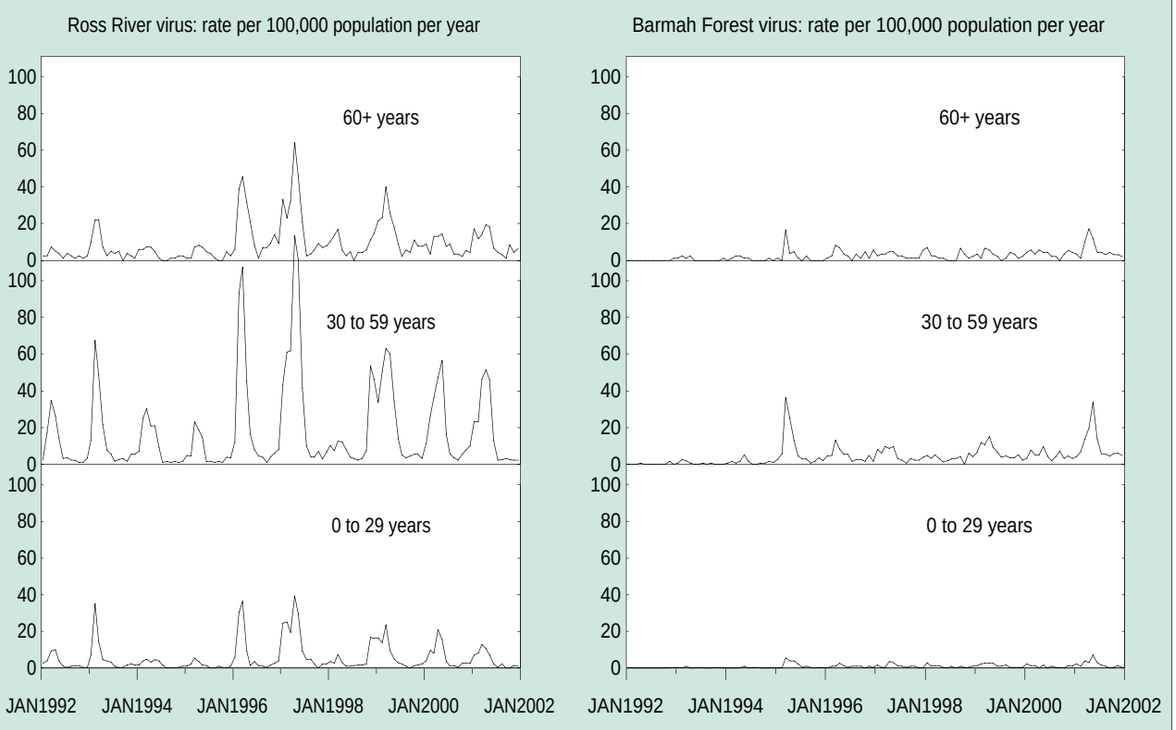
- A blood lead survey of children attending outpatient pathology departments for other reasons at Sydney's 2 children's hospitals, was conducted from June to November 1999.
- Simultaneously, a survey was conducted in 7 NSW regional centres where children were also recruited from private pathology services, hospital emergency departments, and children's wards at regional base hospitals. Results were compared to 5 studies undertaken at Australian hospitals since 1980, and these results were correlated with national leaded petrol sales.
- The geometric mean blood lead level in 1999 was 2.4 micrograms per decilitre (µg/dL). Nine (1.2%) children had blood lead levels equal to or greater than the goal (10 µg/dL) set by the National Health and Medical Research Council (NHMRC). No levels were greater than 20 µg/dL.
- Children from regional centres had higher lead levels (2.7 µg/dL) than children from city hospitals (2.3 µg/dL).
- The mean blood lead level of NSW children has dropped significantly since the mid-1980s. The proportion of children exceeding the NHMRC goal is lower than for previous studies and is well within the guideline levels.
- The decline in blood lead levels occurs simultaneously with the falling volume of leaded petrol sales.

For more information:

Department of Industry, Tourism and Resources Web site at www.industry.gov.au/resources/petr_statistics/index.html.

Balding B, Carroll A, Morgan G, Corbett S. An opportunistic blood lead survey in NSW children: Monitoring the decline in children's lead exposure (unpublished).

Arboviral infection: notifications by month and age, persons of all ages, NSW, 1992 to 2001



Note: Age-standardised rates were age-adjusted using the Australian population as at 30 June 1991. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

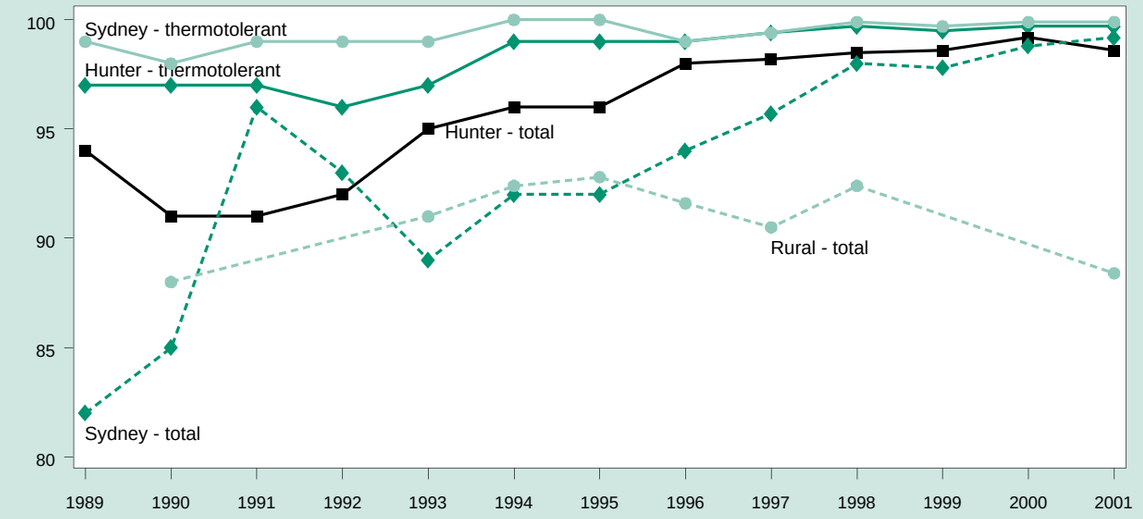
- In NSW, the most common notifiable human arboviral infections are caused by the Ross River (RRV) and Barmah Forest (BFV) viruses. Both are transmitted by mosquitoes. Laboratories are required by law to notify cases of arbovirus infection to the NSW Department of Health. In the period 1992 to 2001, 7052 cases of RRV and 1678 cases of BFV infection were notified.
- Outbreaks of BFV in coastal NSW appear to be increasing. Between April and June 2001, the largest recorded epidemic (307 cases) of BFV occurred on the mid-north coast revolving around Kempsey. This outbreak followed heavy rainfall and flooding in the area.
- In January 2001, Murray Valley encephalitis (MVE) virus, also an arbovirus, was detected in blood from flocks of sentinel chickens in the west and north-west of the state. This is the first time the MVE virus has been detected in NSW since an outbreak in 1974.
- Surveillance of sentinel birds, cattle, and a range of other domestic species, indicated the virus first appeared in the far west at Menindee and moved north-east as far as Macquarie Marshes over a period of 3 weeks. The virus was not detected in the south and south-west of the state.
- The NSW Department of Health issued advice regarding mosquito avoidance. There were no reported human MVE cases in NSW, although several cases were reported in Queensland, Northern Territory, and Western Australia.
- No vaccine has been developed for RRV, BFV or MVE infections. Prevention depends on the reduction of exposure to mosquitoes through environmental control and personal protection.

For more information:

NSW Arbovirus Surveillance and Vector Monitoring Program Web site 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.

Thermotolerant and total coliform counts
in metropolitan and rural water supplies, NSW 1989 to 2001



Note: Results for rural total coliform counts are for financial years (1989–90 is shown under 1990 in the table, 1992–93 under 1993 and so on) and are for rural water supplies as a whole. Data for rural total coliform counts for some years are not available. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: Sydney and Hunter Water Corporations (Quarterly Reports) and NSW Department of Analytical Laboratories, unpublished data. NSW Department of Health NSW Drinking Water Database.

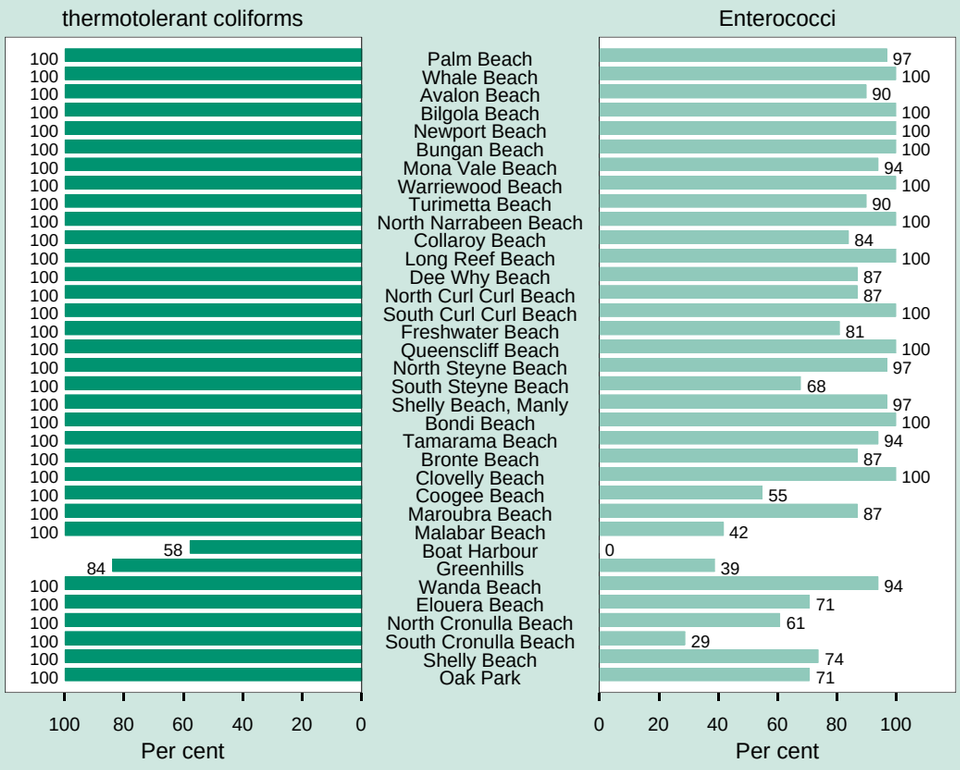
- Drinking water supplies in NSW are monitored for possible faecal contamination. This monitoring is performed by water supply authorities with oversight by the NSW Department of Health. *Escherichia coli (E. Coli)* or thermotolerant coliforms are used as the primary indicator species, and total coliforms are the 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 1996* (the Guidelines) state that 98% of samples should contain no *E. coli* or thermotolerant coliforms, and that 95% of samples should contain no total coliforms. The Guidelines also recommend minimum sample numbers for monitoring of water supplies based on the population and the complexity of the supply. Water testing results from the Sydney and Hunter Water Corporations indicate that drinking water meets the Guidelines and is of good quality. Both Corporations monitor in accordance with Guideline recommendations.
- The NSW Department of Health developed the 'Drinking water monitoring program' in October 2000 to provide a framework for regional and rural water suppliers on the application of the Guidelines. Under the program, the Department offers free drinking water analysis to local councils for public water supplies. In addition, a NSW Drinking Water Database has been set up to store information and monitoring results for regional and rural water supplies. The database has been operational since 1 January 2000; all microbiological compliance monitoring results for public water supplies in NSW, other than Sydney and Hunter Water Corporations, are entered on a weekly basis.
- In rural areas, water supplies achieved a 96% compliance for *E. coli* in 2001 (data not shown). Although the overall compliance rate is high, data from individual supplies may vary substantially. Compliance rate for total coliforms in rural supplies was 88%. Compliance with Guideline recommendations for monitoring frequency varies widely throughout the State.

For more information:

National Health and Medical Research Council and Agricultural Resource Management Council of Australia and New Zealand. *Australian Drinking Water Guidelines 1996.* Canberra: NHMRC, 1996.

The Sydney Water Corporation Web site at www.sydneywater.com.au.

Compliance with upper limits for thermotolerant coliforms and Enterococci counts in water samples at Sydney beaches, NSW October 2000 to April 2001



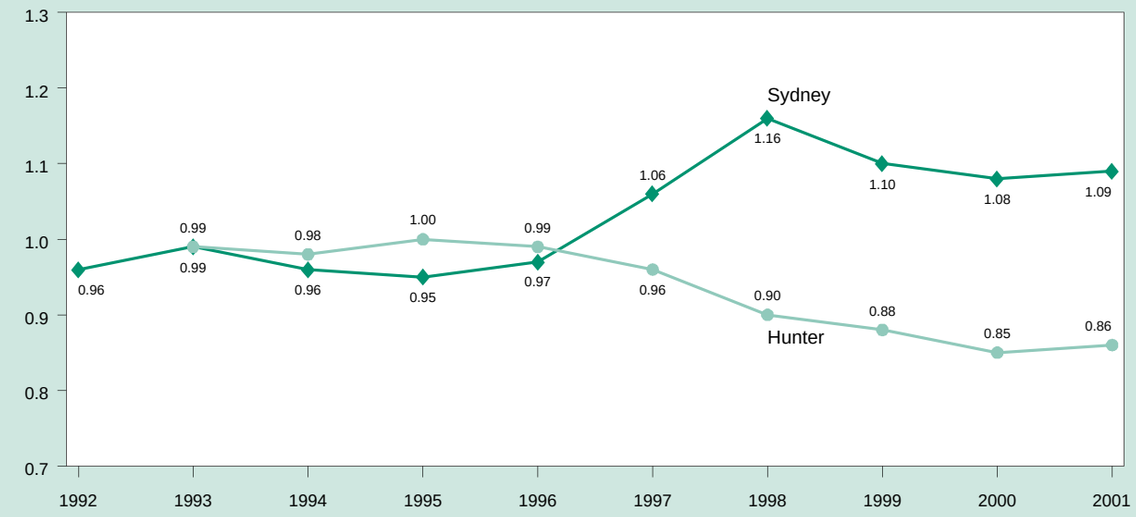
Source: NSW Environment Protection Authority. *Beachwatch and Harbourwatch State of the Beaches 2000–2001 Report.* Sydney: NSW EPA, 2001. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

- The NSW Environment Protection Authority (EPA) coordinates the *Beachwatch* and *Harbour watch* monitoring programs, which involve routine monitoring of bacterial levels to determine water quality at selected recreational sites.
- The program uses 2 indicator organisms, thermotolerant coliforms and enterococci, as recommended by the National Health and Medical Research Council (NHMRC) and the Australian and New Zealand Environment Conservation Council (ANZECC) recreational water quality guidelines. Enterococci are able to survive for longer periods in marine waters than thermotolerant coliforms, providing information on recent and residual or aged faecal contamination.
- Two *Beachwatch* monitoring programs were carried out during Winter 2000 and Summer 2000–2001. A total of 130 swimming sites were included in the program and 54 of the sites showed 100% compliance with both bacterial indicators. Also, 88% of the sites complied with the thermotolerant coliform criteria at all times.
- The Sutherland Shire beaches showed the lowest compliance rates. However, a substantial improvement in water quality at these beaches should be seen with the completion of the up-grade of the Cronulla Sewage Treatment Plant.
- The Illawarra and Hunter beaches showed high compliance both for thermotolerant coliform counts and enterococci counts.

For more information:

NSW Environment Protection Authority. *Beachwatch and Harbourwatch State of the Beaches Sydney–Hunter–Illawarra 2000–2001 Report.* Sydney, NSW EPA, 2001.

Fluoride levels in drinking water,
Sydney and Hunter Water Corporations, NSW 1992 to 2001



		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Flouride level (mg/L)	Sydney	0.96	0.99	0.96	0.95	0.97	1.06	1.16	1.10	1.08	1.09
Flouride level (mg/L)	Hunter	n/a	0.99	0.98	1.00	0.99	0.96	0.90	0.88	0.85	0.86

Note: The 1996 NHMRC–ARMCANZ guideline level for fluoride in water is 1.5 mg/L. The target dose for fluoride in NSW is 1.0 mg/L.

Source: Sydney and Hunter Water Corporations (Quarterly Reports).

- Fluoridation of drinking water supplies provides a significant dental health benefit, by reducing dental caries, along with the associated savings in the cost of treatment. It is carried out under the provisions of the *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 per litre (mg/L) of fluoride. 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 of fluoride.

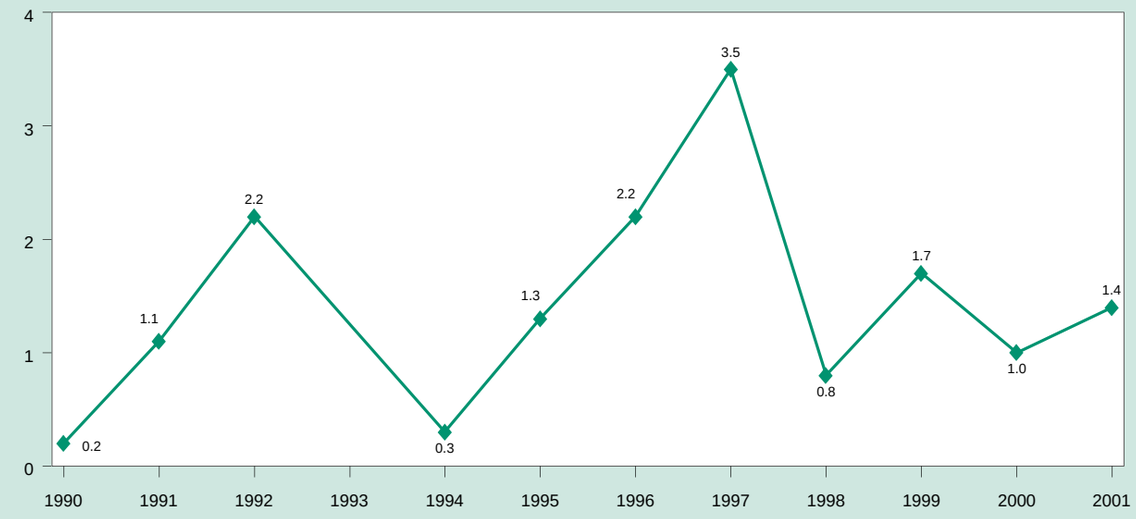
For more information:

National Health and Medical Research Council and Agricultural Resource Management Council of Australia and New Zealand. *Australian Drinking Water Guidelines 1996.* Canberra: NHMRC, 1996.

The Sydney Water Corporation Web site at www.sydneywater.com.au.

The Hunter Water Corporation Web site at www.hwc.com.au.

Pesticides in rural water supplies,
NSW 1990 to 2001



	% samples positive for pesticides in rural water supplies		% samples positive for pesticides in rural water supplies		% samples positive for pesticides in rural water supplies
1990	0.2	1994	0.3	1998	0.8
1991	1.1	1995	1.3	1999	1.7
1992	2.2	1996	2.2	2000	1
1993	.	1997	3.5	2001	1.4

Note: n/a = data not available

Source: Division of Analytical Laboratories, NSW Department of Health.

- Pesticides include many different agricultural chemicals, such as insecticides, herbicides, and other classes of chemicals. Some may be authorised for use in water or water catchment areas; otherwise their presence in drinking water or catchment areas indicates contamination.
- In greater metropolitan Sydney, test results from Sydney Catchment Authority, and the Sydney Water and Hunter Water Corporations for the period 1990–2001 indicate that pesticides were not detected in raw water sources or water supplied to customers. Raw water is tested, as it is deemed to be representative of treated water. Conventional treatment is not considered an adequate barrier for the removal of pesticides from drinking water.
- The monitoring program for regional and rural water supplies, funded by the NSW Department of Health, has been reoriented since 1999. The program now provides for targeted surveys in 5 to 6 local government areas or catchments each year. The council or water supply authority conducts sampling, while testing is undertaken by the NSW Health Division of Analytical Laboratories. The location of the surveys is expected to vary each year.
- Water supply authorities not participating in this program are expected to carry out sufficient monitoring or catchment surveys to satisfy themselves that their water supply is not at risk of pesticide contamination.
- During 2000 and 2001, 1381 samples were collected, with pesticides detected in only 17 regional and rural drinking water samples. Four pesticides—chlordane, endosulfan, dieldrin, and glyphosate—were found at levels exceeding NHMRC–ARMCANZ *Australian Drinking Water Guidelines 1996*.

For more information:

National Health and Medical Research Council and Agricultural Resource Management Council of Australia and New Zealand. *Australian Drinking Water Guidelines 1996.* Canberra: NHMRC, 1996.

Chapter 1.4

Health-related behaviours

- Unhealthy behaviours contribute significantly to the burden of death and ill-health in the NSW. For example:
  - —smoking causes more than 6500 deaths and more than 50,000 hospitalisations each year;
  - —use of illicit drugs causes around 400 deaths and more than 10,000 hospitalisations each year.
- Unhealthy behaviours affect people of all ages.

  Among adults:
  - —27% of men and 21% of women are current smokers;
  - —50% of men and 35% of women are overweight or obese, based on self-reported height and weight;

  while only:
  - —65% of men and 57% of women are adequately physically active;
  - —38% of men and 50% of women eat recommended quantities of fruit;
  - —10% of men and 21% women of eat recommended quantities of vegetables.
- Among secondary school students aged 12–16 years:
  - —18% of boys and 19% of girls are current smokers;
  - —34% of boys and 29% of girls have recently consumed alcohol;
  - —30% of boys and 24% of girls have used cannabis at least once.
- Among children aged up to 12 years:
  - —93% eat recommended quantities of fruit, but much of this is in the form of fruit juice, which may contain added sugar and is low in fibre;
  - —13% eat recommended quantities of vegetables;
  - —10% live in households with smokers who sometimes smoke inside.
- Encouragingly, though:
  - —smoking rates have declined among both men and women since 1990, and just over half of current adult smokers say that they intend to quit in the next 6 months;
  - —smoking rates and cannabis use in secondary school students have declined since 1996;
  - —the death rate from opiate overdose, and the number of ambulance attendances for overdose, declined considerably in 2000.

In this chapter

- Physical activity among adults
- Overweight and obesity among adults
- Fruit and vegetable consumption among adults
- Fruit and vegetable consumption among children
- Breastfeeding
- Sun protection among adults
- Sun protection among children
- Sun protection among secondary school students
- Smoking among adults
- Intention to quit smoking
- Smoking among secondary school students
- Households with smokers
- Death and illness attributable to smoking
- Alcohol use among adults
- Alcohol use by health area
- Alcohol use among secondary school students
- Death and illness attributable to alcohol
- Cannabis use among secondary school students
- Deaths from opiates
- Death and illness attributable to illicit drugs
- Ambulance attendances for drug overdose
- Methadone program use

Introduction

Good health enhances the quality of life and benefits the community. Opportunities to participate in and contribute to society are maximised in a healthy population. Social, economic, and environmental factors influence health and health-related behaviours, which in turn contribute to cardiovascular and respiratory diseases, cancer, and other conditions that account for much 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. This chapter includes information from the 1997 and 1998 NSW Health Surveys; the 2001 NSW Child Health Survey; the ABS National Health Surveys; the 1993, 1996, and 1999 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 existing data come from a range of surveys that used different modes. They may reflect real changes in the prevalence of behaviour, or differences due to variations in sampling and data collection methods.

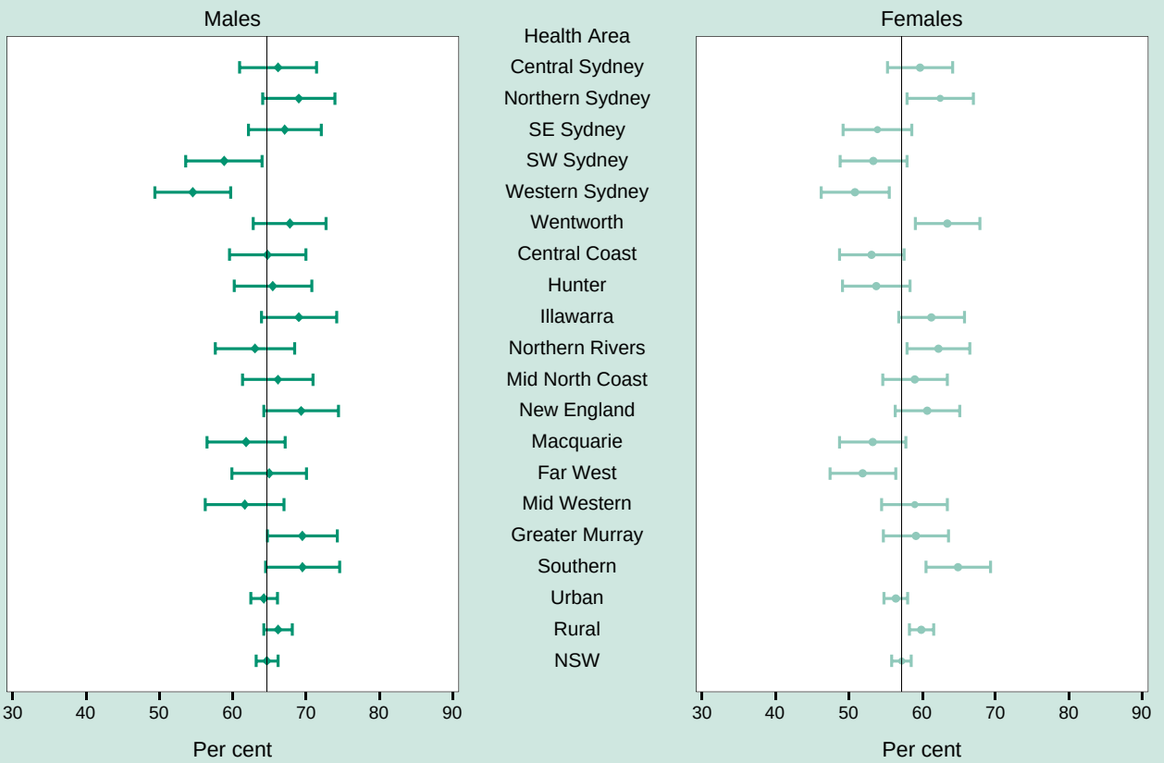
For details of the methods used for analysing data from the 1997 and 1998 NSW Health Surveys and the 2001 NSW Child Health Survey, refer to the Methods section.

For more information:

Epidemiology and Surveillance Branch. *1997 and 1998 NSW Health Survey Report.* Sydney: NSW Department of Health, 2000. Web site at www.health.nsw.gov.au/public-health/nswhs.

Health Promotion Branch Web site at www.health.nsw.gov.au/public-health/health-promotion.

Adequate energy expenditure by Health Area and sex, persons aged 16 years and over, NSW 1998



Note: A threshold value of 150 minutes was used to designate 'adequate' physical activity, calculated from adding (minutes walking + minutes moderate activity + minutes vigorous household chores + minutes heavy yardwork + 2 x minutes vigorous activity) in the last week. Estimates based on 17,494 respondents. 753 (4.3%) not stated for physical activity. All urban: includes Wentworth, Central Coast, Hunter, Illawarra and Sydney metropolitan health areas. Upper and lower limits of 95% confidence interval of the point estimate.

Source: 1998 NSW Health Survey (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Physical inactivity accounts for 6.7% of the disease and injury burden in Australia (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 days of the week for at least 30 minutes per day (US Department of Health and Human Services, 1996). Moderate intensity activity includes brisk walking, dancing, swimming, or cycling.
- Among males aged 16 years and over in 1998, reported levels of recommended physical activity ranged from 54.5% in Western Sydney Health Area to 69.5% in Greater Murray and Southern Health Areas. Among females, reported levels ranged from 50.9% in Western Sydney Health Area to 64.9% in Southern Health Area.
- Females from Western Sydney and Far West Health Areas were less likely than the state average to report recommended physical activity, as were males from Western Sydney and South Western Sydney Health Areas.
- The goal of *Simply Active Every Day*, is to increase safe and ongoing participation, particularly among less active people.

For more information:

Armstrong T, Bauman A, and Davies J. *Physical activity patterns of Australian adults.* Canberra: Australian Institute of Health and Welfare, 2000. www.aihw.gov.au.

Mathers C, Vos T, Stevenson C. T*he burden of disease and injury in Australia.* Canberra: Australian Institute of Health and Welfare, 1999. www.aihw.gov.au.

NSW Physical Activity Task Force. *Simply Active Every Day.* Sydney: NSW Department of Health, 1998.

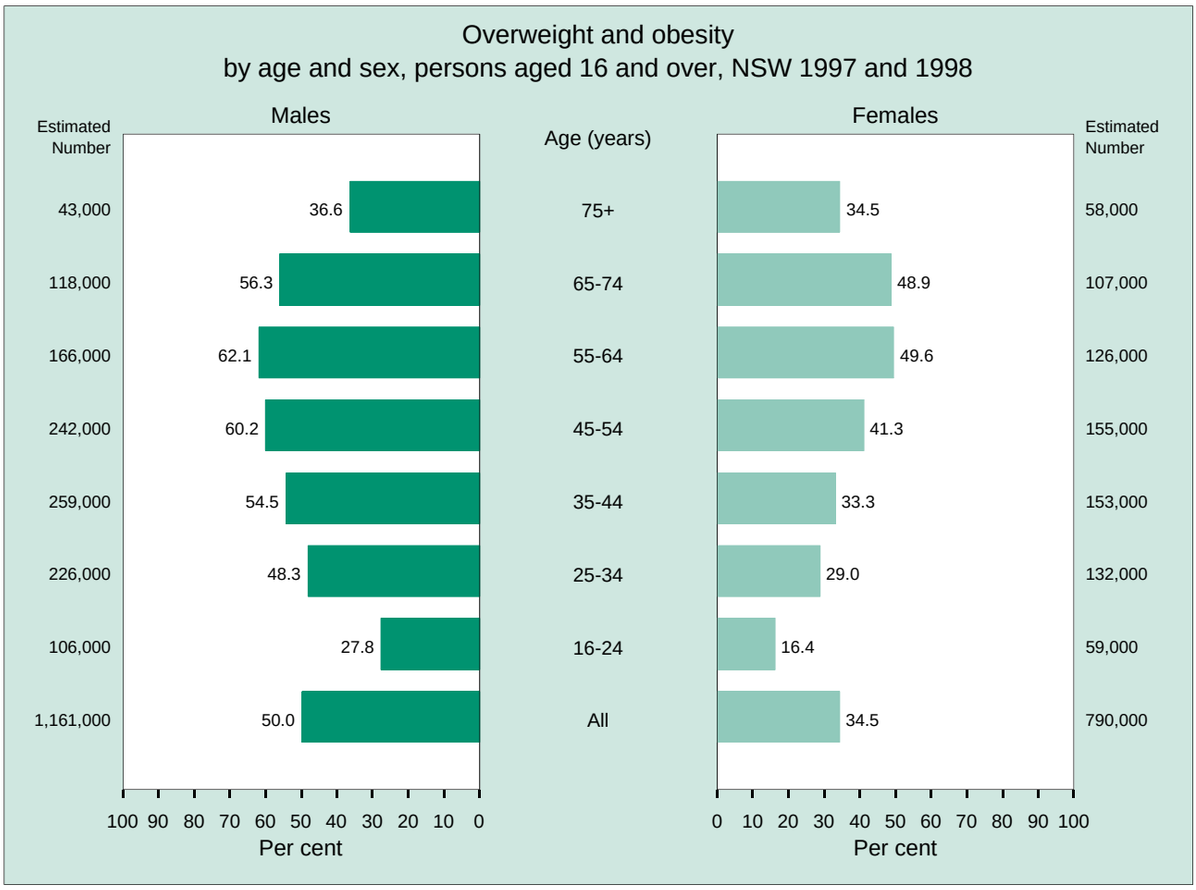
US Department of Health and Human Services. *Physical Activity and Health: A Report of the Surgeon General.* Atlanta: Centers for Disease Control and Prevention, 1996.

Adequate energy expenditure by health area and sex, persons aged 16 years and over, NSW, 1998

Health Area		Per cent	Lower 95% CI	Upper 95% CI	Estimated Number
Central Sydney	Males	66.2	60.9	71.4	124000
	Females	59.7	55.3	64.2	116000
	Persons	62.9	59.5	66.3	240000
Northern Sydney	Males	69.0	64.0	74.0	200000
	Females	62.4	57.9	67.0	186000
	Persons	65.7	62.3	69.0	385000
SE Sydney	Males	67.1	62.1	72.1	201000
	Females	53.9	49.2	58.6	163000
	Persons	60.5	57.0	63.9	365000
SW Sydney	Males	58.8	53.6	64.0	157000
	Females	53.4	48.8	57.9	148000
	Persons	56.0	52.6	59.5	305000
Western Sydney	Males	54.5	49.4	59.7	133000
	Females	50.9	46.2	55.5	122000
	Persons	52.7	49.2	56.2	255000
Wentworth	Males	67.8	62.8	72.8	70000
	Females	63.4	59.0	67.8	68000
	Persons	65.6	62.3	68.9	139000
Central Coast	Males	64.7	59.5	69.9	64000
	Females	53.1	48.7	57.5	58000
	Persons	58.7	55.2	62.1	122000
Hunter	Males	65.5	60.2	70.8	126000
	Females	53.8	49.2	58.4	103000
	Persons	59.6	56.1	63.2	229000
Illawarra	Males	69.0	63.9	74.1	85000
	Females	61.3	56.8	65.8	75000
	Persons	65.1	61.7	68.6	160000
Northern Rivers	Males	63.1	57.6	68.5	57000
	Females	62.2	57.9	66.5	59000
	Persons	62.6	59.2	66.1	116000
Mid North Coast	Males	66.1	61.3	71.0	60000
	Females	59.0	54.6	63.4	57000
	Persons	62.5	59.2	65.7	117000
New England	Males	69.3	64.3	74.4	42000
	Females	60.7	56.3	65.1	39000
	Persons	64.9	61.5	68.3	80000
Macquarie	Males	61.8	56.5	67.2	22000
	Females	53.3	48.8	57.8	20000
	Persons	57.5	54.0	61.0	42000
Far West	Males	65.0	59.9	70.1	12000
	Females	51.9	47.4	56.4	9000
	Persons	58.6	55.1	62.1	21000
Mid Western	Males	61.6	56.3	67.0	34000
	Females	59.0	54.5	63.5	34000
	Persons	60.3	56.8	63.8	69000
Greater Murray	Males	69.5	64.8	74.3	64000
	Females	59.1	54.7	63.6	54000
	Persons	64.4	61.1	67.6	118000
Southern	Males	69.5	64.5	74.6	45000
	Females	64.9	60.5	69.3	42000
	Persons	67.2	63.9	70.6	86000
Urban	Males	64.3	62.4	66.1	1160000
	Females	56.4	54.8	58.0	1040000
	Persons	60.3	59.1	61.5	2200000
Rural	Males	66.2	64.2	68.1	336000
	Females	59.9	58.2	61.6	314000
	Persons	63.0	61.7	64.3	649000
NSW	Males	64.7	63.2	66.2	1496000
	Females	57.2	55.9	58.5	1353000
	Persons	60.9	59.9	61.9	2849000

Note: A threshold value of 150 minutes was used to designate 'adequate' physical activity, calculated from adding (minutes walking + minutes moderate activity + minutes vigorous household chores + minutes heavy yardwork + 2 x minutes vigorous activity) in the last week. Estimates based on 17,494 respondents. 753 (4.3%) not stated for physical activity. All urban: includes Wentworth, Central Coast, Hunter, Illawarra and Sydney metropolitan Health Areas. LL/UL 95% CI = Lower and upper limits of 95% confidence interval of the point estimate.

Source: 1998 NSW Health Survey (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.



Note: Body Mass Index (BMI) = weight(kg)/height*height(m). BMI categories were as follows: underweight: BMI<18.5, acceptable weight: 20<=BMI<25, overweight: 25<=BMI 30, obese: BMI=30. Estimates based on 35,025 respondents. 1728 (4.9%) not stated for height or weight. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Health Surveys 1997 and 1998 (HOIST), Epidemiology and Surveillance Branch, NSW Department of Health.

- Consistent with world and Australian trends, NSW is experiencing an obesity pandemic. The high prevalence of overweight and obesity is a major public health problem, as it contributes to premature morbidity and mortality from many conditions, such as hypertension, cardiovascular disease, and non-insulin-dependent diabetes mellitus (NHMRC, 1997).
- In the 1997 and 1998 NSW Health Surveys, similar proportions of male (11.8%) and female (11.6%) respondents were classified as obese, while 38.2% of males and 22.9% of females were classified as overweight. Combining these 2 categories, 50% of male and 34.5% of female respondents were classified as overweight or obese.
- The results presented here underestimate the true prevalence of overweight and obesity, because they rely on self-report of height and weight. A validation study of 1997 NSW Health Survey data reported that the prevalence of overweight and obesity was underestimated by 23% for men and 15% for women (Flood et al., 2000).
- 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. More males of all ages were classified as overweight or obese.
- The NSW Department of Health has developed a strategic plan for public health nutrition, *Eat Well NSW*. Strategies emphasise healthy eating habits, increased energy expenditure, and life skills that support healthy decision-making (NSW Department of Health, 2002).

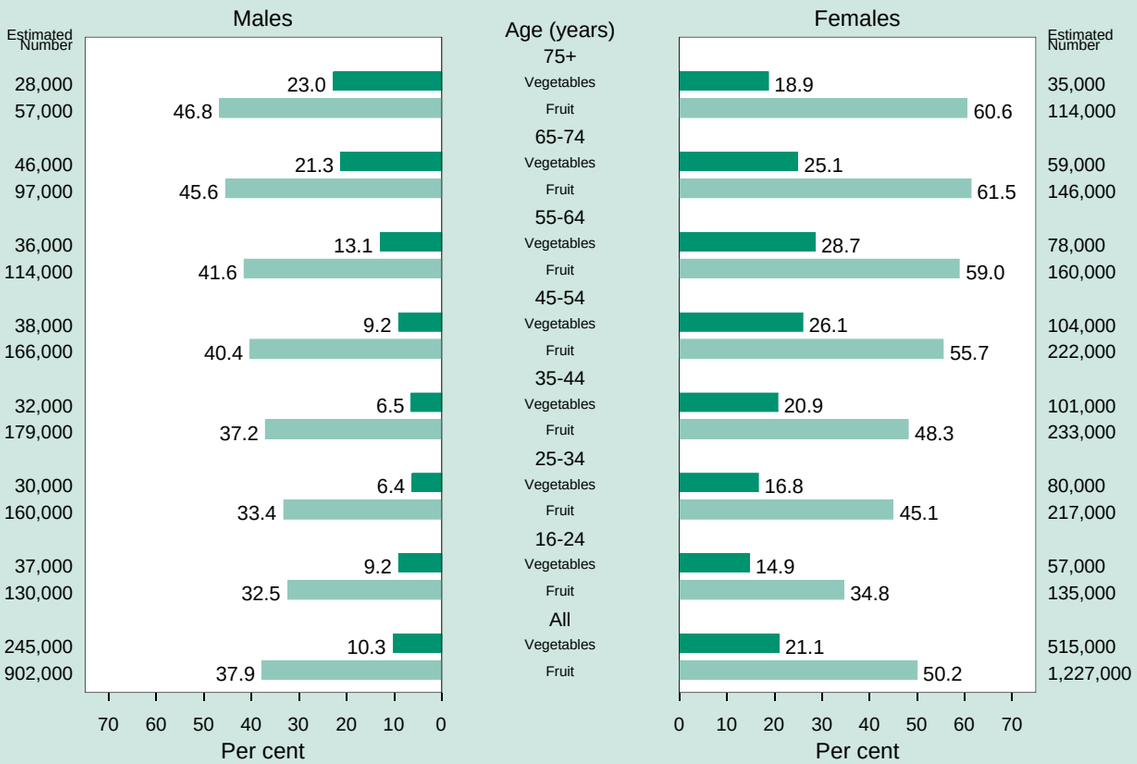
For more information:

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.* Canberra: NHMRC, 1997.

Public Health Division. *Eat Well NSW.* Sydney: NSW Department of Health, 2002.

Adequate fruit and vegetable consumption by age and sex, persons aged 16 and over, NSW 1997 and 1998



Note: Recommended daily consumption of vegetables is 4 serves for females aged over 12 and males aged 12–18 or over 60, and five serves for males aged 19–60. One serve is equivalent to 1/2 cup of cooked vegetables or 1 cup of salad vegetables. Recommended daily consumption of fruit is 3 serves for people aged 12–18, and 2 serves for people aged 19 and over. One serve is equivalent to 1 medium piece or 2 small pieces of fruit. Estimates based on 35,025 respondents. 141 (0.4%) not stated for serves of vegetables eaten and 86 (0.2%) not stated for serves of fruit eaten. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

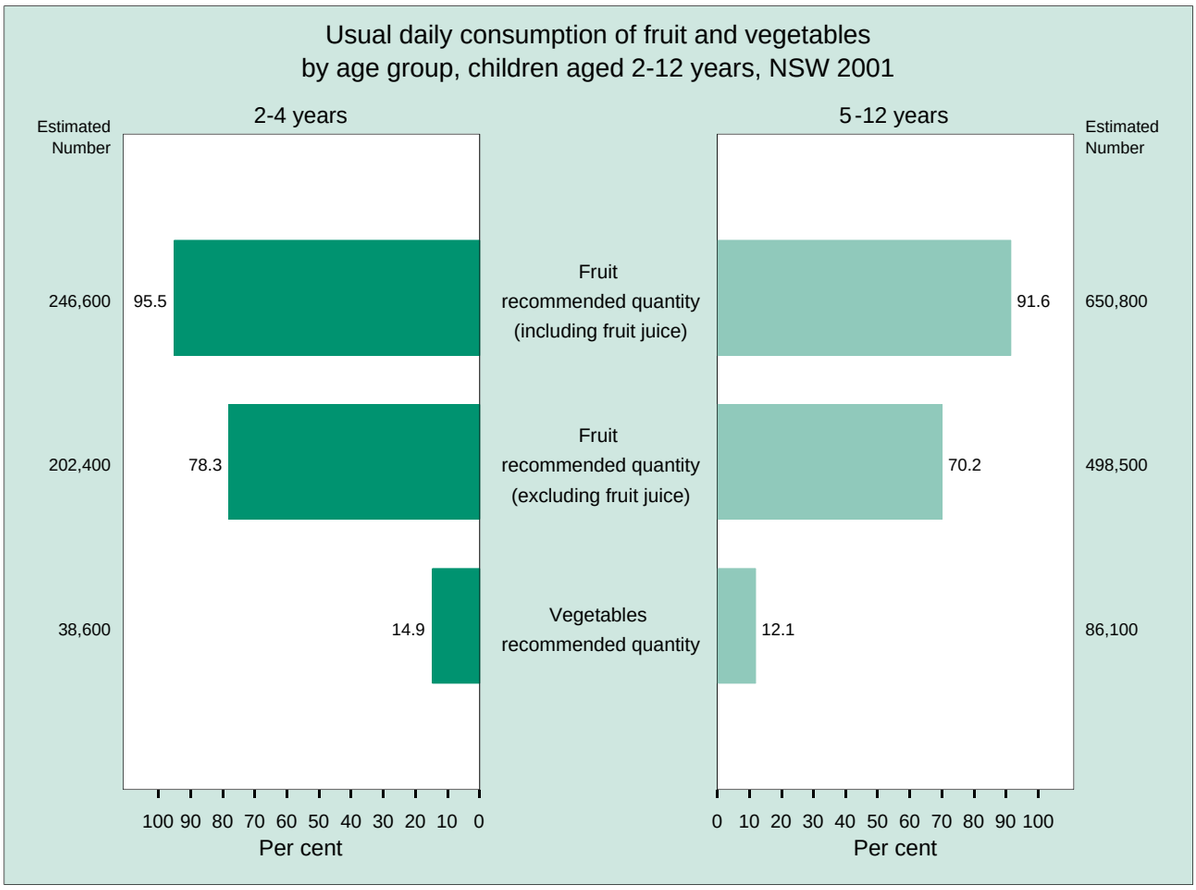
Source: NSW Health Surveys 1997 and 1998 (HOIST), Epidemiology and Surveillance Branch, NSW Department of Health.

- Recommended consumption of fruit and vegetables is protective against coronary heart disease, hypertension, stroke, diabetes mellitus, and many forms of cancer (National Public Health Partnership, 2001). Vegetables and fruit are 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).
- At the 1997 and 1998 NSW Health Surveys, twice as many females (21.1%) as males (10.3%) reported adequate consumption of vegetables. The proportion of males who reported eating recommended quantities of vegetables increased with age, while in females this proportion increased to age 55–64 years and then declined. More females than males reported adequate consumption of vegetables across all age groups, except among people aged 75 years or more.
- Just over half of females (50.2%), and 37.9% of males reported recommended consumption of fruit. The proportion of males who reported eating recommended quantities of fruit increased with age, while in females this proportion increased to age 65 years and then levelled out. Across all age groups more females than males reported adequate consumption of fruit.
- The NSW Department of Health document *Eat Well NSW* sets out population strategies for increasing consumption of vegetables and fruit.

For more information:

National Public Health Partnership. *Eat Well Australia*. Canberra: Strategic Inter-Governmental Nutrition Alliance, 2001. www.nphp.gov.au/signal.

Public Health Division. *Eat Well NSW*. Sydney: NSW Department of Health, 2002.



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 1 cup of salad vegetables. Recommended daily consumption of fruit is 1 or more serves for children aged 2–11, and 3 or more serves for children aged 12. One serve is equivalent to 1 medium piece of fruit, 1/2 cup of fruit juice or 2 tablespoon of dried fruit. Estimates based on 7916 respondents. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Child Health Survey 2001 (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Healthy diets in childhood are important because they shape diets in later life. Many chronic diseases, including cardiovascular diseases and osteoporosis, may have their beginnings in childhood (Mascarenhas et al., 1999).
- Fruits and vegetables are a significant source of antioxidants, which play an important protective role in many diseases including cardiovascular and eye diseases (Machlin, 1995). Fruits and vegetables are important sources of dietary fibre, complex carbohydrates, and folate; an increase in their consumption will most likely result in a corresponding decrease in fat intake.
- In the 2001 NSW Child Health Survey, most children aged 2–4 years (95.5%) and 5–12 years (91.6%) 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 (NHMRC, 2001). If fruit juice was excluded, the proportion of children reported to consume the recommended minimum daily quantity of fruits dropped considerably.
- Less than 1 in 7 children aged 2–4 years (14.9%) and 5–12 years (12.1%) were reported to consume the recommended daily minimum quantity of vegetables.

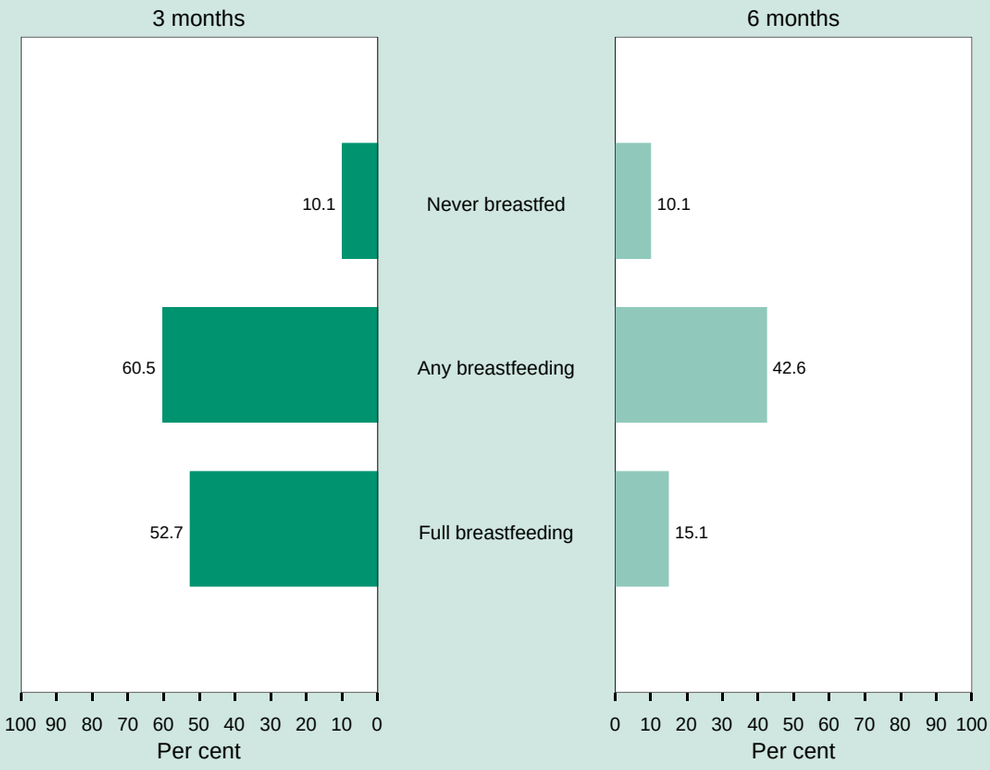
For more information:

Machlin L. Critical assessment of epidemiological data concerning the impact of antioxidant nutrients on cancer and cardiovascular disease. *Crit Rev Food Sci Nut* 1995; 35: 41–50.

Mascarenhas MR, Tershakovec AM, Stettler N. Nutrition interventions in childhood for the prevention of chronic diseases in adulthood. *Curr Opin Pediatr* 1999; 11: 598–604.

National Health and Medical Research Council. *Draft dietary guidelines for children and adolescents*. Canberra: NHMRC, 2001.

Breastfeeding status of infants at 3 months and 6 months of age
children aged less than 2 years, NSW 2001



Note: Full breastfeeding = breastfed only, no solids or milk substitutes but may include water. Estimates were based on 1487 respondents and were produced using survival analysis (see Methods section).

Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

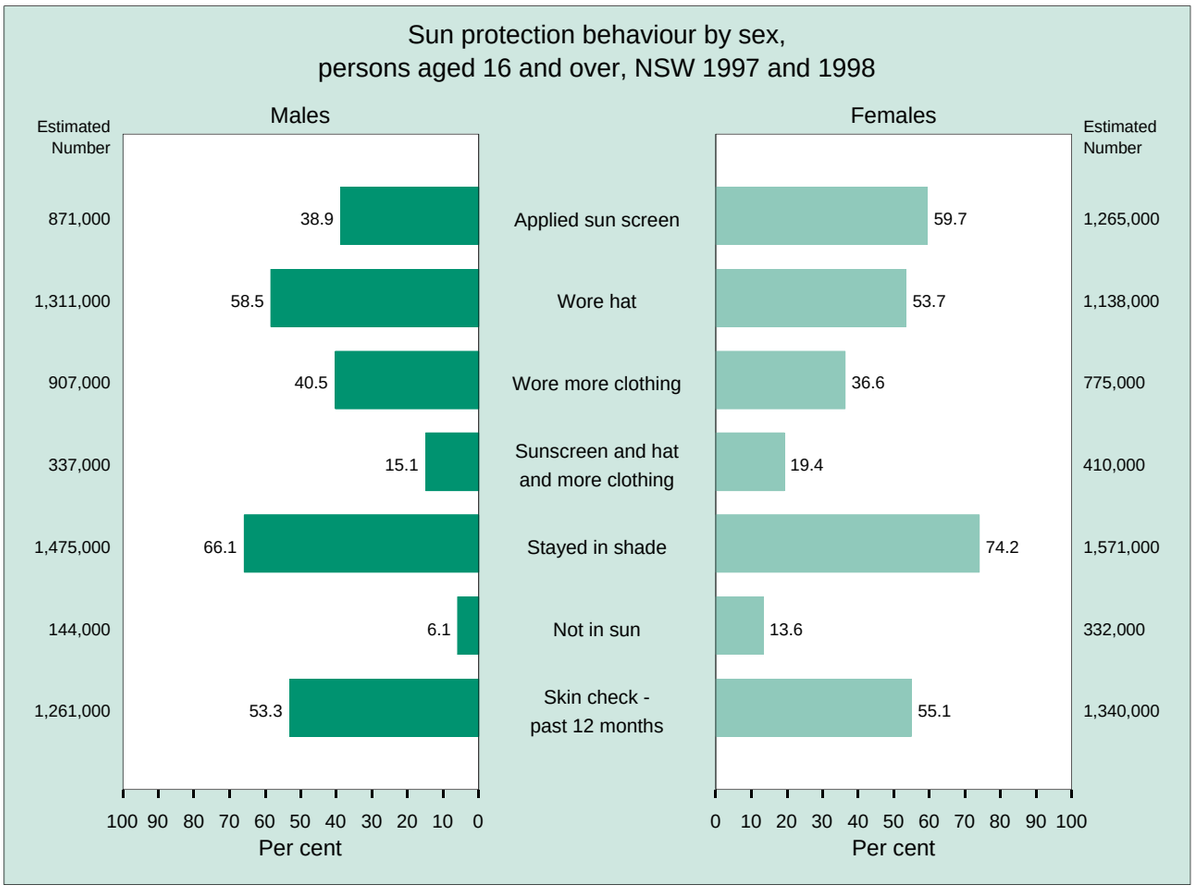
Source: NSW Child Health Survey, 2001 (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Breastfeeding has health advantages for both infants and mothers. For infants, these include protection against diarrhoeal illnesses, respiratory infections, and otitis media; reduced risk of childhood obesity; and improved visual acuity and psychomotor development. For mothers, benefits include quicker recovery from childbirth, and reduced risk of ovarian cancer and premenopausal breast cancer (NHMRC, 2001). The World Health Organization (WHO) recommends exclusive breastfeeding to the age of 6 months and sustained breastfeeding together with adequate complementary foods thereafter for up to 2 years of age or beyond (WHO, 2002).
- In the 2001 Child Health Survey, mothers of children aged less than 2 years were asked a series of questions about breastfeeding and infant feeding practices.
- Most mothers (89.9%) reported that their infant had been breastfed. However, many breastfed their baby for only a short period, with only 76.5% of babies still being breastfed at 4 weeks of age. At 3 months of age, this proportion was 60.5%, and at 6 months of age it had dropped to 42.6%.
- With regard to full breastfeeding (breastfed only, with no solids or milk substitutes), just over half of mothers (52.7%) reported that their child was fully breastfed at 3 months of age. Less than 1 in 6 (15.1%) reported that their child was fully breastfed at 6 months of age.

For more information:

National Health and Medical Research Council. *Draft dietary guidelines for children and adolescents*. Canberra: NHMRC, 2001.

World Health Organization. *Nutrition and Infant Feeding*. www.who.int/child-adolescent-health/NUTRITION/infant.htm.



Note: All responses refer to usual behaviours from the pre-survey summer between the hours of 11.00 a.m. and 3.00 p.m. The survey defined: Sun screen as when a broad spectrum 15+ sunscreen (no less) was applied to at least half of all exposed skin; Wore protective clothing as wore more clothing to protect yourself from the sun; 'Wore a hat' as wearing a wide-brimmed hat or cap with a flap; Skin check during the past 12 months as deliberately checking the skin for changes during the past 12 months. Estimates for 'not in sun' and 'skin checks' bsaed on 32,025 respondents. Estimates for protection when in the sun based on 31,429 respondents who were ever in the sun for at least 15 minutes between 11.00 a.m. and 3.00 p.m.
Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Health Surveys 1997 and 1998 (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

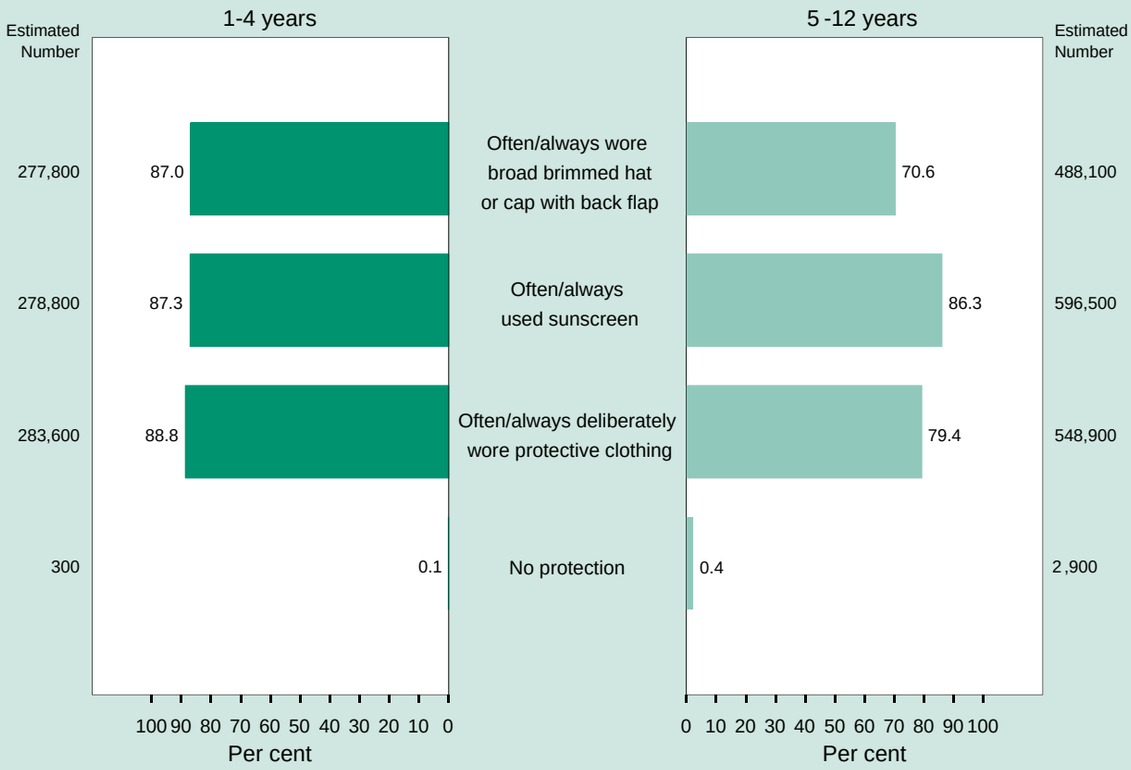
- Australia has the highest incidence of skin cancer in the world. Unprotected exposure to solar ultra-violet radiation (UVR) is the primary modifiable risk factor in the development of skin cancer.
- Apart from avoiding exposure, combining a range of sun protective behaviours when outside is the most effective way to minimise exposure to UVR (Cancer Council Australia, 2001).
- In NSW in 1997 and 1998, women were more likely than men to report usually or always staying in the shade or applying sunscreen. Men were more likely to report wearing protective clothing or a hat. Women (13.6%) were more than twice as likely as men (6.1%) to state that they did not go out in the sun during summer between 11.00 a.m. and 3.00 p.m. Women were more likely (19.4%) than men (15.1%) to combine sun protective behaviours: that is, usually or often apply sunscreen, wear more protective clothing, and wear a hat when outside between 11.00 a.m. and 3.00 p.m.
- The NSW Department of Health and The Cancer Council NSW are working with key stakeholders to reduce the incidence of skin cancer and associated morbidity and mortality through the *Skin Cancer Prevention Strategic Plan for New South Wales 2001–2005*. The plan outlines priorities for environmental, organisational, and community strategies and outcomes at state, area, regional, and local levels.

For more information:

The Cancer Council Australia. *National Cancer Prevention Policy 2001–03*. The Cancer Council Australia, 2001.

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

Use of hats, sunscreen and protective clothing last summer, by age group, children aged 1-12 years who were exposed to sun, NSW 2001



Note: Estimates based on 8372 children who were ever in the sun for at least 15 minutes between 11.00 a.m. and 3.00 p.m. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

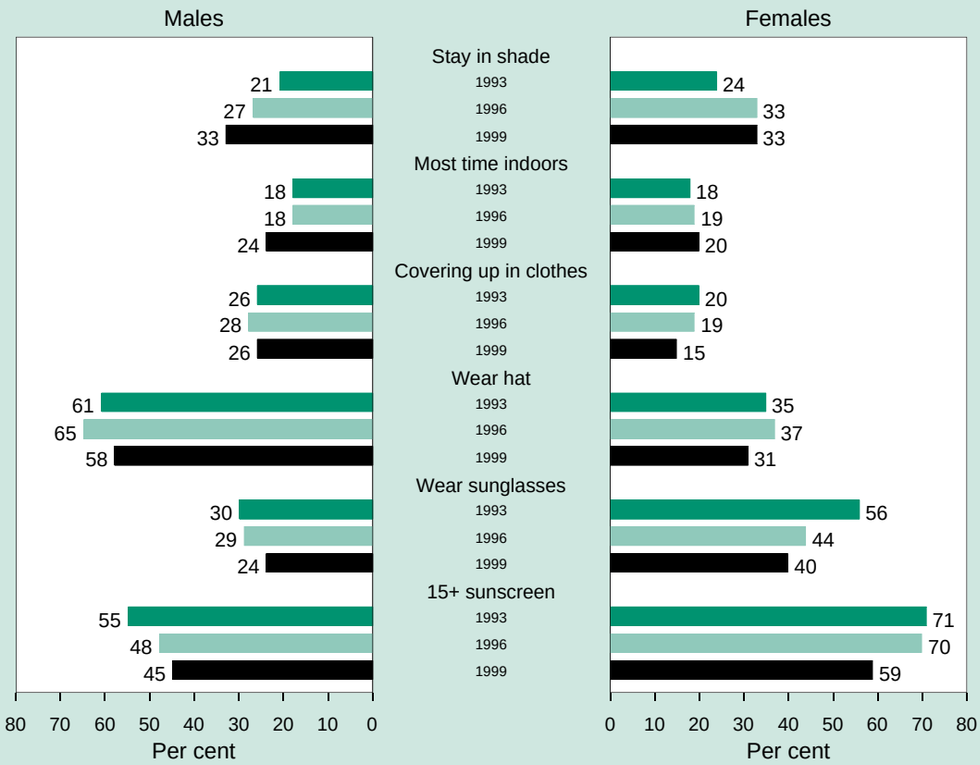
Source: NSW Child Health Survey 2001 (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Australia has the highest incidence of skin cancer in the world and melanoma is the third most common potentially fatal cancer. Unprotected exposure to solar ultra-violet radiation (UVR) is the primary modifiable risk factor in the development of skin cancer, and childhood exposure has been shown to be particularly important in increasing the risk of skin cancer in later life (National Health and Medical Research Council, 1996). Sun protection behaviours play a key role in minimising the risk of developing skin cancer.
- In the 2001 NSW Child Health Survey, parents and carers of children aged 12 months and over were asked to describe their use of sun protection measures in the previous summer.
- When out in the sun for 15 minutes or more between 11.00 a.m. and 3.00 p.m., most children aged 1–4 years were reported to have often or always used sunscreen (87.3%), worn a broad-brimmed hat or cap with a flap (87.0%), and worn protective clothing (88.8%). Reported use of sunscreen was similar among older children, with 86.3% of children aged 5–12 years reported to have used it often or always. However, smaller proportions of these older children were reported to often or always worn a broad-brimmed hat or cap with a flap (70.6%) or protective clothing (79.4%).

For more information:

National Health and Medical Research Council. *Primary prevention of skin cancer in Australia.* Canberra: NHMRC, 1996.

Sun protection behaviours by sex,
secondary school students aged 12-16 years, NSW 1993, 1996 and 1999



Note: Figure gives proportions of students who responded 'usually' or 'always' to the following questions: 'Thinking about sunny days in summer, when you are in the sun for an hour or more between 11.00 a.m. and 3.00 p.m., how often would you: stay mainly in the shade, spend most of the time indoors, wear clothes covering most of your body, wear a hat, wear sunglasses?'. For 1999, the maximum protection sunscreen includes SPF 15+ and SPF 30+. For 1996, the maximum protection sunscreen included only SPF15+. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

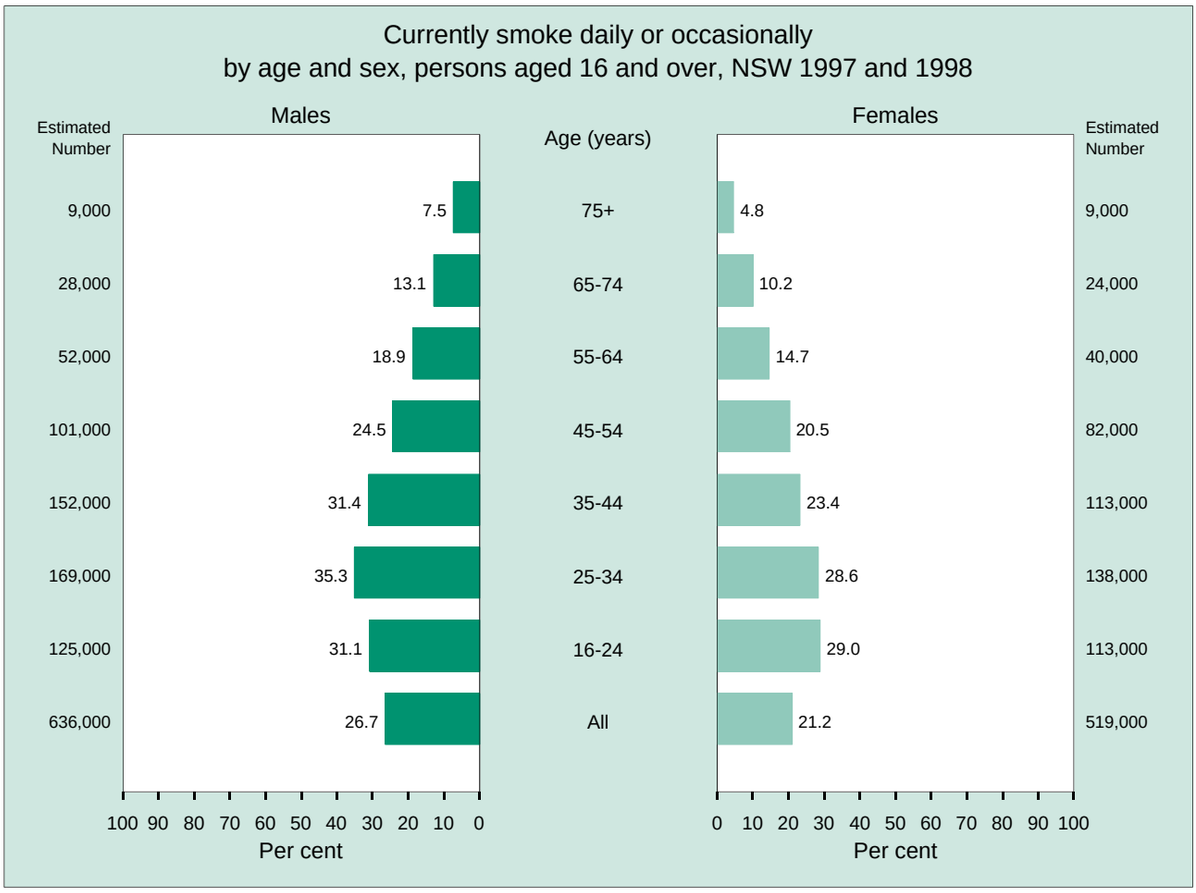
Source: The Australian Secondary Schools' Alcohol and Drugs Surveys. NSW Department of Health and NSW Cancer Council.

- Childhood and adolescence is the time of life when the most time is spent outdoors. Reducing one's exposure to UV radiation, particularly between the ages of 0–15 years, is the principle modifiable risk factor for skin cancer. Use of personal skin protection measures, and avoiding outdoor activities during peak UV radiation time between 11.00 a.m. and 3.00 p.m., are the most effective methods of reducing exposure.
- Less than half of secondary school students in 1999 were practising sun protection. The most commonly reported sun protection measures among female students were 'wearing sunscreen' (59%) and 'wearing sunglasses' (40%), with 'covering up in clothes' (15%) the least common. Among males, 'wearing a hat' (58%) and 'wearing sunscreen' (45%) were most popular, and 'wearing sunglasses' (24%) and 'most time indoors' (24%) least often reported.
- Self-reported regular use of 15+ sunscreen, wearing sunglasses, and hat-wearing had all declined among both male and female students, compared to previous surveys. Covering up in clothes when out in the sun and use of sunscreen both declined considerably among females between 1993 and 1999. Reports of 'staying in the shade' and 'most time indoors' increased among males over the same period.
- The *Skin Cancer Strategic Plan 2001–2005* (The Cancer Council NSW and NSW Department of Health, 2001) outlines policy directions, and monitoring priorities for New South Wales.

For more information:

Schofield W, Lovelace K et al. *Self Reported Behaviours of NSW Secondary School Students—Sun Protection, Physical Activity, Eating Patterns, and Injury.* Sydney: The Cancer Council NSW and NSW Department of Health, 2002.

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



Note: Current smoking includes daily and occasional use. Estimates based on 35,025 respondents. 6 (0.0%) not stated for current smoking status.

Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Health Surveys 1997 and 1998 (HOIST), Epidemiology and Surveillance Branch, NSW Department of Health.

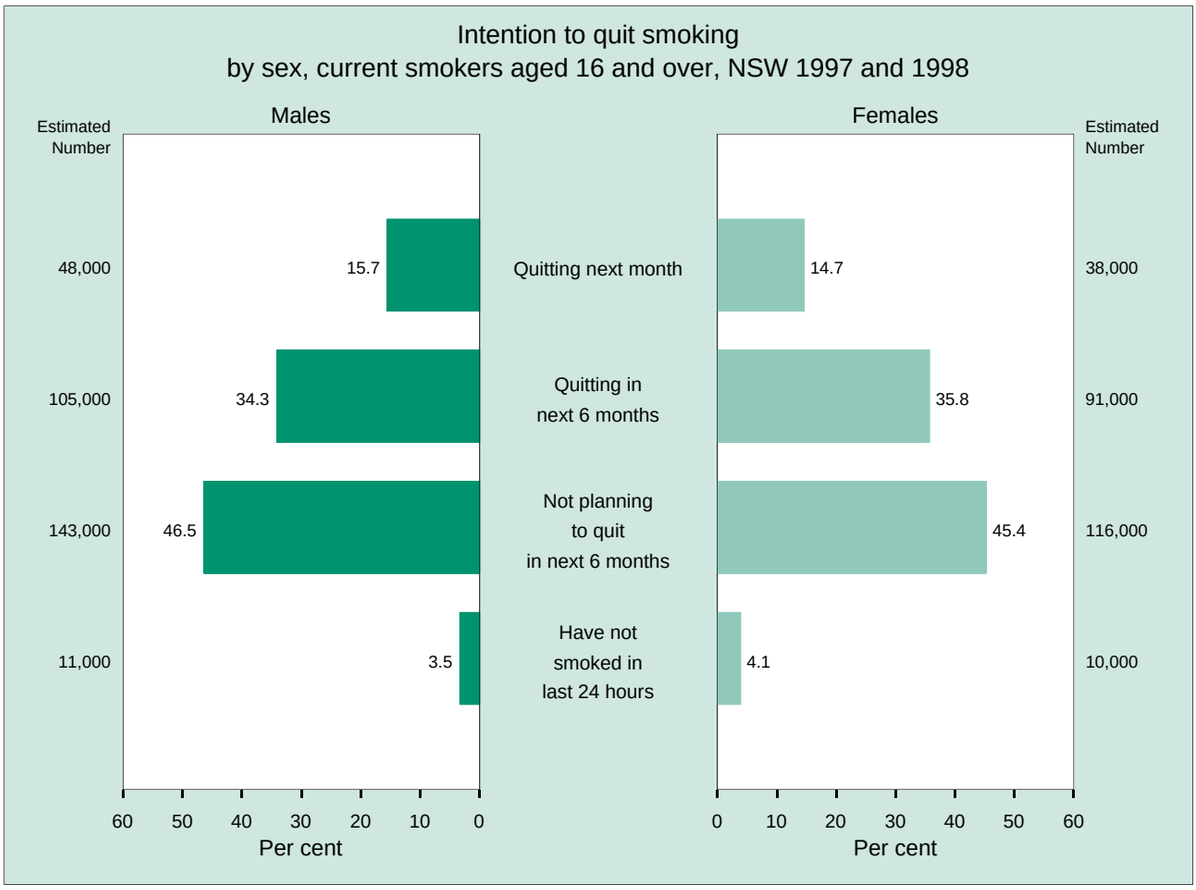
- Smoking is a leading cause of mortality and morbidity in NSW; and is the main cause, or a significant cause, of many diseases including cancer and cardiovascular disease. Of all behavioural risk factors, tobacco use (including passive smoking) is responsible for the greatest burden of premature death and disability (Mathers et al., 1999).
- This chart presents data on current smoking from the 1997 and 1998 NSW Health surveys. Overall, 26.7% of all males and 21.2% of females reported being current 'daily' or 'occasional' smokers. Smoking rates in NSW have declined by approximately 4% among both men and women since 1989–90.
- Rates of current smoking were highest in young adults. In males, current smoking peaked at 35.3% in the 25–34 years age group and declined to 7.5% in the 75+ age group. In females, the highest rate of current smoking (29%) was reported in the 16–24 years age group; remained high among women aged 25–29 years (28.6%); and declined steadily to only 4.8% among women aged 75 years and over.
- The *NSW Tobacco Action Plan 2001–2004* focuses on 6 key strategy areas to reduce tobacco related harm. These are: community awareness and education; smoking cessation; availability and supply of tobacco products; marketing and promotion of tobacco products; tobacco product regulation; and exposure to environmental tobacco smoke.

For more information:

Mathers C, Vos T, Stevenson C. *The burden of disease and injury in Australia.* Canberra: AIHW, 1999. www.aihw.gov.au .

Public Health Division. *NSW Tobacco Action Plan 2001–2004.* Sydney: NSW Department of Health, 2001. Online: www.health.nsw.gov.au.

Victorian Smoking and Health Program. *Tobacco in Australia: Facts and Issues.* Melbourne: Quit Victoria, 1995. http://203.147.184.40/quit/Fandl/welcome.htm.



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 to planning on quitting in the next month. Estimates based on 4272 respondents who currently smoke regularly or occasionally. 131 (3.1%) not stated for intention to quit smoking. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Health Surveys 1998 (HOIST), Epidemiology and Surveillance Branch, NSW Department of Health.

- Smoking cessation has immediate health benefits. Ex-smokers have improved life expectancy and reduced risk of smoking-related disease (Fiore et al., 2000). While the proportion of ex-smokers has increased steadily since the mid-1970s (CDHAC, 1999), around 80% of smokers have made unsuccessful attempts to quit (Borland, 1990).
- In the 1998 NSW Health Survey, respondents were asked about their intention to quit smoking. Just over half (50.2%) who reported being current smokers said they intended to quit in the next 6 months, while just under half (46.5%) reported they were not planning to quit in the next 6 months. Results were similar for males and females.
- The proportion reporting that they did not intend to quit in the next 6 months increased with age, from 39.6% in the 16–24 age group to 75.6% among those aged 75 years or more. The proportion reporting that they did not plan to quit did not vary markedly among health areas or by degree of remoteness.
- Access to smoking cessation services is an integral part of the *NSW Tobacco Action Plan 2001–2004*. NSW Quitline provides smoking cessation information and advice, and is accessible for the cost of a local call throughout NSW.

For more information:

Borland R, Hill D. Two month follow up on callers to a telephone quit smoking service. *Drug and Alcohol Review.* 1990; 9; 211–218.

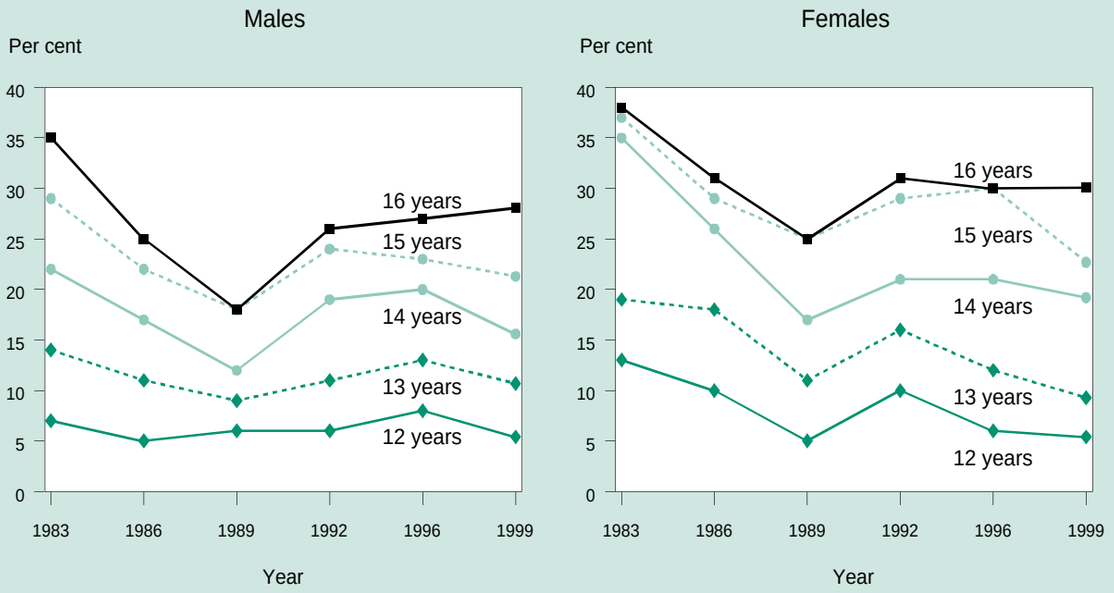
Fiore MC, Baily WC, Cohen SJ, et al. *Treating tobacco use and dependence.* Rockville MD: US Department of Health and Human Services, 2000.

Public Health Division. *NSW Tobacco Action Plan 2001–2004.* Sydney: NSW Department of Health, 2001.

NSW Quitline phone 131848.

US Department of Health and Human Services. *The health benefits of smoking cessation.* Rockville, MD: Office on Smoking and Health, 1990.

Current tobacco use by age and sex,
secondary school students aged 12-16 years, NSW 1983 to 1999



Note: Current smoking includes daily and occasional smokers for earlier surveys (1983–1992). Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: Australian Secondary Schools' Alcohol and Drug Surveys, NSW Department of Health and NSW Cancer Council.

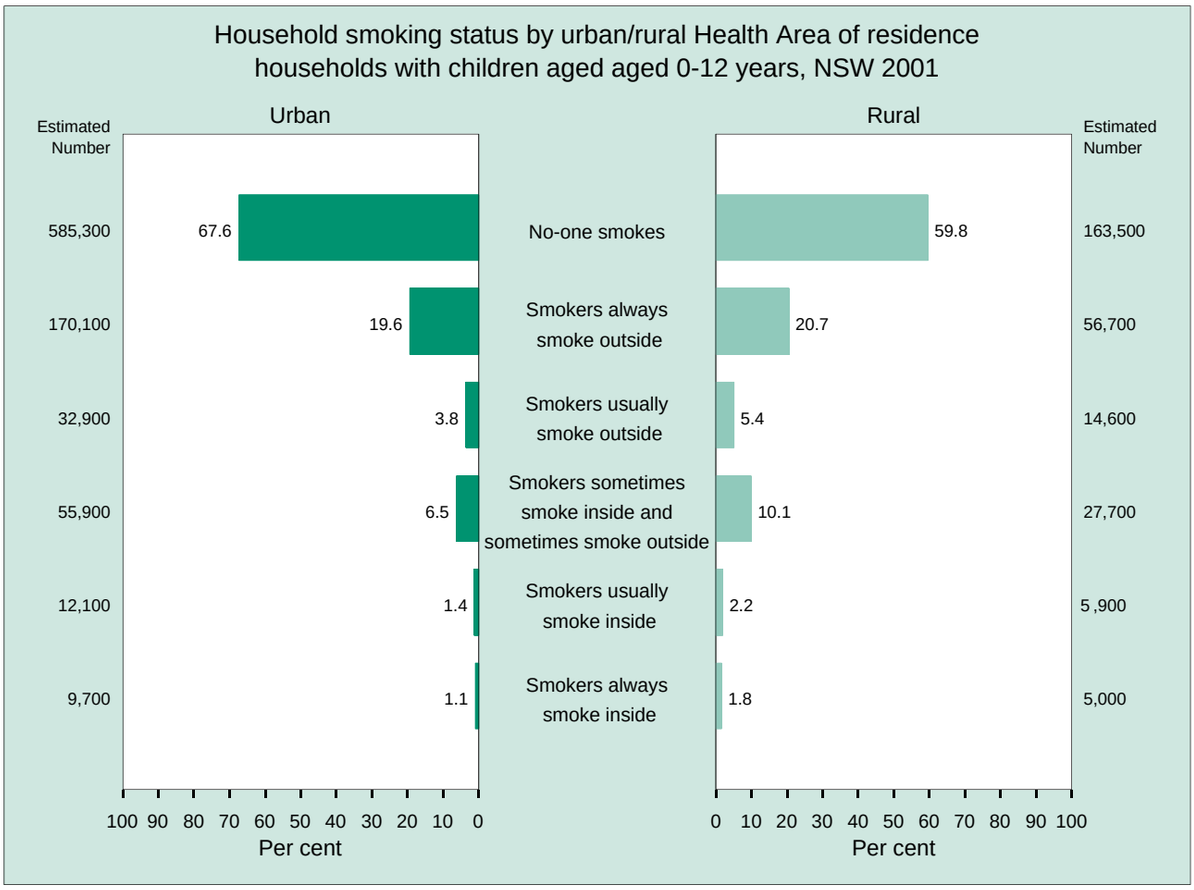
- Most people who become long-term smokers started smoking during their secondary school years, and early uptake is associated with heavier smoking patterns and greater difficulty in quitting. Nicotine dependence is established rapidly even among adolescents (Fiore et al., 2000).
- Among NSW secondary school students aged 12–16 years in 1999, 54% of males and 52% of females reported ever smoking. Overall, 18% of males and 19% of females were recent smokers. During the 1980s there was a decline in current (daily and occasional) smoking among both sexes, followed by an increase between 1989 and 1992. Between 1996 and 1999 there was an overall decline of 2.4% in the proportion of students who reported smoking in the week prior to the survey.
- Most secondary students who smoke do not buy their own cigarettes. In 1996, 32% of cigarettes were bought by the student, declining to 28% in 1999. There was a corresponding increase over the same period in the proportion of cigarettes given by a friend, from 68% in 1996 to 72% in 1999.
- When asked in 1999 about the degree of difficulty of 'giving up smoking forever', 86% of male students and 93% of females thought it would be 'fairly–very hard' or 'impossible'. This represents a significant increase since the 1996 survey.
- The *NSW Tobacco Action Plan 2001–2004* (NSW Department of Health, 2001) identifies young people as a priority group for smoking cessation, and outlines a broad range of stakeholders and strategies to reduce smoking and access to tobacco products.

For more information:

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

Lovelace KS, Schofield WN, Mckenzie JE, Thomas MM. *Self-reported behaviours of secondary students. NSW 1999 Statistical Bulletin—Tobacco.* Sydney: The Cancer Council NSW and NSW Department of Health Department, 2001.

Public Health Division. *NSW Tobacco Action Plan 2001–2004*. Sydney: NSW Department of Health, 2001.



Note: Health areas in Greater Sydney, Hunter and Illawarra were classified as urban. Estimates based on 9425 respondents.
Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Child Health Survey 2001 (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

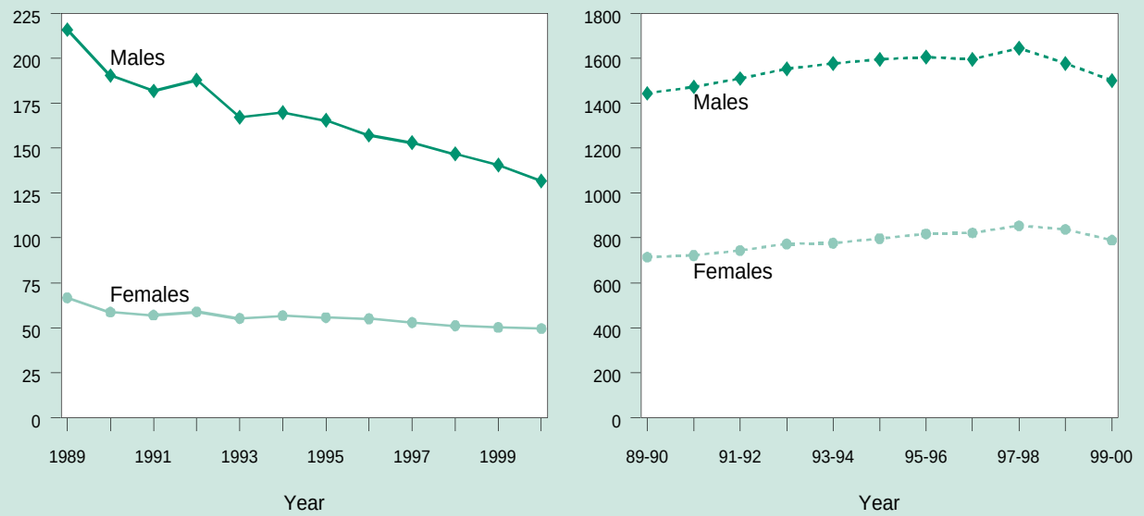
- Children are particularly vulnerable to the adverse effects of passive smoking. Parental smoking causes lower respiratory infections, middle ear disease, asthma, and sudden infant death syndrome (SIDS). Passive smoking also exacerbates symptoms of asthma (Cook and Strachan, 1999; Wahlgren et al., 2000).
- In the 2001 NSW Child Health Survey, parents and carers of children aged up to 12 years were asked to describe the smoking status of their household. Two-thirds of respondents (65.7%) reported that no-one living in their household smoked. A further one-quarter (24.1%) reported that smokers living in the household usually or always smoked outside the house. The remaining respondents (10.2%) reported that smokers living in the household sometimes, usually, or always, smoked inside the house.
- The proportion of parents and carers reporting that their household was smoke-free was lower among residents of rural health areas (80.5%) than urban health areas (87.2%). This difference reflected both a higher prevalence of smoking among residents of rural areas, and a greater proportion of smokers smoking inside the home.

For more information:

Cook DG, Strachan DP. Health effects of passive smoking—10: Summary of effects of parental smoking on the respiratory health of children and implications for research. *Thorax* 1999; 54: 357–366.

Wahlgren DR, Hovell MF, Meltzer EO, Meltzer SB. Involuntary smoking and asthma. *Curr Opin Pulm Med* 2000; 6: 31–36. www.abs.gov.au.

Deaths and hospital separations attributable to smoking
by sex, NSW 1989 to 2000



			1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Number	Males	Deaths	5290	4792	4701	4967	4535	4722	4704	4603	4618	4548	4487	4322
	Females		2284	2042	2045	2160	2078	2202	2209	2258	2243	2205	2214	2256
	Males	Separations	38931	40565	42413	44546	46236	47707	49038	49916	52674	51595	50153	.
	Females		22987	23621	24857	26239	26720	27871	29078	29766	31486	31361	30163	.
Rate	Males	Deaths	215.9	190.3	181.8	187.8	167.2	169.9	165.4	157.1	153.1	146.7	140.5	131.8
per 100,000	Females		66.7	58.7	57.0	58.9	55.3	56.8	55.7	55.1	52.9	51.1	50.2	49.6
	Males	Separations	1443.4	1472.4	1509.6	1553.2	1576.4	1595.0	1605.3	1595.1	1644.9	1577.1	1500.7	.
	Females		714.6	722.1	744.0	773.5	776.8	797.2	818.3	822.5	854.3	838.2	789.5	.

Note: Deaths and hospital separations attributable to smoking were calculated using age- and sex-specific aetiologic fractions from AIHW, 2001. Deaths are for calendar years. Separations are for financial years. Rates were age-adjusted using the Australian population as at 30 June 1991. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

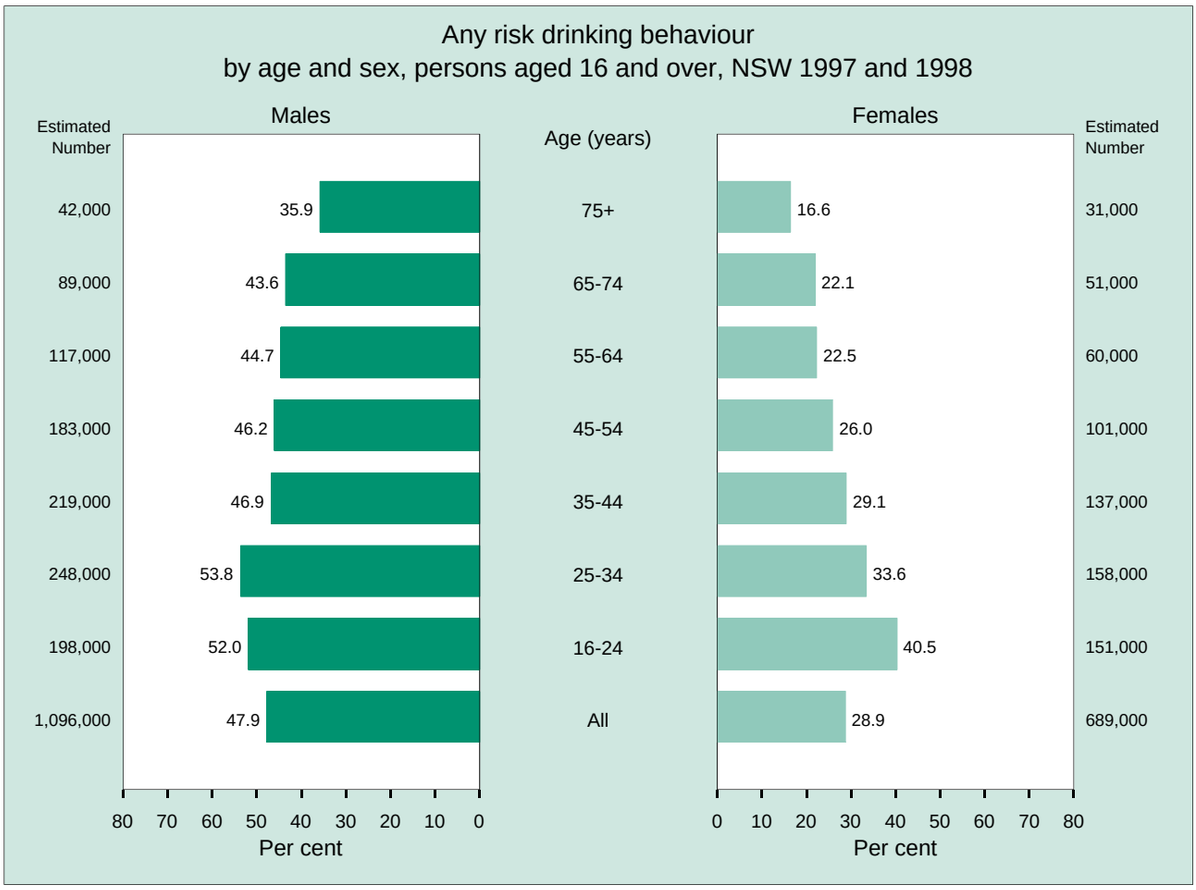
Source: Australian Institute of Health and Welfare (aetiologic fractions), 2001. NSW Department of Health Inpatient Statistics Collection (ISC) and ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Tobacco smoking is the leading preventable cause of morbidity and premature mortality, particularly from cardiovascular disease, cancers of the lung, larynx, mouth, and cervix, and chronic obstructive pulmonary disease. Smoking also contributes to sudden infant death syndrome (SIDS) and low birthweight (Ridolfo and Stevenson, 1998).
- The data presented here were derived by applying aetiologic fractions (the probability that a particular case of death or illness was caused by smoking) to death and hospital separation data for NSW.
- In NSW in 2000, smoking caused 6578 deaths, comprising 4322 males and 2256 females (18.5% of all male deaths and 10.3% of female deaths). In 1999–00, smoking caused 50,153 hospitalisations among males and 30,163 hospitalisations among females. (5.6% of all male and 3.0% of all female hospitalisations).
- Between 1989 and 2000, there was an overall 34% decline in the age-adjusted rate of deaths attributable to smoking.
- The age-adjusted rate of smoking-related hospitalisations increased by about 11% for females and 4% for males between 1989–90 and 1999–00.

For more information:

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

Mathers C, Vos T, Stevenson C. *The burden of disease and injury in Australia.* Canberra: Australian Institute of Health and Welfare, 1999. www.aihw.gov.au.



Note: Risk drinking was defined as 1 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 1 'heavy drinking' day in the past 12 months; or consuming alcohol every day. Estimates based on 26,683 respondents who were regular and occasional drinkers. 1127 (4.2%) not stated for alcohol risk factors. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Health Surveys 1997 and 1998 (HOIST), Epidemiology and Surveillance Branch, NSW Department of Health.

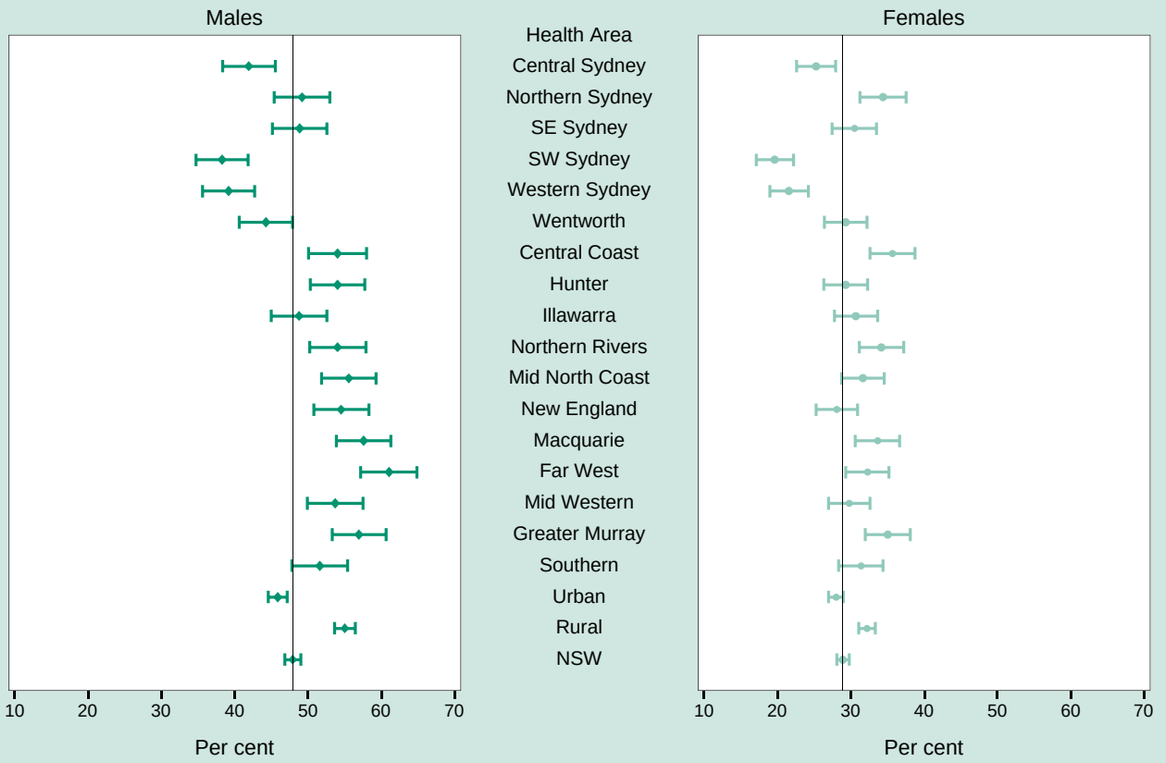
- At low to moderate levels, alcohol provides health benefits for some people, particularly reduction of risk of heart disease from middle age. However, regular excessive alcohol consumption increases risk over time of chronic ill health and premature death. Episodic heavy drinking places the drinker, and others, at risk of injury and death (NHMRC, 2001).
- Respondents to the 1997 and 1998 NSW Health Surveys 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'. Almost one-half (47.9%) of male respondents and more than one-quarter (28.9%) of females reported risk drinking behaviours. Males were more likely than females to report this in all age groups.
- Both males and females in the 16–34 year age group were most likely to report risk drinking. Risk drinking was reported by more than one-half of males.
- *The NSW Adult Alcohol Action Plan 1998–2002* (NSW Department of Health, 1998) outlines strategies to reduce the health, social, and economic costs of alcohol misuse. Strategies include treatment and clinical interventions, prevention and education, and research and surveillance.

For more information:

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

Public Health Division. *The NSW Adult Alcohol Action Plan 1998–2002.* Sydney: NSW Department of Health, 1998.

Any risk drinking behaviour by Health Area and sex, persons aged 16 years and over, NSW 1997 and 1998



Note: 'Risk drinking' (defined as 1 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 1 'heavy drinking' day in the past 12 months; or consuming alcohol every day). Estimates based on 26,683 respondents who were regular and occasional drinkers. 1127 (4.2%) not stated for alcohol risk factors. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Health Surveys 1997 and 1998 (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

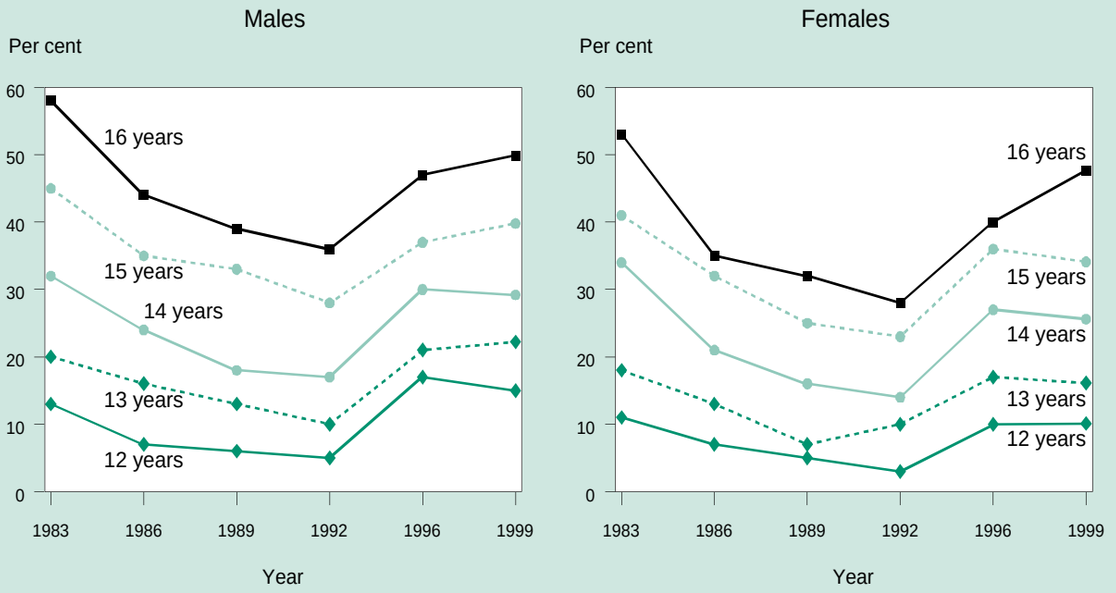
- Social and cultural factors that affect alcohol consumption include socioeconomic status, educational attainment, employment status, and country of birth.
- The analyses of data from the 1997 and 1998 NSW Health Survey presented here use the Australian Alcohol Guidelines (NHMRC, 2001). These differ from the previous guidelines (NHMRC, 1992) by focusing on patterns of drinking rather than overall levels of consumption. Reported usual weekly intake, heavy drinking days (4 or 6 drinks per day for males and females respectively) and alcohol-free days were combined to give an overall measure of 'risk drinking'.
- In men, the prevalence of risk drinking behaviour varied from 38.2% in South Western Sydney, to 61.0% in the Far West Health Area. In women, risk drinking ranged from 19.6% in South Western Sydney to 35.7% in the Central Coast Health Area.
- In rural areas, 43.4% of respondents reported risk drinking, compared to 36.7% of those in urban areas. Rural men (55%) were more likely to report risk drinking than urban men (45.9%). Almost one-third of rural women (32.2%) and 28.0% of urban women reported drinking alcohol in a pattern risky to health.

For more information:

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

Pols RG, Hawks DV. *Is there a safe level of daily consumption of alcohol for men and women?* Canberra: NHMRC, 1992.

Recent consumption of alcohol by age and sex,
secondary school students aged 12-16 years, NSW 1983 to 1999



Note: Students were asked whether they drank alcohol during the week preceding the survey. Percentages are age-adjusted. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: Australian Secondary Schools' Alcohol and Drug Surveys, NSW Department of Health and NSW Cancer Council.

- Although per capita alcohol consumption has declined in Australia, more young people drink alcohol; drink at an earlier age; and are increasingly adopting high risk drinking patterns. Alcohol misuse is associated with health and social problems affecting young people including depression, suicide, road trauma, assault, and other risk behaviours (CHAC, 2001).
- In 1999, the majority of NSW secondary school students (88% of males and 85% of females) reported that they had ever consumed at least part of an alcoholic drink. However, for 32% of males and 35% of females this was 'only a few sips' and 45% of males and 51% of females described themselves as 'non-drinkers'. The proportion of both male and female students who have ever drunk alcohol was about the same in 1999 as it was in 1996.
- More males (34%) than females (29%) reported recent drinking, at all ages. Among those who reported drinking in the week before the survey, 52% had consumed alcohol on 2 or more days that week and 15% daily).
- Overall, 17% of males and 12% of females reported that they had tried to buy alcohol in licensed premises. Of these, more females (52%) than males (38%) reported that they had not been refused service; and 38% of males and 36% of females stated that they had not been asked for proof of age (Schofield et al., 2001).
- The NSW Department of Health is working towards preventing and reducing alcohol use in young people through strategies outlined in the Public Health Division *NSW Youth Alcohol Action Plan 2001–2005* (NSW Department of Health, 2002).

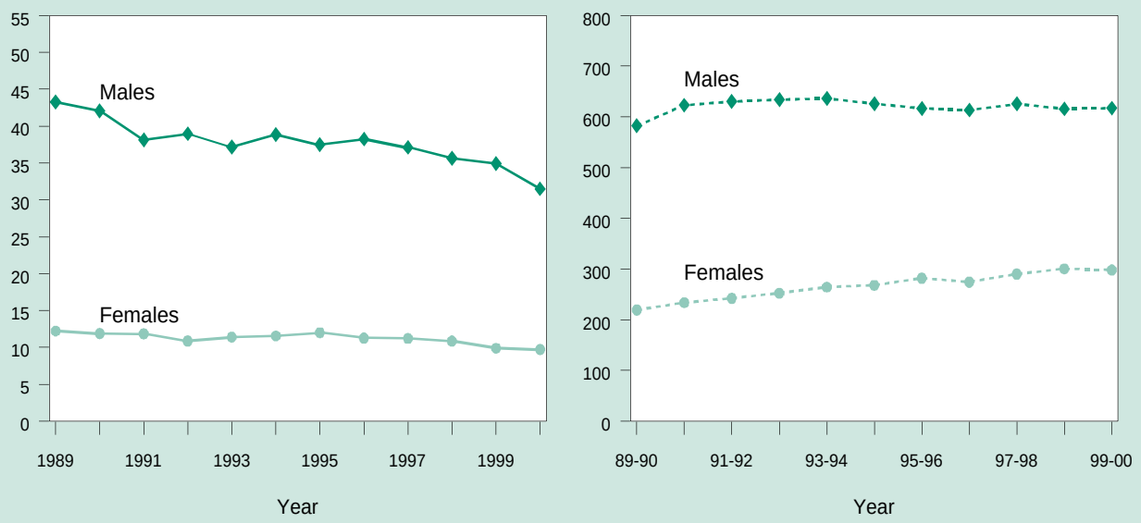
For more information:

Department of Health and Aged Care. *National Alcohol Strategy.* Canberra: 2001.

National Health and Medical Research Council. *Australian Alcohol Guidelines.* Canberra: NHMRC, 2001. www.health.gov.au/nhmrc/publications.

Public Health Division. *NSW Youth Alcohol Action Plan 2001–2005.* Sydney: NSW Department of Health, 2000. www.health.nsw.gov.au.

Deaths and hospital separations attributable to alcohol by sex, NSW 1989 to 2000



			1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Number	Males	Deaths	1187	1173	1081	1117	1083	1142	1129	1169	1156	1132	1128	1036
	Females		382	377	382	361	387	402	421	412	414	412	380	387
	Persons		1568	1550	1463	1479	1471	1545	1550	1580	1569	1544	1509	1423
	Males	Separations	16676	18060	18481	18791	19030	19002	18982	19175	19822	19784	20183	.
	Females		6566	7105	7503	7911	8375	8604	9198	9143	9844	10334	10428	.
	Persons		23242	25166	25985	26702	27405	27606	28180	28318	29665	30118	30611	.
Rate per 100,000	Males	Deaths	43.2	42.1	38.1	39.0	37.1	38.9	37.5	38.2	37.1	35.6	34.9	31.5
	Females		12.2	11.9	11.9	10.9	11.4	11.6	12.0	11.3	11.2	10.9	9.9	9.7
	Persons		26.9	26.2	24.3	24.1	23.6	24.4	24.0	24.0	23.5	22.7	21.7	20.1
	Males	Separations	582.2	622.9	630.2	634.0	636.2	626.0	616.6	613.5	625.5	615.7	617.2	.
	Females		219.4	233.7	242.5	252.5	264.4	268.1	282.1	274.5	290.3	300.6	298.2	.
	Persons		398.7	425.0	432.0	438.9	446.5	443.4	445.6	440.0	454.0	454.4	454.0	.

Note: Excludes conditions where low to moderate alcohol consumption has an apparent overall protective effect.

Source: Australian Institute of Health and Welfare, 2001 (aetiological fractions). NSW Department of Health Inpatient Statistics Collection (ISC) and ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Harm caused by excessive alcohol consumption accounts for 4.9% of the total disease burden in Australia (Mathers et al., 1999). Diseases caused by 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.
- The age-adjusted hospital separation rate between 1989–90 and 1999–00 increased by about 14%, from 399 to 454 hospitalisations per 100,000. The rate of increase in hospitalisations attributable to alcohol was around 6 times higher for females (36%) than for males (6%) over this 11-year period.

For more information:

Commonwealth Department of Health and Aged Care. *National Alcohol Strategy. A Plan for Action 2001 to 2003–04.* Canberra: CDHAC, 2001.

Mathers C, Vos T, Stevenson C. *The burden of disease and injury in Australia.* Canberra: Australian Institute of Health and Welfare, 1999. Online: www.aihw.gov.au.

National Health and Medical Research Council. *Australian Alcohol Guidelines.* Canberra: NHMRC, 2001. www.health.gov.au/nhmrc.

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

Ever used cannabis by age and sex,
secondary school students aged 12-16 years, NSW 1983 to 1999

Note: Students were asked if they had 'ever smoked or used marijuana (grass, hash, cannabis, dope, mull, pot, a joint)'. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: Australian Secondary Schools' Alcohol and Drug Surveys, NSW Department of Health and NSW Cancer Council, 2001.

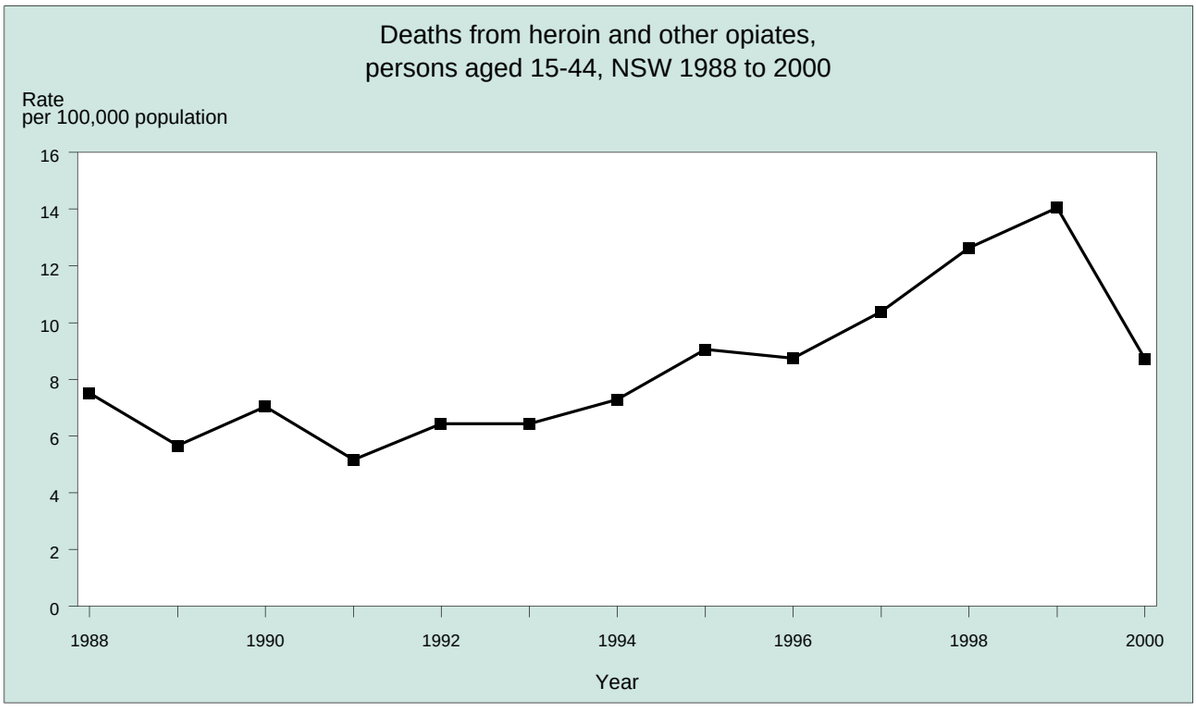
- Cannabis is the most widely-used illicit drug reported among the population. Teenagers aged 14 to 19 years are the biggest consumers of cannabis in NSW, with 36% reporting cannabis use in the past 12 months in 1998 (Fitzsimmons and Cooper-Stanbury, 2000).
- In NSW in 1999, 30% of male secondary school students and 24% of female secondary school students aged 12–16 years reported having used cannabis in their lifetime. This represents a drop from 1996 levels overall (from 35% in 1996 to 27% in 1999) and in each age group. In 1996, 39% of males and 31% of females reported using cannabis.
- The incidence of cannabis use increased with age. Between the age of 12 and 13 years, the proportion who had used cannabis doubled for males (9% aged 12 years and 18% aged 13 years); more than doubled for females (5% aged 12 years and 12% aged 13 years).
- More males than females reported using cannabis across all age groups.
- Over three-quarters of those students who used cannabis reported they had also used other substances at the same time. Alcohol and tobacco were the substances most likely to be used concurrently.

For more information:

Fitzsimmons G, Cooper-Stanbury M. *1998 National Drug Strategy Household Survey: State and Territory Results.* Canberra: Australian Institute of Health and Welfare, 2000.

Schofield WN, Lovelace KS, McKenzie JE and Burns L. *Self-reported Tobacco and Alcohol use among NSW Secondary Students. The 1996 Australian School Students Alcohol and Drugs Survey.* Sydney: NSW Department of Health and NSW Cancer Council, 1998.

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



		1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
NSW	Number	201	154	193	142	178	177	201	251	244	292	358	401	249
	Rate per 100,000 population	7.51	5.66	7.04	5.15	6.43	6.42	7.28	9.05	8.73	10.38	12.64	14.06	8.71
Australia	Number	347	302	316	243	327	357	406	550	526	600	737	958	725
	Rate per 100,000 population	4.53	3.83	3.99	3.01	4.06	4.36	4.96	6.70	6.29	7.15	8.71	11.25	8.48

Note: Data shown are for deaths in which opioids were the underlying cause of death, i.e., the primary factor responsible for death.

Source: National Drug and Alcohol Research Centre (2001).

- Victims of overdose are predominantly single, unemployed, men, aged in their late-20s and early-30s, with a long history of heroin dependence (Warner-Smith, Lynskey, et al., 2000).
- In 2000, an estimated 249 people aged between 15 and 44 years died from opiate overdose (198 males and 51 females). It is difficult to differentiate opiate type with the coding used with deaths data. It is also difficult to determine whether death was due to heroin overdose, as the drug quickly breaks down to morphine in the bloodstream. Around 80% of opiate deaths are attributable to heroin (Zador, Sunkic and Darke, 1995).
- While there was a large increase in the number of deaths from opioids during the 1990s, preliminary figures for 2000 show that in NSW, there was a substantial decline of 38% from 1999, especially among males. This compares with decline between 1999 and 2000 of only 25% Australia-wide (NDARC, 2001).
- Strategies implemented by a number of agencies have contributed to the reduction in overdose. Increases in access to treatment services, education initiatives, and an increase in policing activities, have all had an effect.

For more information:

National Drug and Alcohol Research Centre. *Australian Bureau of Statistics data on opioid overdose deaths.* Sydney: National Drug and Alcohol Research Centre, 2001.

Zador DA, Sunjic S, Darke S. T*oxicological findings and circumstances of heroin related deaths in NSW, 1992.* Sydney: National Drug and Alcohol Research Centre, 1995.

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.

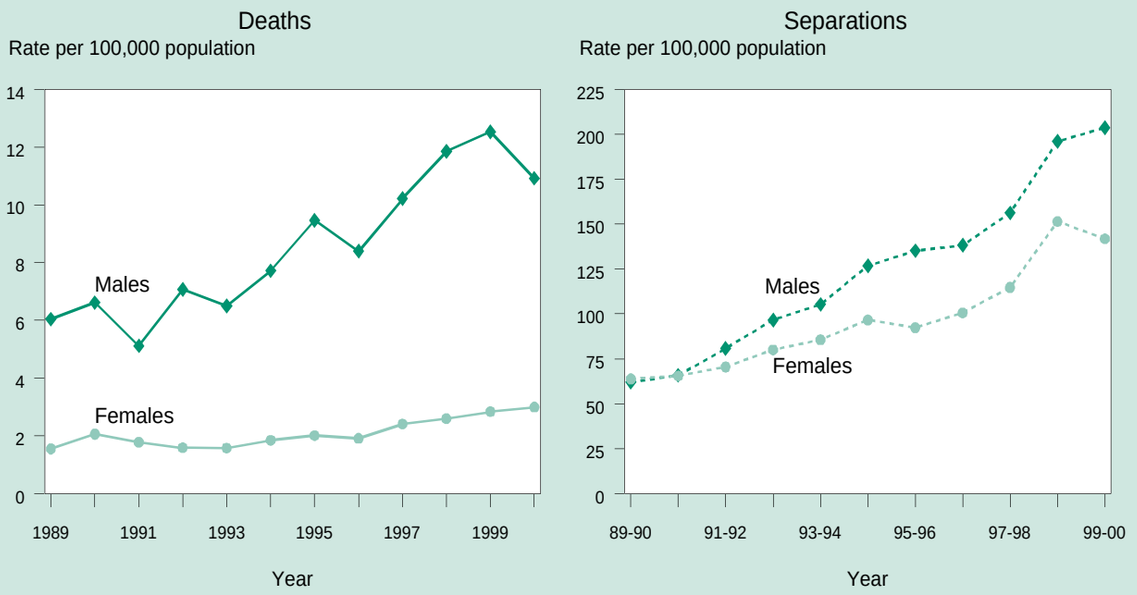
National Drug and Alcohol Research Centre Web site at http://ndarc.med.unsw.edu.au/ndarc.nsf.

Drug Program Bureau Web site at www.health.nsw.gov.au/public-health/dpb.

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

Australian Drug Information Network Web site at www.adin.com.au.

Deaths and hospital separations attributable to illicit drugs
by sex, NSW 1989 to 2000



			1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Number	Males	Deaths	176	193	150	210	194	229	286	253	309	359	386	342
	Females		45	59	52	47	47	54	59	57	72	80	88	95
	Males	Separations	1802	1927	2381	2863	3121	3750	4016	4127	4673	5891	6142	.
	Females		1833	1892	2063	2344	2511	2822	2723	2991	3407	4476	4208	.
Rate	Males	Deaths	6.0	6.6	5.1	7.1	6.5	7.7	9.5	8.4	10.2	11.8	12.5	10.9
per 100,000	Females		1.5	2.1	1.8	1.6	1.6	1.8	2.0	1.9	2.4	2.6	2.8	3.0
	Males	Separations	62.0	65.9	80.8	96.6	105.3	126.7	135.1	138.2	156.2	196.0	203.7	.
	Females		63.9	65.5	70.5	80.1	85.7	96.7	92.4	100.6	114.8	151.4	141.9	.

Note: Deaths and hospital separations attributable to illicit drugs were calculated using age- and sex-specific aetiologic fractions from AIHW, 2001. Deaths are for calendar years. Separations are for financial years. Rates were age-adjusted using the Australian population as at 30 June 1991. Source: Australian Institute of Health and Welfare (aetiologic fractions, 2001).

Source: NSW Department of Health Inpatient Statistics Collection (ISC) and ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

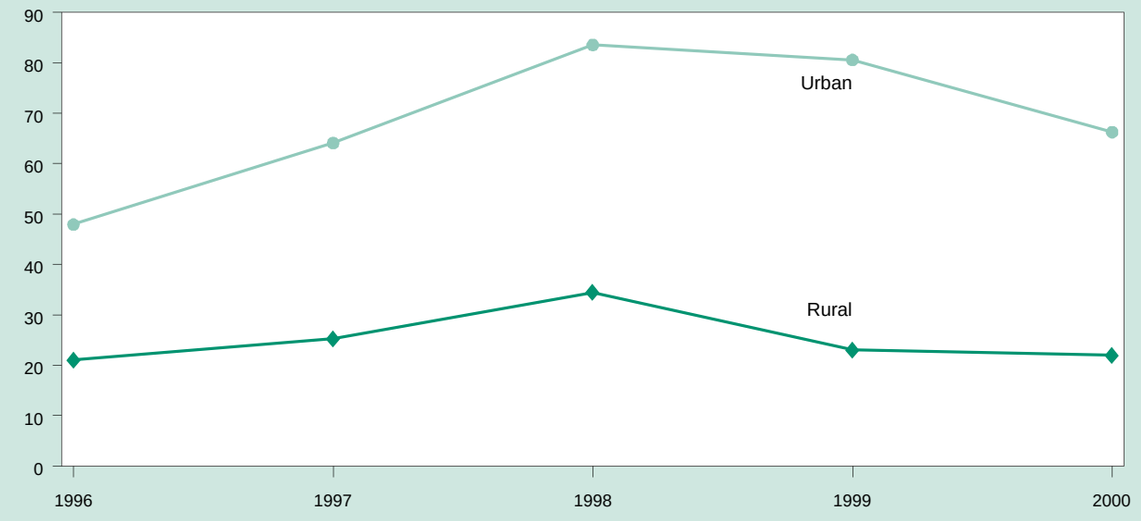
- The use of illicit drugs contributes to many causes of death and illness, including poisoning by overdose, hepatitis B, hepatitis C, HIV and AIDS, psychoses, suicide, and low birthweight (English et al., 1995).
- The data presented here were derived by applying aetiological fractions (that is, the probability that a particular case of illness or death was caused by use of specific illicit drugs) to death and hospital separation data (see Methods section).
- Illicit drugs caused an estimated 342 male deaths and 95 female deaths in 2000, representing 1.5% and 0.4% of all male and female deaths, respectively.
- In 1999–00, illicit drugs caused an estimated 6142 hospitalisations among males and 4208 hospitalisations among females (0.7% and 0.4% of all hospitalisations, respectively). Opiate dependence and drug psychoses were the major contributors to drug-caused hospitalisations.
- Between 1999 and 2000, there was a decrease in the rate of male deaths attributable to illicit drugs, but an increase for females. In contrast, the age-adjusted rate of hospitalisations attributable to illicit drug use rose for males but decreased for females between 1998–99 and 1999–00.

For more information:

English D R, Holman C D J, Milne M G, et al. *The quantification of drug caused morbidity and mortality in Australia.* Canberra: Commonwealth Department of Human Services and Health, 1995.

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

Patients attended by ambulance for drug overdose, by location of attendance and sex, NSW 1996 to 2000



		1996	1997	1998	1999	2000
Number	Urban	2305	3120	4114	4019	3337
	Rural	301	363	497	332	320
	NSW	2647	3522	4656	4396	3694
Rate	Urban	47.9	64.1	83.6	80.6	66.3
per 100,000 population	Rural	21.0	25.3	34.5	23.0	22.0
	NSW	42.4	55.9	73.2	68.4	56.9

Note: Location of ambulance attendances where the Ambulance Service Protocol 28 (drug overdose and poisoning) was used and where Pharmacology 215 (Naloxone or Narcan—a narcotic antagonist) was administered.

Source: Ambulance Service of NSW attendance data (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Non-fatal overdoses are common among heroin users. They may be defined as instances where there is a loss of consciousness and depression of respiration that is not fatal (Warner-Smith, Lynskey et al., 2000).
- The rate of ambulance attendance for drug overdose in NSW was highest in 1998 (73.2 per 100,000). In 2000 the rate was 56.9 per 100,000, around the same level as in 1997.
- The trend in ambulance attendance was similar for both urban and rural areas, although the rate of ambulance attendance is much higher in urban areas. In 2000, the rate of ambulance attendance to overdose was 66.4 per 100,000 in urban NSW, compared with 21.0 per 100,000 in rural NSW. Between 1998 and 2000 there was a 36% decline in ambulance attendances for drug overdose in rural areas, compared with a 20% decline in urban areas over this period.
- The majority of calls to the NSW Ambulance Service occurred in larger cities, particularly in Sydney. The 2 most common areas in Sydney were Liverpool and South Sydney, which are areas where the largest heroin markets are concentrated (Maher, Dixon et al., 1998). NSW Health is working with treatment services in these areas, to provide recovery services to young people who have experienced non-fatal overdoses.

For more information:

Degenhardt L, Hall W and Adelstein, BA. *Ambulance calls to suspected drug overdoses: Analysis of New South Wales patterns—July 1997 to June 1998.* Sydney: National Drug and Alcohol Research Centre, 2000.

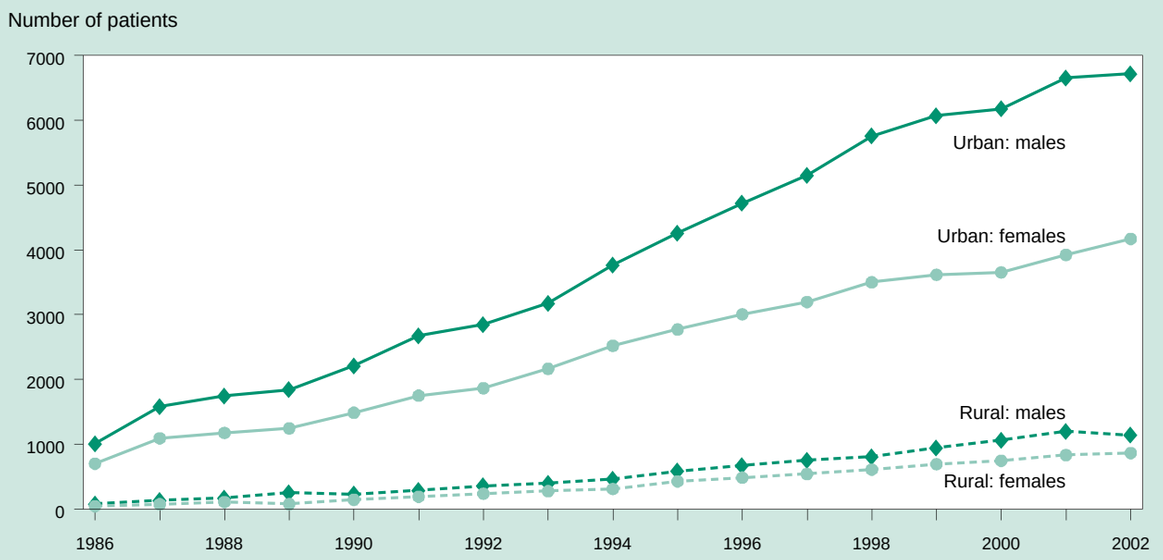
Maher L, Dixon D, Lynskey M and Hall W. *Running the risks.* Sydney: National Drug and Alcohol Research Centre, 1998.

Warner-Smith M, Lynskey M, Darke S and Hall W. *Heroin Overdose: Prevalence, Correlates, Consequences and Interventions.* Sydney: NDARC, 2000.

Drug Program Bureau at www.health.nsw.gov.au/public-health/dpb.

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

Number of patients on NSW Methadone Program, by location of treatment and sex, NSW 1986 to 2002



		1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Urban	Males	3179	3768	4260	4720	5150	5760	6070	6179	6658	6720
	Females	2164	2520	2772	3006	3196	3501	3616	3653	3923	4171
	Persons	5387	6303	7055	7739	8551	9284	9721	9849	9855	10920
Rural	Males	396	461	584	669	751	807	942	1060	1201	1140
	Females	275	309	425	483	540	608	692	745	832	864
	Persons	674	771	1012	1154	1296	1421	1641	1808	2042	2016
Other	Males	580	642	640	725	794	801	937	851	1327	1554
	Females	157	164	178	187	234	160	170	148	291	470
	Persons	742	809	825	912	1082	963	1116	1002	1627	2032
NSW	Males	4155	4871	5484	6114	6695	7368	7949	8090	9186	9414
	Females	2596	2993	3375	3676	3970	4269	4478	4546	5046	5505
	Persons	6803	7883	8892	9805	10929	11668	12478	12659	13524	14968

Note: Data extracted as at 1 January for each year. Location is derived from the postcode of the dosing point.

Source: Pharmaceutical Services Branch database, NSW Department of Health.

- The risk of overdose death is substantially reduced in drug-dependent people who are enrolled in treatment. Methadone maintenance is the major treatment used in Australia (Warner-Smith, Lynskey, et al., 2000).
- Since the Drug Summit in May 1999, around $14 million has been committed to the expansion of methadone treatment places in NSW up to July 2002, with a further $11 million committed to July 2003. This has enabled a significant increase in the number of new places in the methadone program. Between 2000 and 2002, the number of new clients in the program has increased by 18%.
- In 2002, 9414 males were on the NSW Methadone Maintenance Program, comprising 63% of all program patients. The number of females on the program was 5505.
- The growth of the methadone program in rural NSW has been considerably greater than in urban areas. In 1986, there were around 15 times more patients on the program in urban areas compared with rural areas; whereas in 2002, there are only around 5 times more.

For more information:

Warner-Smith M, Lynskey M, Darke S and Hall W. *Heroin Overdose: Prevalence, Correlates, Consequences and Interventions.* Sydney: NDARC, 2000.

National Drug and Alcohol Research Centre at http://ndarc.med.unsw.edu.au/ndarc.nsf.

Drug Program Bureau at www.health.nsw.gov.au/public-health/dpb.

Office of Drug Policy, NSW Cabinet Office at www.druginfo.nsw.gov.au/druginfo/treatment/OtherMeth.html.

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

2 Burden of disease

Section 2

Chapter 2.1

Burden of disease

- Life expectancy in NSW continues to increase:
  - —newborn males can expect to live for 77.2 years, while newborn females can expect to live for 82.6 years;
  - —men who have reached age 65 can expect to live to 82.3 years, while women who have reached age 65 can expect to live to 85.8 years.
- Although females can still expect to live longer than males, the difference between the sexes is decreasing.
- The age-adjusted death rate has almost halved in the last 20 years, but the male rate has remained about 1.6 to 1.7 times greater than the female rate.
- The most important causes of premature death are:
  - —in males: ischaemic heart disease, lung cancer, and stroke;
  - —in females: ischaemic heart disease, stroke, and breast cancer.
- The most important causes of disability burden are:
  - —in males: depression, adult-onset hearing loss, and alcohol dependency;
  - —in females: depression, dementia, and osteoarthritis.
- 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. Using 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.
- In terms of DALYs, males suffer a relatively greater disease burden from:
  - —suicide and self-harm;
  - —road traffic injuries;
  - —alcohol dependency and abuse;
  - —heroin dependency and abuse;
  - —HIV–AIDS;
  - —cirrhosis of the liver.

  While females suffer a relatively greater disease burden from:
  - —breast cancer;
  - —generalised anxiety disorder;
  - —age-related vision disorders.

In this chapter

- Life expectancy at birth
- Life expectancy at 65 years of age
- Deaths from all causes
- Deaths from all causes by health area
- Causes of death
- Infant mortality
- Hospitalisations for all causes
- Causes of hospitalisation
- Years of life lost due to premature mortality
- Leading causes of years of life lost due to premature mortality
- Years of life lived with disability
- Leading causes of years of life lived with disability
- Overall burden of disease
- Leading causes of overall burden of disease
- Self-rated health
- Physical functioning in older people

Introduction

This chapter focuses on trends in life expectancy and death rates in NSW, and examines the major causes of death, hospitalisation, and disability. Traditional indicators, such as life expectancy and age-adjusted death and hospitalisation rates, are examined first. Newer indicators, which use the global 'burden of disease' approach, are then presented, followed by 2 measures of self-reported health status and physical functioning. The burden of disease approach warrants 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 do not 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 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. 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.

More information on the methods used for calculating life expectancy, age-adjusted death and hospitalisation rates, and the components of DALYs, can be found in the Methods section.

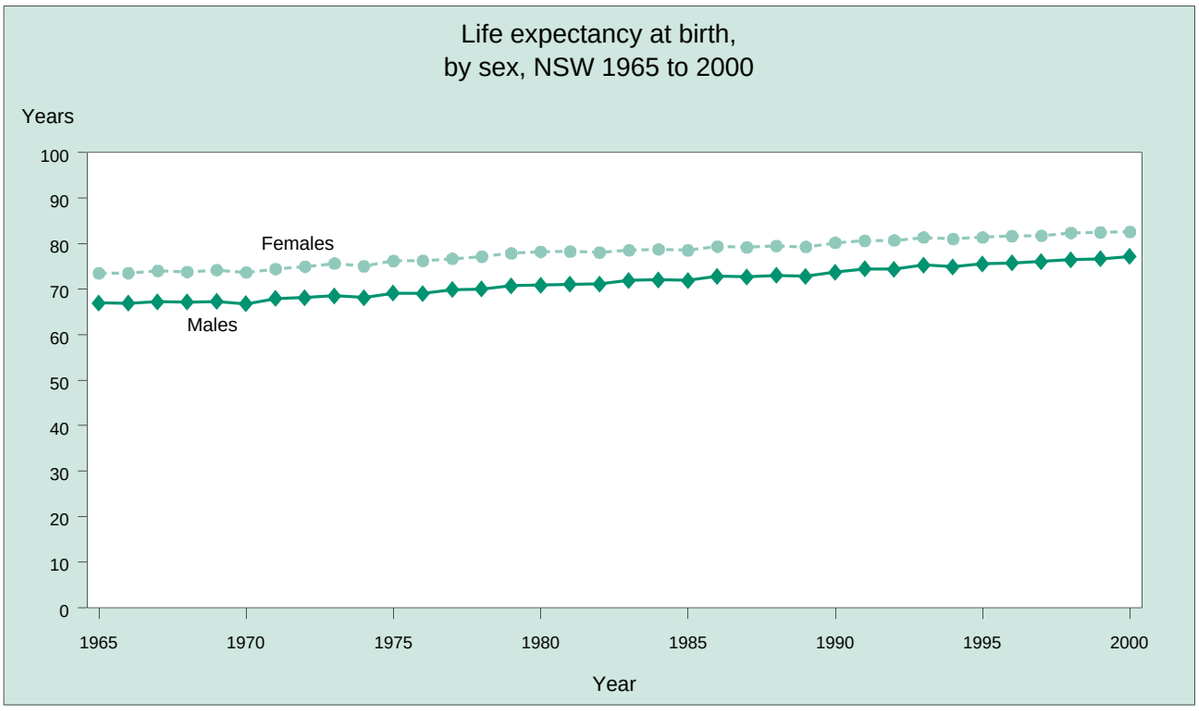
For more information:

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

Australian Institute of Health and Welfare (AIHW) Burden of Disease Web site at www.aihw.gov.au/bod/index.html.

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

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



		1965	1970	1975	1980	1985	1990	1995	2000
NSW	Males	67.0	66.8	69.1	70.8	71.9	73.7	75.6	77.2
	Females	73.5	73.7	76.2	78.2	78.5	80.2	81.4	82.6
Aus	Males	67.6	67.3	69.4	71.1	72.4	74.1	75.7	77.4
	Females	74.2	74.1	76.5	78.3	78.8	80.4	81.5	82.8

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

Source: ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- 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 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, nutritional and environmental factors, and advances in the detection and treatment of disease.
- In NSW, between 1965 and 2000, life expectancy at birth steadily increased, by 10.2 years for males (from 67.0 to 77.2 years) and by 9.1 years for females (from 73.7 years to 82.6 years). Similar increases were seen for the whole of Australia.
- Although females can still expect to live longer than males, the difference between the sexes is decreasing. In NSW, the difference in life expectancy between males and females dropped from 6.5 years in 1965 to 5.4 years in 2000. This represents a 30% reduction in the male-to-female difference as a proportion of male life expectancy.
- Life expectancy at birth in Australia for males and females was only about 1 and 2 years respectively behind Japan, which is the top ranked country on this measure (WHO, 2002).
- However, life expectancy at birth for Aboriginal and Torres Strait Islander people is significantly lower than for the non-indigenous population. The Australian Bureau of Statistics estimates that an Aboriginal or Torres Strait Islander person born today has a life expectancy approximately 20 years less than their non-indigenous counterparts (ABS, 2001).

For more information:

Australian Institute of Health and Welfare. *Australia's health 2002*. Canberra: AIHW, 2002. Available at www.aihw.gov.au/publications/aus/ah02/index.html.

Australian Bureau of Statistics. *Deaths Australia 2000*. ABS Catalogue no. 3302.0. Canberra:ABS, 2001.

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

		1965	1970	1975	1980	1985	1990	1995	2000
NSW	Males	77.0	76.6	78.0	78.6	79.0	80.2	81.1	82.3
	Females	80.4	80.4	82.0	83.1	83.1	84.1	84.9	85.8
Aus	Males	77.2	76.9	78.1	78.8	79.4	80.4	81.2	82.4
	Females	80.8	80.6	82.2	83.2	83.4	84.4	85.0	86.0

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

Source: ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

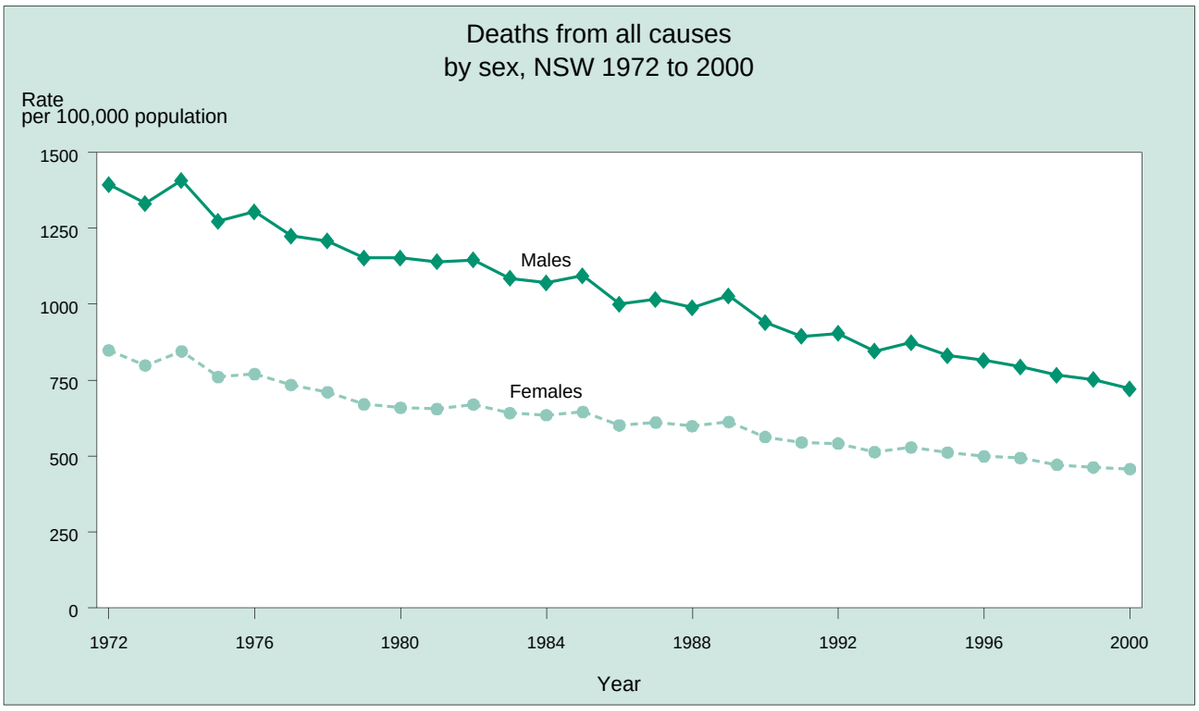
- Life expectancy at 65 years of age is an estimate of the average age at death for someone who has already reached the age of 65, assuming that the current rates of death prevail for the remaining lifetime of that person. Thus, life expectancy at 65 years assumes that death rates in older people will remain constant for the next 20 to 30 years. Although this is unlikely to be true, it is nevertheless a much more conservative assumption than the one used to calculate life expectancy at birth.
- Life expectancy at age 65 years is an overall indicator of the effect of many different factors that influence death rates in older people. These include lifestyle, nutritional and environmental factors, as well as access to and the quality of treatment services for diseases and injury.
- In NSW between 1965 and 2000, life expectancy at 65 years increased from 77.0 years to 82.3 years in males, and from 80.4 years to 85.8 years in females.
- Although women who have reached the age of 65 can still expect to live longer than men of the same age, the difference is less than the sex difference for expectation of life at birth. This reflects the fact that males are at greater risk than women of dying before they reach the age of 65, primarily from accidents, suicide, and cardiovascular disease.

For more information:

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

Australian Bureau of Statistics Web site at www.abs.gov.au.

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



		1972	1975	1980	1985	1990	1995	1996	1997	1998	1999	2000
Number	Males	23273	22389	22037	23364	23147	23313	23566	23612	23443	23670	23340
	Females	18948	18208	17845	20083	19927	21021	21249	21697	21205	21391	21908
	Persons	42221	40597	39882	43447	43074	44334	44815	45309	44648	45061	45248
Rate	Males	1394.6	1273.8	1152.3	1095.0	940.6	831.5	815.7	793.1	765.9	751.9	721.0
per 100,000	Females	848.1	760.1	658.9	644.9	562.4	511.2	498.6	493.1	470.8	462.2	456.7
population	Persons	1082.4	978.9	868.4	834.7	726.7	650.0	637.1	625.2	601.2	590.6	575.1

Note: Data are reported by year of death. Death rates were age-adjusted using the Australian population as at 30 June 1991. Numbers for 2000 include an estimate of the small number of deaths which were registered in 2001, data for which were not available at the time of production.

Source: NSW Inpatient Statistics Collection and ABS mortality data (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

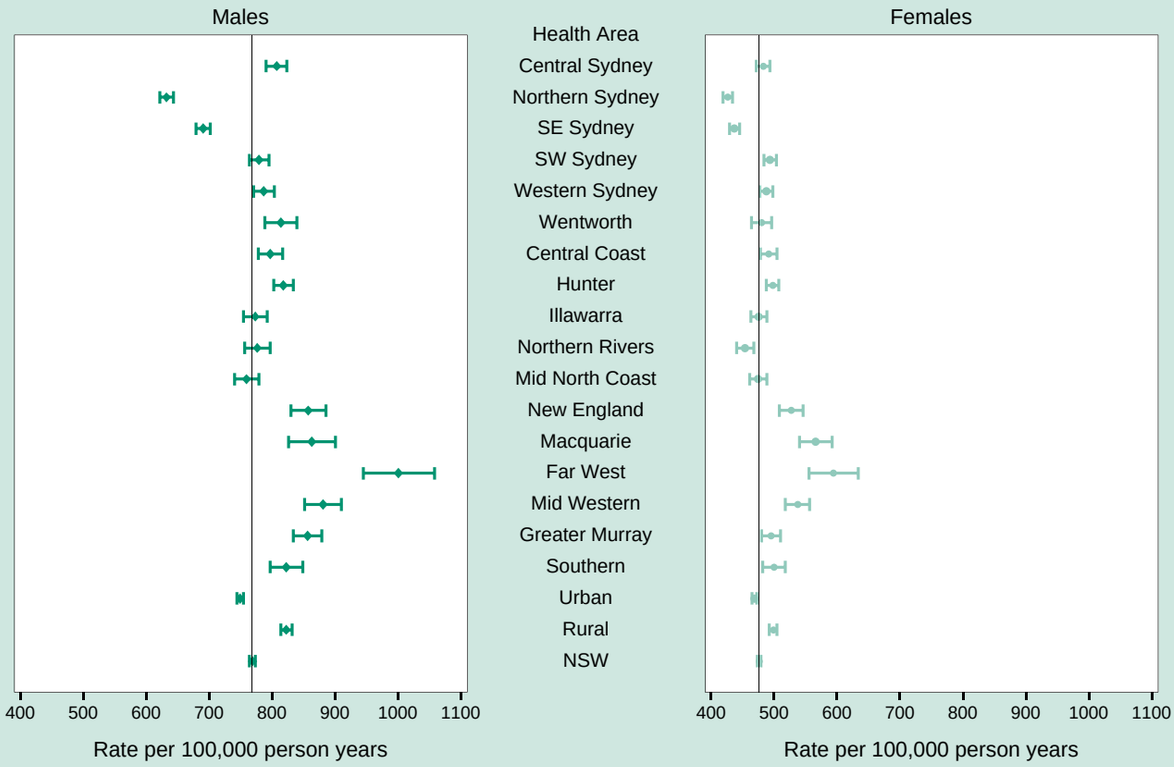
- Older people are more likely to die than younger people. Therefore, as the proportion of older people in the population increases, the overall (crude) death rate is expected to increase also. Age-adjustment (also known as age-standardisation) controls for the effect of changes in the age structure of the population, allowing for valid comparisons of death rates over time.
- The age-adjusted death rate in NSW decreased by approximately 47% over the period 1972 to 2000 (48.3% for males and 46.2% for females).
- Throughout this period, the age-adjusted death rate for males remained about 1.6 to 1.7 times greater than the female death rate.
- Owing to the decline in the underlying death rate, the absolute number of deaths in NSW residents per annum rose by only 7.2%, from 42,221 in 1972 to approximately 45,248 in 2000, despite a 35% increase in the NSW population over the same period.

For more information:

Australian Institute of Health and Welfare. *Australia's health 2002.* Canberra: AIHW, 2002. Available at www.aihw.gov.au/publications/aus/ah02/index.html.

Australian Bureau of Statistics Web site at www.abs.gov.au.

Deaths from all causes by health area and sex, persons of all ages, NSW 1996 to 2000



Note: Numbers and rates of deaths include an estimate of the small numbers of deaths which occurred in 2000 but were registered in 2001, data for which were unavailable at the time of production. Rates were age-adjusted using the standard Australian population as at 30 June 1991. Lower and upper limits for 95% confidence interval of the rate are shown.

Source: ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Older people are more likely to die in any given time period than younger people, so a geographical area with a larger proportion of older people would be expected to have a higher overall (crude) death rate than one with a smaller proportion of older people. The statistical technique of age-adjustment (also known as age standardisation), as used for the indicators on this page and elsewhere in this report, controls for the effect of differences in the age distributions of populations, allowing for valid comparisons of death rates between different populations, such as different health areas.
- In NSW in the period 1996 to 2000, the lowest age-adjusted death rates were observed in the Northern Sydney Health Area, with male and female death rates 18% and 10 percent lower than the respective death rates for all of NSW.
- In the same period, the highest age-adjusted death rates were seen in the Far West Health Area, with male and female death rates 30% and 25% higher respectively than the NSW averages for each sex.
- 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 3.4

For more information:

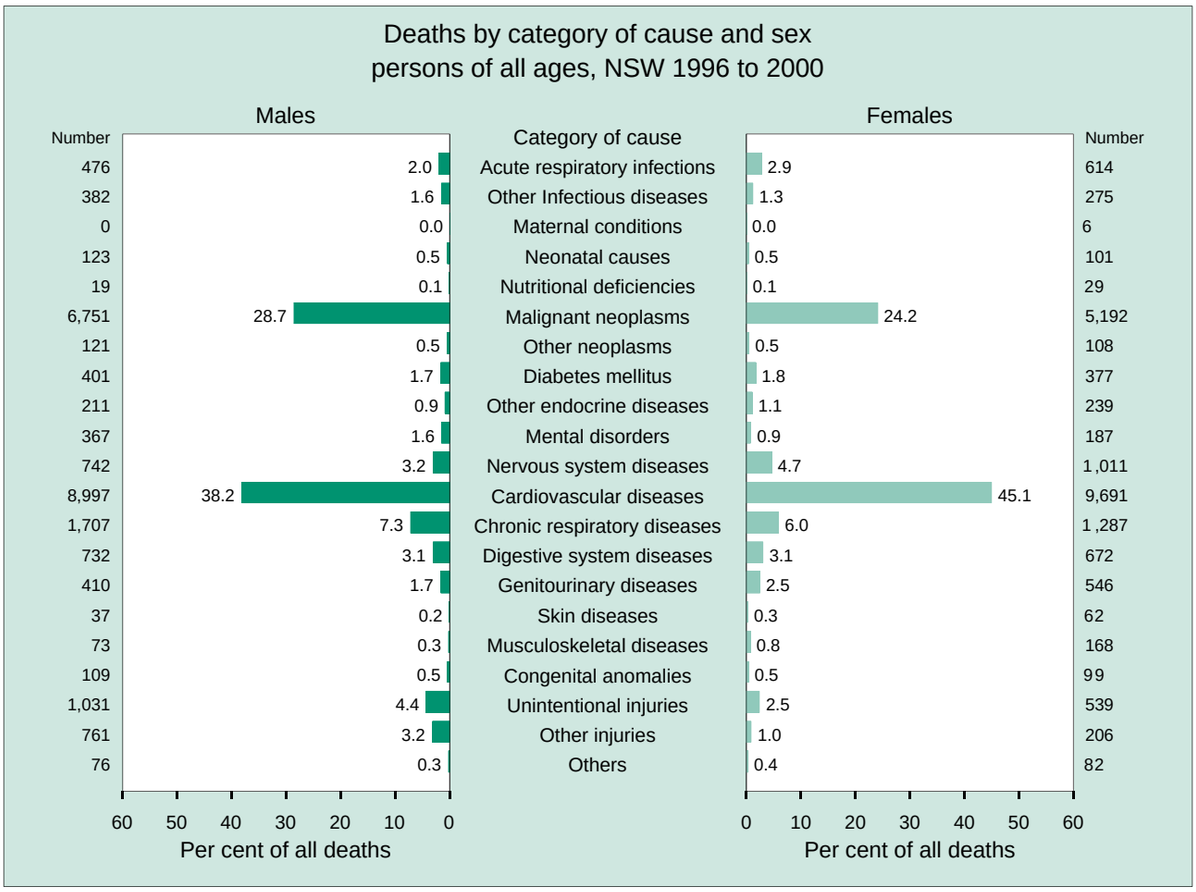
NSW Department of Health. Area Health Service Health Status Profiles 1999/2000. Sydney: NSW Department of Health, 1999. Available at www.health.nsw.gov.au/public-health/ah sprof/ahsprof.html.
Australian Institute of Health and Welfare Web site at www.aihw.gov.au.
Australian Bureau of Statistics Web site at www.abs.gov.au.

Deaths from all causes by health area, 1996 to 2000 combined

Health Area		Deaths	Rate/100,000	LL 95% CI	UL 95% CI
Central Sydney	Males	9364	806.8	790.5	823.4
	Females	8417	482.3	471.6	493.3
	Persons	17781	628.1	618.8	637.6
Northern Sydney	Males	12572	632.2	621.1	643.4
	Females	15309	426.0	418.7	433.4
	Persons	27881	510.9	504.7	517.1
SE Sydney	Males	13474	690.1	678.5	701.9
	Females	13303	436.7	428.9	444.6
	Persons	26777	548.2	541.5	555.0
SW Sydney	Males	10678	779.1	763.9	794.6
	Females	9159	493.3	483.2	503.6
	Persons	19837	618.0	609.3	626.7
Western Sydney	Males	9491	786.3	769.9	802.9
	Females	8583	487.7	477.3	498.3
	Persons	18074	615.2	606.2	624.3
Wentworth	Males	4179	813.6	788.3	839.5
	Females	3470	479.7	463.6	496.1
	Persons	7648	621.2	607.2	635.4
Central Coast	Males	7043	796.9	778.0	816.1
	Females	6183	490.9	478.1	504.0
	Persons	13226	626.9	615.9	638.0
Hunter	Males	11120	817.7	802.4	833.1
	Females	9985	497.5	487.4	507.7
	Persons	21105	640.0	631.3	648.8
Illawarra	Males	6871	772.7	754.2	791.5
	Females	5682	475.5	463.0	488.2
	Persons	12553	610.2	599.5	621.0
Northern Rivers	Males	5954	776.4	756.4	796.7
	Females	4718	453.5	440.1	467.2
	Persons	10672	602.0	590.3	613.8
Mid North Coast	Males	6399	759.1	740.0	778.4
	Females	5248	474.5	461.1	488.1
	Persons	11647	607.6	596.2	619.1
New England	Males	3777	857.4	830.1	885.3
	Females	3392	526.7	508.4	545.5
	Persons	7169	675.7	659.9	691.8
Macquarie	Males	2161	862.7	826.3	900.3
	Females	1962	565.9	540.4	592.2
	Persons	4122	702.0	680.5	723.9
Far West	Males	1250	1000	944.7	1058
	Females	955	593.7	555.4	633.9
	Persons	2205	780.0	747.5	813.5
Mid Western	Males	3591	880.3	851.6	909.8
	Females	3276	536.9	518.0	556.4
	Persons	6867	690.5	674.1	707.2
Greater Murray	Males	5487	855.8	833.2	878.9
	Females	4584	494.7	479.9	509.8
	Persons	10071	654.3	641.4	667.3
Southern	Males	3998	822.2	796.5	848.6
	Females	3200	499.5	481.9	517.5
	Persons	7198	648.3	633.3	663.6
Urban	Males	84793	749.0	744.0	754.1
	Females	80089	468.6	465.3	472.0
	Persons	164881	591.0	588.2	593.9
Rural	Males	32616	822.3	813.3	831.3
	Females	27335	498.3	492.2	504.5
	Persons	59951	646.5	641.2	651.7
NSW	Males	117650	768.5	764.1	772.9
	Females	107472	475.9	472.9	478.8
	Persons	225122	605.3	602.8	607.8

Note: Numbers and rates of deaths include an estimate of the small numbers of deaths which occurred in 2000 but were registered in 2001, data for which were unavailable at the time of production. Rates were age-adjusted using the standard Australian population as at 30 June 1991. LL/UL 95% CI = Lower and upper limits of 95% confidence interval for rate.

Source: ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.



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. Data are reported by year of death. Numbers for 2000 include an estimate of the small number of deaths which were registered in 2001, data for which were not available at the time of production. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

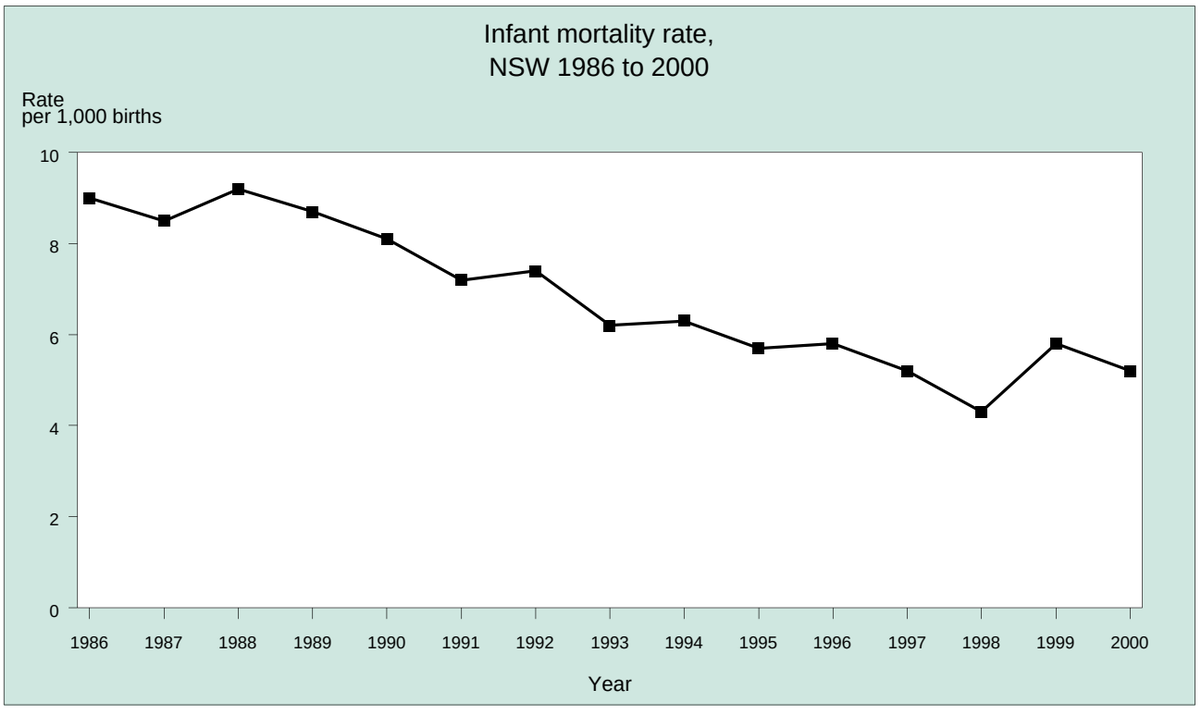
Source: ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Overall, cardiovascular diseases, primarily ischaemic heart disease and stroke, are the leading cause of death, responsible for 41.5% of all deaths in NSW residents in the years 1996 to 2000. The next most common cause of death was malignant neoplasms (cancer), accounting for 26.5% of all deaths. However, the contribution of different causes of deaths varies greatly across age groups.
- In the 0 to 4 year age group, neonatal conditions were responsible for 40% of deaths, followed by congenital anomalies which caused approximately 23% of deaths.
- In the 5 to 14 year age group, injury and poisoning was the leading cause of death, causing 37% of deaths in males and 28% of deaths in females.
- In the 15 to 24 year age group, injury and poisoning was the leading cause of death in both sexes, accounting for nearly 70% of deaths in males.
- Injury and poisoning was also the most common cause of death in males in the 25–44 year age group, but in women, malignant neoplasms were the leading cause of death. Approximately one quarter of these were breast cancers.
- In the 45 to 64 year age group, malignant neoplasms were the leading cause of death in both sexes, accounting for 53.5% of deaths in females.
- In the 65 year and older age group, deaths due to cardiovascular disease dominate. Cardiovascular disease was responsible for 47% of all deaths, with malignant neoplasm the next most common cause (24.5%), followed by chronic respiratory diseases (mainly chronic bronchitis and emphysema) which accounted for 7.5% of deaths.

For more information:

Australian Institute of Health and Welfare. *Australia's health 2002.* Canberra: AIHW, 2002. Available at www.aihw.gov.au/publications/aus/ah02/index.html.

Australian Bureau of Statistics Web site at www.abs.gov.au.



		1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Number of deaths	NSW	775	744	733	632	688	552	551	498	499	451	371	504	447
	Australia	2132	2004	2145	1836	1843	1591	1512	1449	1460	1341	1252	1408	1290
Mortality rate	NSW	9.2	8.7	8.1	7.2	7.4	6.2	6.3	5.7	5.8	5.2	4.3	5.8	5.2
per 1,000 births	Australia	8.7	8.0	8.2	7.1	7.0	6.1	5.9	5.7	5.8	5.3	5.0	5.7	5.2

Note: Infant mortality rate is defined as the number of deaths in children aged < 1 year per 1000 live births.

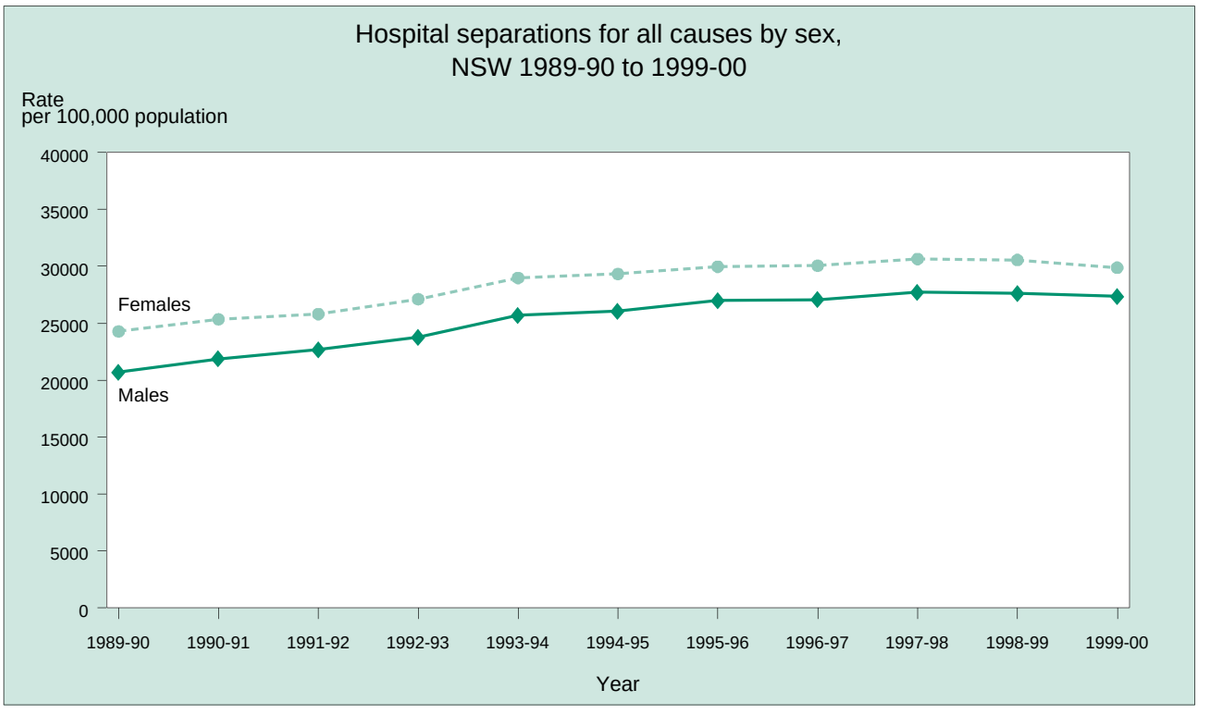
Source: Australian Bureau of Statistics Deaths, Australia. Catalogue no. 3302.0. Canberra, ABS, 2000.

- The infant mortality rate is the number of deaths in children aged under 1 year per 1000 live births. The NSW infant mortality rate in 2000 was 5.2 per 1000 live births, a drop from 9.0 per 1000 live births in 1986. Although this was slightly higher than the lowest recorded rate for NSW, which was 4.3 per 1000 live births in 1998, this minor year-to-year fluctuation must be viewed in the light of the 95% reduction in infant mortality rates which has occurred over the last century. In 1900, the infant mortality rate for Australia was over 100 per 1000 live births—in other words, 1 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 section 4.8 for more details. Of the 447 deaths in NSW infants in 2000, 68% occurred in the neonatal period (up to 28 days of life). One hundred and seventy nine (40%) deaths occurred on the first day of life.
- Respiratory conditions and infections, and congenital malformations, accounted for approximately three quarters of infant deaths. The single most common cause of infant death outside the perinatal period was sudden infant death syndrome (SIDS), which was responsible for 45 (10%) infant deaths registered in 2000.

For more information:

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

Australian Bureau of Statistics. *Deaths 2000*. Catalogue no. 3302.0. ABS: Canberra, 2002.



	Sex	89–90	90–91	91–92	92–93	93–94	94–95	95–96	96–97	97–98	98–99	99–00
Number	Males	577492	619106	652214	694025	761030	783545	823974	841010	874077	883355	888437
	Females	725121	768091	795319	846187	911285	935708	972539	990324	1022668	1032541	1023922
	Persons	1302613	1387196	1447533	1540212	1672315	1719253	1796513	1832133	1896800	1915922	1912361
Rate	Males	20688.2	21863.4	22662.1	23778.2	25683.3	26057.6	26988.3	27082.5	27731.2	27622.8	27367.5
per 100,000	Females	24284.2	25348.4	25806.3	27122.6	28981.9	29334.7	29981.1	30062.5	30650.6	30565.5	29891.5
population	Persons	22300.1	23419.5	24053.3	25269.6	27148.7	27517.3	28310.7	28429.3	29031.0	28934.5	28463.2

Note: Rates were age-adjusted using the Australian population as at 30 June 2001.

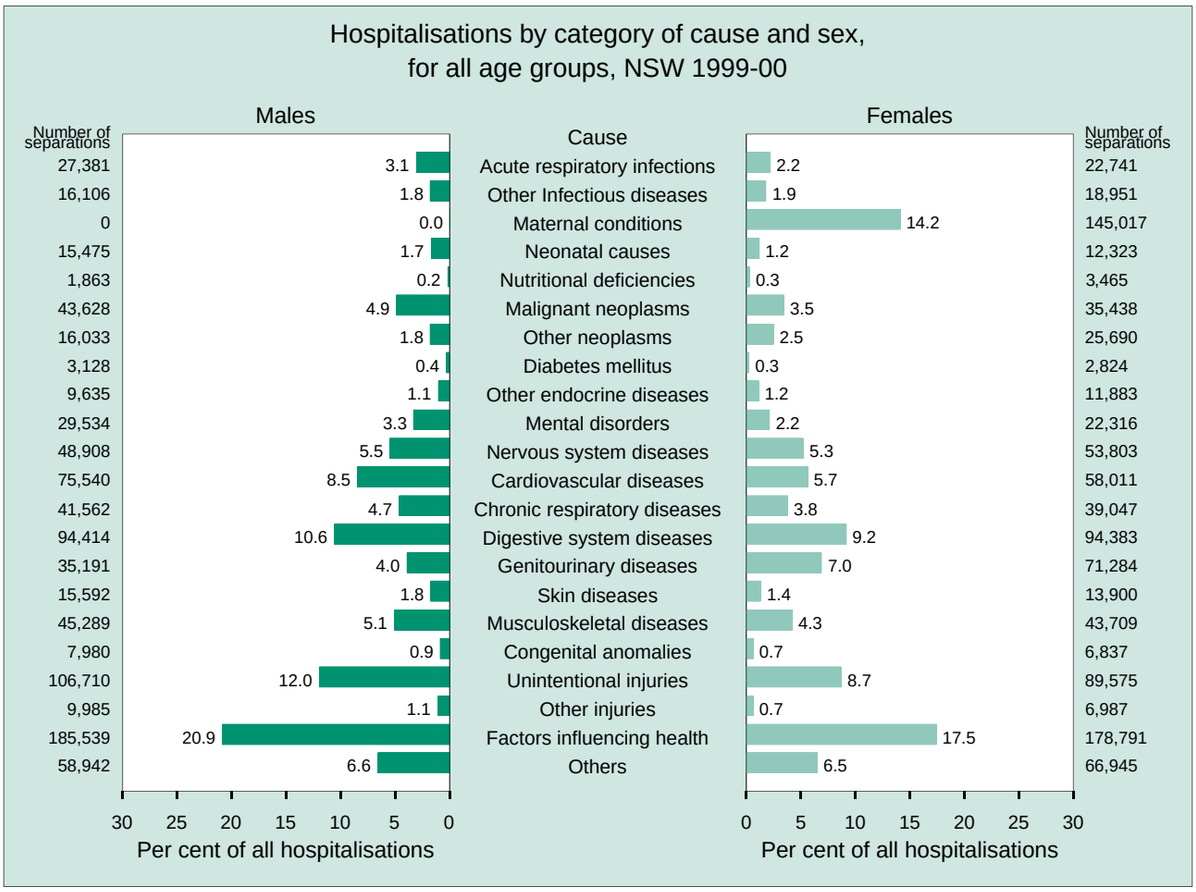
Source: NSW Inpatient Statistics Collection and ABS mortality data (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- 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.
- Older people use hospitals more than younger people, so that as the proportion of older people in the population increases, the overall (crude) hospital separation rate is also expected to increase. Age-adjustment controls for the effect of changes in the age structure of the population, allows for valid comparisons of hospital separation rates over time.
- The age-adjusted hospital separation rate in NSW increased by 30% over the period 1988–89 to 1998–1999 (34% for males and 26% for females). Note that the data for 1999–00 were incomplete at the time of production (see the Methods section for more details).
- Throughout this period, the age-adjusted female hospital separation rate has been consistently higher than the rate for males, but has increased somewhat more slowly, leading to a gradual narrowing of the gap between male and female hospitalisation rates.
- Hospitalisation rates are affected by many factors including changes in reporting, admission and treatment practices, changes in the number of hospitals beds per head of population, and underlying changes in the occurrence of conditions requiring hospitalisation.

For more information:

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

NSW Health Services Comparison Data Book 1998–1999. Sydney: NSW Department of Health, 2000. Available at www.health.nsw.gov.au/iasd/iad/yb9899.



Note: Hospital separations were classified using ICD-10-AM and were grouped into categories as described in the Methods section. 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). Epidemiology and Surveillance Branch, NSW Department of Health.

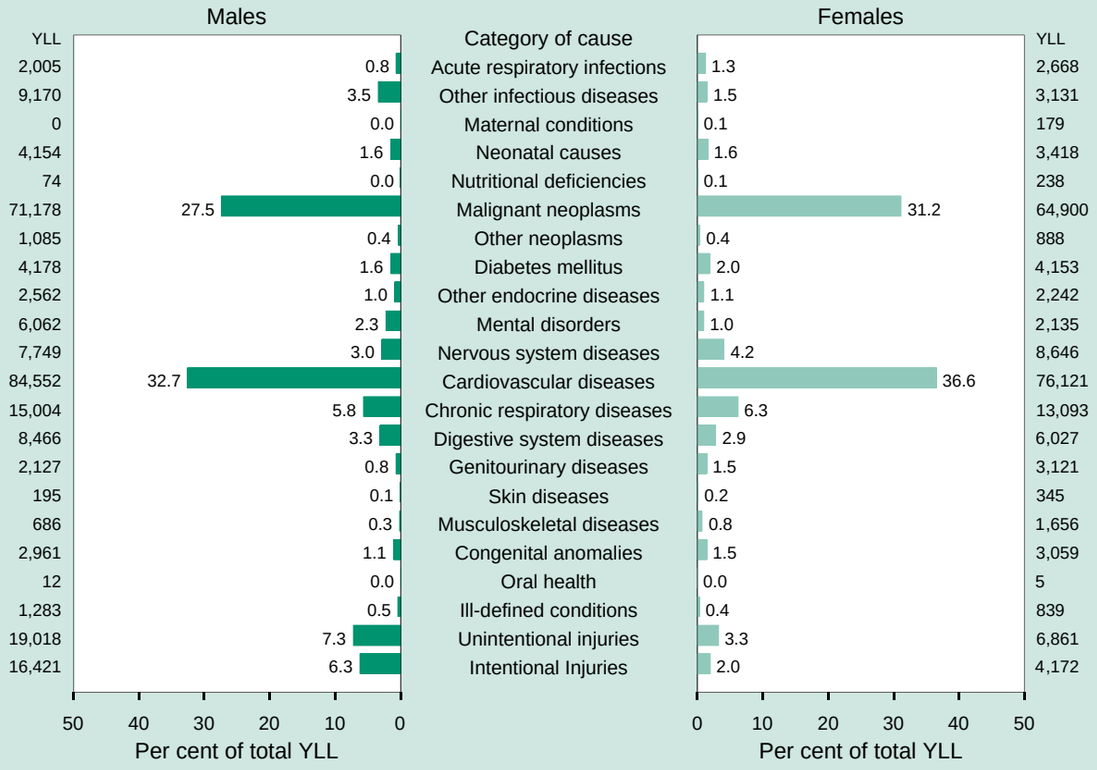
- A hospital separation occurs whenever a patient is admitted to hospital (including a day-only admission) and is then discharged, transferred to another hospital, or dies while in hospital.
- The graph on this page shows hospital separations by broad categories of cause for each sex, in NSW, in 1999–00
- Overall, the most common cause of hospitalisation was 'Factors influencing health'. This category includes ICD-10-AM codes for 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. These include admissions for motor vehicle and other transport accidents, and admissions for injuries sustained in falls by older people.
- Diseases of the digestive system and conditions relating to pregnancy and childbirth are also leading causes of hospital admission.

For more information:

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

NSW Health Services Comparison Data Book 1998–1999. Sydney: NSW Department of Health, 2000. Available at www.health.nsw.gov.au/iasd/iad/yb9899.

Years of life lost due to premature mortality (YLL) by category of cause and sex for all age groups, NSW 1996



Note: Based on deaths of NSW residents registered in 1996 and Australian cohort life expectancies 1996. YLL were discounted by 3% per year and not age weighted. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: ABS mortality data (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health. Australian cohort life expectancies from the Australian Burden of Disease and Injury Study. Australian Institute of Health and Welfare 1999.

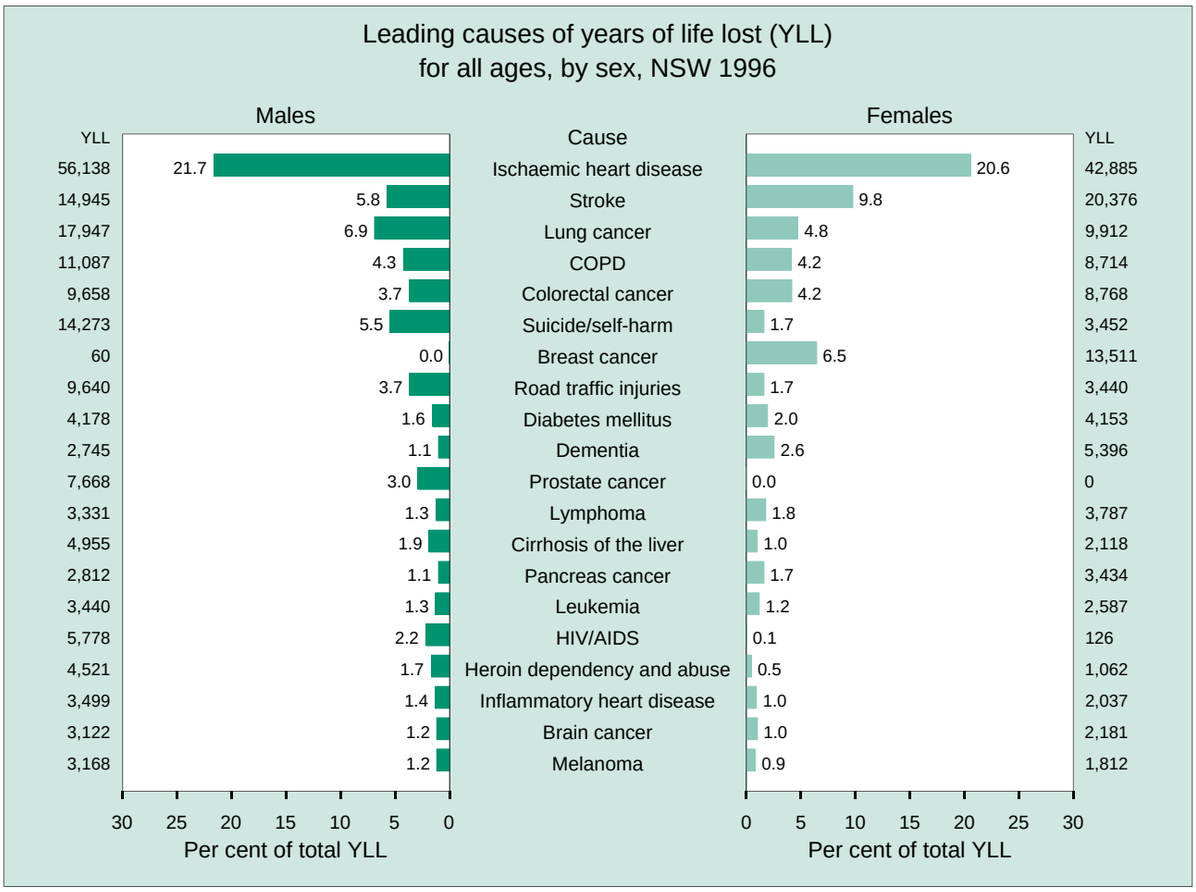
- The years of life lost due to premature death (YLL) form the mortality component of the disability adjusted life year (DALY) or overall measure of burden of disease. See the chapter introduction for an explanation of the DALY, discounting and age weighting.
- In 1996, in NSW, there was an estimated total of 466,838 YLL, of which males accounted for 258,940 (55%) and females for 207,897 (45%). In males, cardiovascular diseases (33%), followed by malignant neoplasms (28%) and unintentional injuries (7%), were the major categories of causes of YLL. In females, cardiovascular diseases (37%), followed by malignant neoplasms (31%) and chronic respiratory diseases (6%), were the major categories of causes of YLL.
- Compared with females, males experienced a substantially greater relative YLL burden from unintentional injuries (7% versus 3%), intentional injuries (6% versus 2%) and communicable diseases (4% versus 2%)—mainly due to deaths from AIDS.

For more information:

Australian Institute of Health and Welfare Burden of Disease Web site at www.aihw.gov.au/bod/index.html.

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

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



Note: Based on deaths of NSW residents registered in 1996 and Australian cohort life expectancies 1996. YLL were discounted by 3% per year and not age weighted.

Source: ABS mortality data (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health. Australian cohort life expectancies from the Australian Burden of Disease and Injury Study. Australian Institute of Health and Welfare 1999.

- The years of life lost due to premature death (YLL) forms the mortality component of the disability adjusted life year (DALY) or overall measure of burden of disease. See the chapter introduction for an explanation of the DALY, discounting and age weighting.
- Of the total 466,838 YLL estimated for NSW in 1996, the top 20 ranked individual causes accounted for 322,718 YLL (69%). The conditions causing the greatest burden of YLL were ischaemic heart disease (99,022 YLL, 21%), stroke (35,321 YLL, 8%), and lung cancer (27,859 YLL, 6%).
- In males, the highest ranking causes of YLL were ischaemic heart disease (56,138 YLL, 22%), followed by lung cancer (17,947 YLL, 7%) and stroke (14,945 YLL, 6%). In females, the highest ranking causes were ischaemic heart disease (42,885 YLL, 21% of female YLL), followed by stroke (20,376 YLL, 10%), and breast cancer (13,511 YLL, 6%).
- Of the top 20 conditions in males, the relative YLL burden was more than double that for females for suicide and self-harm (5.5 versus 1.7%), road traffic injuries (3.7 versus 1.7%), HIV–AIDS (2.2 versus 0.1%), and heroin dependency and abuse (1.7 versus 0.5%).
- Of the top 20 conditions in females, the relative YLL burden for dementia was more than double that for males (2.6 versus 1.1%).

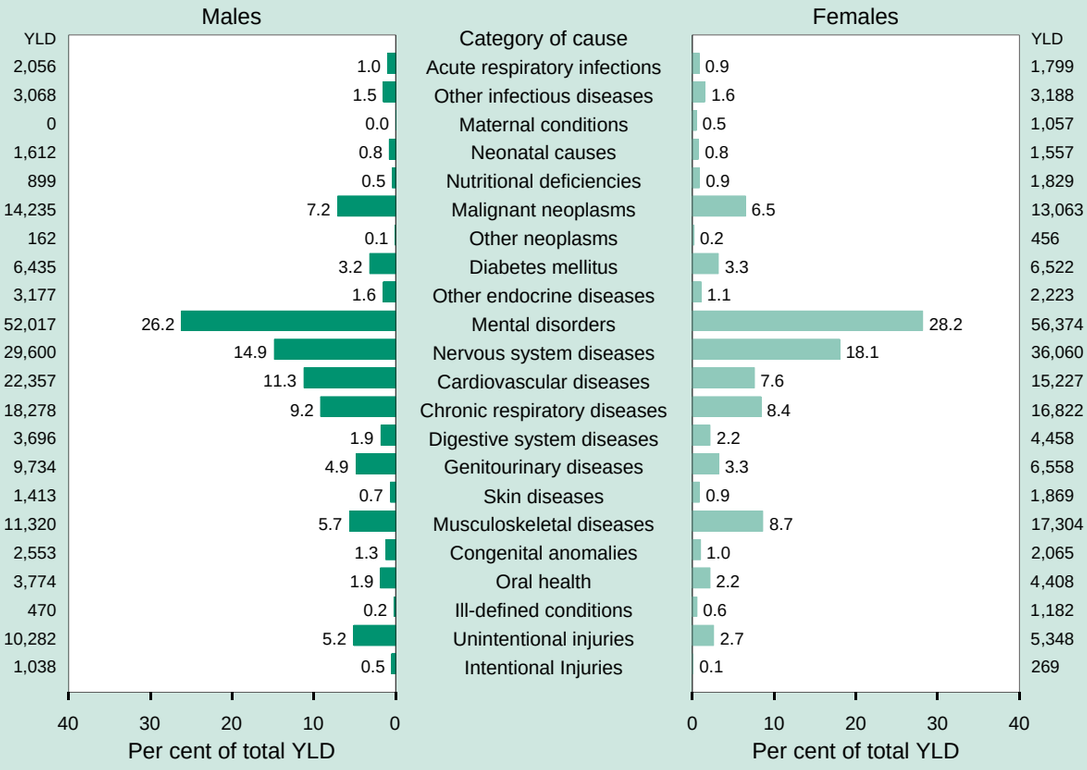
For more information:

Australian Institute of Health and Welfare Burden of Disease Web site at www.aihw.gov.au/bod/index.html.

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

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

Years of life lived with disability (YLD) by category of cause and sex for all age groups, NSW 1996



Note: YLD were approximated for NSW from national results from the Australian Burden of Disease and Injury Study 1996. YLDs were discounted by 3% per year and not age weighted. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

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

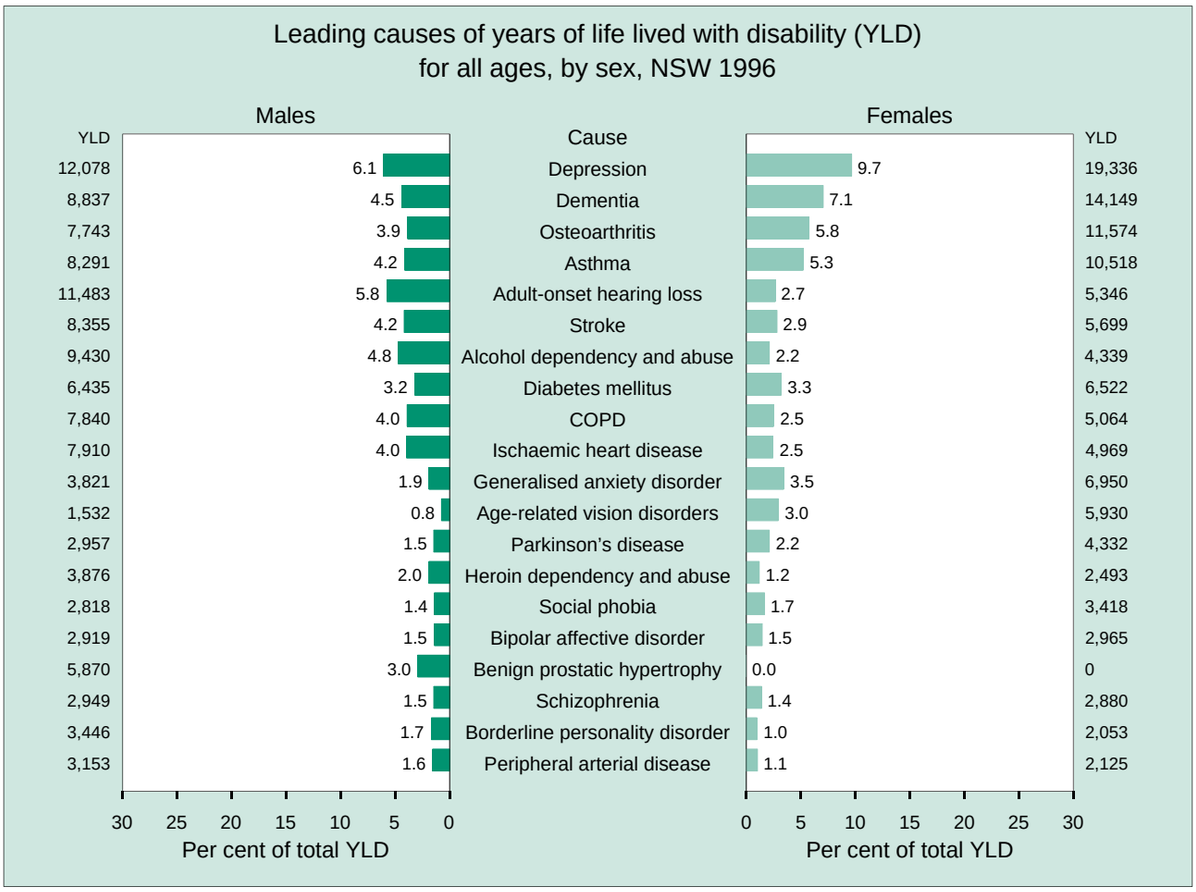
- The years of life lived with disability (YLD) form the morbidity or non-fatal component of the disability adjusted life year (DALY) or overall burden of disease. See the chapter introduction for an explanation of the DALY, discounting and age weighting. Note that the YLD for NSW were approximated from national figures from the Australian Burden of Disease Study 1996 (AIHW, 1999).
- In 1996 in NSW there was an estimated total of 397,815 YLD resulting from new cases of disease occurring in that year. Males accounted for 198,175 (50%) of these and females for 199,640 (50%). In males, mental disorders (26%), followed by nervous system disorders (15%), and cardiovascular diseases (11%), were the major cause categories. In females, mental disorders (28%), followed by nervous system disorders (18%), and musculoskeletal diseases (9%), were the major cause categories.
- Compared with females, males experienced a substantially greater relative YLD burden from cardiovascular diseases (11% versus 8%), unintentional injuries (5% versus 3%), and genitourinary diseases (5% versus 3%).
- Compared with males, females experienced a relatively greater YLD burden from musculo-skeletal diseases (9% versus 6%).

For more information:

Australian Institute of Health and Welfare Burden of Disease Web site at www.aihw.gov.au/bod/index.html.

Victorian Department of Human Services Burden of Disease Web site 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% per year and not age weighted. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

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

- The years of life lived with disability (YLD) forms the morbidity or non-fatal component of the disability adjusted life year (DALY) or overall burden of disease. See the chapter introduction for an explanation of the DALY, discounting. 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 individual causes overall accounted for 242,407 YLD (61%). The conditions causing the greatest burden of YLD 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%), followed by adult-onset hearing loss (11,483 YLD, 6%) and alcohol dependency and abuse (9430 YLD, 5%). In females, the highest ranking causes were depression (19,336 YLD, 10%), followed by dementia (14,149 YLD, 7%) and osteoarthritis (11,574 YLD, 6%).
- Of the top 20 conditions in males, the relative YLD burden was more than double that for 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%).
- Of the top 20 conditions in females, the relative YLD burden was more than double that for males for age-related vision disorders (3.0% versus 0.8%).

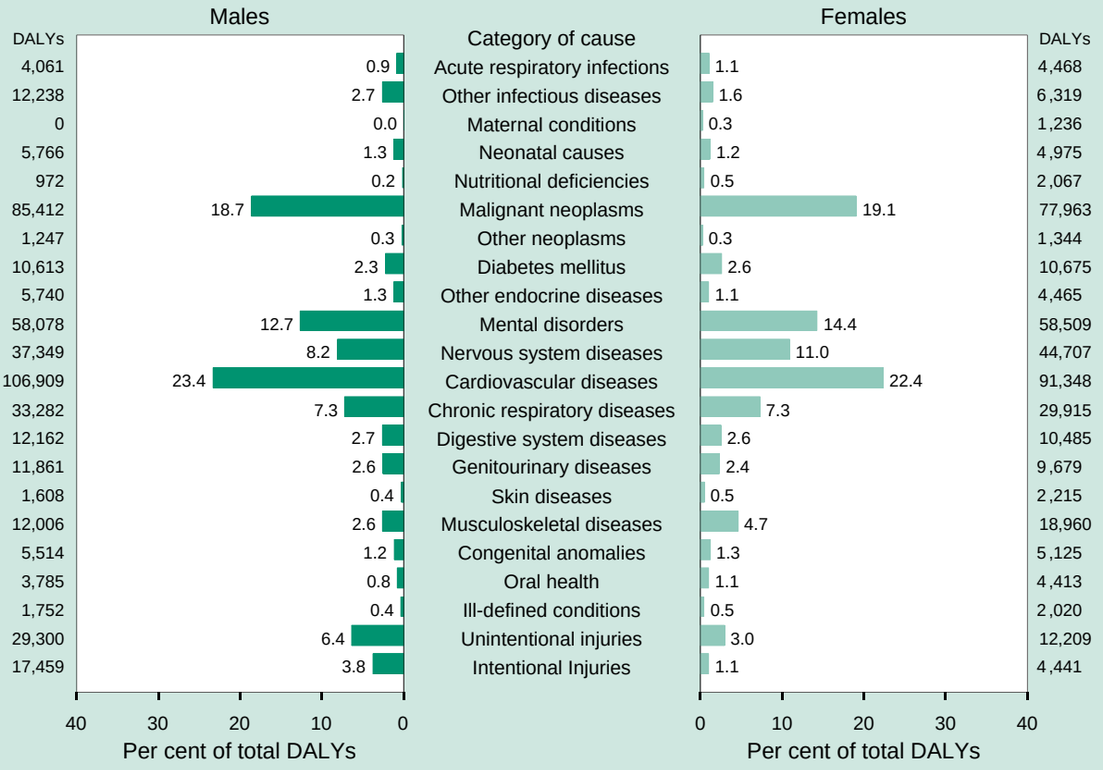
For more information:

Australian Institute of Health and Welfare Burden of Disease Web site at www.aihw.gov.au/bod/index.html.

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

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

Disability adjusted life years (DALYs) by category of cause and sex for all age groups, NSW 1996



Note: The contribution of deaths from each cause category to the 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. 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). Epidemiology and Surveillance Branch, NSW Department of Health. 1996 Australian Burden of Disease and Injury study. Australian Institute of Health and Welfare 1999.

- The disability adjusted life year (DALY) is a summary measure of overall burden of disease 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 and discounting and age weighting.
- In 1996 in NSW there was an estimated total burden of 864,652 DALYs, of which males accounted for 457,115 (53%) and females for 407,537 (47%). The major categories of causes were cardiovascular diseases (23% of DALYs in males, 22% in females), followed by malignant neoplasms (19% in males and females) and mental disorders (13% in males, 14% in females).
- Compared with females, males experienced a substantially greater relative DALY burden from unintentional injuries (6% versus 3%) and intentional injuries (4% versus 1%).
- Compared with males, females experienced a greater relative DALY burden from musculo-skeletal conditions (5% versus 3%).

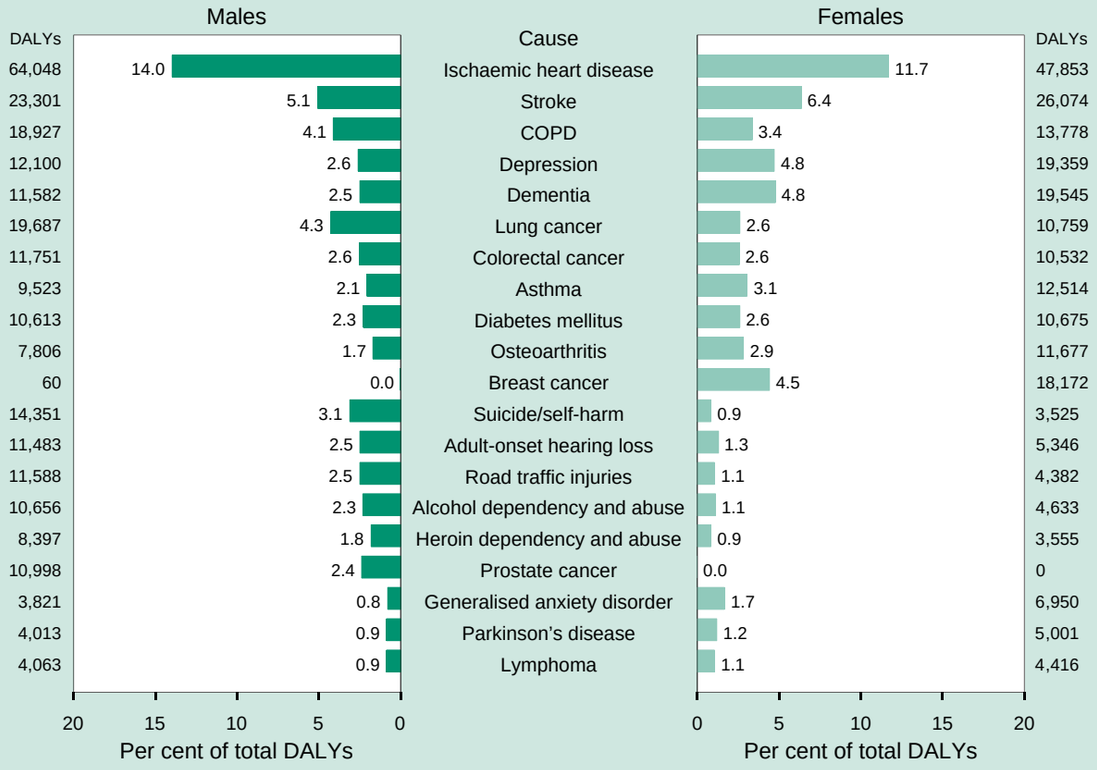
For more information:

Australian Institute of Health and Welfare Burden of Disease Web site at www.aihw.gov.au/bod/index.html.

Victorian Department of Human Services Burden of Disease Web site 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 disability adjusted life years (DALYs) for all age groups, by sex, NSW 1996



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 approximate d using national results from the Australian Burden of Disease and Injury Study 1996. DALYs were discounted by 3% per year and not age weighted. 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). Epidemiology and Surveillance Branch, NSW Department of Health. 1996 Australian Burden of Disease and Injury study. Australian Institute of Health and Welfare 1999.

- The disability adjusted life year (DALY) is a summary measure of overall burden of disease 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.
- Of the total 864,652 DALYs estimated for NSW in 1996, the top 20 ranked causes overall accounted for 507,516 DALYs (59%). The conditions causing the greatest burden of DALYs 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%), 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%), followed by stroke (26,074 DALYs, 6%), and dementia (19,545 DALYs, 5%).
- Of the top 20 conditions in males, the relative DALY burden was more than double that for females for suicide and self-harm, road traffic injuries, alcohol dependency and abuse, heroin dependency and abuse, HIV–AIDS and cirrhosis of the liver.
- Of the top 20 conditions in females, the relative DALY burden was more than double that for males for generalised anxiety disorder and age-related vision disorders.

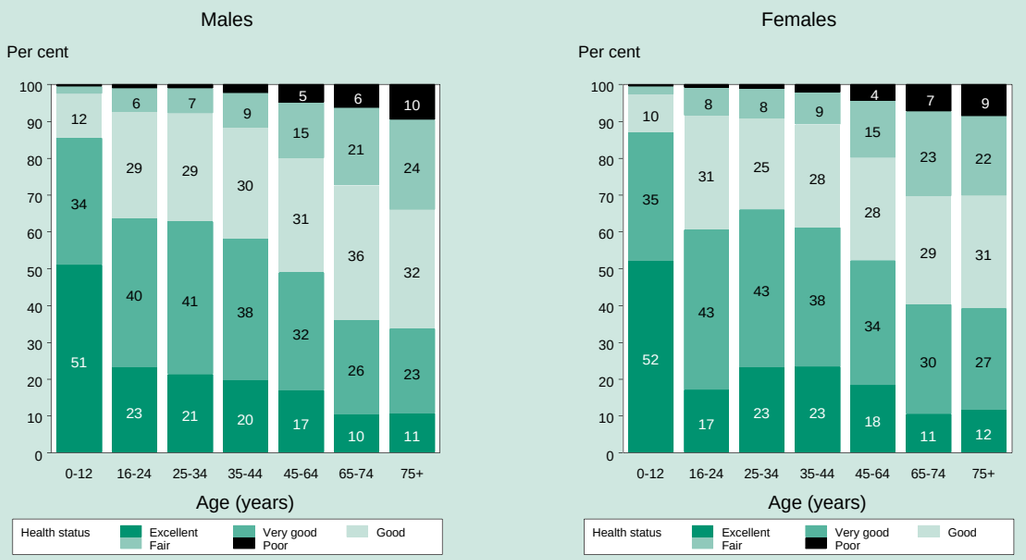
For more information:

Australian Institute of Health and Welfare Burden of Disease Web site at www.aihw.gov.au/bod/index.html.

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

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

Self-rated health, NSW 1997-1998 and 2001



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 35,025 adult and 9425 child respondents. 26 (0.07%) adults and 2 (0.02%) children not stated for self-rated health. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Health Surveys 1997 and 1998 and NSW Child Health Survey 2001 (HOIST). Epidemiology and Surveillance Branch, 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 (Idler and Benyamini, 1997). For example, an Australian study that followed people aged 60 years and over for 7 years found that people who rated their health as fair or poor (women) and poor (men) at the beginning of follow-up were significantly more likely to die prematurely. This association remained after controlling for demographic factors, a range of illnesses, disability, depression, and social support (McCallum et al., 1994).
- In the 1997 and 1998 NSW Health Surveys, very good or excellent health was reported with similar frequency by males (54%) and females (56%) aged 16 years and over, as was fair or poor health (15% and 16%, respectively). The proportion of both men and women rating their health as fair or poor increased steadily with age. Ten per cent of men and 9% of women aged 75 years or more rated their health as poor.
- In the 2001 NSW Child Health Survey, parents and carers rated the health of children aged 0–12 years. The great majority of both boys (85%) and girls (87%) were reported to have very good or excellent health.

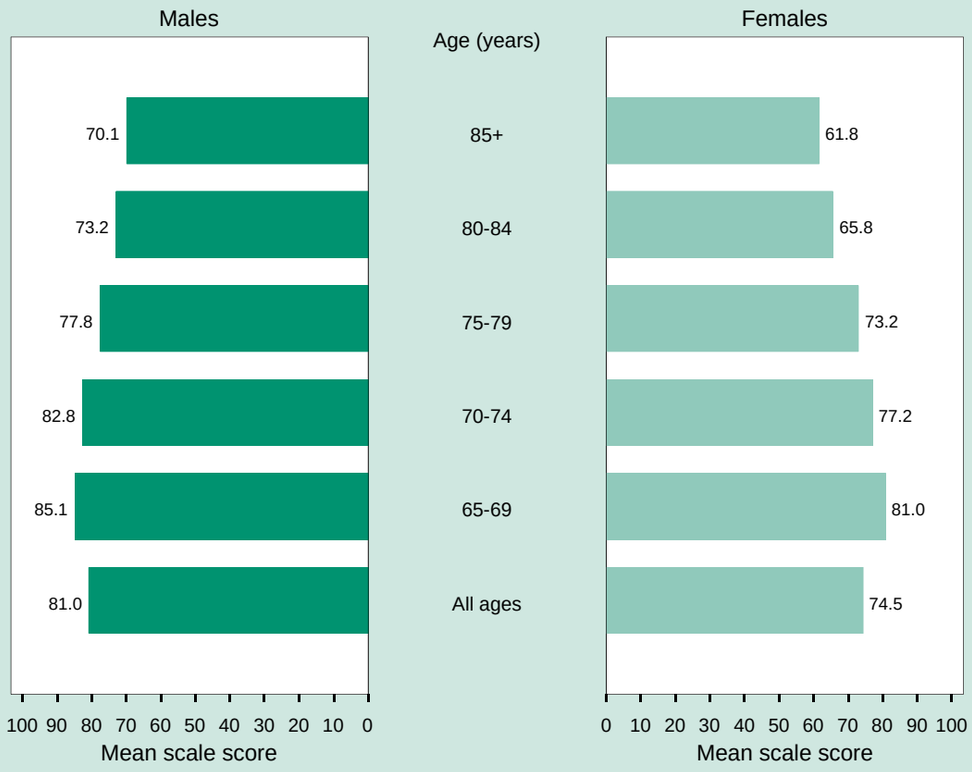
For more information:

Idler EL, Benyamini Y. Self-rated health and mortality: a review of twenty-seven community studies. *J Health and Social Behaviour* 1997; 38: 21–37.

McCallum J, Shadbolt B, Wang D. Self-rated health and survival: a 7-year follow-up study of Australian elderly. *Am J Public Health* 1994; 84:1100–5.

Public Health Division. *Electronic Report of the 1997 and 1998 NSW Health Surveys* at www.doh.health.nsw.gov.au/public-health/nswhs. Sydney: NSW Department of Health.

Physical functioning as measured by SF-36 by age and sex, persons aged 65 and over, NSW 1999



Note: Estimates based on 8881 respondents. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Older People's Health Survey 1999 (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- The physical functioning scale of the SF-36 instrument (Ware et al., 1993) comprises 10 questions concerning a person's ability to do various moderate and vigorous activities.
- In the 1999 NSW Older People's Health Survey, older males reported better physical functioning using this scale than older females across all age groups. Reported physical functioning declined markedly with age, particularly among females.
- Mean SF-36 Physical Functioning scores (81.0 for males and 74.5 for females) were markedly higher than the published Australian population average scores for this age group (66.1 for males and 57.3 for females) (Stevenson, 1996). These differences probably reflect 2 factors. First, the data were collected in different ways: the NSW data were collected by telephone survey, while the Australian data came from a self-administered survey. Second, respondents to the NSW survey may have represented a relatively 'healthy' group of older people.
- Reductions in physical functioning result in restrictions in older people's ability to participate in day-to-day activities. The *NSW Healthy Ageing Framework 1998–2003* emphasises the importance of strategies to increase the participation of older people in the community, and to live as independently as possible (NSW Ageing and Disability Department, 1998).

For more information:

NSW Ageing and Disability Department and NSW Department of Health. *NSW Healthy Ageing Framework, 1998–2003*. Sydney: NSW Ageing and Disability Department, 1998.

Public Health Division. *New South Wales Older People's Health Survey 1999*. Sydney: NSW Department of Health, 2001. Available at www.health.nsw.gov.au/public-health/ophs99/index.htm.

Stevenson C. *SF-36: Interim norms for Australian data*. Canberra: Australian Institute of Health and Welfare, 1996.

Ware JE, Snow KK, Kosinski MA, et al. *SF-36 Health Survey: Manual and interpretation guide*. Boston: Nimrod Press, 1993.

3 Health inequalities

Section 3

Chapter 3.1

Aboriginal and Torres Strait Islander peoples

- Around 110,000 indigenous people live in NSW, making up just under 2% of the total population.
- Indigenous people are socioeconomically disadvantaged, compared with the general population.
- Newborn indigenous males can expect to live 56 years, and newborn indigenous females can expect to live 64 years. This is 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 16% of deaths of indigenous people, compared with 3% of deaths among non-indigenous people.
- 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 in ways that are risky for health.
- Indigenous people have higher hospitalisation rates than non-Aboriginal people for many health conditions. Also, indigenous people who live in rural areas have higher hospitalisation rates than those who live in urban areas.
- Compared with urban indigenous people, rural indigenous people:
  - —are 1.5 times more likely to be hospitalised for injury and poisoning;
  - —are over 1.5 times more likely to be hospitalised for heart disease and stroke;
  - —are 5 times more likely to be hospitalised for diabetes;
  - —are 2.5 times more likely to be hospitalised for respiratory diseases;
  - —are more likely to be hospitalised as children for middle ear infections.
- Factors that contribute to higher hospitalisation rates among rural compared to urban indigenous people are better reporting of aboriginality in rural areas; and an increased likelihood of being admitted due to the greater distance rural people may live from hospitals.

In this chapter

- Indigenous population pyramid
- Socioeconomic factors
- Life expectancy
- Mortality
- Prematurity and low birthweight
- Perinatal deaths
- Hospitalisation
- Injury and poisoning
- Cardiovascular risk factors
- Cardiovascular disease
- Diabetes mellitus
- Respiratory diseases
- Otitis media
- Oral health

Introduction

In *The health of the people of New South Wales—Report of the Chief Health Officer, 2000* we compared the health of indigenous people with non-indigenous people and found that indigenous people have poorer health for the majority of available health indicators. In this report, we focus on comparing the health of indigenous people living in urban and rural areas in NSW and find that those living in rural areas are generally at a health disadvantage compared to those living in urban areas.

NSW Health is committed to improving health outcomes for Aboriginal people. The *NSW Aboriginal Health Strategic Plan* identifies the following key priorities: improving access to health services; addressing certain areas, in particular diabetes and diseases of the circulatory system, eye health, maternal health, infant and child health, and oral health; improving social and emotional wellbeing; increasing the effectiveness of health promotion; and creating an environment supportive of good health. The Strategic Plan is further supported by Aboriginal Health Regional Plans, which have been developed in partnership with Aboriginal communities in NSW.

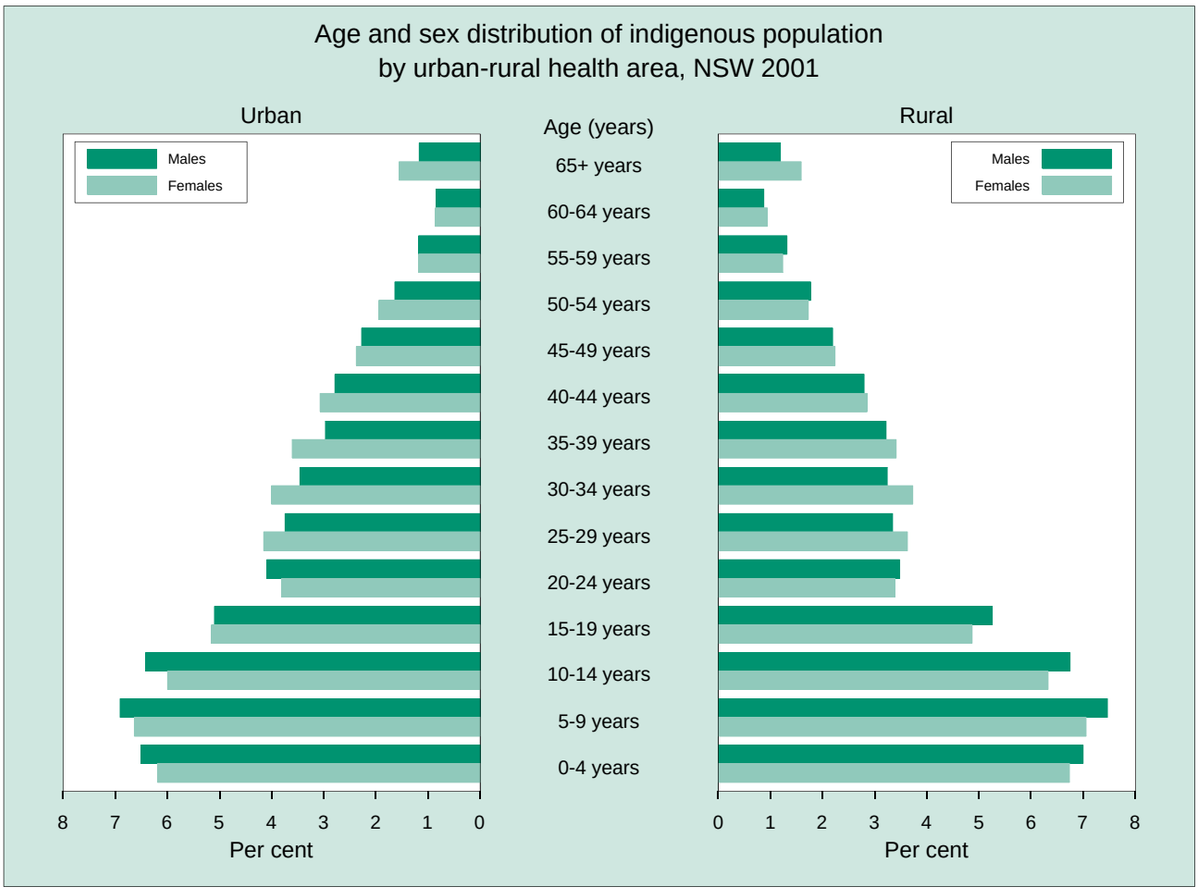
A range of issues affect the quality of available data about the health of the Aboriginal and Torres Strait Islander people of NSW. Indigenous status is substantially under-reported in both death and hospital morbidity data, making their interpretation especially difficult. In 1996–97, a change in coding practice for indigenous status in hospital morbidity data resulted in a disproportionately large number of hospital separations being attributed to indigenous people, and the artifact is evident in some of the health indicators reported in this chapter. Even data about the number of indigenous people in the population (which are used to calculate rates) must be treated with caution. Estimates of the indigenous population have risen markedly in successive censuses, with increasing participation by indigenous people, and increasing willingness to self-identify as an Aboriginal or Torres Strait Islander person.

Estimates of the prevalence of health conditions and behaviours among Aboriginal people derived from the available sources of health survey data vary quite markedly. This reflects differences in sampling methods, modes of administration, and in the increasing propensity of Aboriginal people to self-identify and to participate in surveys.

For more information:

Policy Division. *New South Wales Aboriginal Health Strategic Plan.* Sydney: NSW Department of Health, 1999. This document may be viewed at the NSW Department of Health Web site at www.health.nsw.gov.au/health-public-affairs/ahealth.

Commonwealth Department of Health and Aged Care, Aboriginal Health and Medical Research Council NSW, NSW Department of Health, Aboriginal and Torres Strait Islander Commission. *From the Ground Up—Summary, NSW Aboriginal Health Regional Plans.* Sydney: NSW Department of Health, 2000.



Note: ABS 2001 Census counts. Health areas in Greater Sydney, Hunter, and Illawarra, were classified as urban.

Source: Australian Bureau of Statistics population data (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- At the 2001 Census 119,895 indigenous people were reported to be living in NSW, comprising 1.9% of the NSW population. Slightly more indigenous people lived in rural health areas compared to urban health areas.
- The age distributions of indigenous people living in urban and rural areas of NSW were similar. The proportion of the indigenous population less than 15 years of age was 38.7% for urban areas, 41.4% for rural areas and 40.1% overall. There was a higher proportion of children aged less than 15 years in the indigenous population (40.1%), compared to the non-indigenous population (20.4%). In both urban and rural areas, 51.3% of the under-15 population were male and 48.7% were female.
- People aged 65 years and over comprised 2.8% of the indigenous population in both urban and rural areas. This compares with 13.3% for the non-indigenous population. In both urban and rural areas, 42.9% of the over-65 population were male and 57.1% were female.
- The shape of the population pyramid reflects higher death rates and shorter life expectancy for indigenous men compared to women in both urban and rural areas. The difference is greater in urban areas. There is also a substantial drop in the size of the population between 10–14 years and 15–19 years, reflecting a relatively high mortality rate among older teenagers.

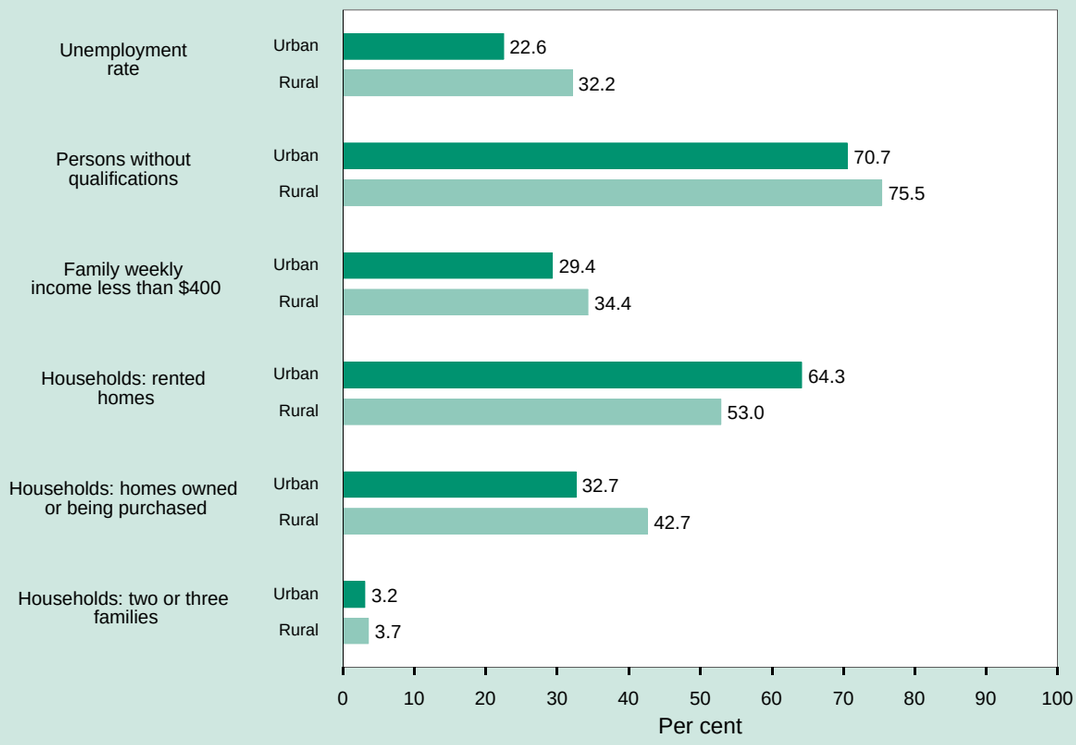
For more information:

Australian Bureau of Statistics. *The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples 2001.* Catalogue no. 4704.0. Canberra: ABS, 2001.

Australian Bureau of Statistics. *Aboriginal and Torres Strait Islander People, New South Wales.* Catalogue no. 2034.1. Canberra: ABS, 1998.

Australian Bureau of Statistics. *Aboriginal and Torres Strait Islander People, Australia.* Catalogue no. 2034.0. Canberra: ABS, 1998.

Socioeconomic factors among indigenous people
by urban-rural health area of residence, NSW 1996



Note: Health areas in Greater Sydney, Hunter and Illawarra were classified as urban. Major urban areas and other urban areas as defined by ABS were classified as urban; bounded locality and rural balance as defined by ABS were classified as rural for the following indicators: rented households and households owned or being purchased. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: Australian Bureau of Statistics 1996 Indigenous Profiles (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health. Australian Bureau of Statistics. *Census of Population and Housing. Aboriginal and Torres Strait Islander People, New South Wales.* Catalogue no. 2034.1. Canberra: ABS, 1998.

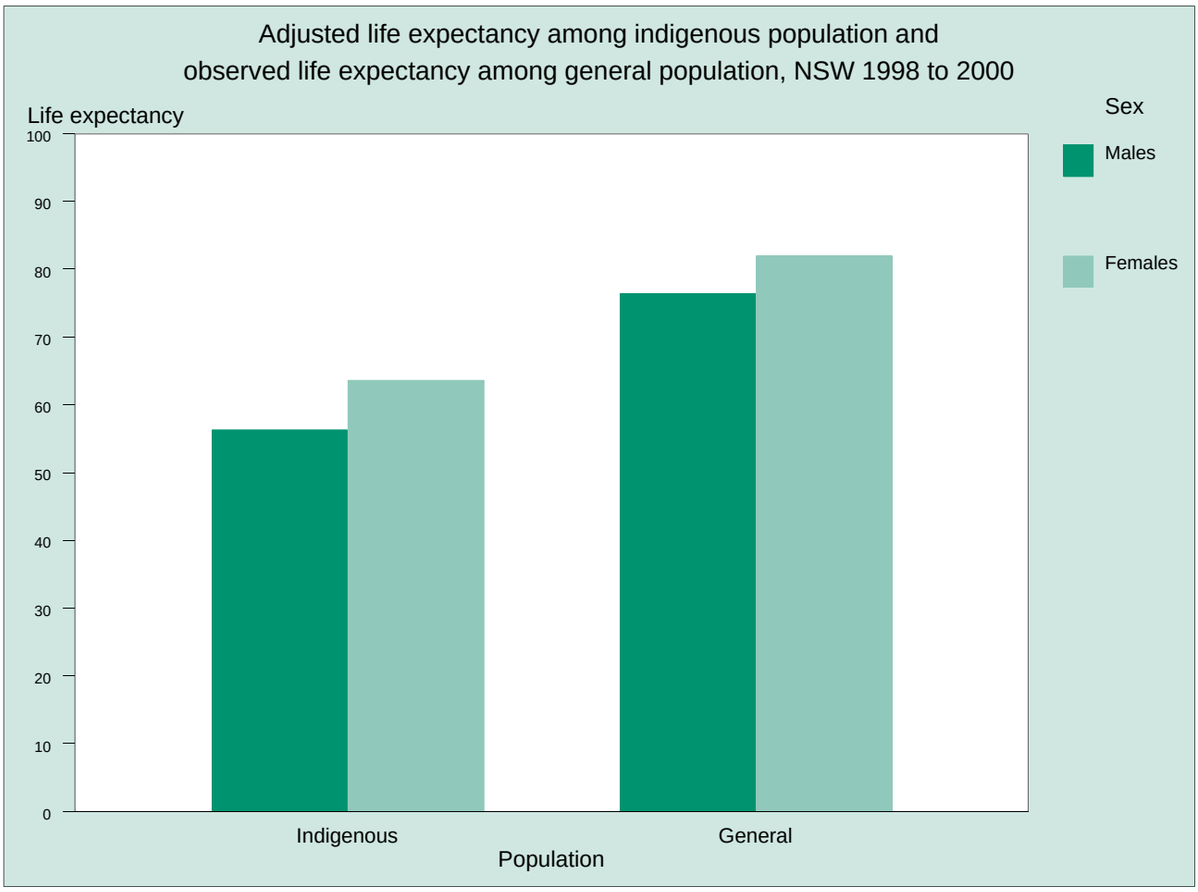
- The association between socioeconomic status and health is well-documented and described in detail in Chapter 3.4, with lower socio-economic status being associated with poorer health.
- The indigenous population in 1996 had an unemployment rate over 3 times that of the general population (27.0% versus 8.8%) and unemployment was higher in rural than urban areas.
- A slightly higher percentage of indigenous families had a family weekly income of less than $400 compared with the general population (31.9% versus 27.6%). Indigenous people living in rural areas were more likely than those living in urban areas to have a weekly income of less than $400.
- Compared with the general population, households of indigenous people were more than twice as likely to be living in rented homes (62.6% versus 27.8%), and indigenous households in urban areas were more likely than those in rural areas to be living in rented homes.
- In 1996, 73.1% of indigenous people aged 15 years and over did not have post-secondary qualifications compared with 55.7% of non-indigenous people. Indigenous people living in rural areas were slightly more likely to not have post-secondary qualifications than those living in urban areas.

For more information:

Australian Bureau of Statistics. *Australian Housing Survey–Aboriginal and Torres Strait Islander Results.* Catalogue no. 4712.0. Canberra: ABS, 2001.

Australian Indigenous HealthInfoNet (1998). *Australian Indigenous HealthInfoNet overviews: housing and physical environment.* www.healthinfonet.ecu.edu.au/html/html_environment/environment_physical.htm.

The Center for Aboriginal Economic Policy Research Web site at www.anu.edu.au/caepr.



		Life expectancy			Life expectancy
Indigenous population	Males	56.3	General population	Males	76.4
	Females	63.6		Females	82.0

Note: Life expectancies for the indigenous population are experimental estimates.

Source: Australian Bureau of Statistics. *Deaths Australia 2000*. Catalogue no. 3302.0. Canberra: ABS, 2001.
Australian Bureau of Statistics. *Demography New South Wales 2000*. Catalogue no. 3311.1. Canberra: ABS, 2001.

- 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 1998–2000, the life expectancy of indigenous males was estimated to be 56 years and indigenous females to be 63.6 years. For both males and females, the life expectancy of indigenous people was estimated to be about 20 years less than the general population.
- Experimental estimates of indigenous life expectancy in NSW are similar to other states and territories: estimates of the life expectancy of indigenous males vary from 55.3 years in South Australia to 56.2 years in Queensland, and for indigenous females vary from 61.2 years in South Australia to 63.5 years in Victoria.

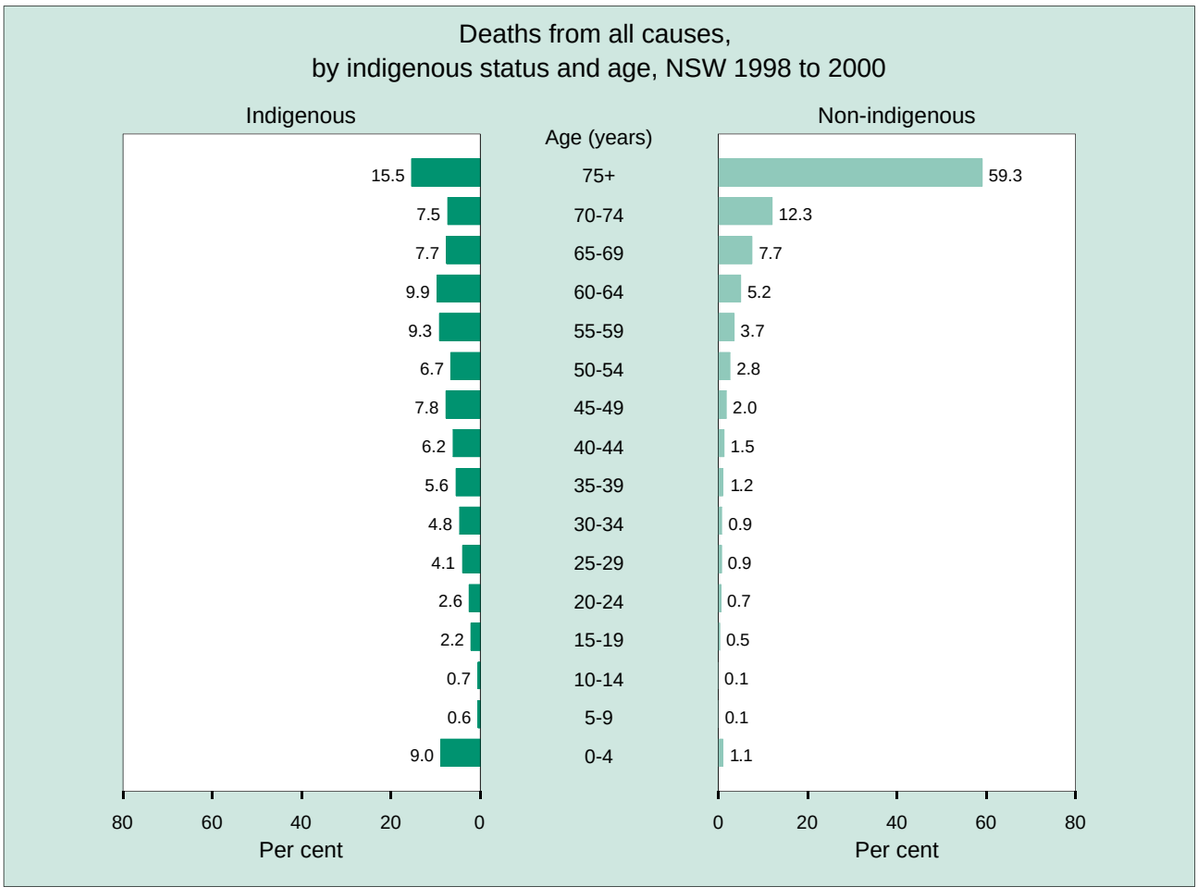
For more information:

Australian Bureau of Statistics. *Deaths, Australia 2000*. Catalogue no. 3302.0. Canberra: ABS, 2001.

Indigenous life tables:

Australian Bureau of Statistics. *Deaths, Australia 1999*. Appendix 1. Catalogue no. 3302.0. Canberra: ABS, 2001.

Australian Bureau of Statistics. *Demography Working Paper 2001–02: Aboriginal and Torres Strait Islander Mortality: Evaluation of Experimental Indigenous Life Tables*. ABS Web site at www.abs.gov.au.



Note: Data are reported by year of death and include an estimate of the small numbers of deaths that were registered in 2001, data for which were not available at the time of production. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: Australian Bureau of Statistics mortality data (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

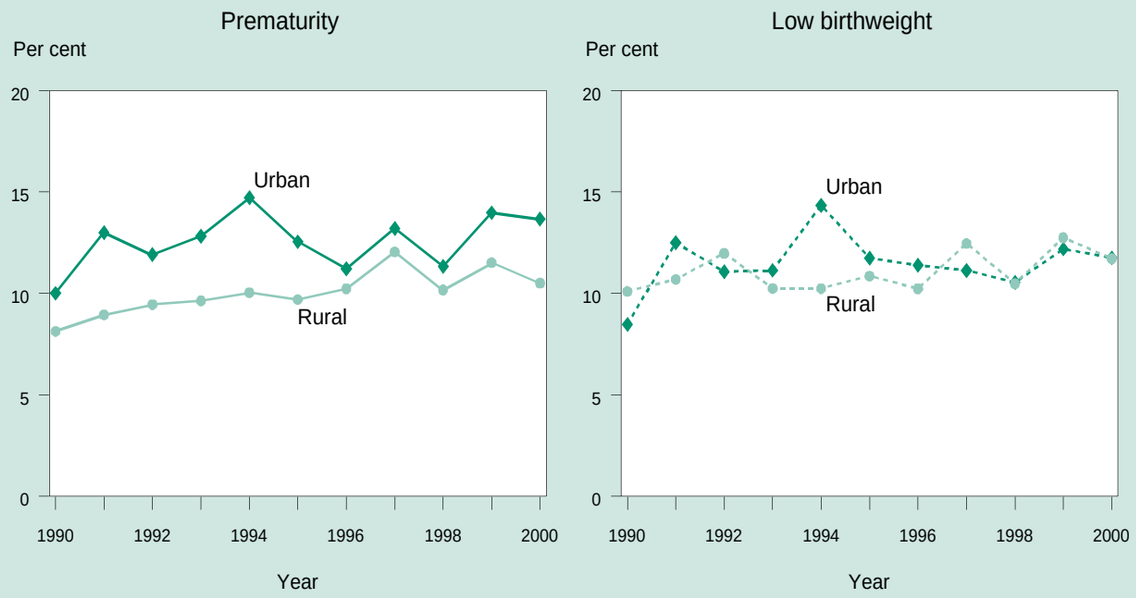
- Registration of indigenous deaths in NSW improved in the period 1998–2000 compared with previous years. However, indigenous deaths continue to be under-enumerated in NSW. The Australian Bureau of Statistics estimated that between 46% and 83% of total indigenous deaths were registered as indigenous in 2000.
- Over the period 1998–2000, deaths among indigenous people were more likely to occur at younger ages. Deaths in people aged less than 25 years made up 15% of deaths of indigenous people compared with 3% of deaths among non-indigenous people. Deaths among people aged 65 years and over comprised only 31% of indigenous deaths compared to 79% of non-indigenous deaths.
- Of the 1372 deaths reported among indigenous people between 1998 and 2000, 58% were among males and 42% were among females. The median age at death for indigenous males and females was 51 and 59 years respectively, over 20 years less than for non-indigenous males and females (75 and 81 years respectively).
- While registration of indigenous deaths has improved, there is insufficient information at present to comment on the patterns of causes of death.

For more information:

Australian Bureau of Statistics. *Deaths, Australia 2000.* Catalogue no. 3302.0. Canberra: ABS, 2001.

Australian Bureau of Statistics. *Demography, NSW 2000.* Catalogue no. 3311.1. Canberra: ABS, 2001.

Prematurity and low birthweight among indigenous babies, by urban-rural health area of residence, NSW 1990 to 2000



			1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Premature	Number	Urban	39	54	57	61	79	78	65	83	86	94	107
		Rural	66	87	90	95	100	109	116	146	131	159	139
		Total	105	141	147	156	179	187	181	229	217	253	246
	Per cent	Urban	10.0	13.0	11.9	12.8	14.7	12.5	11.2	13.2	11.3	14.0	13.7
		Rural	8.1	8.9	9.5	9.6	10.0	9.7	10.2	12.0	10.2	11.5	10.5
		Total	8.7	10.2	10.3	10.7	11.7	10.7	10.6	12.4	10.6	12.3	11.7
Low birthweight	Number	Urban	33	52	53	53	77	73	66	70	80	82	92
		Rural	82	104	114	101	102	122	116	151	135	176	155
		Total	115	156	167	154	179	195	182	221	215	258	247
	Per cent	Urban	8.5	12.5	11.1	11.1	14.3	11.7	11.4	11.1	10.5	12.2	11.7
		Rural	10.1	10.7	12.0	10.2	10.2	10.9	10.2	12.5	10.5	12.7	11.7
		Total	9.6	11.2	11.7	10.5	11.7	11.2	10.6	12.0	10.5	12.6	11.7

Note: Births for which gestational age was less than 37 weeks were classified as premature births. Infants with birthweight <2,500 grams were classified as low birthweight. Infants with birthweight >400 grams or of greater than 20 weeks gestation were included. Births to mothers resident outside NSW were excluded. Health areas in Greater Sydney, Hunter, and Illawarra, were classified as urban.

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

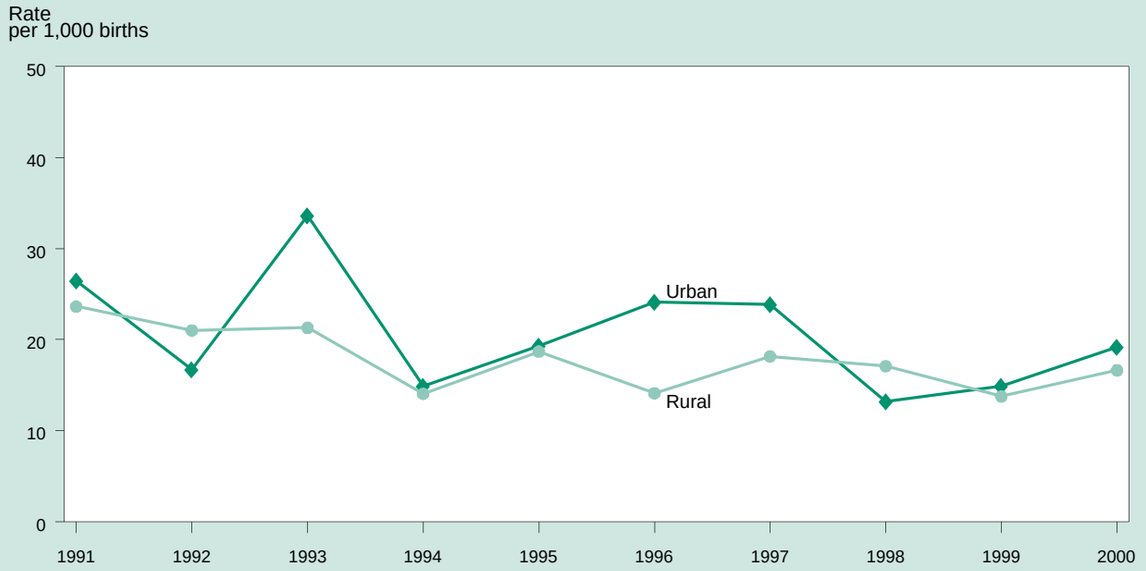
- In 2000, 2122 babies were born to indigenous mothers in NSW, 2.4% of all births. This is an underestimate of the total number of indigenous babies born, because the NSW Midwives Data Collection only gathers information on the indigenous status of mothers, and because this status is under-reported. In 2000, it is estimated that only 66% of all babies born to Aboriginal mothers were actually reported as having an Aboriginal mother.
- Since 1991, the rate of low birthweight in indigenous babies has been over 10%. It was 11.7% in 2000, higher than the overall NSW rate of 6.4%. In recent years, the percentage of low birthweight babies was similar in urban and rural areas.
- Similarly, the rate of prematurity in indigenous babies has been over 10% since 1991. It was 11.7% in 2000, compared to an overall NSW rate of 7.3%. Over the last decade, rates of prematurity were consistently higher in urban areas than rural areas.
- Smoking in pregnancy is a risk factor for both low birthweight and prematurity, and smoking in the second half of pregnancy poses the greatest risk. In 2000, 55.2% of Aboriginal mothers reported smoking in the second half of pregnancy.

For more information:

Public Health Division. New South Wales Mothers and Babies 2000. *N S W Public Health Bull* 2001; S-3. www.health.nsw.gov.au/public-health/mdc/mdcrep00.html.

Nassar N, Sullivan EA. *Australia's mothers and babies 1999*. Sydney: AIHW National Perinatal Statistics Unit, 2001.

Perinatal deaths among indigenous mothers,
by urban-rural health area of residence, NSW 1991 to 2000



		1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Perinatal deaths	Urban	11	8	16	8	12	14	15	10	10	15
	Rural	23	20	21	14	21	16	22	22	19	22
	Total	34	28	37	22	33	30	37	32	29	37
Rate	Urban	26.4	16.7	33.6	14.9	19.3	24.1	23.8	13.2	14.9	19.2
per 1000 births	Rural	23.6	21.0	21.3	14.1	18.7	14.1	18.2	17.1	13.8	16.6
	Total	24.5	19.6	25.3	14.4	18.9	17.5	20.1	15.6	14.1	17.6

Note: Perinatal deaths include stillbirths and deaths within 28 days of birth. Births to mothers resident outside NSW were excluded. Health areas in Greater Sydney, Hunter and Illawarra were classified as urban.

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

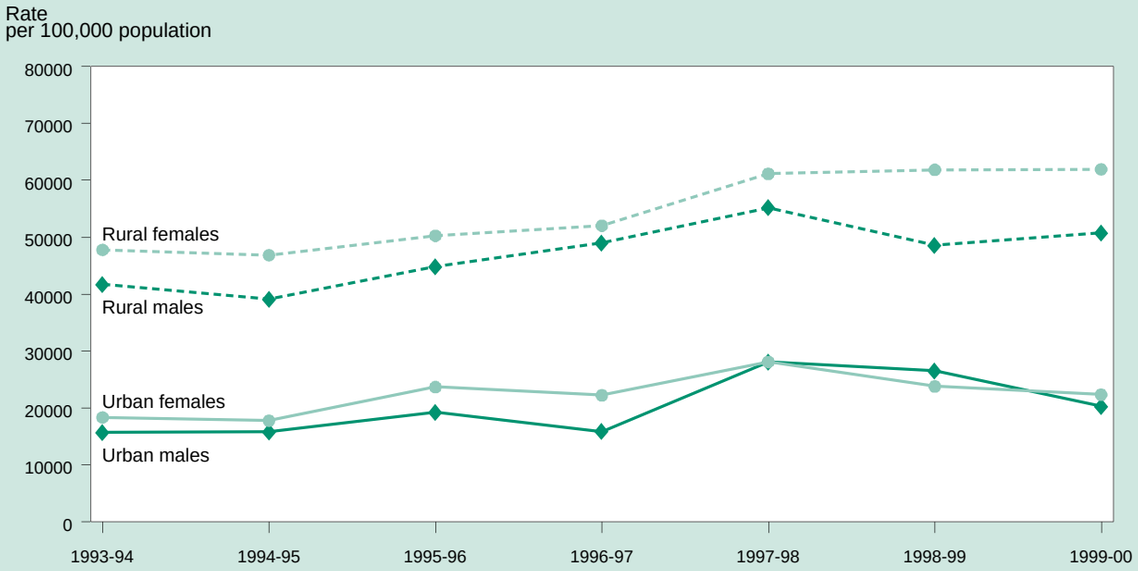
- Since 1990, the perinatal mortality rate among babies born to indigenous mothers in NSW has been more than 14 per 1000. It was 17.6 per 1000 in 2000, almost twice the rate of 9.7 per 1000 reported for NSW overall.
- There has been a decrease in the reported perinatal mortality rate in rural areas. Over the period 1990 to 1993, the perinatal mortality rate in rural areas was more than 20 per 1000, and since 1994 has remained less than 20 per 1000. The perinatal mortality rate in urban areas has been more variable and has tended to be higher than the rate in rural areas.
- This information was obtained from the NSW Midwives Data Collection (MDC). This collection underestimates the total number of indigenous babies born, because it collects information on the indigenous status of babies only, and because this status is under-reported. In 2000, it is estimated that only 66% of all babies born to Aboriginal mothers were actually reported as having an Aboriginal mother.
- In the period 1994–1996, the reported perinatal mortality rate for babies of indigenous mothers was 21.8 per 1000 for Australia overall, compared to 16.3 per 1000 in NSW. The NSW rate was the lowest of all Australian states and territories.

For more information:

Day P, Sullivan EA, and Lancaster P. *Indigenous mothers and their babies Australia 1994–1996*. Sydney: AIHW National Perinatal Statistics Unit, 1999.

Public Health Division. New South Wales Mothers and Babies 2000. *N S W Public Health Bull* 2001; S-3. www.health.nsw.gov.au/public-health/mdc/mdcrep00.html.

Hospital separations for all causes among indigenous people, by urban-rural health area of residence, NSW 1993-94 to 1999-00



			1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
Number	Urban	Persons	6083	6151	7231	7285	9091	8846	9158
	Rural	Persons	18963	18191	20544	21752	23727	24148	23602
	NSW	Persons	25152	24491	27917	29149	32902	33100	32898
Rate	Urban	Persons	17015.7	16660.6	21249.8	19103.3	27059.0	24150.2	21161.8
	Rural	Persons	44572.9	43085.9	47693.0	50475.5	57858.7	55593.5	56507.6
	NSW	Persons	31441.6	30541.6	35056.5	35441.5	43120.5	40569.6	39692.6

Note: Health areas in Greater Sydney, Hunter, and Illawarra, were classified as urban. Rates were age-adjusted using the Australian population as at 30 June 1991. Data table for this graph available at www.health.nsw.gov.au/public-health/choindex.htm.

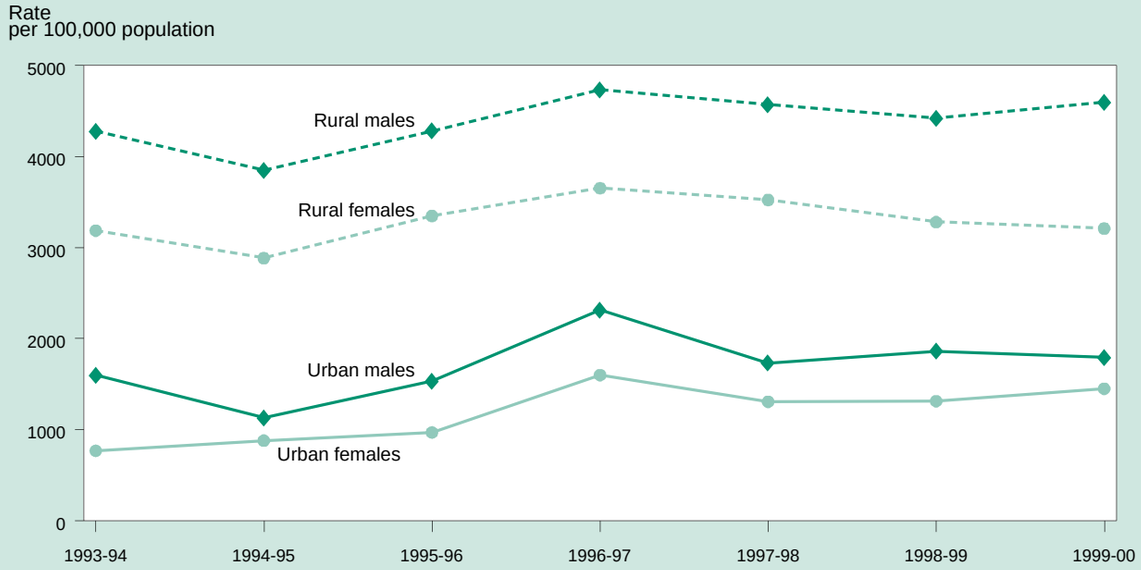
Source: NSW Inpatient Statistics Collection and ABS population data (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- 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 are much higher than those for non-indigenous people. In 1999–2000 the age-adjusted hospital separation rates were 36,690 and 42,683 per 100,000 population for indigenous males and females respectively, compared to 27,287 and 29,792 per 100,000 for non-indigenous males and females.
- Within the indigenous population, hospital separation rates were higher in the rural than the urban population. This is likely to be due to a variety of causes including better reporting of Aboriginality in rural areas; an increased likelihood of admission to hospital for care that might be provided on an outpatient basis in a rural area; and higher incidence of disease.
- In 1999–2000 the most common groups of conditions causing hospitalisation of indigenous people were: factors influencing health (23.5%), most commonly renal dialysis; maternal conditions, including childbirth (10.8%); injury and poisoning (11.5%); and acute respiratory infections (6.5%).
- Among rural residents there was a higher percentage of hospitalisations for acute respiratory infections (7.2%) compared to urban (4.7%) residents, and a relatively lower percentage of hospitalisations for mental disorders (4.6% versus 8.2%), and maternal conditions (9.9% versus 13.0%). Patterns of causes of hospitalisation were otherwise fairly similar.

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 2001.* Canberrra: ABS and AIHW, 2002.

Hospital separations for injury and poisoning among indigenous people by urban-rural health area of residence, NSW 1993-94 to 1999-00



			1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
Number	Urban	Persons	497	456	545	720	674	686	783
	Rural	Persons	1840	1659	1962	2029	2070	2025	2064
	NSW	Persons	2349	2128	2518	2765	2746	2725	2858
Rate	Urban	Persons	1142.8	1009.5	1238.9	1960.9	1518.4	1577.4	1641.8
per 100,000	Rural	Persons	3720.1	3349.8	3817.7	4209.5	4025.4	3842.7	3877.7
	NSW	Persons	2478.7	2237.8	2580.1	3134.5	2808.8	2750.1	2798.3

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Records relating to acute hospital transfer and statistical discharge were excluded. Health areas in Greater Sydney, Hunter, and Illawarra, were classified as urban. Rates were age-adjusted using the Australian population as at 30 June 1991. Data table for this graph available at www.health.nsw.gov.au/public-health/choindex.htm.

Source: NSW Inpatient Statistics Collection and ABS population data (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Indigenous status is believed to be substantially under-reported in NSW hospital morbidity data. Nevertheless, rates of age-adjusted hospital separations for injury and poisoning among indigenous people are consistently higher than the rates for non-indigenous people.
- Rates of injury-related hospital separations among indigenous people living in rural areas were more than double those for urban areas, and were higher for males than for females.
- In 1999–00, the most common causes of injury-related hospital separations among indigenous people were interpersonal violence (19.9%), falls (19.6%), self-inflicted injury (8.8%), and transport accidents (6.5%).
- The Mid North Coast Aboriginal Injury Surveillance Project found that correction of under-identification resulted in a six-fold relative increase in injury rates among Aboriginal people.

The Shoalhaven Aboriginal Injury Surveillance and Prevention Project has identified priorities for action including: home-based injuries, particularly among children; leisure and sports injuries, particularly among youth; positive development of individual, community, and cultural identity; access to health and community services; and indigenous injury surveillance.

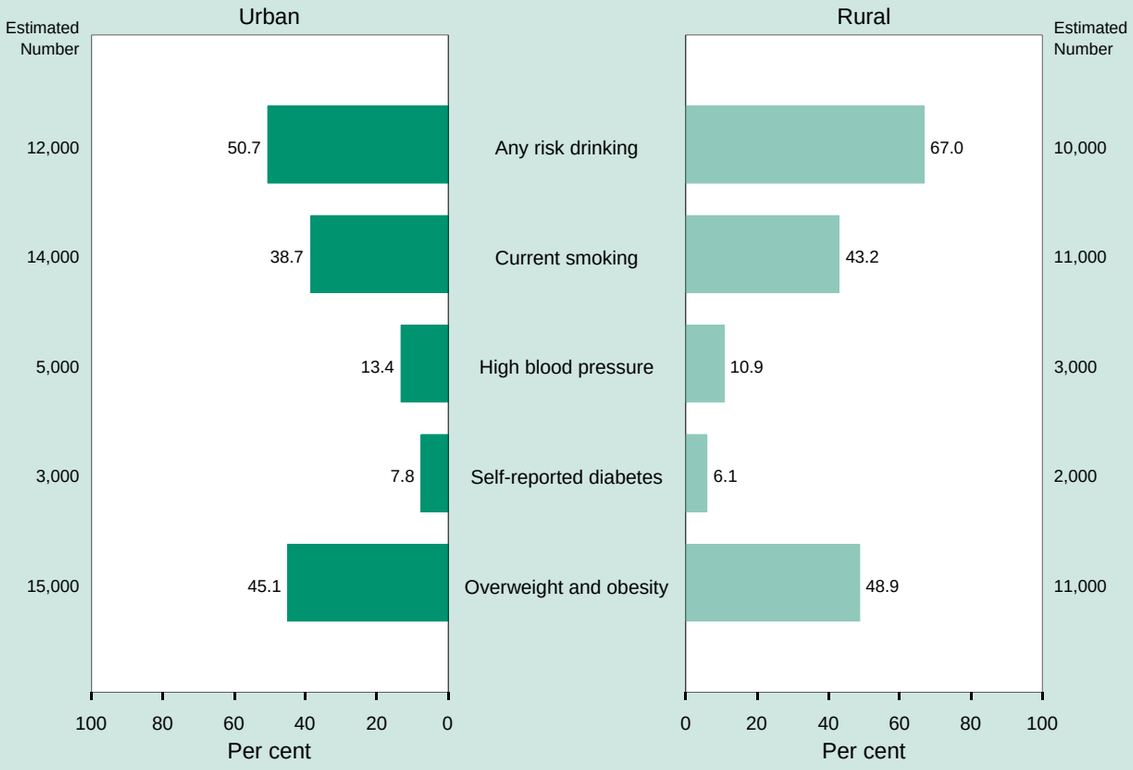
For more information:

Mid North Coast Aboriginal Health Partnership. *Mid North Coast Aboriginal Injury Surveillance Project Report—'Pride, Respect and Responsibility'*. Port Macquarie, NSW: Mid North Coast Area Health Service, 2001.

Illawarra Area Health Service. *Shoalhaven Aboriginal Injury Surveillance and Prevention Project—Phase 1 Report.* Wollongong, NSW: Illawarra Area Health Service, 2001.

Harrison J, Miller E, Weeramanthri T, Wakerman J, Barnes T. *Information sources for injury prevention among Indigenous Australians—Status and prospects for improvement.* Canberra: Australian Institute of Health and Welfare (AIHW catalogue no. INJC AT 38), 2001. www.nisu.flinders.edu.au/topics/topiclist.php.

Cardiovascular risk factors among indigenous people
by urban-rural Health Area of residence, NSW 1997 and 1998



Note: Risk drinking behaviour 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. Current smoking: daily or occasional smoking. High blood pressure and diabetes: Self-report of doctor-diagnosed high blood pressure or diabetes. Body Mass Index (BMI) was based on self reported height and weight. BMI = weight(kg)/height*height(m). Overweight or obese was classified as BMI>=25. Rates are for persons aged 16 years and over. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Health Surveys 1997 and 1998 (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

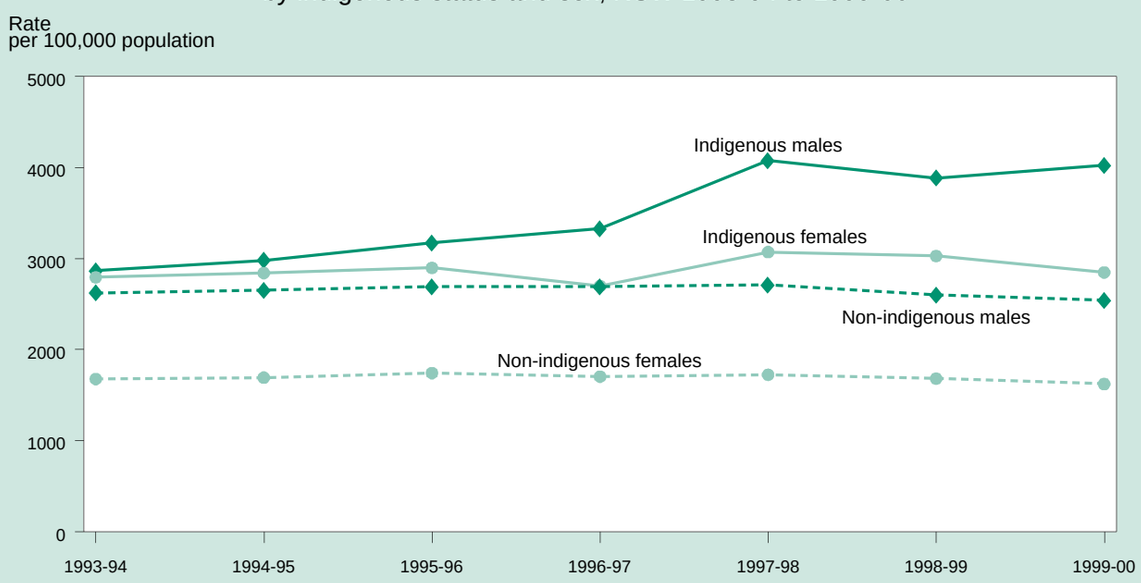
- The reported prevalence of health-related behaviours varies quite markedly among the available sources of survey data for Aboriginal and Torres Strait Islander peoples. This may be due to differences in the sampling and interview methods used, and differences in Aboriginal participation and self-identification.
- In 1997 and 1998 NSW Health Surveys, 57% of indigenous people in NSW reported drinking alcohol at any level of health risk, and this rate varied from 51% in urban areas to 67% in rural areas. By comparison, 50% of non-indigenous people reported drinking alcohol at a level that posed a risk to their health.
- In the same surveys, 41% of indigenous people reported being a current smoker, with rates being higher in urban than rural areas. This is lower than the 51% of indigenous people aged 18 years and over who reported being current smokers at the 1995 National Health Survey. In the NSW Health Surveys, 24% of non-indigenous people reported being current smokers.
- Seven per cent of indigenous people reported having diabetes, almost twice the reported rate of 3.5% in non-indigenous people. Self-reported diabetes was slightly more common among indigenous people living in urban areas compared to rural areas.
- Forty-seven per cent of indigenous people surveyed reported being overweight or obese, with slightly higher rates in rural than urban areas. This compares with 42% of non-indigenous people.

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 2001*. ABS Catalogue no. 4704.0. Canberra: ABS, 2001.

Australian Bureau of Statistics. *National Health Survey: Aboriginal and Torres Strait Islander Results, Australia 1995*. ABS Catalogue no. 4806.0. Canberra: ABS, 1999.

Hospital separations for cardiovascular diseases
by indigenous status and sex, NSW 1993-94 to 1999-00



			1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
Number	Urban	Persons	285	290	337	318	348	331	357
	Rural	Persons	885	950	991	1043	1178	1145	1169
	NSW	Persons	1172	1243	1330	1364	1526	1480	1526
Rate	Urban	Persons	1535.1	1528.9	1733.2	1580.6	1909.1	1715.8	1667.6
per 100,000	Rural	Persons	4014.2	4150.0	4187.1	4263.1	4939.2	4891.7	4801.4
	NSW	Persons	2851.6	2910.1	3040.5	2999.1	3496.6	3396.2	3324.6

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Health areas in Greater Sydney, Hunter and Illawarra were classified as urban. Rates were age-adjusted using the Australian population as at 30 June 1991. Data table for this graph available at www.health.nsw.gov.au/public-health/choindex.htm.

Source: NSW Inpatient Statistics Collection and ABS population data (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Indigenous status is believed to be substantially under-reported in NSW hospital morbidity data. Despite this, age-adjusted hospital separation rates for cardiovascular diseases among indigenous people are consistently higher than the rates for non-indigenous people. In 1999–00 the rate among indigenous people was almost double that of non-indigenous people.
- Among indigenous people, hospital separation rates for cardiovascular disease are higher in rural than urban areas. This is likely to be due to a variety of factors including better reporting of Aboriginality in rural areas; an increased likelihood of admission to hospital for care that might be provided on an outpatient basis in an urban area; and higher incidence of disease.
- In 1999–2000, there were 629 hospitalisations of indigenous people for coronary heart disease, and 154 hospitalisations for stroke (41.2% and 10.1% of all hospitalisations for cardiovascular disease respectively).
- While reporting of indigenous deaths continues to improve in NSW, reporting is insufficient to comment on patterns of causes of death. However, in Western Australia, South Australia, and the Northern Territory combined, circulatory diseases were responsible for 29% of excess deaths among indigenous males and 23% of excess deaths among indigenous females (Australian Bureau of Statistics, 1999).

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, 1999.

Thomson N, Winter J, Pumphrey M. *Review of the state of knowledge of cardiovascular disease among Aboriginal and Torres Strait Islander populations.* National Aboriginal and Torres Strait Islander Health Clearinghouse, 1999. www.healthinfonet.ecu.edu.au.

Hospital separations for diabetes mellitus among indigenous people by urban-rural health area of residence, NSW 1993-94 to 1999-00

		1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
Number	Urban	24	34	23	67	48	44	42
	Rural	165	225	220	197	228	217	234
	NSW	189	259	243	264	276	261	277
Rate	Urban	108.0	120.5	92.7	317.8	168.9	121.5	165.9
per 100,000	Rural	560.4	806.0	784.3	717.4	848.2	716.5	782.9
	NSW	346.7	483.3	458.5	522.6	528.5	434.4	494.6

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Health areas in Greater Sydney, Hunter, and Illawarra, were classified as urban. Rates were age-adjusted using the Australian population as at 30 June 1991.

Source: NSW Inpatient Statistics Collection and ABS population data (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

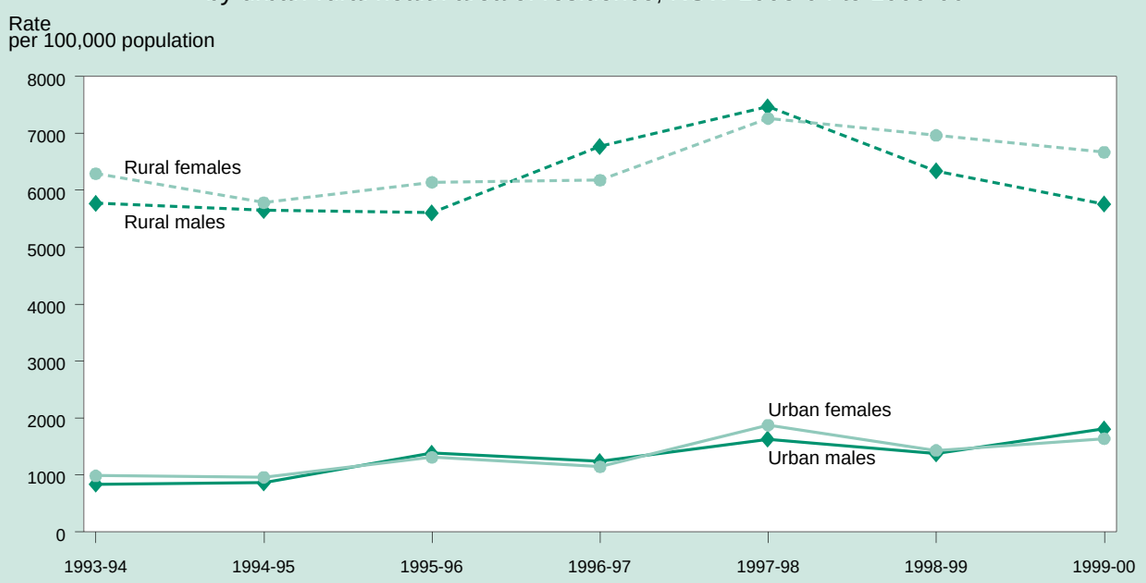
- Indigenous status is believed to be substantially under-reported in NSW hospital morbidity data. Despite this, age-adjusted hospital separation rates for a primary diagnosis of diabetes mellitus among indigenous people are over 5 times higher the rates for non-indigenous people.
- The rates of self-reported diabetes mellitus from the 1997 and 1998 NSW Health Surveys were 7.1% for indigenous people compared with 3.5% for non-indigenous people. Among indigenous people, rates of self-reported diabetes were higher in urban areas than rural areas (7.8 versus 6.1 per cent) (see p. 91).
- Hospital separation rates for diabetes mellitus were over four-fold higher for indigenous people living in rural areas compared to urban areas. Factors contributing to this higher rate for rural residents may be improved reporting of Aboriginality in rural areas and poorer access to health services, resulting in late detection and higher rates of complications such as infections, kidney disease, and cardiovascular disease.

For more information:

Couzos S, Metcalf S, Murray R and O'Rourke S. *Systematic review of existing evidence and primary care guidelines on the management of non-insulin-dependent diabetes in Aboriginal and Torres Strait Islander populations.* Canberra: Office for Aboriginal and Torres Strait Islander Health Services. Commonwealth Department of Health and Family Services, 1998.

De Courten M, Hodge A, Dowse G, King I, Vickery J and Zimmet P. *Review of the epidemiology, aetiology, pathogenesis and preventability of diabetes in Aboriginal and Torres Strait Islander populations.* Canberra: Office for Aboriginal and Torres Strait Islander Health Services. Canberra: Commonwealth Department of Health and Family Services, 1998.

Hospital separations for respiratory diseases among indigenous people by urban-rural health area of residence, NSW 1993-94 to 1999-00



			1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
Number	Urban	Persons	405	392	499	488	623	644	667
	Rural	Persons	2707	2554	2598	2800	3103	3170	2659
	NSW	Persons	3117	2951	3102	3289	3732	3821	3339
Rate	Urban	Persons	917.4	925.3	1316.4	1176.5	1784.4	1384.2	1675.5
per 100,000	Rural	Persons	6038.1	5636.6	5900.9	6413.9	7353.2	6688.0	6264.1
	NSW	Persons	3616.6	3414.2	3748.1	3928.0	4717.9	4192.3	4096.5

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Health areas in Greater Sydney, Hunter and Illawarra were classified as urban. Rates were age-adjusted using the Australian population as at 30 June 1991. Data table for this graph available at www.health.nsw.gov.au/public-health/choindex.htm.

Source: NSW Inpatient Statistics Collection and ABS population data (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

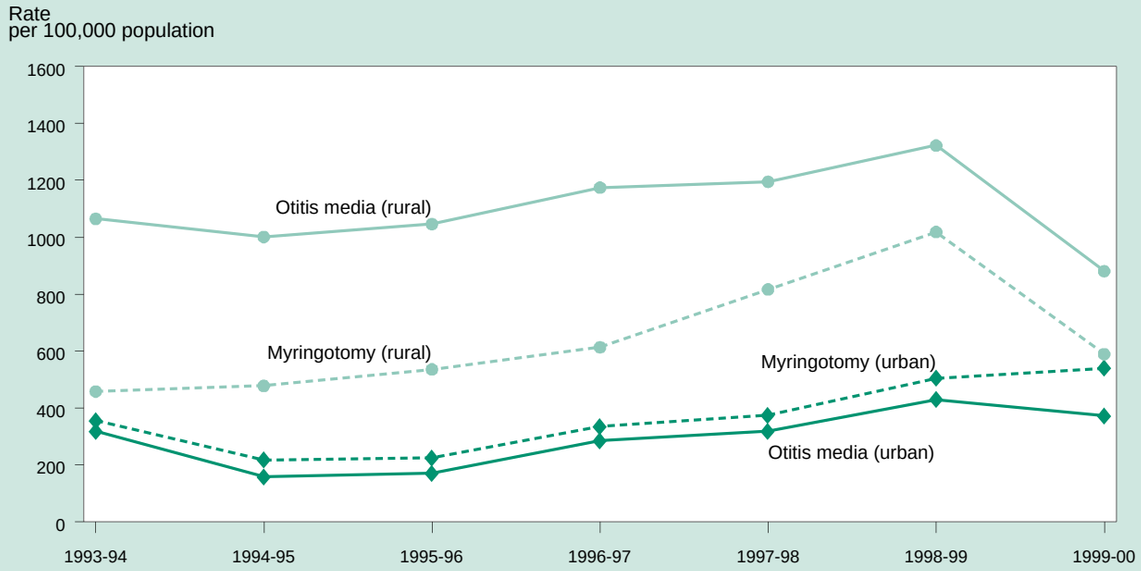
- Indigenous status is believed to be substantially under-reported in NSW hospital morbidity data. Despite this, age-adjusted hospital separation rates for respiratory diseases among indigenous people are consistently more than twice those for non-indigenous people. In 1999–00 the hospital separation rate for indigenous people was 4097 per 100,000 population compared with 1639 for non-indigenous people.
- In 1999–00, 10.1% of all hospital separations in NSW for indigenous people were due to respiratory diseases. The most common were: pneumonia (18.4%); acute bronchitis–bronchiolitis (14.4%); asthma (13.2%); and emphysema and chronic obstructive pulmonary disease, such as chronic bronchitis (11.8%). Children less than 5 years of age comprised 42.2% of hospitalisations.
- There is a marked urban–rural differential for hospital separation rates for respiratory diseases, with rates for rural indigenous people about four-fold higher than for urban indigenous people. Factors that contribute to the higher reported hospital separation rates in rural areas include: better reporting of Aboriginality in rural areas; longer distances to travel to health services; an increased likelihood of admission to hospital for care that might otherwise be provided on an outpatient basis in an urban area; and higher incidence of disease.

For more information:

Australian Bureau of Statistics. *The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples 2001*. Catalogue no. 4704.0. Canberra: ABS, 2001.

The Australian Indigneous Health*InfoNet* at www.healthinfonet.ecu.edu.au.

Hospital separations for otitis media among indigenous children aged less than 10 years by urban-rural health area of residence, NSW 1993-94 to 1999-00



			1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
Number	Otitis media	Urban	46	23	26	43	49	67	59
		Rural	172	165	175	201	207	232	158
		NSW	218	188	201	244	256	299	217
	Myringotomy	Urban	50	31	34	50	57	78	86
		Rural	72	78	88	103	139	177	105
		NSW	122	109	122	153	196	255	191
Rate	Otitis media	Urban	317.9	157.5	170.5	284.7	318.1	429.2	371.2
per 100,000		Rural	1065.0	1001.3	1046.3	1174.9	1195.3	1322.9	880.7
		NSW	709.4	599.3	630.6	749.6	778.7	900.6	638.1
	Myringotomy	Urban	354.9	216.8	224.3	334.7	373.4	504.0	539.6
		Rural	457.5	477.4	535.4	613.1	816.6	1018.6	588.6
		NSW	409.5	353.1	390.5	482.2	609.7	777.9	565.5

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Health areas in Greater Sydney, Hunter, and Illawarra, were classified as urban. Rates were age-adjusted using the Australian population as at 30 June 1991. Data table for this graph available at www.health.nsw.gov.au/public-health/choindex.htm.

Source: NSW Inpatient Statistics Collection and ABS population data (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

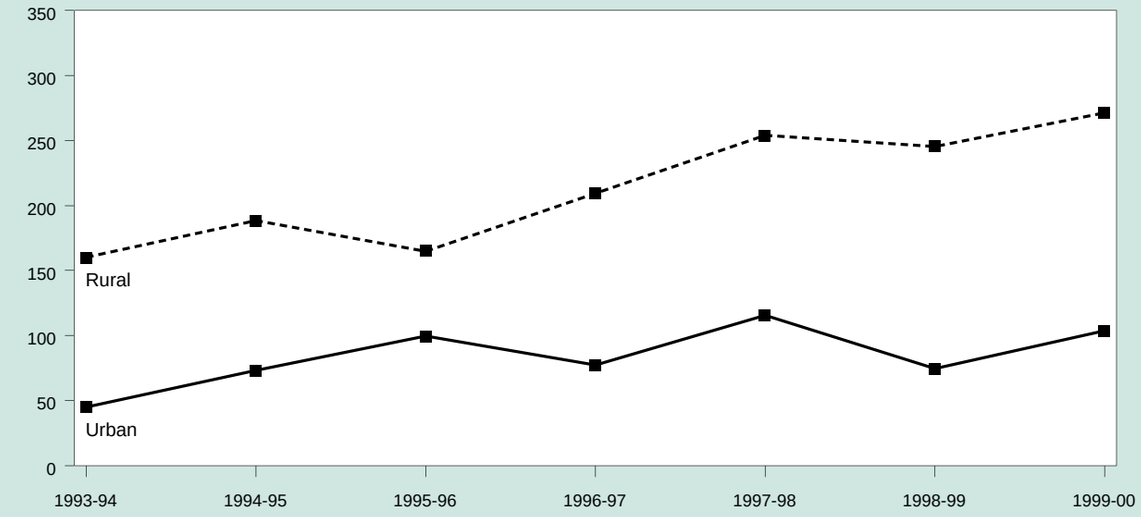
- Otitis media, or middle ear infection, commonly follows an upper respiratory tract infection in children. Repeated infections can lead to 'glue ear', hearing problems, and learning difficulties. Myringotomy is a surgical procedure, usually involving the insertion of small tubes (grommets), which release fluid build-up in the middle ear and help to restore hearing.
- High levels of otitis media among indigenous children have been well documented in Australia. The rate of hospital separation for otitis media in NSW has been consistently more than twice that in urban areas, though the rural rate fell in 1999–00. The rate of hospital separation for myringotomy is also higher in rural than urban areas.
- The urban–rural difference is likely to be due to a variety of factors including better reporting of Aboriginality in rural areas and an increased incidence of severe or recurrent infections—particularly at very young ages.

For more information:

NSW Department of Health Working Party on Ear Disease in Aboriginal Children. Guidelines on the prevention and control and otitis media and its sequelae in Aboriginal children. *Med J Aust* 1996; 164: S1–S17.

Morris P. A systematic review of clinical research addressing the prevalence, aetiology, diagnosis, prognosis and therapy of otitis media in Australian Aboriginal children. *J Paediatr Child Health* 1998; 34: 487–497.

Hospital separations for removal or restoration of teeth among indigenous people by urban-rural health area of residence, NSW 1993-94 to 1999-00



		1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
Number	Urban	29	40	62	62	79	58	70
	Rural	121	133	131	166	202	216	224
	NSW	150	173	193	228	281	274	294
Rate	Urban	44.8	73.2	99.7	77.2	115.5	74.4	103.8
per 100,000	Rural	160.2	188.4	165.0	209.6	253.9	245.6	271.5
	NSW	104.9	132.3	133.6	145.8	187.6	164.2	190.3

Note: Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Health areas in Greater Sydney, Hunter, and Illawarra, were classified as urban. Rates were age-adjusted using the Australian population as at 30 June 1991.

Source: NSW Inpatient Statistics Collection and ABS population data (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Poor oral health can result in mouth problems such as pain, infection, and problems with eating. These problems, as well as concerns about appearance of teeth, can significantly affect quality of life.
- Among indigenous people in NSW, hospital separation rates for removal or restoration of teeth were substantially higher in rural than urban areas for both males and females over the period 1993–94 to 1999–00, and steadily rose in rural areas over the 7-year period. Indigenous status is believed to be substantially under-reported in NSW hospital morbidity data, and actual hospital separation rates are likely to be higher than reported here.
- The higher observed rates in rural areas are likely to be due to a variety of factors including better reporting of Aboriginality in rural areas; and longer distances to travel to health services, which results in poorer access overall; and an increased likelihood of more severe dental decay requiring admission to hospital for treatment.
- Australia-wide, the 1995 National Health Survey found that indigenous people were less likely than non-indigenous people to report a recent dental consultation. The National Dental Telephone Interview Surveys in 1994 to 1996 found that indigenous Australians had a higher rate of edentulism (complete tooth loss) than non-indigenous Australians, and a higher percentage of dentate indigenous adults reported experience of toothache in the previous 12 months compared to non-indigenous adults.

For more information:

AIHW Dental Statistics and Research Unit. *Oral health and access to dental services among Indigenous Australians.* Adelaide: AIHW Dental Statistics and Research Unit, 2000.

Brennan DS, Carter KD. *Adult access to dental care—Indigenous Australians.* Adelaide: AIHW Dental Statistics and Research Unit (AIHW Catalogue no. DEN 40), 1998.

The Australian Indigenous Health*InfoNet* at www.healthinfonet.ecu.edu.au.

Chapter 3.2

Country of birth

- More than one-quarter of NSW residents were born overseas and around one-fifth speak a language other than English at home.
- Overseas-born residents 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 (Fiji, Laos, and the Philippines);
  - —report more consultations with general practitioners (countries of the Middle East and Southern Europe);
  - —have high rates of hospitalisation for coronary heart disease (countries of Eastern Europe, the Middle East, Melanesia, Micronesia, and Polynesia);
  - —have high rates of hospitalisation for complications of diabetes (countries of South Asia, the Middle East and Melanesia, Micronesia, and Polynesia);
  - —have low rates of 2-yearly Pap smears (countries of Eastern Asia) and high rates of cervical cancer (countries of Eastern Asia, South Eastern Asia, New Zealand, Melanesia, Polynesia, and Micronesia);
  - —have high rates of tuberculosis (countries of South Eastern Asia and South Asia);
  - —report more toothache and fewer routine dental check-ups (countries of Eastern Asia, South Eastern Asia, and the Middle East).
- Refugees suffer higher rates of health conditions including poor oral health and minor mental health disorders.
- Compared with people born in many overseas countries, people born in Australia or New Zealand:
  - —are more likely to report drinking alcohol in ways that can harm their health;
  - —report more visits to hospital emergency departments.

In this chapter

Introduction

More than 1 in every 4 NSW residents was born overseas and around 1 in 5 speaks a language other than English at home. The composition and age 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, Northern Europe, Greece, Italy, and Yugoslavia. These were followed by people from the Middle East, mainly from Turkey, Lebanon, and Egypt. Most recently, immigrants have come in large numbers from Asian countries, particularly China, Vietnam, and the Philippines.

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. It is particularly difficult to differentiate the effects of cultural factors and socioeconomic factors on health differentials by country of birth.

This chapter examines health differentials by country of birth. It includes, for the first time, information on hospitalisations for complications of diabetes mellitus and coronary heart disease, and rates of revascularisation procedures (coronary artery bypass graft, and angioplasty with and without stenting).

Also for the first time, this chapter contains specific information relating to the health status of refugees. Data on this group are limited, as no routine data collection in NSW currently identifies migration category (although from July 2001 the Information System for Oral Health has recorded refugee status). Overseas studies highlight certain conditions as being more prevalent in people of refugee background. Specific antecedents of poor health include human rights abuses, deprivation, and exposure to practices such as female genital mutilation. The NSW Department of Health has produced a document, *Strategic Directions in Refugee Health Care*, to complement other multicultural health initiatives.

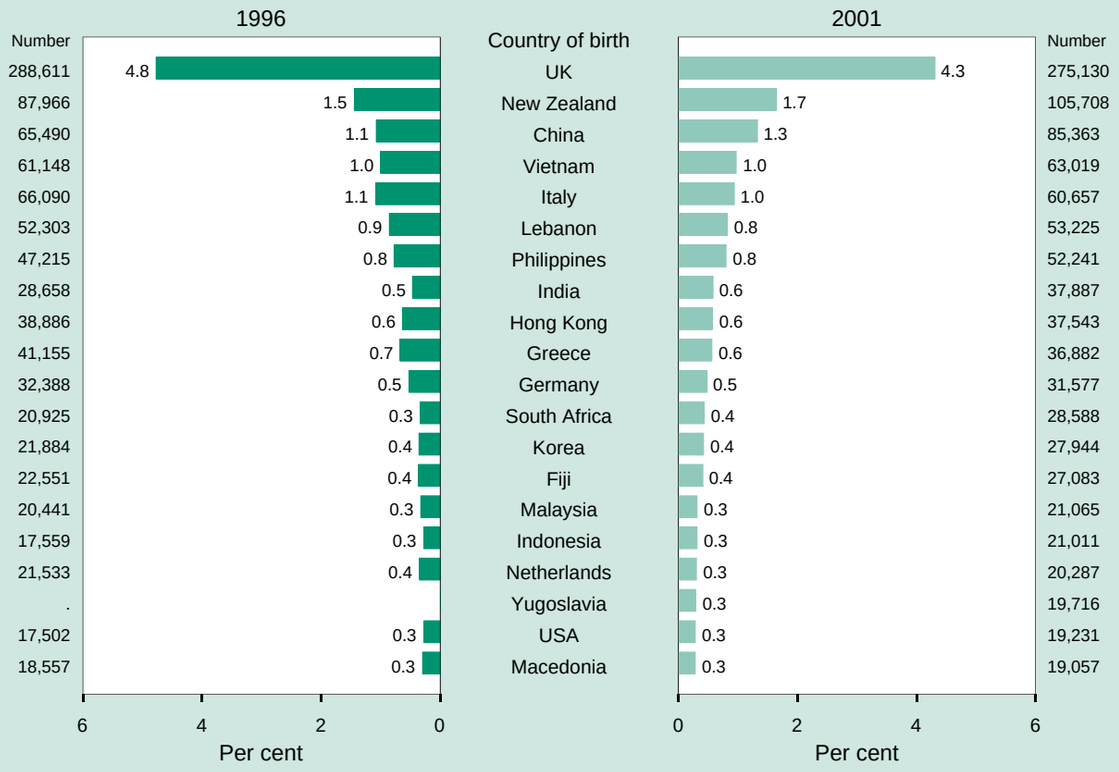
More information on the methods used for analysing data is given in the Methods section. The Methods section includes tables showing the countries included in the country-of-birth groups used for some indicators, and giving the numbers of overseas-born respondents who participated in the 1997 and 1998 NSW Health Surveys.

For more information:

NSW Department of Health. *Strategic Directions in Refugee Health Care in NSW*. Sydney, NSW Department of Health, 1999.

Strong K, Trickett P, Bhatia K. The health of overseas-born Australians 1994–1996. *Australian Health Review* 1998; 21: 124–133.

Country of birth: most common 20 countries excluding Australia
NSW 1996 and 2001



Note: 72.8% and 69.9% of 1996 and 2001 NSW residents, respectively, were Australian-born. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: ABS 1996 Census Basic Community Profiles and special tabulations from the ABS 1991 Census (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

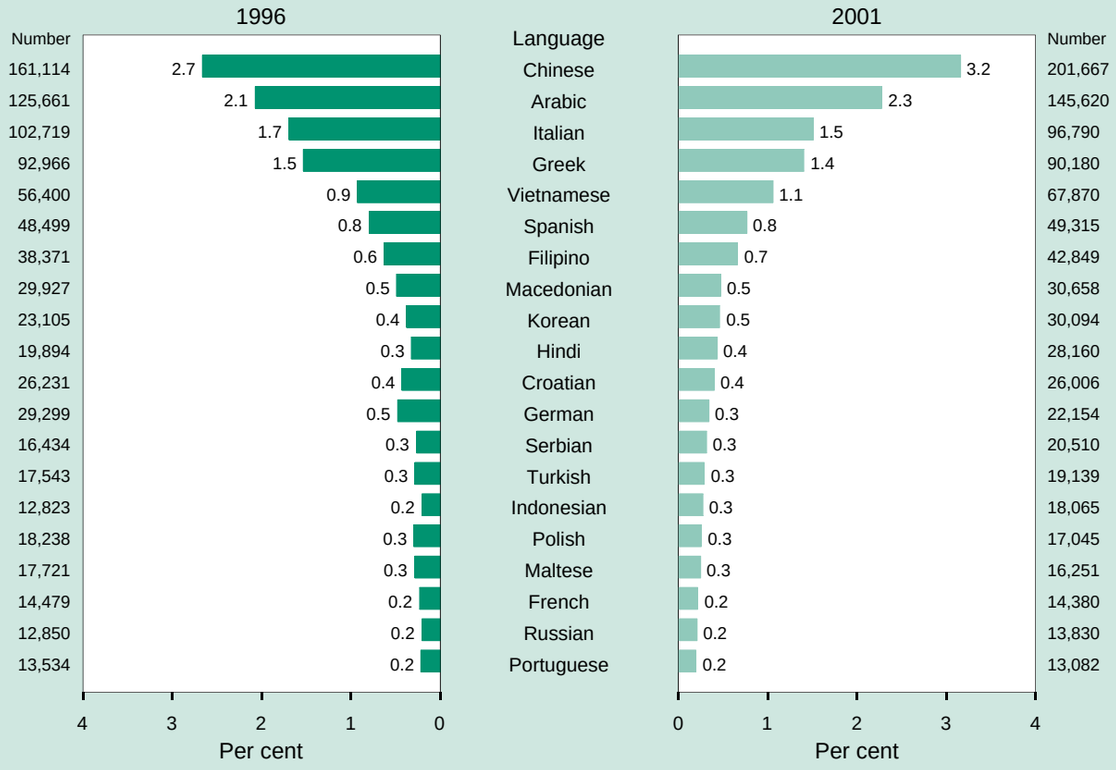
- The percentage of the NSW population born overseas rose from 27.2% in 1996 to 30.1% in 2001.
- In 2001, the largest number of overseas-born residents came from the United Kingdom, followed by New Zealand, China, Vietnam, Italy, Lebanon, and the Philippines.
- The highest rates of growth between 1996 and 2001 occurred among resident populations born in Yugoslavia, New Zealand, China, India, Korea, and South Africa.
- Some overseas-born populations declined between 1996 and 2000, notably those born in the Netherlands, Greece, Germany, Italy and the United Kingdom. This indicates that losses due to death and out-migration exceeded the number of new arrivals from these countries.

For more information:

Australian Bureau of Statistics Web site at www.abs.gov.au.

Australian Bureau of Statistics. *1996 and 2001 Census Community Basic Profile for NSW residents.* Canberra: ABS, 2002.

Languages spoken at home: most common 20 languages, excluding English
NSW 1996 and 2001



Note: 78.2% and 75.0%, respectively, of 1996 and 2001 NSW residents spoke only English at home. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

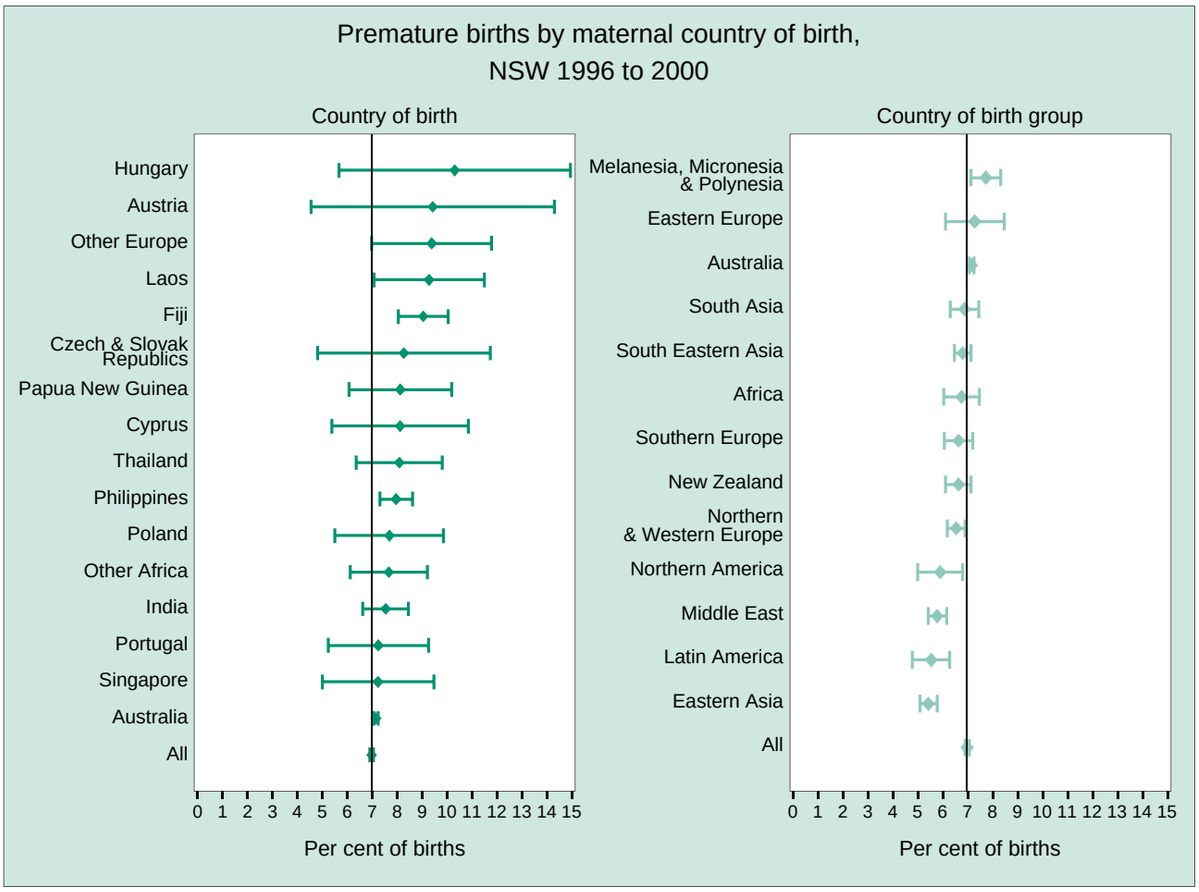
Source: ABS 1996 Census Basic Community Profiles and special tabulations from the ABS 1991 Census (HOIST), Epidemiology and Surveillance Branch, NSW Department of Health.

- The total proportion of the 2001 population who spoke a language other than English at home was 25.0%, compared with 21.8% in 1996.
- Changes in the leading languages spoken at home between 1996 and 2001 reflect shifting migration patterns. For example, between 1996 and 2001, people who reported their country of birth as China increased by one-third. This change is reflected in the large increase (from 2.7% to 3.2%) in the NSW population who reported speaking Chinese languages at home.

For more information:

Australian Bureau of Statistics Web site at www.abs.gov.au.

Australian Bureau of Statistics. *1996 and 2001 Census Community Basic Profile for NSW residents,* Canberra: ABS, 2002.



Note: Individual maternal countries of birth with less than 50 total births are not displayed. 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 95% confidence interval for standardised rate.

Source: NSW Midwives Data Collection (HOIST), Epidemiology and Surveillance Branch, 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 1996 to 2000, 7.0% of all NSW babies were born before 37 weeks gestation. Rates of prematurity were greater than the state average for babies of mothers born in Fiji (9.0%), Laos (9.3%), and the Philippines (8.0%). Babies of Fijian-born mothers were also more likely than the state average to be born very prematurely and extremely prematurely: 2.2% of these babies were born before 32 weeks gestation and 1.2% were born before 28 weeks gestation. This compares with 1.4% and 0.7%, respectively, of babies overall.
- When individual countries of birth were grouped into regions, only babies of mothers born in Melanesia, Micronesia, and Polynesia (7.7%) had a higher rate of prematurity than NSW babies overall. This was due to the inclusion of mothers born in Fiji and Papua New Guinea in this grouping.

For more information:

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

Public Health Division. New South Wales Mothers and Babies 2000. *N S W Public Health Bull* 2001; 13 (S-3). www.health.nsw.gov.au/public-health/mdc/mdcrep00.html.

National Health and Medical Research Council. *Clinical Practice Guidelines: Care around Preterm Birth*. Canberra: NHMRC, 1997.

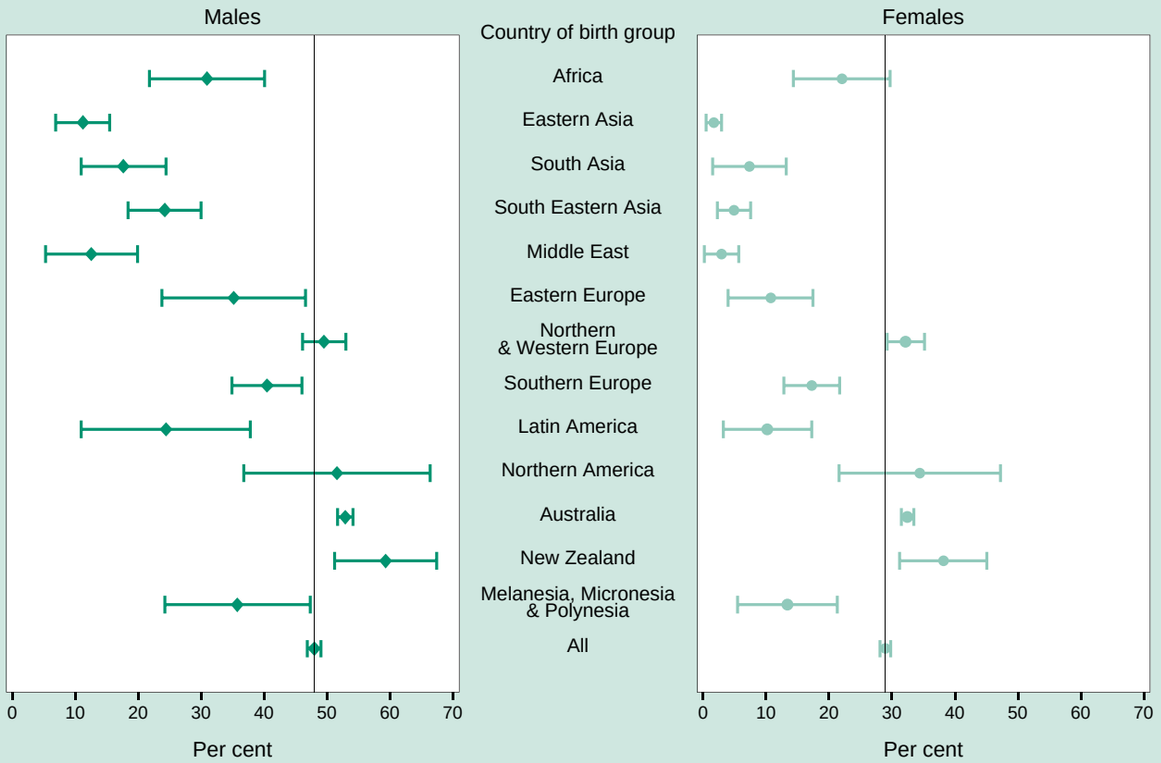
Premature births by maternal country of birth, NSW 1996–2000

Maternal country of birth	Total births	Premature births	Per cent	LL 95% CI	UL 95% CI
Hungary	165	17	10.3	5.7	14.9
Austria	138	13	9.4	4.5	14.3
Other Europe	565	53	9.4	7.0	11.8
Laos	658	61	9.3	7.1	11.5
Fiji	3176	287	9.0	8.0	10.0
Czech & Slovak Republics	242	20	8.3	4.8	11.7
Papua New Guinea	677	55	8.1	6.1	10.2
Cyprus	382	31	8.1	5.4	10.9
Thailand	953	77	8.1	6.3	9.8
Philippines	6510	518	8.0	7.3	8.6
Poland	573	44	7.7	5.5	9.9
Other Africa	1135	87	7.7	6.1	9.2
India	3200	241	7.5	6.6	8.4
Portugal	635	46	7.2	5.2	9.3
Singapore	512	37	7.2	5.0	9.5
Australia	315115	22527	7.1	7.1	7.2
All	432749	30162	7.0	6.9	7.0
Maternal country of birth group	**Total births**	**Premature births**	**Per cent**	**LL 95% CI**	**UL 95% CI**
Africa	4786	323	6.7	6.0	7.5
Eastern Asia	16458	892	5.4	5.1	5.8
South Asia	7597	521	6.9	6.3	7.4
South Eastern Asia	23235	1578	6.8	6.5	7.1
Middle East	14939	863	5.8	5.4	6.2
Eastern Europe	1882	137	7.3	6.1	8.5
Northern & Western Europe	17895	1168	6.5	6.2	6.9
Southern Europe	7064	468	6.6	6.0	7.2
Latin America	3563	197	5.5	4.8	6.3
Northern America	2648	156	5.9	5.0	6.8
Australia	315115	22527	7.1	7.1	7.2
New Zealand	9260	613	6.6	6.1	7.1
Melanesia, Micronesia & Polynesia	7805	603	7.7	7.1	8.3
Other/not stated	502	116	23.1	19.4	26.8
All	432749	30162	7.0	6.9	7.0

Note: Individual maternal countries of birth with less than 50 total births are not displayed. Premature birth: less than 37 weeks gestation. Rates include stillbirths and livebirths of at least 20 weeks gestation or 400 grams birthweight. LL/UL95% CI = Lower and upper limits of 95% confidence interval for standardised rate.

Source: NSW Midwives Data Collection (HOIST), Epidemiology and Surveillance Branch, NSW Department of Health.

Any risk drinking behaviour by country of birth group and sex, persons aged 16 years and over, NSW 1997 and 1998



Note: Risk drinking behaviour was defined as 1 or more of: drinking more than 14 (females), or 28 (males) standard drinks per week; at least one 'heavy drinking' day in the past 12 months; or consuming alcohol every day. Estimates based on 35,025 respondents. 1193 (3.4%) not stated for alcohol risk. Lower and upper limits of 95% confidence interval for standardised rate.

Source: NSW Health Surveys 1997 and 1998 (HOIST), Epidemiology and Surveillance Branch, NSW Department of Health.

- Alcohol affects health in a number of ways, including acute physical effects, such as intoxication and alcohol overdose; chronic physical effects, such as liver cirrhosis, heart disease, brain damage, and memory loss; and effects on the health of others, such as alcohol-related road trauma and violence (English et al., 1995). Alcohol abuse is also associated with crime and social problems, and lost productivity.
- At the 1997 and 1998 NSW Health Surveys, 47.9% of males and 28.9% of females aged over 16 years reported any risk drinking behaviour (as defined in the footnote to the figure). Both male and female NSW residents who were born in Australia or New Zealand were much more likely than those born in other countries to report risk drinking behaviour. People born in Asian and Middle Eastern countries, in particular, reported low rates of risk drinking behaviours.
- Among men, reported rates of risk drinking behaviour ranged from less than 15% among those born in Lebanon, China, and India, to 53% among the Australian-born and 59% among the New Zealand-born. Among women, rates ranged from less than 5% among women born in China, the Philippines, Vietnam, and India, to 31% among those born in Australia, the United Kingdom, and New Zealand (see Electronic Report of the 1997 and 1998 NSW Health Surveys).

For more information:

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.

Public Health Division, NSW Department of Health. *Electronic Report of the 1997 and 1998 NSW Health Surveys* at www.health.nsw.gov.au/public-health/nswhs.

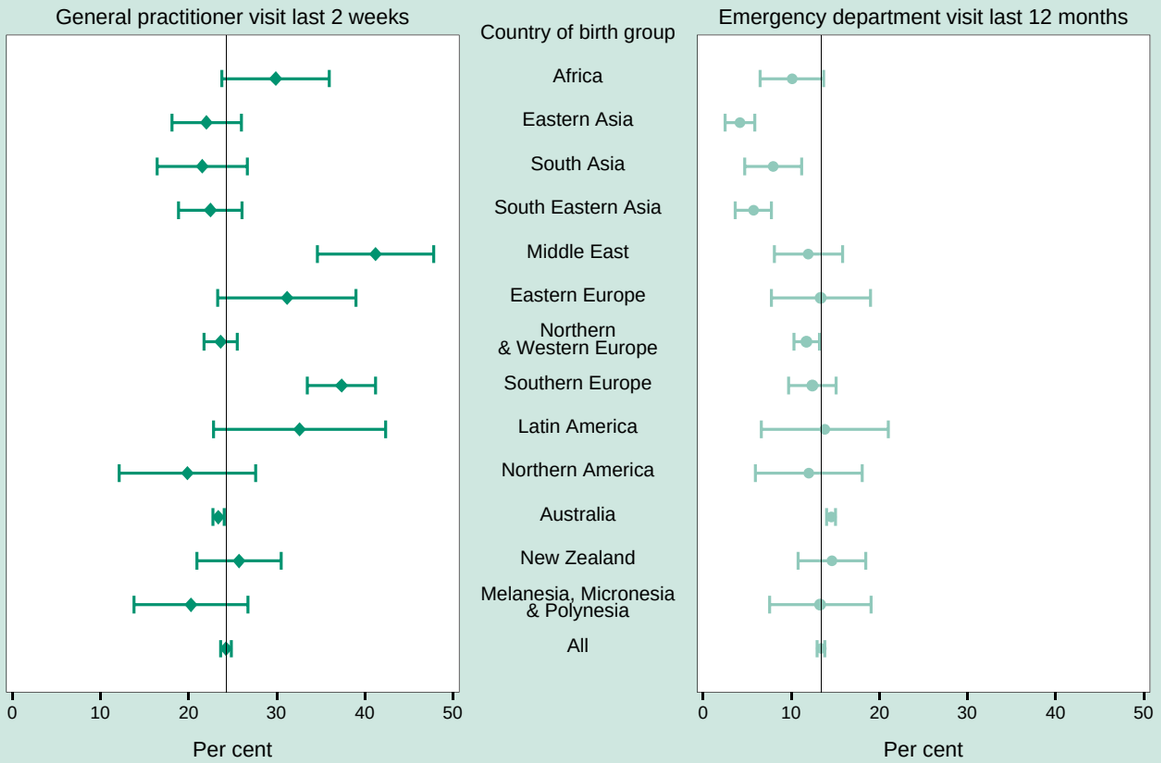
Alcohol use by country of birth group, NSW 1997 and 1998

Country of birth group	Males Per cent	LL 95% CI	UL 95% CI	Females Per cent	LL 95% CI	UL 95% CI	People Per cent	LL 95% CI	UL 95% CI
Africa	30.9	21.8	40.0	22.0	14.3	29.7	26.7	20.7	32.7
Eastern Asia	11.2	6.9	15.5	1.7	0.4	2.9	6.3	4.1	8.5
South Asia	17.6	10.9	24.4	7.3	1.5	13.2	14.2	9.2	19.1
South Eastern Asia	24.2	18.4	29.9	4.9	2.2	7.5	13.8	10.7	17.0
Middle East	12.5	5.2	19.8	2.9	0.1	5.6	7.7	3.7	11.7
Eastern Europe	35.1	23.7	46.6	10.7	4.0	17.5	24.7	17.2	32.2
Northern & Western Europe	49.5	46.1	52.9	32.2	29.2	35.1	40.9	38.6	43.2
Southern Europe	40.5	34.9	46.0	17.2	12.8	21.7	29.2	25.5	32.9
Latin America	24.4	10.9	37.8	10.2	3.1	17.2	16.5	9.3	23.8
Northern America	51.5	36.8	66.3	34.4	21.5	47.2	43.2	33.3	53.2
Australia	52.9	51.6	54.1	32.4	31.4	33.4	42.3	41.5	43.1
New Zealand	59.3	51.2	67.4	38.1	31.2	45.1	48.4	42.9	53.8
Melanesia, Micronesia & Polynesia	35.7	24.2	47.3	13.4	5.5	21.3	25.6	18.0	33.1
All	47.9	46.9	49.0	28.9	28.1	29.7	38.2	37.5	38.9

Note: Risk drinking behaviour was defined as one or more of: drinking more than 14 (females), or 28 (males) standard drinks per week; at least one 'heavy drinking' day in the past 12 months; or consuming alcohol every day. Estimates based on 35,025 respondents. 1193 (3.4%) not stated for alcohol risk. LI/UL = Lower and upper limits of the 95% confidence interval for standardised rate.

Source: NSW Health Surveys 1997 and 1998 (HOIST), Epidemiology and Surveillance Branch, NSW Department of Health.

General practitioner and emergency department visits by country of birth group, persons aged 16 years and over, NSW 1997 and 1998



Note: Estimates based on 35,025 respondents. 85 (0.2%) not stated for general practitioner visits in previous 2 weeks. 27 (0.1%) not stated for emergency department visits in previous 12 months. Lower and upper limits of 95% confidence interval for point of estimate.

Source: NSW Health Surveys 1997 and 1998 (HOIST), Epidemiology and Surveillance Branch, NSW Department of Health.

- Patterns of health service use reflect not only patterns of illness, but differences in the availability of health services, and in the way people choose to use them. Generally, migrants are less likely than the Australian-born to be hospitalised for most causes (Australian Institute of Health and Welfare, 2000). However, use of general practitioner and emergency department services varies markedly among migrant groups.
- At the 1997 and 1998 NSW Health Surveys, respondents born in countries of the Middle East and Southern Europe were more likely than the Australian-born to report having consulted a general practitioner in the previous 2 weeks. For individual countries, reported consultation rates ranged from 15.1% among the Indian-born to 44.3% among the Lebanese-born.
- A different pattern was seen for emergency department visits within the past 12 months, which were most likely to be reported by people born in Australia or New Zealand and least likely to be reported by people born in countries of Asia and Northern and Western Europe. For individual countries, reported rates ranged from 4.3% and 4.8%, respectively, among people born in China and Vietnam, to 14.5% among the Australian-born and 15.4% among the Greek-born.
- These differences are likely to reflect, in part, variations in the age structure of migrant populations: survey respondents born in Asian, Middle Eastern, and African countries had a median age of around 40 years, compared with more than 50 years for those born in Southern, Western, and Northern Europe.

For more information:

Australian Institute of Health and Welfare. *Australia's Health 2000: The seventh biennial report of the Australian Institute of Health and Welfare.* Canberra: AIHW, 2000.

Public Health Division, NSW Department of Health. *Electronic Report of the 1997 and 1998 NSW Health Surveys* at www.health.nsw.gov.au/public-health/nswhs.

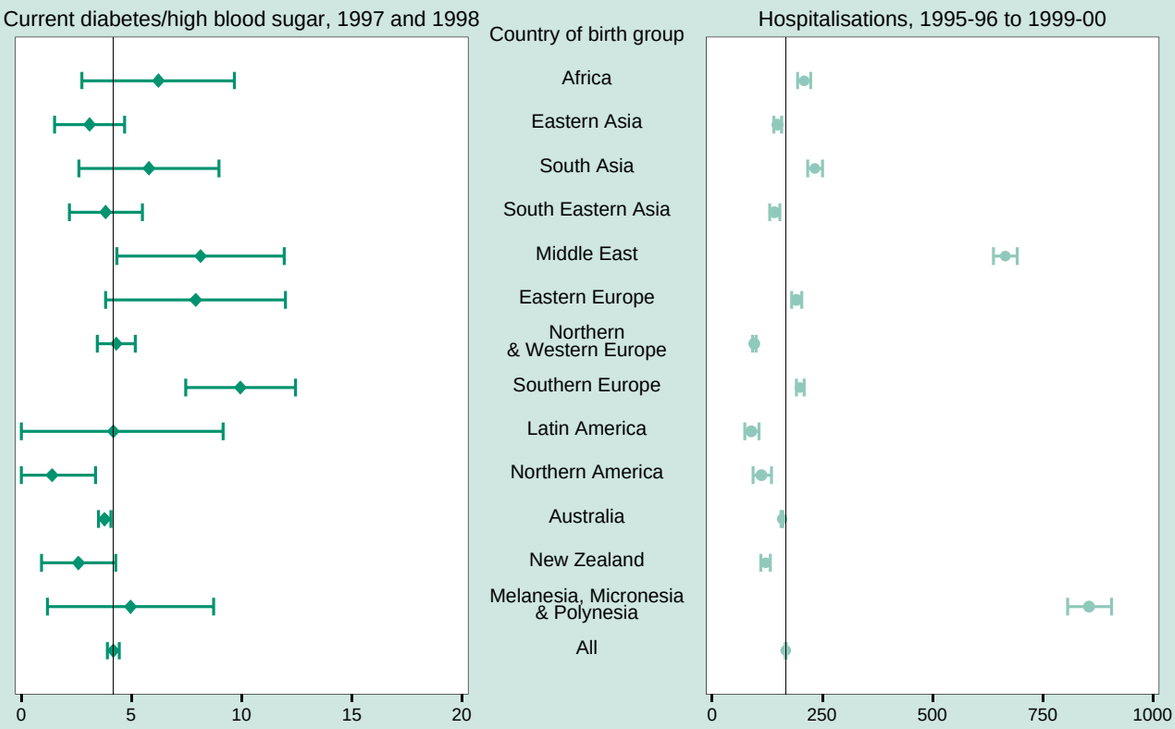
Health service use by country of birth, NSW 1997 and 1998

Country of birth group	General Practitioner visits last 2 weeks			Emergency department visits last 12 months		
		LL	UL		LL	UL
	Per cent	95% CI	95% CI	Per cent	95% CI	95% CI
Africa	29.9	23.8	35.9	10.1	6.5	13.7
Eastern Asia	22.0	18.1	26.0	4.2	2.5	5.8
South Asia	21.5	16.4	26.6	7.9	4.7	11.1
South Eastern Asia	22.4	18.8	26.1	5.7	3.6	7.8
Middle East	41.2	34.6	47.8	11.9	8.0	15.8
Eastern Europe	31.2	23.3	39.0	13.3	7.7	19.0
Northern & Western Europe	23.6	21.7	25.5	11.7	10.3	13.2
Southern Europe	37.3	33.5	41.2	12.4	9.7	15.1
Latin America	32.6	22.8	42.4	13.8	6.6	21.0
Northern America	19.8	12.1	27.6	12.0	5.9	18.0
Australia	23.4	22.7	24.0	14.5	14.0	15.0
New Zealand	25.7	20.9	30.5	14.6	10.8	18.4
Melanesia, Micronesia & Polynesia	20.3	13.8	26.8	13.3	7.5	19.0
All	24.2	23.6	24.8	13.4	12.9	13.8

Note: Estimates based on 35,025 respondents. 85 (0.2%) not stated for general practitioner visits in previous 2 weeks. 27 (0.1%) not stated for emergency department visits in previous 12 months. LL/UL95% CI = Lower and upper limits of 95% confidence interval for point of estimate.

Source: NSW Health Surveys 1997 and 1998 (HOIST), Epidemiology and Surveillance Branch, NSW Department of Health.

Current diabetes or high blood sugar and hospitalisations with diabetes complications by country of birth group and sex, NSW



Note: Survey estimates based on self-report by 35,025 respondents. 183 (0.5%) not stated for current diabetes. Hospital separations were classified by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Hospital separations were age-adjusted using the Australian population as at 30 June 1991. Lower and upper limits of 95% confidence interval for rate shown.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST), Epidemiology and Surveillance Branch, NSW Department of Health.

- Non-insulin-dependent diabetes mellitus (NIDDM) is the main form of diabetes in Australia. Complications of diabetes include ketoacidosis, retinopathy, and circulatory disorders. These are preventable to some degree, through good management of diabetes.
- At the 1997 and 1998 NSW Health Surveys, people born in countries of Southern Europe and the Middle East reported a higher prevalence of current diabetes or high blood sugar, than NSW residents generally. People born in countries of Africa, Southern Asia, Eastern Europe, Latin America, Melanesia, Micronesia, and Polynesia, also reported higher-than-average rates, but the numbers of respondents from these groups were small.
- In the period 1995–96 to 1999–00, hospitalisation rates per 100,000 population for complications of diabetes varied markedly by country-of-birth group, from 96 among people born in countries of Northern and Western Europe, to 233 among people born in South Asia, 644 among people born in the Middle East, and 855 among people born in Melan-esia, Micronesia and Polynesia. These differences may reflect variations in the incidence and severity of diabetes, and in how well diabetes is managed. Also, underenumeration of certain country-of-birth groups in the population estimates used to calculate rates could artifically inflate the hospitalisation rate for that group.
- Diabetes mellitus shares common risk factors with coronary heart disease, including physical inactivity, obesity, and genetic predisposition. People born in countries of South Asia, the Middle East, Melanesia, Micronesia, and Polynesia, have high hospitalisation rates for coronary heart disease as well as diabetes.

For more information:

Public Health Division, NSW Department of Health. *Electronic Report of the 1997 and 1998 NSW Health Surveys* at www.health.nsw.gov.au/public-health/nswhs.

Diabetes mellitus by country of birth, NSW

Country of birth group	Doctor-diagnosed diabetes or high blood sugar,1997 and 1998			Hospitalisations, 1995–96 to 1999–00			
	Per cent	LL 95% CI	UL 95% CI	Number per year	Rate per 100,000 per year	LL 95% CI	UL 95% CI
Africa	6.2	2.7	9.7	162	208.3	194.0	223.4
Eastern Asia	3.1	1.5	4.7	205	148.2	139.2	157.7
South Asia	5.8	2.6	9.0	161	232.6	216.1	250.0
South Eastern Asia	3.8	2.2	5.5	149	141.5	130.6	152.9
Middle East	8.1	4.3	11.9	534	664.3	637.4	691.9
Eastern Europe	7.9	3.8	12.0	254	191.6	180.0	203.6
Northern & Western Europe	4.3	3.4	5.2	744	95.7	91.6	99.8
Southern Europe	9.9	7.4	12.4	836	199.1	190.7	207.7
Latin America	4.2	0.0	9.2	30	89.0	73.9	106.0
Northern America	1.4	0.0	3.4	26	111.8	92.0	134.5
Australia	3.8	3.5	4.1	7541	158.0	156.4	159.6
New Zealand	2.6	0.9	4.3	107	120.7	109.9	132.2
Melanesia, Micronesia & Polynesia	5.0	1.2	8.7	295	855.1	806.7	905.5
All	4.2	3.9	4.4	11345	166.2	164.8	167.6

Note: Survey estimates based on self-report by 35,025 respondents. 183 (0.5%) not stated for current diabetes. Hospital separation rates were age-adjusted using the Australian population as at 30 June 1991. LL/UL95% CI = Upper and lower limits of 95% confidence interval for rate.

Source: NSW Health Surveys 1997 and 1998, NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

Coronary heart disease and revascularisation procedures,
hospitalisations by country of birth group and sex, NSW 1995-96 to 1999-00

Note: Hospital separations were classifed by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Hospital separations were age-adjusted using the Australian population as at 30 June 1991. Lower and upper limits of 95% confidence interval for rate shown.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST), Epidemiology and Surveillance Branch, NSW Department of Health.

- Coronary heart disease is caused by blockages in the coronary arteries that supply blood to the heart muscle. 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 per 100,000 population for coronary heart disease in the 5-year period 1995–96 to 1999–00 varied markedly according to country-of-birth group, from 396 among people born in countries of South Eastern Asia, to 1274 per 100,000 among people born in the Middle East (mainly Lebanon), and 1351 among people born in Melanesia, Micronesia, and Polynesia (mainly Fiji).
- 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. Also, underenumeration of certain country-of-birth groups, in the population estimates used to calculate rates, could artifically inflate the hospitalisation rate for that group.
- Hospitalisation rates for revascularisation procedures also varied with country-of-birth group. The ratio of separations for revascularisation procedures to total coronary heart disease separations ranged from 0.19 for people born in Australia or the Middle East; to 0.24 for people born in Africa, Northern America, Melanesia, Micronesia, and Polynesia, and 0.26 for people born in countries of South Asia. Higher 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:

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

Public Health Division, NSW Department of Health. *Electronic Report of the 1997 and 1998 NSW Health Surveys* at www.health.nsw.gov.au/public-health/nswhs.

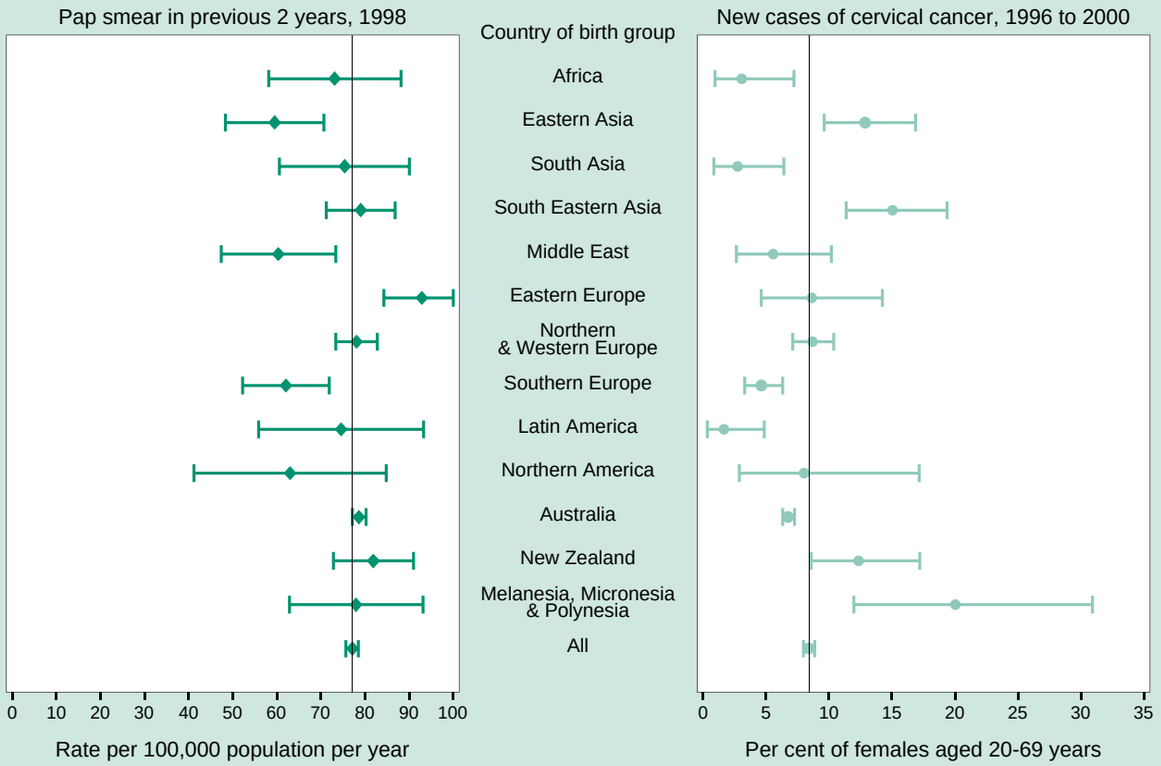
Heart disease by country of birth, NSW 1995–96 to 1999–00

Country of birth group	Coronary heart disease				Revascularisation procedures			
	Number/ year	Rate/ 100,000/ year	LL 95% CI	UL 95% CI	Number/ year	Rate/ 100,000/ year	LL 95% CI	UL 95% CI
Africa	662	822.3	794.1	851.3	165	200.0	186.3	214.4
Eastern Asia	371	261.0	249.1	273.3	81	56.1	50.7	61.9
South Asia	659	964.6	930.6	999.5	169	236.8	220.4	253.9
South Eastern Asia	510	403.7	386.7	421.2	129	91.8	84.3	99.8
Middle East	1191	1274.5	1239.0	1310.7	241	235.8	221.6	250.5
Eastern Europe	1251	849.1	825.8	872.7	265	192.1	180.9	203.8
Northern & Western Europe	5548	658.5	650.3	666.8	1160	142.6	138.9	146.4
Southern Europe	3603	714.7	703.0	726.6	826	154.0	149.2	159.0
Latin America	253	664.8	623.3	708.1	53	128.1	111.1	146.8
Northern America	143	628.5	579.8	679.9	33	149.7	125.9	176.4
Australia	39543	827.5	823.8	831.2	7261	156.7	155.1	158.3
New Zealand	458	571.6	546.9	597.0	96	120.2	109.0	132.1
Melanesia, Micronesia & Polynesia	485	1459.3	1395.7	1524.8	133	379.2	348.2	412.0
All	56197	805.7	802.7	808.7	11096	162.0	160.6	163.3

Note: Hospital separations were classified by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Hospital separations were age-adjusted using the Australian population as at 30 June 1991. LL/UL 95% CI = Lower and upper limits of 95% confidence interval for rate.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST), Epidemiology and Surveillance Branch, NSW Department of Health.

Pap smear within the previous 2 years and new cases of cervical cancer by country of birth group, NSW



Note: Survey estimates based on self-report by 7232 female respondents aged 20–69 years who had not had a hysterectomy. Ninety-nine (1.4%) not stated for Pap test in previous 2 years. Cancer rates were age-adjusted using the Australian population as at 30 June 1991. Lower and upper limits of 95% confidence interval for rate shown.

Source: NSW Health Survey 1998, NSW Cancer Registry incidence data and ABS population estimates (HOIST), Epidemiology and Surveillance Branch, NSW Department of Health.

- Cancer of the cervix is an important preventable cancer in women. The Pap test is very effective at detecting precancerous lesions in the cervix. Regular 2-yearly testing of women aged 18–69 years, with appropriate treatment, can prevent cervical cancer from developing.
- In the 1998 NSW Health Survey, women born in countries of Eastern Asia (mainly China) were less likely to report having a Pap test in the previous 2 years than Australian-born women, and women born in these countries, countries of South East Asia (mainly the Philippines and Vietnam), New Zealand, Melanesia, Polynesia, and Micronesia (mainly Fiji), also had higher rates of new cases of cervical cancer in the period 1996 to 2000.
- Women born in Southern Europe (mainly Greece, Italy, and countries of the former Yugoslavia) were also less likely to report a Pap test in the previous 2 years than women overall. However, these populations experienced slightly lower rates of new cases of cervical cancer. Lower than average rates of cervical cancer were also recorded among women born in Australia and countries of Africa, South Asia, and Latin America.
- These variations may relate to differences in the prevalence of risk factors for cervical cancer, including the number of sexual partners, age at first sex and first pregnancy, oral contraceptive use, and smoking. Also, underenumeration of certain country-of-birth groups in the population estimates used to calculate rates could artifically inflate the cancer incidence rate for that group.

For more information:

Kricker A, Bell J, Coates M, Taylor R and Armstrong BK. *Cancer of the cervix in NSW in 1972 to 1992*. Sydney: NSW Cancer Council, 1996.

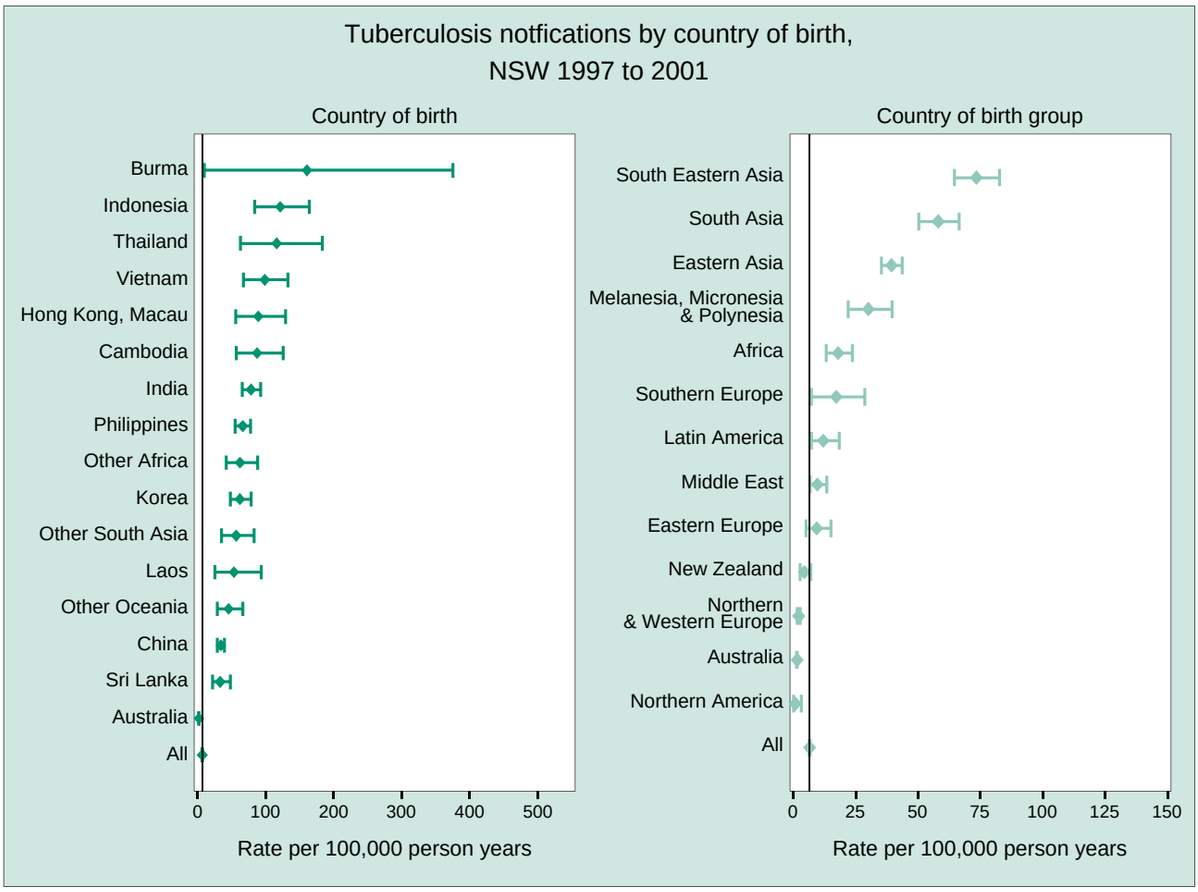
Public Health Division, NSW Department of Health. *Electronic Report of the 1997 and 1998 NSW Health Surveys* at www.health.nsw.gov.au/public-health/nswhs.

Pap smears and cervical cancer by country of birth, NSW

Country of birth group	Pap smear in previous 2 years, 1998			New cases of cervical cancer, 1996 to 2000			
	Per cent	LL 95% CI	UL 95% CI	Number/ year	Rate/ 100,000/ year	LL 95% CI	UL 95% CI
Africa	73.1	58.1	88.1	1	3.1	1.0	7.2
Eastern Asia	59.5	48.4	70.7	11	12.9	9.6	16.9
South Asia	75.3	60.6	90.1	1	2.7	0.8	6.4
South Eastern Asia	79.1	71.3	86.9	15	15.0	11.4	19.3
Middle East	60.4	47.4	73.4	2	5.5	2.6	10.2
Eastern Europe	92.9	84.2	100.0	4	8.6	4.6	14.2
Northern & Western Europe	78.1	73.4	82.8	28	8.6	7.1	10.4
Southern Europe	62.1	52.3	71.9	10	4.6	3.3	6.3
Latin America	74.6	55.9	93.4	1	1.6	0.3	4.8
Northern America	63.0	41.2	84.8	1	8.0	2.8	17.2
Australia	78.7	77.1	80.2	165	6.8	6.3	7.2
New Zealand	81.9	72.8	91.0	8	12.3	8.5	17.2
Melanesia, Micronesia & Polynesia	78.0	62.8	93.2	5	20.0	11.9	30.9
All	77.1	75.7	78.5	293	8.4	8.0	8.8

Note: Survey estimates based on 7232 female respondents aged 20–69 years who had not had a hysterectomy. Ninety-nine (1.4%) not stated for Pap test in previous 2 years. Cancer rates were age-adjusted using the Australian population as at 30 June 1991. LL/UL95% CI = Lower and upper limits of 95% confidence interval.

Source: NSW Health Survey 1998, NSW Cancer Registry incidence data and ABS population estimates (HOIST), Epidemiology and Surveillance Branch, NSW Department of Health.



Note: Notification rates were age-adjusted using the Australian population as at 30 June 1991. Lower and upper limits of 95% confidence interval for rate are shown.

Source: NSW Notifiable Diseases Database and ABS population estimates (HOIST), Epidemiology and Surveillance Branch, 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 pulmonary 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 in NSW are required by law to notify cases of TB to the NSW Department of Health. In the period 1997–2001, 2137 cases of TB were notified. The highest notification rates were among people born in countries of South East Asia (particularly Burma, Indonesia, Thailand, Vietnam, and Hong Kong and Macau) and South Asia (mainly India). Relatively high notification rates were also recorded among people born in countries of Melanesia, Micronesia, Polynesia, and Africa. 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 at www.health.nsw.gov.au/public-health/phb/phb.html.

National communicable disease data are published in *Communicable Disease Intelligence* at www.health.gov.au/pubhlth/cdi/cdihtml.htm.

Tuberculosis by country of birth, NSW 1997 to 2001

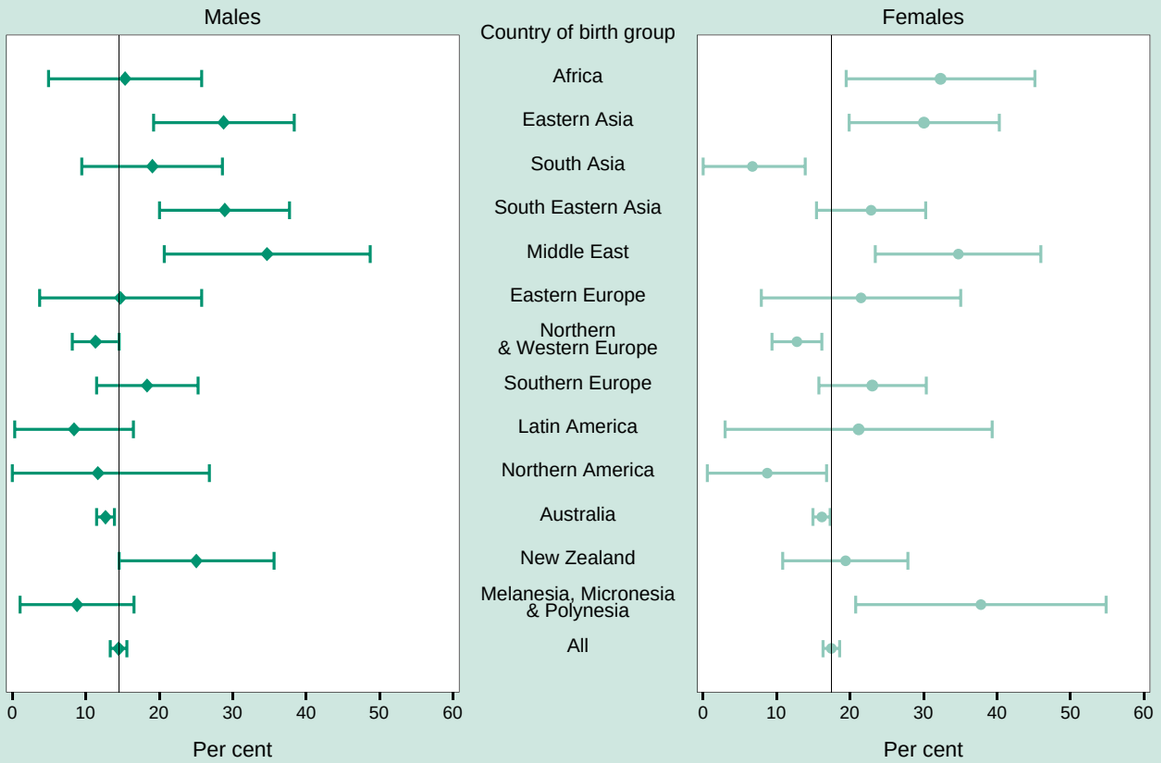
Country of birth	Number	Rate per 100,000 person years	LL 95% CI	UL 95% CI
Burma	18	160.4	9.7	375.2
Indonesia	121	121.0	83.9	163.6
Thailand	44	116.0	62.5	183.1
Vietnam	251	98.5	67.4	132.7
Hong Kong, Macau	56	88.9	55.9	129.2
Cambodia	40	87.2	57.0	125.5
India	183	78.0	65.0	92.5
Philippines	192	65.8	55.2	77.7
Other Africa	41	62.1	41.4	88.3
Korea	91	61.7	47.7	78.2
Other South Asia	51	56.4	34.7	83.1
Laos	16	53.2	25.5	93.6
Other Oceania	37	45.3	29.1	66.0
China	197	33.9	29.0	39.4
Taiwan	7	13.8	4.9	29.6
Australia	359	1.4	1.3	1.6
Other	432	6.9	5.9	7.9
All	2136	6.5	6.3	6.8

Country of birth group	Number	Rate per 100,000 per year	LL 95% CI	UL 95% CI
South Eastern Asia	698	73.3	64.5	82.6
South Asia	275	58.0	50.4	66.4
Eastern Asia	356	39.3	35.2	43.7
Melanesia, Micronesia & Polynesia	67	30.1	22.1	39.7
Africa	59	17.9	13.3	23.6
Southern Europe	111	17.2	7.3	28.7
Latin America	26	12.0	7.2	18.4
Middle East	46	9.6	6.7	13.3
Eastern Europe	32	9.4	5.0	15.1
New Zealand	23	4.5	2.7	6.9
Northern & Western Europe	68	2.1	1.6	2.8
Australia	359	1.4	1.3	1.6
Northern America	2	0.9	0.1	3.2
All	2136	6.5	6.3	6.8

Note: Notification rates were age-adjusted using the Australian population as at 30 June 1991. LL/UL95% CI = Lower and upper limits of 95% confidence interval.

Source: NSW Notifiable Diseases Database and ABS population estimates (HOIST), Epidemiology and Surveillance Branch, NSW Department of Health.

Toothache in the last 12 months, by country of birth group and sex, persons with at least one natural tooth aged 16 years and over, NSW 1998



Note: Toothache = toothache experienced sometimes, often or very often in the past 12 months. Estimates based on 15,557 respondents with at least one natural tooth. 36 (0.2%) not stated for toothache in the previous 12 months. Lower and upper limits of 95% confidence interval for point estimate.

Source: NSW Health Survey 1998 (HOIST), Epidemiology and Surveillance Branch, NSW Department of Health.

- Some migrant groups experience poor oral health status and difficulties in accessing dental care. National dental health surveys conducted in the period 1994–1996 reported that people who were born overseas and spoke a language other than English were most likely to have extractions and fillings, experience toothache, not be insured, and report difficulties paying dental bills (Australian Institute of Health and Welfare, Dental Statistics and Research Unit, 1998).
- Consistent with these findings, the 1998 NSW Health Survey found considerable differences in reported rates of toothache (sometimes, often, or very often) in the past 12 months among country-of-birth groups. People born in countries of the Eastern Asia, South Eastern Asia, and the Middle East were more likely to report toothache than people born in Australia. Among individual countries, male and female respondents born in Lebanon and China, and males born in Vietnam, Laos or Cambodia reported higher than average rates of toothache. Additionally, respondents born in many overseas countries were less likely than the Australian-born to report having had a routine dental check-up in the past 12 months (see Electronic Report of the 1997 and 1998 NSW Health Surveys).

For more information:

Australian Institute of Health and Welfare, Dental Statistics and Research Unit. *Adult access to dental care—Migrants.* AIHW Catalogue no. DEN 33. Adelaide: AIHW DSRU, 1998.

Public Health Division, NSW Department of Health. *Electronic Report of the 1997 and 1998 NSW Health Surveys* at www.health.nsw.gov.au/public-health/nswhs.

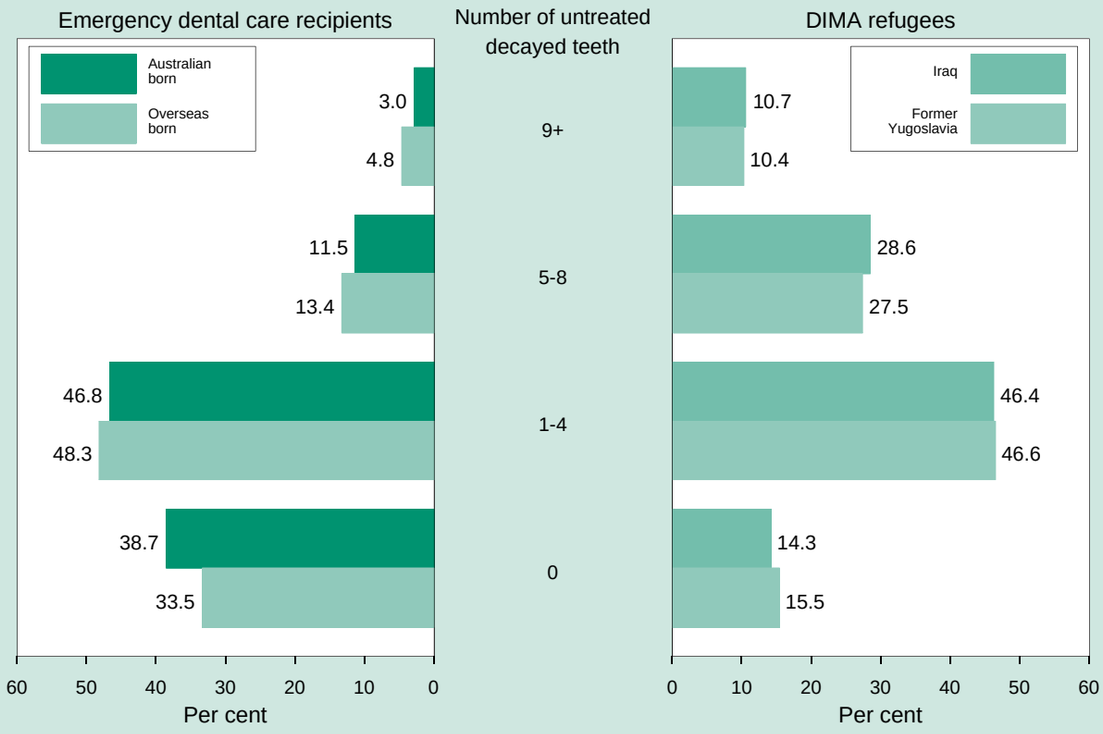
Toothache in the last 12 months, by country of birth, NSW 1998

Country of birth group	Males			Females			People		
	Per cent	LL 95% CI	UL 95% CI	Per cent	LL 95% CI	UL 95% CI	Per cent	LL 95% CI	UL 95% CI
Africa	15.4	4.9	25.8	32.3	19.5	45.2	22.7	14.4	31.1
Eastern Asia	28.8	19.2	38.3	30.1	19.8	40.3	29.4	22.4	36.4
South Asia	19.0	9.5	28.6	6.7	0.0	13.8	14.9	8.0	21.8
South Eastern Asia	28.9	20.0	37.7	22.8	15.4	30.2	25.9	20.1	31.7
Middle East	34.7	20.7	48.7	34.7	23.4	46.0	34.7	25.6	43.8
Eastern Europe	14.7	3.7	25.8	21.5	7.9	35.1	17.2	8.6	25.9
Northern & Western Europe	11.3	8.2	14.5	12.8	9.4	16.2	12.0	9.7	14.3
Southern Europe	18.4	11.4	25.3	23.0	15.8	30.3	20.9	15.8	26.0
Latin America	8.4	0.3	16.5	21.2	3.0	39.3	14.0	4.4	23.7
Northern America	11.7	0.0	26.8	8.7	0.6	16.8	10.3	1.1	19.6
Australia	12.6	11.4	13.9	16.1	14.9	17.3	14.4	13.5	15.2
New Zealand	25.1	14.5	35.6	19.3	10.8	27.9	22.2	15.4	29.0
Melanesia, Micronesia & Polynesia	8.8	1.0	16.5	37.8	20.7	54.8	20.7	11.4	29.9
All	14.5	13.4	15.6	17.4	16.3	18.5	15.9	15.1	16.7

Note: Toothache = toothache experienced sometimes, often or very often in the past 12 months. Estimates based on 15,557 respondents with at least one natural tooth. 36 (0.2%) not stated for toothache in the previous 12 months. LL/UL95%CI = Lower and upper limits of 95% confidence interval of the point estimate.

Source: NSW Health Survey 1998 (HOIST), Epidemiology and Surveillance Branch, NSW Department of Health.

Untreated tooth decay
Refugees and emergency dental care recipients, United Dental Hospital, Sydney, 1996



Note: DIMA refugees = humanitarian entrants housed temporarily in accommodation subsidised by the Department of Immigration and Multicultural Affairs (DIMA). Emergency dental care recipients = random, age-matched social security recipients attending for emergency dental care.

Source: Kingsford Smith D, Szuster F. Aspects of tooth decay in recently arrived refugees. *Aust N Z J Public Health* 2000; 24: 623–626.

- NSW settled 9400 refugees in the 3 years 1999 to 2001. Over one-third were from countries of the former Yugoslavia, with Iraq (23.6%), Afghanistan (9.2%), and Sudan (7.7%) the next most common countries of origin.
- Certain health conditions are more prevalent among refugees. Compared with other migrants, refugees are more likely to rate their health as less than good, and to have visited health care providers in the previous 4 months. A relatively greater proportion of refugees suffer from a minor mental health disorder (Vanden-Heuvel and Wooden, 1999).
- The above graph presents data from a study of newly arrived refugees from Iraq and former Yugoslavia (Kingsford Smith and Szuster, 2000). Although numbers in this study were small, only 15% of refugees had no untreated decayed teeth and more than 10% had high levels of decay (9 or more teeth). Emergency public patients were better off, with more than one third having no untreated decayed teeth and less than 5% having a high level of decay. These findings were supported by those documented among Kosovar and East Timorese evacuees during Operation Safe Haven.
- Reasons for the poor oral health of refugees include high sugar diets, lack of water fluoridation in countries of origin, poor oral hygiene, poor nutrition, limited access to health services, and physical beatings or torture.
- Under the Priority Oral Health Program, public dental services in NSW offer fast dental care for recently arrived refugees.

For more information:

Kingsford Smith D, Szuster F. Aspects of tooth decay in recently arrived refugees. *Aust N Z J Public Health* 2000; 24: 623–626.

Vanden-Heuvel A, Wooden M. *New Settlers Have Their Say—How immigrants fare over the early years of settlement.* Canberra: Department of Immigration and Multicultural Affairs, 1999.

Chapter 3.3

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 Aboriginal people.
- The population of NSW is highly urbanised. Less than 1% of the total population live in areas classified as 'remote' or 'very remote' according to the Accessibility–Remoteness Index of Australia (ARIA).
- Aboriginal people make up an increasing proportion of the population with increasing remoteness, and comprise almost half of the population of 'very remote' areas.
- Compared with people who live in 'highly accessible' areas, people who live in 'remote' or 'very remote' areas:
  - —can expect to live 6 years less (males) or 4 years less (females);
  - —are more likely to die from causes classified as 'avoidable';
  - —report fewer consultations with general practitioners and more visits to 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.
- NSW Health is working to improve the provision of health services in small rural and remote communities through:
  - —providing telehealth services;
  - —initiatives to build the nursing, medical, and allied health workforce;
  - —transport initiatives, such as the Isolated Patients' Travel and Accommodation Scheme;
  - —developing health service infrastructure through the NSW Rural Hospital and Health Service Program.

In this chapter

Introduction

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 socioeconomic disadvantage, geographic isolation, shortage of health care providers, greater exposure to injury risks, and Aboriginal health needs (AIHW, 1998). Other chapters in this report present breakdowns of health measures according to health area of residence, and compare grouped urban and rural health areas. Although useful for highlighting areas for action, such analyses do not explore the effect of remoteness on health, because they do not take into account the actual distances that individuals live from service centres.

This chapter presents a range of health indicators for NSW according to Accessibility–Remoteness Index of Australia (ARIA) category. It highlights the challenges for health services posed by the large and often sparsely populated areas that they serve. ARIA is derived from the road distance of 11,338 populated localities to 201 towns of specified size ('service centres') across Australia. For each locality, distances are converted to a continuous measure from 0 (high accessibility) to 12 (high remoteness) and grouped into 5 categories: 'highly accessible', 'accessible', 'moderately accessible', 'remote', and 'very remote' (CDHAC and GISCA, 1999) (See Methods).

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, general practitioners, or schools. However, there is a strong relationship between population size and availability of services, particularly education and health services (CDHAC and GISCA, 1999).

NSW Health is addressing the provision of services to small rural and remote communities through wide-ranging initiatives including: the provision of telehealth services; nursing initiatives such as Nurse Practitioner Services and training opportunities for rural nurses; medical workforce initiatives such as the Area of Need Program, the Rural Medical Undergraduate Program, and the NSW Resident Medical Officer Cadetship Scheme; allied health initiatives such as the NSW Rural Allied Health Scholarships and Clinical Placement Grants; and transport initiatives including the Isolated Patients' Travel and Accommodation Scheme. The first phase of the NSW Rural Hospital and Health Service Program is currently underway. The Program involves the collaboration of the NSW Department of Health, the Commonwealth Department of Health and Ageing, the Ambulance Service of NSW, rural area health services, and local communities, in developing health service infrastructure and capacity. The first phase includes 18 community developments in rural areas. NSW Health is also working with other agencies on strategies to build the capacity of rural and remote communities to address the social determinants of ill-health.

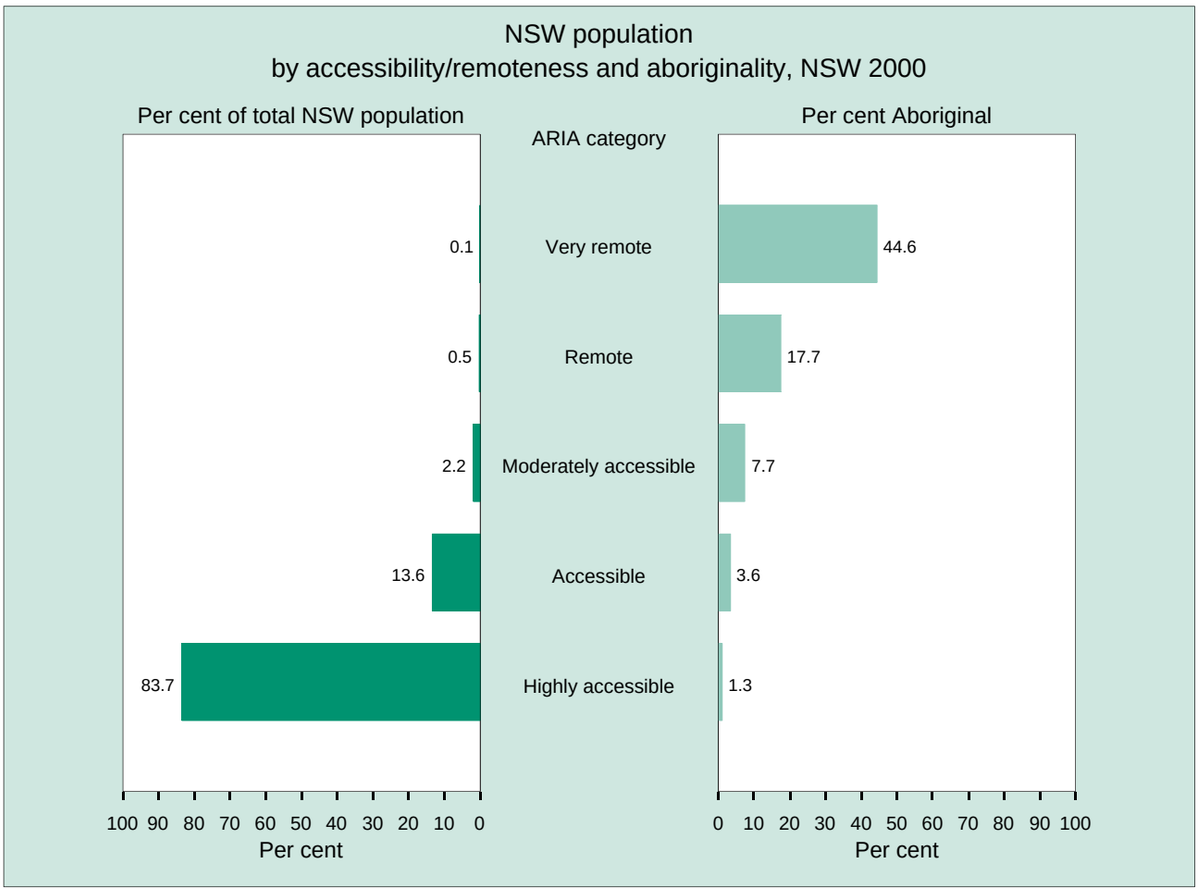
For more information:

Australian Institute of Health and Welfare. *Health in rural and remote Australia.* AIHW Catalogue no. PHE6. Canberra: AIHW, 1998.

Commonwealth Department of Health and Aged Care and the National Key Centre for Social Applications of Geographical Information Systems (GISCA), *Accessibility–Remoteness Index of Australia,* Occasional Papers Series no 5. Canberra: CDHAC, 1999.

National Key Centre for Social Applications of Geographical Information Systems at www.gisca.adelaide.edu.au.

NSW Health Rural Hospital and Health Service Program at www.asset.gov.com.au/ruralhospitals/about.shtm.



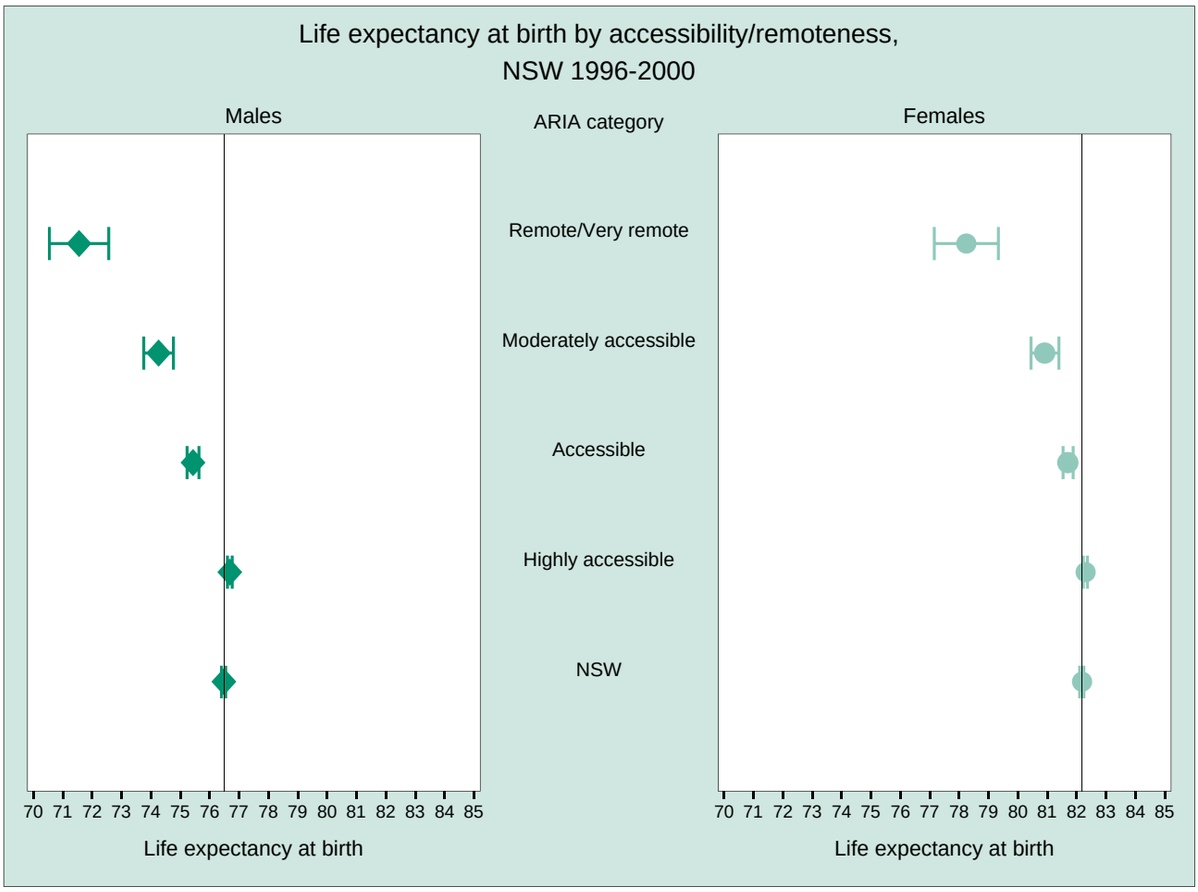
Note: Statistical local areas were assigned to the Accessibility–Remoteness Index of Australia (ARIA). 'Aboriginal' is used here to refer to both Aboriginal and Torres Strait Islander people.

Source: ABS population estimates (HOIST), Epidemiology and Surveillance Branch, NSW Department of Health.

- The population of NSW is highly urbanised. Less than 38,000 people (0.6% 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 northwest of the state: 2 statistical local areas (SLAs) (Bourke and Brewarrina) are classified as 'very remote', and 8 SLAs (Cobar, Bogan, Warren, Coonamble, Carrathool, Walgett, Central Darling, and Unincorporated Far West) are classified as 'remote'. Among NSW health areas, only 4 (Greater Murray, Southern, Macquarie, and Far West) include SLAs that are classified as 'remote' or 'very remote'. Because ARIA is based on distance from populated towns of specified size ('service centres'), many large rural towns such as Tamworth, Goulburn, Wagga Wagga, and Broken Hill, are classified as 'highly accessible'.
- Aboriginal people make up an increasing proportion of the population with increasing remoteness, and comprise close to half (44.4%) of the population of 'very remote' areas. However, less than 1 in 10 (6.8%) Aboriginal people in NSW live in 'remote' or 'very remote' areas.
- Children comprise an increasing proportion of the population with increasing remoteness, while the proportion of older people decreases. Almost 1 in 5 residents (19.3%) of 'very remote' areas are aged less than 15 years, compared with 13.1% of residents of 'highly accessible' areas. The proportion of the population aged 60 years or more is 11.7% in 'very remote' areas, compared with 16.6% in 'highly accessible' areas. This difference in age structure is largely attributable to the lower life expectancy of Aboriginal people (see page 85).

For more information:

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: DHAC, 1999.



Note: Statistical local areas were assigned to the Accessibility–Remoteness Index of Australia (ARIA). Abridged current life tables using Chiang's method were used to calculate point estimates and confidence intervals for life expectancy (see Methods section). Mortality data for 2000 include an estimate of the small number of deaths which were registered in 2001, data for which were unavailable at the time of production. Lower and upper limits of 95% confidence interval for life expectancy shown.

Source: ABS mortality and population estimates (HOIST). Epidemiology and Surveillance Branch, 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 1996 to 2000, life expectancy at birth decreased with remoteness. For males it ranged from 71.6 years in 'remote' and 'very remote' areas combined, to 76.7 years in 'highly accessible' areas. In females, the corresponding range was 78.2 years to 82.3 years. It is important to note that while Aboriginal people make up almost 7% of the population of 'remote' and 'very remote' areas, the life expectancy of the whole population in these areas is still considerably above that estimated for Aboriginal residents of NSW (56.3 years for males and 63.6 years for females, see page 85).
- Differences in life expectancy according to ARIA category reflect higher death rates from many causes in rural and remote areas (see page 124).

For more information:

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

Australian Bureau of Statistics Web site at www.abs.gov.au.

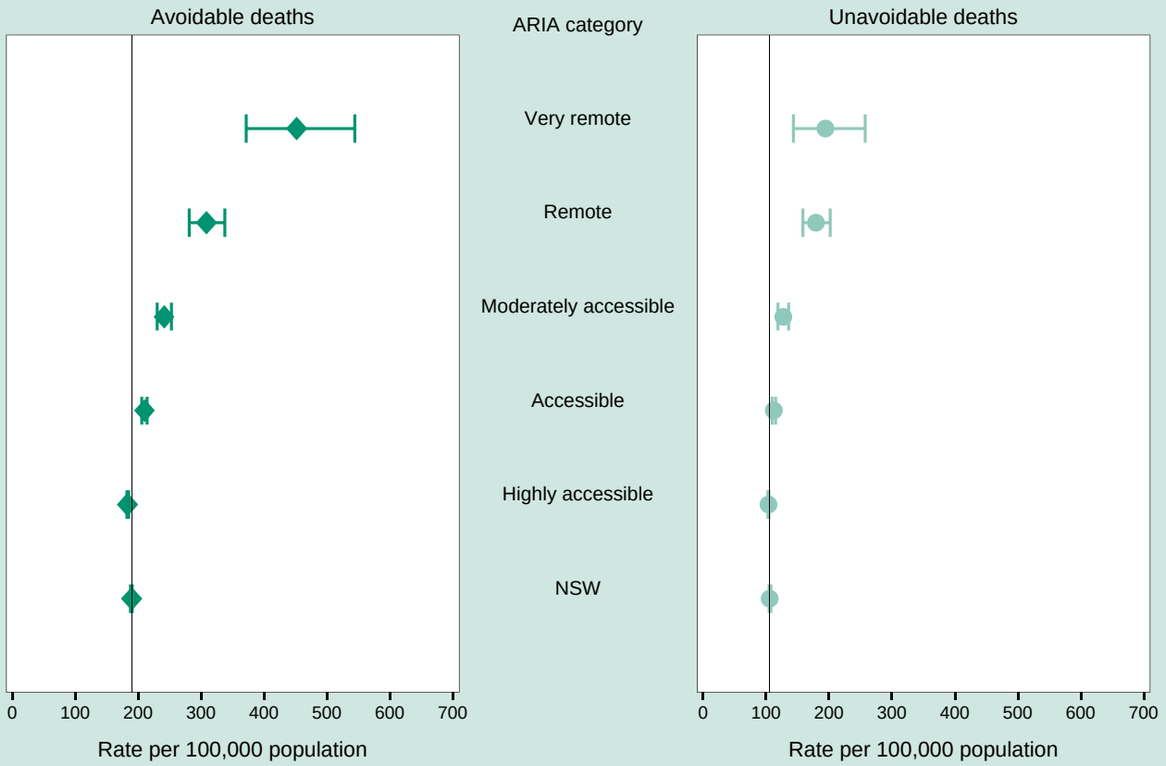
Life expectancy at birth by accessibility–remoteness, NSW 1996–2000

ARIA category	Sex	Life expectancy at birth	LL 95%CI	UL 95%CI
Remote–Very remote	Males	71.6	70.5	72.6
	Females	78.2	77.1	79.3
	Persons	74.5	73.8	75.3
Moderately accessible	Males	74.3	73.8	74.8
	Females	80.9	80.4	81.4
	Persons	77.4	77.0	77.8
Accessible	Males	75.4	75.2	75.6
	Females	81.7	81.5	81.9
	Persons	78.5	78.3	78.6
Highly accessible	Males	76.7	76.6	76.8
	Females	82.3	82.2	82.4
	Persons	79.5	79.5	79.6
NSW	Males	76.5	76.4	76.5
	Females	82.2	82.1	82.2
	Persons	79.3	79.3	79.4

Note: Statistical local areas were assigned to the Accessibility–Remoteness index of Australia (ARIA). Abridged current life tables using Chiang's method were used to calculate point estimates and confidence intervals for life expectancy (see Methods section). LL/UL 95% CI = Lower and upper limits of 95% confidence interval for life expectancy.

Source: ABS mortality and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

Premature deaths, by accessibility/remoteness and avoidability, persons aged 74 years and under, NSW 1996 to 2000



Note: Statistical local areas were assigned to the Accessibility–Remoteness Index of Australia (ARIA). Deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001, data for which were unavailable at the time of production. Rates were age-adjusted using the standard Australian population as at 30 June 1991. Lower and upper limits of 95% confidence interval for rate shown.

Source: ABS mortality and population estimates (HOIST). Epidemiology and Surveillance Branch, 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 1996 to 2000, the death rate from 'avoidable' causes increased with remoteness, and was 3.0 times higher in 'very remote' areas than in 'highly accessible' areas. Similar gradients were observed when avoidable deaths were further partitioned into 'primary' avoidable deaths (preventable through individual and population-based preventive interventions), 'secondary' avoidable deaths (conditions amenable to early detection and intervention), and 'tertiary' avoidable deaths (conditions amenable to medical or surgical treatments). Death rates from these causes were all more than 3 times higher in 'very remote' than in 'highly accessible' areas.
- The death rate from causes classified as 'unavoidable' also increased with remoteness, though less dramatically. The death rate from these causes was 2.4 times higher in 'very remote' areas than in 'highly accessible' areas.
- These findings indicate that there is considerable scope for closing the health gap between residents of remote and more accessible areas through health services and programs. However, they do not provide information on the feasibility or cost-effectiveness of such interventions.

For more information:

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

Australian Bureau of Statistics Web site at www.abs.gov.au.

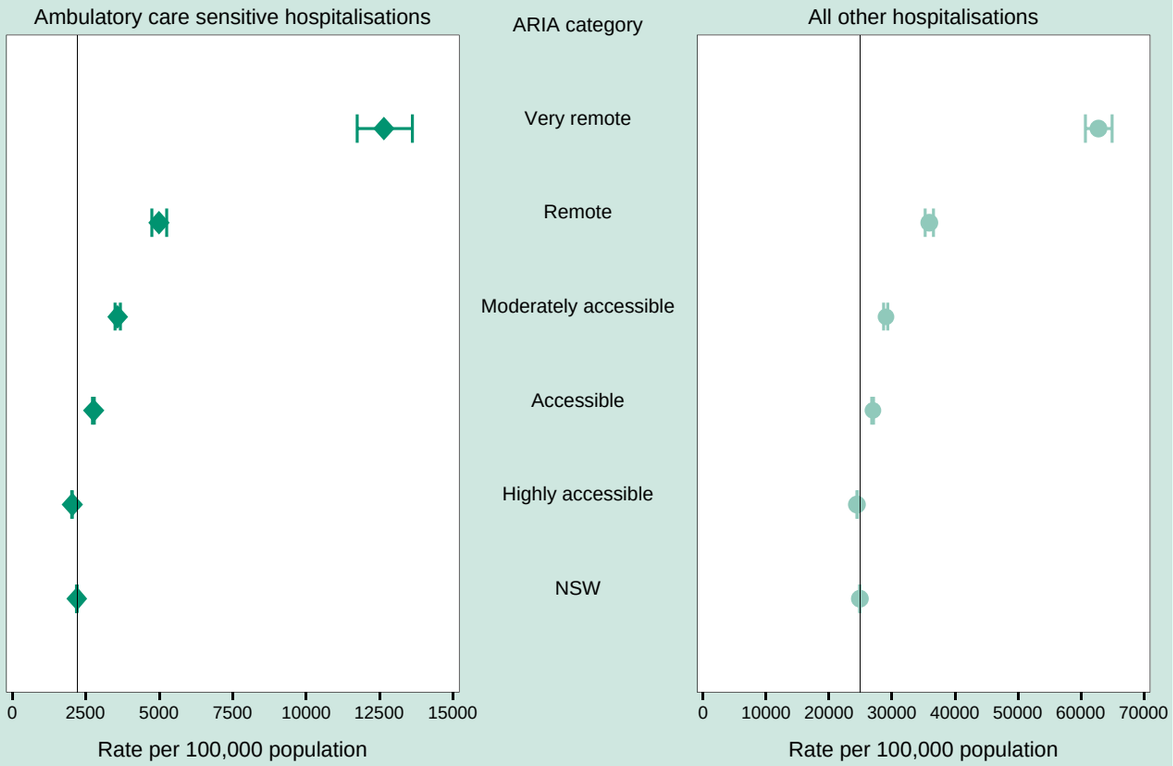
Premature deaths, by accessibility–remoteness and avoidability, persons aged 74 years and under, NSW 1996 to 2000

	ARIA category	Number	Rate/ 100,000 population	LL95%CI	UL95%CI
Avoidable deaths	Very remote	114	451.3	371.1	543.5
	Remote	477	308.1	280.8	337.4
	Moderately accessible	1871	240.8	229.8	252.1
	Accessible	10209	209.7	205.5	213.8
	Highly accessible	47798	183.0	181.4	184.7
	NSW	60611	189.5	188.0	191.0
Unavoidable deaths	Very remote	50	194.1	143.3	256.8
	Remote	280	178.6	158.1	201.1
	Moderately accessible	983	126.8	118.9	135.1
	Accessible	5460	111.8	108.8	114.9
	Highly accessible	27014	103.6	102.4	104.9
	NSW	33894	105.8	104.7	107.0
All premature deaths	Very remote	164	645.4	549.0	753.7
	Remote	756	486.7	452.3	523.1
	Moderately accessible	2853	367.6	354.0	381.6
	Accessible	15669	321.5	316.4	326.7
	Highly accessible	74812	286.6	284.6	288.7
	NSW	94505	295.7	293.8	297.6

Note: Statistical local areas were assigned to the Accessibility–Remoteness Index of Australia (ARIA). Deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Rates were age-adjusted using the standard Australian population as at 30 June, 1991. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001, 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 standardised rate.

Source: ABS mortality and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

Hospitalisations for ambulatory care sensitive and all other conditions, by accessibility/remoteness, NSW 1999-00



Note: Statistical local areas were assigned to the Accessibility–Remoteness Index of Australia (ARIA). Hospital separations were classified by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the standard Australian population as at 30 June 1991. Lower and upper limits of 95% confidence interval for the rate are shown.

Source: NSW Inpatients Statistics Collection and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, 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 influenza, asthma, congestive heart failure, and diabetes complications (see Methods).
- In NSW, in 1999–00, hospitalisation rates for ambulatory care sensitive conditions increased dramatically with remoteness, and were almost 7 times higher among residents of 'very remote' areas compared with residents of 'highly accessible' areas.
- Hospitalisation rates for all other conditions also increased with remoteness, though less markedly. These rates were almost 3 times higher among residents of 'very remote' areas compared with residents of 'highly accessible' areas.
- Factors contributing to these gradients may include the higher prevalence of many health conditions among Aboriginal people, and a greater propensity to admit to hospital people who come from remote areas. The more pronounced gradient seen for ambulatory care sensitive conditions reflects barriers to accessing primary care in remote areas. These include geographic isolation, transport difficulties, shortages of general practitioners, limited after-hours services, and lack of bulk-billing practices.

For more information:

Victorian Government Department of Human Services. *The Victorian ambulatory care sensitive conditions study: preliminary analyses*. Melbourne: Health Outcomes Section, Public Health Division, Victorian Government Department of Human Services, 2001.

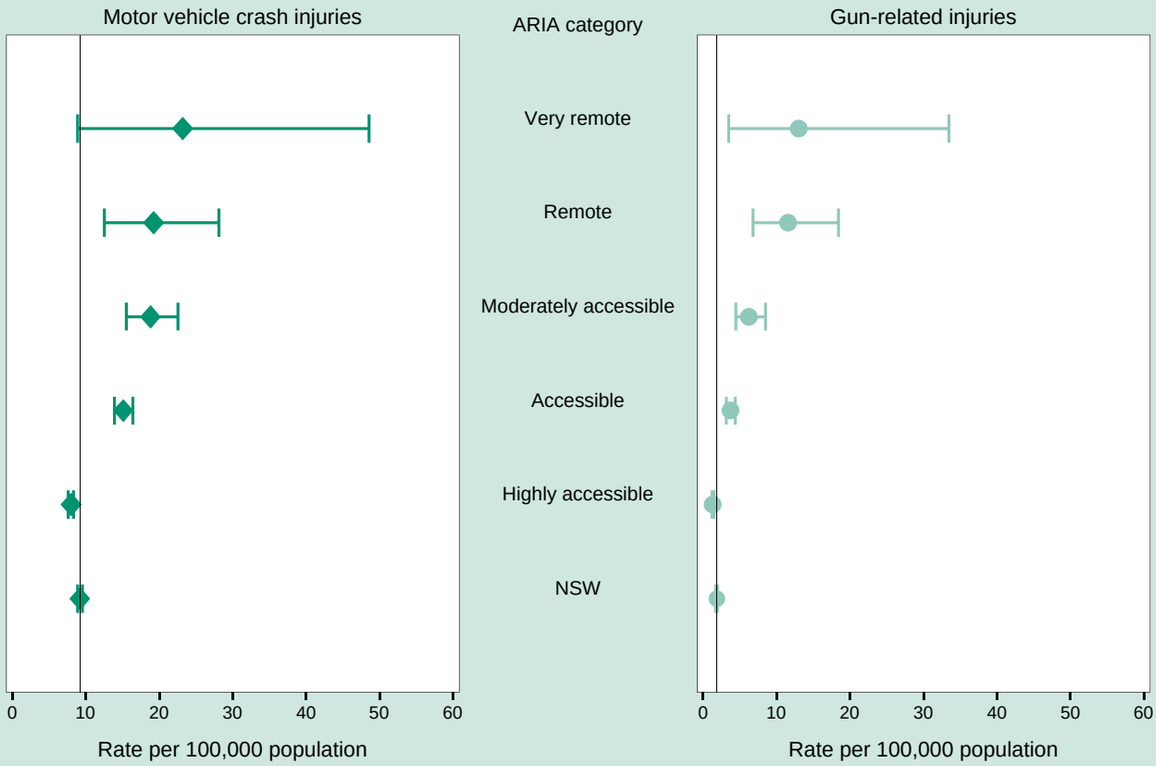
Hospitalisations for ambulatory care sensitive and all other conditions, by accessibility–remoteness, NSW 1995–96 to 1999–00

	ARIA category	Number	Rate per 100,000	LL95%CI	UL95%CI
Ambulatory care sensitive hospitalisations	Very remote	743	12642.6	11725.5	13610.9
	Remote	1578	4987.9	4740.5	5244.6
	Moderately accessible	5495	3580.1	3483.1	3679.1
	Accessible	27159	2759.5	2725.6	2793.7
	Highly accessible	114517	2031.6	2019.7	2043.5
	NSW	156095	2288.2	2276.7	2294.7
All other hospitalisations	Very remote	3524	62753.9	60656.6	64904.1
	Remote	11124	35874.0	35198.0	36559.5
	Moderately accessible	41898	28965.5	28678.6	29254.6
	Accessible	247995	26893.8	26783.8	27004.1
	Highly accessible	1362475	24425.9	24384.6	24467.4
	NSW	1760093	26233.7	26194.5	26272.8
All hospitalisations	Very remote	4267	75396.5	73102.0	77743.4
	Remote	12702	40861.8	40141.2	41592.0
	Moderately accessible	47393	32545.7	32242.6	32850.8
	Accessible	275154	29653.2	29538.1	29768.7
	Highly accessible	1476992	26457.6	26414.5	26500.6
	NSW	1916188	28521.8	28481.0	28562.6

Note: Statistical local areas were assigned to the Accessibility–Remoteness Index of Australia (ARIA). Hospital separations were classified by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the standard Australian population as at 30 June, 1991. LL/UL 95% CI = Lower and upper limits of 95% confidence interval for the standardised rate.

Source: NSW Inpatients Statistics Collection and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

Deaths from motor vehicle crash and gun-related injuries, by accessibility/remoteness, NSW 1996 to 2000



Note: Statistical local areas were assigned to the Accessibility–Remoteness Index of Australia (ARIA). Deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001, data for which were unavailable at the time of production. Rates were age-adjusted using the standard Australian population as at 30 June 1991. Lower and upper limits of the 95% confidence interval for the rate are shown.

Source: ABS mortality and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- In NSW, between 1996 and 2000, the death rate from all injury and poisoning was 1.7 times higher in 'very remote' areas than in 'highly accessible' areas. Death rates tended to increase with remoteness for many injury causes, including motor vehicle crashes, suicide, drowning, burns and scalds, interpersonal violence and gun-related injuries. There was no clear trend for deaths due to falls or poisoning.
- Residents of 'very remote' areas were almost 3 times more likely to die as a result of motor vehicle crashes than residents of 'highly accessible' areas. Most (85.3%) of those who died in motor vehicle crashes in 'remote' and 'very remote' areas were males, and almost half (47.1%) were aged less than 25 years. Death rates due to both road traffic and non-road traffic crashes increased with remoteness, although non-road traffic crashes contributed a greater proportion of motor vehicle crash deaths in 'remote' or 'very remote' areas. Of the road traffic crashes recorded by the NSW Roads and Traffic Authority (RTA) in 2000, almost one-third (31%) occurred on country roads, and these accounted for 58% of all fatal crashes. Almost two-thirds of fatal crashes on country roads occurred on stretches where the speed limit was 100 kilometres per hour or more (RTA, 2001).
- Residents of 'very remote' areas were 10 times more likely than those in 'highly accessible' areas to die from gun-related injuries. Almost all (95.4%) those who died from gun-related injuries in 'remote' and 'very remote' areas were males. Rates of gun-related homicide, suicide and accidental death all increased with remoteness.

For more information:

Roads and Traffic Authority. *Road traffic accidents in NSW 2000*. Sydney: Roads and Traffic Authority, Road Safety Strategy Branch, 2001.

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.

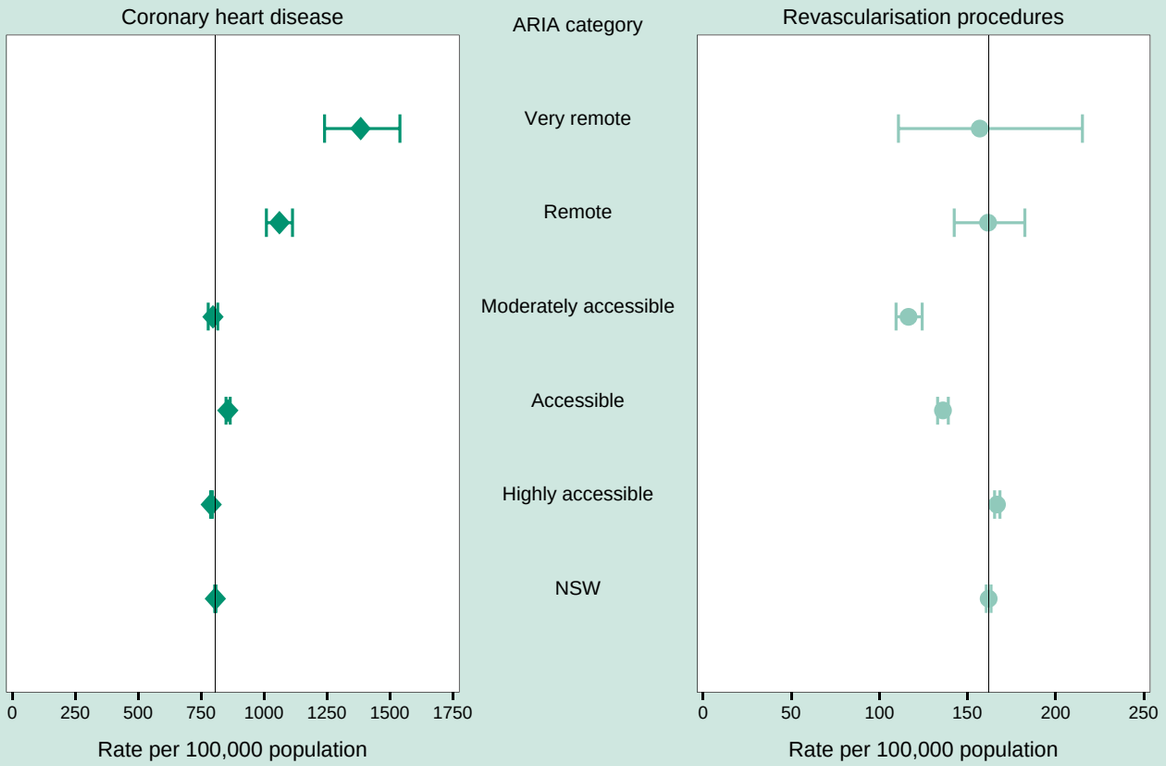
Deaths from motor vehicle crash and gun-related injuries, by accessibility–remoteness, NSW 1996 to 2000

	ARIA category	Average number per year	Rate/100,000 per year	LL95%CI	UL95%CI
Motor vehicle crash injuries	Very remote	1	23.2	8.9	48.6
	Remote	5	19.2	12.5	28.1
	Moderately accessible	24	18.8	15.5	22.5
	Accessible	121	15.1	13.9	16.4
	Highly accessible	423	8.0	7.6	8.3
	NSW	578	9.2	8.8	9.5
Gun-related injuries	Very remote	1	13.0	3.5	33.4
	Remote	4	11.5	6.7	18.4
	Moderately accessible	9	6.2	4.4	8.4
	Accessible	33	3.7	3.1	4.3
	Highly accessible	70	1.3	1.2	1.4
	NSW	117	1.8	1.7	2.0
All injury and poisoning	Very remote	5	92.2	59.9	135.3
	Remote	24	79.5	65.8	95.3
	Moderately accessible	77	55.7	50.1	61.8
	Accessible	410	47.3	45.2	49.4
	Highly accessible	1977	35.7	35.0	36.4
	NSW	2512	38.1	37.4	38.7

Note: Statistical local areas were assigned to the Accessibility–Remoteness Index of Australia (ARIA). Deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Rates were age-adjusted using the standard Australian population as at 30 June, 1991. Numbers for 2000 include an estimate of the small numbers of deaths which were registered in 2001, data for which were unavailable at the time of production. LL/UL 95% CI = Lower and upper limits of 95% confidence interval for the standardised rate.

Source: ABS mortality and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

Hospitalisations for coronary heart disease and revascularisation procedures, by accessibility/remoteness, NSW 1995-96 to 1999-00



Note: Statistical local areas were assigned to the Accessibility–Remoteness Index of Australia (ARIA). Hospital separations were classified by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the standard Australian population as at 30 June 1991. Lower and upper limits of 95% confidence interval for rate shown.

Source: NSW Inpatients Statistics Collection and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Coronary heart disease is caused by blockages in the coronary 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 5-year period 1995–96 to 1999–2000 were highest among people living in 'remote' and 'very remote' parts of NSW, and lowest among those living in 'moderately accessible' areas. Variations in the incidence of coronary heart disease according to ARIA category reflect differences in levels of risk factors such as smoking, obesity, and consumption of high fat foods (Public Health Division, 2001).
- Hospitalisation rates for revascularisation procedures also varied with ARIA category. The ratio of separations for revascularisation procedures to total coronary heart disease separations decreased with remoteness, from 0.21 for people living in 'highly accessible' areas to 0.11 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. Overseas evidence suggests that higher rates of revascularisation are not independently associated with increased survival rates following heart attack. Instead, survival rates, and quality of life, are influenced by many factors, including the patient's initial risk factor profile, and geographic proximity to the hospital, and the follow-up cardiac care (Alter et al., 2000).

For more information:

Alter DA, Naylor CD, Austin PC et al. Long-term MI outcomes at hospitals with or without on-site revascularization. *JAMA* 2000; 285: 2101–2108.

Public Health Division. *NSW Health Surveys 1997 and 1998*. Sydney: NSW Department of Health, 2001. www.health.nsw.gov.au/public-health/nswhs.

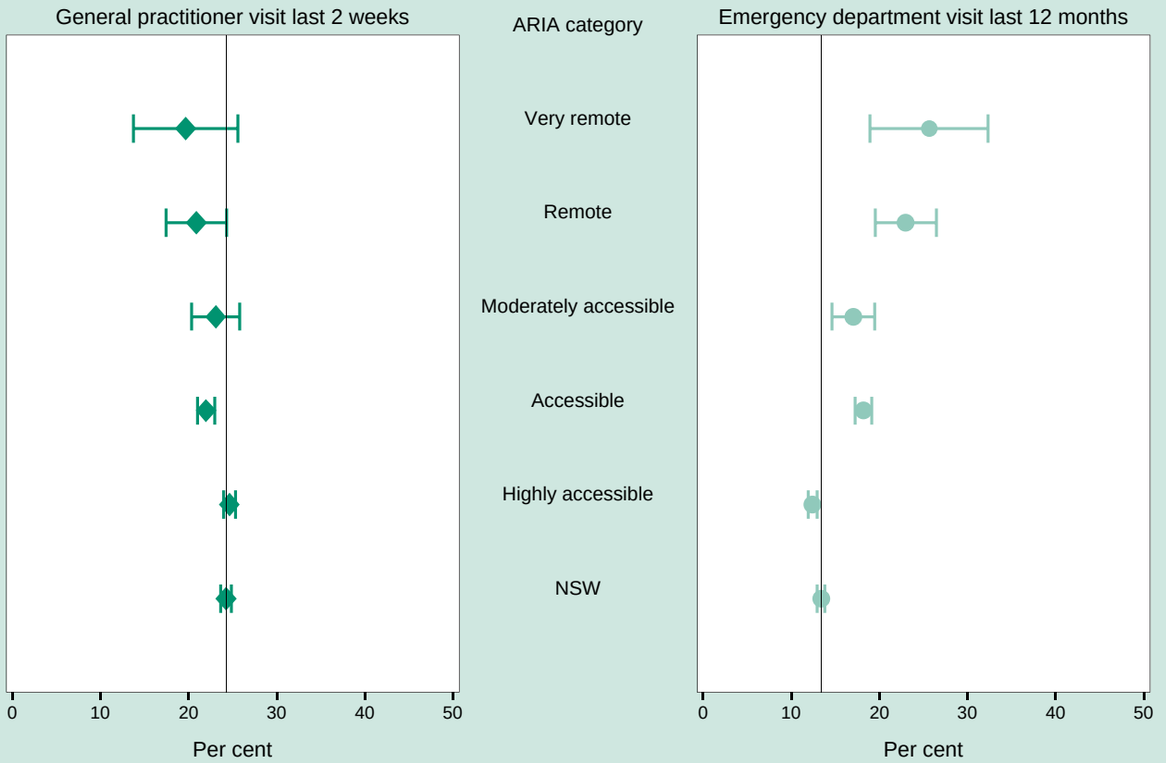
Hospitalisations for coronary heart disease and revascularisation procedures, NSW 1995–96 to 1999–00

	ARIA category	Number per year	Rate/100,000 per year	LL95%CI	UL95%CI
Coronary heart disease	Very remote	69	1382.1	1238.1	1538.1
	Remote	338	1059.3	1008.7	1111.7
	Moderately accessible	1358	795.5	776.6	814.8
	Accessible	9297	855.7	847.9	863.6
	Highly accessible	44826	789.4	786.1	792.7
	NSW	56197	805.7	802.7	808.7
Revascularisation procedures	Very remote	8	156.7	110.8	215.1
	Remote	53	161.4	142.3	182.3
	Moderately accessible	197	116.5	109.3	124.1
	Accessible	1451	135.9	132.8	139.1
	Highly accessible	9290	166.7	165.2	168.2
	NSW	11096	162.0	160.6	163.3

Note: Statistical local areas were assigned to the Accessibility–Remoteness Index of Australia (ARIA). Hospital separations were classified by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the standard Australian population as at 30 June 1991. LL/UL 95% CI = Lower and upper limits of 95% confidence interval for the standardised rate.

Source: NSW Inpatients Statistics Collection and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

General practitioner and emergency department visits by accessibility/remoteness, persons aged 16 years and over, NSW 1997 and 1998



ARIA	General practitioner visit			Emergency department visit		
	Per cent	LL 95% CI	UL 95% CI	Per cent	LL 95% CI	UL 95% CI
Very remote	19.7	13.7	25.6	25.6	18.9	32.3
Remote	20.8	17.4	24.3	23.0	19.5	26.4
Moderately accessible	23.1	20.4	25.8	17.0	14.6	19.4
Accessible	22.0	21.0	22.9	18.2	17.2	19.1
Highly accessible	24.6	23.9	25.3	12.4	11.9	12.9
NSW	24.2	23.6	24.8	13.4	12.9	13.8

Note: Statistical local areas were assigned to the Accessibility–Remoteness Index of Australia (ARIA). Estimates based on 35,025 respondents. 254 respondents (0.7%) could not be assigned an ARIA category or general practitioner visits were not stated; 196 respondents (0.6%) could not be assigned an ARIA category or emergency department visits were not stated. LL/UL95%CI = Lower and upper limits of 95% confidence interval of the point estimate.

Source: NSW Health Surveys 1997 and 1998 (HOIST), Epidemiology and Surveillance Branch, NSW Department of Health.

- 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. Hospital admission rates are higher among residents of remote areas than residents of capital cities, due to higher rates of medical admissions (AIHW, 1998). Use of general practitioner and emergency department services also varies with remoteness.
- At the 1997 and 1998 NSW Health Surveys, the proportion of respondents reporting that they had recently consulted a general practitioner decreased with remoteness. One in 5 people living in 'very remote' areas reported a consultation in the last 2 weeks, compared with 1 in 4 people living in 'highly accessible' areas.
- A different pattern was seen for emergency department visits. People living in 'very remote' areas were more than twice as likely as those living in 'highly accessible' areas to report an emergency department visit in the last 12 months.

For more information:

Australian Institute of Health and Welfare. *Health in rural and remote Australia.* AIHW Catalogue no. PHE6. Canberra: AIHW, 1998.

Public Health Division. *NSW Health Surveys 1997 and 1998.* Sydney: NSW Department of Health, 2001. Web site at www.health.nsw.gov.au/public-health/nswhs.

Chapter 3.4

Socioeconomic status

- In NSW and Australia, as in most other countries, inequalities in mortality, morbidity, health behaviours, and risk factors, are not confined to differences between 'rich' and 'poor', but exist in a gradient across socioeconomic groups.
- 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.
- Similar patterns are seen for:
  - —deaths from causes classified as 'potentially avoidable' through primary, secondary, and tertiary health system interventions;
  - —all other deaths;
  - —teenage pregnancies.
- A different pattern exists for hospitalisations that can be potentially avoided through prevention and early disease management. Over the last 10 years, rates of these hospitalisations increased by 7% in the highest socioeconomic group and 5% in the middle group, but remained static in the lowest socioeconomic group.
- Overall, over the last 10 to 20 years, the rate of health gain using the measures in this chapter has been considerably greater in those from the highest SES group compared to both the lowest SES group and the rest of the population. This indicates a continuing lack of fairness in the distribution of health benefit in NSW.

In this chapter

- Life expectancy
- Premature deaths
- Potentially avoidable deaths
- Primary potentially avoidable deaths
- Secondary potentially avoidable deaths
- Tertiary potentially avoidable deaths
- Unavoidable deaths
- Potentially avoidable hospitalisations
- Teenage mothers

Introduction

The *World Health Report 2000* assessed the relative performance of health systems in different countries, based on how well these systems contributed to the objective of providing good health. 'Good health' was defined as 'the best attainable average level—*goodness*—and the smallest feasible differences among individuals and groups—*fairness*' (WHO, 2000). The report found that inequalities in life expectancy persist and are strongly associated with socioeconomic class, even in countries that enjoy an average of quite good health. In the report, Australia ranked second among all member states in the measure of Disability-Adjusted Life Expectancy (DALE); however, it ranked seventeenth in the measure of health benefit distribution in the population (equality of child survival) (WHO, 2000). This raises questions of the fairness of the distribution of the overall experience of good health within Australia, particularly where inequalities in health are caused by conditions that are potentially preventable.

In Australia, inequalities in mortality, morbidity, health behaviours, and risk factors are not confined to differences between 'rich' and 'poor', but exist in a gradient across socioeconomic groups (Turrell and Mathers 2000a). Mortality rates (overall, premature, and from specific causes), and years of life lost, have been shown to increase with increasing socioeconomic disadvantage (Turrell and Mathers, 2000a; Mathers, Vos, and Stevenson, 1999). Measures of morbidity (for example, adverse birth outcomes and behavioural disturbances), health behaviours (for example, smoking prevalence and physical inactivity), and risk factors (for example, obesity and high cholesterol levels) are also significantly higher in people in the lowest compared to the highest socioeconomic groups. Similar gradients in inequalities among socioeconomic groups in rates of mortality, morbidity, and health behaviours and risk factors, have been demonstrated in NSW (Public Health Division, 2000 and 2001; Moore and Jorm, 2001).

There is also growing evidence that inequality in mortality among socioeconomic groups within countries, including Australia, have widened over time. In Australia, this is generally due to greater declines in the rate of mortality among those of higher socioeconomic status, but also results from actual increases in mortality for some conditions among the most disadvantaged (for example, diabetes mellitus and asthma and emphysema in both sexes, and lung cancer in women) (Turrell and Mathers, 2000b).

Policy responses to the socioeconomic gradient in health need to address the complex interplay between the factors that affect the psychosocial environment and material living conditions that act to support or undermine health status (Hertzman, 2001). These include 'upstream' factors (for example: government policies, education, and housing); 'midstream' factors (for example: psychosocial factors, healthcare availability, and health-related behaviours); and 'downstream' factors (for example: biological reactions) that have an effect in different population groups, and life course stages and settings (Turrell and Mathers, 2000a). While the evidence base for effective interventions to reduce socioeconomic health inequalities is scant, broad areas for action to modify macroeconomic and social policies, living and working conditions, behavioural risk factors, and the healthcare system in Australia, have been identified (Oldenburg, McGuffog, and Turrell, 2000).

In NSW, a Health and Equity Statement has been developed which recommends a range of strategies to reduce health inequalities in NSW (NSW Department of Health, unpublished). In particular it emphasises engaging the community, the broader health sector, other government and non-government organisations, in acting, planning and building a capacity in NSW to redress health inequalities in a sustainable way. In the United Kingdom, a wide-ranging plan is being developed by the UK Department of Health to tackle health inequalities through simultaneous and coordinated changes to national policies and action in local communities (UK Department of Health, 2001). This plan is being driven by the need to achieve national and local health inequality targets aimed at reducing the gap in infant mortality and life expectancy between the most disadvantaged groups and the rest of the population (Bull and Hamer, 2001).

This chapter examines trends in life expectancy, potentially avoidable mortality and hospitalisations, and teenage mothers, among socioeconomic groups in NSW over the last 10 to 20 years. Assessments are made of the absolute and relative magnitude of the health gap between groups of different socioeconomic status in NSW (a measure of the *fairness* of the health system) as well as changes in the population as a whole over time (a measure of the *goodness* of the health system). More information about the methods used in this chapter can be found in the Methods section.

For more information:

World Health Organization. *The World Health Report 2000. Health Systems: Improving Performance.* Geneva: WHO, 2000.

Turrell G and Mathers CD. Socioeconomic status and health in Australia. *MJA* 2000a; 172: 434–438.

Mathers C, Vos T, and Stevenson C. *The burden of disease and injury in Australia.* Canberra: Australian Institute of Health and Welfare, 1999.

Moore H and Jorm L. Measuring health inequalities in New South Wales. *N S W Public Health Bull* 2001; 12(5): 120–125. Also see other issues in the Bulletin's health inequalities series: 2001, 12(7); 2002, 13(3); 2002, 13(6); and 2002, 13(7) at www.nsw.health.gov.au/public-health/phb/phb.html.

Turrell G and Mathers CD. Socioeconomic inequalities in all-cause mortality in Australia: 1985–97 and 1995–97. *Int J Epidemiol* 2000b; 29: 231–239.

NSW Department of Health. *The health of the people of New South Wales—Report of the Chief Health Officer, 2000.* Sydney: NSW Department of Health, 2000.

NSW Department of Health. *NSW Health Survey Report 1997 and 1998.* Sydney: NSW Department of Health, 2000. Web site at: www.health.nsw.gov.au/public–health.

Hertzman C. Wealthier nations are not always healthier, and efforts to improve health can be swamped by the effects of inequality and conflict. *American Scientist* 2001; 89(6): 538–545.

Oldenburg B, McGuffog ID, and Turrell G. Socioeconomic determinants of health in Australia: Policy responses and intervention options. *MJA* 2000; 175: 489–492.

NSW Department of Health. *NSW Health and Equity Statement.* Sydney: NSW Department of Health, (unpublished).

Department of Health (United Kingdom). *Tackling Health Inequalities. Consultation on a plan for delivery.*London: Department of Health, 2001.

Bull J and Hamer L. *Closing the gap: Setting local targets to reduce health inequalities.* London: National Health Service, 2001.

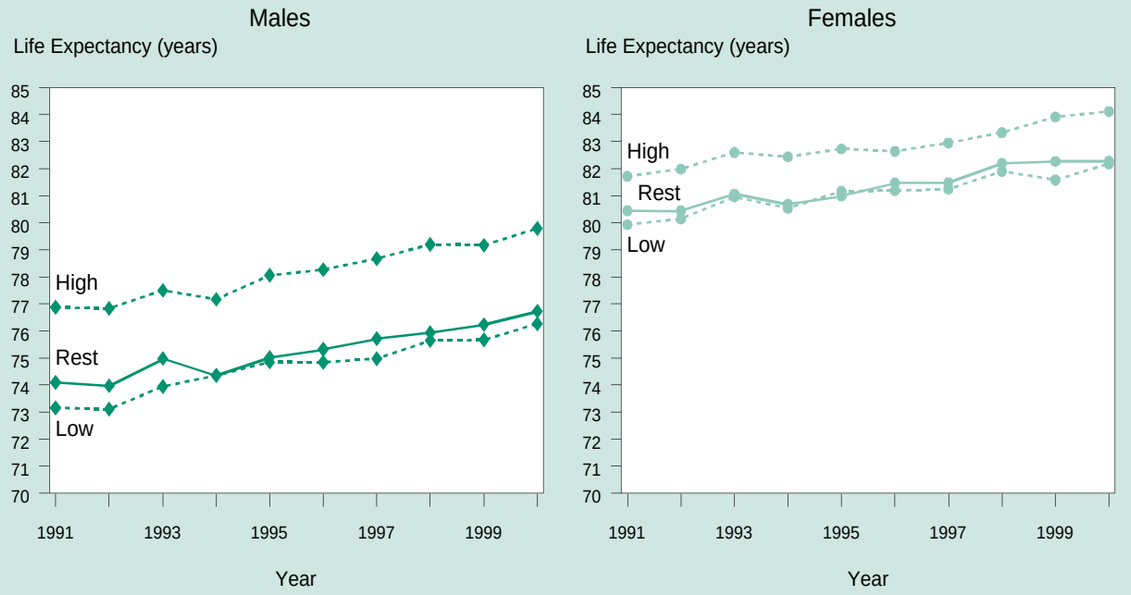
Tobias M and Jackson G. Avoidable mortality in New Zealand, 1981–97. *Aust N Z J Public Health* 2001; 25(1): 12–20.

Department of Human Services. *The Victorian Ambulatory Care Sensitive Conditions Study: Preliminary Analyses.* Melbourne: Victorian Government Department of Human Services, 2001.

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

Australian Bureau of Statistics. *Information paper: 1996 Census socioeconomic indices for areas.* Canberra: ABS Catalogue no. 29120, 1998.

Life expectancy at birth for highest and lowest socioeconomic status quintiles and rest of population by sex, NSW 1991 to 2000



Note: Life expectancy was calculated using the method of Chiang (see Methods section). Deaths data for 2000 include an estimate of the small numbers of deaths that were registered in 2001, data for which were not available at the time of production. Deaths data for 2000 include an estimate of the small numbers of deaths which were registered in 2001, data for which were not available at the time of production.

Source: ABS mortality data and ABS Socioeconomic Indices for Areas (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Life expectancy at birth is an estimate of the number of years a newborn baby would survive, were it to experience the current death rates throughout its life. It is only an estimate of actual life expectancy, as death rates will change over time with changes in social, economic and environmental factors, as well as improvements in health services.
- In NSW, life expectancies at birth in 2000 for both males (77.2 years) and females (82.6 years) were slightly higher than the Australian average. In the 10 years between 1991 and 2000, life expectancy increased for all socioeconomic groups. This increase was greater for males (2.7 years) than for females (2.0 years). The increase in life expectancy was about the same for males and females in both the highest and lowest SES groups (2.9 and 3.1 years respectively for males and 2.4 and 2.3 years respectively for females). The rest, or middle 60% of the population, showed the smallest increase in life expectancy (2.6 years for males and 2.9 years for females).
- The gap in life expectancy between the highest and lowest SES groups in NSW remained about the same over this period. Males from the highest SES group were expected to live to 76.9 years in 1991 and 79.8 years in 2000, while those from the lowest SES had a life expectancy 3.7 years less (73.3 years) in 1991 and 3.5 years less (76.3 years) in 2000. For females, the highest SES group were expected to live to 81.7 years in 1991 and 84.1 years in 2000, while those from the lowest SES had a life expectancy 1.8 years less (79.9 years) in 1991 and 1.9 years less (82.2 years) in 2000.
- The NSW Health and Equiy Statement will focus on those aspects of health inequality associated with social and economic disadvantage to address this life expectancy gap over time (NSW Department of Health, unpublished).

For more information:

NSW Department of Health. *NSW health and equity statement.* Sydney: NSW Department of Health, (unpublished).

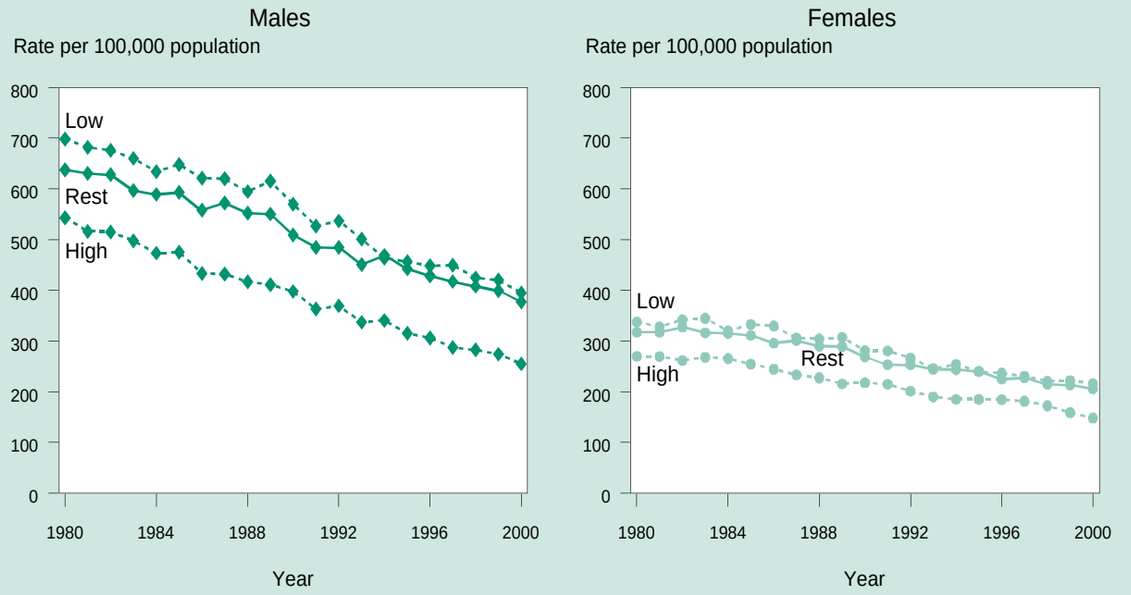
Life expectancy at birth by socioeconomic group and sex, NSW 1991–2000

	SES group	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Males	Lowest socioeconomic	73.2	73.1	73.9	74.4	74.8	74.8	75.0	75.6	75.7	76.3
Females	status quintile	79.9	80.1	81.0	80.5	81.2	81.2	81.2	81.9	81.6	82.2
Persons		76.4	76.5	77.3	77.4	77.9	77.9	78.0	78.7	78.5	79.2
Males	Rest of	74.1	74.0	75.0	74.3	75.0	75.3	75.7	75.9	76.2	76.7
Females	population	80.4	80.4	81.1	80.7	81.0	81.5	81.5	82.2	82.3	82.3
Persons		77.3	77.2	78.0	77.5	78.0	78.4	78.6	79.0	79.2	79.5
Males	Highest socioeconomic	76.9	76.8	77.5	77.2	78.1	78.3	78.7	79.2	79.2	79.8
Females	status quintile	81.7	82.0	82.6	82.4	82.7	82.6	83.0	83.3	83.9	84.1
Persons		79.4	79.6	80.2	79.9	80.5	80.6	81.0	81.4	81.7	82.1
Males	NSW	74.5	74.4	75.3	74.9	75.6	75.8	76.1	76.5	76.7	77.2
Females		80.6	80.7	81.4	81.0	81.4	81.7	81.7	82.4	82.5	82.6
Persons		77.5	77.5	78.3	77.9	78.5	78.7	78.9	79.4	79.6	79.9

Note: Life expectancy was calculated using the method of Chiang (see Methods section). Deaths data for 2000 include an estimate of the small numbers of deaths that were registered in 2001, data for which were not available at the time of production. Deaths data for 2000 include an estimate of the small numbers of deaths which were registered in 2001, data for which were not available at the time of production.

Source: ABS mortality data and ABS Socioeconomic Indicaes for Areas (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

All deaths for highest and lowest socioeconomic status quintiles and rest of population by sex, persons aged less than 75 years, NSW 1980 to 2000



Note: Premature deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Data are reported by year of death. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001, data for which were not available at the time of production. Rates were age-adjusted using the standard Australian population as a 30 June 1991. A Poisson regression model was fitted to assess differences in the slope of the trend lines.

Source: ABS mortality data, ABS population estimates and ABS Socioeconomic Indices for Areas (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- In NSW, between 1980 and 2000, death rates before the age of 75 years fell across all socioeconomic groups for both males and females. For males, death rates fell by 53% in the highest SES group (least disadvantaged 20%), by 44% in the lowest group (most disadvantaged 20%) and by 41% in the rest (middle 60%) of the population. For females, these declines were 45%, 36%, and 35% respectively.
- In absolute terms, the 'gap' between the highest and lowest SES groups in NSW narrowed in males, with the difference in death rates decreasing from 156 to 140 per 100,000. However, it increased slightly in females, from 67 to 68 per 100,000. In relative terms, however, the gap actually increased. The relative difference in rates between the lowest and highest SES groups increased from 30% to 52% for males and from 24% to 32% for females.
- The gap between the middle SES group and the highest SES group increased in both absolute and relative terms for both males and females between 1980 and 2000. This gap increased from 20% to 48% in males and 18% to 30% in females.
- Higher mortality and morbidity in lower SES groups is principally accounted for by higher rates of cardiovascular disease (particularly coronary heart disease), cancer (particularly lung cancer), and injuries (particularly from motor vehicle crashes, suicide, and occupational injuries) (Taylor, 2001).

For more information:

Taylor R. Mediation of the effects of social and economic status on health and mortality: the roles of behaviour and constitution. In *The social origins of health and well being.* Eckersley R, Dixon J, Douglas B Editors. Cambridge: Cambridge University Press, 2002.

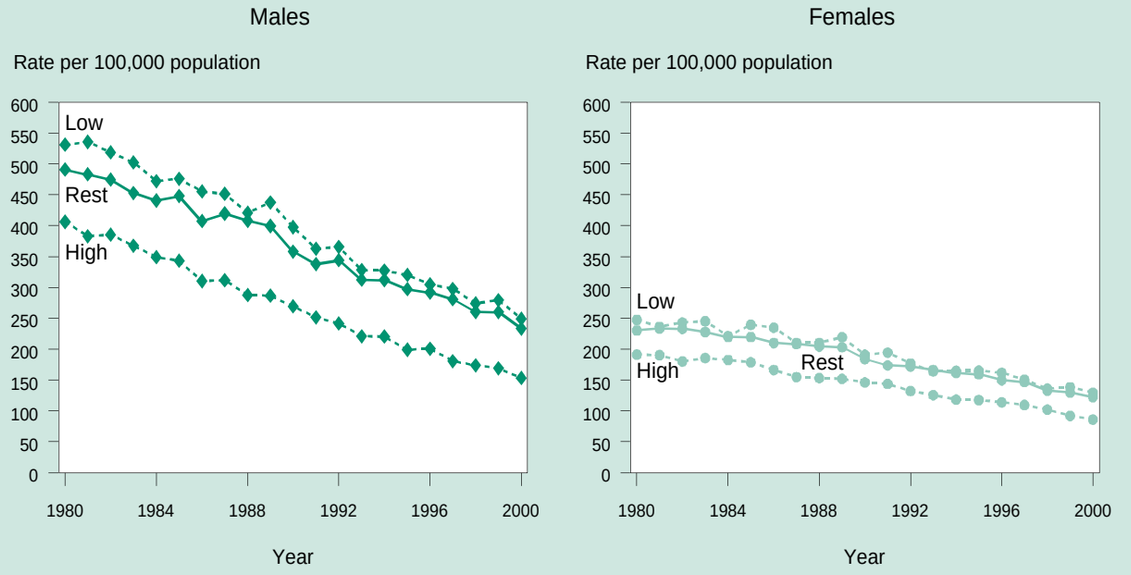
All deaths by socioeconomic group and sex, persons aged less than 75 years, NSW 1990 to 2000

		SES group	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Number	Males	Lowest	3147	2973	3090	2941	2866	2869	2864	2913	2788	2786	2655
	Females	socioeconomic	1600	1621	1576	1478	1646	1574	1564	1543	1489	1513	1478
	Persons	status quintile	4747	4594	4666	4419	4512	4443	4428	4456	4277	4299	4133
	Males	Rest of	8309	8074	8209	7757	8148	7786	7633	7539	7445	7387	7066
	Females	population	4755	4561	4627	4529	4525	4490	4262	4358	4161	4120	4037
	Persons		13064	12635	12836	12286	12673	12276	11895	11897	11606	11507	11102
	Males	Highest	2283	2101	2178	2009	2049	1926	1884	1780	1769	1733	1633
	Females	socioeconomic	1415	1412	1331	1271	1248	1256	1260	1227	1192	1095	1033
	Persons	status quintile	3698	3513	3509	3280	3297	3182	3144	3007	2961	2828	2667
	Males	NSW	13739	13148	13477	12708	13064	12587	12414	12274	12060	11950	11395
	Females		7770	7594	7534	7278	7419	7320	7090	7132	6850	6735	6557
	Persons		21509	20742	21011	19986	20483	19907	19504	19406	18910	18685	17952
Rate per	Males	Lowest	569.9	526.7	536.7	501.0	463.4	456.6	448.2	449.4	424.5	420.2	395.0
100,000	Females	socioeconomic	281.1	280.5	266.4	246.2	253.9	239.8	236.6	230.6	220.8	222.2	216.1
population	Persons	status quintile	424.1	402.8	400.6	372.9	357.6	346.8	341.1	338.8	321.5	320.5	305.0
	Males	Rest of	509.1	484.8	484.5	450.5	469.0	442.0	428.1	417.2	407.9	399.5	377.2
	Females	population	268.9	253.6	253.4	244.4	244.1	240.2	224.9	228.0	215.0	213.7	206.1
	Persons		384.7	365.0	365.0	343.8	353.3	338.2	323.8	320.2	309.5	304.6	290.1
	Males	Highest	397.6	362.7	369.5	337.0	340.4	315.3	306.0	287.1	282.2	273.9	255.0
	Females	socioeconomic	217.9	214.8	201.2	190.2	185.2	184.9	184.5	181.4	172.7	159.0	148.3
	Persons	status quintile	302.2	284.1	279.9	259.1	258.5	246.5	241.9	231.6	225.1	214.4	200.1
	Males	NSW	497.5	467.0	471.0	436.9	441.4	419.5	408.4	398.8	387.7	379.3	357.2
	Females		260.1	250.2	244.6	233.1	233.5	228.5	218.9	218.7	207.4	204.3	196.6
	Persons		374.5	354.8	353.9	331.6	334.4	321.1	310.9	306.4	295.6	289.9	275.5

Note: Premature deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Data are reported by year of death. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001. Rates were age-adjusted using the standard Australian population as a 30 June 1991. A Poisson regression model was fitted to assess differences in the slope of the trend lines.

Source: ABS mortality data, ABS population estimates and ABS SEIFA indices HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

Potentially avoidable deaths for highest and lowest socioeconomic status quintiles and rest of population by sex, persons aged less than 75 years, NSW 1980 to 2000



Note: Potentially avoidable deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Data are reported by year of death. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001, data for which were not available at the time of production. Rates were age-adjusted using the standard Australian population as a 30 June 1991. A Poisson regression model was fitted to assess differences in the slope of the trend lines.

Source: ABS mortality data, ABS population estimates and ABS Socioeconomic Indices for Areas (HOIST), avoidable mortality fractions from Tobias et al., 2001. Epidemiology and Surveillance Branch, NSW Department of Health.

- Classification of premature deaths as 'potentially avoidable' and 'unavoidable' gives an indication of the potential scope for improving health and closing health gaps. Deaths classified as 'avoidable' are those that could *potentially* be avoided through the activities of the health and related sectors. Here, we use a summary measure, developed in New Zealand, of avoidable mortality, which incorporates a range of causes of death before the age of 75 years, including selected cardiovascular diseases, cancers, communicable diseases, and injuries.
- In 1980 in NSW, deaths from potentially avoidable causes accounted for 75.0% of all premature deaths, falling to 61.1% in 2000. Over the 20 year period, rates of avoidable death fell by 51.8%. This fall was higher for males (54.3%) than for females (48.4%) and was greater in the highest SES group, compared to the lowest.
- In absolute terms, the gap in potentially avoidable mortality between the highest and lowest SES groups narrowed, with rate differences of 124.7 and 56.3 per 100,000 in males and females in 1980, falling to 96.1 and 43.5 per 100,000 in 2000.
- However the relative difference in rates between the lowest and highest SES groups increased from 34% to 63% in males, and from 27% to 40% in females.
- The diseases contributing most to the burden of potentially avoidable mortality were ischaemic heart disease, stroke, and lung cancer in 1980, and ischaemic heart disease, lung cancer and colorectal cancer in 2000.

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

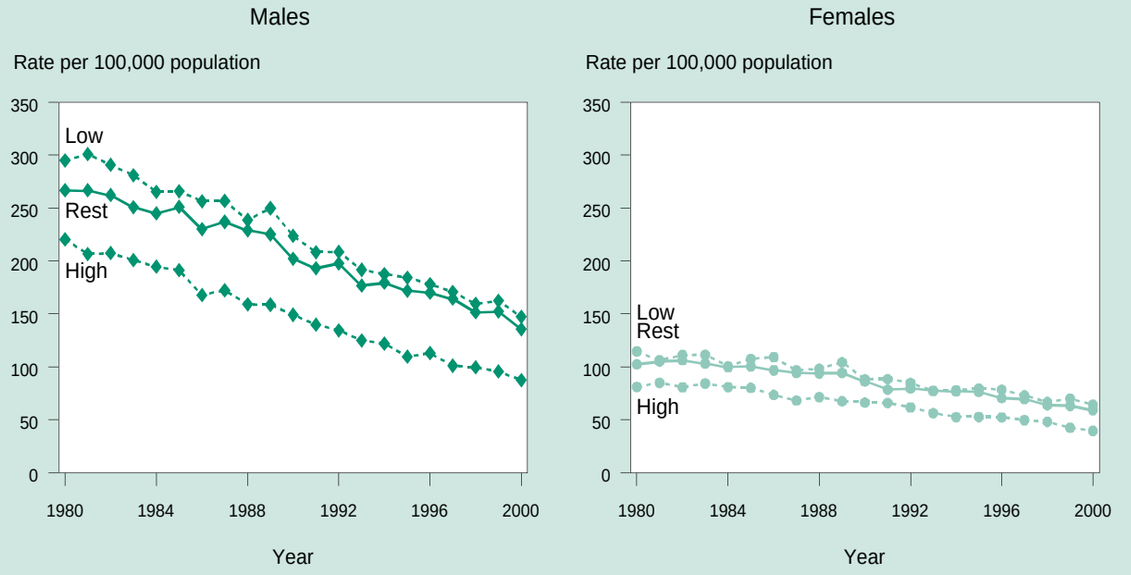
Potentially avoidable deaths by socioeconomic group and sex, persons aged less than 75 years, NSW 1990 to 2000

		SES group	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Number	Males	Lowest	2201	2051	2107	1929	2026	2011	1949	1935	1801	1855	1679
	Females	socioeconomic	1090	1126	1049	986	1073	1082	1077	1011	922	946	889
	Persons	status quintile	3291	3177	3156	2915	3099	3093	3026	2946	2723	2801	2567
	Males	Rest of	5844	5627	5835	5379	5419	5229	5203	5074	4753	4817	4372
	Females	population	3257	3129	3151	3089	2996	2984	2838	2812	2585	2516	2412
	Persons		9101	8756	8986	8468	8415	8213	8041	7886	7338	7333	6784
	Males	Highest	1539	1453	1418	1317	1321	1215	1231	1117	1088	1072	983
	Females	socioeconomic	953	942	873	840	801	801	779	743	711	638	604
	Persons	status quintile	2492	2395	2291	2157	2122	2016	2010	1860	1799	1710	1586
	Males	NSW	9584	9131	9360	8625	8766	8455	8383	8126	7642	7744	7033
	Females		5300	5197	5073	4915	4870	4867	4694	4566	4218	4100	3905
	Persons		14884	14328	14433	13540	13636	13322	13077	12692	11860	11844	10938
Rate per	Males	Lowest	397.6	362.7	365.6	328.1	327.3	320.0	304.9	297.8	274.1	279.5	249.2
100,000	Females	socioeconomic	191.1	194.6	176.9	164.1	164.9	165.0	162.0	150.8	136.3	138.6	129.7
population	Persons	status quintile	293.3	278.1	270.3	245.2	245.3	241.5	232.7	223.3	204.5	208.6	189.1
	Males	Rest of	358.0	337.6	344.3	312.3	312.1	296.9	292.0	280.8	260.5	260.3	233.4
	Females	population	184.1	173.8	172.3	166.6	161.7	159.5	150.1	147.2	133.0	130.1	122.8
	Persons		267.7	252.7	255.3	236.8	234.5	226.1	219.2	212.2	195.5	193.8	177.2
	Males	Highest	269.3	251.6	241.6	221.0	220.4	199.1	200.6	180.6	173.7	169.2	153.1
	Females	socioeconomic	146.4	143.8	132.3	125.6	118.7	117.9	114.0	109.6	102.3	92.2	86.2
	Persons	status quintile	203.9	194.0	183.1	170.4	166.7	156.2	154.7	143.4	136.4	129.4	118.7
	Males	NSW	347.0	324.2	327.1	296.4	296.3	281.7	275.9	264.0	245.6	245.5	220.3
	Females		177.3	171.2	164.5	157.3	153.3	151.9	145.1	139.9	127.1	124.0	116.6
	Persons		259.0	244.9	243.0	224.4	222.5	214.7	208.6	200.2	185.1	183.5	167.6

Note: Potentially avoidable deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Data are reported by year of death. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001. Rates were age-adjusted using the standard Australian population as a 30 June 1991. A Poisson regression model was fitted to assess differences in the slope of the trend lines. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: ABS mortality data and ABS Socioeconomic Indices for Areas (HOIST), avoidable mortality fractions from Tobias et al., 2001. Epidemiology and Surveillance Branch, NSW Department of Health.

Primary potentially avoidable deaths for highest and lowest socioeconomic status quintiles and rest of population by sex, persons aged less than 75 years, NSW 1980 to 2000



Note: Potentially avoidable deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Data are reported by year of death. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001, data for which were not available at the time of production. Rates were age-adjusted using the standard Australian population as a 30 June 1991. A Poisson regression model was fitted to assess differences in the slope of the trend lines.

Source: ABS mortality data, ABS population estimates and ABS Socioeconomic Indices for Areas (HOIST), avoidable mortality fractions from Tobias et al., 2001. Epidemiology and Surveillance Branch, NSW Department of Health.

- Potentially avoidable deaths are those that are considered preventable through the activities of the health and related sectors. Potentially avoidable mortality may be sub-categorised into 3 levels of intervention: primary, secondary, and tertiary (Tobias et al., 2001). Primary level interventions are those that can prevent a condition from developing, such as those that encourage individual behaviour change through the promotion of healthy lifestyles and legislation to protect the public from health hazards.
- The majority of potentially avoidable deaths are preventable through primary level interventions. In 1980, 51% of potentially avoidable deaths were from primary preventable causes, increasing to 55% in 2000. This indicates that, overall, there was a relatively gr eater reduction in causes associated with secondary (early intervention) and tertiary (medical treatment) interventions over the period. Rates of primary potentially avoidable death fell by 51% in males and 44% in females, which may reflect the greater reduction in smoking rates in males compared with females, over this period.
- In absolute terms, the gap in primary potentially avoidable mortality between the highest and lowest SES groups narrowed, with rate differences of 74.7 and 33.4 per 100,000 in males and females in 1980, falling to 59.8 and 24.7 per 100,000 respectively in 2000.
- However, the relative difference in rates between the lowest and highest SES groups, increased from 38% to 68% in males and from 32% to 53% in females.
- The diseases contributing most to the burden of primary potentially avoidable mortality in both 1980 and 2000 were ischaemic heart disease and lung cancer.
- These results imply greater lifestyle changes, such as smoking cessation, in people from higher SES groups.

For more information:

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

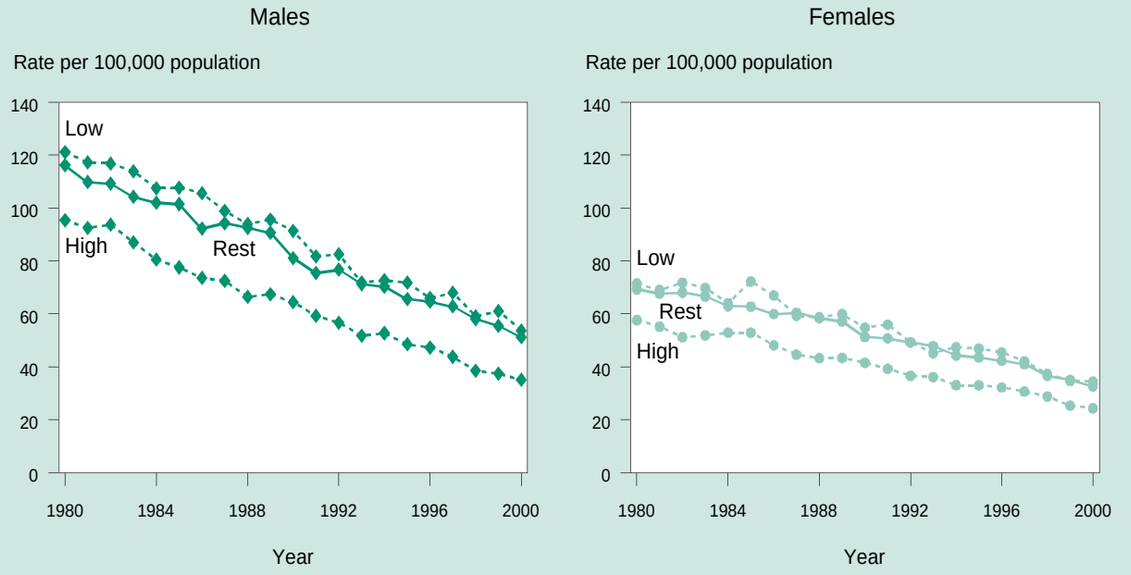
Primary potentially avoidable deaths by socioeconomic group and sex, persons aged less than 75 years, NSW 1990 to 2000

		SES group	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Number	Males	Lowest	1239	1178	1203	1127	1160	1159	1137	1108	1047	1081	991
	Females	socioeconomic	506	514	504	466	509	521	523	490	453	477	440
	Persons	status quintile	1744	1692	1706	1593	1668	1680	1660	1598	1500	1558	1431
	Males	Rest of	3303	3217	3348	3043	3113	3027	3029	2967	2763	2820	2540
	Females	population	1529	1419	1459	1445	1427	1432	1332	1332	1242	1225	1165
	Persons		4833	4637	4807	4488	4540	4459	4360	4299	4005	4045	3705
	Males	Highest	855	808	790	746	731	670	696	625	625	606	562
	Females	socioeconomic	434	433	407	377	356	360	361	339	334	294	275
	Persons	status quintile	1289	1241	1197	1123	1087	1030	1057	964	958	900	837
	Males	NSW	5397	5204	5341	4916	5004	4856	4862	4700	4435	4507	4093
	Females		2469	2366	2369	2288	2292	2313	2216	2161	2029	1996	1880
	Persons		7866	7569	7710	7204	7296	7169	7077	6861	6463	6503	5973
Rate per	Males	Lowest	223.5	208.4	208.6	191.6	187.5	184.3	178.0	170.7	159.5	162.4	147.2
100,000	Females	socioeconomic	88.3	88.5	84.9	77.2	78.0	79.5	78.6	73.0	66.8	69.9	64.2
population	Persons	status quintile	155.4	148.0	146.1	134.0	132.1	131.2	127.8	121.3	112.7	115.8	105.5
	Males	Rest of	202.2	193.1	197.6	176.8	179.4	172.0	170.0	164.3	151.5	152.4	135.6
	Females	population	86.2	78.6	79.6	77.6	76.8	76.4	70.5	69.7	63.8	63.2	59.3
	Persons		142.1	133.8	136.6	125.6	126.6	122.8	119.0	115.8	106.8	106.9	96.8
	Males	Highest	149.1	139.8	134.5	125.0	121.9	109.5	112.9	101.0	99.6	95.6	87.4
	Females	socioeconomic	66.4	66.0	61.7	56.3	52.7	52.8	52.4	49.8	48.1	42.5	39.5
	Persons	status quintile	105.4	100.4	95.7	88.7	85.4	79.7	81.0	74.2	72.7	68.1	62.7
	Males	NSW	195.2	184.7	186.6	168.9	169.2	161.8	160.0	152.7	142.6	142.8	128.2
	Females		82.4	77.7	76.8	73.0	71.9	72.1	68.5	66.1	61.0	60.3	56.1
	Persons		136.8	129.3	129.8	119.4	119.1	115.6	113.0	108.3	100.9	100.7	91.6

Note: Potentially avoidable deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Data are reported by year of death. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001. Rates were age-adjusted using the standard Australian population as a 30 June 1991. A Poisson regression model was fitted to assess differences in the slope of the trend lines.

Source: ABS mortality data, ABS population estimates and ABS SEIFA indices (HOIST), avoidable mortality fractions from Tobias et al., 2001. Epidemiology and Surveillance Branch, NSW Department of Health.

Secondary potentially avoidable deaths for highest and lowest socioeconomic status quintiles and rest of population by sex, persons aged less than 75 years, NSW 1980 to 2000



Note: Potentially avoidable deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Data are reported by year of death. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001, data for which were not available at the time of production. Rates were age-adjusted using the standard Australian population as a 30 June 1991. A Poisson regression model was fitted to assess differences in the slope of the trend lines.

Source: ABS mortality data, ABS population estimates and ABS Socioeconomic Indices for Areas (HOIST), avoidable mortality fractions from Tobias et al., 2001. Epidemiology and Surveillance Branch, NSW Department of Health.

- Potentially avoidable deaths are those conditions that are considered to be potentially preventable through the activities of the health and related sectors. Potentially avoidable mortality may be sub-categorised into 3 levels of intervention: primary, secondary, and tertiary (Tobias et al., 2001). Secondary level interventions are those that can prevent the worsening of a condition through early actions, such as the screening for and treatment of diseases in early stages.
- In 1980, around 25% of potentially avoidable deaths were preventable through secondary level interventions, falling to 24% in 2000. Rates of secondary avoidable death fell by 57% in males and 54% in females, which may reflect earlier detection and effective treatment of risk factors for cardiovascular disease, such as hypertension, over this period.
- In absolute terms, the gap in secondary potentially avoidable mortality between the highest and lowest SES groups narrowed between 1980 and 2000, with rate differences of 25.7 and 13.9 per 100,000 in males and females in 1980, falling to 18.5 and 10.1 per 100,000 respectively in 2000. However, the gap, measured by the relative difference in rates between the lowest and highest SES groups, increased from 28% to 54% in males and from 26% to 34% in females.
- The diseases contributing most in both 1980 and 2000 to the burden of secondary potentially avoidable mortality were ischaemic heart disease, stroke, and colorectal cancers.
- These results imply earlier detection and effective early treatment of conditions such as hypertension or colorectal cancer, in people from higher SES groups.

For more information:

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

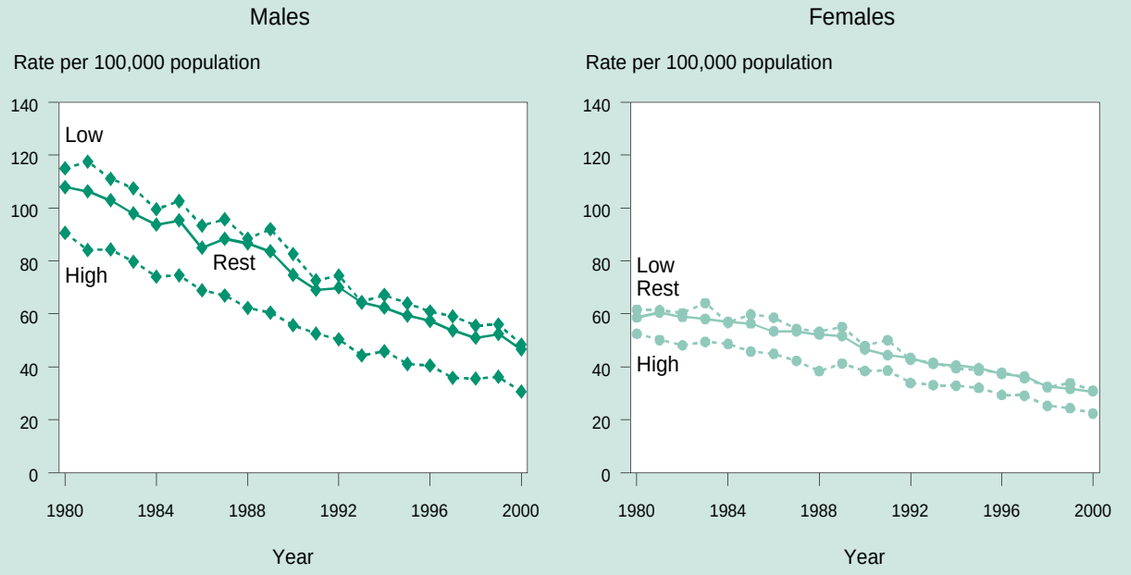
Secondary potentially avoidable deaths by socioeconomic group and sex, persons aged less than 75 years, NSW 1990 to 2000

		SES group	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Number	Males	Lowest	506	463	476	424	453	453	426	446	393	408	365
	Females	socioeconomic	314	325	294	273	310	312	305	283	255	241	238
	Persons	status quintile	820	788	770	697	763	765	730	728	647	649	603
	Males	Rest of	1318	1255	1298	1228	1222	1158	1153	1138	1062	1031	961
	Females	population	910	916	906	889	825	820	806	788	715	682	646
	Persons		2227	2171	2204	2117	2048	1978	1959	1926	1776	1713	1607
	Males	Highest	366	342	332	308	317	296	288	271	242	238	224
	Females	socioeconomic	272	260	245	245	226	226	220	208	202	176	173
	Persons	status quintile	639	602	578	553	542	522	508	480	445	415	397
	Males	NSW	2190	2060	2106	1961	1992	1906	1867	1855	1696	1677	1550
	Females		1496	1501	1445	1407	1361	1358	1330	1279	1172	1099	1057
	Persons		3686	3561	3551	3368	3353	3264	3197	3134	2868	2776	2607
Rate per	Males	Lowest	91.4	81.8	82.5	71.9	72.6	71.8	66.0	68.0	59.1	61.1	53.6
100,000	Females	socioeconomic	54.8	55.9	49.3	45.2	47.4	46.9	45.5	42.1	37.3	34.8	34.4
population	Persons	status quintile	72.8	68.8	65.7	58.3	59.9	59.2	55.6	54.8	48.0	47.8	43.9
	Males	Rest of	81.1	75.4	76.7	71.3	70.3	65.6	64.6	62.8	58.0	55.5	51.2
	Females	population	51.3	50.8	49.3	47.9	44.3	43.6	42.3	41.0	36.6	35.1	32.7
	Persons		65.5	62.6	62.5	59.0	56.8	54.2	53.1	51.6	47.1	45.0	41.7
	Males	Highest	64.4	59.2	56.7	51.7	52.7	48.5	47.3	43.8	38.6	37.4	35.1
	Females	socioeconomic	41.6	39.3	36.7	36.2	33.1	33.1	32.2	30.7	28.8	25.4	24.3
	Persons	status quintile	52.0	48.5	45.9	43.4	42.3	40.3	39.1	36.9	33.5	31.2	29.6
	Males	NSW	79.6	73.2	73.7	67.3	67.2	63.4	61.3	60.1	54.3	52.9	48.4
	Females		49.9	49.2	46.6	44.8	42.5	42.1	40.9	39.0	35.1	33.0	31.3
	Persons		64.0	60.7	59.6	55.6	54.4	52.3	50.7	49.2	44.5	42.7	39.7

Note: Potentially avoidable deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Data are reported by year of death. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001. Rates were age-adjusted using the standard Australian population as a 30 June 1991. A Poisson regression model was fitted to assess differences in the slope of the trend lines.

Source: ABS mortality data and ABS Socioeconomic Indices for Areas (HOIST), avoidable mortality fractions from Tobias et al., 2001. Epidemiology and Surveillance Branch, NSW Department of Health.

Tertiary potentially avoidable deaths for highest and lowest socioeconomic status quintiles and rest of population by sex, persons aged less than 75 years, NSW 1980 to 2000



Note: Potentially avoidable deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Data are reported by year of death. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001, data for which were not available at the time of production. Rates were age-adjusted using the standard Australian population as a 30 June 1991. A Poisson regression model was fitted to assess differences in the slope of the trend lines.

Source: ABS mortality data, ABS population estimates and ABS Socioeconomic Indices for Areas (HOIST), avoidable mortality fractions from Tobias et al., 2001. Epidemiology and Surveillance Branch, NSW Department of Health.

- Potentially avoidable deaths are those conditions that are considered to be potentially preventable through the activities of the health and related sectors. Potentially avoidable mortality may be sub-categorised into 3 levels of intervention: primary, secondary and tertiary (Tobias et al., 2001). Tertiary level interventions are those that can cure diseases or extend life through medical treatment.
- In 1980, 23% of potentially avoidable deaths were preventable through tertiary level interventions, falling to 22% in 2000. Rates of tertiary potentially avoidable death fell by 59% in males and 50% in females, which may reflect the availability of more effective medical treatments for diseases that are more common in men, such as revascularisation procedures for acute myocardial infarcts.
- In absolute terms, the gap in tertiary potentially avoidable mortality between the highest and lowest SES groups narrowed between 1980 and 2000, with rate differences of 24.5 and 9.2 per 100,000 in males and females in 1980, falling to 17.8 and 8.2 per 100,000 respectively in 2000. However, the gap, measured by the relative difference in rates between the lowest and highest SES groups, increased from 31% to 58% in males and from 21% to 34% in females
- The disease contributing the most to the burden of tertiary potentially avoidable mortality in both 1980 and 2000 was ischaemic heart disease.
- These results imply a greater effect of medical interventions in reducing death rates in people from higher SES groups.

For more information:

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

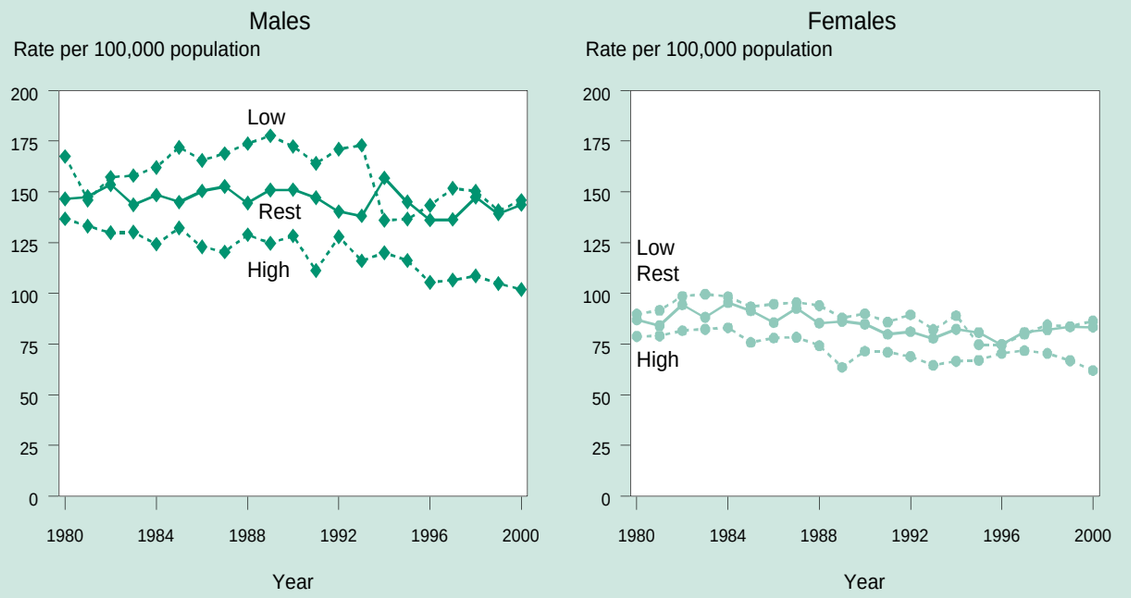
Tertiary potentially avoidable deaths by socioeconomic group and sex, persons aged less than 75 years, NSW 1990 to 2000

		SES group	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Number	Males	Lowest	456	409	428	378	414	399	386	381	361	367	323
	Females	socioeconomic	270	288	251	247	254	249	249	238	215	228	210
	Persons	status quintile	727	697	680	624	668	648	636	620	576	595	534
	Males	Rest of	1223	1155	1189	1107	1083	1044	1021	969	928	966	871
	Females	population	818	794	786	755	744	732	700	692	628	609	601
	Persons		2041	1949	1975	1863	1827	1777	1722	1661	1557	1575	1472
	Males	Highest	318	303	295	263	273	249	247	221	221	228	196
	Females	socioeconomic	247	249	221	218	220	215	198	196	175	168	156
	Persons	status quintile	565	552	517	481	493	464	445	416	396	395	352
	Males	NSW	1997	1868	1913	1748	1770	1692	1655	1571	1511	1560	1390
	Females		1335	1330	1259	1220	1218	1196	1148	1126	1018	1005	968
	Persons		3332	3198	3172	2968	2988	2889	2803	2697	2529	2565	2358
Rate per	Males	Lowest	82.6	72.6	74.5	64.5	67.1	64.0	60.9	59.1	55.6	56.0	48.4
100,000	Females	socioeconomic	47.9	50.2	42.8	41.6	39.5	38.6	37.9	35.7	32.3	33.9	31.1
population	Persons	status quintile	65.1	61.4	58.5	52.9	53.2	51.2	49.3	47.3	43.8	44.9	39.7
	Males	Rest of	74.7	69.1	70.0	64.2	62.4	59.3	57.4	53.7	51.0	52.4	46.6
	Females	population	46.6	44.4	43.3	41.1	40.6	39.5	37.3	36.5	32.6	31.8	30.8
	Persons		60.1	56.4	56.3	52.2	51.1	49.1	47.1	44.8	41.6	41.9	38.6
	Males	Highest	55.7	52.6	50.4	44.3	45.9	41.1	40.4	35.9	35.5	36.2	30.6
	Females	socioeconomic	38.4	38.6	34.0	33.1	32.9	32.0	29.4	29.1	25.3	24.4	22.4
	Persons	status quintile	46.5	45.1	41.6	38.3	39.0	36.2	34.5	32.2	30.1	30.1	26.4
	Males	NSW	72.3	66.3	66.8	60.2	59.9	56.5	54.6	51.2	48.7	49.8	43.7
	Females		45.1	44.2	41.2	39.5	38.8	37.7	35.8	34.8	30.9	30.6	29.1
	Persons		58.2	54.9	53.6	49.4	49.0	46.8	44.9	42.7	39.6	40.0	36.3

Note: Potentially avoidable deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Data are reported by year of death. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001. Rates were age-adjusted using the standard Australian population as a 30 June 1991. A Poisson regression model was fitted to assess differences in the slope of the trend lines.

Source: ABS mortality data and ABS Socioeconomic Indices for Areas (HOIST), avoidable mortality fractions from Tobias et al., 2001. Epidemiology and Surveillance Branch, NSW Department of Health.

Unavoidable deaths for highest and lowest socioeconomic status quintiles and rest of population by sex, persons aged less than 75 years, NSW 1980 to 2000



Note: Unavoidable deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Data are reported by year of death. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001, data for which were not available at the time of production. Rates were age-adjusted using the standard Australian population as a 30 June 1991. A Poisson regression model was fitted to assess differences in the slope of the trend lines.

Source: ABS mortality data, ABS population estimates and ABS Socioeconomic Indices for Areas (HOIST), avoidable mortality fractions from Tobias et al., 2001. Epidemiology and Surveillance Branch, NSW Department of Health.

- Avoidable deaths are those conditions that are considered to be potentially preventable through the activities of the health and related sectors. All other causes of mortality before the age of 75 years may be considered to be 'unavoidable' (Tobias et al., 2001).
- In 1980, deaths from unavoidable causes accounted for 25% of all premature deaths (before the age of 75 years), increasing to 39% of all premature deaths in 2000. This indicates that avoidable deaths declined more rapidly than unavoidable deaths. Over the 20-year period, rates of unavoidable death fell by only 7%, compared with 41% for all premature deaths. The fall in unavoidable death rates was slightly higher for males (9%) than for females (7%). The fall was greater in the highest SES group (26% in males and 21% in females), compared to the lowest SEES group (13% in males and 4% in females). This suggests that there still may be further scope to intervene to reduce death rates in causes currently considered to be 'unavoidable'.
- In absolute terms, the gap in unavoidable mortality between the highest and lowest SES groups increased, with rate differences of 30.7 and 11.1 per 100,000 in males and females in 1980, increasing to 43.9 and 24.4 per 100,000 respectively in 2000.
- However, the gap, measured by the relative difference in rates between the lowest and highest SES groups, increased from 19% to 34% in males and from 16% to 20% in females.

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

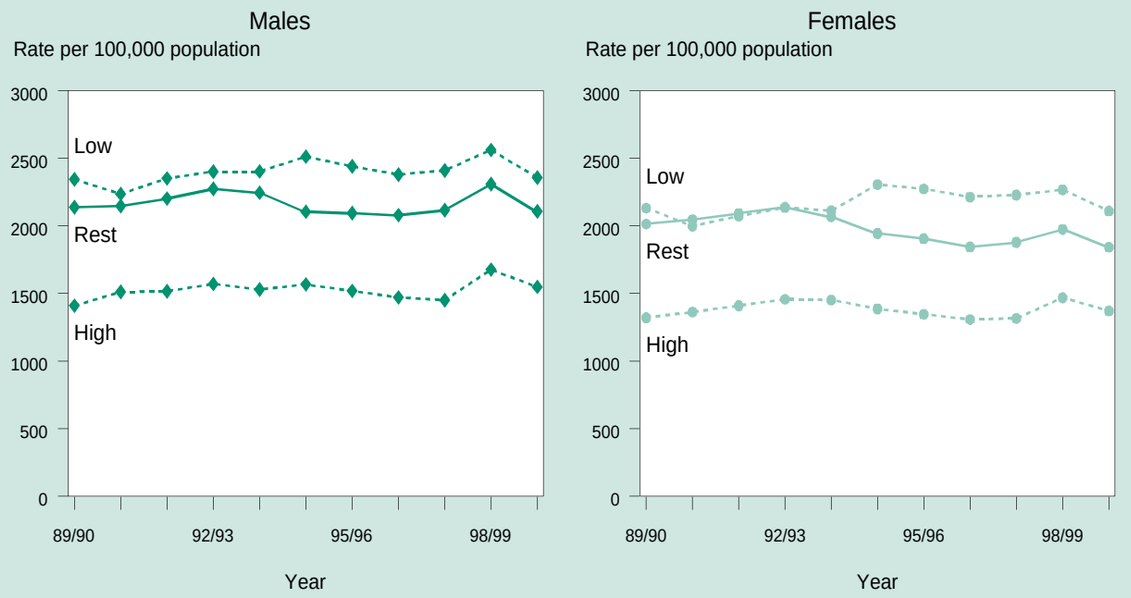
Unavoidable deaths by socioeconomic group and sex, persons aged less than 75 years, NSW 1990 to 2000

		SES group	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Number	Males	Lowest	946	922	983	1012	840	858	915	978	987	931	976
	Females	socioeconomic	510	495	527	492	573	492	487	532	567	567	590
	Persons	status quintile	1456	1417	1510	1504	1413	1350	1402	1510	1554	1498	1566
	Males	Rest of	2465	2447	2374	2378	2729	2557	2430	2465	2692	2570	2694
	Females	population	1498	1432	1476	1440	1529	1506	1424	1546	1576	1604	1624
	Persons		3963	3879	3850	3818	4258	4063	3854	4011	4268	4174	4318
	Males	Highest	744	648	760	692	728	711	653	663	681	661	651
	Females	socioeconomic	462	470	458	431	447	455	481	484	481	457	430
	Persons	status quintile	1206	1118	1218	1123	1175	1166	1134	1147	1162	1118	1080
	Males	NSW	4155	4017	4117	4082	4297	4126	3998	4106	4360	4162	4321
	Females		2470	2397	2461	2363	2549	2453	2392	2562	2624	2628	2643
	Persons		6625	6414	6578	6445	6846	6579	6390	6668	6984	6790	6965
Rate per	Males	Lowest	172.4	164.0	171.1	173.0	136.0	136.6	143.3	151.7	150.4	140.7	145.8
100,000	Females	socioeconomic	90.0	85.8	89.4	82.2	89.0	74.8	74.7	79.8	84.5	83.6	86.4
population	Persons	status quintile	130.9	124.7	130.3	127.7	112.3	105.3	108.4	115.4	117.0	111.9	115.9
	Males	Rest of	151.1	147.1	140.3	138.2	156.9	145.1	136.1	136.4	147.5	139.3	143.7
	Females	population	84.8	79.8	81.1	77.8	82.3	80.7	74.7	80.8	82.0	83.6	83.4
	Persons		116.9	112.3	109.6	107.0	118.8	112.2	104.6	108.0	114.0	110.8	112.9
	Males	Highest	128.3	111.1	127.9	116.0	119.9	116.2	105.4	106.5	108.5	104.8	101.9
	Females	socioeconomic	71.5	71.0	68.8	64.6	66.6	67.0	70.5	71.8	70.4	66.8	62.0
	Persons	status quintile	98.3	90.1	96.8	88.7	91.8	90.3	87.2	88.2	88.8	85.0	81.4
	Males	NSW	150.5	142.8	143.8	140.4	145.0	137.5	131.4	133.4	140.2	132.4	135.6
	Females		82.8	79.1	80.1	75.8	80.3	76.6	73.6	78.7	80.1	80.1	79.7
	Persons		115.6	109.9	111.0	107.1	111.9	106.2	101.7	105.3	109.4	105.6	107.1

Note: Unavoidable deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Data are reported by year of death. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001. Rates were age-adjusted using the standard Australian population as a 30 June 1991. A Poisson regression model was fitted to assess differences in the slope of the trend lines. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: ABS mortality data and ABS Socioeconomic Indices for Areas (HOIST), avoidable mortality fractions from Tobias et al., 2001. Epidemiology and Surveillance Branch, NSW Department of Health.

ACS hospitalisations for highest and lowest socioeconomic status quintiles and rest of population by sex, persons aged less than 75 years, NSW 1989/90 to 1999/00



Note: Ambulatory care sensitive hospitalisations were classified by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the standard Australian population as a 30 June 1991. A Poisson regression model was fitted to assess differences in the slope of the trend lines.

Source: NSW Department of Health Inpatient Statistics Collection (ISC), ABS population estimates and ABS Socioeconomic Indices for Areas (HOIST), avoidable hospitalisation fractions from Victorian Government Department of Human Services, 2001. Epidemiology and Surveillance Branch, NSW Department of Health.

- Ambulatory care sensitive hospitalisations are those that are potentially avoidable through prevention 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 these conditions are used as an indicator of access to, and quality of, primary care. Variations in hospitalisation rates for these conditions can also be affected by changes in disease prevalence, changes to hospital admission practices, and personal choices. More details of this analysis can be found in the Methods section.
- In 1999–00, hospitalisations for ambulatory care sensitive conditions accounted for 6.2% of all admissions, a drop from 8.4% of all hospitalisations in 1989–90 and slightly less than the 7% found in a similar study in Victoria (Victorian Government Department of Human Services, 2001). The 5 most common conditions identified were angina; asthma; chronic obstructive pulmonary disease; convulsions and epilepsy; and ear, nose, and throat infections.
- Between 1989–90 and 1999–00, hospitalisation rates for ambulatory care sensitive conditions remained fairly stable, decreasing by only 1.8% overall. While rates were consistently lower for the highest SES group compared to the lowest and middle SES groups, they actually increased by 7% in the highest group, remained the same for the lowest SES group, and decreased by 5% in the middle group.
- In absolute terms, the gap in potentially avoidable hospitalisations between the highest and lowest SES groups narrowed, with an overall rate difference of 874.5 in 1989–90, falling to 775.4 in 1999–00. The gap, measured by the relative difference in rates between the lowest and the highest SES groups increased only slightly, from 58% to 59% in males and from 52% to 64% in females.

For more information:

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

Jackson G, Tobias M. Potentially avoidable hospitalisations in New Zealand, 1989–98. *Aust N Z J Public Health* 2001; 25(3): 212–219.

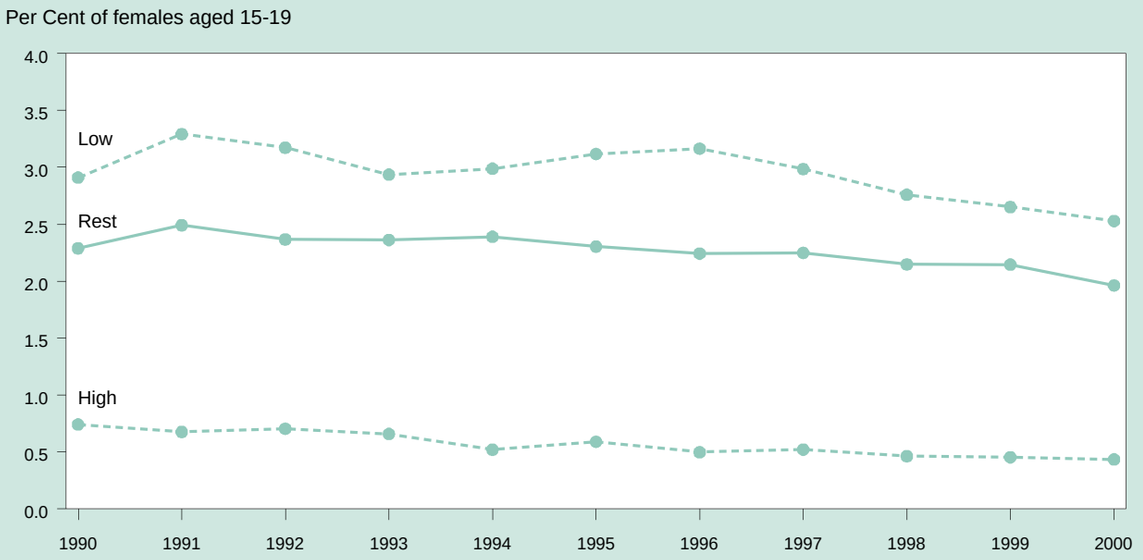
Ambulatory care sensitive hospitalisations by socioeconomic group and sex, persons aged less than 75 years, NSW 1989–90 to 1999–00

		SES group	89–90	90–91	91–92	92–93	93–94	94–95	95–96	96–97	97–98	98–99	99–00
Number	Males	Lowest	13447	12798	13672	14212	13429	15314	15005	14874	15231	16371	15109
	Females	socioeconomic	11843	11047	11642	12195	11404	13533	13491	13290	13531	13915	12999
	Persons	status quintile	25290	23846	25315	26407	24833	28847	28496	28164	28762	30286	28108
	Males	Rest of	35122	35882	37261	38840	39563	36847	36938	36951	37938	41753	38485
	Females	population	33098	34112	35298	36394	36249	33826	33503	32748	33585	35598	33477
	Persons		68220	69994	72559	75234	75812	70673	70441	69699	71525	77351	71962
	Males	Highest	8009	8637	8724	9123	8985	9105	8924	8648	8653	10127	9486
	Females	socioeconomic	7802	8068	8413	8741	8780	8378	8219	7933	8064	9084	8593
	Persons	status quintile	15811	16704	17137	17865	17765	17483	17143	16581	16717	19211	18079
	Males	NSW	56578	57317	59657	62176	61977	61266	60867	60473	61822	68251	63080
	Females		52743	53227	55353	57330	56433	55737	55213	53971	55180	58597	55069
	Persons		109321	110544	115011	119506	118410	117003	116080	114444	117004	126848	118149
Rate per	Males	Lowest	2341.0	2234.9	2349.4	2400.1	2400.8	2510.5	2438.0	2378.5	2408.5	2559.7	2355.2
100,000	Females	socioeconomic	2130.7	1997.2	2071.2	2135.1	2110.5	2304.6	2272.8	2212.2	2228.1	2265.8	2108.6
population	Persons	status quintile	2233.3	2114.6	2209.8	2267.1	2256.2	2405.9	2354.4	2293.9	2317.4	2412.5	2231.9
	Males	Rest of	2135.3	2144.9	2200.6	2272.9	2243.6	2103.4	2092.5	2077.7	2115.6	2307.2	2105.7
	Females	population	2012.6	2044.9	2091.5	2136.3	2066.2	1942.5	1904.4	1843.5	1878.0	1974.0	1841.2
	Persons		2068.0	2089.4	2140.7	2199.6	2149.9	2019.6	1995.0	1957.7	1993.3	2137.6	1970.3
	Males	Highest	1407.7	1509.9	1515.8	1569.0	1528.4	1565.3	1517.7	1469.3	1449.6	1674.9	1547.0
	Females	socioeconomic	1320.4	1361.6	1409.1	1456.4	1451.1	1385.7	1344.6	1307.1	1314.3	1467.9	1370.1
	Persons	status quintile	1358.8	1429.4	1457.6	1507.6	1485.7	1470.8	1427.3	1385.1	1378.7	1567.4	1456.5
	Males	NSW	2028.1	2033.4	2090.0	2155.0	2126.9	2078.2	2046.8	2016.5	2041.8	2229.8	2042.0
	Females		1889.6	1890.5	1943.5	1993.3	1945.4	1899.6	1861.9	1804.4	1830.3	1926.4	1796.3
	Persons		1953.4	1957.0	2012.3	2069.8	2032.1	1985.5	1951.2	1907.6	1933.0	2075.4	1916.8

Note: Avoidable hospitalisations were classified by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the standard Australian population as a 30 June 1991. A Poisson regression model was fitted to assess differences in the slope of the trend lines.

Source: NSW Department of Health Inpatient Statistics Collection (ISC), ABS population estimates and ABS Socioeconomic Indices for Areas (HOIST), avoidable hospitalisation fractions from Victorian Government Department of Human Services, 2001). Epidemiology and Surveillance Branch, NSW Department of Health.

Teenage mothers for highest and lowest socioeconomic status quintiles and rest of population, NSW 1990 to 2000



Note: The percentage of teenage mothers is the number of live births 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 population estimates and ABS Socioeconomic Indices for Areas (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- The health risks of pregnancy and childbirth are higher for teenage mothers (aged less than 20 years), than for mothers in their 20s. For the teenage mother, there is a higher risk of 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 2000, the percentage of teenage mothers decreased in NSW from 2.1% to 1.8% of women aged 15–19 years. This decline was seen across all SES groups, with rates declining from 0.7% to 0.4% in the highest SES group, from 2.9% to 2.5% in the lowest SES group, and from 2.3% to 2.0% in the rest (middle 60%) of the population. The absolute gap between the highest and lowest SES groups remained about the same, decreasing from 2.2% to 2.1% over the period.
- The gap, as measured by the relative difference in rates between the lowest and highest SES groups, increased from over 4 times in 1990, to almost 6 times higher in 2000.
- The results show that, 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. A range of factors may be influencing the increase in this gap, including access to health education, family planning and counselling services, as well as cultural differences between the highest SES and other groups. The NSW Health and Equity Statement has identified investing in the early years of life as 1 of its 6 key areas for action (NSW Department of Health, unpublished).

For more information:

Public Health Division. New South Wales Mothers and Babies 2000. *N S W Public Health Bull* 2001; 12 (S-3). Also available at www.health.nsw.gov.au/public-health/mdc/mdcrep00.htm.

NSW Department of Health. *New South Wales Health and Equity Statement.* Sydney: NSW Department of Health, (unpublished).

Teenage mothers by socioeconomic group, NSW 1990 to 2000

	Lowest and highest quintiles and balance	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Number	Lowest socioeconomic status quintile	1321	1475	1353	1210	1231	1259	1293	1246	1117	1089	1049
	Rest of population	3113	3269	3039	2976	2907	2801	2758	2797	2754	2788	2590
	Highest socioeconomic status quintile	343	303	304	275	224	250	211	222	198	195	188
	NSW	4777	5047	4696	4461	4362	4310	4262	4265	4069	4072	3827
Per cent of Females aged 15–19	Lowest socioeconomic status quintile	2.9	3.3	3.2	2.9	3.0	3.1	3.2	3.0	2.8	2.7	2.5
	Rest of population	2.3	2.5	2.4	2.4	2.4	2.3	2.2	2.2	2.1	2.1	2.0
	Highest socioeconomic status quintile	0.7	0.7	0.7	0.7	0.5	0.6	0.5	0.5	0.5	0.5	0.4
	NSW	2.1	2.3	2.2	2.1	2.1	2.1	2.1	2.0	1.9	1.9	1.8

Note: The percentage of teenage mothers is the number of live births 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 population estimates and ABS Socioeconomic Indices for Areas (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

Chapter 3.5

Prisoner health

- There are around 7800 prison inmates in NSW.
- Prisoner populations are mainly male (94%) and are young, with a median age of 30 years (males) and 28 years (females).
- A high proportion of prisoners come from disadvantaged backgrounds.
- A history of drug use is common among prisoners—40% of males and 64% of females report 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, particularly females.
- Health conditions that are relatively common among prisoners, compared with the general population, include:
  - —back problems;
  - —heart problems;
  - —asthma;
  - —poor eyesight;
  - —poor oral health;
  - —mental illnesses.

In this chapter

- Demographic characteristics
- Communicable diseases
- Chronic conditions
- Health risk factors

Introduction

Prisons contain a largely male population, many of whom come from disadvantaged backgrounds. Compared with the general population, the prison population includes more people with low levels of educational attainment, Aboriginal and Torres Strait Islander people, and people with mental illnesses and drug dependencies. With disadvantage comes poor health and a range of special health needs. Most prisoners eventually return to the community. It is important that their health needs are addressed while they are in prison, and that their health does not deteriorate further during incarceration.

The health needs of prisoners differ from those of the general community because of the unique characteristics of the prisoner population. Most studies have found the prisoner population to have an increased risk of a range of health problems including blood-borne communicable diseases, sexually transmissible infections, tuberculosis, and mental health problems. Some of these health problems, such as viral hepatitis and HIV infection, can be attributed to lifestyle factors such as injecting drug use and sexual activity; whereas others, for example tuberculosis, can arise from living conditions within prison.

The Corrections Health Service (CHS) is a statutory health corporation under the *NSW Health Services Act, 1997*. The CHS provides healthcare to inmates at 32 correctional centres, 11 periodic detention centres, and 6 police cell complexes. The precursor of the Corrections Health Service was formed in England along with the First Fleet and was Australia's first established health service.

In 1996, the CHS undertook a wide-ranging health survey of the prisoner population, which was the first survey of its kind to be conducted in Australia. The survey screened a representative sample of almost 800 prisoners stratified by age, sex, and Aboriginality; and covered physical, mental, and social factors, as well as screening for communicable diseases.

The 1996 survey was repeated in late 2001. Permission was also granted to re-screen inmates from the 1996 survey who were in detention at the time the 2001 survey was conducted. Results of the 2001 survey, when they are available, will allow assessment of recent trends in prisoner health.

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

For more information:

NSW Department of Corrective Services. *NSW Inmate Census 2000. Summary of characteristics.* Sydney: NSW Department of Corrective Services, Statistical Publication no. 22. April 2001. ISSN 0814 1215.

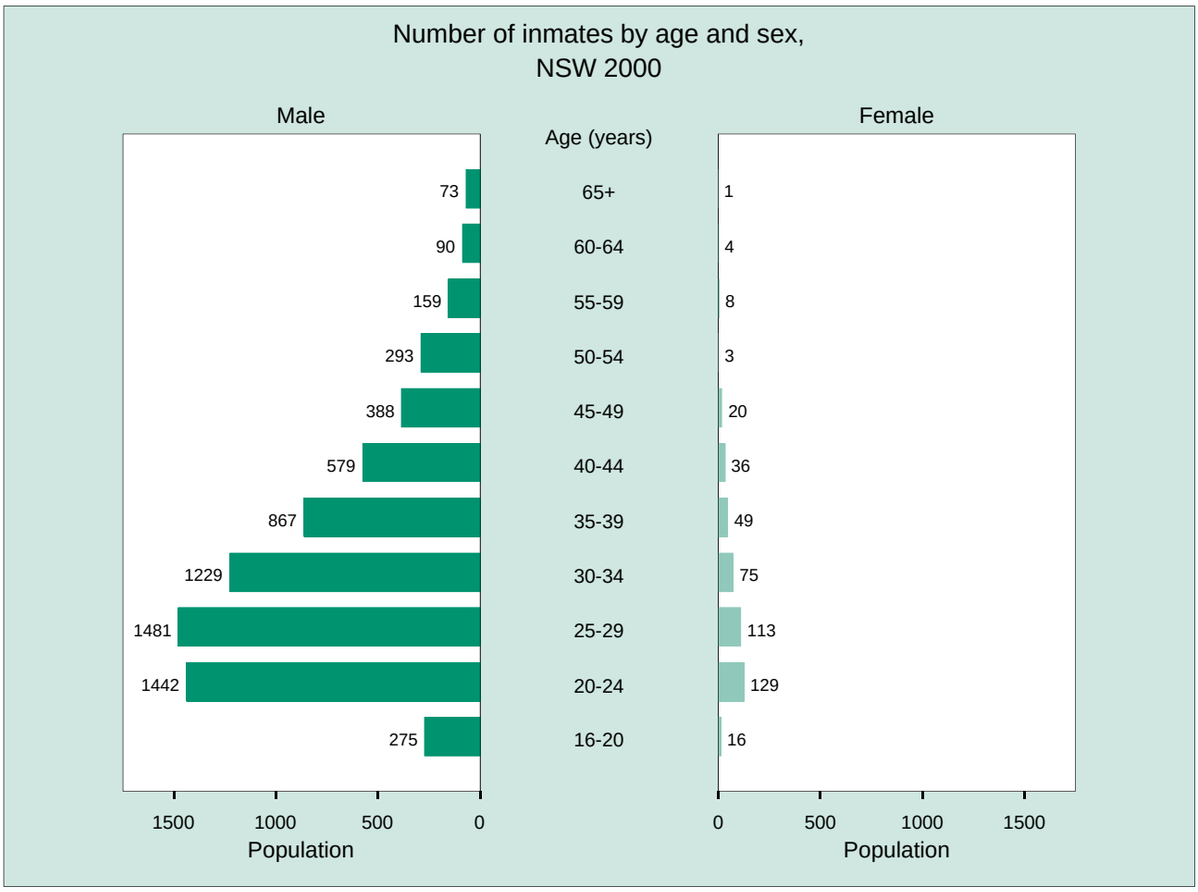
Butler T, Robertson P, Kaldor J, Donovan B. Syphilis in New South Wales (Australia) prisons—Its correlates in an Australian prisoner population. *Int J STD & AIDS* 2001; 12: 376–9.

Butler T, Spencer J, Cui J, Vickery K, Zou J, Kaldor J. Seroprevalence of markers for hepatitis B, C and G in male and female prisoners, NSW, 1996. *Aust N Z J Public Health* 1999; 23: 384.

Butler T, Levy M. Mantoux positivity among prison inmates, 1996. *Aust N Z J Public Health* 1999; 23: 185–8.

Butler T, Donovan B, Taylor J, Cunningham AL, Mindel A, Levy M, Kaldor J. Herpes simplex virus type 2 in prisoners, New South Wales, Australia. *Int J STD & AIDS* 2000; 11: 743–7.

National Centre in HIV Epidemiology and Clinical Research. *HIV–AIDS, viral hepatitis and sexually transmissible infections in Australia. Annual Surveillance Report 2001.* Sydney: University of New South Wales, 2001.



Source: NSW Inmate Census 2000. Summary of characteristics. NSW Department of Corrective Services. Statistical Publication no. 22. April 2001. ISSN 0814 1215.

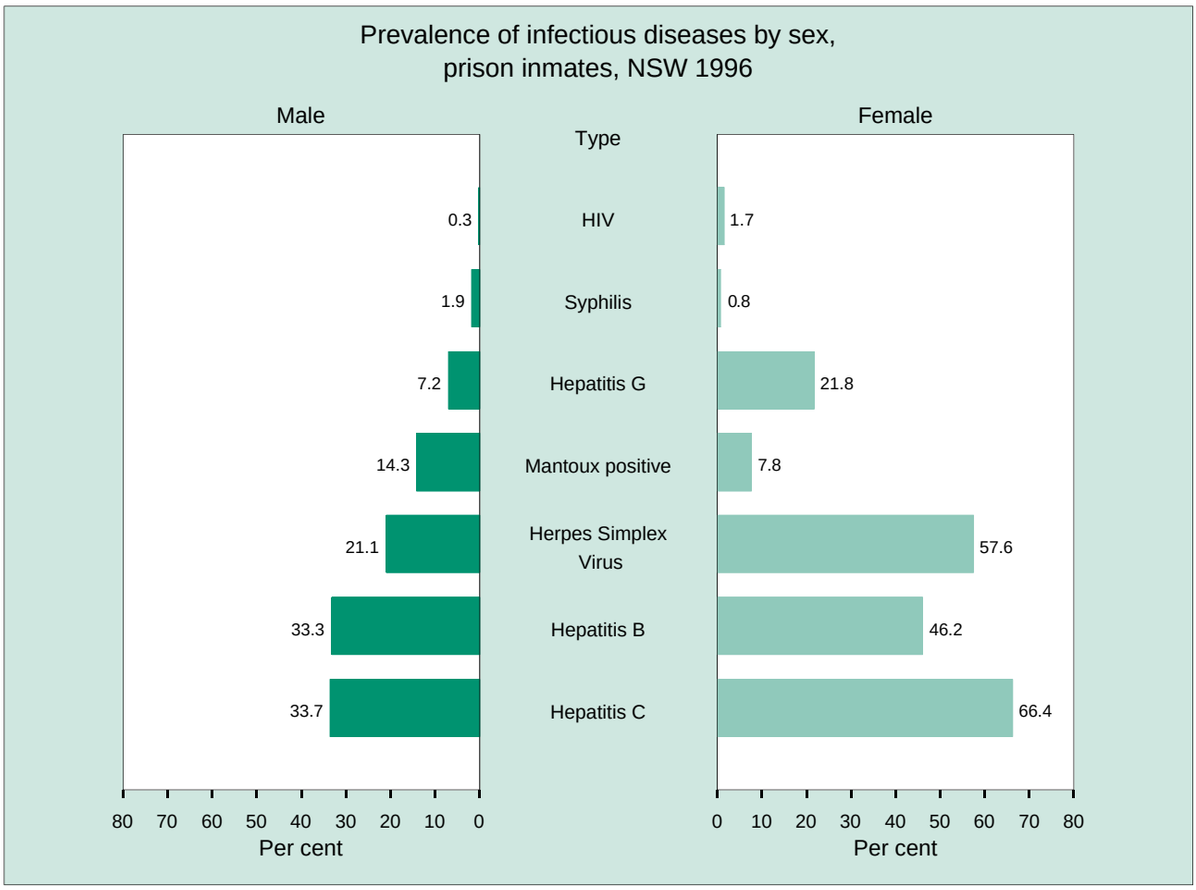
Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

- At June 30 2001, there were 22,458 prisoners in Australia, with 8846 (39%) detained in correctional centres in NSW (Australian Bureau of Statistics, 2002).
- The prisoner population is predominantly male (94%) and is young. The median age of male prisoners in NSW is 30 years (range 18 to 81 years) compared with 28 years (range 17 to 65 years) for females. Forty-six per cent of males and 57% of females are aged under 30 years.
- Aboriginal and Torres Strait Islander people are over-represented in the NSW correctional system, comprising 15% of the prisoner population, compared with 2% of the general community (Australian Bureau of Statistics, 2002). The rate of imprisonment among the indigenous population of NSW was 1971 per 100,000, which is lower than Western Australia (3036 per 100,000) but higher than Queensland (1724 per 100,000), South Australia (1652 per 100,000), the Northern Territory (1357 per 100,000), Victoria (1060 per 100,000), and Tasmania (418 per 100,000) (Australian Bureau of Statistics, 2002).
- The NSW inmate population is not static. In 1999–00, although the prisoner population at any one time was around 7400, there were 16,000 ‘receptions’ (entries to prison) relating to 12,000 individuals.
- Imprisonment rates vary by area health service, with the Northern Sydney Health Area having the lowest rate and the Far West Health Area having the highest rate.

For more information:

Australian Bureau of Statistics. *Prisoners in Australia, 30 June 2001.* Catalogue no. 4517.0. Canberra: ABS, 2002.

Department of Corrective Services. *NSW Inmate Census 2000. Summary of characteristics.* Sydney: NSW Department of Corrective Services, 2001.



Note: The 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). Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Inmates' Health Survey, 1996, Corrections Health Service.

- Hepatitis C virus infection is strongly associated with injecting drug use. In the 1996 Inmates' Health Survey, one-third (33.7%) of male and two-thirds (66.4%) of female prisoners were infected with hepatitis C virus (Butler et al., 1999). The prevalence of infection is about 1.3% in the general community and 53% among those who have injected drugs (National Centre in HIV Epidemiology and Clinical Research, 2001).
- The prevalence of HIV is low among inmates. The 1996 NSW Inmates' Health Survey detected no new cases that had not already been diagnosed outside of prison (Butler, 1997).
- Among those surveyed, sexually transmissible infections were strongly associated with the reported number of sexual partners (Butler et al., 2000). While the prevalence of herpes simplex virus type 2 was high, the prevalence of untreated syphilis was low.
- Fourteen per cent of males and 8% of females were positive on the Mantoux tuberculin skin test, which provides evidence of exposure to tuberculosis. Prevalence was higher among prisoners who were male, aged over 25 years, Aboriginal, born overseas, or living in a jail in which a recent outbreak of tuberculosis had occurred (Butler and Levy, 1999).

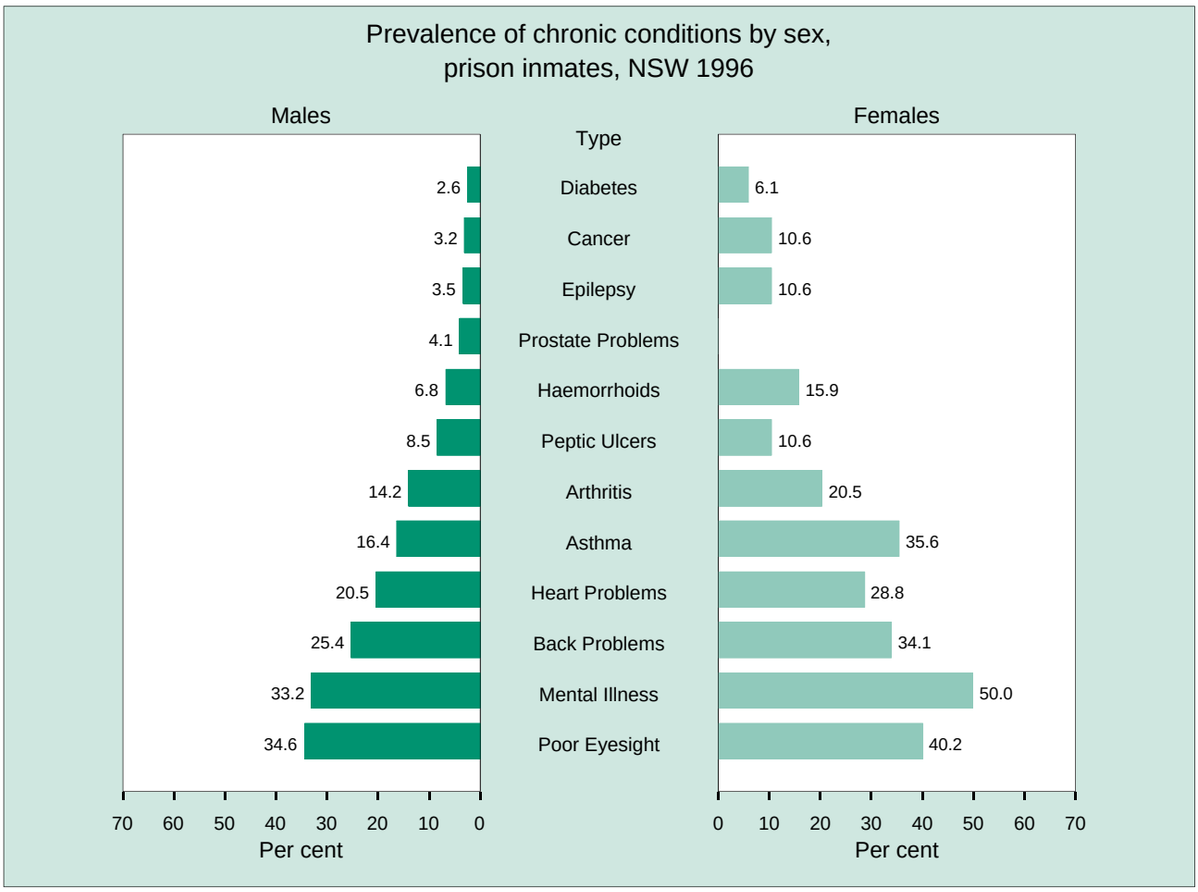
For more information:

Butler T. *Preliminary findings of the NSW Inmates' Health Survey.* Sydney: NSW Corrections Health Service, 1997.

Butler T, Spencer J, Cui J, et al. Seroprevalence of markers for hepatitis B, C and G in male and female prisoners, NSW, 1996. *Aust N Z J Public Health*, 1999; 23: 384.

Butler T, Levy M. Mantoux positivity among prison inmates, 1996. *Aust N Z J Public Health*, 1999; 23:185–8.

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, University of New South Wales, 2001.



Note: Estimates based on 657 male respondents and 132 female respondents. Survey respondents were asked: 'Have you ever been told by a doctor that you have any of the following illnesses–conditions?', except for the mental illness question, where survey respondents were asked: 'Have you ever received treatment or assessment by a psychiatrist or doctor for an emotional or mental problem?' Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Inmates' Health Survey, 1996, Corrections Health Service.

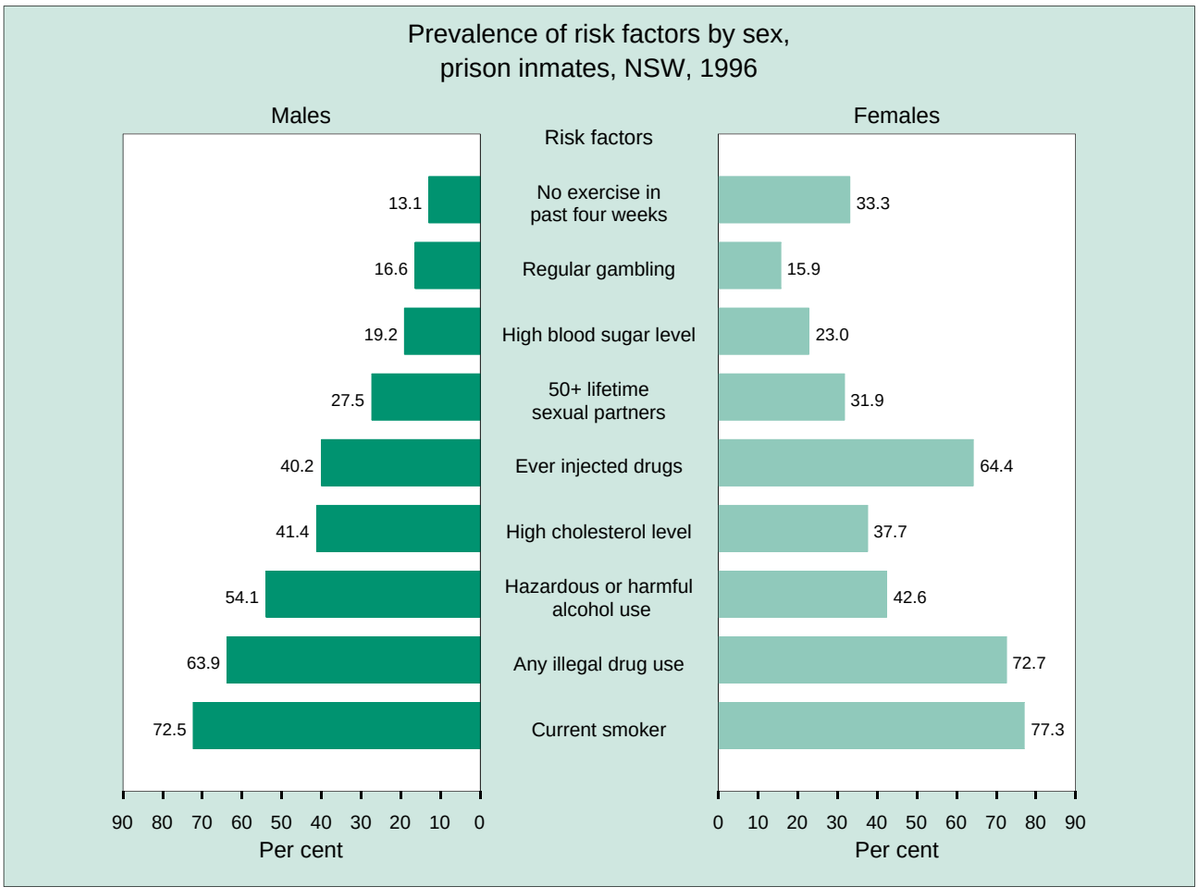
- The 1996 NSW Inmates' Health Survey demonstrated that back and heart problems, asthma, poor eyesight, oral health problems, and mental illnesses, are relatively common among prisoners compared with the general population.
- The oral health status of inmates is particularly poor. In the survey, prisoners had on average 20.5 decayed, missing, or filled teeth (Osborn et al., unpublished). This compares with 15.9 for those aged over 20 years in the general population (Barnard, 1993). Twenty-seven per cent of male and 40% of female prisoners reported having seen a dentist in the 12 weeks prior to the survey (Butler, 1997).
- The proportion of inmates who reported having received treatment for a mental illness was high, particularly among females. Depression was the most commonly reported mental illness (7% of males and 16% of females) with 3% of males and 2% of females reporting a diagnosis of schizophrenia (Butler, 1997).

For more information:

Barnard PD. *National Oral Health Survey Australia 1987–88.* Canberra: Australian Government Publishing Service, 1993.

Butler T. *Preliminary findings of the NSW Inmates' Health Survey.* Sydney: NSW Corrections Health Service, 1997.

Osborn M, Butler T, Barnard P. Oral health status of prison inmates—New South Wales, Australia. Unpublished.



Note: Estimates based on 657 male respondents and 132 female respondents. 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. 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. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Inmates' Health Survey, 1996, Corrections Health Service.

- Self-rated health correlates well with objective measures of health status, with negative ratings being a predictor of subsequent illness and premature death. Prison inmates, although younger than the general population, give less positive ratings of their own health. They also engage in a range of health risk behaviours, such as smoking, consuming harmful or hazardous quantities of alcohol, and injecting drugs.
- In the 1996 Inmates' Health Survey, 38% of male inmates and 23% of female inmates reported either 'excellent' or 'very good' health. This compares with 54% and 56%, respectively, for the general community (Public Health Division, 2001).
- In the survey, almost 80% of prisoners reported being current smokers. Further, more than 50% reported smoking pouch tobacco, which is higher in nicotine and tar. Fifty-four per cent of male and 43% of female inmates reported consuming 'harmful' or 'hazardous' quantities of alcohol in the year prior to imprisonment.
- A history of drug use is common among prison inmates. In the survey, around two-thirds (64% of males and 73% of females) reported using illegal drugs at some time in the past. Forty per cent of males and 64% of females reported having injected drugs. Further, 52% of males and 49% of females who had injected drugs before imprisonment reported having injected in prison. It is likely that these figures underestimate the true rate, due to the reluctance of inmates to disclose an illegal activity.

For more information:

Public Health Division, *1997 and 1998 NSW Health Survey Report*, Sydney: NSW Department of Health, 2001.

Butler T. *Preliminary findings of the NSW Inmates' Health Survey*. Sydney: NSW Corrections Health Service, 1997

4 Health priority areas

Section 4

Chapter 4.1

Cardiovascular disease

- Cardiovascular diseases cause more than 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 kills more people than any other disease. It caused almost 9500 deaths in 2000, or around 26 deaths every day. It is also the single largest cause of years of life lost due to premature death in both sexes.
- Death rates, and numbers of deaths, from coronary heart disease are higher in males than in females. Death rates are higher in rural areas than in urban areas.
- Death rates from coronary heart disease have more than halved since 1980. 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. Approaching 6000 coronary artery bypass graft procedures and 6000 coronary angioplasty procedures are performed each year.
- In 2000, stroke caused almost 5000 deaths in NSW, or about 13 deaths each day. Stroke was the second largest cause, after coronary heart disease, of years of life lost due to premature death.
- Death rates from stroke are slightly higher in males than in females, but larger numbers of females die from stroke. Death rates are similar in urban and rural areas.
- Death rates from stroke have more than halved since 1980, as a result of both reduced incidence of stroke and improved survival after stroke.
- Stroke is the principal reason for almost 18,000 hospitalisations each year.
- The hospitalisation rate for stroke is gradually declining. However, its contribution to the burden of disability will increase because:

  —the population is getting older;

  —survival after stroke is increasing.

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. In NSW, cardiovascular diseases are the leading cause of disease burden in both sexes, accounting for almost one-quarter of years of healthy life lost due to premature death, disease, and injury.

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 in NSW. 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. These risk factors 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 health outcomes (NPHP, 2001).

The NSW Department of Health has developed a framework for improving health care for people with chronic and complex health problems, which forms part of the NSW Government Action Plan for Health. The aims are to improve the quality of life of people with these health conditions, and to prevent the need for emergency care and admissions to hospitals (NSW Department of Health, 2000). A recent review of cardiac services in NSW has recommended the development of a range of new and improved diagnostic and treatment services for acute cardiac disease (NSW Department of Health, 2001).

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—2001.* AIHW Catalogue no. CVD 13. Canberra: AIHW, Heart Foundation of Australia, and National Stroke Foundation of Australia, 2001.

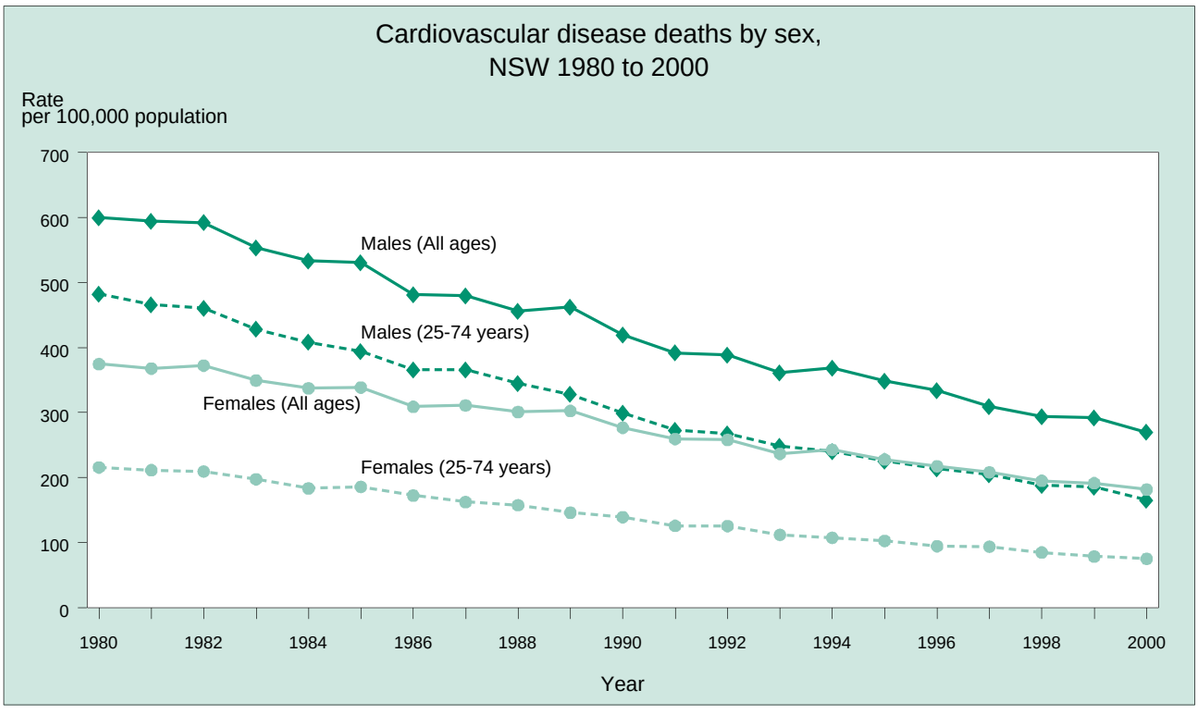
National Heart Foundation Web site at www.heartfoundation.com.au.

National Public Health Partnership. *Preventing Chronic Disease: A strategic framework.*. Melbourne: NPHP, 2001. www.dhs.vic.gov.au/nphp/chrondis/index.htm.

National Stroke Foundation Web site at www.natstroke.asn.au.

NSW Department of Health. *Improving health care for people with chronic and complex needs in NSW.* Sydney: NSW Department of Health, 2000.

NSW Department of Health. *Report of the Greater Metropolitan Services Implementation Group.* Sydney: NSW Department of Health, 2001.



				1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
NSW	Number	All ages	Males	9920	9583	9759	9345	9781	9525	9455	9073	8883	9104	8674
			Females	10219	9950	10228	9722	10363	10067	9990	9902	9538	9758	9606
			Persons	20139	19533	19987	19067	20144	19592	19445	18975	18421	18862	18280
	Rate per 100,000 population	All ages	Males	419.6	391.8	388.8	361.4	368.7	348.6	334.0	309.6	293.7	292.1	269.7
			Females	276.8	259.4	258.1	236.7	242.7	227.9	217.4	208.1	195.1	191.5	181.6
			Persons	340.3	318.9	316.3	292.1	298.8	280.9	269.3	254.0	239.6	236.7	221.7

Note: Cardiovascular disease deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Data are reported by year of death. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001, data for which were not available at the time of production. Rates were age-adjusted using the standard Australian population as at 30 June 1991. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

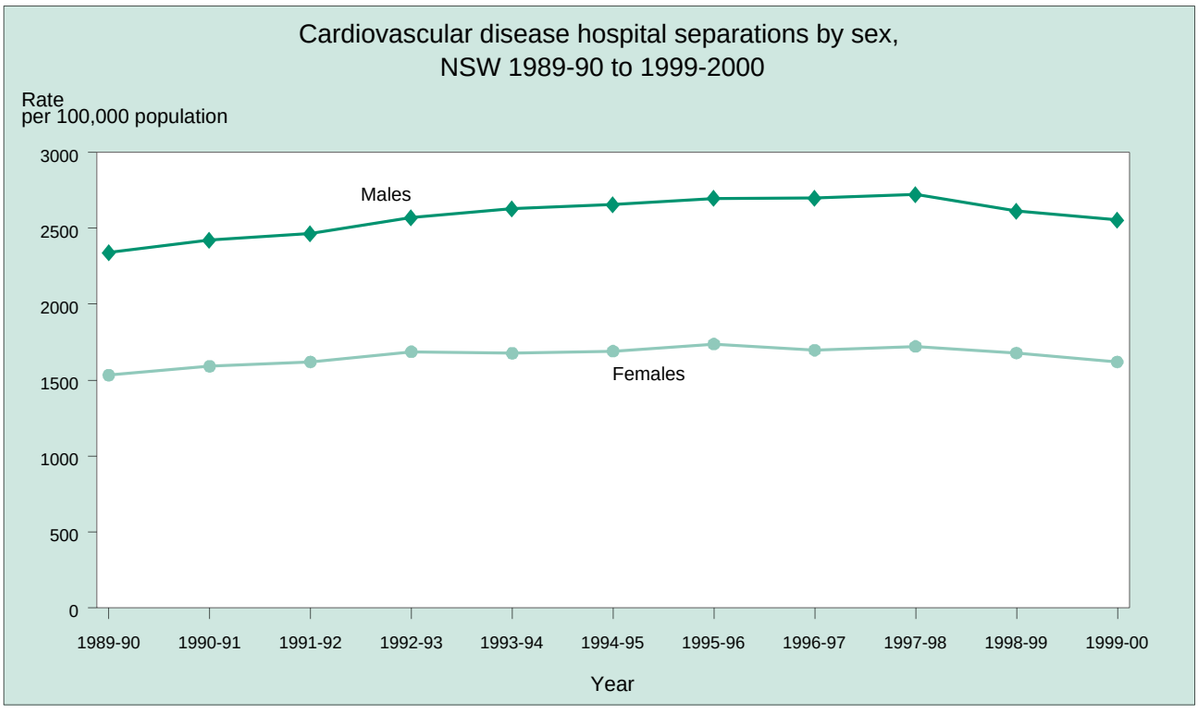
Source: ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- In 2000, cardiovascular diseases accounted for 18,280 deaths (40% of all deaths) in NSW, or around 50 deaths each day. They caused more than one-third of years of life lost due to premature death. Coronary heart disease caused more than half (51.0%) and stroke caused more than one-quarter (25.8%) of cardiovascular disease deaths. 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 overall the male death rate from these diseases is 1.5 times the female rate.
- Death rates from cardiovascular disease have more than halved since 1980. This decline has been steeper in males than in females. The declining death rate can be attributed to both reduced incidence of cardiovascular disease and improved survival of people with 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, 2001). 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.

For more information:

Australian Institute of Health and Welfare. *Heart, stroke and vascular diseases, Australian Facts—2001.* AIHW Catalogue no. CVD 13. Canberra: AIHW, Heart Foundation of Australia and National Stroke Foundation of Australia, 2001. Available on AIHW Web site at www.aihw.gov.au.

Australian Institute of Health and Welfare (AIHW) Burden of Disease Web site at www.aihw.gov.au/bod/index.html.



		1989–90	1990–91	1991–92	1992–93	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
Number	Males	62859	66392	69011	73452	76855	79391	82301	84284	87073	85273	85055
	Females	50044	53029	55334	58842	59548	61206	64245	64212	66355	66234	65400
	Persons	112904	119421	124345	132295	136403	140597	146546	148525	153429	151507	150455
Rate	Males	2339.9	2424.3	2467.2	2571.1	2631.2	2658.3	2698.9	2699.4	2725.3	2614.2	2554.9
per 100,000	Females	1532.9	1591.5	1620.3	1687.0	1677.1	1691.1	1738.0	1697.9	1722.5	1679.0	1620.4
population	Persons	1908.2	1978.2	2014.3	2101.2	2123.4	2145.9	2188.7	2168.2	2194.1	2120.3	2060.1

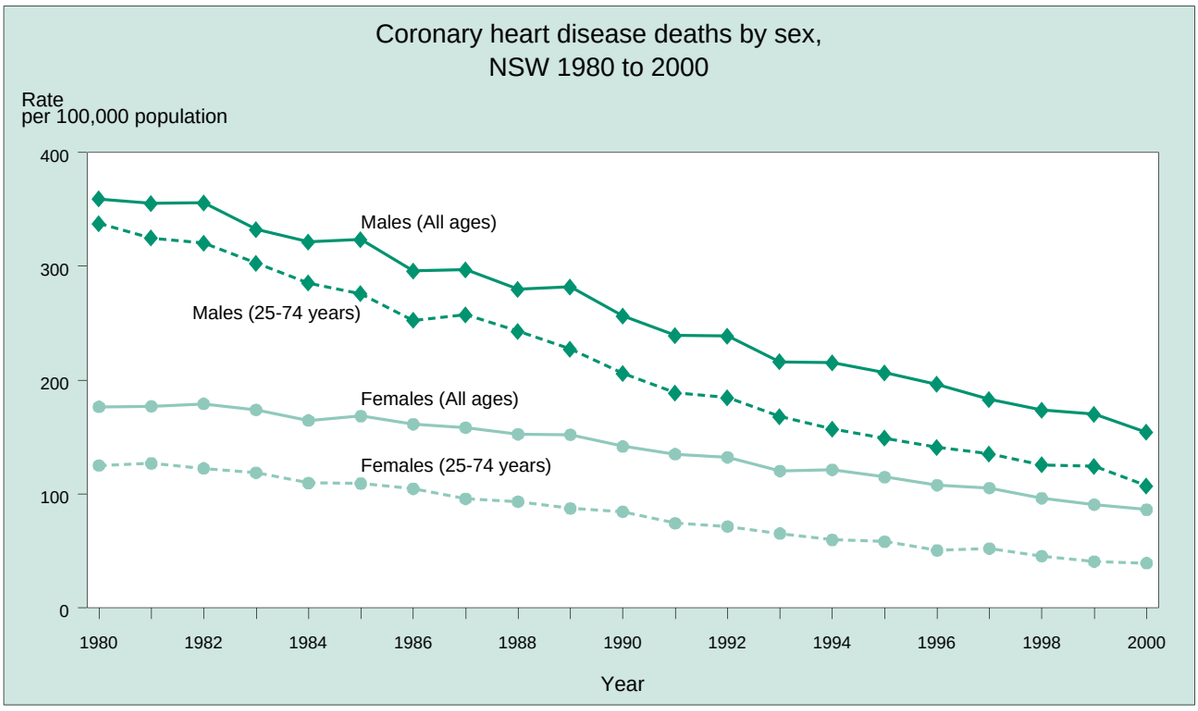
Note: Hospital separations were classified using ICD-9 up to 1997–98 and ICD-10 from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 1991.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Cardiovascular diseases were the principal reason for 150,455 hospitalisations of NSW residents (7.9% of all hospitalisations) in the financial year 1999–00. More than one-third of these (36.1%) were for coronary heart disease and 11.9% were for stroke. The next most common causes were heart failure and peripheral vascular disease.
- The male hospitalisation rate for cardiovascular disease is around 1.6 times the female rate. Hospital use for cardiovascular disease increases with age, with people aged 60 years and over contributing about 60% of hospitalisations (AIHW, 2001).
- Between 1989–90 and 1997–98, the hospitalisation rate for cardiovascular disease increased gradually, but it then declined slightly in 1998–99 and 1999–00.
- Trends in hospitalisations for cardiovascular disease do not directly reflect the incidence of disease. They are based on episodes rather than people (1 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—2001.* AIHW Catalogue no. CVD 13. Canberra: AIHW, Heart Foundation of Australia and National Stroke Foundation of Australia, 2001. Available on AIHW Web site at www.aihw.gov.au.



			Sex	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
NSW	Number	All ages	Males	6221	6005	6119	5706	5811	5718	5634	5431	5315	5352	4992
			Females	5167	5109	5179	4868	5103	4984	4881	4931	4643	4555	4487
			Persons	11388	11114	11298	10574	10914	10702	10515	10362	9958	9907	9479
	Rate	All ages	Males	256.6	239.3	238.6	216.2	215.2	206.4	196.3	183.1	173.8	169.9	154.1
	per 100,000		Females	141.7	134.9	132.1	120.2	121.1	114.7	107.7	105.1	96.1	90.5	86.1
	population		Persons	191.6	181.1	178.8	162.5	162.5	154.4	146.8	140.0	130.9	126.0	116.6

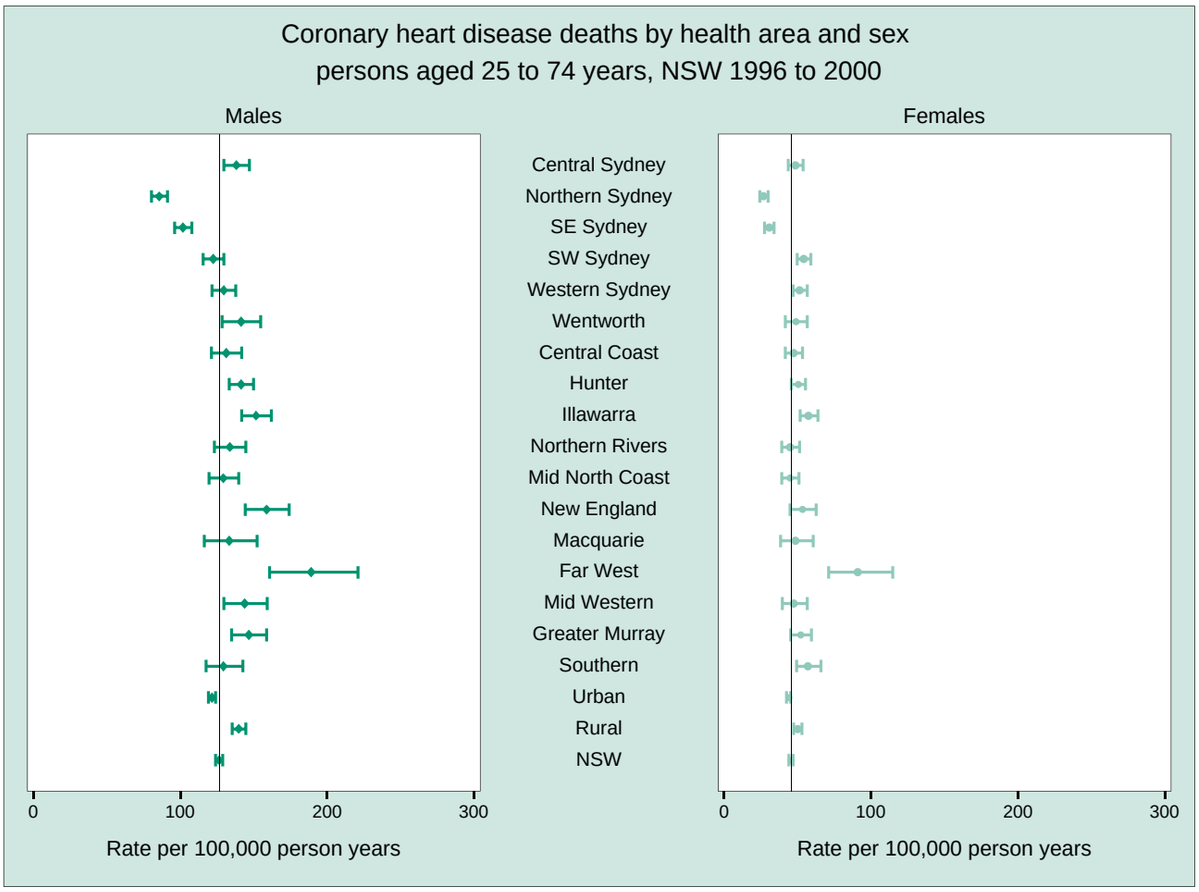
Note: Deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Data are reported by year of death. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001, data for which were not available at the time of production. Rates were age-adjusted using the standard Australian population as at 30 June 1991. 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). Epidemiology and Surveillance Branch, 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 1 of the coronary arteries suddenly becomes blocked by a blood clot. Coronary heart disease kills more people than any other disease in NSW. In 2000, it accounted for 9479 deaths (20.9% of all deaths), or around 26 deaths every day. It is also the single largest cause of years of life lost due to premature death in both sexes.
- Coronary heart disease kills more males than females. In the 25–74 years age group, the male death rate from coronary heart disease is 3.7 times the female rate, and overall the male death rate from this cause is 1.8 times the female rate.
- Death rates from coronary heart disease have more than halved since 1980. This decline has been steeper in males than in females. The decline can be attributed to both reduced incidence of disease and improved survival of people with disease. Improved survival reflects improved medical treatment (including increased use of drugs to lower blood pressure and cholesterol), surgical treatment (including increases in revascularisation procedures, and rehabilitation and follow-up care (AIHW, 2001). Reductions in some risk factors, including smoking, saturated fats in the diet, and levels of blood pressure, have contributed to reducing the incidence of coronary heart disease.

For more information:

Australian Institute of Health and Welfare. *Heart, stroke and vascular diseases, Australian Facts—2001.* AIHW Catalogue no. CVD 13. Canberra: AIHW, Heart Foundation of Australia and National Stroke Foundation of Australia, 2001. Available on AIHW Web site at www.aihw.gov.au.



Note: Deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Data are reported by year of death. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001, data for which were not available at the time of production. Rates were age-adjusted using the standard Australian population as at 30 June 1991. Lower and upper limits of 95% confidence interval of the point estimate are shown.

Source: ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- In the period 1996 to 2000, there was substantial geographic variation in rates of premature death from coronary heart disease in NSW.
- Residents of the Northern Sydney and South Eastern Sydney Health Areas had the lowest age-adjusted rates of premature death from coronary heart disease. Higher-than-average rates were recorded in males from the Wentworth, Hunter, Illawarra, New England, Far West, Mid Western and Greater Murray Health Areas. In females, higher-than-average rates were recorded in the South Western Sydney, Western Sydney, Illawarra, Far West, and Southern Health Areas. Overall, both male and female residents of rural health areas were more likely than residents of urban health areas to die from coronary heart disease.
- Although death rates from coronary heart disease were low in Northern and South Eastern Sydney, the actual number of deaths in these areas was large: 1319 deaths in Northern Sydney and 1530 deaths in South Eastern Sydney among people aged 25–74 years over the 5-year period. This reflects the large population sizes in these areas, and their age structures.
- The higher death rates from coronary heart disease in rural and remote areas reflect differences in socioeconomic conditions, in the prevalence of risk factors, and in access to and use of health services (see page 130). They are also influenced by the high rates of coronary heart disease among Aboriginal people (see page 92).

For more information:

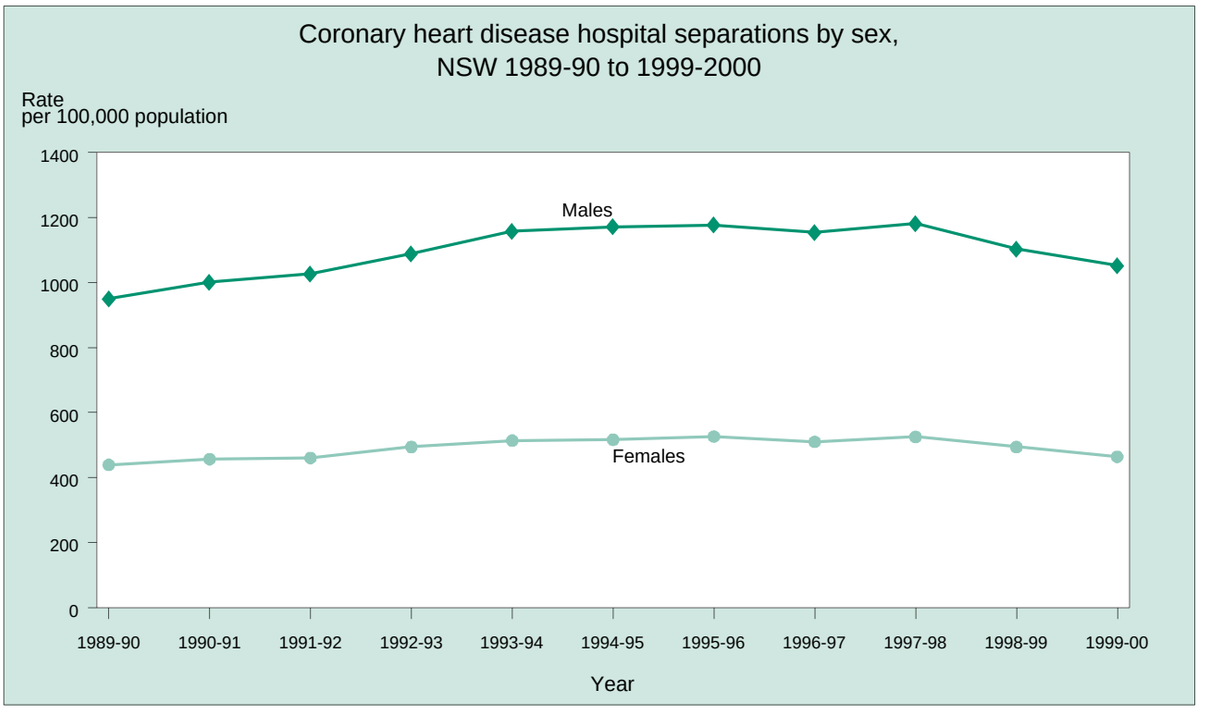
Australian Institute of Health and Welfare. *Heart, stroke and vascular diseases, Australian Facts—2001.* AIHW Catalogue no. CVD 13. Canberra: AIHW, Heart Foundation of Australia and National Stroke Foundation of Australia, 2001. Available on AIHW Web site at www.aihw.gov.au.

Coronary heart disease deaths by health area and sex, persons aged 25–74 years, NSW, 1996–2000

Health Area		Number	Rate per 100,000 person years	LL 95% CI	UL 95% CI
Central Sydney	Males	969	138.0	129.5	147.0
	Females	358	48.5	43.6	53.8
	Persons	1328	93.3	88.4	98.5
Northern Sydney	Males	971	85.7	80.3	91.3
	Females	348	26.7	24.0	29.7
	Persons	1319	54.6	51.6	57.6
SE Sydney	Males	1147	101.9	96.0	108.0
	Females	383	30.6	27.6	33.8
	Persons	1530	65.1	61.9	68.5
SW Sydney	Males	1152	122.3	115.3	129.7
	Females	546	54.0	49.6	58.8
	Persons	1698	87.0	82.9	91.3
Western Sydney	Males	1086	129.4	121.7	137.5
	Females	453	51.4	46.7	56.4
	Persons	1539	89.2	84.8	93.8
Wentworth	Males	469	141.2	128.4	154.9
	Females	172	48.7	41.6	56.6
	Persons	641	93.1	86.0	100.8
Central Coast	Males	647	131.1	121.1	141.8
	Females	273	47.2	41.7	53.3
	Persons	920	87.0	81.3	92.9
Hunter	Males	1183	141.3	133.3	149.6
	Females	467	50.2	45.7	55.1
	Persons	1650	94.4	89.8	99.1
Illawarra	Males	883	151.6	141.7	162.0
	Females	357	57.4	51.6	63.8
	Persons	1240	103.4	97.7	109.4
Northern Rivers	Males	615	133.5	123.0	144.6
	Females	221	44.7	39.0	51.1
	Persons	836	88.2	82.2	94.4
Mid North Coast	Males	659	129.3	119.5	139.7
	Females	244	44.7	39.1	50.7
	Persons	903	86.4	80.8	92.3
New England	Males	444	158.7	144.3	174.3
	Females	150	53.1	44.9	62.3
	Persons	595	105.4	97.0	114.2
Macquarie	Males	219	133.3	116.2	152.2
	Females	80	48.5	38.5	60.4
	Persons	299	91.2	81.1	102.2
Far West	Males	158	189.0	160.6	221.0
	Females	71	90.9	70.9	114.7
	Persons	229	142.9	124.9	162.7
Mid Western	Males	374	143.7	129.4	159.1
	Females	128	47.3	39.4	56.3
	Persons	502	95.2	87.1	104.0
Greater Murray	Males	598	146.4	134.9	158.7
	Females	219	51.9	45.2	59.3
	Persons	817	99.1	92.4	106.2
Southern	Males	422	129.4	117.3	142.4
	Females	185	57.0	49.0	65.9
	Persons	606	93.5	86.2	101.2
Urban	Males	8508	121.5	118.9	124.1
	Females	3358	43.8	42.3	45.3
	Persons	11866	81.4	79.9	82.8
Rural	Males	3489	139.7	135.1	144.4
	Females	1298	50.1	47.4	52.9
	Persons	4786	94.7	92.0	97.4
NSW	Males	12019	126.4	124.2	128.7
	Females	4659	45.4	44.1	46.7
	Persons	16677	84.9	83.6	86.2

Note: Deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Death data are reported by year of death and include an estimate of the small number of deaths occurring in 2000, but registered in 2001. Death rates were age-adjusted using the Australian population as at 30 June 1991. LL/UL95%CI = Lower and upper limits of 95% confidence interval of the point estimate.

Source: ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.



		1989–90	1990–91	1991–92	1992–93	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
Number	Males	26323	28268	29473	31806	34559	35679	36559	36672	38394	36578	35556
	Females	14448	15376	15834	17324	18283	18730	19463	19298	20201	19509	18756
	Persons	40771	43644	45307	49130	52842	54409	56022	55971	58595	56087	54312
Rate	Males	950.5	1001.7	1026.7	1088.6	1158.1	1172.0	1177.3	1155.0	1182.1	1104.2	1052.0
per 100,000	Females	439.4	456.9	460.4	494.4	514.0	516.6	526.4	510.2	525.3	494.3	464.2
population	Persons	684.4	719.3	731.8	779.3	822.4	831.3	838.2	818.9	841.1	787.5	745.9

Note: Hospital separations were classified using ICD-9 up to 1997–98 and ICD-10 from 1998–99 onwards. Hospital separations were age-adjusted using the Australian population as at 30 June 1991.

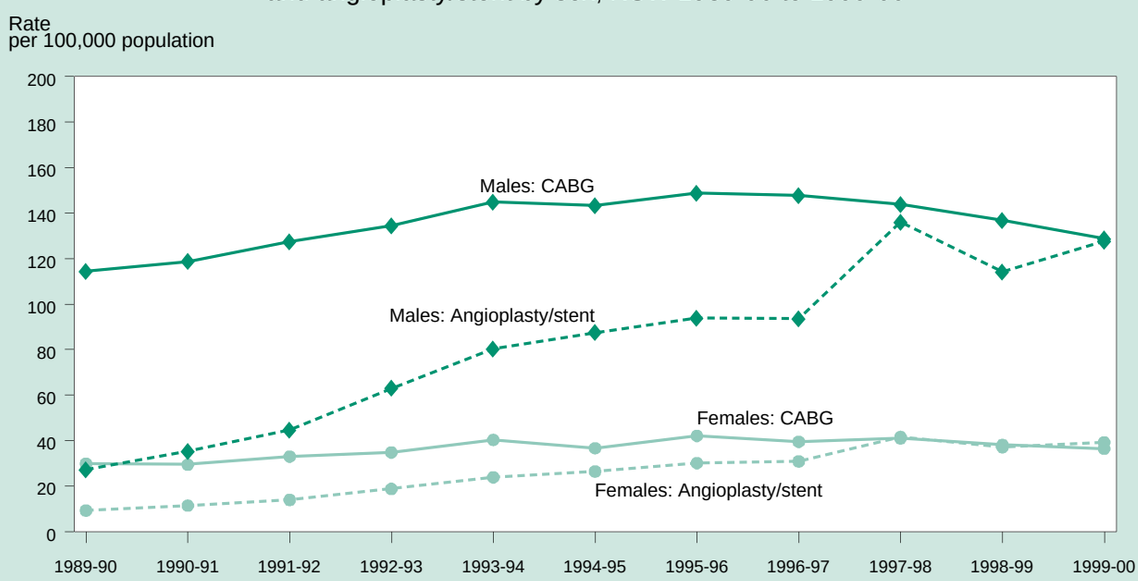
Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Coronary heart disease was the principal reason for 54,312 hospitalisations of NSW residents (2.8% of all hospitalisations) in the financial year 1999–00.
- The male hospitalisation rate for coronary heart disease is around 2.3 times the female rate. Hospital use for coronary heart disease increases with age, with people aged 65 years and over contributing about 60% of hospitalisations (AIHW, 2001).
- Between 1989–90 and 1997–98, the hospitalisation rate for coronary heart disease increased gradually, but it then declined slightly in 1998–99 and 1999–00.
- Trends in hospitalisations for coronary heart disease do not directly reflect the incidence of disease. They are based on episodes rather than people (1 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—2001.* AIHW Catalogue no. CVD 13. Canberra: AIHW, Heart Foundation of Australia and National Stroke Foundation of Australia, 2001. Available on AIHW Web site at www.aihw.gov.au.

Hospital separations for coronary artery bypass graft and angioplasty/stent by sex, NSW 1989-90 to 1999-00



Note: Hospital separations were classified by ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Hospital separations were age-related using the Australian population as at 30 June 1991.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Revascularisation procedures are used to restore adequate blood flow to blocked coronary arteries. Coronary artery bypass grafting (CABG) involves using blood vessel grafts to bypass blocked coronary arteries. Coronary angioplasty is less invasive; it involves inserting a catheter with a balloon, through the skin into a coronary artery, and inflating the balloon to clear block-ages. Stents (expanding metal tubes) may be inserted during the procedure, to hold the artery open and prevent re-blockage (AIHW, 2001a). The CABG procedure has been used extensively in Australia since the early 1970s, coronary angioplasties since the early 1980s, and stents since 1993.
- In the financial year 1999–00, 5772 coronary artery bypass graft procedures and 5872 coronary angioplasty procedures were performed in NSW. Around three-quarters of those undergoing revascularisation procedures were males.
- The rate of coronary artery bypass graft procedures increased gradually in NSW between 1989–90 and 1995–96, before declining slightly. In contrast, the rate of coronary angioplasty procedures increased rapidly between 1989–90 and 1993–94, increased more gradually until 1997–98, where it peaked before dropping back to the previous rate of increase. The rates of coronary artery bypass grafting and coronary angioplasty are now similar. The proportion of total angioplasty procedures in which stents were inserted increased from 23% in 1996–97 to 82% in 1999–00. This pattern is reflected in national figures (AIHW, 2001b).
- A possible explanation for the peak in 1997–98 angioplasties is that there may have been higher repeat procedure rates associated with complications (subacute stent thrombosis) in that year. This may have been countered with improved drug therapy in subsequent years. Further investigation of repeat procedure rates in individuals is required.

For more information:

Australian Institute of Health and Welfare. *Heart, stroke and vascular diseases, Australian Facts—2001.* AIHW Catalogue no. CVD 13. Canberra: AIHW, Heart Foundation of Australia and National Stroke Foundation of Australia, 2001a. Available on AIHW Web site at www.aihw.gov.au.

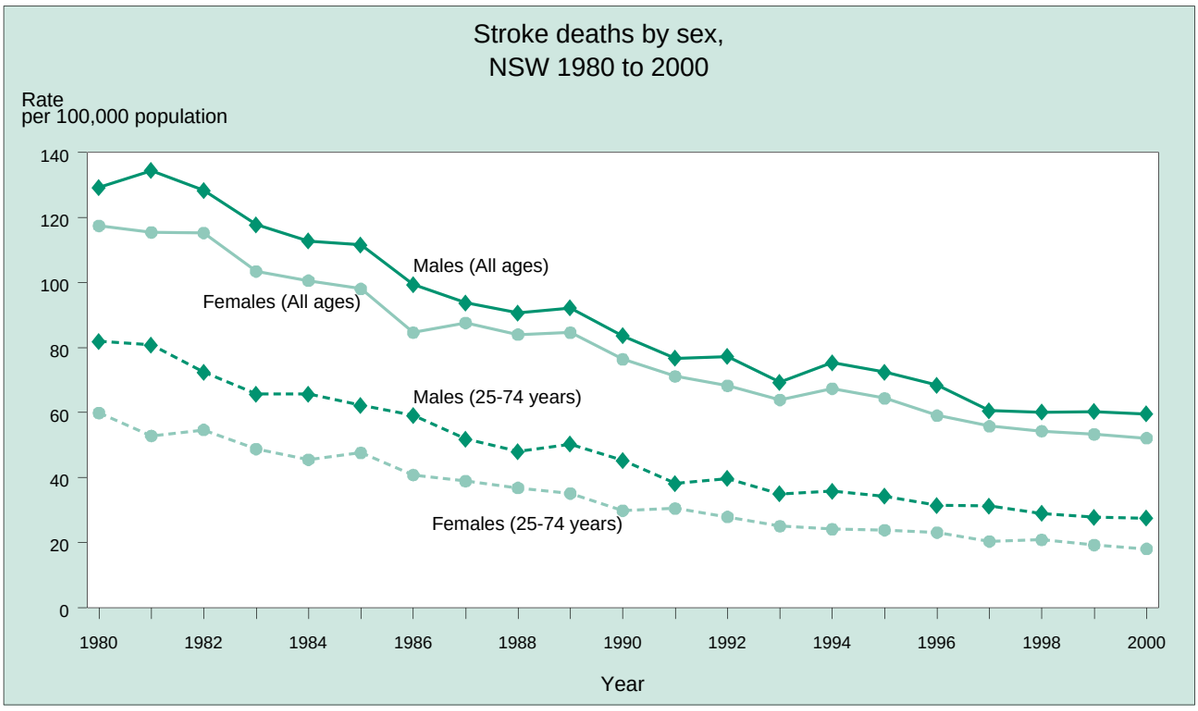
Australian Institute of Health and Welfare. *Coronary angioplasty in Australia 1998.* AIHW Catalogue no. CVD 14. Canberra: AIHW and Heart Foundation of Australia, 2001b. Available on AIHW Web site at www.aihw.gov.au.

Coronary artery bypass graft and angioplasty–stent procedures, hospitalisations by sex, NSW 1989–90 to 1999–2000

			89–90	90–91	91–92	92–93	93–94	94–95	95–96	96–97	97–98	98–99	99–00
Number	Coronary artery bypass graft	Males	3325	3485	3785	4045	4423	4439	4684	4749	4697	4558	4380
		Females	941	946	1076	1153	1363	1253	1467	1407	1473	1421	1392
		Persons	4266	4431	4861	5198	5786	5692	6151	6156	6170	5979	5772
	Coronary angioplasty–stent	Males	798	1045	1340	1920	2479	2740	2990	3051	4514	3855	4396
		Females	289	361	448	615	791	893	1026	1085	1492	1365	1476
		Persons	1087	1406	1788	2535	3270	3633	4016	4136	6006	5220	5872
Rate per 100,000 population	Coronary artery bypass graft	Males	114.5	118.8	127.5	134.5	144.9	143.4	148.9	147.8	143.9	136.8	128.7
		Females	29.8	29.5	33.0	34.8	40.3	36.7	42.1	39.5	41.0	38.1	36.5
		Persons	71.0	72.7	78.5	82.9	90.7	88.0	93.3	91.6	90.4	85.4	80.9
	Coronary angioplasty–stent	Males	27.2	35.3	44.7	63.0	80.3	87.5	93.9	93.6	136.0	114.2	127.6
		Females	9.2	11.5	13.9	18.8	23.9	26.4	30.1	30.9	41.6	37.1	39.2
		Persons	18.3	23.3	29.1	40.6	51.5	56.4	61.2	61.4	87.6	74.8	82.2

Note: Hospital separations were classified by ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.



				1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
NSW	Number	All ages	Males	1887	1782	1859	1721	1930	1921	1884	1740	1785	1846	1894
			Females	2859	2756	2742	2668	2927	2906	2753	2726	2704	2759	2830
			Persons	4746	4538	4601	4389	4857	4827	4637	4466	4489	4605	4724
	Rate per 100,000 population	All ages	Males	83.6	76.7	77.3	69.3	75.4	72.4	68.5	60.6	60.1	60.3	59.6
			Females	76.4	71.1	68.3	63.9	67.4	64.4	59.1	55.8	54.3	53.3	52.1
			Persons	80.6	74.3	72.7	66.9	71.5	68.4	63.4	58.7	57.4	56.6	56.0

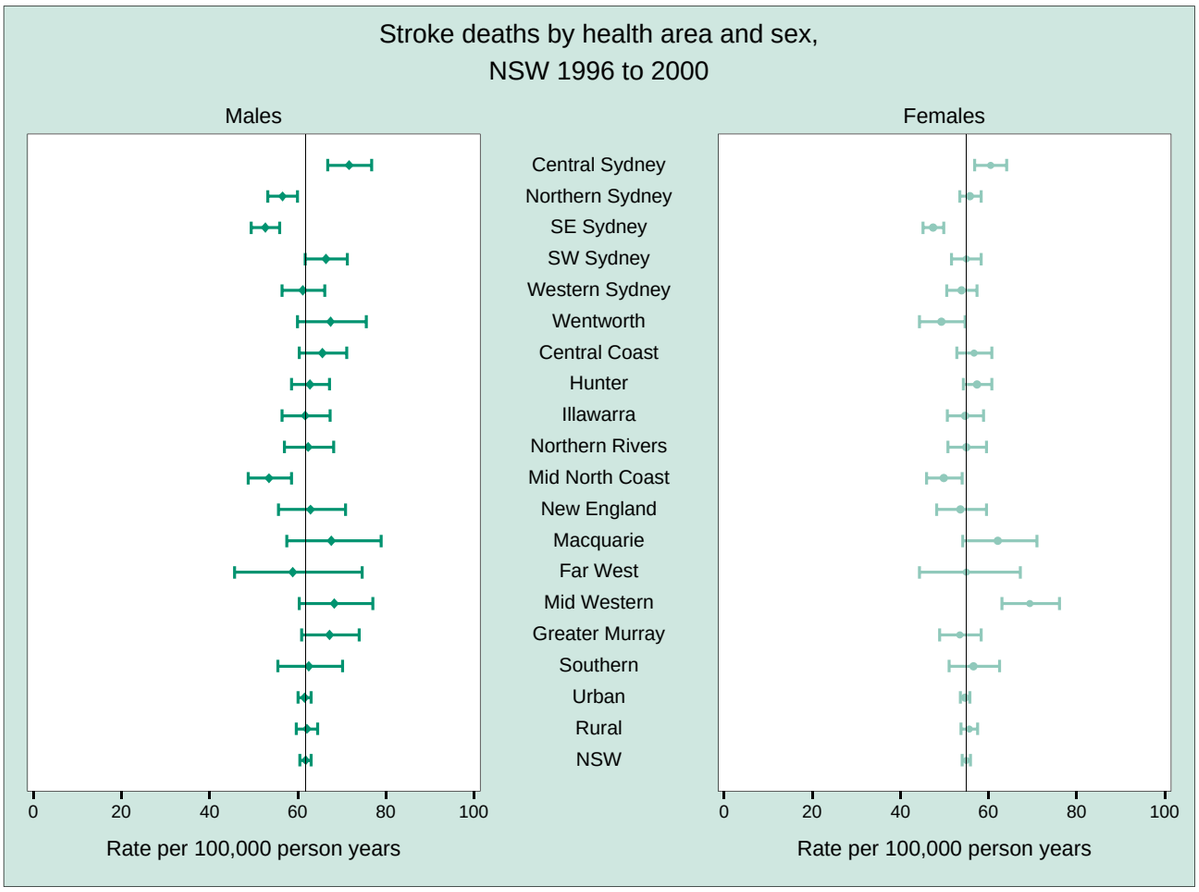
Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001, data for which were unavailable at the time of production. Rates were age-adjusted using the standard Australian population as at 30 June 1991. 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). Epidemiology and Surveillance Branch, NSW Department of Health.

- Stroke, or cerebrovascular disease, refers to sudden blockage of blood vessels supplying the brain, or bleeding into the brain. Stroke can result in damage to the brain and impairment of functions such as movement and communication. About 50% of strokes occur in people aged 75 years or over. About one-third of those who have a stroke will die within 12 months, while a further one-third will have a permanent disability (AIHW, 2001).
- In 2000, stroke caused 4724 deaths (10.4% of all deaths) in NSW, or about 13 deaths each day. Stroke was the second largest cause, after coronary heart disease, of years of life lost due to premature death.
- Death rates from stroke are slightly higher in males than in females. However, larger numbers of females die from stroke. This is because more females live to old age, when the death rate from stroke is higher.
- Death rates from stroke have more than halved since 1980. The declining death rate can be attributed to both reduced incidence and improved survival after stroke. Reductions in some risk factors, including smoking and levels of blood pressure, have contributed to reducing the incidence of stroke. 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, 2001).

For more information:

Australian Institute of Health and Welfare. *Heart, stroke and vascular diseases, Australian Facts—2001.* AIHW Catalogue no. CVD 13. Canberra: AIHW, Heart Foundation of Australia and National Stroke Foundation of Australia, 2001. Available on AIHW Web site at www.aihw.gov.au.



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Source: ABS mortality data and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- In the period 1996 to 2000, there was geographic variation in death rates from stroke in NSW.
- Male and female residents of the South Eastern Sydney and Mid North Coast Health Areas, and male residents of the Northern Sydney Health Area, had the lowest age-adjusted death rates. Higher-than-average rates were recorded in males and females from the Central Sydney Health Area and females from the Mid Western Health Area. Overall, death rates from stroke were similar in urban and rural areas.
- Although death rates from stroke were low in Northern and South Eastern Sydney, these 2 areas had the largest actual numbers of deaths: 3483 deaths in Northern Sydney and 2679 deaths in South Eastern Sydney over the 5-year period. This reflects the large population sizes in these areas, and their age structures.
- 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—2001.* AIHW Catalogue no. CVD 13. Canberra: AIHW, Heart Foundation of Australia and National Stroke Foundation of Australia, 2001. Available on AIHW Web site at www.aihw.gov.au.

Stroke deaths by health area and sex, NSW, 1996 to 2000

Health Area		Number	Rate per 100,000 person years	LL 95% CI	UL 95% CI
Central Sydney	Males	804	71.6	66.7	76.7
	Females	1194	60.4	56.8	64.1
	Persons	1998	66.0	63.1	69.0
Northern Sydney	Males	1134	56.5	53.2	59.9
	Females	2348	55.8	53.4	58.2
	Persons	3483	56.5	54.6	58.5
SE Sydney	Males	1018	52.6	49.4	55.9
	Females	1661	47.4	45.0	49.8
	Persons	2679	50.2	48.3	52.2
SW Sydney	Males	802	66.3	61.7	71.2
	Females	1036	54.9	51.6	58.3
	Persons	1838	59.9	57.2	62.7
Western Sydney	Males	668	61.1	56.4	66.1
	Females	984	53.9	50.5	57.4
	Persons	1652	57.7	55.0	60.6
Wentworth	Males	308	67.4	59.9	75.5
	Females	371	49.3	44.3	54.6
	Persons	679	56.8	52.6	61.3
Central Coast	Males	599	65.6	60.4	71.1
	Females	819	56.6	52.7	60.7
	Persons	1417	61.0	57.8	64.3
Hunter	Males	837	62.8	58.5	67.2
	Females	1270	57.4	54.2	60.7
	Persons	2107	60.1	57.6	62.8
Illawarra	Males	525	61.6	56.4	67.3
	Females	706	54.6	50.7	58.9
	Persons	1230	58.5	55.2	61.8
Northern Rivers	Males	490	62.3	56.9	68.2
	Females	638	54.9	50.7	59.5
	Persons	1128	58.8	55.4	62.3
Mid North Coast	Males	467	53.5	48.7	58.6
	Females	617	49.8	45.9	54.0
	Persons	1084	52.2	49.1	55.4
New England	Males	271	62.8	55.5	70.8
	Females	382	53.6	48.1	59.5
	Persons	652	57.5	53.1	62.2
Macquarie	Males	162	67.6	57.5	78.9
	Females	232	62.1	54.2	70.9
	Persons	394	64.5	58.3	71.3
Far West	Males	70	58.8	45.6	74.5
	Females	98	54.9	44.2	67.2
	Persons	168	57.1	48.7	66.4
Mid Western	Males	267	68.3	60.3	77.0
	Females	469	69.3	63.0	76.1
	Persons	736	69.1	64.1	74.3
Greater Murray	Males	421	67.1	60.8	73.9
	Females	548	53.4	48.9	58.2
	Persons	969	59.5	55.8	63.4
Southern	Males	298	62.5	55.5	70.1
	Females	399	56.5	51.1	62.5
	Persons	697	60.4	56.0	65.1
Urban	Males	6695	61.6	60.1	63.1
	Females	10389	54.7	53.6	55.7
	Persons	17083	58.1	57.3	59.0
Rural	Males	2446	62.0	59.6	64.5
	Females	3382	55.5	53.6	57.5
	Persons	5829	58.9	57.4	60.4
NSW	Males	9149	61.7	60.5	63.0
	Females	13772	54.9	53.9	55.8
	Persons	22921	58.3	57.6	59.1

Note: Deaths were classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Death data are reported by year of death and include an estimate of the small number of deaths occurring in 2000, but registered in 2001. Rates were age-adjusted using the Australian population as at 30 June 1991. LL/UL95%CI = Lower and upper limits of 95% confidence interval of the point estimate.

Source: ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

		1989–90	1990–91	1991–92	1992–93	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
Number	Males	7682	8004	8117	8265	8288	8724	8937	9267	9107	9178	9287
	Females	7496	7876	8402	8204	8020	8183	8551	8556	8545	8922	8655
	Persons	15179	15880	16519	16470	16308	16907	17488	17825	17652	18100	17942
Rate	Males	305.9	311.0	306.8	303.5	298.2	304.7	305.0	307.4	293.8	288.2	285.0
per 100,000	Females	218.3	224.6	231.9	221.2	210.8	211.8	214.9	210.2	204.9	209.2	197.3
population	Persons	256.8	262.5	265.7	258.7	249.9	253.3	255.2	253.3	245.0	245.4	237.2

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 1991.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Stroke was the principal reason for 17,942 hospitalisations of NSW residents in the financial year 1999–00. Stroke is an important contributor to hospital costs, because the average length of hospital stays is 9.5 days, around twice that for other cardiovascular diseases (AIHW, 2001).
- The male hospitalisation rate for stroke is around 1.4 times the female rate. Hospitalisation for stroke increases with age, with people aged 65 years and over contributing three-quarters of hospitalisations (AIHW, 2001).
- Between 1989–90 and 1997–98, 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 NSW. With improvements in survival after stroke, and more elderly people in the population, its contribution to the burden of disability will increase.
- Trends in hospitalisations for stroke do not directly reflect the incidence of disease. They are based on episodes rather than people (1 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—2001.* AIHW Catalogue no. CVD 13. Canberra: AIHW, Heart Foundation of Australia and National Stroke Foundation of Australia, 2001. Available on AIHW Web site at www.aihw.gov.au.

Australian Institute of Health and Welfare (AIHW) Burden of Disease Web site at www.aihw.gov.au/bod/index.html.

Chapter 4.2

Diabetes

- Around 8% of males and 7% of females aged 25 years or more have diabetes, and up to half of these may be undiagnosed.
- Diabetes has an important effect on quality of life. People with diabetes are much more likely than the general population to rate their own health as fair or poor.
- Diabetes is the main cause of around 2% of all deaths, and is a contributing cause in around 8% of all deaths. Cardiovascular disease is the most common cause of death among people with diabetes.
- Death rates from diabetes increase with increasing levels of socioeconomic disadvantage.
- Hospitalisations due to diabetes have declined over the past 10 years, both in terms of total hospitalisations and persons hospitalised, per head of population. This may indicate improved management of diabetes in primary health care settings.
- However, there were 293 hospital admissions for diabetic coma in 1999–00. This complication of diabetes should occur only rarely, if at all, with proper medication, management, and diet.

In this chapter

- Diabetes or high blood sugar
- Self-rated health
- Cause of death
- Deaths by socioeconomic status
- Diabetes hospitalisations and persons hospitalised
- Hospitalisations for diabetic coma

Introduction

Diabetes mellitus is a chronic condition characterised by high blood sugar levels; it is caused by either a deficient production of insulin or resistance to its action. In uncontrolled diabetes, sugar builds up in the bloodstream and can lead to a range of short- and long-term problems (AIHW, 2002). There are 3 main forms of diabetes: type 1, or insulin-dependent diabetes mellitus (IDDM), is characterised by a complete deficiency of insulin and is present in 10–15% of people with diabetes; type 2, or non-insulin-dependent diabetes mellitus (NIDDM), is the most common form of diabetes, affecting mainly people aged 40 years and over; gestational diabetes occurs during pregnancy in about 4–6% of women not previously known to have diabetes. Gestational diabetes increases the risk of developing diabetes later in life. Heredity, pregnancy, low birthweight, and age are risk factors for diabetes, as are lifestyle factors such as poor diet, physical inactivity, and—particularly—obesity (AIHW, 2002).

Because diabetes shares a number of risk factors with other chronic diseases—such as cardiovascular diseases and chronic obstructive pulmonary diseases—the coordination of prevention strategies is essential to ensure better health outcomes (CDHAC, 1999; NPHP, 2001). The management of diabetes depends on: careful control of blood sugar (glucose) levels, blood lipid (fat) levels, especially cholesterol levels and blood pressure; and regular screening for complications (NSW Department of Health, 1996; Australian Centre for Diabetes Strategies, 2001). The NSW Department of Health has developed a framework for improving health care for people with chronic and complex health problems. Its aims are to improve the quality of life of people with these health conditions, and to prevent the need for emergency care and admission to hospital (NSW Department of Health, 2000).

This chapter presents recent data on the prevalence of diabetes, the self-rated health status of people with diabetes, and deaths and hospitalisations where diabetes is a principal or contributing cause. The methods used are described in more detail in the Methods section.

For more information:

Australian Institute of Health and Welfare. *Chronic diseases and associated risk factors in Australia, 2001.* Canberra: AIHW, 2002.

National Public Health Partnership. *Preventing Chronic Disease: A strategic framework—Background paper*. Melbourne: NPHP, 2001. Available on the NPHP Web site at www.dhs.vic.gov.au /nphp/chrondis/index.htm.

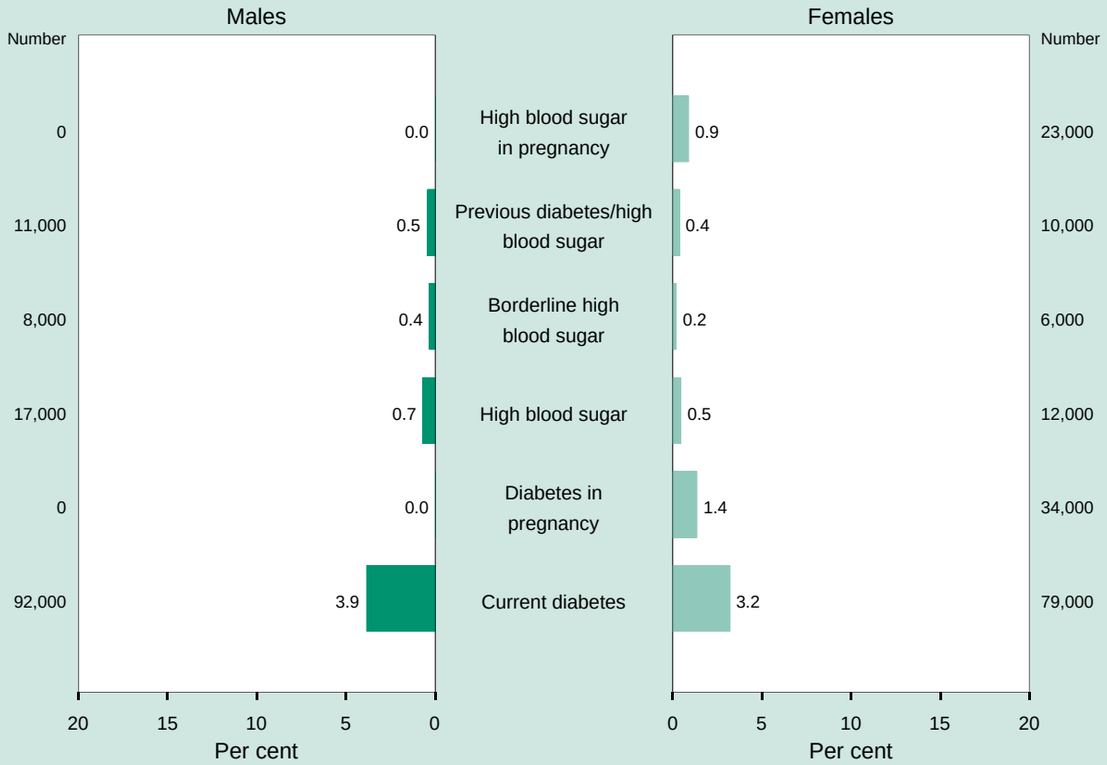
NSW Department of Health. *Improving health care for people with chronic and complex needs in NSW.* Sydney: NSW Department of Health, 2000.

Commonwealth Department of Health and Aged Care. *National Diabetes Strategy, 2000–2004.* Canberra: CDHAC, 1999.

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/crcp/publications/diabetes/diabguid.html

Australian Centre for Diabetes. *National evidence based guidelines for the management of Type 2 diabetes mellitus.* Sydney: Prince of Wales Hospital, 2001.

Self-reported doctor-diagnosed diabetes or high blood sugar by sex, persons aged 16 years and over, NSW 1997 and 1998



Note: Diabetes or high blood sugar include 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 blood sugar (HBS)?' Estimates are based on 35,025 respondents. 183 (0.5%) not stated for having diabetes or high blood sugar. LL/UL95%CI = Lower and upper limits of 95% confidence interval of the point estimate.

Source: 1997 and 1998 NSW Health Survey (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- In the 1997 and 1998 NSW Health Surveys, 3.9% of males and 3.2% of females aged 16 years or more reported that they currently suffer from diabetes diagnosed by a doctor or at a hospital. A further 1.1% of males and 0.7% of females reported high or borderline blood glucose levels. The prevalence of diabetes or high blood sugar increased dramatically with age, consistent with the pattern of a higher incidence of the much more common Type 2 diabetes mellitus, which is known to increase sharply with age.
- These estimates are likely to underestimate the true number of people suffering from diabetes in NSW, because it is well known that a considerable proportion of the population suffers from undiagnosed Type 2 diabetes mellitus (Hadden and Harris, 1987).
- A study of blood sugar levels and glucose tolerance in a sample of the Australian population in 2000 suggests that the true prevalence of diabetes in people aged 25 years or more is 7.5% (8.0% for males and 7.0% for females), and that the prevalence of impaired glucose tolerance (which is an early stage of Type 2 diabetes mellitus) is over 16% (AIHW, 2002).

For more information:

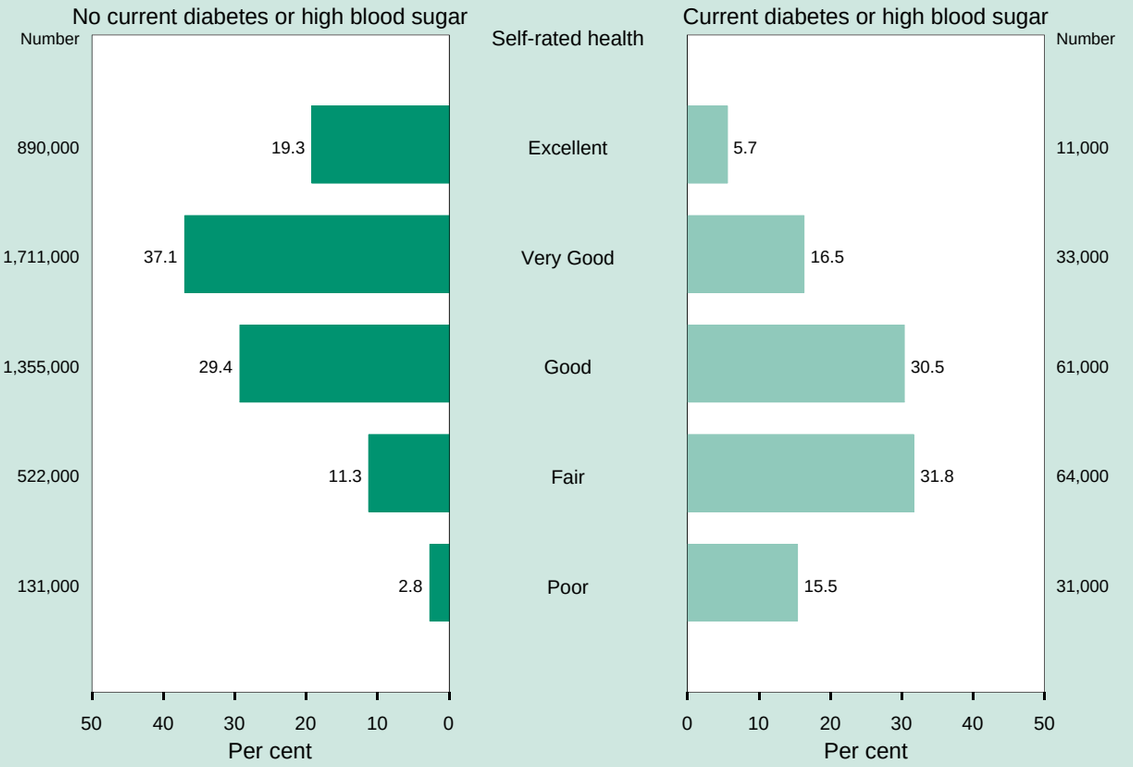
Australian Bureau of Statistics. *1995 National Health Survey: Diabetes.* ABS Catalogue no. 4371.0. Canberra: ABS, 1997.

Hadden WC, Harris MI. Prevalence of diagnosed diabetes, undiagnosed diabetes, and impaired glucose tolerance in adults 20–74 years of age, United States, 1976–1980. *Vital and health statistics* 1987; 11(237).

Australian Bureau of Statistics Web site at www.abs.gov.au.

Australian Institute of Health and Welfare. *Chronic diseases and associated risk factors in Australia, 2001.* Canberra: AIHW, 2002.

Self-rated health by current diabetes or high blood sugar, persons aged 16 years and over, NSW 1997 and 1998



Note: Current diabetes or high blood sugar include 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 blood sugar (HBS)?' The figures exclude those reporting previous diabetes–HBS or diabetes–HBS during pregnancy. Estimates are based on 35,025 respondents. 183 (0.5%) not stated for having diabetes or high blood sugar. LL/UL95%CI = Lower and upper limits of 95% confidence interval of the point estimate.

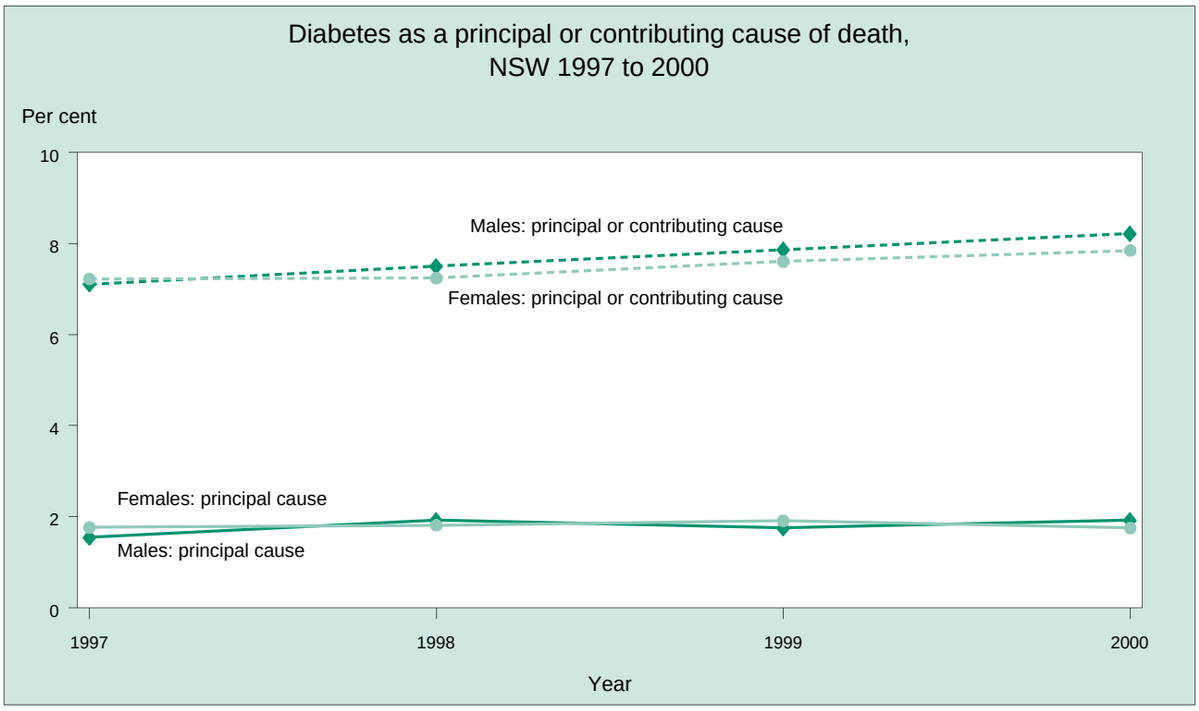
Source: 1997 and 1998 NSW Health Survey (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Longitudinal studies worldwide have consistently shown that global self-rated health is a strong and independent predictor of subsequent illness and premature death (Idler and Benyamini, 1997; McCallum et al., 1994).
- In the 1997 and 1998 NSW Health Surveys, people reporting that they currently have diabetes or high blood sugar that was diagnosed by a doctor or at a hospital, also rated their health as being worse than those without diabetes. Respondents with current diabetes or high blood sugar were over 5 times more likely to report that their health was 'poor' and almost 4 times more likely to report that it was only 'fair' compared with those without diabetes or high blood sugar. This result can be partly explained by the influence of age and socioeconomic status. Older people and those of lower socioeconomic status are more likely to rate their health as being only 'fair' or 'poor'. These groups are also more likely to have diabetes or high blood sugar levels.

For more information:

Idler EL, Benyamini Y. Self-rated health and mortality: A review of twenty-seven community studies. *J Health and Soc Behav* 1997; 38: 21–37.

McCallum J, Shadbolt B, Wang D. Self-rated health and survival: A 7-year follow-up study of Australian elderly. *Am J Public Health* 1994; 84: 1100–5.



			1997	1998	1999	2000
Number	Principal or contributing cause	Persons	3245	3296	3488	3636
	Principal cause	Persons	747	834	822	832
Per cent	Principal or contributing cause	Persons	7.2	7.4	7.7	8.0
	Principal cause	Persons	1.6	1.9	1.8	1.8

Note: Data includes deaths from diabetes as an underlying (principal) cause and also as a contributing cause of death. Deaths were classified by ICD-9 up to 1998 and ICD-10 from 1999 onwards. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001, data for which were not available 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 ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

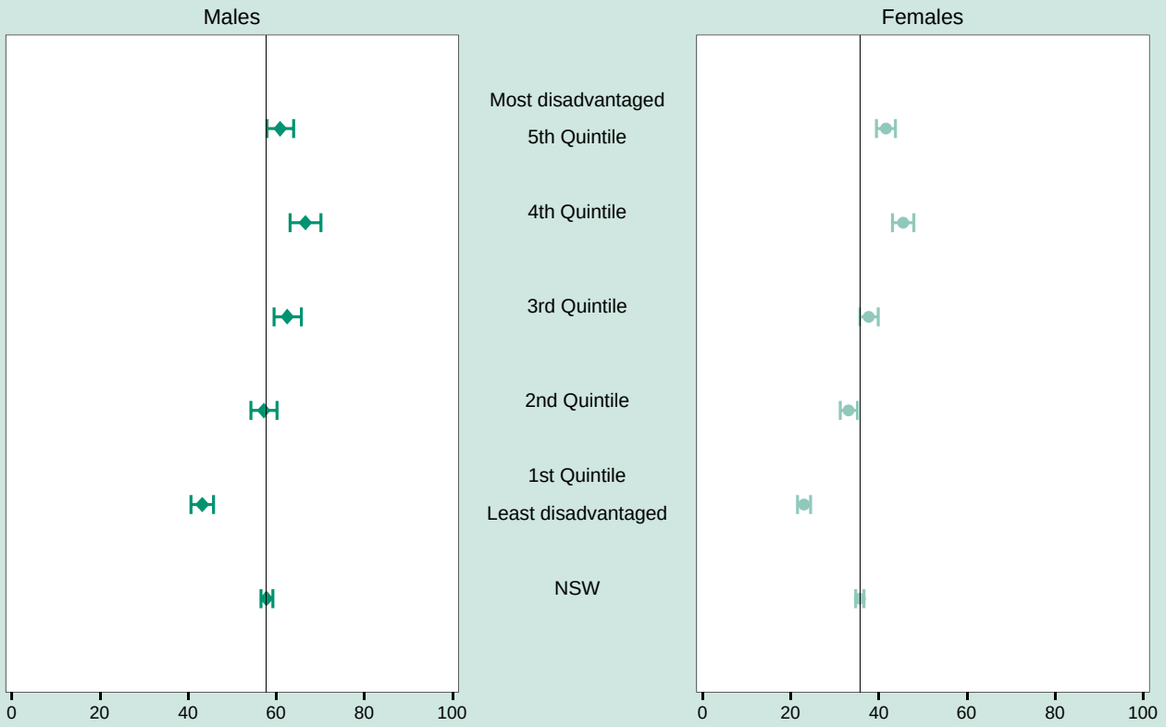
- In 1999, diabetes was recorded as the underlying or principal cause of death in 2.3% of all deaths registered in Australia (ABS, 2000). However, because diabetes is associated with a range of long-term complications that may also cause death, it is also useful to consider deaths in which diabetes is a contributing factor. Since 1997, the Australian Bureau of Statistics has recorded both the underlying cause and contributing factors in deaths data. Diabetes was either the principal cause of death or a contributing factor in 7.5% of all deaths registered in 1999 (ABS, 2000).
- In NSW, diabetes was the principal underlying cause of 1.8% (832) deaths in 2000 and the principal cause or a contributing factor in 8.0% (3636) deaths. The mortality burden of diabetes was slightly higher in males (8.2% of all deaths as principal or contributing cause) compared with females (7.8% of all deaths as principal or contributing cause). Cardiovascular disease, including ischaemic heart disease, heart failure, and stroke, is the most common (principal or contributing) cause of death among people with diabetes (AIHW, 2001).
- The percentage of deaths with diabetes as a principal cause remained stable between 1997 and 2000. However, the proportion of deaths with diabetes as a contributing cause increased slightly but steadily over this time in both sexes, from 7.1% to 8.2% of all male deaths, and from 7.2% to 7.8% of all female deaths.

For more information:

ABS. *Causes of Death, Australia 1999.* ABS Catalogue No. 3303.0. Canberra: Australian Bureau of Statistics, 2000.

Australian Institute of Health and Welfare. *Heart, stroke and vascular diseases. Australian facts, 2001.* Canberra: AIHW, 2001.

Diabetes as a principal or contributing cause of death
by quintile of socioeconomic disadvantage and sex, NSW 1997 to 2000



Quintile of IRSD score for LGAs		Rate per 100,000 person years	LL 95% CI	UL 95% CI
5th Quintile (Most disadvantaged)	Persons	50.3	48.5	52.1
4th Quintile	Persons	54.7	52.7	56.7
3rd Quintile	Persons	48.6	46.8	50.4
2nd Quintile	Persons	43.6	41.9	45.3
1st Quintile (Least disadvantaged)	Persons	31.2	29.8	32.6
NSW	Persons	45.2	44.5	46.0

Note: Includes deaths from diabetes as principal or contributing cause of death. Deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001, data for which were not available at the time of production. Rates were age-adjusted using the standard Australian population as a 30 June 1991. LL/UL95%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, ABS population estimates and ABS SocioEconomic Indices for Areas (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

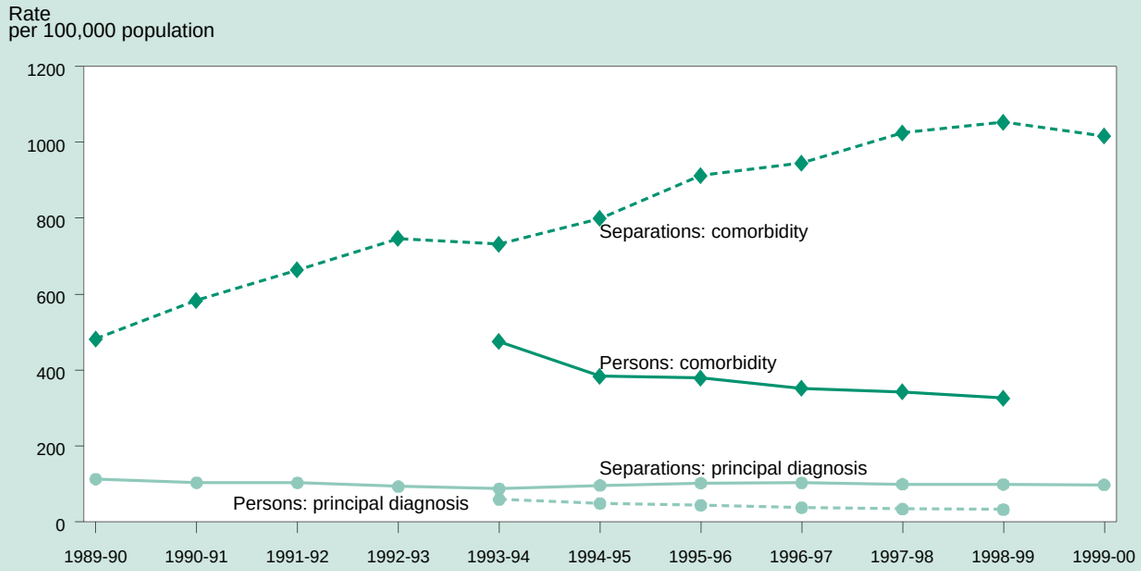
- In NSW, for the period 1997–2000, the death rate from diabetes as a principal or contributing cause, was 62% higher in people from the lowest SES group compared to the highest. This difference was greater for females (82%) than males (42%). The death rate increased gradually from the highest SES group to the second lowest. A similar socioeconomic gradient has been observed in death rates from other causes (see Chapter 3.4).
- The socioeconomic differences in diabetes death rates reflects a higher prevalence of risk factors for diabetes in people in lower SES groups, and also possibly poorer management of the disease in these groups. It may be more difficult for people of lower SES to comply with guidelines, both for financial reasons and because of lesser access to appropriate services.

For more information:

Australian Institute of Health and Welfare. *Chronic diseases and associated risk factors in Australia, 2001.* Canberra: AIHW, 2002.

Public Health Division, NSW Department of Health. *Electronic Report of the 1997 and 1998 NSW Health Surveys* at www.doh.health.nsw.gov.au/public-health/nswhs.

Hospital separations for diabetes and persons hospitalised with diabetes as a principal diagnosis or comorbidity, NSW 1989-90 to 1999-00



		Sex		89–90	90–91	91–92	92–93	93–94	94–95	95–96	96–97	97–98	98–99	99–00
Number	Principal diagnosis	Persons	Separations	6299	6026	5943	5588	5275	5948	6442	6598	6461	6511	6518
			Persons	.	.	.	.	3642	3013	2762	2394	2194	2113	.
	Comorbidity	Persons	Separations	27817	34906	39946	46513	46271	51639	60026	63452	70310	73660	72440
			Persons	.	.	.	.	30467	25099	25171	23837	23622	22993	.
Rate/100,000	Principal diagnosis	Persons	Separations	106.9	100.6	97.6	90.4	84.4	93.7	99.8	100.5	96.8	96.3	95.5
			Persons	.	.	.	.	58.3	47.6	43.0	36.7	33.2	31.7	.
	Comorbidity	Persons	Separations	4468.5	576.3	645.1	737.6	721.1	789.1	901.1	932.9	1013.6	1037.7	1001.6
			Persons	.	.	.	.	474.8	383.9	378.9	351.4	342.0	325.8	.

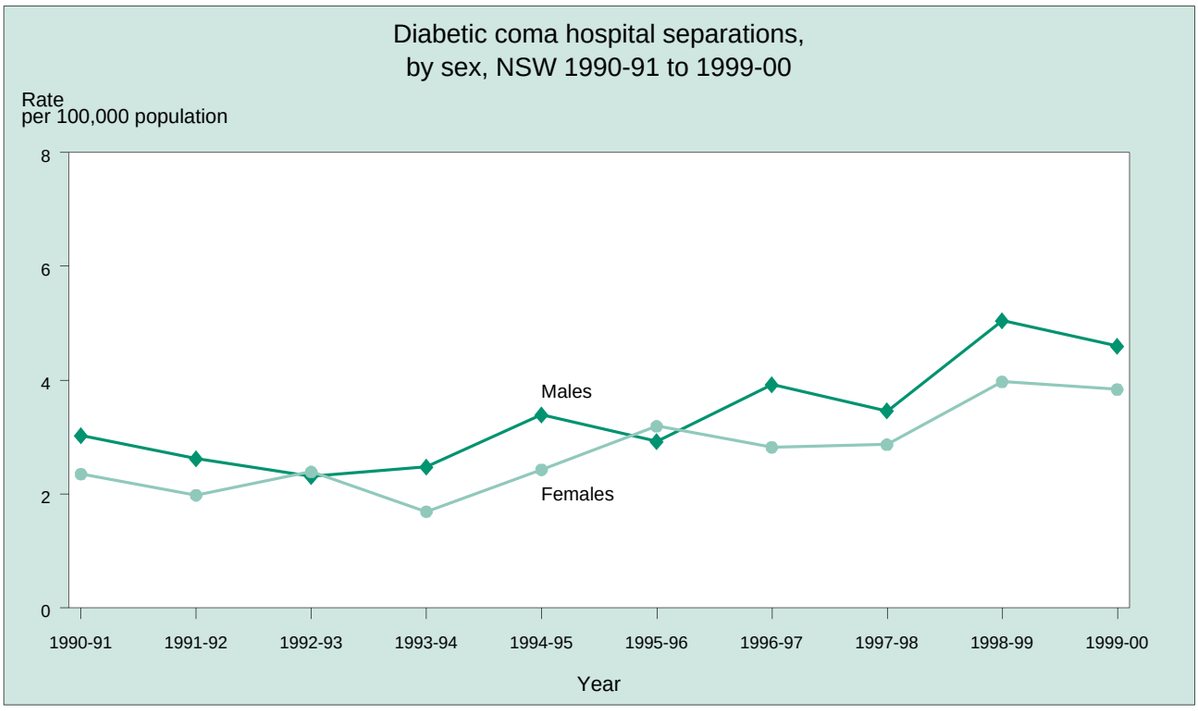
Note: Diabetes was the principal reason for hospitalisation or 1 of the first 5 reasons (comorbidity). Persons hospitalised were calculated from 6 years of hospital inpatient data linked using probabilistic methods (see Methods section). Hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 1991. 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). Epidemiology and Surveillance Branch, NSW Department of Health.

- Uncontrolled diabetes can lead to short-and long-term health problems that may require hospitalisation. Diabetes also contributes to the development of cardiovascular 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, with diabetes recorded as a comorbidity.
- The rate of hospital separations for diabetes as a principal diagnosis declined by about 10% between 1989–90 and 1999–00 in NSW, mainly due to a 19% decline in females. The rate in males was stable. In contrast, the rate of hospitalisation with diabetes as a comorbidity more than doubled for both sexes over the same period. When the hospital separation data was linked to provide information on a person, rather than on a hospitalisation basis, rates for diabetes as both a principal diagnosis and as a comorbidity actually declined between 1993–94 and 1998–99, by 46% and 30%, respectively. This may indicate improved management of diabetes in primary health care settings.
- The average number of hospital separations per person increased from about 1.5 in 1993–94 to around 3 in 1998–99, for diabetes as a principal diagnosis or as a comorbidity. This may reflect improved recording of diabetes in hospital data, changes in criteria for hospital admission, and perhaps increasingly severe disease in a smaller number of people.

For more information:

Australian Institute of Health and Welfare. *Chronic diseases and associated risk factors in Australia, 2001*. Canberra: AIHW, 2002.



		1990–91	1991–92	1992–93	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
Deaths	Males	83	74	65	70	102	90	120	110	162	150
	Females	75	66	82	58	85	116	100	107	150	147
	Persons	157	140	147	128	187	206	220	217	312	297
Rate	Males	3.0	2.6	2.3	2.5	3.4	2.9	3.9	3.5	5.0	4.6
per 100,000	Females	2.3	2.0	2.4	1.7	2.4	3.2	2.8	2.9	4.0	3.8
population	Persons	2.6	2.3	2.4	2.0	2.9	3.1	3.3	3.2	4.4	4.2

Note: Data include hospital separations for diabetic coma as a principal diagnosis only. Hospital separations were classified using ICD-9 up to 1997–98 and ICD-10 from 1998–99 onwards. Hospital separations were age-adjusted using the Australian population as at 30 June 1991.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Severely impaired consciousness (coma) can occur in any type of diabetes mellitus as a result of wide-ranging metabolic complications. It is a life threatening situation and can affect people know to have diabetes, as well as those whose diabetes has not yet been recognised. Proper medication, management, and diet, prevent the occurrence of diabetic coma, which usually develops over a period of time, accompanied by symptoms. Consequently, diabetic coma is considered an indication of poor management of diagnosed diabetes.
- Although hospital separations for diabetic coma in NSW are still rare, between 1990–91 and 1999–00, the rate of hospitalisation increased by 60%. The rate of increase was slightly higher in females (65%) than in males (50%) over the period. In 1999–00, there were 297 hospital admissions for diabetic coma in NSW (150 in males and 147 in females).
- The national guidelines for the management of diabetes aim to achieve control of blood sugar (glucose) levels through a combination of diet, exercise, and insulin injections or tablets. The guidelines also recommend a range of regular tests to monitor metabolic indicators in people with diabetes, to help prevent complications or coma (Australian Centre for Diabetes Strategies, 2001).

For more information:

Public Health Division, NSW Department of Health. *Electronic Report of the 1997 and 1998 NSW Health Surveys* at www.doh.health.nsw.gov.au/public-health/nswhs.

Australian Centre for Diabetes Strategies. *National evidence based guidelines for the management of Type 2 diabetes mellitus.* Sydney: Prince of Wales Hospital, 2001.

Chapter 4.3

Cancer

- Cancer is the second most common cause of disease burden in both sexes (after cardiovascular diseases), accounting for just under one-fifth of years of healthy life lost due to premature death, disease, and injury.
- In 2000, there were 28,889 new cases of cancer, and 12,185 deaths from cancer. Between 1980 and 2000, the incidence rates for all cancers rose by almost 25%. This reflects earlier diagnosis of some cancers owing to increased screening; a real rise in new cases of some cancers; and improved notification of cancer cases.
- In 2000, death rates from all cancers were the lowest recorded since 1972.
- Lung cancer:
  - —is the most common cause of cancer death;
  - —incidence has decreased by 18% in males in the last decade, but increased by 17% in females, reflecting trends in smoking;
- Colorectal cancer:
  - —is the most commonly diagnosed cause of new cases of cancer and the second most common cause of cancer death;
  - —had a 5-year survival rate of 60% in 1994–1998, increasing from 50% survival in 1980–1984;
- Melanoma:
  - —increased in incidence and mortality in males, but not in females, between 1990 and 2000;
- Prostate cancer:
  - —incidence increased dramatically between 1988 and 1994, but then declined, probably reflecting the effect of PSA testing;
- Breast cancer:
  - —incidence has increased by 19% in the last decade, but mortality rates have declined by 24%, in association with the 2-yearly breast cancer screening program targeted at women aged 50–69 years;
- Cervical cancer:
  - —has been decreasing in incidence since 1972 in association with increasing uptake of Pap tests by 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, forming 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. Some invade and spread quickly, while others may remain in the body for years without symptoms. A number of cancers share risk factors, but most have a unique set of causal factors. These include smoking, dietary influences, infectious agents, radiation, and genetic factors. Causal factors for many cancers remain unknown. Some cancers can be prevented though avoiding 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, 2001).

In NSW, all public and private hospitals and pathology laboratories are required to notify cases of cancer. The NSW Central Cancer Registry, based at The Cancer Council NSW, collects and reports annually on cancer cases and deaths on behalf of the NSW Department of Health. The latest published data are for cases diagnosed in 2000. Non-melanocytic skin cancers—the most common type of cancer—are not included in the collection.

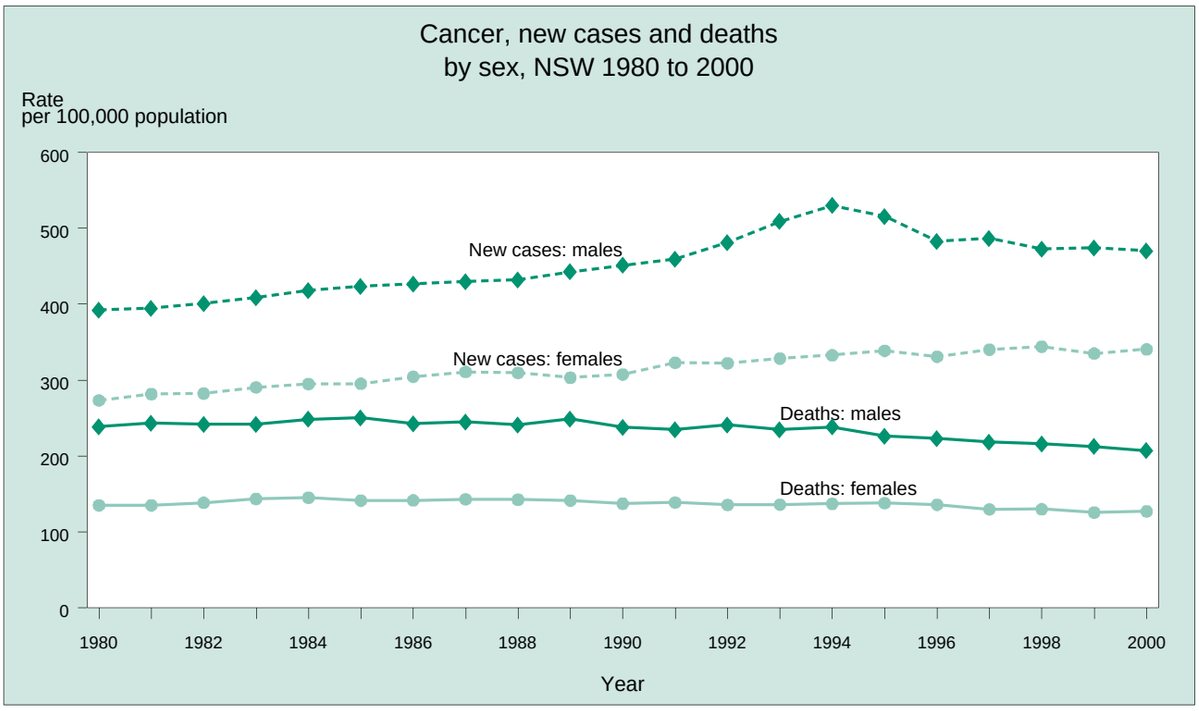
This chapter contains an analysis of the incidence and mortality of 6 cancers: lung, colorectal (large bowel), melanoma of the skin, prostate, breast, and cervical cancers. Death data presented here are from the Australian Bureau of Statistics mortality collection. Further detail on other cancers can be found in publications of The Cancer Council NSW (Coates and Tracey et al., 2002). The methods used for analysing and presenting data are described in more detail in the Methods section.

For more information:

Australian Institute of Health and Welfare and Australasian Association of Cancer Registries. *Cancer in Australia 1998.* AIHW Catalogue no. CAN 12. 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 the Web site at www.cancercouncil.com.au.

Coates M, Tracey EA. *Cancer in NSW: Incidence and mortality 1999. Featuring 30 years of cancer registration.* Sydney: The Cancer Council NSW, 2001.



		1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
New cases	Number	21120	21821	23080	24090	25594	26864	27257	26681	27694	27934	28253	28889
Rate per 100,000 population		359.4	365.1	377.5	386.4	402.6	414.9	413.0	395.2	401.9	398.1	394.4	395.9
Deaths	Number	10882	10682	10930	11236	11323	11731	11663	11839	11755	11966	11969	12185
Rate per 100,000 population		185.2	178.5	178.1	179.1	176.5	179.0	173.9	171.9	166.7	166.0	162.2	161.1

Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Deaths data are reported by year of death. Rates were age-adjusted using the Australian population as at 30 June 1991. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

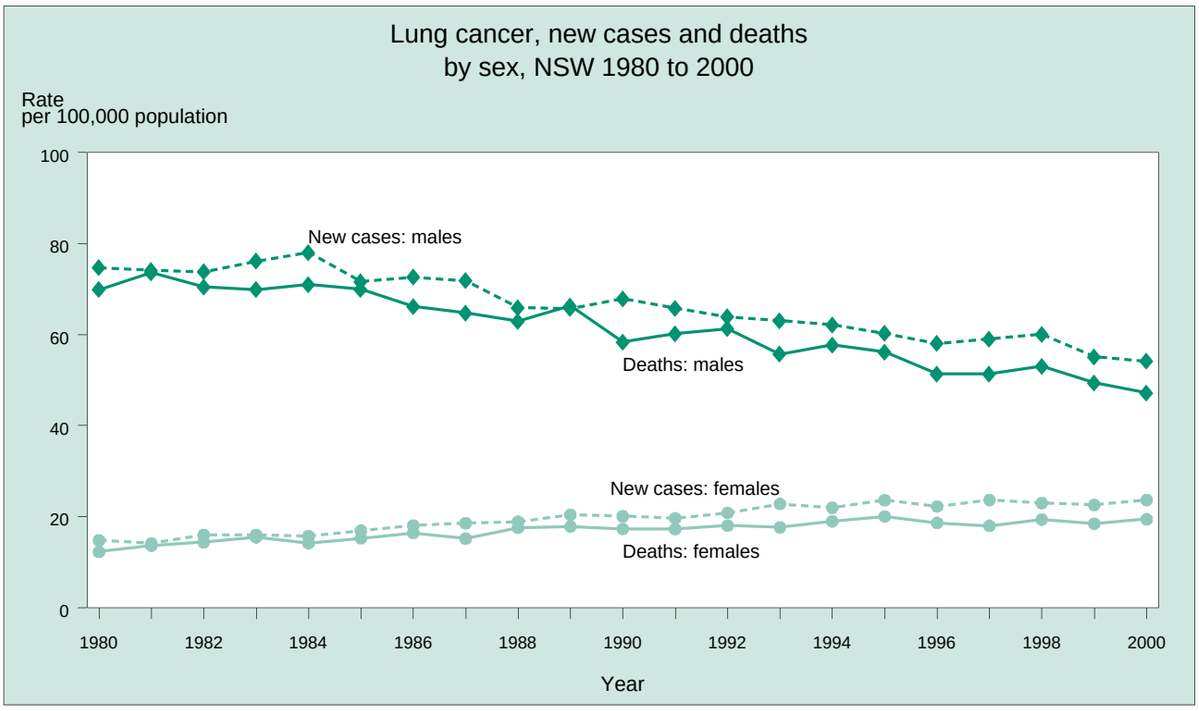
Source: NSW Central Cancer Registry incidence data, ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- In NSW in 2000, there were 28,889 new cases of cancer (54% in males) and 12,185 deaths from cancer (56% in males).
- Four cancers accounted for 62% of new cancers in males. These were prostate cancer (24%); large bowel (15%); melanoma (11%); and lung cancer (9%). Four cancers accounted for 58% of new cancers in females. These were breast cancer (29%); large bowel (13%); melanoma of the skin (9%); and lung cancer (7%).
- For males, 3 cancers accounted for 49% of cancer deaths. These were lung cancer (23%); large bowel (13%); and prostate cancer (13%). For females, 3 cancers accounted for 44% of cancer deaths. These were breast cancer (16%); colorectal cancer (14%); and lung cancer (14%) (Tracey et al., 2002).
- Between 1980 and 2000, the incidence rates for all cancers rose by almost 25%. The peak in male cancer incidence rates in 1994 was due to increased notificaton of prostate cancer, which then declined. Death rates over this time dropped in both sexes. Death rates in 2000 were the lowest since the NSW Cancer Registry began operation in 1972 (Tracey et al., 2002).
- Five year relative survival rates for the 10 most common cancers in the period 1980 to 1995 ranged from 10.1% for lung cancer in males to 95.1% for melanoma of the skin in females. (Supramaniam et al., 1999).
- Increased incidence for all cancers reflects earlier diagnosis of some cancers due to increased screening; a real rise in new cases of some cancers; and improved notification of cases. Reduced death rates reflect successful treatment of some 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.

Supramaniam R, Smith DP, Coates MS, Armstrong BK. *Survival from cancer in NSW in 1980 to 1995.* Sydney: NSW Cancer Council, 1999.



		1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
New cases	Number	2387	2483	2465	2503	2589	2581	2634	2588	2716	2781	2665	2735
	Rate per 100,000 population	40.3	41.2	40.0	39.9	40.5	39.6	39.7	38.2	39.2	39.5	37.1	37.2
Deaths	Number	2300	2116	2214	2318	2190	2346	2375	2245	2267	2432	2328	2356
	Rate per 100,000 population	38.8	35.1	35.9	36.9	34.2	35.9	35.6	33.0	32.5	34.1	32.1	31.8

Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Deaths data are reported by year of death. Rates were age-adjusted using the Australian population as at 30 June 1991. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

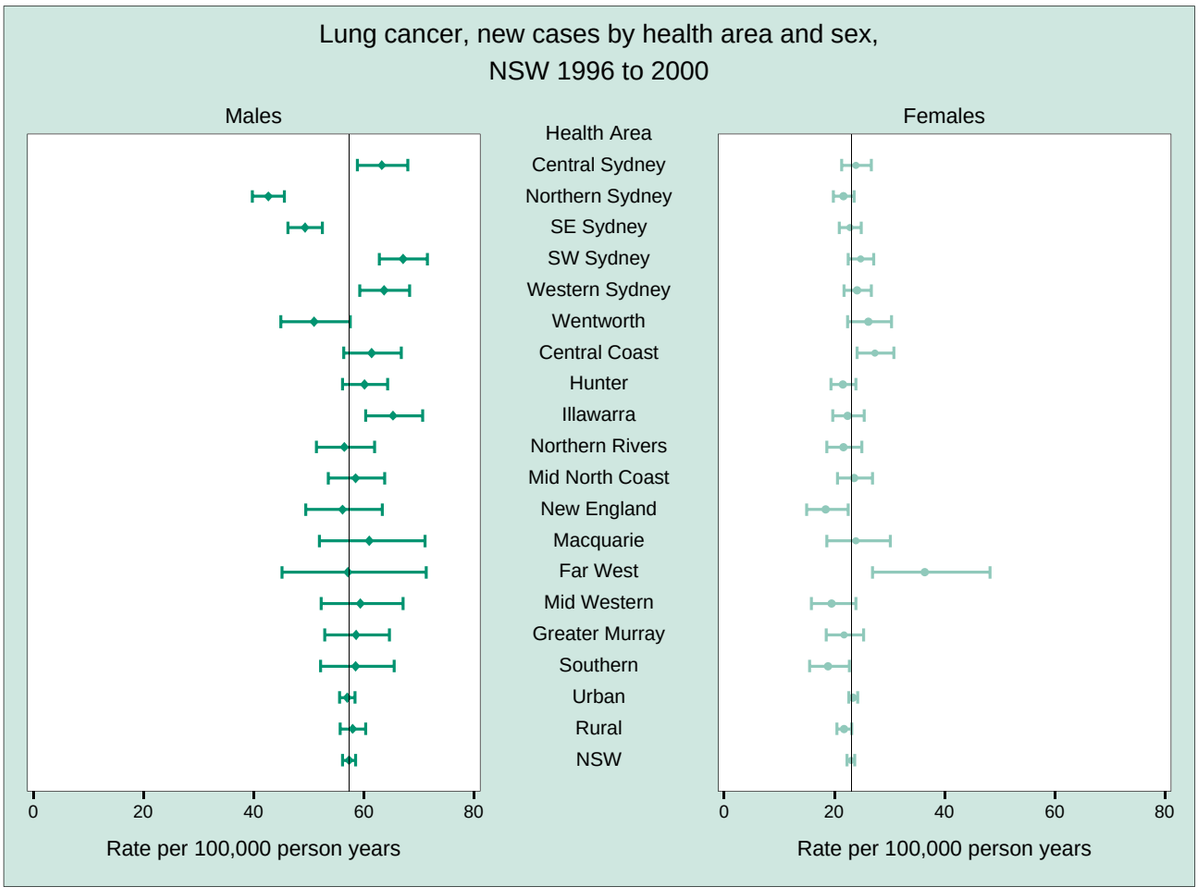
Source: NSW Central Cancer Registry incidence data, ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- In NSW, lung cancer was the sixth most common cause of overall disease burden in 1996, accounting for just under 4% of total years of healthy life lost.
- In 2000, lung cancer was the third most commonly diagnosed cause of new cases of cancer in men and the fourth most common in women. There were 1805 new cases in males and 930 in females (12% and 7% of all new cases respectively). Lung cancer ranked first among males and second among females as a cause of cancer death (23% and 14% of cancer deaths respectively) (Tracey et al., 2002).
- Between 1980 and 2000, overall lung cancer incidence and death rates declined slightly, reflecting a decrease in males and an increase in females. Between 1990 and 2000, there was an 18% decrease in incidence and 22% decrease in death rates in males, whereas for females there was a 17% increase in incidence and a slight increase in death rates. Incidence is expected to decline further in males, but remain static in females until 2010 (Tracey et al., 2002).
- The main risk factor for lung cancer is cigarette smoking. Current lung cancer rates reflect smoking rates 20 years or more in the past. Tobacco smoking among men has been declining over the last 50 years, while smoking in women only began to decline 20 years ago (Goumas et al., 2002).
- Five-year relative survival for lung cancer is the lowest of any cancer, but has improved. Between 1980–84 and 1995–95, survival increased from 9% to 14% in males and 11% to 17% in females (Goumas et al., 2002).

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.

Goumas C, O'Connell D, Smith D, Armstrong BK. *Lung cancer in NSW in 1973 to 1998.* Sydney: The Cancer Council NSW, 2002.



Note: New cases of cancer and deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Deaths data are reported by year of death and include an estimate of the small number of deaths occurring in 2000, but registered in 2001, data for which were not available at the time of production. Rates were age-adjusted using the standard Australian population as at 30 June 1991. Lower and upper limits of 95% confidence interval of the point estimate are shown.

Source: NSW Central Cancer Registry incidence data and ABS mortality and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- In the period 1996 to 2000, lung cancer incidence rates were higher than the state average in males in Central Sydney, South Western Sydney, Western Sydney, and the Illawarra Health Areas, and females living in the Central Coast and Far West Health Areas. Males had lower than average rates in the Northern Sydney and South Eastern Sydney Health Areas.
- While lung cancer incidence is similar in health areas grouped into urban and rural categories, differences are apparent according to degree of remoteness based on road distance from major service centres. Between 1993 and 1998, the highest incidence and mortality rates were found in remote areas, whereas the lowest rates were in moderately accessible and accessible areas (Goumas et al., 2002). Survival rates were lowest in females in remote areas and males in moderately accessible areas (Jong et al., 2001).
- Although there is a lag between exposure to tobacco smoking and lung cancer of around 20 years, geographic patterns of current smoking are similar to those for lung cancer (Public Health Division, 2001). Higher rates of current smoking are associated with lower socio-economic status and with indigenous status.

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.

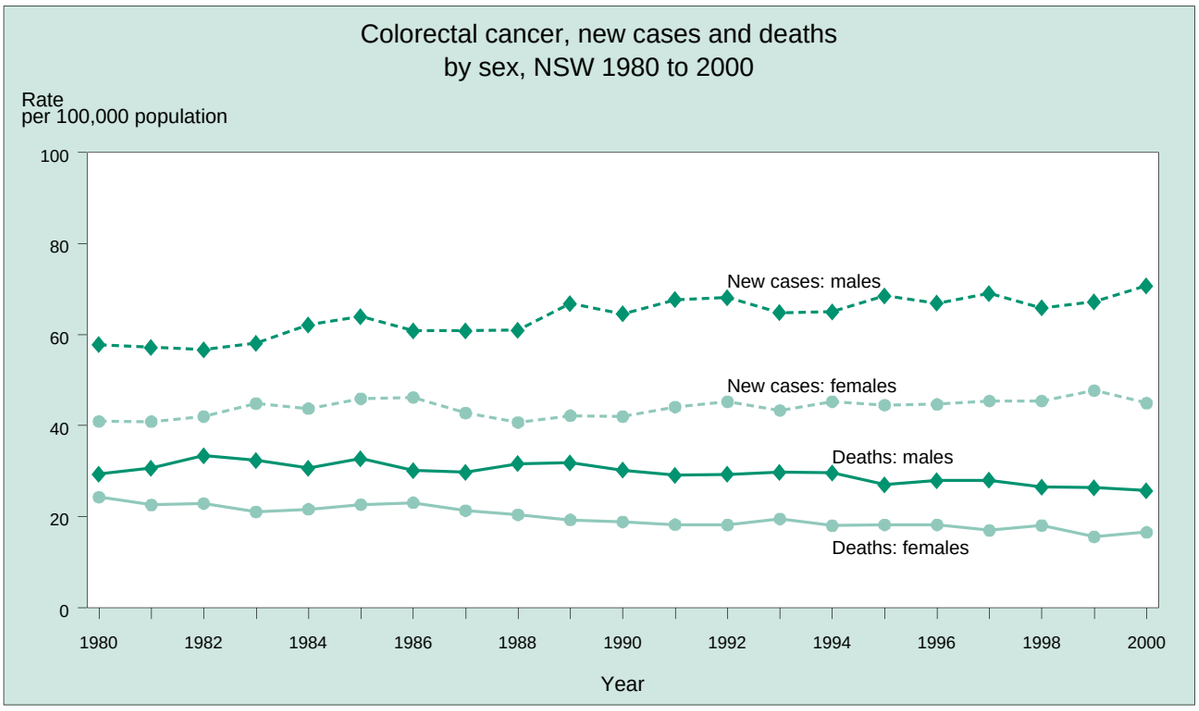
Public Health Division. *The 1997 and 1998 NSW Health Survey Report.* Sydney: NSW Department of Health, 2001. Web site at www.health.nsw.gov.au/public-health/nswhs.

Lung cancer, new cases by health area and sex, NSW 1996 to 2000

Health Area		New cases Number	Rate/ 100,000	LL 95% CI	UL 95% CI	Deaths Number	Rate/ 100,000	LL 95% CI	UL 95% CI
Central Sydney	Males	748	63.3	58.8	68.0	615	52.5	48.4	56.8
	Females	319	23.9	21.3	26.7	263	18.8	16.5	21.2
	Persons	1067	41.7	39.2	44.3	878	33.9	31.7	36.2
Northern Sydney	Males	846	42.6	39.8	45.6	722	36.6	33.9	39.3
	Females	560	21.6	19.8	23.6	447	16.4	14.8	18.0
	Persons	1406	30.2	28.6	31.8	1169	24.5	23.1	26.0
SE Sydney	Males	963	49.3	46.2	52.5	822	42.0	39.2	45.0
	Females	559	22.8	20.9	24.8	423	16.5	14.9	18.2
	Persons	1522	34.3	32.6	36.1	1245	27.5	26.0	29.1
SW Sydney	Males	976	67.1	62.8	71.5	821	57.6	53.7	61.8
	Females	443	24.7	22.5	27.1	350	19.6	17.6	21.8
	Persons	1419	43.2	40.9	45.5	1172	36.0	33.9	38.1
Western Sydney	Males	819	63.7	59.3	68.3	710	55.8	51.7	60.2
	Females	387	24.1	21.7	26.7	318	19.7	17.5	22.0
	Persons	1206	41.3	39.0	43.8	1028	35.4	33.2	37.6
Wentworth	Males	275	50.9	44.9	57.5	246	47.2	41.3	53.6
	Females	179	26.2	22.4	30.4	147	21.5	18.1	25.3
	Persons	454	37.0	33.6	40.6	393	32.6	29.4	36.0
Central Coast	Males	556	61.4	56.3	66.8	498	54.3	49.6	59.3
	Females	284	27.3	24.1	30.8	256	23.5	20.6	26.7
	Persons	840	42.4	39.5	45.4	753	37.1	34.4	39.9
Hunter	Males	850	60.1	56.1	64.3	761	54.2	50.4	58.2
	Females	361	21.5	19.3	23.9	320	18.7	16.7	20.9
	Persons	1211	38.6	36.4	40.9	1081	34.1	32.1	36.2
Illawarra	Males	633	65.3	60.3	70.7	556	57.6	52.8	62.6
	Females	251	22.4	19.7	25.4	234	20.6	18.0	23.4
	Persons	884	42.0	39.2	44.8	790	37.3	34.8	40.0
Northern Rivers	Males	459	56.5	51.4	61.9	407	50.3	45.5	55.4
	Females	193	21.7	18.7	25.0	164	18.2	15.5	21.2
	Persons	652	37.7	34.9	40.8	571	32.6	30.0	35.5
Mid North Coast	Males	529	58.5	53.6	63.7	462	50.8	46.2	55.7
	Females	230	23.6	20.6	27.0	195	19.2	16.6	22.2
	Persons	759	40.1	37.3	43.1	657	34.0	31.5	36.8
New England	Males	258	56.1	49.4	63.4	235	52.0	45.5	59.1
	Females	100	18.4	14.9	22.5	103	18.2	14.8	22.2
	Persons	358	35.5	31.9	39.4	339	33.2	29.7	36.9
Macquarie	Males	164	60.9	51.9	71.1	150	56.4	47.7	66.2
	Females	71	23.9	18.6	30.2	67	22.1	17.1	28.2
	Persons	235	41.1	36.0	46.8	217	37.9	33.0	43.3
Far West	Males	79	57.1	45.1	71.3	87	63.8	51.0	78.9
	Females	49	36.4	26.9	48.3	46	32.9	24.0	44.0
	Persons	128	46.1	38.4	54.8	133	47.5	39.8	56.3
Mid Western	Males	253	59.3	52.2	67.1	225	53.1	46.3	60.5
	Females	97	19.5	15.8	23.9	74	14.7	11.5	18.5
	Persons	350	37.2	33.4	41.3	299	31.8	28.3	35.6
Greater Murray	Males	394	58.5	52.9	64.6	378	56.5	50.9	62.5
	Females	167	21.7	18.5	25.3	143	17.9	15.0	21.2
	Persons	561	38.1	35.0	41.4	521	35.1	32.1	38.2
Southern	Males	312	58.5	52.2	65.4	283	53.5	47.4	60.2
	Females	109	18.8	15.4	22.7	102	17.4	14.2	21.2
	Persons	421	37.5	34.0	41.2	385	34.4	31.0	38.0
Urban	Males	6666	57.0	55.6	58.4	5751	49.6	48.3	50.9
	Females	3343	23.4	22.6	24.2	2758	18.8	18.1	19.5
	Persons	10009	38.1	37.3	38.8	8510	32.1	31.4	32.8
Rural	Males	2448	58.0	55.7	60.3	2228	53.0	50.8	55.2
	Females	1016	21.7	20.4	23.1	895	18.6	17.4	19.9
	Persons	3464	38.5	37.2	39.8	3122	34.3	33.1	35.5
NSW	Males	9120	57.3	56.1	58.5	7983	50.5	49.4	51.6
	Females	4365	23.0	22.3	23.7	3653	18.8	18.1	19.4
	Persons	13485	38.2	37.6	38.9	11636	32.7	32.1	33.3

Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Deaths data are reported by year of death. Rates were age-adjusted using the Australian population as at 30 June 1991. LI/UL 95% CI = Lower and upper limits of 95% confidence interval of the point estimate.

Source: NSW Central Cancer Registry incidence data, ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.



			1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
New cases	Number	Persons	3130	3100	3349	3461	3389	3522	3683	3729	3908	3870	4117	4185
	Rate per 100,000	Persons	53.1	51.7	54.5	55.3	53.0	54.0	55.3	54.7	56.1	54.7	56.6	56.6
Deaths	Number	Persons	1437	1413	1416	1442	1535	1521	1476	1546	1541	1566	1512	1579
	Rate per 100,000	Persons	24.5	23.6	23.1	22.9	23.9	23.2	21.9	22.3	21.8	21.7	20.3	20.7

Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Deaths data are reported by year of death. Rates were age-adjusted using the Australian population as at 30 June 1991. 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). Epidemiology and Surveillance Branch, NSW Department of Health.

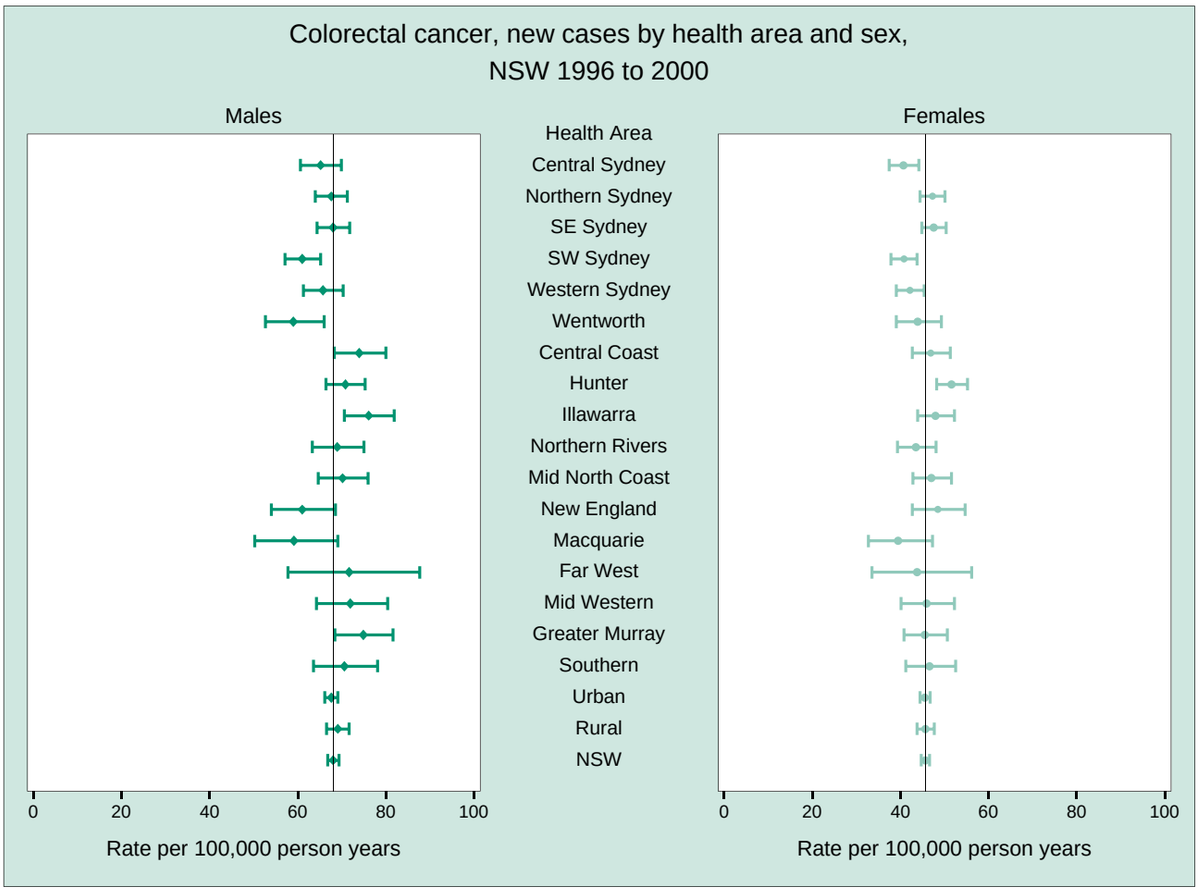
- Between 1972 and 2000, the incidence of colorectal cancer more than doubled.
- In 2000, colorectal cancer was the second most common cancer in men (after prostate) and women (after breast), comprising 15% and 14% of all cancers in males and females respectively. It was the most common new cancer for the population overall and the second biggest cause of cancer death in both men and women (Tracey et al., 2002).
- In the period between 1990 and 2000, the age-standardised incidence rate of colorectal cancer increased by 7% in females and the mortality rate fell by 14% in males and 13% in females. Incidence rates are expected to remain constant in males to 2010, but to increase in females (Tracey et al., 2002).
- The 5-year survival rate for colorectal cancer between 1994 and 1998 was 60% for both males and females, with survival rates increasing from around 50% in 1980–1984 (Supramaniam et al., 1999).
- Factors are consistently associated with increased risk of colorectal cancer include a diet high in fat, meat or protein, and low in vegetables and fibre, and low levels of physical activity. The NHMRC has released guidelines for the prevention, early detection and management of colorectal cancer which will assist in both reducing incidence rates and improving survival rates (NHMRC, 1999).

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.

Supramaniam R, Smith DP, Coates MS, Armstrong BK. *Survival from cancer in NSW in 1980 to 1995.* Sydney: NSW Cancer Council, 1999.

National Health and Medical Research Council. *Guidelines for the prevention, early detection, and management of colorectal cancer.* Canberra: NHMRC, 1999.



Note: New cases of cancer and deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Deaths data are reported by year of death and include an estimate of the small number of deaths occurring in 2000, but registered in 2001, data for which were not available at the time of production. Rates were age-adjusted using the standard Australian population as at 30 June 1991. Lower and upper limits of 95% confidence interval of the point estimate.

Source: NSW Central Cancer Registry incidence data and ABS mortality and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- In the period 1996 to 2000, the age-adjusted rate for new cases of colorectal cancer was higher than for NSW overall in males in the Illawarra and females in the Hunter Health Areas, and lower in both males and females in South Western Sydney, males in Wentworth and females in Central Sydney Health Areas. Death rates were higher than the state average for males in Central Coast, males and females in Hunter and females in the Mid Western Health Areas, and lower for males in the Central Sydney Health Area.
- No difference in colorectal cancer incidence or mortality was observed for health areas grouped into urban and rural categories, nor when further analysed by degree of remoteness based on road distance from major service centres. Males living in remote areas, however, experienced the lowest 5-year survival rate from 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. In the 1997 and 1998 NSW Health Surveys residents of rural health areas were more likely to report that they ate the recommended quantities of vegetables. There was no difference in reports of consumption of fruit and breads and cereals; however, the reported consumption of fried foods was lower in rural residents (Public Health Division, 2001).

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.

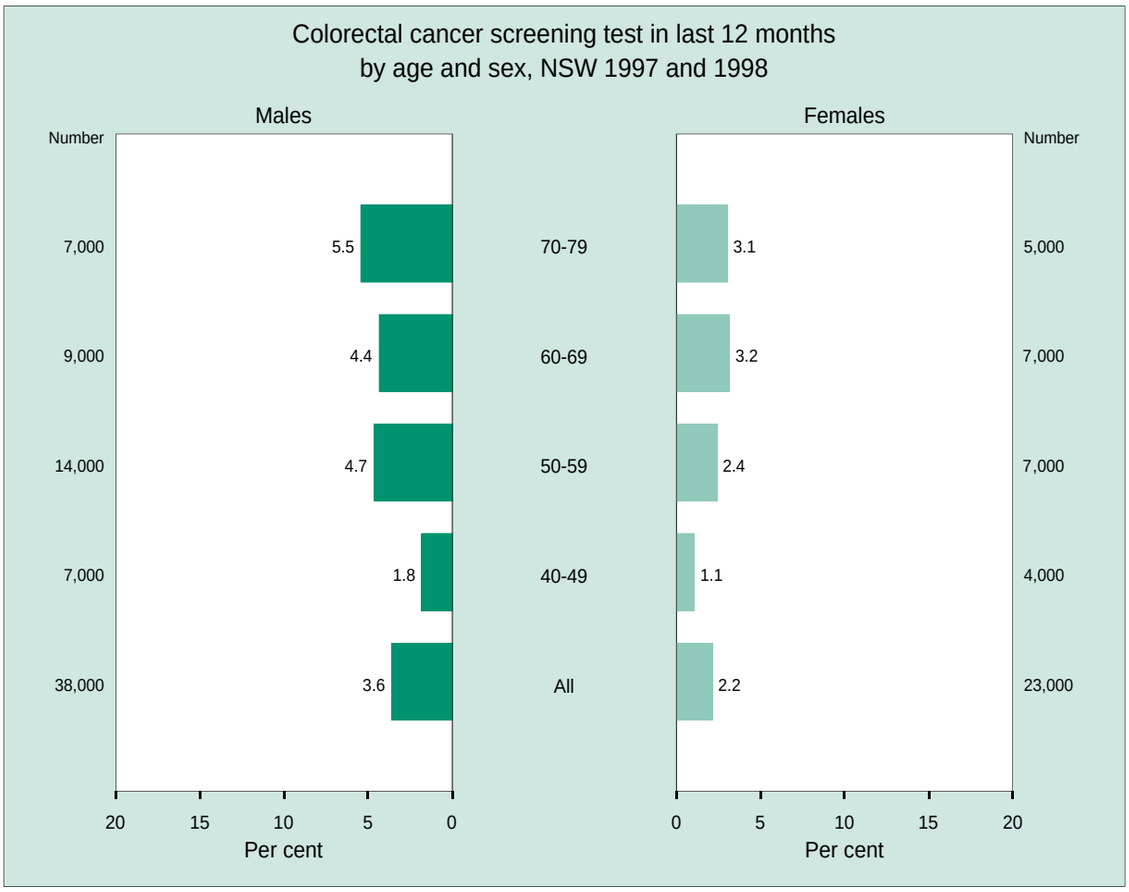
Public Health Division. *The 1997 and 1998 NSW Health Survey Report.* Sydney: NSW Department of Health, 2001. Web site at www.health.nsw.gov.au/public-health/nswhs.

Colorectal cancer, new cases by health area and sex, NSW 1996 to 2000

Health Area		New cases Number	Rate/ 100,000	LL 95% CI	UL 95% CI	Deaths Number	Rate/ 100,000	LL 95% CI	UL 95% CI
Central Sydney	Males	768	65.1	60.6	69.9	270	23.0	20.3	25.9
	Females	598	40.7	37.4	44.1	257	16.5	14.4	18.7
	Persons	1366	51.6	48.9	54.5	527	19.3	17.7	21.0
Northern Sydney	Males	1350	67.5	64.0	71.3	501	25.2	23.0	27.5
	Females	1250	47.2	44.5	50.0	508	17.1	15.6	18.8
	Persons	2600	55.9	53.8	58.2	1009	20.4	19.1	21.7
SE Sydney	Males	1342	68.0	64.4	71.7	488	24.9	22.7	27.2
	Females	1204	47.5	44.8	50.4	442	16.3	14.7	17.9
	Persons	2546	56.9	54.6	59.1	930	20.1	18.8	21.4
SW Sydney	Males	923	61.0	57.0	65.2	385	27.1	24.4	30.1
	Females	734	40.7	37.8	43.8	296	16.4	14.6	18.4
	Persons	1657	49.8	47.4	52.3	681	21.0	19.4	22.6
Western Sydney	Males	872	65.6	61.2	70.3	330	26.7	23.8	29.8
	Females	698	42.1	39.0	45.4	251	14.9	13.1	16.9
	Persons	1570	52.6	50.0	55.3	581	20.0	18.4	21.7
Wentworth	Males	329	59.0	52.6	66.0	141	25.5	21.4	30.3
	Females	300	43.9	39.0	49.2	106	15.7	12.8	19.1
	Persons	629	50.4	46.5	54.6	246	20.0	17.5	22.7
Central Coast	Males	656	73.9	68.3	79.9	285	31.4	27.8	35.3
	Females	507	46.8	42.6	51.2	197	17.2	14.7	19.9
	Persons	1163	58.8	55.4	62.4	481	23.5	21.4	25.7
Hunter	Males	1007	70.7	66.4	75.3	442	31.6	28.7	34.7
	Females	887	51.6	48.2	55.2	367	20.1	18.1	22.4
	Persons	1894	60.0	57.4	62.8	809	25.1	23.4	26.9
Illawarra	Males	725	76.1	70.6	81.9	261	27.4	24.2	31.0
	Females	529	47.9	43.9	52.2	190	16.5	14.2	19.1
	Persons	1254	60.7	57.4	64.2	451	21.6	19.7	23.7
Northern Rivers	Males	550	69.0	63.3	75.0	207	25.9	22.5	29.7
	Females	411	43.5	39.3	48.0	156	16.4	13.8	19.2
	Persons	961	55.7	52.2	59.4	362	20.9	18.8	23.2
Mid North Coast	Males	623	70.1	64.7	75.9	239	26.9	23.6	30.6
	Females	475	47.0	42.8	51.5	172	16.1	13.7	18.7
	Persons	1098	58.2	54.7	61.7	411	21.2	19.1	23.3
New England	Males	284	61.0	54.0	68.5	115	24.9	20.5	29.9
	Females	266	48.4	42.6	54.7	126	21.1	17.4	25.2
	Persons	550	53.8	49.4	58.6	241	22.9	20.1	26.1
Macquarie	Males	159	59.1	50.2	69.1	51	19.1	14.2	25.2
	Females	123	39.4	32.6	47.2	51	15.3	11.3	20.3
	Persons	282	49.2	43.6	55.3	102	17.4	14.2	21.1
Far West	Males	96	71.6	57.8	87.7	31	24.1	16.2	34.4
	Females	64	43.8	33.5	56.1	22	14.6	9.0	22.2
	Persons	160	56.7	48.2	66.2	53	18.4	13.8	24.2
Mid Western	Males	313	71.9	64.1	80.4	116	28.1	23.2	33.7
	Females	240	45.9	40.1	52.2	122	22.2	18.3	26.6
	Persons	553	58.2	53.4	63.2	238	24.2	21.2	27.5
Greater Murray	Males	509	74.8	68.4	81.6	205	30.7	26.6	35.3
	Females	353	45.5	40.8	50.6	136	16.6	13.9	19.7
	Persons	862	58.8	54.9	62.9	341	23.0	20.6	25.5
Southern	Males	375	70.6	63.5	78.1	165	31.4	26.7	36.6
	Females	274	46.6	41.2	52.5	118	19.2	15.8	23.1
	Persons	649	57.8	53.4	62.4	282	24.9	22.1	28.0
Urban	Males	7972	67.5	66.0	69.0	3103	26.8	25.8	27.7
	Females	6707	45.5	44.4	46.7	2613	16.8	16.2	17.5
	Persons	14679	55.3	54.4	56.2	5716	21.1	20.6	21.7
Rural	Males	2909	69.0	66.6	71.6	1128	27.1	25.5	28.7
	Females	2206	45.6	43.7	47.6	903	17.8	16.6	19.0
	Persons	5115	56.7	55.1	58.3	2031	22.1	21.1	23.1
NSW	Males	10890	68.0	66.7	69.3	4231	26.9	26.1	27.7
	Females	8919	45.6	44.7	46.6	3516	17.1	16.5	17.6
	Persons	19809	55.7	55.0	56.5	7747	21.4	20.9	21.9

Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Deaths data are reported by year of death. Rates were age-adjusted using the Australian population as at 30 June 1991. LL/UL 95% CI = Lower and upper limits of the 95% confidence interval of the point estimate.

Source: NSW Central Cancer Registry incidence data, ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.



Note: Colorectal cancer screening is defined as those who had a bowel x-ray, endoscopy or faecal test for cancer within the last year and who had no symptoms of family history of bowel cancer. Estimates based on 17,343 respondents persons aged 40 to 79 years. 205 (1.2%) not stated for having screening.

Source: NSW Health Survey (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

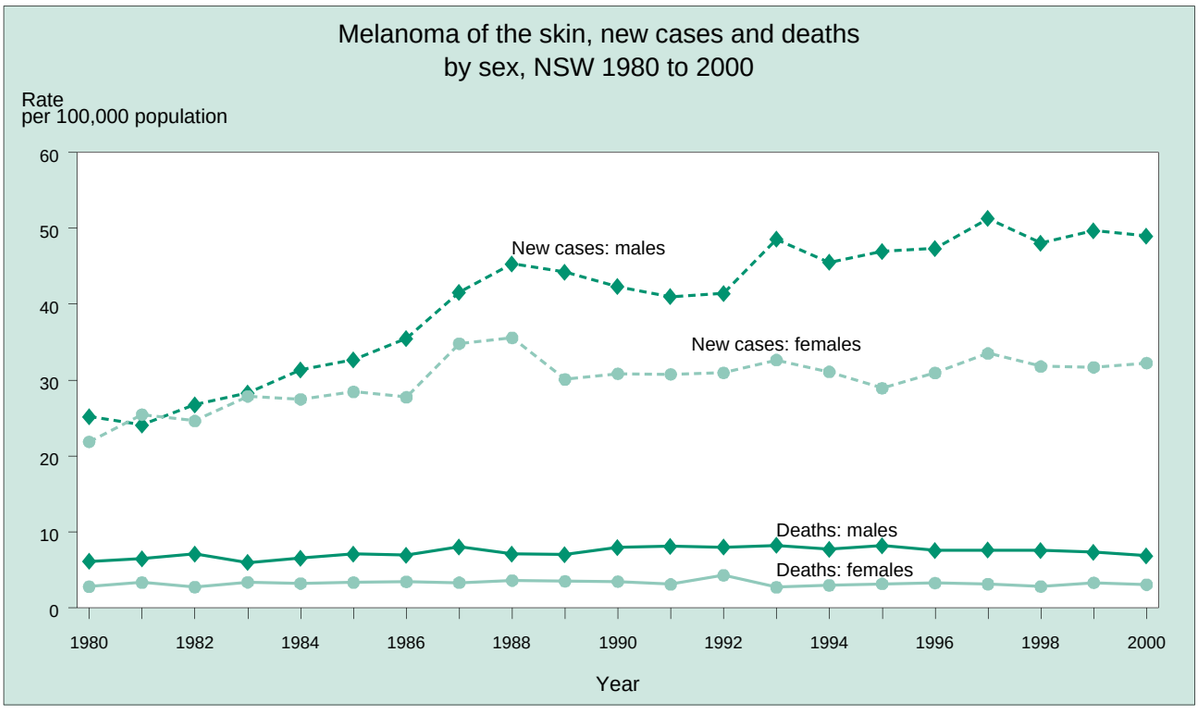
- The aim of screening for cancer is to reduce mortality and disability from the disease.
- Evidence from clinical trials involving asymptomatic people aged 50 years and over suggests that performing faecal occult blood tests (FOBT) at least every 2 years (but preferably annually), will result in a 40% reduction in mortality from colorectal cancer (NHMRC, 1999). The Commonwealth is currently embarking on pilot studies of screening; an initial analysis has revealed that the most cost-effective program would be 2-yearly FOBT screening of people aged 55–74 years (Cancer Strategy Working Group, 2001).
- In the 1997 and 1998 NSW Health Surveys, 2.9% of respondents aged 40–79 years (3.6% of males and 2.2% of females) reported having a faecal screening test in the last 12 months. This is well below the levels which would be required for an effective screening program. Reported screening rates increased with age from 1.5% in those aged 40–49 years, to 4.1% in those aged 70–79 years. Most diagnoses of colorectal cancer are made in people in their early 70s (Tracey et al., 2002).

For more information:

National Health and Medical Research Council. *Guidelines for the prevention, early detection and management of colorectal cancer.* Canberra: NHMRC, 1999.

Cancer Strategy Working Group. *Priorities for action in Cancer Control 2001–2003. Colorectal cancer screening. Draft, January 2001.* Canberra: Commonwealth Department of Health and Aged Care, 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.



			1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
New cases	Number	Persons	2120	2115	2121	2190	2481	2378	2396	2535	2808	2687	2793	2852
	Rate per 100,000	Persons	36.3	35.7	35.1	35.6	39.6	37.4	36.9	38.1	41.5	39.0	39.8	39.8
Deaths	Number	Persons	296	326	320	366	331	324	351	346	352	355	370	348
	Rate per 100,000	Persons	5.1	5.5	5.3	5.9	5.2	5.0	5.3	5.1	5.1	5.0	5.0	4.7

Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Deaths data are reported by year of death. Rates were age-adjusted using the Australian population as at 30 June 1991. 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). Epidemiology and Surveillance Branch, NSW Department of Health.

- Between 1972 and 2000, the incidence of melanoma of the skin in NSW more than trebled, to 2852 new cases (1655 males, 1197 females).
- In 2000 melanoma was the third most common cancer in both sexes, comprising 11% and 9% of all cancers in males and females, respectively. It was only the tenth and thirteenth biggest cause of cancer death in males and females, respectively (Tracey et al., 2002).
- Between 1990 and 2000, the age-standardised incidence rate of melanoma increased by 20% and the age-standardised mortality rate increased by 11%. There was no significant trend in females (Tracey et al., 2002). Peaks in incidence occurred in 1986–1988 and again in 1993–1994, possibly as a result of media campaigns. Incidence rates are expected to remain constant in females to 2010, but to increase further in males (Tracey et al., 2002).
- The 5-year survival rate for melanoma between 1994 and 1998 was 89% for males and 93% for females, representing an increase since 1980–1984 (Supramaniam et al., 1999).
- Risk factors in melanoma include exposure to sunlight, especially intermittent and childhood exposure; sensitivity of the skin to the sun; and family history of melanoma. The effect of skin cancer should be further reduced through the implementation of the *Skin Cancer Prevention Strategic Plan for New South Wales 2001–2005* (The Cancer Council NSW and NSW Department of Health, 2001).

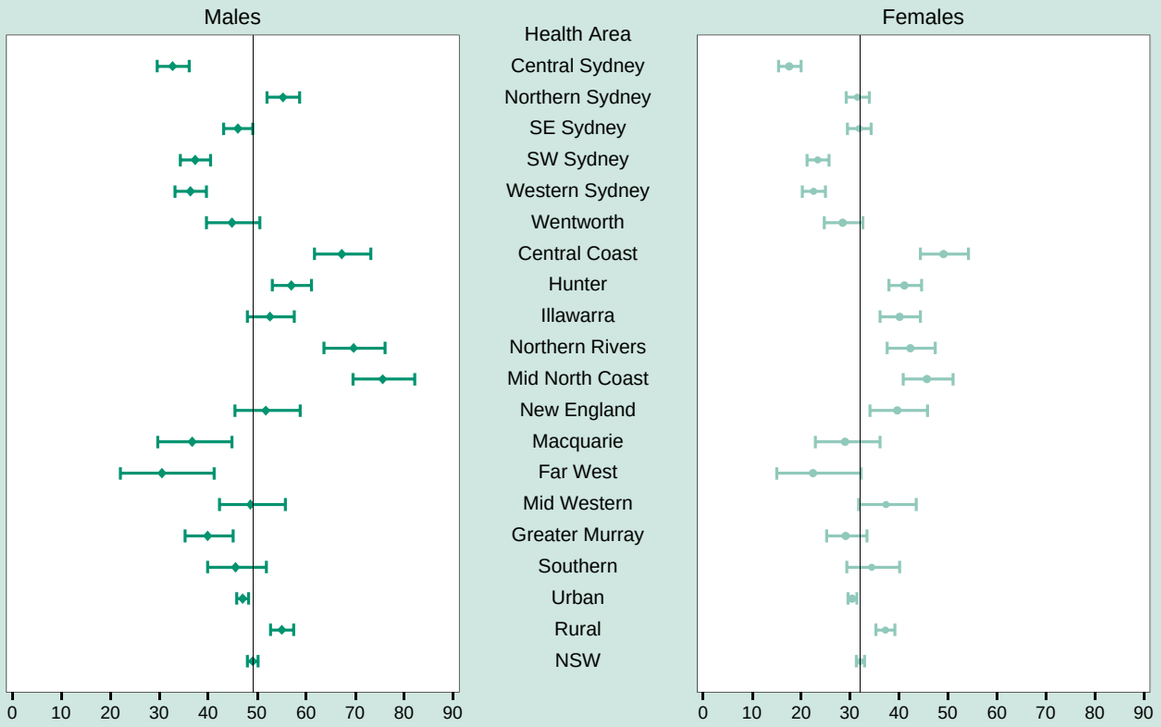
For more information:

Tracey EA, Supramaniam R. *Cancer in NSW: Incidence and mortality 2000. Featuring projections to 2010 for selected sites.* Sydney: The Cancer Council NSW, 2002.

Supramaniam R, Smith DP, Coates MS, Armstrong BK. *Survival from cancer in NSW in 1980 to 1995.* Sydney: NSW Cancer Council, 1999.

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

Melanoma of the skin, new cases by health area and sex, NSW 1996 to 2000



Note: New cases of cancer and deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Deaths data are reported by year of death and include an estimate of the small number of deaths occurring in 2000, but registered in 2001, data for which were not available at the time of production. Rates were age-adjusted using the standard Australian population as at 30 June 1991. Lower and upper limits of 95% confidence interval of the point estimate are shown.

Source: NSW Central Cancer Registry incidence data and ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Incidence rates for melanoma of the skin are higher in coastal areas of NSW, particularly those to the north of Sydney. In the period 1996 to 2000, incidence rates were higher than the state average in males in Northern Sydney, males and females in Central Coast, Hunter, Northern Rivers and Mid North Coast and females in the Illawarra and New England Health Areas. Rates were lower in males and females in Central Sydney, South Western Sydney and Western Sydney and for males only in the Macquarie, Far West and Greater Murray Health Areas. Death rates were higher than the state average for males in the Northern Rivers and Mid North Coast and for females in Hunter Health Area. Death rates from melanoma were lower than the state in males from Central Sydney Health Area.
- The striking difference in incidence between health areas grouped into rural and urban categories, reflects the higher incidence rates in rural coastal areas. Analysis by degree of remoteness, based on road distance from major service centres, also showed significant variation, with incidence rates for both males and females being highest in 'accessible' areas, which include the large towns along the coast in rural NSW. Rates were lowest in 'remote' areas, which include inland areas in the north-west of the state. (Jong et al., 2001).
- The higher rates for melanoma in coastal areas are likely to be associated with environments and behaviours resulting in greater sun exposure.

For more information:

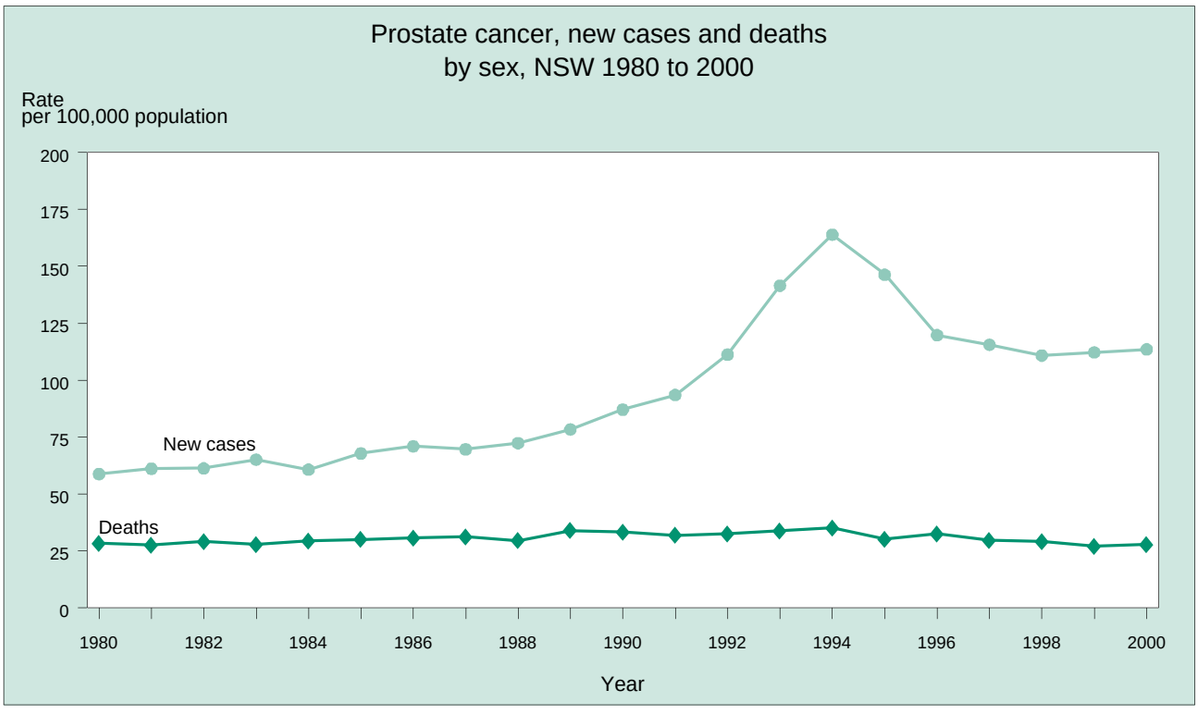
Jong K, Smith DP, Yu XQ, Goumas C, O'Connell D, Armstrong BK. *Remoteness and cancer incidence, mortality and survival in New South Wales 1992 to 1996.* Sydney: The Cancer Council NSW, 2002.

Melanoma of the skin—new cases and deaths by health area and sex, NSW 1996 to 2000

Health Area		New cases Number	Rate/ 100,000	LL 95% CI	UL 95% CI	Deaths Number	Rate/ 100,000	LL 95% CI	UL 95% CI
Central Sydney	Males	401	32.7	29.6	36.1	57	4.8	3.6	6.2
	Females	246	17.6	15.4	20.0	37	2.4	1.7	3.4
	Persons	647	24.3	22.4	26.2	94	3.5	2.8	4.3
Northern Sydney	Males	1117	55.2	52.0	58.6	137	7.0	5.9	8.3
	Females	747	31.4	29.2	33.9	82	3.0	2.4	3.8
	Persons	1864	41.9	39.9	43.8	219	4.8	4.1	5.4
SE Sydney	Males	929	46.0	43.1	49.1	145	7.3	6.1	8.6
	Females	709	31.8	29.5	34.3	71	2.7	2.1	3.4
	Persons	1638	37.9	36.0	39.8	215	4.7	4.1	5.4
SW Sydney	Males	601	37.3	34.3	40.4	103	6.9	5.6	8.5
	Females	432	23.3	21.2	25.6	56	3.1	2.3	4.0
	Persons	1033	29.5	27.8	31.4	159	4.7	4.0	5.5
Western Sydney	Males	534	36.3	33.2	39.6	79	5.9	4.6	7.4
	Females	379	22.5	20.2	24.9	42	2.5	1.8	3.3
	Persons	913	28.6	26.8	30.6	121	3.9	3.2	4.7
Wentworth	Males	289	44.8	39.6	50.5	51	8.5	6.2	11.2
	Females	214	28.4	24.7	32.6	23	3.1	1.9	4.7
	Persons	503	35.7	32.6	39.0	74	5.5	4.3	6.9
Central Coast	Males	553	67.3	61.7	73.2	74	8.2	6.4	10.4
	Females	423	49.0	44.3	54.2	29	2.8	1.8	4.1
	Persons	976	56.9	53.2	60.7	103	5.2	4.2	6.3
Hunter	Males	805	57.0	53.1	61.1	122	8.6	7.1	10.3
	Females	619	41.1	37.8	44.5	78	4.6	3.6	5.8
	Persons	1424	48.1	45.6	50.7	200	6.3	5.5	7.3
Illawarra	Males	488	52.6	48.0	57.5	62	6.5	5.0	8.4
	Females	388	40.1	36.1	44.4	40	3.7	2.6	5.1
	Persons	876	45.5	42.5	48.6	102	4.9	4.0	6.0
Northern Rivers	Males	517	69.7	63.7	76.1	92	12.0	9.7	14.8
	Females	322	42.3	37.5	47.4	27	3.0	1.9	4.4
	Persons	839	55.1	51.3	59.1	119	7.2	5.9	8.6
Mid North Coast	Males	606	75.6	69.5	82.2	84	10.2	8.1	12.7
	Females	362	45.7	40.8	51.0	29	3.3	2.1	4.8
	Persons	968	60.0	56.1	64.2	113	6.5	5.3	7.9
New England	Males	242	51.8	45.4	58.8	29	6.4	4.2	9.2
	Females	191	39.6	34.1	45.7	23	4.1	2.6	6.2
	Persons	433	45.3	41.1	49.8	52	5.1	3.8	6.7
Macquarie	Males	97	36.7	29.7	44.9	18	6.8	4.0	10.8
	Females	81	28.9	22.9	36.1	11	3.7	1.8	6.7
	Persons	178	32.7	28.1	38.0	29	5.1	3.4	7.3
Far West	Males	43	30.5	22.0	41.2	6	4.5	1.6	9.8
	Females	30	22.4	15.0	32.2	5	4.0	1.3	9.3
	Persons	73	26.9	21.0	33.9	11	4.0	2.0	7.2
Mid Western	Males	210	48.6	42.2	55.7	27	6.1	4.0	9.0
	Females	166	37.3	31.7	43.5	14	2.9	1.5	4.9
	Persons	376	42.2	38.0	46.8	41	4.3	3.1	5.9
Greater Murray	Males	266	39.9	35.2	45.0	54	8.2	6.2	10.7
	Females	204	29.1	25.1	33.4	16	2.1	1.2	3.5
	Persons	470	34.2	31.1	37.4	70	4.9	3.8	6.2
Southern	Males	237	45.6	39.9	51.9	34	6.8	4.6	9.5
	Females	175	34.4	29.3	40.1	15	2.7	1.5	4.5
	Persons	412	39.2	35.5	43.3	49	4.5	3.3	5.9
Urban	Males	5717	47.0	45.8	48.2	829	7.0	6.5	7.5
	Females	4157	30.4	29.5	31.4	458	3.1	2.8	3.4
	Persons	9874	37.7	36.9	38.4	1287	4.8	4.5	5.1
Rural	Males	2218	55.0	52.7	57.4	344	8.5	7.6	9.5
	Females	1531	37.2	35.3	39.1	140	3.0	2.5	3.6
	Persons	3749	45.5	44.1	47.0	484	5.5	5.1	6.1
NSW	Males	7968	49.1	48.0	50.2	1174	7.4	7.0	7.8
	Females	5707	32.0	31.2	32.9	598	3.1	2.8	3.3
	Persons	13675	39.7	39.0	40.3	1771	5.0	4.7	5.2

Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Deaths data are reported by year of death. Rates were age-adjusted using the Australian population as at 30 June 1991. LI/UL 95% CI = Lower and upper limits of the 95% confidence interval of the point estimate.

Source: NSW Central Cancer Registry incidence data, ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.



			1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
New cases	Number	Males	1884	2153	2401	2940	3894	4681	4301	3607	3560	3493	3629	3749
	Rate per 100,000	Males	78.3	87.0	93.5	111.2	141.5	164.0	146.4	119.8	115.6	110.8	112.2	113.5
Deaths	Number	Males	750	762	756	797	859	920	818	908	860	876	836	888
	Rate per 100,000	Males	33.9	33.1	31.7	32.4	33.7	35.1	30.0	32.5	29.5	29.1	26.9	27.6

Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Deaths data are reported by year of death. Rates were age-adjusted using the Australian population as at 30 June 1991. 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). Epidemiology and Surveillance Branch, NSW Department of Health.

- Between 1972 and 2000, the incidence of prostate cancer increased more than 5-fold, to 3749 new cases. Prostate cancer was the most common cancer in men in 2000, comprising almost one-quarter of all new cases. (Tracey et al., 2002).
- Between 1988 and 1994, the incidence rate of prostate cancer increased by 125%. Since then, the rate has fallen back to the 1992 level. This pattern was also followed nationally. Between 1990 and 2000 in NSW, the age-standardised prostate cancer death rate fell by 21% (Tracey et al., 2002). Incidence is expected to decline to 2010 (Tracey et al., 2002). The 5-year survival rate for prostate cancer between 1994 and 1998 was 85%, increasing from a level of 61% in 1980–1984 (Supramaniam et al., 1999).
- The surge in prostate cancer incidence has been mirrored by a similar increase in the blood testing of men for Prostate Specific Antigen (PSA) (Smith et al., 1998). PSA testing has been increasingly used as a screening test for men who do not have symptoms of prostate cancer. The value of earlier detection remains unclear, as there is a lack of agreement about the value of treatment for men with early stage localised prostate cancer (Australian Cancer Network, 2000). Prostate cancer screening is not currently recommended (AHTAC, 1996).

For more information:

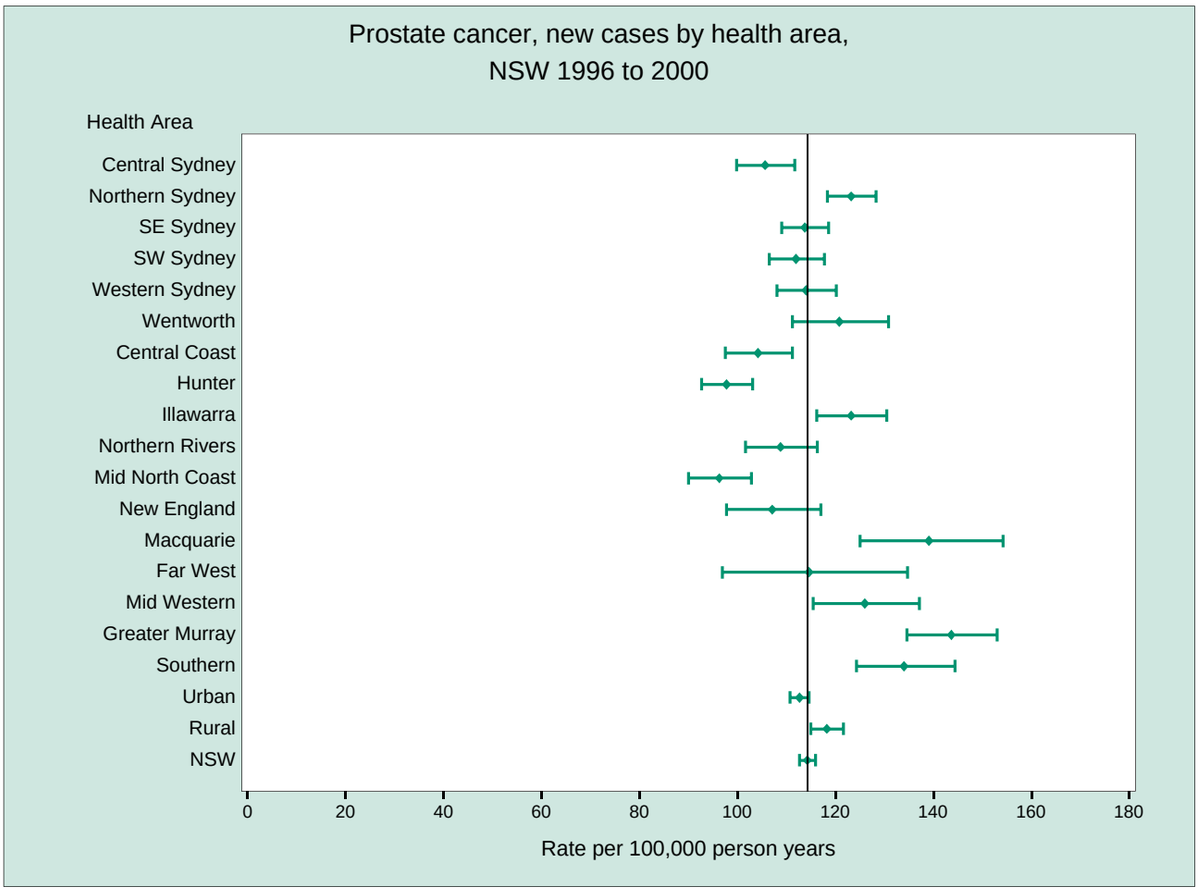
Tracey EA, Supramaniam R. *Cancer in NSW: Incidence and mortality 2000. Featuring projections to 2010 for selected sites.* Sydney: The Cancer Council NSW, 2002.

Supramaniam R, Smith DP, Coates MS, Armstrong BK. *Survival from cancer in NSW in 1980 to 1995.* Sydney: NSW Cancer Council, 1999.

Smith DP, Armstrong BK, Saunders R. *Patterns of Prostate Specific Antigen testing in Australia 1992 to 1996.* Sydney: NSW Cancer Council, 1998.

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: New cases of cancer and deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Deaths data are reported by year of death and include an estimate of the small number of deaths occurring in 2000, but registered in 2001, data for which were not available at the time of production. Rates were age-adjusted using the standard Australian population as at 30 June 1991. Lower and upper limits of 95% confidence interval of the point estimate.

Source: NSW Central Cancer Registry incidence data and ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Incidence rates for prostate cancer are higher in central and southern areas than elsewhere in the state. In the period 1996 to 2000, the incidence of new cases of prostate cancer was higher than for NSW overall in Macquarie, Mid Western, Greater Murray, Southern, Illawarra and Northern Sydney Health Areas. Rates were lower in Central Sydney, Central Coast, Hunter and Mid North Coast Health Areas. Death rates were higher than the state average in New England, Macquarie, Far West and Greater Murray Health Areas and lower in Central Sydney and South Eastern Sydney Health Areas.
- Prostate cancer incidence was also higher for rural health areas grouped together; however, there was no difference when further analysed by degree of remoteness based on road distance from major service centres. Prostate cancer death rates were highest in men living in 'remote' areas and lowest in those living in 'highly accessible' areas of the state. Five-year survival rates from prostate cancer ranged from about 64% in the 'remote' group to 87% in the 'highly accessible' group (Jong et al., 2001).
- Higher rates of prostate cancer are reported in areas with higher socioeconomic status (Lewis et al., 1999). In the light of the relationship between Prostate Specific Antigen (PSA) testing and increased incidence of prostate cancer, at least part of the variation could be explained by socioeconomic differences in PSA testing (Smith et al., 1998).

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.

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.

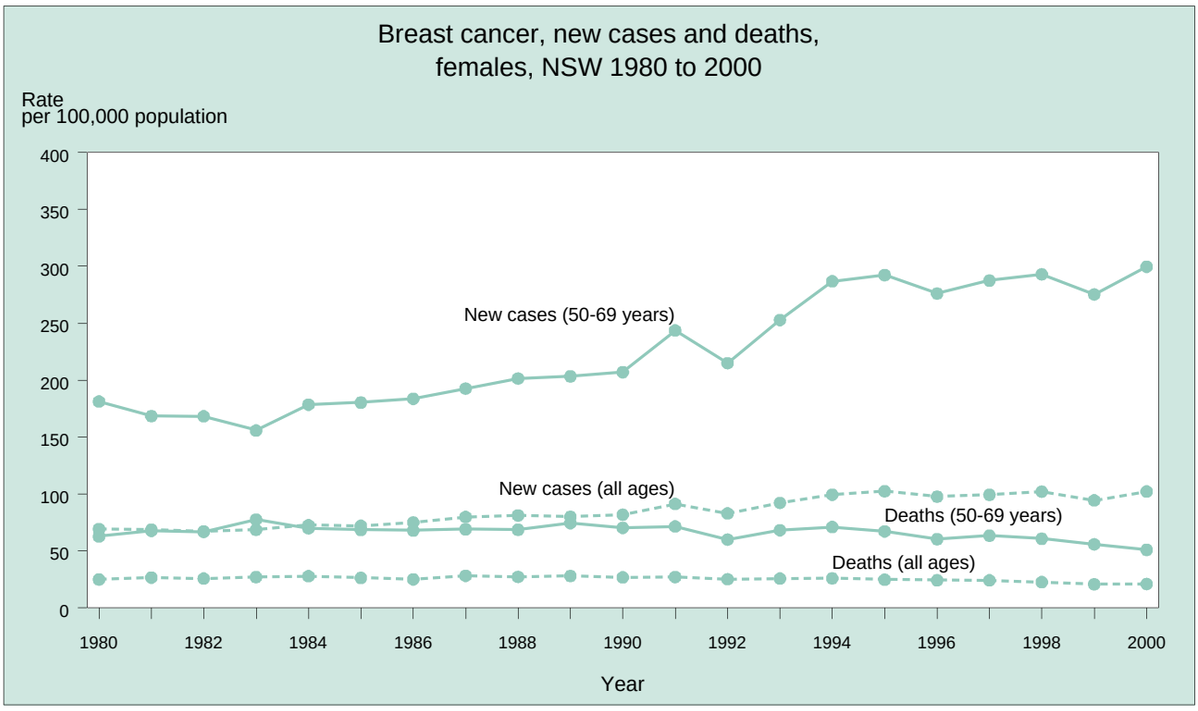
Smith DP, Armstrong BK, Saunders R. *Patterns of Prostate Specific Antigen testing in Australia 1992 to 1996.* Sydney: NSW Cancer Council, 1998.

Prostate cancer in males, new cases and deaths by health area, NSW 1996 to 2000

Health Area	New cases Number	Rate/ 100,000	LL 95% CI	UL 95% CI	Deaths Number	Rate/ 100,000	LL 95% CI	UL 95% CI
Central Sydney	1228	105.6	99.8	111.7	243	21.8	19.1	24.7
Northern Sydney	2433	123.2	118.3	128.2	565	28.3	26.0	30.7
SE Sydney	2211	113.8	109.1	118.6	470	24.2	22.0	26.5
SW Sydney	1601	112.0	106.4	117.7	343	28.1	25.1	31.3
Western Sydney	1456	113.9	108.0	120.1	305	28.4	25.2	31.8
Wentworth	619	120.7	111.3	130.8	154	34.1	28.9	40.0
Central Coast	940	104.2	97.6	111.2	263	28.0	24.7	31.6
Hunter	1374	97.8	92.6	103.1	423	31.3	28.4	34.4
Illawarra	1196	123.2	116.2	130.5	267	30.0	26.4	33.9
Northern Rivers	879	108.8	101.7	116.3	247	30.7	26.9	34.8
Mid North Coast	883	96.2	90.0	102.9	270	29.7	26.2	33.4
New England	490	107.1	97.8	117.0	175	39.8	34.1	46.2
Macquarie	363	139.1	125.0	154.3	90	37.5	30.1	46.2
Far West	151	114.6	96.9	134.7	55	45.3	34.0	59.2
Mid Western	536	125.9	115.5	137.1	134	33.4	27.9	39.6
Greater Murray	962	143.6	134.7	153.0	217	34.7	30.2	39.7
Southern	708	134.0	124.3	144.4	149	31.0	26.2	36.5
Urban	13058	112.7	110.8	114.7	3033	27.6	26.6	28.6
Rural	4972	118.3	115.0	121.6	1337	33.2	31.4	35.0
NSW	18038	114.3	112.6	116.0	4371	29.1	28.2	30.0

Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Deaths data are reported by year of death. Rates were age-adjusted using the Australian population as at 30 June 1991. LL/UL 95% CI = Lower and upper limits of 95% confidence interval of the point estimate.

Source: NSW Central Cancer Registry incidence data, ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.



			1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
New cases	Number	All ages	2444	2546	2902	2688	3036	3321	3498	3413	3537	3711	3478	3842
		50–69 years	1071	1098	1300	1151	1362	1559	1614	1547	1649	1728	1652	1844
	Rate per 100,000	All ages	79.9	81.7	91.1	82.9	92.1	99.4	102.3	97.6	99.2	102.0	94.3	102.1
		50–69 years	203.3	207.0	243.7	214.9	252.9	287.0	292.4	276.2	287.6	293.1	275.4	299.7
Deaths	Number	All ages	882	856	882	849	877	899	885	885	889	856	801	838
		50–69 years	394	373	381	322	366	386	369	335	361	352	329	305
	Rate per 100,000	All ages	27.8	26.6	26.9	25.0	25.5	25.7	24.6	24.1	24.0	22.4	20.5	20.7
		50–69 years	74.3	70.1	71.3	59.8	68.1	70.9	67.0	60.2	63.3	60.6	55.6	50.8

Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Deaths data are reported by year of death. Rates were age-adjusted using the Australian population as at 30 June 1991.

Source: NSW Central Cancer Registry incidence data, ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- In 2000, breast cancer was the most common cancer in women, comprising 29% of all cancers (Tracey et al., 2002).
- Between 1990 and 2000, the age-standardised incidence rate of breast cancer increased by 19% in females. The mortality rate fell by 24% in this period. Incidence is expected to decline from 2001 to 2010 (Tracey et al., 2002). The 5-year survival rate for breast cancer in 1994–1998 was 85%, increasing from around 74% in 1980–1984 (Supramaniam et al., 1999).
- Women aged 50–69 years are the target group for the BreastScreen NSW program, which began in 1991, and offers mammograms every 2 years. Part of the increasing incidence of breast cancer is explained by the earlier detection of cancers through mammographic screening. This is supported by evidence that breast cancer tumour size has decreased (Kricker et al., 1999).

A combination of increased mammographic screening and the implementation of clinical practice guidelines for the management of breast cancer should bring a further increase in survival (National Breast Cancer Centre 1991 and 2000).

For more information:

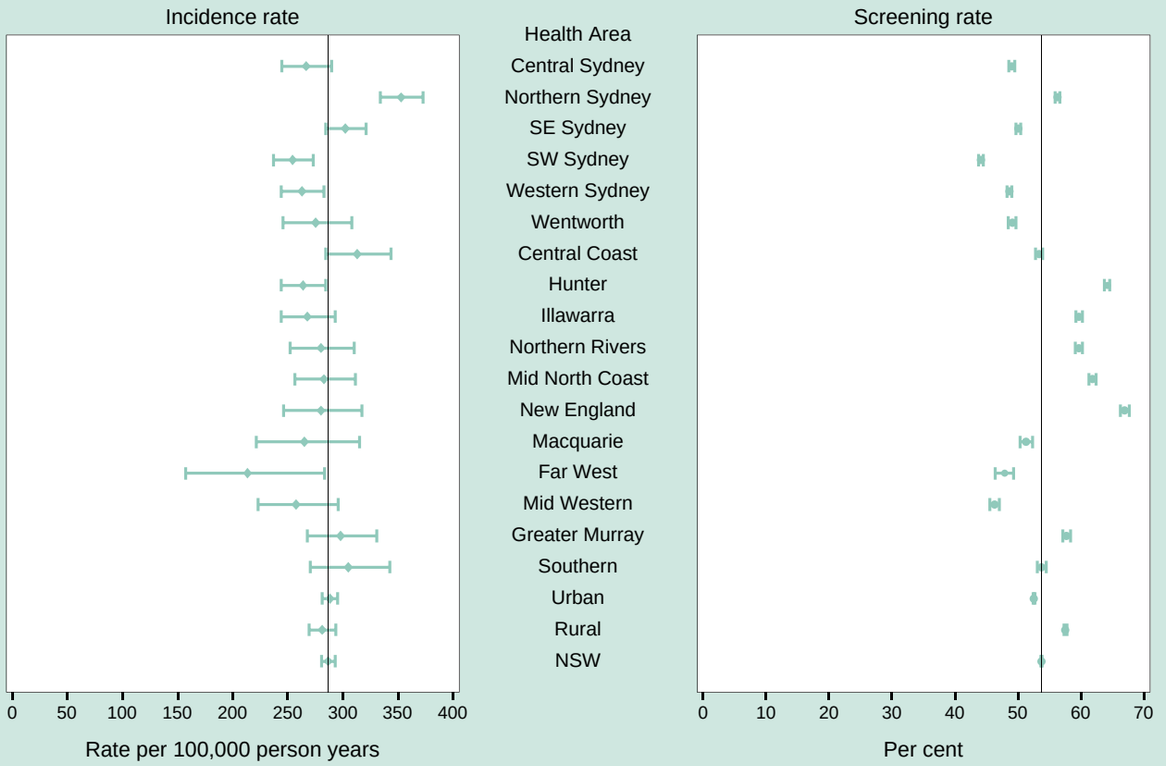
Tracey EA, Supramaniam R. *Cancer in NSW: Incidence and mortality 2000. Featuring projections to 2010 for selected sites.* Sydney: The Cancer Council NSW, 2002.

Supramaniam R, Smith DP, Coates MS, Armstrong BK. *Survival from cancer in NSW in 1980 to 1995.* Sydney: NSW Cancer Council, 1999.

Kricker A, Farac K, Smith D, Sweeny A, McCredie M, Armstrong BK. Breast cancer in NSW in 1972–1995: Tumour size and the impact of mammographic screening. *Int J Cancer*, 1999; 81: 877–81.

National Breast Cancer Centre. *Clinical practice guidelines for the management of early breast cancer.* Canberra: NHMRC, 1995; and *Clinical practice guidelines for the management of advanced breast cancer.* Canberra: NHMRC, 2000.

Breast cancer, new cases in females 50-69 years by health area, NSW 1996-2000 and biennial screening rate by health area, females 50-69 years, NSW 2000-2001



Note: New cases of cancer and deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Deaths data are reported by year of death and include an estimate of the small number of deaths occurring in 2000, but registered in 2001, data for which were not available at the time of production. Rates were age-adjusted using the standard Australian population as at 30 June 1991. Lower and upper limits of 95% confidence interval of the point estimate are shown.

Source: NSW Central Cancer Registry incidence data and ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health; and BreastScreen NSW.

- In the period 1996 to 2000, incidence rates for breast cancer in women aged 50–69 years were higher in the Northern Sydney Health Area, than elsewhere in the state, and lower than the state average in South Western Sydney Health Area. Death rates from breast cancer were not different from the state average in any area.
- In 2000–2001, 2-yearly breast cancer screening rates in women aged 50–69 years were higher than the state average in Northern Sydney, Hunter, Illawarra, Northern Rivers, Mid North Coast, New England, and Greater Murray Health Areas. Rates were lower than the state average in Central Sydney, South Eastern Sydney, South Western Sydney, Western Sydney, Wentworth, Macquarie, Far West, and Mid Western Health Areas. The highest screening rate in the state was 67% in New England and the lowest was 44% in South Western Sydney Health Area. The target for women in this age group is 70% screened every 2 years.
- Breast cancer incidence rates were higher for rural health areas grouped together, but there was no difference in incidence, death or 5-year survival rates when further analysed by degree of remoteness based on road distance from major service centres (Jong et al., 2001).
- Higher rates of breast cancer are reported in areas of higher socioeconomic status (Lewis et al., 1999). 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.

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.

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.

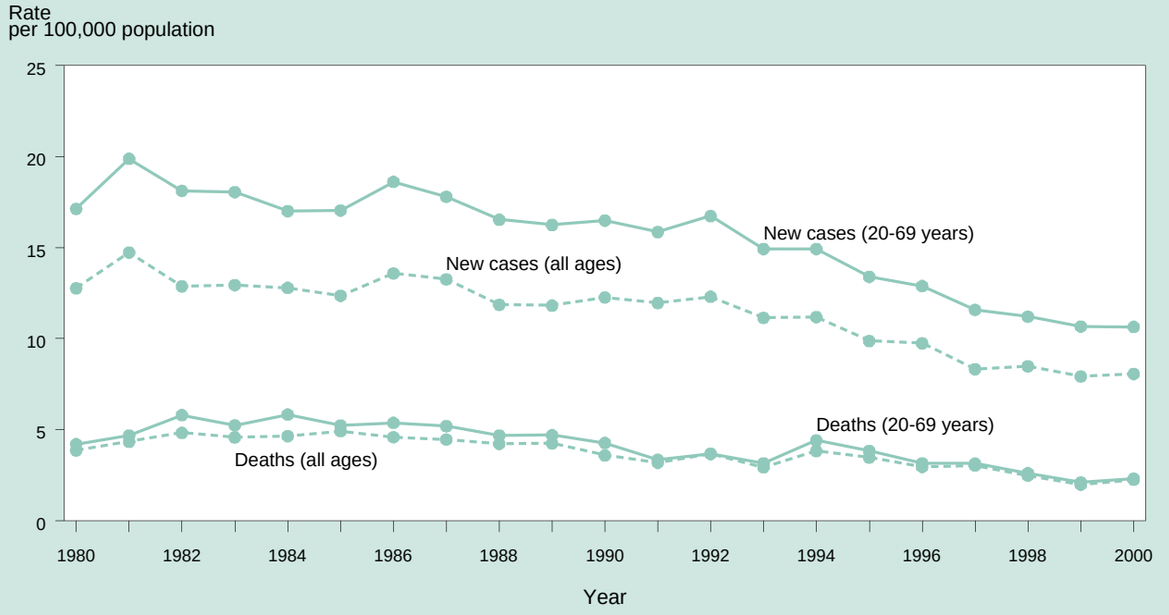
Breast cancer in females, new cases of breast cancer and deaths by health area, NSW 1996 to 2000; and biennial screening rate by health area, females aged 50–56 years, NSW 2000

Health Area	New cases Number	Rate/ 100,000	LL 95% CI	UL 95% CI	Deaths Number	Rate/ 100,000	LL 95% CI	UL 95% CI	Women screened	Biennial screening rate (%)	LL 95% CI	UL 95% CI
Central Sydney	557	266.4	244.6	289.6	117	55.7	46.0	66.8	20988	49.0	48.5	49.5
Northern Sydney	1320	352.8	333.8	372.6	227	63.3	55.2	72.2	44882	56.3	55.9	56.6
SE Sydney	1058	302.3	284.2	321.2	222	64.2	56.0	73.3	36460	50.1	49.7	50.4
SW Sydney	782	254.4	236.8	273.0	153	50.7	42.9	59.4	29017	44.1	43.7	44.5
Western Sydney	744	262.6	243.8	282.6	145	53.7	45.2	63.4	29859	48.6	48.2	49.0
Wentworth	324	275.3	245.3	307.8	73	65.7	51.2	83.0	12783	49.1	48.5	49.7
Central Coast	445	313.0	284.5	343.5	92	64.2	51.7	78.8	16043	53.4	52.8	53.9
Hunter	669	263.6	244.0	284.4	138	54.9	46.1	64.9	34037	64.1	63.7	64.6
Illawarra	467	267.7	243.9	293.1	113	64.8	53.4	77.9	21553	59.7	59.2	60.2
Northern Rivers	364	279.8	251.8	310.1	71	54.8	42.8	69.1	16149	59.6	59.1	60.2
Mid North Coast	414	282.9	256.2	311.5	73	50.0	39.2	62.8	19045	61.8	61.3	62.4
New England	245	279.9	245.8	317.4	57	66.7	50.5	86.5	12049	66.9	66.2	67.6
Macquarie	130	265.1	221.4	314.9	29	59.5	39.8	85.5	5196	51.3	50.3	52.3
Far West	48	213.5	157.3	283.2	11	47.5	23.7	85.0	2177	47.8	46.4	49.3
Mid Western	202	257.4	223.0	295.6	47	61.7	45.4	82.0	7584	46.3	45.5	47.0
Greater Murray	356	298.0	267.8	330.6	61	51.1	39.1	65.6	14230	57.7	57.1	58.3
Southern	286	304.9	270.6	342.5	51	55.8	41.6	73.3	10643	53.7	53.0	54.4
Urban	6366	287.9	280.8	295.1	1280	59.0	55.8	62.4	245622	52.5	52.4	52.6
Rural	2045	281.2	269.1	293.7	402	55.3	50.0	61.0	87073	57.5	57.3	57.8
NSW	8420	286.7	280.6	292.9	1683	58.0	55.3	60.9	332695	53.7	53.6	53.8

Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Deaths data are reported by year of death. Rates were age-adjusted using the Australian population as at 30 June 1991. LL/UL 95% CI = Lower and upper limits of the 95% confidence interval of the point estimate.

Source: NSW Central Cancer Registry incidence data, ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health, and BreastScreen NSW.

Cancer of the cervix, new cases and deaths, females, NSW 1980 to 2000



			1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
New cases	Number	All ages	352	370	370	386	355	363	324	330	282	294	278	285
		20–69 years	296	302	296	318	286	291	264	260	236	231	221	222
	Rate per 100,000	All ages	11.8	12.3	12.0	12.3	11.1	11.2	9.9	9.7	8.3	8.5	7.9	8.1
		20–69 years	16.2	16.5	15.9	16.7	14.9	14.9	13.4	12.9	11.6	11.2	10.7	10.6
Deaths	Number	All ages	132	112	105	122	99	131	121	106	113	94	77	89
		20–69 years	86	79	64	70	61	87	77	64	65	55	45	50
	Rate per 100,000	All ages	4.2	3.6	3.2	3.7	2.9	3.8	3.5	2.9	3.0	2.5	2.0	2.2
		20–69 years	4.7	4.3	3.3	3.7	3.1	4.4	3.8	3.1	3.1	2.6	2.1	2.3

Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Deaths data are reported by year of death. Rates were age-adjusted using the Australian population as at 30 June 1991. 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). Epidemiology and Surveillance Branch, NSW Department of Health.

- The incidence of cervical cancer has been decreasing since 1972, although this trend has accelerated in recent years. Between 1972 and 2000, cervical cancer declined from the fourth to the fourteenth most common cancer in women (Tracey et al., 2002).
- The Pap test is very effective at detecting precancerous lesions in the cervix and regular 2-yearly testing with appropriate follow-up treatment can prevent cervical cancer from developing in most cases (Evaluation Steering Committee, 1995). 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.
- In the period between 1990 and 2000, both incidence and death rates of cervical cancer fell by 40%. Cervical cancer rates are expected to almost halve between 2001 and 2010 (Tracey et al. , 2002). The 5-year survival rate for invasive cervical cancer between 1994 and 1998 was 73%, increasing from about 69% in 1980–1984 (Supramaniam et al., 1999).

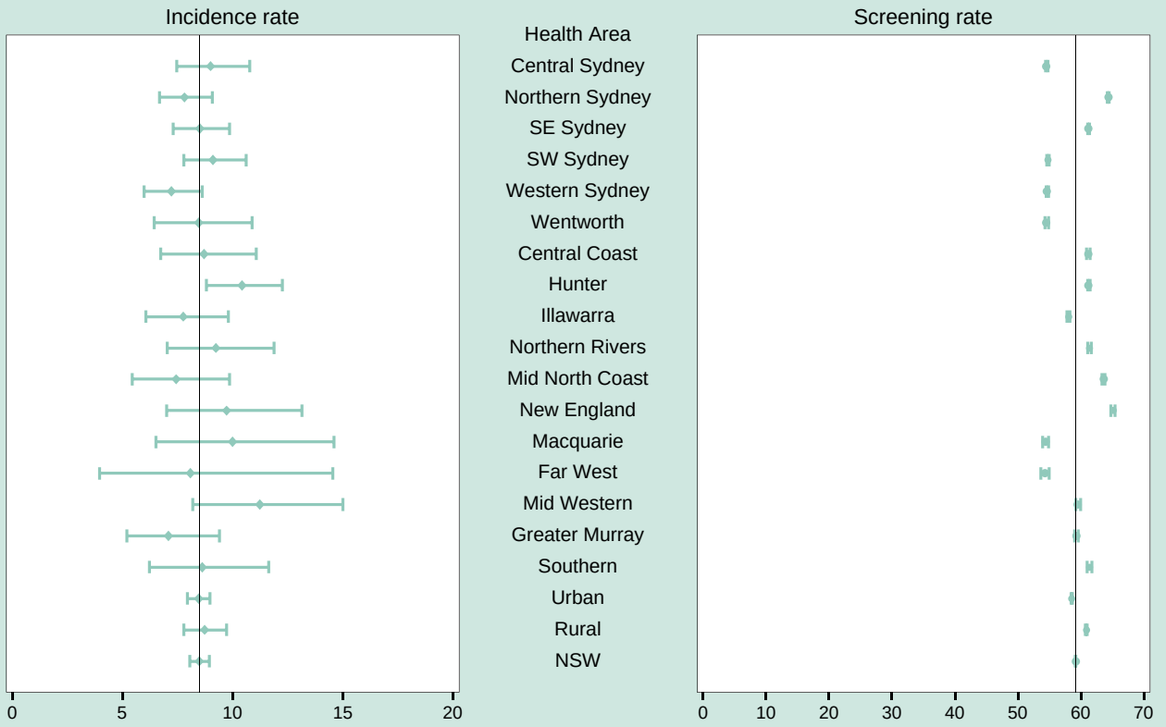
For more information:

Tracey EA, Supramaniam R. *Cancer in NSW: Incidence and mortality 2000. Featuring projections to 2010 for selected sites.* Sydney: The Cancer Council NSW, 2002.

Evaluation Steering Committee. *The interim evaluation of the organised approach to preventing cancer of the cervix 1991–1995.* Canberra, Commonwealth Department of Human Services and Health, 1995.

Supramaniam R, Smith DP, Coates MS, Armstrong BK. *Survival from cancer in NSW in 1980 to 1995.* Sydney: NSW Cancer Council, 1999.

Cervical cancer, new cases in females by health area, NSW 1996-2000 and biennial screening rate by health area, females 20-69 years, NSW 2000



Note: New cases of cancer and deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Deaths data are reported by year of death and include an estimate of the small number of deaths occurring in 2000, but registered in 2001, data for which were not available at the time of production. Rates were age-adjusted using the standard Australian population as at 30 June 1991. Lower and upper limits of 95% confidence interval of the point estimate are shown.

Source: NSW Central Cancer Registry incidence data and ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health. Screening data from NSW Cervical Screening Program and the NSW Pap Test Register, *Annual Statistical Report 2000*.

- In the period 1996 to 2000, incidence rates for cervical cancer did not vary markedly by health area, although death rates were just below the state average in Western Sydney Health Area and just above the average in Southern Health Area. No difference in incidence or mortality was observed for health areas grouped into urban and rural categories nor when further analysed by degree of remoteness.
- There is great geographic variation, however, in 2-yearly cervical screening rates. Screening rates in 2000 were higher in Northern Sydney, South Eastern Sydney, Central Coast, Hunter, Northern Rivers, Mid North Coast, New England and Southern Health Areas and lower than the average in Central Sydney, South Eastern Sydney, South Western Sydney, Wentworth, Illawarra, Macquarie and Far West Health Areas. Five-year survival rates ranged from 76% in 'highly accessible' areas to around 52% in 'remote' areas (Jong et al., 2000). This may relate to both under-screening and a lack of appropriate follow-up treatment in remote areas.
- Cervical cancer incidence is higher in areas of low socioeconomic status, among women from some non-English speaking background groups, and among indigenous women (Lewis et al., 1999; Jong et al., 2000). Pap test screening rates are also lower in women in these groups (Public Health Division, 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.

Public Health Division. *The 1997 and 1998 NSW Health Survey Report.* Sydney: NSW Department of Health, 2001. Web site at www.health.nsw.gov.au/public-health/nswhs.

Cervical cancer, new cases and deaths by health area, NSW 1996 to 2000; and biennial screening rate by health area, NSW 2000.

Health Area	New cases Number	Rate/ 100,000	LL 95% CI	UL 95% CI	Deaths Number	Rate/ 100,000	LL 95% CI	UL 95% CI	Women screened	Biennial screening rate (%)	LL 95% CI	UL 95% CI
Central Sydney	122	9.0	7.5	10.8	34	2.5	1.7	3.4	85027	54.5	54.4	54.7
Northern Sydney	179	7.8	6.7	9.1	53	1.9	1.4	2.6	148910	64.4	64.2	64.5
SE Sydney	181	8.5	7.3	9.9	66	2.8	2.2	3.6	139615	61.2	61.1	61.3
SW Sydney	169	9.1	7.8	10.6	57	3.1	2.3	4.0	116938	54.7	54.6	54.9
Western Sydney	121	7.2	6.0	8.6	27	1.6	1.0	2.3	104483	54.6	54.5	54.8
Wentworth	62	8.5	6.4	10.9	21	2.8	1.7	4.3	46487	54.5	54.3	54.8
Central Coast	70	8.7	6.7	11.1	23	2.2	1.3	3.3	44860	61.2	60.9	61.4
Hunter	152	10.4	8.8	12.2	53	3.3	2.5	4.4	83595	61.2	61.1	61.4
Illawarra	73	7.8	6.1	9.8	26	2.4	1.6	3.6	53300	58.0	57.8	58.2
Northern Rivers	64	9.2	7.0	11.9	17	2.2	1.3	3.6	39533	61.3	61.1	61.6
Mid North Coast	52	7.4	5.4	9.9	16	1.7	0.9	2.8	37378	63.6	63.3	63.8
New England	44	9.7	7.0	13.1	14	2.8	1.5	4.7	28575	65.1	64.7	65.4
Macquarie	27	10.0	6.5	14.6	8	2.4	1.0	4.8	14020	54.4	53.9	54.8
Far West	11	8.1	4.0	14.5	9	5.9	2.6	11.4	6211	54.3	53.6	54.9
Mid Western	47	11.2	8.2	15.0	11	2.3	1.1	4.2	24019	59.5	59.2	59.9
Greater Murray	49	7.1	5.2	9.4	22	2.9	1.8	4.4	38708	59.3	59.0	59.6
Southern	44	8.6	6.2	11.6	24	4.3	2.8	6.5	27375	61.3	61.0	61.7
Urban	1129	8.4	8.0	9.0	359	2.5	2.2	2.8	823215	58.5	58.4	58.6
Rural	338	8.7	7.8	9.7	121	2.7	2.2	3.2	215819	60.9	60.7	61.0
NSW	1469	8.5	8.1	8.9	480	2.5	2.3	2.8	1042968	59.2	59.1	59.2

Note: Cancers were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Deaths data are reported by year of death. Rates were age-adjusted using the Australian population as at 30 June 1991. LL/UL 95% CI = Lower and upper limits of 95% confidence interval of the point estimate.

Source: NSW Central Cancer Registry incidence data, ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health; and NSW Pap Test Register, *Annual Statistical Report, 2000*.

Chapter 4.4

Respiratory disease

- Asthma is responsible for a considerable burden of illness in NSW:
  - —9% of adult males and 11% of adult females have asthma;
  - —among children aged 2–12 years, 18% of boys and 13% of girls have asthma;
  - —there are around 180 deaths each year from asthma;
  - —there are around 16,000 hospitalisations for asthma each year.
- In recent years, there have been indications that management of asthma is improving:
  - —the death rate from asthma is declining;
  - —the rate of hospitalisation for asthma is declining;
  - —44% of children and 36% of adults with asthma have a written asthma management plan.
- Chronic obstructive pulmonary diseases (COPD), including chronic bronchitis and emphysema, are also major causes of illness, especially among older people. COPD is responsible for around 2000 deaths and 18,000 hospitalisations each year.
- Smoking is the main risk factor for COPD, and trends in COPD mirror trends in smoking rates. In recent years:
  - —the male death rate from COPD has decreased steeply, while the female death rate has gradually increased;
  - —the rate of hospitalisations for COPD has increased in both sexes, but much more steeply in females.
- 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.

In this chapter

Introduction

The respiratory system includes the lungs, the airways, the chest wall, and the pulmonary circulation. This chapter focuses on chronic respiratory diseases, specifically asthma, chronic obstructive pulmonary diseases, and asbestosis.

Asthma is a chronic inflammatory disorder of the airways that results in obstruction of airflow in response to specific triggers. About 40% of all Australians will have respiratory symptoms consistent with asthma at some time in their lives. The prevalence of current asthma is estimated at 11% and there is evidence of increasing asthma prevalence and severity in children.

Diseases classified as chronic obstructive pulmonary diseases (COPD) include: chronic bronchitis, emphysema, extrinsic allergic alveolitis, and primary pulmonary hypertension (AIHW, 2000). As well as being important principal causes of death, COPD also contributes to death from other causes, particularly ischaemic heart disease (AIHW, 2000).

Asbestosis is a fibrosis of the lungs resulting from the long-term inhalation of asbestos dust in the mining, milling, manufacturing, and application (for example, of insulation) or removal of asbestos products. Asbestosis is totally preventable, primarily by effective suppression of asbestos dust in the work environment. The incidence of mesothelioma is reported in Chapter 1.3.

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 the health care of people with chronic conditions in NSW.

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

For more information:

The NSW Department of Health Web site at www.health.nsw.gov.au/public-health/a–z/asthma1.html.

The National Asthma Council Web site at www.nationalasthma.org.au.

National Asthma Council. *Asthma Management Handbook 2002.* Melbourne: NAC, 2002. Available at www.nationalasthma.org.au.

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.

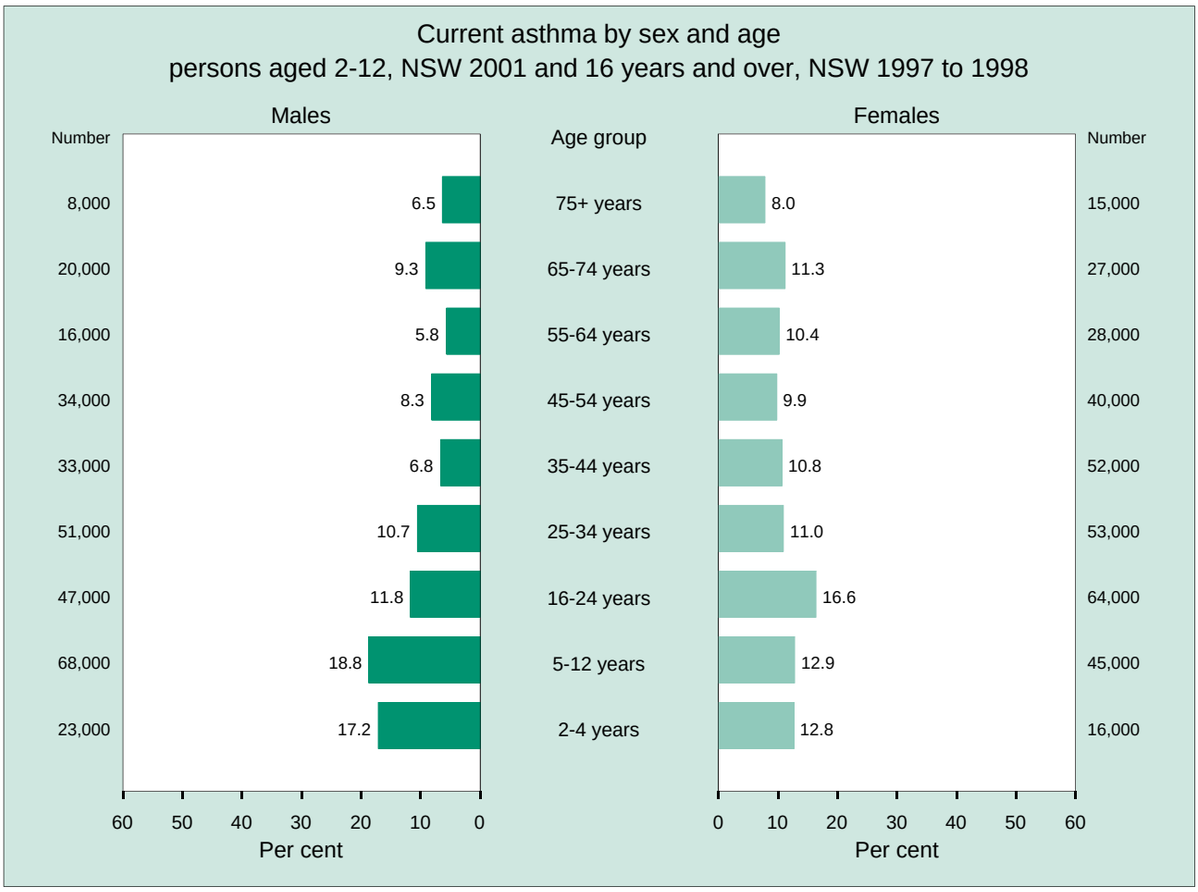
Australian Bureau of Statistics. *Asthma and other respiratory conditions.* Canberra: ABS 1998.

Jenkins C. *Asthma. HealthInsite. Diseases. Expert Views.* Canberra: Commonwealth Department of Health and Ageing. Available at www.healthinsite.gov.au.

Looper de M, Bhatia K. *International health—how Australia compares.* Canberra: Australian Institute of Health and Welfare, 1998.

Gibson PG, Coughlan J, Wilson AJ, Abramson M, Bauman A, Hensley MJ et al. *Self-management education and regular practitioner review for adults with asthma* (Cochrane Review). Oxford: *The Cochrane Library*, 1999. www.cochrane.hcn.net.au or www.health.nsw.gov.au/ciap.

Mathers C, Vos T, Stevenson C. *The burden of disease and injury in Australia.* AIHW Catalogue no. PHE 17. Canberra: AIHW, 1999.



Note: Current asthma was defined as diagnosed by a doctor and producing symptoms or requiring treatment in previous 12 months. Estimates based on 35,025 respondents in NSW Health Survey 1997 and 1998 (55, that is 0.2%, not stated for current doctor diagnosed asthma) and 7915 in the NSW Child Health Survey 2001 (1, that is 0.01%, not stated). Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: 1997 and 1998 NSW Health Survey and Child Health Survey 2001 (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- 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 among the highest prevalence of asthma in the world (Jenkins, 2002; Looper, 1998). It is estimated that about 30–40% of Australians will have symptoms consistent with asthma at some time in their lives (NAC, 2002).
- In the National Health Survey (NHS), the self-reported prevalence of asthma in all ages in Australia increased from 8.5% in 1989–90 to 11.3% in 1995 (a 35% increase) (ABS, 1998). Most respondents reported asthma of mild to moderate severity.
- In the NSW Health Surveys 1997 and 1998, 8.8% of adult males and 11.4% of adult females reported having current asthma (Public Health Division, 2001). Among children aged 2–12 years, 18.4% of boys and 12.9% of girls were reported to have current asthma.
- In males, the prevalence of asthma was highest among children aged 2–12 years; in females, prevalence was highest among young adults aged 16–24 years.

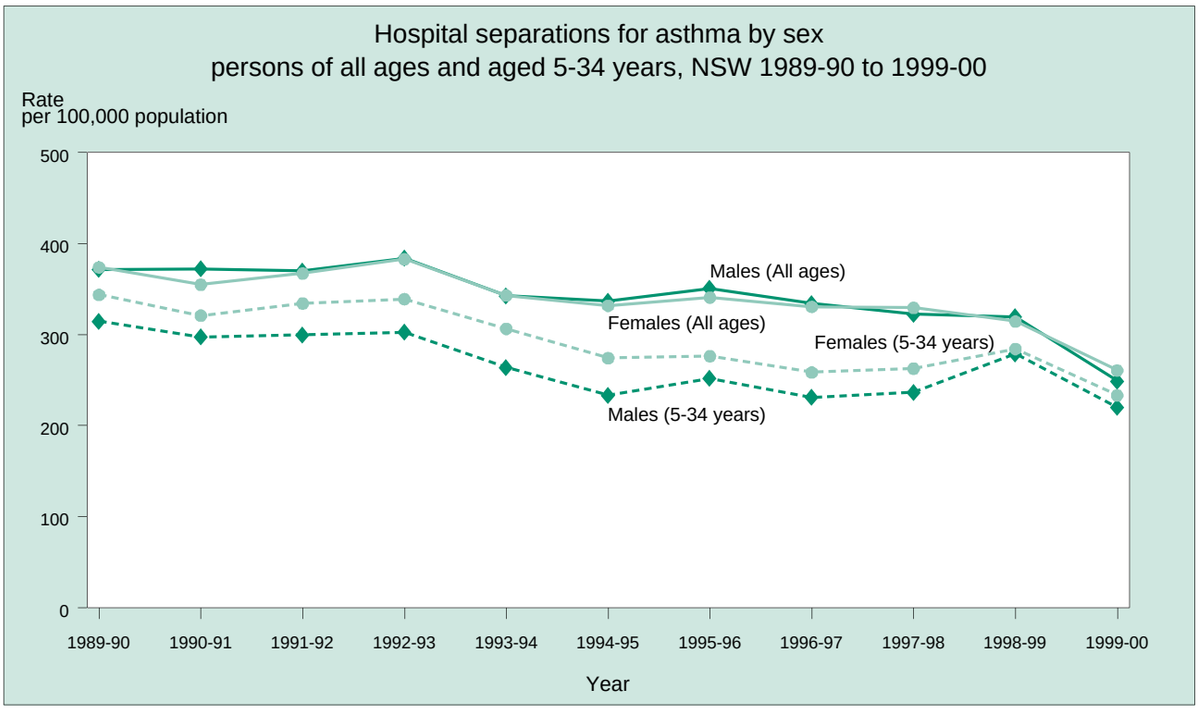
For more information:

Jenkins C. *Asthma. HealthInsite. Diseases. Expert Views.* Canberra: Commonwealth Department of Health and Ageing. www.healthinsite.gov.au.

Looper de M, Bhatia K. *International health: how Australia compares.* Canberra: Australian Institute of Health and Welfare, 1998.

Australian Bureau of Statistics. *Asthma and other respiratory conditions.* Canberra: ABS, 1998.

Public Health Division. *NSW Health Surveys 1997 and 1998.* Sydney: NSW Department of Health, 2001. www.health.nsw.gov.au.



			89–90	90–91	91–92	92–93	93–94	94–95	95–96	96–97	97–98	98–99	99–00
Number	All ages	Males	10837	10899	10956	11468	10289	10177	10671	10251	9935	9820	7682
		Females	10863	10398	10942	11492	10399	10191	10604	10444	10605	9806	8243
		Persons	21701	21297	21898	22960	20688	20368	21275	20695	20540	19626	15925
Rate	All ages	Males	371.6	372.3	370.1	384.0	342.7	336.8	350.8	334.5	322.3	319.6	249.0
per 100,000		Females	373.8	354.9	367.3	382.8	343.1	331.7	340.8	330.6	329.5	314.5	260.6
population		Persons	373.4	363.7	369.6	384.5	343.9	335.1	347.1	333.6	327.2	318.5	256.0

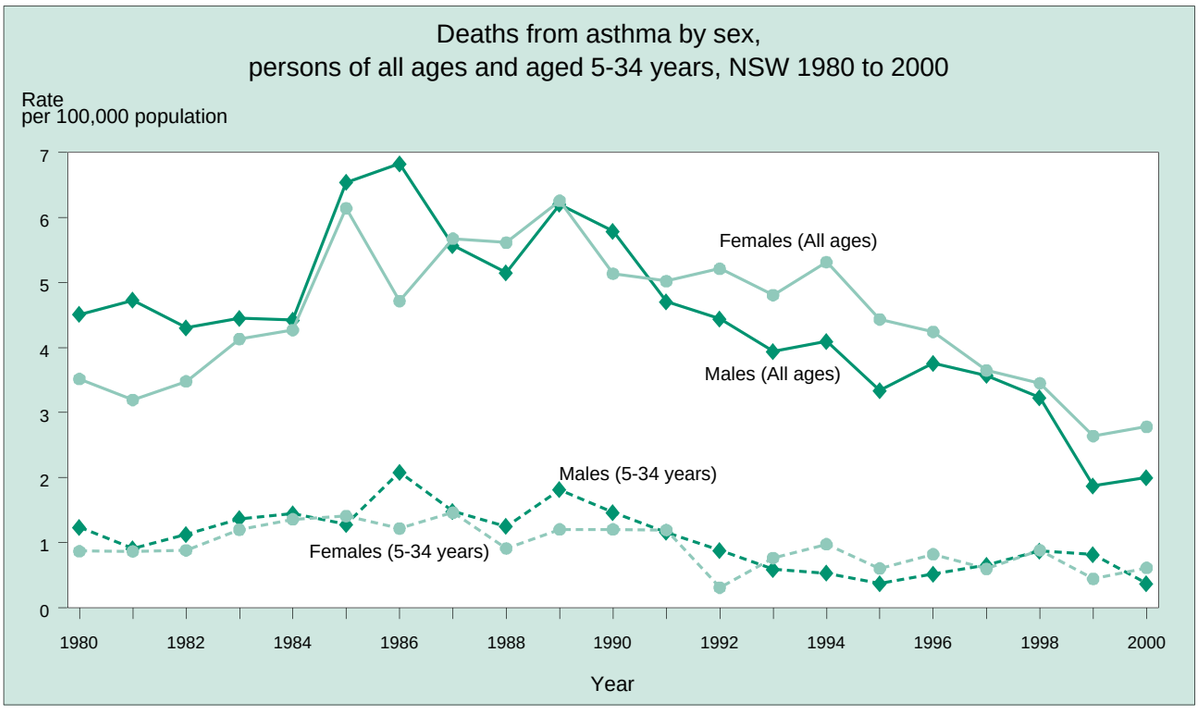
Note: Hospital separations were classified by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 1991. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Department of Health Inpatient Statistics Collection (ISC) data and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Hospital separation rates for asthma gradually decreased in NSW between 1989–90 and 1999–00. The age-adjusted separation rate decreased by 31.4% for all ages and by 31.1% in people aged 5–34 years. This decrease may reflect the continuing improvement in asthma management outside of hospitals, as well as gradual changes in coding practices. Over the same period, the self-reported rate of asthma has increased by around 35% (ABS, 1998).
- Despite the general decrease in hospital separation rates, there were fluctuations from year to year. In 1998–99, for those aged 5–34 years, the separation rate increased by around 13% over the previous year. A substantial increase in presentations with severe asthma symptoms to emergency departments was also reported in that year (Sheppeard et al., 2000).
- The diagnosis of asthma is more reliable in the 5–34 year age group than it is in children younger than 5 years and in older people.
- In 1999–00 hospital separation rates decreased in those aged 5–34 years, as well as for all ages. This decrease may be due to more restricted application of the asthma code as a primary reason for hospital admission in that year.

For more information:

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.



			1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Number	5–34 years	Males	20	16	12	8	7	5	7	9	12	11	5
		Females	16	16	4	10	13	8	11	8	12	6	8
		Persons	36	32	16	18	20	13	18	17	24	17	14
	All ages	Males	151	123	120	111	111	97	110	108	100	58	66
		Females	171	169	188	172	198	169	164	150	142	110	114
		Persons	322	292	308	283	309	266	274	258	242	168	180
Rate per 100,000 population	5–34 years	Males	1.5	1.2	0.9	0.6	0.5	0.4	0.5	0.7	0.9	0.8	0.4
		Females	1.2	1.2	0.3	0.8	1.0	0.6	0.8	0.6	0.9	0.4	0.6
		Persons	1.3	1.2	0.6	0.7	0.7	0.5	0.7	0.6	0.9	0.6	0.5
	All ages	Males	5.8	4.7	4.4	3.9	4.1	3.3	3.8	3.6	3.2	1.9	2.0
		Females	5.1	5.0	5.2	4.8	5.3	4.4	4.2	3.6	3.5	2.6	2.8
		Persons	5.4	4.8	4.9	4.4	4.7	4.0	4.0	3.7	3.4	2.3	2.4

Note: Deaths 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 1991.

Source: ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Asthma death rates in NSW declined by 38.5% in all ages and 54.5% in the 5–34 year age group between 1980 and 2000.
- Asthma death rates peaked in the 5–34 year age group in 1986 (1.7 deaths per 100,000) and in all age groups in 1989 (6.2 deaths per 100,000). Rates diminished thereafter. A corresponding reduction in asthma death rates has been observed in Australia as a whole (AIHW, 2000; ABS, 1998).
- The recent decline in asthma deaths may be due to improvements in classification of the cause of death as well as improvements in asthma management and education. Strategies encouraged by the National Asthma Council to improve asthma management include: more use of preventive medications, use of structured asthma management plans, more frequent reviews by general practitioners, improved management in emergency department settings, and greater awareness of asthma (NAC, 2002).

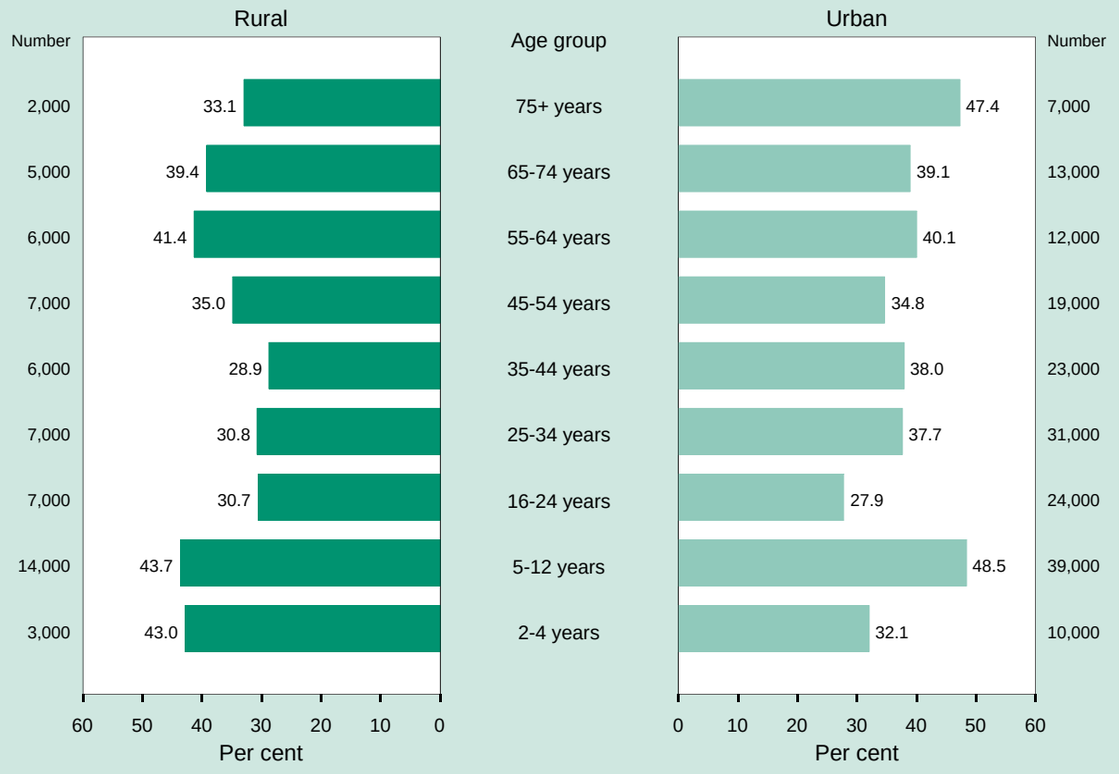
For more information:

Australian Bureau of Statistics. *Asthma and other respiratory conditions.* Canberra: ABS, 1998.

National Asthma Council. *Asthma management handbook* 2002. Melbourne: NAC, 2002. www.nationalasthma.org.au.

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.

Written asthma management plan by age and region,
persons aged 2-12, NSW 2001 and aged 16 and over, NSW 1997 to 1998



Note: Current asthma classified where doctor diagnosed asthma and asthma symptoms or treatment in last 12 months. Estimates based on 3764 respondents with current asthma in the NSW Health Survey 1997 and 1998 (34, that is 0.9%, not stated for having an asthma management plan) and 1292 in the NSW Child Health Survey 2001 (4, that is 0.3%, not stated). Urban areas include the Sydney, Hunter, and Illawarra Health Areas. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

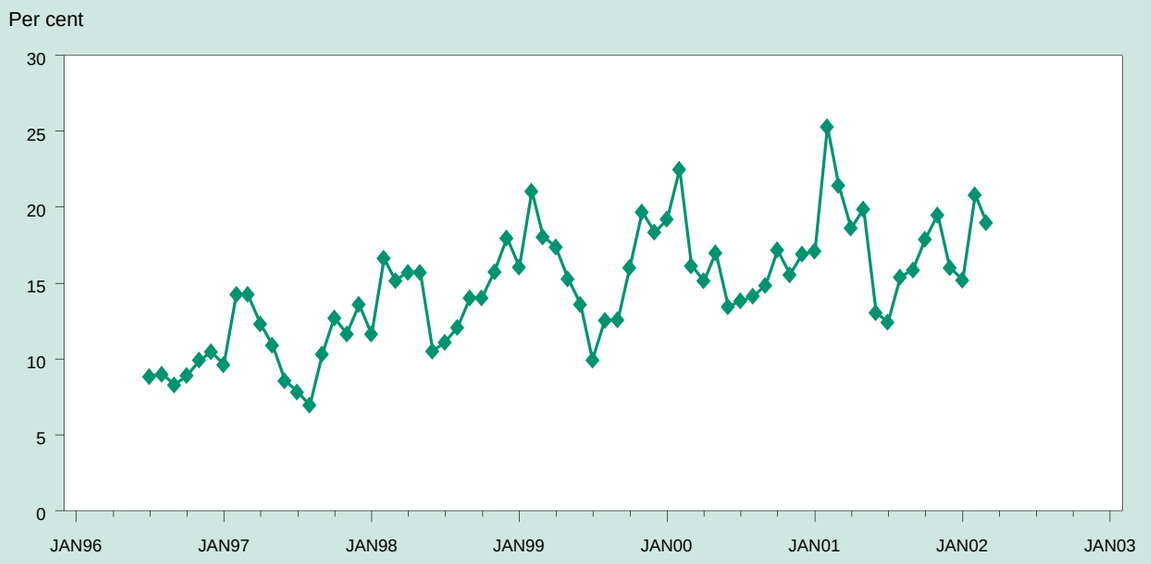
Source: 1997 and 1998 NSW Health Survey and 2001 Child Health Survey (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Regular review by a general practitioner and the use of a written asthma management plan are effective in preventing hospital admissions and attendance at emergency departments for asthma (Gibson, 1999).
- The aims of an asthma management plan are to prevent the occurrence of asthma attacks, identify trigger factors, minimise the symptoms of asthma, maintain the best lung function, and minimise side effects from medication.
- The NSW Health Surveys reported that of those respondents with current asthma, 35.1% of adults in 1997 and 1998 and 43.7% of children in 2001, had a written asthma management plan.
- Among adults and children with asthma who responded to the surveys, the proportion of those with asthma management plans was lower than 50% in all age groups, regardless of whether respondents lived in rural or urban health areas. The highest proportion of asthma management plans (48.5%) was reported among children aged 5–12 years living in urban health areas and the lowest (27.9%), was among adults aged 16–24 years living in urban health areas.

For more information:

Gibson PG, Coughlan J, Wilson AJ, Abramson M, Bauman A, Hensley MJ et al. *Self-management education and regular practitioner review for adults with asthma* (Cochrane Review). *The Cochrane Library*, 1999. www.cochrane.hcn.net.au.

Severe asthma presentations as a proportion of all asthma presentations, children aged 1-14 years, NSW July 1996 to March 2002



Year	Jan	Feb	March	April	May	June	July	Augt	Sept	Oct	Nov	Dec
1996	-	-	-	-	-	-	8.8	9.0	8.3	8.9	9.9	10.5
1997	9.6	14.3	14.3	12.3	10.9	8.6	7.8	7.0	10.3	12.7	11.7	13.6
1998	11.6	16.6	15.2	15.7	15.7	10.5	11.1	12.1	14.0	14.0	15.8	18.0
1999	16.1	21.1	18.1	17.4	15.3	13.6	9.9	12.6	12.6	16.0	19.7	18.4
2000	19.2	22.5	16.1	15.1	17.0	13.4	13.8	14.1	14.9	17.2	15.6	16.9
2001	17.1	25.3	21.5	18.6	19.9	13.1	12.4	15.4	15.9	17.9	19.5	16.0
2002	15.2	20.8	19.0	-	-	-	-	-	-	-	-	-

Note: Severe asthma was defined as asthma symptoms requiring treatment in less than 10 minutes after arrival to an emergency department.

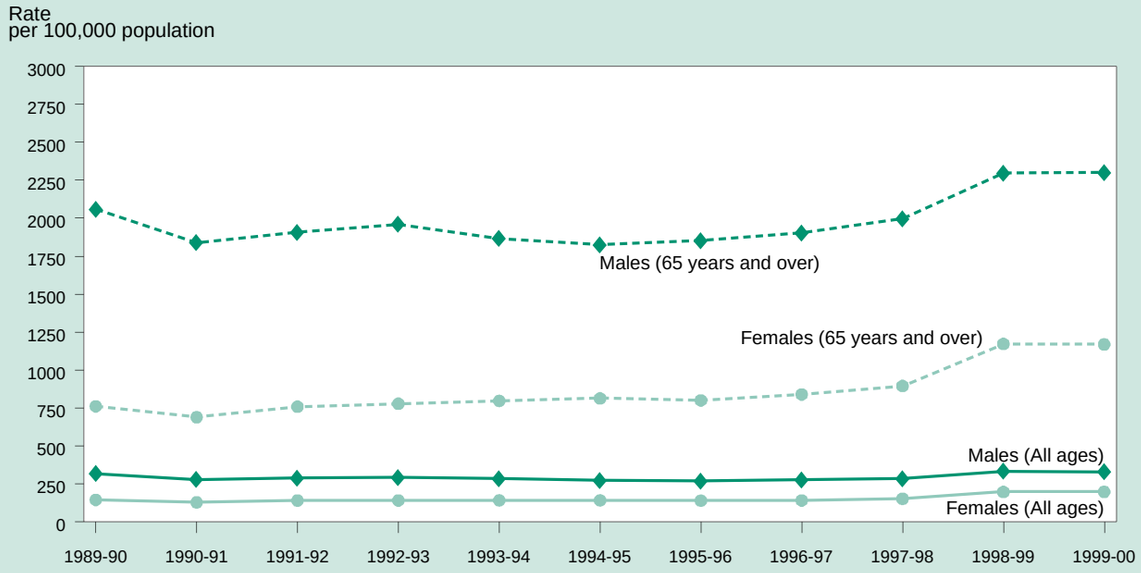
Source: Emergency Department Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Between July 1996 and March 2002, among children, there was a clear trend towards increasing presentations of severe cases of asthma to emergency departments, as a proportion of all cases of asthma. This proportion increased from an average of 11.1% in 1997 to an average of about 17.7% in 2001.
- It is likely that the prevalence of asthma in NSW has increased in that period, reflecting the increase in the prevalence of asthma throughout Australia (Jenkins, 2002). However, hospitalisations for asthma decreased in NSW in the same period.
- The shift in the types of presentations to emergency departments (ED) may indicate the growing number of people who successfully manage their own 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) continued to rely on the assistance of EDs to stabilise their symptoms.
- The information from the Emergency Department Data Collection (EDDC) is not representative and should be interpreted with caution, because it includes data from only two-thirds of ED presentations in NSW. Coding of EDDC data may also be less consistent than the coding 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:

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; 12(11): 293–295.

Hospital separations for chronic obstructive pulmonary disease by sex
persons of all ages and 65 years and over, NSW 1989-90 to 1999-00



			89–90	90–91	91–92	92–93	93–94	94–95	95–96	96–97	97–98	98–99	99–00
Number	All ages	Males	8146	7305	7701	8040	8010	7828	7903	8339	8825	10574	10684
		Females	4665	4220	4715	4854	4965	5072	5091	5279	5803	7661	7831
		Persons	12811	11525	12415	12894	12975	12900	12994	13618	14628	18235	18515
Rate	All ages	Males	316.8	277.8	285.9	291.6	283.1	271.5	268.4	275.7	284.7	332.0	327.7
per 100,000		Females	143.2	126.8	138.9	139.8	140.1	140.0	138.4	139.6	150.5	195.9	196.5
population		Persons	215.4	189.9	200.0	203.6	200.7	195.5	192.9	197.6	207.6	253.3	252.0

Note: Hospital separations were classified by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 1991. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

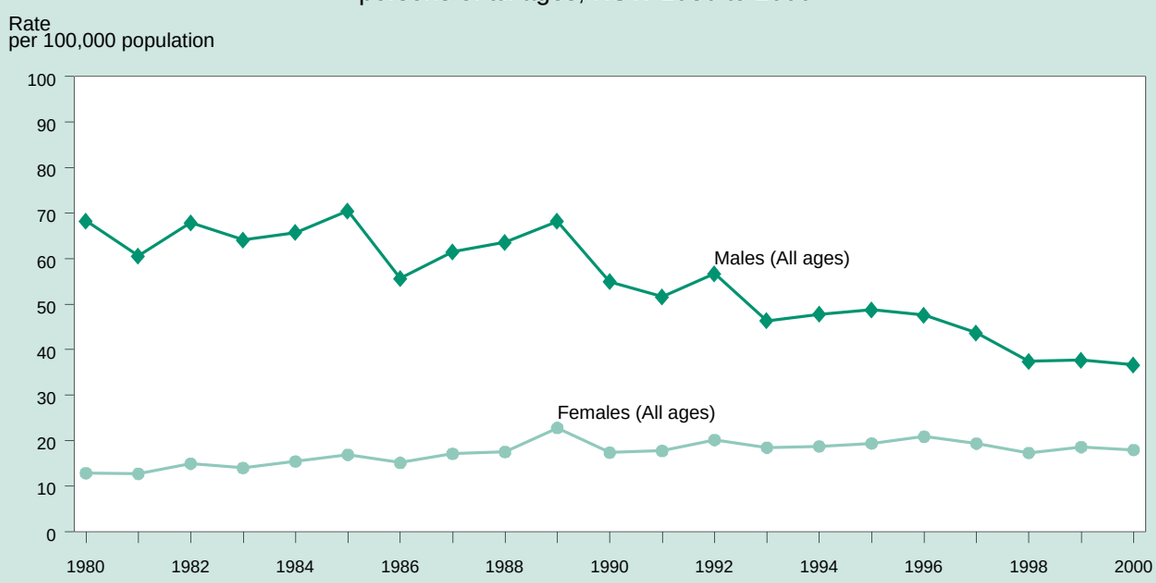
Source: NSW Department of Health Inpatient Statistics Collection (ISC) data and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- 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 common risk factor, while exposure to pollution and infections have also been identified as risk factors for COPD (AIHW, 2000).
- In Australia in 1997–98, there were almost 40,000 hospital separations with the principal diagnosis of COPD, with an average length of stay of 5.3 days (AIHW, 2000).
- In NSW between 1989–90 and 1999–00, the rate of hospitalisations for COPD increased by 17.0% for all ages and by 28.8% in people over 65 years old.
- Trends differed in males and females. Between 1989–90 and 1999–00, the hospital separation rate for COPD increased by 11.9% in males aged over 65 years and by 53.7% in females in the same age group, and by 3.4% in males and by 37.2% in females of all ages. Consequently, the difference between male and female hospital separation rates for COPD has narrowed over this period.
- This increase in female hospitalisation rates for COPD and the narrowing of the gap between male and female rates, can be explained by the increasing prevalence of the disease 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 2000: The seventh biennial health report of the Australian Institute of Health and Welfare.* Canberra: AIHW, 2000

Deaths from chronic obstructive pulmonary disease by sex, persons of all ages, NSW 1980 to 2000



			1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Number	All ages	Males	1292	1253	1424	1199	1280	1342	1349	1294	1138	1184	1185
		Females	608	644	740	695	727	775	859	819	734	828	811
		Persons	1900	1897	2164	1894	2007	2117	2208	2113	1872	2012	1996
Rate per 100,000 population	All ages	Males	54.9	51.6	56.7	46.4	47.8	48.7	47.5	43.7	37.5	37.7	36.6
		Females	17.4	17.7	20.1	18.4	18.7	19.4	20.9	19.4	17.3	18.6	17.9
		Persons	31.8	30.8	34.2	29.2	30.1	30.9	31.1	29.1	25.2	26.3	25.6

Note: Deaths 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 1991.

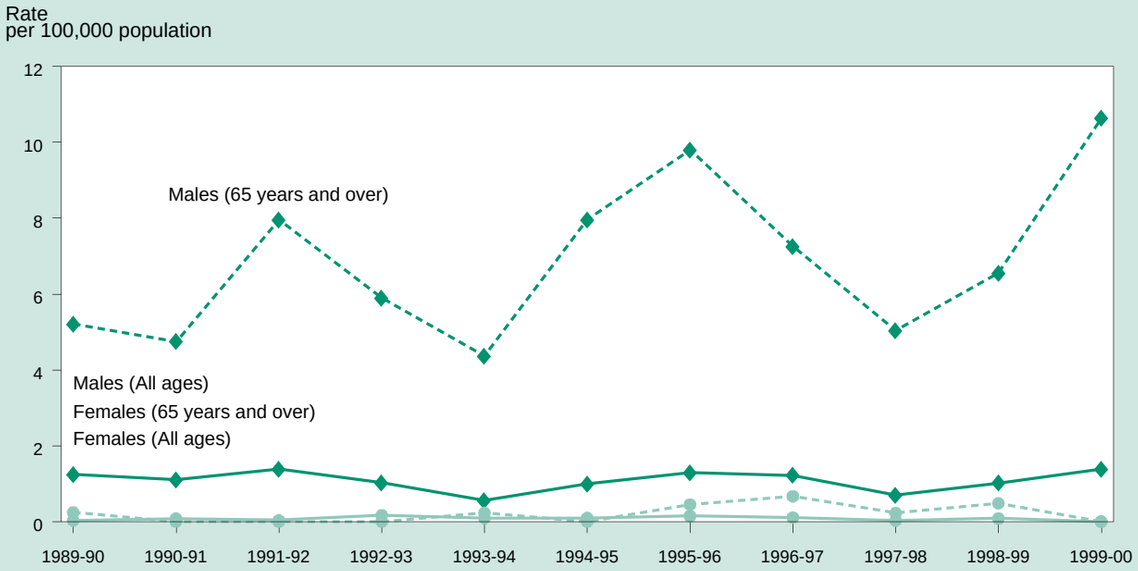
Source: ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- 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 common risk factor, while exposure to pollution and incidence of chest infections have also been identified as risk factors (AIHW, 2000).
- In NSW between 1980 and 2000, the overall male death rate from COPD decreased by 46.4%. In contrast, the overall female death rate increased by 39.8%, from 12.8 to 17.9 per 100,000 in 2000. However, the female rate has been stable over the past 5 years.
- Reductions in male mortality from COPD parallel 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, 2000).
- In Australia in 1998, COPD was the fourth most common cause of death in males and sixth most common cause of death in females (AIHW 2000). COPD is also a major contributor to death from other causes. COPD was reported as an underlying cause of death in 11% of male and 8% of female deaths from ischaemic heart disease in 1998 (AIHW, 2000).

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.

Hospital separations for asbestosis by sex
persons of all ages and aged 65 years and over, NSW 1989-90 to 1999-00



			89–90	90–91	91–92	92–93	93–94	94–95	95–96	96–97	97–98	98–99	99–00
Number	65 years and over	Males	16	15	24	19	14	26	32	24	18	23	39
		Females	1	0	0	0	1	0	2	3	1	2	0
		Persons	17	15	24	19	15	26	34	27	19	25	39
	All ages	Males	36	32	39	30	16	29	38	36	22	32	45
		Females	1	2	1	5	3	3	5	4	1	3	0
		Persons	37	34	40	35	19	32	43	40	23	35	45
Rate per 100,000 population	65 years and over	Males	5.2	4.7	8.0	5.9	4.4	8.0	9.8	7.3	5.0	6.6	10.6
		Females	0.2	0.0	0.0	0.0	0.2	0.0	0.4	0.7	0.2	0.5	0.0
		Persons	2.5	2.2	3.5	2.6	2.0	3.5	4.3	3.4	2.4	3.1	4.7
	All ages	Males	1.2	1.1	1.4	1.0	0.6	1.0	1.3	1.2	0.7	1.0	1.4
		Females	0.0	0.1	0.0	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.0
		Persons	0.6	0.6	0.7	0.6	0.3	0.5	0.6	0.6	0.3	0.5	0.6

Note: Hospital separations were classified by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Rates were age-adjusted using the Australian population as at 30 June 1991.

Source: NSW Department of Health Inpatient Statistics Collection (ISC) data and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Asbestosis is a fibrosis of the lungs resulting from the long-term inhalation of asbestos dust in the mining, milling, manufacture, and application or removal of asbestos products (for example, insulation).
- Asbestosis is preventable, primarily by effective suppression of asbestos dust 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). To minimise exposure, the handling of asbestos is subject to a National Code of Practice and to regulations in NSW (Leigh, 2001).
- Between 1989–90 and 1999–00, the hospitalisation rate among males was stable; however the distribution has shifted to older men. In 1989–90, 43.2% of hospital separations for asbestosis were among males 65 years and over; in 1999–00, 86.7% were among males in this age group. This may indicate a decreasing incidence of asbestosis in NSW.
- There were 2 deaths from asbestosis in NSW in 1981 and 28 deaths in 2000.

For more information:

Beers MH, Berkow R. *The Merck manual of diagnosis and therapy.* West Point: Merck & 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.

Chapter 4.5

Injury and poisoning

- There are around 2400 injury-related deaths and 123,000 injury-related hospitalisations each year.
- Injury and poisoning are 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, poisoning, and interpersonal violence.
- In recent years, death rates have declined for:
  - —all injuries and poisonings combined;
  - —motor vehicle crash injuries;
  - —drowning;
  - —firearm-related deaths.
- Hospitalisation rates have decreased for:
  - —pedestrian injury;
  - —near-drowning;
  - —unintentional poisoning;
  - —firearm-related injuries.
- But hospitalisation rates have increased for:
  - —all injuries and poisonings combined;
  - —injuries to pedal cyclists;
  - —fall-related injuries;
  - —injuries caused by interpersonal violence.
- There are around 27,000 hospitalisations each year for work-related injuries and 8000 hospitalisations for sporting injuries.
- There are around 37,000 hospitalisations each year for fall-related injuries, and these cost the health system more than any other single injury cause, including road trauma.
- 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. Injuries resulted in 8361 deaths in 1999, or 6.5% of all deaths (AIHW, 2001); and approximately 403,386 episodes of inpatient hospital care in 1997–98 (AIHW, 2000). Nationwide inpatient health system costs due to injury are approaching $3 billion, around 8% of total recurrent health expenditure (Mathers and Penm, 1999). In NSW, the total cost of direct morbidity following injuries is estimated to be around $1.5 billion per year (Moller, 2000).

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 2001–2003, the goal of which is to reduce the incidence and the effect of injuries on the health and wellbeing of the Australian population in 4 identified priority areas (falls in older people, falls in children, poisoning in children, and drowning and near drowning).

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 Inpatient Statistics Collection (ISC). In this chapter ISC data excludes those records where a patient was transferred from 1 acute care hospital to another acute care hospital, or where they were a 'statistical discharge' (that is, the patient is still in the same hospital but the type of service being provided has 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 1 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.

Since the last report (Public Health Division, 2000), a new version of the International Classification of Diseases was introduced in NSW hospitals (from 1998–99). This new 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 had a major effect in 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 mode of transport in which the person was injured.

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. *Australian Health Trends 2001.* Canberra, AIHW, 2001.

Australian Institute of Health and Welfare. *Australia's Health 2000.* Canberra, AIHW, 2000.

Commonwealth Department of Health and Aged Care. *National Injury Prevention Plan: Priorities for 2001–2003.* Canberra: DHAC, 2001.

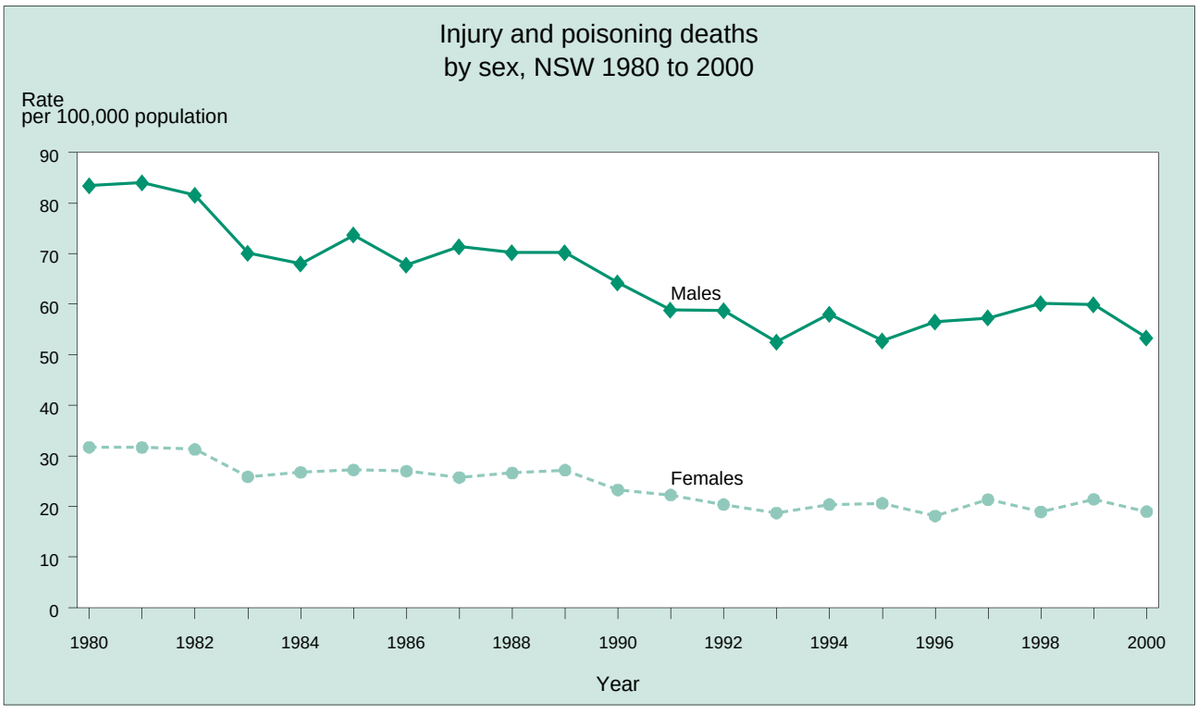
Mathers C. Penm R. *Health System Costs of Injury, Poisoning and Musculoskeletal Disorders in Australia 1993–94.* Canberra: AIHW, 1999.

Moller J. *Estimated cost of injury ($millions) by cause, NSW 1995–96.* Sydney: NSW Department of Health, Injury Prevention and Policy Unit, 1998.

World Health Organization. *Injury: A Leading Cause of the Global Burden of Disease.* Geneva: WHO, 1999.

The National Injury Surveillance Unit Web site at: www.nisu.flinders.edu.au.

Public Health Division. *The health of the people of New South Wales—Report of the Chief Health Officer.* Sydney: NSW Department of Health, 2000. Available at www.health.nsw.gov.au/public-health/chorep00.



		1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Number	Males	1925	1943	1785	1676	1687	1524	1700	1566	1704	1747	1858	1881	1706
	Females	817	856	742	713	672	631	697	712	644	779	706	806	730
	Persons	2742	2799	2527	2389	2359	2155	2397	2278	2348	2526	2564	2687	2436
Rate	Males	70.3	70.3	64.2	58.9	58.8	52.6	58.1	52.8	56.5	57.3	60.2	59.9	53.3
per 100,000	Females	26.6	27.2	23.3	22.3	20.4	18.7	20.4	20.6	18.1	21.4	18.9	21.4	19.0
population	Persons	48.2	48.5	43.2	40.2	39.1	35.3	38.8	36.3	36.9	38.9	39.1	40.1	35.7

Note: Deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001, data for which were unavailable at the time of production. Rates were age-adjusted using the standard Australian population as at 30 June 1991.

Source: ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

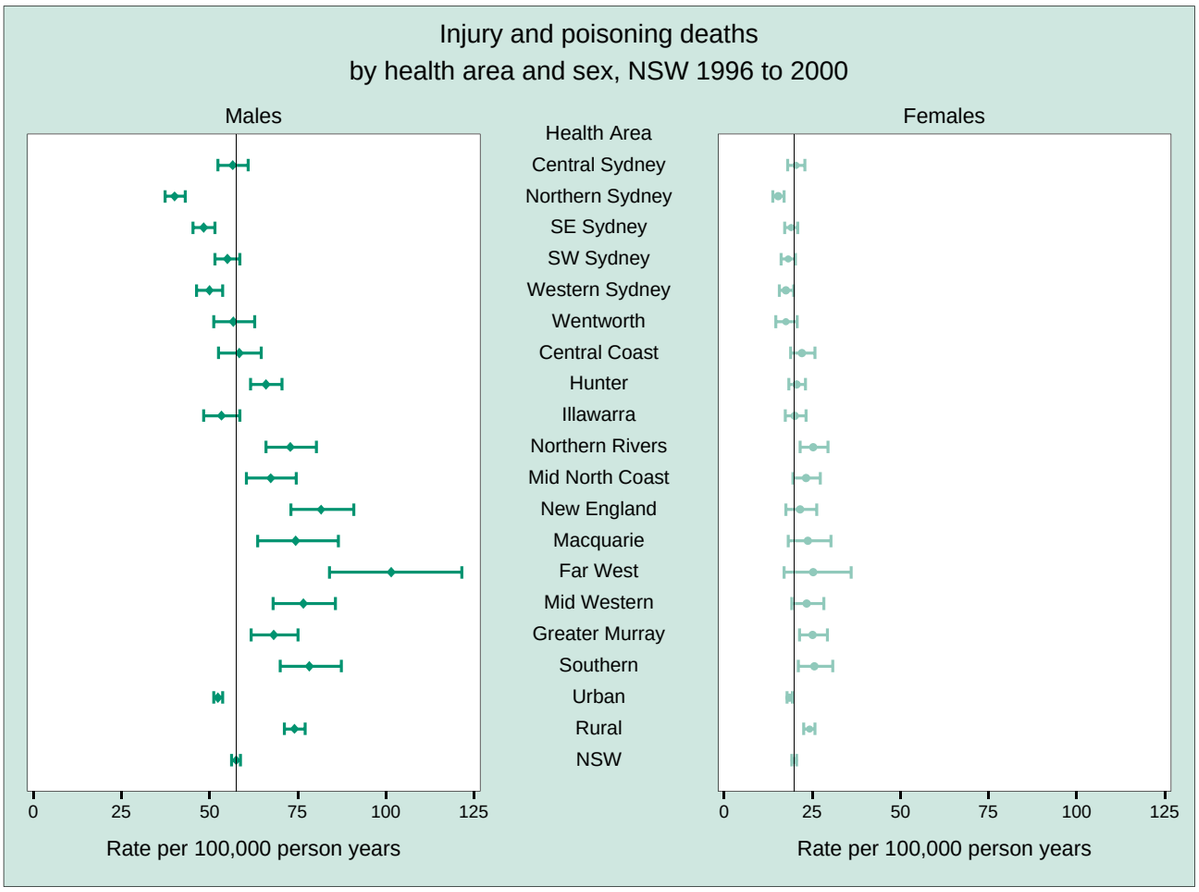
- In 2000, 2436 NSW residents died as a result of injury and poisoning, giving a death rate of 35.7 per 100,000 people.
- Between 1980 and 2000, the majority of deaths due to injury and poisoning were of males. The death rate for males during this period was between 2 and 3 times the female rate, except among those aged 0–4 years, where the male death rate was similar to the female rate.
- Death rates from injury and poisoning declined between 1980 and 2000. However, injury and poisoning remained the leading cause of death among people aged 1–44 years (IRMRC, 2000).
- Common causes of injury-related deaths in 2000 were suicide (30.2%), motor vehicle crashes (25.1%), falls (9.4%), poisoning (6.7%), and interpersonal violence (4.5%).
- Compared with other states in Australia, NSW had the fourth highest age-adjusted death rate for injury and poisoning (40.1 per 100,000) in 1997. However, the NSW death rate was similar to the overall Australian rate of 40.7 per 100,000 (Bordeaux, 1999).

For more information:

Bordeaux S. *Injury Mortality Australia 1997. Australian Injury Prevention Bulletin 20.* Adelaide: NISU, 1999.

Injury Prevention and Policy Unit Web site at www.health.nsw.gov.au/public-health/health-promotion/improve/injuryprev/index.htm.

Injury Risk Management Research Centre. *2001 NSW Injury Profile.* Sydney: IRMRC, 2000. www.irmrc.unsw.edu.au.



Note: Deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001, data for which were unavailable at the time of production. Rates were age-adjusted using the standard Australian population as at 30 June 1991. Lower and upper limits of 95% confidence interval for the rate are shown.

Source: ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- In the period 1996 to 2000, death rates due to injury and poisoning in NSW varied markedly by health area, particularly among males.
- For males, death rates per 100,000 ranged from 40.1 in the Northern Sydney Health Area to 101.5 in the Far West Health Area. For females, death rates per 100,000 ranged from 15.3 per 100,000 in the Northern Sydney Health Area to 25.5 in the Southern Health Area.
- The highest death rates for injury and poisoning were recorded in rural areas, particularly the Far West, Southern, New England, Mid Western, Macquarie, and Greater Murray Health Areas. Overall, death rates in rural areas were 1.4 times higher than in urban areas. Injury death rates were higher in rural areas for most injury causes, including motor vehicle accidents, suicide, and homicide.

For more information:

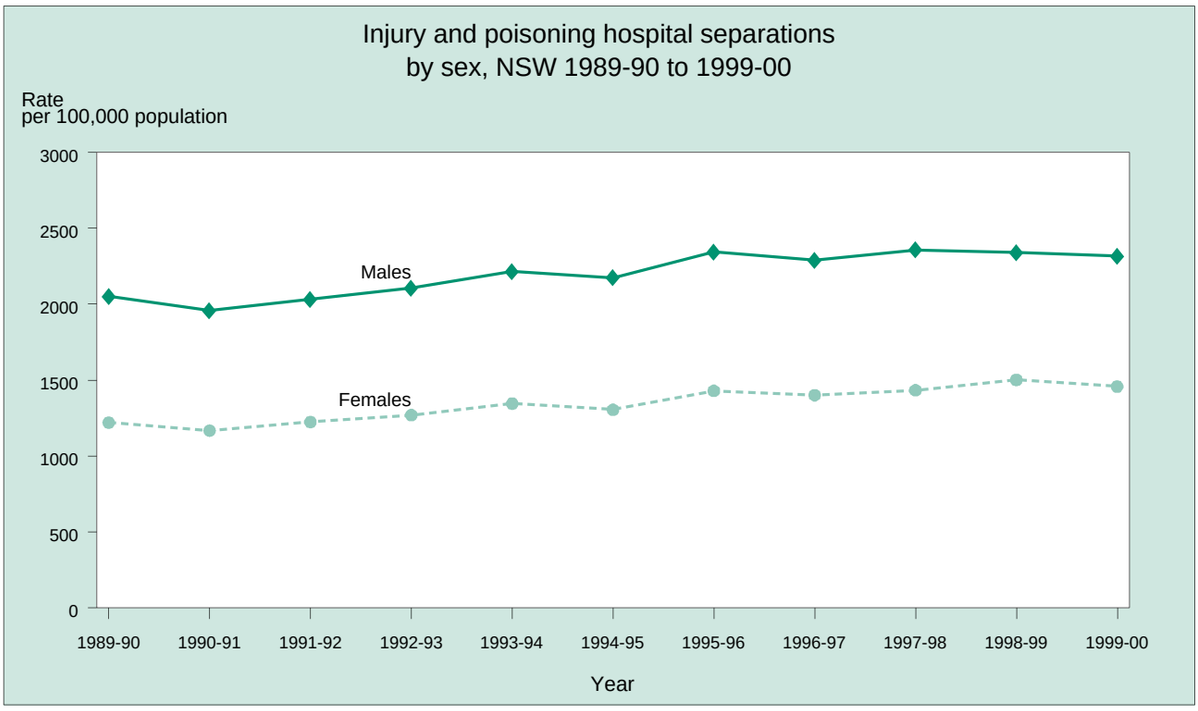
NSW Department of Health A*rea Health Service Health Status Profiles* www.health.nsw.gov.au/public-health/ahsprof/ahsprof.html.

Deaths from injury and poisoning by health area and sex, NSW, 1996–2000

Health Area		Deaths	Rate/100,000	LL 95% CI	UL 95% CI
Central Sydney	Males	710	56.5	52.4	60.9
	Females	297	20.2	17.9	22.8
	Persons	1006	37.7	35.4	40.1
Northern Sydney	Males	779	40.1	37.3	43.0
	Females	421	15.3	13.8	17.0
	Persons	1199	27.0	25.4	28.6
SE Sydney	Males	972	48.3	45.3	51.5
	Females	463	19.0	17.2	20.9
	Persons	1434	33.2	31.5	35.0
SW Sydney	Males	965	55.0	51.4	58.6
	Females	340	18.1	16.2	20.1
	Persons	1305	36.1	34.2	38.1
Western Sydney	Males	773	49.9	46.3	53.6
	Females	298	17.5	15.5	19.6
	Persons	1071	33.2	31.2	35.2
Wentworth	Males	402	56.7	51.1	62.7
	Females	135	17.4	14.6	20.7
	Persons	536	36.6	33.5	39.8
Central Coast	Males	390	58.4	52.6	64.6
	Females	193	22.0	18.8	25.7
	Persons	583	39.7	36.4	43.3
Hunter	Males	853	66.0	61.6	70.6
	Females	330	20.5	18.2	23.0
	Persons	1183	42.9	40.5	45.5
Illawarra	Males	437	53.3	48.3	58.5
	Females	196	20.1	17.3	23.2
	Persons	633	36.5	33.6	39.5
Northern Rivers	Males	439	72.9	66.0	80.3
	Females	183	25.2	21.5	29.4
	Persons	622	48.6	44.7	52.7
Mid North Coast	Males	402	67.2	60.4	74.5
	Females	180	23.2	19.5	27.2
	Persons	582	44.7	40.8	48.7
New England	Males	339	81.5	73.0	90.8
	Females	110	21.5	17.5	26.2
	Persons	449	51.5	46.7	56.6
Macquarie	Males	176	74.4	63.6	86.4
	Females	67	23.7	18.2	30.3
	Persons	243	48.2	42.3	54.8
Far West	Males	122	101.5	84.0	121.4
	Females	31	25.2	17.0	36.0
	Persons	153	63.3	53.6	74.3
Mid Western	Males	304	76.5	68.1	85.7
	Females	119	23.4	19.2	28.3
	Persons	423	50.2	45.4	55.3
Greater Murray	Males	419	68.2	61.8	75.1
	Females	174	25.1	21.3	29.3
	Persons	593	46.3	42.6	50.3
Southern	Males	336	78.3	69.9	87.4
	Females	121	25.5	21.0	30.7
	Persons	457	51.4	46.7	56.5
Urban	Males	6281	52.4	51.1	53.7
	Females	2670	18.5	17.8	19.2
	Persons	8951	34.9	34.2	35.7
Rural	Males	2536	74.1	71.1	77.1
	Females	985	24.1	22.6	25.8
	Persons	3521	48.8	47.1	50.5
NSW	Males	8897	57.5	56.3	58.7
	Females	3669	19.8	19.1	20.5
	Persons	12566	38.2	37.5	38.8

Note: Deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001, data for which were unavailable at the time of production. Rates were age-adjusted using the standard Australian population as at 30 June 1991. LL/UL 95% CI = Lower and upper limits of 95% confidence interval for the standardised rate.

Source: ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.



		1989–90	1990–91	1991–92	1992–93	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
Number	Males	58922	56749	59356	61839	65328	64711	70534	69640	72389	72746	72811
	Females	36955	35821	38317	40228	43201	42639	47380	47433	49323	52830	52183
	Persons	95877	92570	97673	102068	108529	107350	117914	117079	121713	125576	124994
Rate	Males	2051.9	1959.6	2033.0	2107.2	2215.9	2175.5	2343.7	2290.7	2358.4	2342.3	2319.2
per 100,000	Females	1219.8	1167.0	1223.9	1269.1	1345.3	1305.1	1429.8	1400.7	1433.4	1501.7	1457.7
population	Persons	1653.5	1580.3	1646.6	1705.1	1796.4	1755.8	1902.7	1860.7	1911.6	1938.2	1904.8

Note: Hospital separations were classifed by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Records relating to acute hospital transfer and statistical discharge were excluded. Hospital separation rates were age-adjusted using the Australian population as at 30 June 1991.

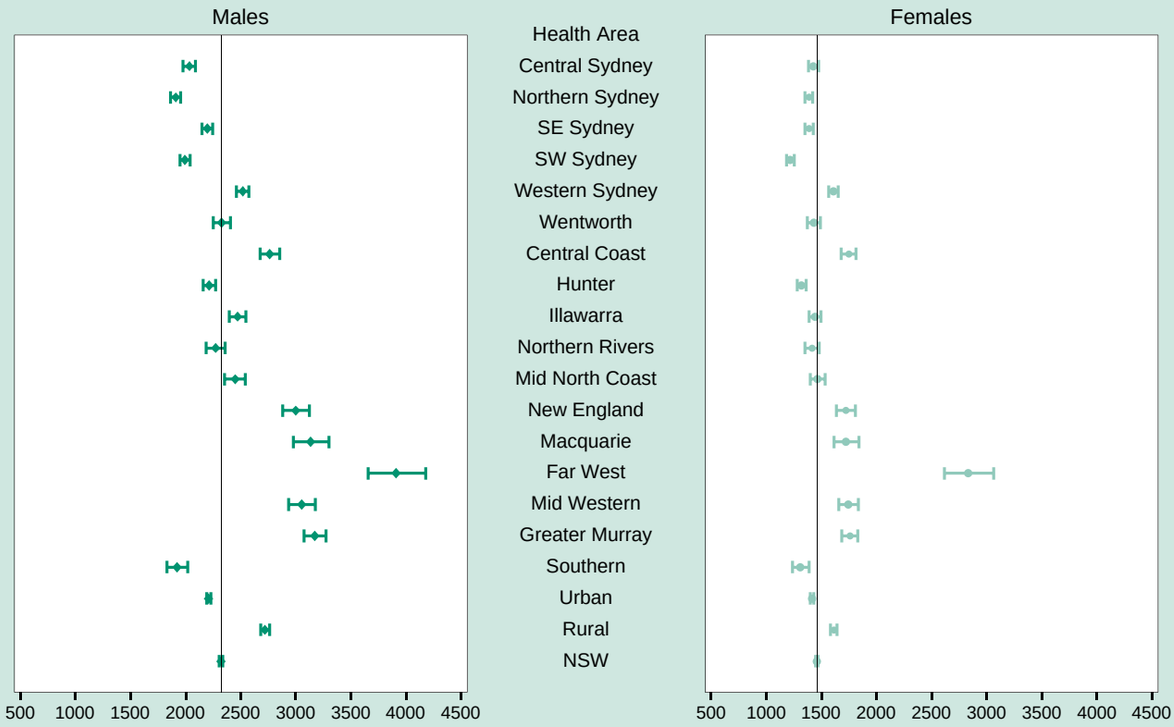
Source: NSW Department of Health Inpatient Statistics Collection (ISC) and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- In 1999–00 there were almost 125,000 hospitalisations of NSW residents following injury or poisoning, giving a hospitalisation rate of around 1900 per 100,000 people.
- During 1989–90 to 1999–00, the hospitalisation rate for injury and poisoning in NSW rose gradually. The hospitalisation for males during this period was around 1.5–2 times the female rate.
- The highest rates of hospitalisation were recorded among people aged 15–29 years (2176 per 100,000) and people aged more than 70 years (4345 per 100,000).
- Common causes of injury-related hospitalisations in 1999–00 were falls (33.4%), motor vehicle accidents (9.7%), attempted suicide (5.9%), sporting injuries (5.4%), cutting and piercing injuries (5.1%), interpersonal violence (4.9%), and poisoning (3.4%).
- Compared with other states in Australia, NSW had the fifth highest age-adjusted hospitalisation rate for injury-related hospitalisations in 1997. The NSW hospitalisation rate was slightly lower than the overall Australian rate (IRMRC, 2000).

For more information:

Injury Risk Management Research Centre. *2001 NSW Injury Profile*. Sydney: IRMRC, 2000. www.irmrc.unsw.edu.au.

Injury and poisoning hospital separations
by health area and sex, NSW 1999-00



Note: Hospital separations were classified by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Records relating to acute hospital transfer and statistical discharge were excluded. Hospital separations were age-adjusted using the Australian population as at 30 June 1991. Lower and upper limits of 95% confidence interval for the standardised rate are shown.

Source: NSW Department of Health Inpatient Statistics Collection (ISC) and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- The pattern of hospitalisation rates for injury and poisoning by health area is similar to that for injury-related deaths.
- In the financial year 1999–00, hospitalisation rates per 100,000 for injury and poisoning for males ranged from 1908 in the Northern Sydney Health Area to 3910 in the Far West Health Area. For females, hospitalisation rates per 100,000 ranged from 1218 in the South Western Sydney Health Area to 2831 in the Far West Health Area.
- The highest hospitalisation rates for injury and poisoning were recorded in rural areas, particularly the Far West, Macquarie, Mid Western, New England, and Greater Murray Health Areas. Overall, hospitalisation rates were 1.2 times higher in rural areas than in urban areas. Hospitalisation rates were higher for a range of injury causes, including motor vehicle accidents, farm-related injuries and interpersonal violence.

For more information:

NSW Department of Health *Area Health Service Health Status Profiles* www.health.nsw.gov.au/public-health/ahsprof/ahsprof.html.

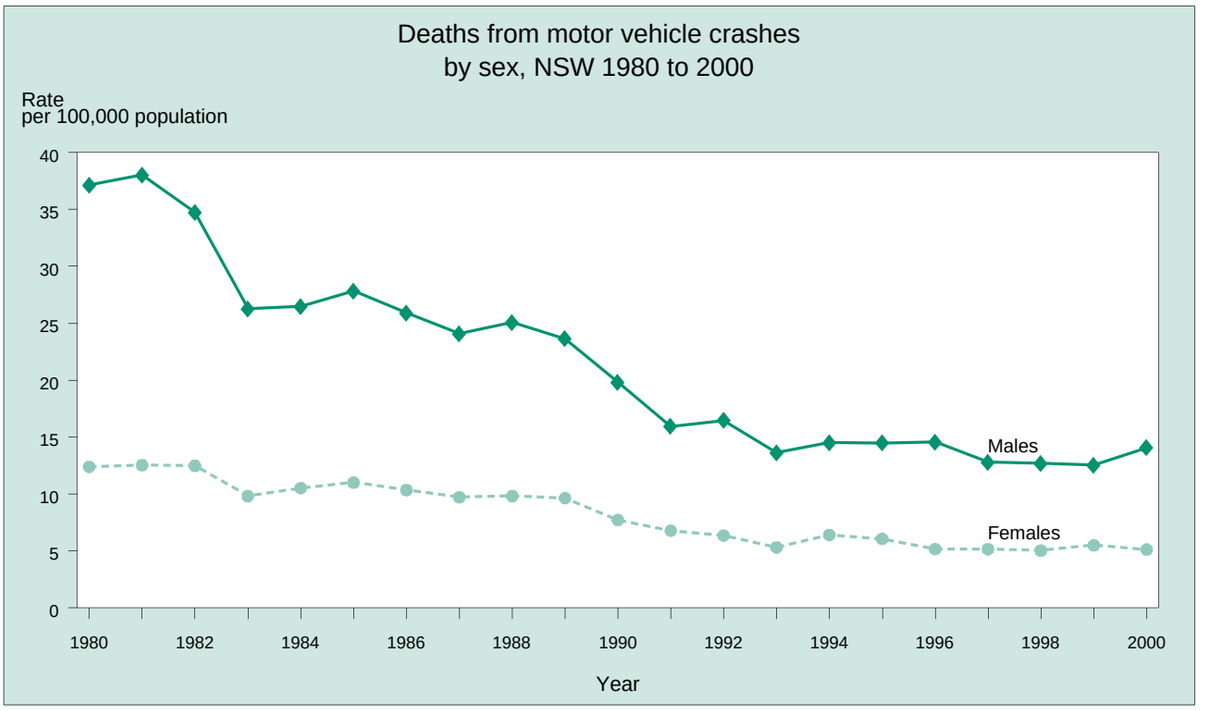
Australian Bureau of Statistics Web site at www.abs.gov.au.

Hospital separations for injury and poisoning by health area and sex, NSW, 1990–00

Health Area		Hospitalisations	Rate/100,000	LL 95% CI	UL 95% CI
Central Sydney	Males	4988	2032	1975	2090
	Females	3992	1428	1381	1475
	Persons	8980	1745	1708	1782
Northern Sydney	Males	7158	1908	1864	1953
	Females	6769	1386	1351	1422
	Persons	13927	1665	1636	1694
SE Sydney	Males	8467	2197	2149	2245
	Females	6118	1385	1349	1423
	Persons	14585	1811	1781	1842
SW Sydney	Males	7549	1994	1948	2040
	Females	4746	1218	1183	1253
	Persons	12295	1621	1593	1651
Western Sydney	Males	8382	2517	2462	2572
	Females	5607	1609	1567	1652
	Persons	13989	2081	2047	2116
Wentworth	Males	3496	2327	2248	2407
	Females	2241	1430	1371	1491
	Persons	5737	1893	1844	1944
Central Coast	Males	3811	2763	2674	2855
	Females	3031	1747	1680	1815
	Persons	6842	2265	2209	2321
Hunter	Males	5846	2214	2157	2272
	Females	4003	1320	1278	1363
	Persons	9849	1782	1746	1818
Illawarra	Males	4141	2470	2395	2548
	Females	2736	1441	1386	1498
	Persons	6877	1971	1924	2019
Northern Rivers	Males	2804	2270	2184	2359
	Females	2048	1413	1348	1480
	Persons	4852	1848	1794	1903
Mid North Coast	Males	2917	2447	2353	2543
	Females	2190	1463	1396	1532
	Persons	5107	1962	1905	2021
New England	Males	2474	2998	2879	3121
	Females	1617	1719	1633	1808
	Persons	4091	2369	2296	2445
Macquarie	Males	1518	3135	2975	3300
	Females	932	1724	1611	1842
	Persons	2450	2442	2344	2543
Far West	Males	918	3910	3657	4175
	Females	662	2831	2613	3061
	Persons	1580	3420	3250	3596
Mid Western	Males	2477	3052	2932	3177
	Females	1588	1745	1657	1836
	Persons	4065	2432	2357	2510
Greater Murray	Males	3905	3172	3073	3275
	Females	2488	1757	1686	1830
	Persons	6393	2490	2429	2553
Southern	Males	1641	1922	1827	2020
	Females	1300	1308	1234	1386
	Persons	2941	1636	1575	1699
Urban	Males	53838	2207	2188	2226
	Females	39243	1415	1400	1429
	Persons	93081	1827	1815	1839
Rural	Males	18654	2720	2680	2761
	Females	12825	1612	1582	1641
	Persons	31479	2183	2158	2208
NSW	Males	72811	2319	2302	2336
	Females	52183	1458	1445	1471
	Persons	124994	1905	1894	1915

Note: Hospital separations were classifed by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Records relating to acute hospital transfer and statistical discharge were excluded. Hospital separation rates were age-adjusted using the Australian population as at 30 June 1991. LL/UL 95% CI = Lower and upper limits of 95% confidence interval for the standardised rate.

Source: NSW Department of Health Inpatient Statistics Collection (ISC) and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.



		1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Number	Males	702	674	570	459	480	397	425	428	437	386	389	387	443
	Females	289	283	231	207	195	164	202	192	166	165	166	182	168
	Persons	991	957	801	666	675	561	627	620	603	551	555	569	612
Rate	Males	25.1	23.6	19.8	15.9	16.5	13.6	14.5	14.5	14.6	12.8	12.7	12.5	14.1
per 100,000	Females	9.8	9.6	7.7	6.8	6.3	5.3	6.4	6.0	5.1	5.1	5.0	5.5	5.1
population	Persons	17.3	16.6	13.7	11.3	11.3	9.4	10.3	10.2	9.7	8.9	8.8	8.9	9.5

Note: Deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001, data for which were unavailable at the time of production. Rates were age-adjusted using the standard Australian population as at 30 June 1991.

Source: ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

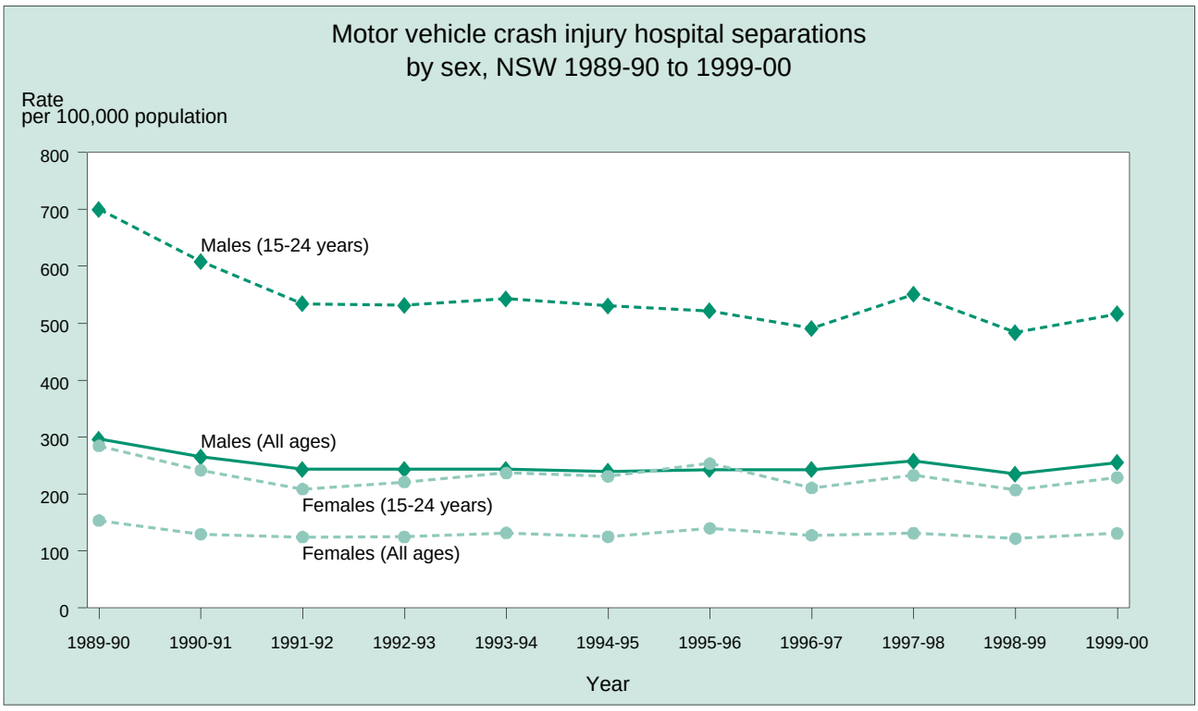
- In 2000, 612 NSW residents died as the result of an incident involving a motor vehicle, giving a death rate of 9.5 per 100,000 people.
- The majority of deaths involving a motor vehicle were of males, with the male death rate being 2 to 3 times higher than the female rate.
- Overall, the death rate from motor vehicle crash injuries in NSW dropped by more than half in the 20 years between 1980 and 2000. However, motor vehicle crashes still cause about one-quarter 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.
- In 2000, NSW had the fourth highest death rate from motor vehicle crash injuries of all Australian states. The NSW rate was the same as the overall Australian rate (9.5 per 100,000). With regard to motor vehicle crash deaths per 100 million vehicle kilometres travelled, again the NSW rate (1.1) was similar to the overall Australian rate (1.0) (Australian Transport Safety Bureau Road Safety Statistics).

For more information:

Australian Transport Safety Bureau www.atsb.gov.au.

Roads and Traffic Authority NSW (RTA). *Road traffic accidents in NSW: 2000.* Sydney: NSW RTA, 2001. www.rta.nsw.gov.au/safety/accidentstats2000.pdf.

Injury Risk Management Research Centre. *2001 NSW Injury Profile.* Sydney: IRMRC, 2000. www.irmrc.unsw.edu.au.



		Sex	89–90	90–91	91–92	92–93	93–94	94–95	95–96	96–97	97–98	98–99	99–00
Number	15–24 years	Males	3279	2843	2488	2462	2494	2426	2365	2206	2473	2177	2345
		Females	1277	1084	932	984	1048	1012	1102	911	1003	892	995
		Persons	4556	3927	3420	3446	3542	3438	3467	3117	3476	3069	3340
	All ages	Males	8591	7739	7143	7145	7156	7113	7262	7320	7817	7228	7915
		Females	4460	3800	3706	3736	3975	3798	4296	3990	4108	3882	4200
		Persons	13051	11540	10849	10881	11131	10911	11558	11310	11925	11110	12115
Rate per 100,000 population	15–24 years	Males	700.4	608.5	534.1	531.8	543.0	530.5	521.6	491.0	551.0	483.6	516.5
		Females	284.4	241.5	208.4	220.8	236.6	230.7	253.2	210.4	232.5	206.7	228.8
		Persons	496.8	428.8	374.7	379.4	392.8	383.5	389.9	353.2	394.8	348.0	375.7
	All ages	Males	295.9	265.4	243.4	243.0	243.1	239.6	242.7	242.6	257.4	235.2	255.2
		Females	153.1	129.1	124.0	124.2	131.4	124.5	139.4	127.1	130.7	121.4	130.5
		Persons	225.2	197.7	184.2	184.0	187.4	182.4	191.2	185.0	194.2	178.9	193.4

Note: Hospital separations were classifed by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Hospital separation rates were age-adjusted using the Australian population as at 30 June 1991.

Source: NSW Department of Health Inpatient Statistics Collection (ISC) and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

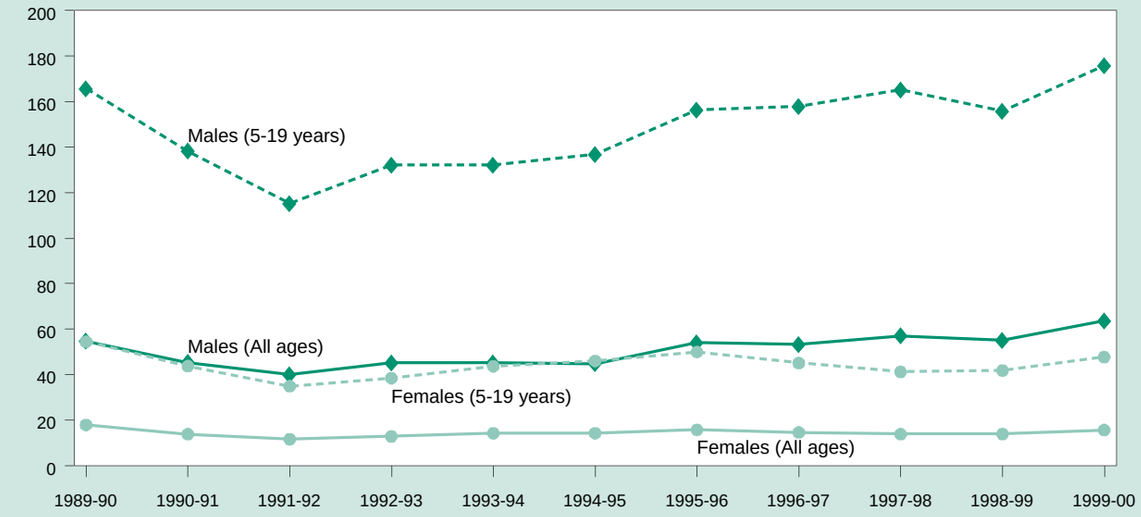
- In the financial year 1999–00, there were just over 12,000 hospitalisations of NSW residents who received an injury in any incident involving a motor vehicle. The hospitalisation rate for these injuries among people aged 15–24 was around twice the all-ages rate. People aged 15–24 years accounted for more than one-quarter of all those hospitalised for injuries due to motor vehicle crashes.
- 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 in 1998–99 coincided with an apparent drop in hospitalisation rates for motor vehicle accident injuries compared with the previous year, but rates increased slightly again in 1999–00.
- Drivers of vehicles were the people most often hospitalised as a result of a motor vehicle accident injury 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 www.atsb.gov.au.

Roads and Traffic Authority NSW (RTA). *Road traffic accidents in NSW: 2000.* Sydney: NSW RTA, 2001. www.rta.nsw.gov.au/safety/accidentstats2000.pdf.

Pedal cycle injury hospitalisations
by sex, persons of all ages and 5-19 years, NSW 1989-90 to 1999-00



			89–90	90–91	91–92	92–93	93–94	94–95	95–96	96–97	97–98	98–99	99–00
Number	5–19 years	Males	1105	920	764	874	872	908	1045	1063	1122	1061	1206
		Females	344	276	220	243	278	294	323	293	270	275	315
		Persons	1449	1196	985	1117	1150	1202	1368	1356	1392	1336	1521
	All ages	Males	1608	1339	1182	1341	1338	1335	1624	1613	1733	1687	1957
		Females	507	392	331	369	409	413	460	430	413	416	467
		Persons	2116	1731	1513	1710	1747	1748	2084	2043	2146	2103	2424
Rate per 100,000 population	5–19 years	Males	165.7	138.2	115.1	132.1	132.1	136.8	156.3	157.9	165.2	155.8	175.9
		Females	54.5	43.8	34.9	38.4	43.7	46.0	50.0	45.1	41.2	41.8	47.7
		Persons	111.4	92.2	76.1	86.5	89.0	92.5	104.4	102.8	104.7	100.2	113.4
	All ages	Males	54.7	45.3	39.9	45.2	45.1	44.8	54.1	53.3	57.0	55.1	63.7
		Females	17.9	13.8	11.6	12.8	14.2	14.3	15.7	14.6	13.8	13.9	15.6
		Persons	36.6	29.9	26.0	29.4	29.9	29.8	35.2	34.2	35.7	34.8	40.0

Note: Hospital separations were classifed by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Records relating to acute hospital transfer and statistical discharge were excluded. Hospital separation rates were age-adjusted using the Australian population as at 30 June 1991.

Source: NSW Department of Health Inpatient Statistics Collection (ISC) and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

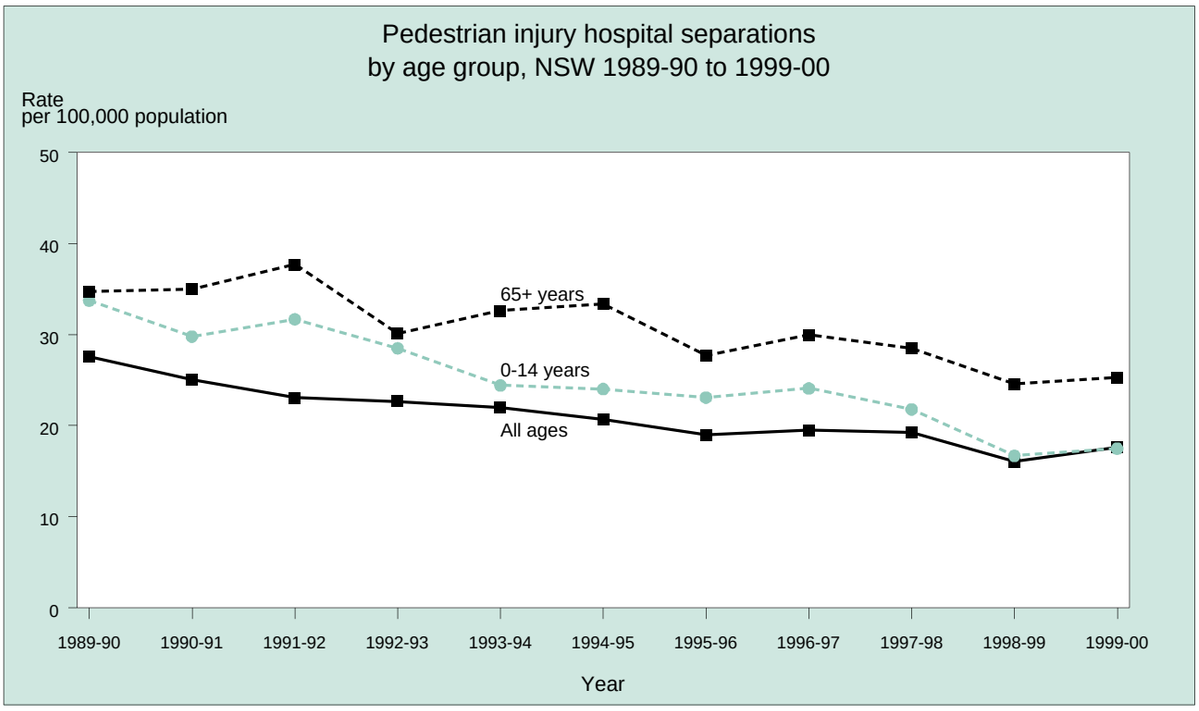
- In the financial year 1999–00, there were 2424 hospital admissions of NSW residents who received an injury while pedal cycling. Almost two-thirds (62.7%) of these were of people aged 5–19 years.
- Overall, the rate of hospitalisations for injuries to pedal cyclists declined between 1989–90 and 1994–95, but has increased 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 6 deaths and around 1218 injuries of pedal cyclists on NSW roads in 2000 (RTA, 2001). This number of injuries appears to be a considerable underestimate, given that more than 2000 hospital separations for pedal cycle injuries have been recorded in each of the 5 most recent financial years.
- The RTA is developing an Action Plan for Motorcycle and Bicycle Rider Safety as part of the Road Safety 2010 strategy.

For more information:

Australian Transport Safety Bureau www.atsb.gov.au.

Katz R. *Bikeplan 2010. The state of cycling.* Sydney: NSW RTA, 1998.

Roads and Traffic Authority NSW (RTA). *Road traffic accidents in NSW—2000.* Sydney: NSW RTA, 2001. www.rta.nsw.gov.au/safety/accidentstats2000.pdf.



			89–90	90–91	91–92	92–93	93–94	94–95	95–96	96–97	97–98	98–99	99–00
Number	0–14 years	Males	278	243	266	239	202	212	191	202	178	143	146
		Females	147	134	138	127	113	100	111	115	109	77	85
		Persons	426	377	404	366	315	312	302	317	287	220	231
	65+ years	Males	110	128	130	105	114	121	107	111	107	92	111
		Females	121	113	137	114	130	136	112	130	127	113	101
		Persons	232	240	267	219	244	257	219	241	234	205	212
	All ages	Males	1061	928	864	847	841	798	734	762	743	638	689
		Females	542	539	506	508	482	464	432	452	467	381	439
		Persons	1603	1467	1370	1355	1323	1262	1166	1214	1210	1019	1128
Rate per 100,000 population	0–14 years	Males	43.1	37.5	40.7	36.3	30.6	31.9	28.5	30.0	26.4	21.2	21.6
		Females	23.9	21.7	22.2	20.3	18.0	15.8	17.4	17.9	16.9	12.0	13.1
		Persons	33.7	29.8	31.7	28.5	24.4	24.0	23.1	24.1	21.8	16.7	17.5
	65+ years	Males	41.0	47.4	45.2	36.2	38.0	38.6	33.3	33.0	31.9	25.8	31.0
		Females	30.8	28.2	33.1	26.7	29.9	30.8	24.9	28.6	27.5	23.6	21.0
		Persons	34.7	35.0	37.7	30.1	32.6	33.4	27.7	30.0	28.5	24.6	25.3
	All ages	Males	36.9	32.4	29.7	28.9	28.6	26.9	24.5	25.1	24.3	20.6	22.0
		Females	18.3	18.1	16.5	16.6	15.5	14.7	13.6	14.0	14.4	11.4	13.4
		Persons	27.6	25.0	23.1	22.7	22.0	20.7	18.9	19.5	19.3	16.0	17.6

Note: Hospital separations were classifed by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Hospital separation rates were age-adjusted using the Australian population as at 30 June 1991.

Source: NSW Department of Health Inpatient Statistics Collection (ISC) and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

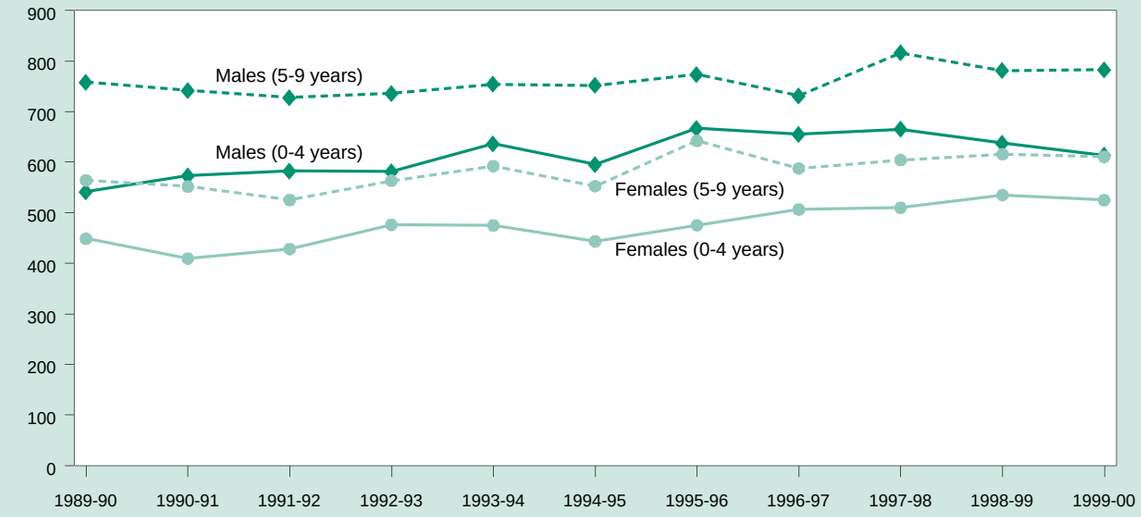
- In the financial year 1999–00 there were 1128 hospital admissions of NSW residents who received an injury while involved as a pedestrian in a road traffic crash. Children aged 0–14 years accounted for around 20% of these, while people aged 65 years or older accounted for around 19%.
- The overall rate of pedestrian injury hospitalisations has declined gradually since 1989–90. The introduction of ICD-10-AM in 1998–99 coincided with a drop in the overall rate.
- The NSW Roads and Traffic Authority (RTA) identified that there were 110 deaths and 2979 injuries of pedestrians in NSW in 2000 (RTA, 2001). The RTA is developing an Action Plan for Pedestrian Safety as part of the Road Safety 2010 strategy.

For more information:

Australian Transport Safety Bureau www.atsb.gov.au.

Roads and Traffic Authority NSW (RTA). *Road traffic accidents in NSW: 2000.* Sydney: NSW RTA, 2001. www.rta.nsw.gov.au/safety/accidentstats2000.pdf.

Fall-related injury hospital separations, by sex, children aged 0-4 and 5-9 years, NSW 1989-90 to 1999-00



		Sex	89–90	90–91	91–92	92–93	93–94	94–95	95–96	96–97	97–98	98–99	99–00
Number	0–4 years	Males	1183	1261	1297	1308	1438	1347	1504	1475	1491	1417	1358
		Females	934	858	907	1016	1016	951	1019	1084	1086	1131	1105
		Persons	2118	2120	2204	2324	2454	2298	2523	2559	2577	2548	2463
	5–9 years	Males	1643	1616	1592	1614	1653	1658	1726	1649	1854	1784	1790
		Females	1160	1143	1095	1178	1239	1163	1367	1262	1305	1337	1326
		Persons	2803	2759	2687	2792	2892	2821	3093	2911	3159	3121	3116
Rate per 100,000 population	0–4 years	Males	541.6	573.8	582.7	581.4	636.9	596.0	667.0	655.1	665.5	637.6	613.9
		Females	448.9	409.7	428.4	476.4	475.1	443.5	475.6	506.7	510.1	535.3	525.1
		Persons	496.4	493.7	507.5	530.3	558.2	521.8	573.7	582.8	589.8	587.7	570.6
	5–9 years	Males	758.7	742.2	728.3	736.6	754.6	752.1	774.1	731.4	816.4	781.5	783.1
		Females	564.3	552.1	525.5	563.7	592.4	552.8	642.6	588.1	604.5	616.1	611.0
		Persons	664.0	649.5	629.3	652.2	675.4	654.8	709.9	661.5	713.2	700.9	699.3

Note: Hospital separations were classifed by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Records relating to acute hospital transfer and statistical discharge were excluded. Hospital separation rates were age-adjusted using the Australian population as at 30 June 1991.

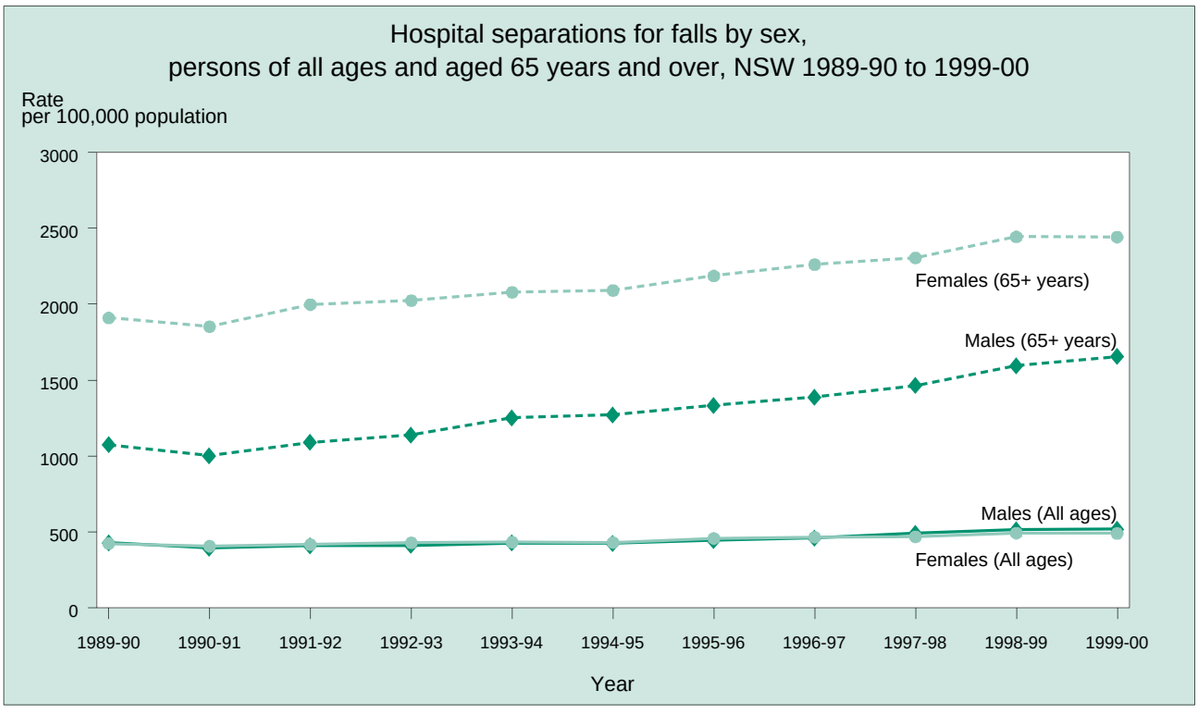
Source: NSW Department of Health Inpatient Statistics Collection (ISC) and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- In the financial year 1999–00, there were 5579 hospitalisations in NSW of children aged 9 years or less following a fall.
- Between 1989–90 and 1999–00, the hospitalisation rate for fall-related injuries in both 0–4 and 5–9 year olds increased gradually. The hospitalisation rate for males in these age groups was around 1.2 times that for females.
- 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%), public buildings (5.2%) and places of recreation or sport (4.8%). For children aged 5–9 years the most frequent locations were the home (21.9%), places of recreation or 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* for 2001 to 2003. One of its key objectives is to decrease the incidence, severity, mortality, and morbidity associated with falls in children aged 0–14 years.

For more information:

Department of Health and Aged Care. *National Injury Prevention Plan: Priorities for 2001–2003*. Canberra: DHAC, 2001.

Steenkamp M, Cripps R. *Child Injuries Due to Falls. Injury Research and Statistics Series*. Adelaide: Australian Institute of Health and Welfare, 2001.



		Sex	89–90	90–91	91–92	92–93	93–94	94–95	95–96	96–97	97–98	98–99	99–00
Number	65+ years	Males	2660	2582	2922	3142	3615	3791	4119	4449	4856	5457	5841
		Females	7809	7781	8708	9121	9646	10009	10793	11518	12131	13158	13621
		Persons	10470	10363	11631	12264	13261	13800	14912	15968	16987	18615	19462
	All ages	Males	11684	10917	11420	11623	12205	12348	13115	13832	15008	15926	16379
		Females	13743	13434	14261	14966	15458	15788	17134	17928	18543	19871	20408
		Persons	25427	24352	25681	26589	27663	28136	30249	31761	33551	35797	36787
Rate per 100,000 population	65+ years	Males	1073.5	1000.3	1089.7	1139.0	1252.6	1272.3	1333.8	1389.2	1464.1	1596.7	1655.8
		Females	1910.2	1852.5	1998.6	2024.2	2079.1	2091.3	2187.6	2262.1	2306.0	2445.2	2443.0
		Persons	1587.9	1523.4	1648.8	1681.6	1758.4	1771.6	1852.1	1917.0	1977.2	2109.5	2133.9
	All ages	Males	427.3	393.7	407.1	410.1	425.4	424.1	442.5	458.5	490.4	513.4	517.5
		Females	422.3	404.6	415.5	427.2	431.0	428.9	456.1	464.2	466.8	490.6	489.2
		Persons	436.7	411.0	424.0	430.7	439.4	437.4	460.2	472.3	489.9	513.0	513.9

Note: Hospital separation were classifed by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Records relating to acute hospital transfer, statistical discharge and same day stays were excluded. Hospital separation rates were age-adjusted using the Australian population as at 30 June 1991.

Source: NSW Department of Health Inpatient Statistics Collection (ISC) and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Falls are the leading cause of hospitalisations due to injury in NSW, accounting for about 30% of all hospitalisations. In 1999–00, there were 36,787 hospitalisations of NSW residents following a fall. More than half of those hospitalised following a fall (53%) were aged 65 years or more. In this age group, the hospitalisation rate for fall-related injuries was almost one-and-a-half times that for males.
- In NSW, no other single cause of injury costs the health system more than fall-related injury. Admissions to hospital for fall-related injury are currently estimated to cost $324.2 million each year. By the year 2050, the expected ageing of the population could result in an escalation of the cost of fall-related injuries to $644.7 million. These figures translate to 4 200-bed acute care facilities and 1200 new nursing home places (Moller, 2002).
- The NSW Department of Health is developing a management policy to reduce fall-related injury among older people by establishing a long-term coordinated approach to falls prevention.

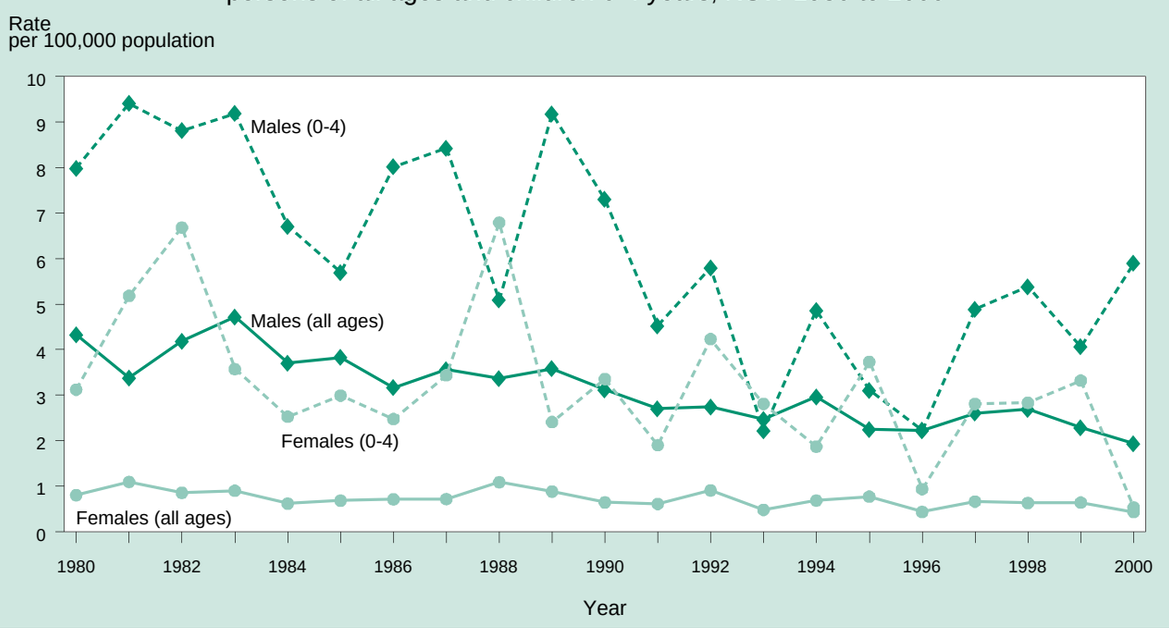
For more information:

Moller J. Changing health resource demands for injury due to falls in an ageing population. *N S W Public Health Bull* 2002; 13:3–6. www.health.nsw.gov.au/public-health/phb/phb.html.

NSW Department of Health. *Preventing injuries from falls in older people*. Sydney: NSW Department of Health, 2001.

NSW Fall Injury Indicators www.health.nsw.gov.au/public-health/health-promotion/improve/injuryprev/fallinjuryindicators/injuryindicators.html.

Unintentional drowning by sex,
persons of all ages and children 0-4 years, NSW 1980 to 2000



		Sex	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Number	0–4 years	Males	20	16	10	13	5	11	7	5	11	12	9	13
		Females	5	7	4	9	6	4	8	2	6	6	7	1
		Persons	25	23	14	22	11	15	15	7	17	18	16	14
	All ages	Males	102	90	80	82	74	89	69	69	81	84	73	62
		Females	27	19	18	27	15	22	24	14	21	20	21	14
		Persons	129	109	98	109	89	111	93	83	102	104	94	76
Rate per 100,000	0–4 years	Males	9.2	7.3	4.5	5.8	2.2	4.9	3.1	2.2	4.9	5.4	4.1	5.9
		Females	2.4	3.4	1.9	4.2	2.8	1.9	3.7	0.9	2.8	2.8	3.3	0.5
		Persons	5.9	5.4	3.2	5.0	2.5	3.4	3.4	1.6	3.9	4.1	3.7	3.3
	All ages	Males	3.6	3.1	2.7	2.7	2.5	3.0	2.2	2.2	2.6	2.7	2.3	1.9
		Females	0.9	0.6	0.6	0.9	0.5	0.7	0.8	0.4	0.7	0.6	0.6	0.4
		Persons	2.2	1.9	1.7	1.8	1.5	1.8	1.5	1.3	1.6	1.6	1.4	1.2

Note: Deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001, data for which were unavailable at the time of production. Rates were age-adjusted using the standard Australian population as at 30 June 1991.

Source: ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- In 2000, there were 76 deaths caused by drowning in NSW. In both years, just under 1 in 5 drownings were of children aged 0–4 years.
- Between 1980 and 2000, the overall rate of drowning in NSW halved, from 2.5 to 1.2 per 100,000. Males had a death rate from drowning 3 to 4 times the female rate.
- The most common locations for drownings of children aged 0–4 years in Australia during 1992–1998 were swimming pools and bathtubs. In older age groups, tidal waters (such as beaches and oceans) were the most common location. Compared with younger adults, drownings among people aged 65 years and over were more likely to have occurred in swimming pools and bathtubs (IRMRC, 2000).
- The NSW Department of Health is a member of the NSW Water Safety Taskforce, which developed the *NSW Water Safety Framework*, 2001 to 2003. The goals of the framework are to achieve a coordinated collaborative framework for water safety, and to ensure an effective and strategic management of water safety.

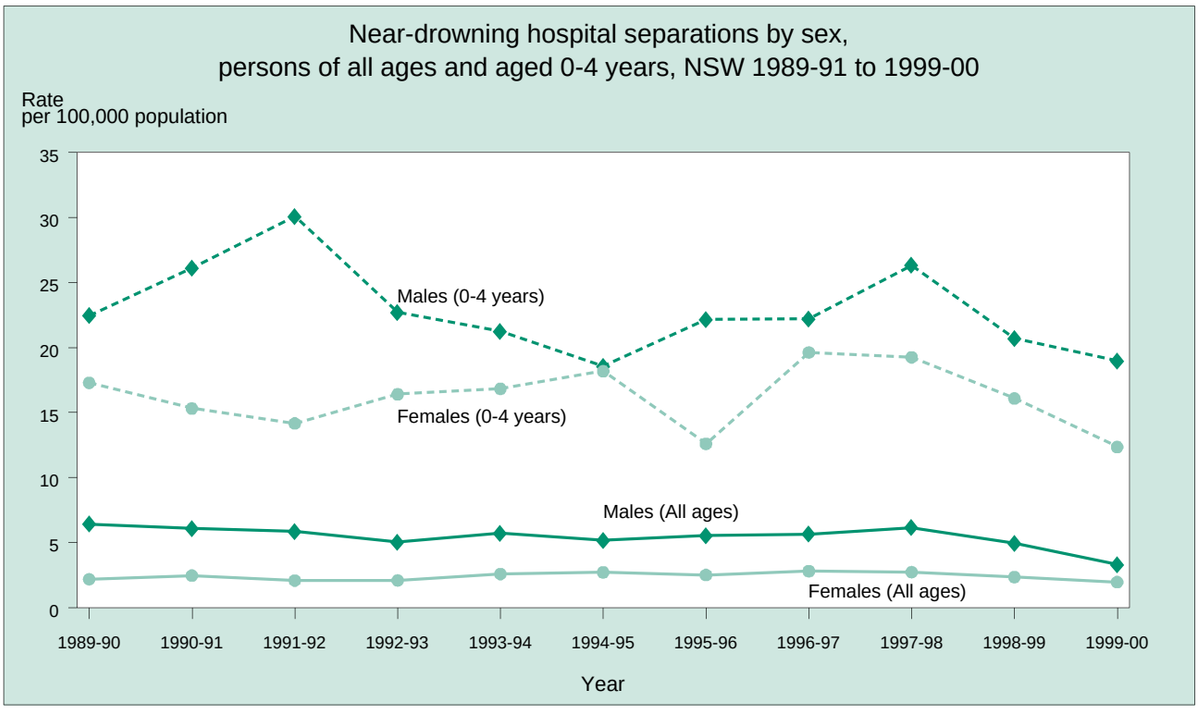
For more information:

Injury Risk Management Research Centre. *Analysis of Drowning in Australia and Pilot Analysis of Near-drowning in NSW*. Sydney: IRMRC, 2000.

NSW Child Death Review Team. *2000–2001 Report*. Sydney: NSW Commission for Children and Young People, 2001.

NSW Water Safety Taskforce. *NSW Water Safety Framework: 2001–2003*. Sydney: NSW Water Safety Taskforce, 2001.

SafeWaters Web site at www.safewaters.nsw.gov.au.



		Sex	89–90	90–91	91–92	92–93	93–94	94–95	95–96	96–97	97–98	98–99	99–00
Number	0–4 years	Males	49	57	67	51	48	42	50	50	59	46	42
		Females	36	32	30	35	36	39	27	42	41	34	26
		Persons	85	89	97	86	84	81	77	92	100	80	68
	All ages	Males	188	179	174	151	173	154	170	172	188	151	101
		Females	62	71	61	62	77	81	76	85	81	71	58
		Persons	250	250	235	214	250	235	246	257	269	222	159
Rate per 100,000 population	0–4 years	Males	22.5	26.1	30.1	22.7	21.3	18.6	22.2	22.2	26.3	20.7	19.0
		Females	17.3	15.3	14.2	16.4	16.8	18.2	12.6	19.6	19.3	16.1	12.4
		Persons	19.9	20.8	22.3	19.6	19.1	18.4	17.5	21.0	22.9	18.5	15.8
	All ages	Males	6.4	6.1	5.8	5.0	5.7	5.2	5.6	5.6	6.1	5.0	3.3
		Females	2.2	2.5	2.1	2.1	2.6	2.7	2.5	2.8	2.7	2.3	2.0
		Persons	4.3	4.3	4.0	3.6	4.2	3.9	4.0	4.3	4.4	3.6	2.6

Note: Hospital separations were classifed by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Records relating to acute hospital transfer and statistical discharge were excluded. Hospital separation rates were age-adjusted using the Australian population as at 30 June 1991.

Source: NSW Department of Health Inpatient Statistics Collection (ISC) and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- In 1999–00, 159 NSW residents were hospitalised following an episode of near drowning. Of these, around 2 in 5 were children aged 0–4 years.
- Between 1989–90 and 1999–00, the rate of hospitalisation for near-drowning in NSW decreased from 4.3 to 2.6 per 100,000. The male rate was around twice the female rate, and the rate among children aged 0–4 years was around 5 times the rate for all ages.
- In the 2001 NSW Child Health Survey, all respondents were asked whether their child had ever been rescued from drowning. One in 8 (12.4%) children aged 0–12 years were reported to have been rescued from drowning. By far the most common places from which children had been rescued were swimming pools (62.5% of rescues), followed by beaches (17.3%) and rivers (7.2%).
- The NSW Department of Health is a member of the NSW Water Safety Taskforce, which developed the *NSW Water Safety Framework, 2001–2003*. Its goals are to achieve a coordinated framework for water safety, and to ensure effective and strategic management of water safety.

For more information:

Injury Risk Managment Research Centre. *Analysis of Drowning in Australia and Pilot Analysis of Near-drowning in NSW.* Sydney: IRMRC, 2000.

NSW Water Safety Taskforce. *NSW Water Safety Framework: 2001–2003.* Sydney: NSW Water Safety Taskforce, 2001.

SafeWaters Web site at www.safewaters.nsw.gov.au.

Unintentional poisoning hospital separations by sex, persons of all ages and aged 0-4 years, NSW 1989-90 to 1999-00

		Sex	89–90	90–91	91–92	92–93	93–94	94–95	95–96	96–97	97–98	98–99	99–00
Number	0–4 years	Males	515	543	597	565	562	488	530	490	467	418	427
		Females	384	471	455	440	487	457	410	395	384	377	306
		Persons	899	1015	1052	1005	1049	945	940	885	851	795	733
Rate per 100,000 population	0–4 years	Males	235.9	247.2	268.2	251.2	248.9	215.9	235.0	217.6	208.4	188.1	193.0
		Females	184.5	225.0	214.9	206.3	227.7	213.1	191.3	184.6	180.4	178.4	145.4
		Persons	210.8	236.4	242.2	229.4	238.6	214.6	213.8	201.6	194.8	183.4	169.8

Note: Hospital separations were classifed by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Records relating to acute hospital transfer and statistical discharge were excluded. Hospital separation rates were age-adjusted using the Australian population as at 30 June 1991.

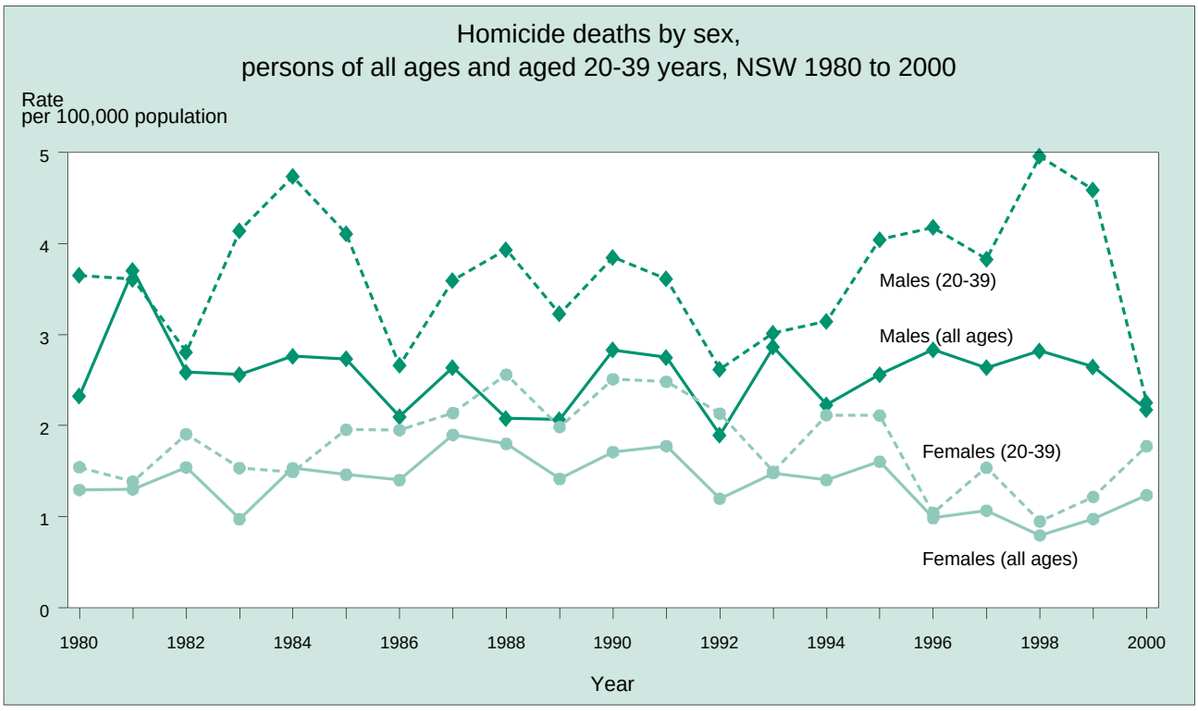
Source: NSW Department of Health Inpatient Statistics Collection (ISC) and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health

- In 1999–00, there were 4314 hospitalisations of NSW residents for the effects of unintentional poisoning. More than 1 in 6 (17.0%) of these were of children aged 0–4 years.
- The hospitalisation rate for unintentional poisoning for children aged 0–4 years decreased between 1989–90 and 1999–00, from 211 to 170 per 100,000. Males in this age group were around 1.3 times more likely to be hospitalised for this cause than females.
- The agent responsible for poisonings is poorly recorded in hospital morbidity data. In 1998–99 and 1999–00, the most common agents recorded as causes of poisoning in children aged 0–4 years were non-opioid analgesics (16.2%) and sedative-hypnotic drugs (17.7%).
- 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%) and antihistamines (3.8%) were the most common products recorded (Muscatello and Saville, 2000).
- Reducing rates of childhood poisoning is one of the key objectives of the National Injury Prevention Plan for 2001–2003.

For more information:

DHAC. *National Injury Prevention Plan: Priorities for 2001–2003*. Canberra: DHAC, 2001.

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 (11): 181–183. www.health.nsw.gov.au/public-health/phb/phb.html.



		Sex	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Number	20–39 years	Males	30	36	34	25	29	30	39	40	37	48	44	22
		Females	18	23	23	20	14	20	20	10	15	9	12	17
		Persons	48	59	57	45	43	50	59	50	52	57	56	39
	All ages	Males	59	83	81	57	85	67	78	87	81	88	83	70
		Females	42	50	52	35	45	43	50	31	33	25	32	38
		Persons	101	133	133	92	130	110	128	118	114	113	115	108
Rate per 100,000	20–39 years	Males	3.2	3.8	3.6	2.6	3.0	3.1	4.0	4.2	3.8	5.0	4.6	2.3
		Females	2.0	2.5	2.5	2.1	1.5	2.1	2.1	1.0	1.5	0.9	1.2	1.8
		Persons	2.6	3.2	3.1	2.4	2.3	2.6	3.1	2.6	2.7	3.0	2.9	2.0
	All ages	Males	2.1	2.8	2.7	1.9	2.9	2.2	2.6	2.8	2.6	2.8	2.6	2.2
		Females	1.4	1.7	1.8	1.2	1.5	1.4	1.6	1.0	1.1	0.8	1.0	1.2
		Persons	1.8	2.3	2.3	1.5	2.1	1.8	2.1	1.9	1.8	1.8	1.8	1.7

Note: Deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001, data for which were unavailable at the time of production. Rates were age-adjusted using the standard Australian population as at 30 June 1991.

Source: ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health

- Between 1980 and 2000, 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 20–39 years, and males were twice as likely as females to be victims of homicide.
- Nationally, in 1999–00, there were 300 homicide incidents, perpetrated by 324 identified offenders and resulting in the death of 337 people, giving a homicide rate of 1.8 per 100,000. The most common primary weapons used in homicides in NSW were knives and other sharp instruments (31.5%), hands and feet (24.3%), firearms (21.6%), and blunt instruments (11.7%) (Mouzos, 2001).

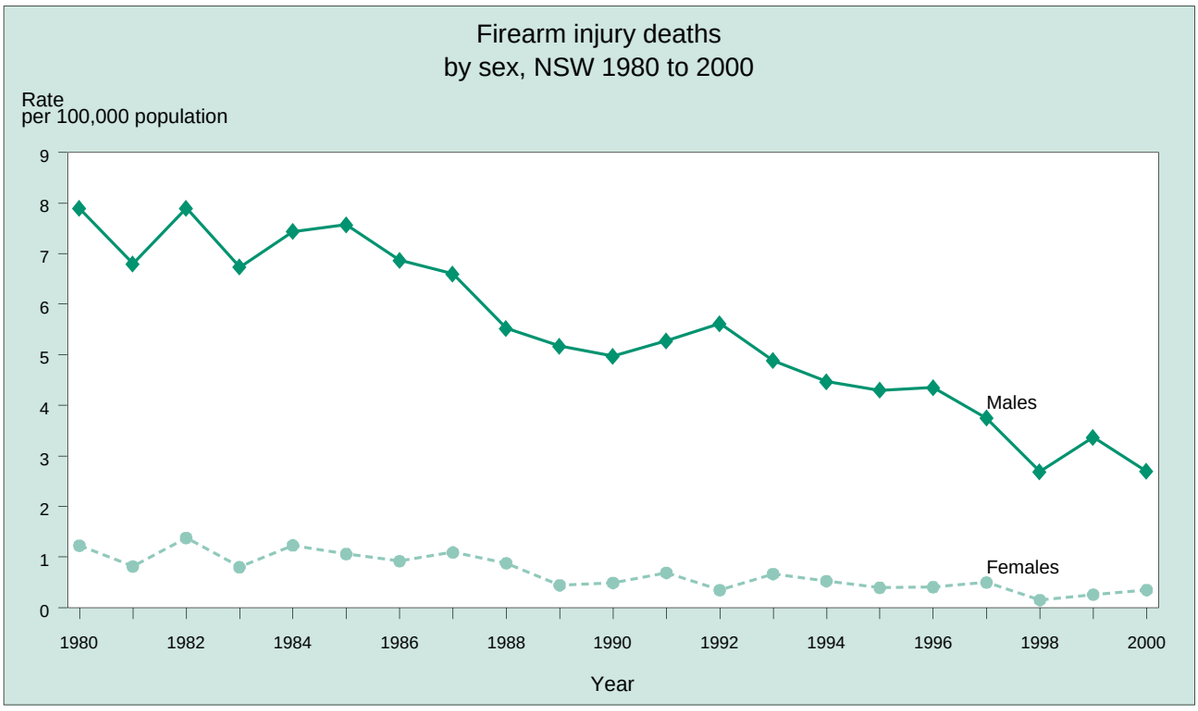
For more information:

Australian Institute of Criminology 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 www.lawlink.nsw.gov.au/bocsar.



		1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Number	Males	155	148	143	155	166	145	133	129	134	117	83	107	89
	Females	24	13	14	20	10	20	16	12	13	16	5	8	12
	Persons	179	161	157	175	176	165	149	141	147	133	88	115	100
Rate	Males	5.5	5.2	5.0	5.3	5.6	4.9	4.5	4.3	4.4	3.7	2.7	3.4	2.7
per 100,000	Females	0.9	0.4	0.5	0.7	0.3	0.7	0.5	0.4	0.4	0.5	0.1	0.3	0.3
population	Persons	3.2	2.8	2.7	3.0	2.9	2.7	2.4	2.3	2.3	2.1	1.4	1.8	1.5

Note: Deaths were classified by ICD-9 up to 1998 and by ICD-10 from 1999 onwards. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001, data for which were unavailable at the time of production. Rates were age-adjusted using the standard Australian population as at 30 June 1991.

Source: ABS mortality data and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health

- In the last 3 years, there have been around 100 deaths from firearm injuries in NSW each year. The death rate due to firearm injury decreased by more than half over the period 1980 to 2000, from 4.4 to 1.5 per 100,000. In the most recent national data published (1998), the death rate in NSW from firearm injuries (1.4 per 100,000) was lower than the national rate (1.8 per 100,000) (Mouzos, 2000).
- In NSW, around half the deaths from firearm injuries are of people aged between 25–54 years, and males are at least 5 times more likely than females to be killed by a firearm. In the period 1996–2000, three-quarters (75.6%) of gun-related deaths in NSW were recorded as suicides, 1 in 5 (20.0%) as homicides, and the remainder as unintentional or undetermined (2.9%), or legal (1.4%). In that period, 77.7% of male deaths from firearm injuries were recorded as suicides and 17.7% as homicides. A lower proportion of female deaths in that period were recorded as suicide (53.7%), and a correspondingly higher proportion were recorded as homicide (44.4%).
- Although the number of homicides involving firearms fell between 1995 and 2000, the number of shooting offences recorded increased, particularly in parts of South Western Sydney (Fitzgerald et al., 2001).

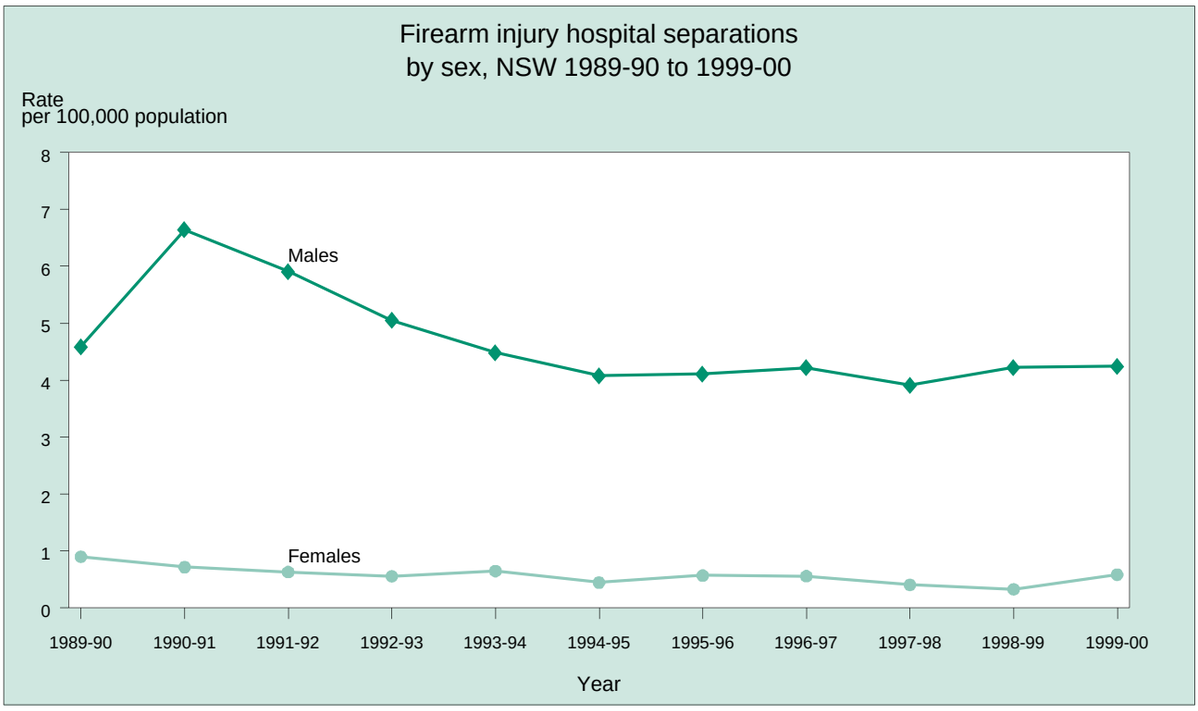
For more information:

Australian Institute of Criminology 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 www.lawlink.nsw.gov.au/bocsar.



	Sex	89–90	90–91	91–92	92–93	93–94	94–95	95–96	96–97	97–98	98–99	99–00
Number	Males	134	195	175	149	132	122	123	127	119	129	129
	Females	25	20	18	16	19	13	17	17	12	10	18
	Persons	159	216	193	165	151	135	140	144	131	139	147
Rate	Males	4.6	6.6	5.9	5.1	4.5	4.1	4.1	4.2	3.9	4.2	4.2
per 100,000	Females	0.9	0.7	0.6	0.6	0.6	0.4	0.6	0.6	0.4	0.3	0.6
population	Persons	2.8	3.7	3.3	2.8	2.6	2.3	2.4	2.4	2.2	2.3	2.4

Note: Hospital separations were classifed by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Records relating to acute hospital transfer and statistical discharge were excluded. Hospital separation rates were age-adjusted using the Australian population as at 30 June 1991.

Source: NSW Department of Health Inpatient Statistics Collection (ISC) and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- There are around 140 hospitalisations of NSW residents for firearm injuries each year. The hospitalisation rate for these injuries decreased over the period 1989–90 to 1999–00, from 2.8 to 2.4 per 100,000.
- More than half of hospitalisations for firearm injuries are of people aged between 15–29 years, and males are around 5 times more likely than females to be the hospitalised for these injuries.
- In the period 1995–96 to 1999–00, assaults (33.8%) and intended self-harm (11.8%) accounted for almost half of firearm-related hospitalisations of males. For females, assaults (40.5%) and intended self-harm (17.6%) together accounted for more than half of firearm-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 2801 firearm-related hospitalisations that occurred 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).

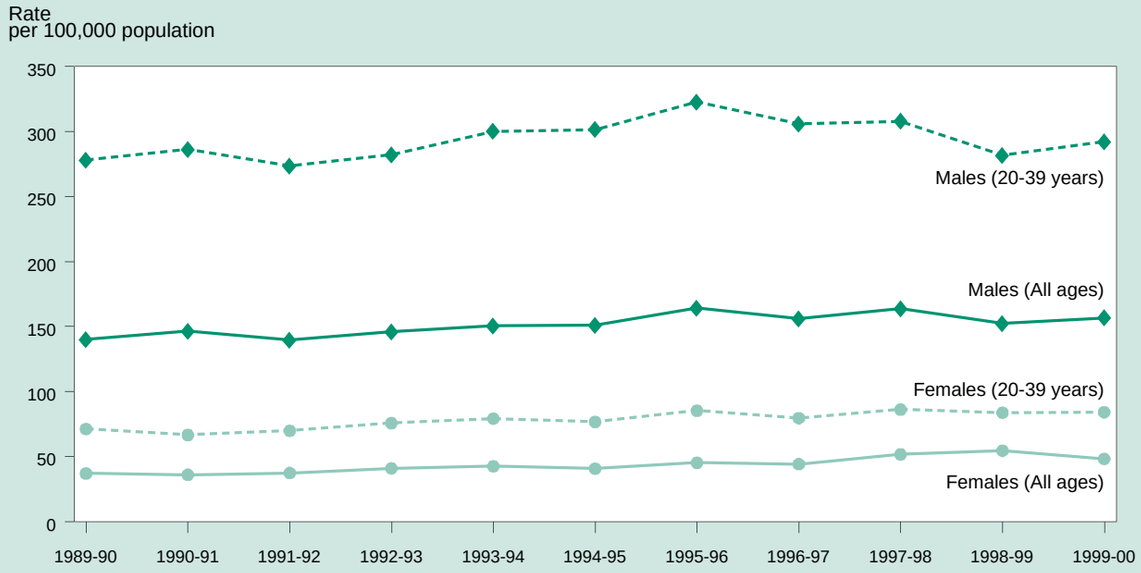
For more information:

Australian Institute of Criminology www.aic.gov.au.

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.

NSW Bureau of Crime Statistics and Research www.lawlink.nsw.gov.au/bocsar.

Interpersonal violence-related hospital separations by sex, persons of all ages and aged 20-39 years, NSW 1989-90 to 1999-00



		Sex	89–90	90–91	91–92	92–93	93–94	94–95	95–96	96–97	97–98	98–99	99–00
Number	20–39 years	Males	2580	2676	2590	2684	2852	2876	3079	2914	2928	2678	2793
		Females	648	613	651	710	743	724	808	755	820	797	806
		Persons	3227	3289	3241	3394	3595	3600	3887	3670	3748	3475	3599
	All ages	Males	4087	4296	4116	4317	4446	4474	4906	4688	4945	4638	4809
		Females	1056	1037	1085	1193	1243	1206	1349	1337	1581	1660	1496
		Persons	5143	5333	5201	5510	5689	5680	6255	6026	6526	6298	6305
Rate per 100,000 population	20–39 years	Males	278.3	286.3	273.6	282.2	300.2	301.6	323.0	306.0	308.0	281.7	292.3
		Females	71.3	66.6	69.9	75.7	79.2	76.7	85.3	79.6	86.2	83.8	84.1
		Persons	175.9	177.6	172.6	179.8	190.6	190.0	204.8	193.3	197.6	183.2	188.9
	All ages	Males	140.1	146.5	139.7	146.1	150.5	150.9	164.2	156.1	164.0	152.5	156.8
		Females	37.0	36.0	37.4	40.9	42.5	40.7	45.2	44.2	51.7	54.5	48.2
		Persons	89.2	91.9	88.9	94.0	96.9	96.3	105.2	100.6	108.3	103.8	103.0

Note: Hospital separations were classifed by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Records relating to acute hospital transfer and statistical discharge were excluded. Hospital separation rates were age-adjusted using the Australian population as at 30 June 1991.

Source: NSW Department of Health Inpatient Statistics Collection (ISC) and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- In 1999–00, there were 6305 hospitalisations of NSW residents for injuries resulting from interpersonal violence, giving a rate of 103 per 100,000. Over half (57.1%) of these were of people aged between 20 and 39 years.
- The overall rate of hospitalisation of NSW residents following interpersonal violence increased between 1989–90 and 1999–00. The male hospitalisation rate for these injuries was consistently between 3–4 times the female rate.
- The NSW Department of Health *Domestic Violence Policy* includes a 'statement of principles' that underpin all Departmental policies, programs, and procedures on domestic violence (NSW Department of Health, 1993). The policy is currently being updated to reflect recent changes to infrastructure, legislation, and service delivery.

For more information:

Australian Institute of Criminology www.aic.gov.au.

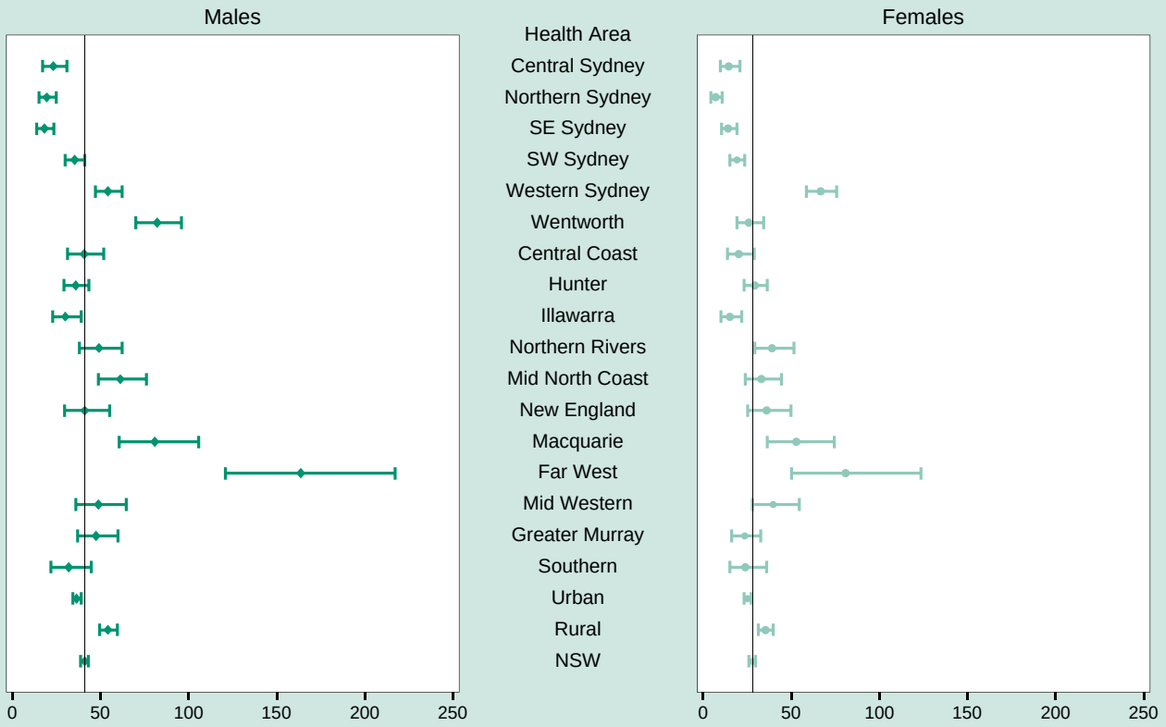
Attorney-General's Department. *Young People and Domestic Violence*. Canberra: Attorney-General's Department, 2001.

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 www.lawlink.nsw.gov.au/bocsar.

NSW Department of Health. *NSW Health domestic violence policy*. Sydney: NSW Department of Health, 1993. www.health.nsw.gov.au/health-public-affairs/domestic-v.

Interpersonal violence-related hospital separations by health area and sex, children aged 0-14 years, NSW 1995-96 to 1999-00



Note: Hospital separations were classifed by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Records relating to acute hospital transfer and statistical discharge were excluded. Hospital separation rates were age-adjusted using the Australian population as at 30 June 1991. LL/UL 95% CI = Lower and upper limits of 95% confidence interval for the standardised rate.

Source: NSW Department of Health Inpatient Statistics Collection (ISC) and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- In NSW between 1995–96 and 1999–00, the hospitalisation rate for injuries due to interpersonal violence among 0–14 year olds varied by health area. On average, rural health areas had a higher hospitalisation rate than their urban counterparts. 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 Far West, Macquarie, Western Sydney, and Wentworth Health Areas. The lowest rates were recorded in the Northern Sydney, South Eastern Sydney, and Central Sydney Health Areas.
- In NSW during 1999–00, 14 children aged 17 years or less died as a result of assault. Of these, 5 were aged less than 1 year and 11 of these children or their siblings had been reported as 'at risk of harm' to the NSW Department of Community Services (NSW Child Death Review Team, 2001).
- The NSW Department of Health *Domestic Violence Policy* includes a 'statement of principles' that underpin all Departmental policies, programs, and procedures on domestic violence (NSW Department of Health, 1993). The policy is currently being updated to reflect recent changes to infrastructure, legislation, and service delivery.

For more information:

Attorney-General's Department. *Young People and Domestic Violence*. Canberra: Attorney-General's Department, 2001.

NSW Child Death Review Team. *2000–2001 Report*. Sydney: NSW Commission for Children and Young People, 2001.

NSW Department of Health. *NSW Health domestic violence policy*. Sydney: NSW Department of Health, 1993. www.health.nsw.gov.au/policy/hsp/domesticviolence/policy.htm.

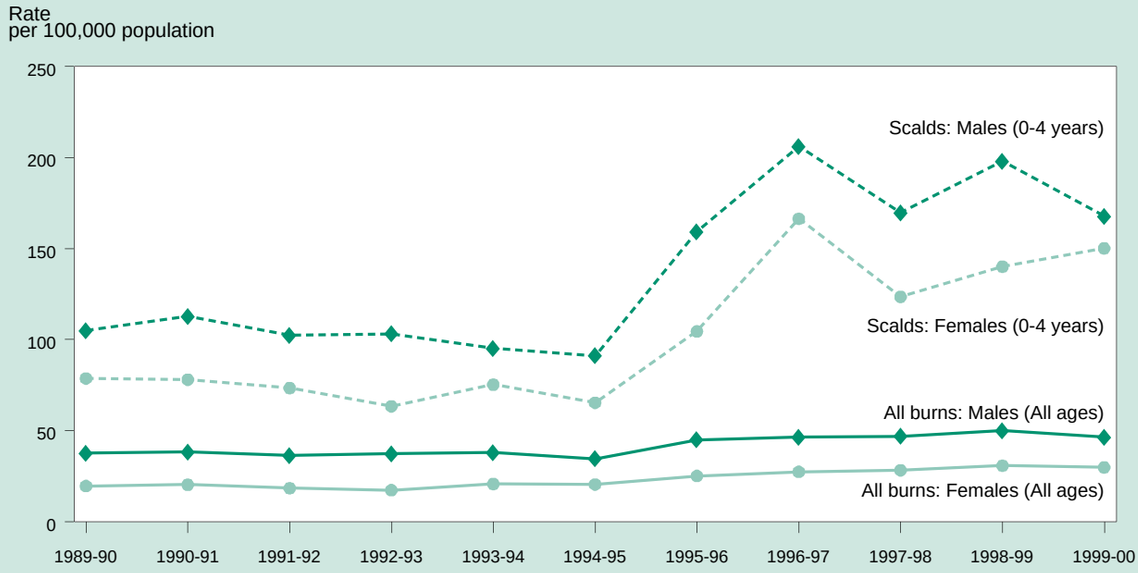
Hospital separations for interpersonal violence by health area and sex, children aged 0–14 years, NSW, 1995–96 to 1999–00

Health Area		Number	Rate per 100,000	LL 95% CI	UL 95% CI
Central Sydney	Males	47	23.2	17.0	30.9
	Females	28	14.5	9.6	20.9
	Persons	75	18.9	14.9	23.7
Northern Sydney	Males	67	19.5	15.1	24.7
	Females	23	7.0	4.5	10.6
	Persons	90	13.4	10.8	16.5
SE Sydney	Males	57	18.1	13.7	23.5
	Females	43	14.2	10.3	19.2
	Persons	100	16.2	13.2	19.7
SW Sydney	Males	163	35.2	30.0	41.0
	Females	84	19.0	15.2	23.5
	Persons	247	27.3	24.0	31.0
Western Sydney	Males	206	54.2	47.0	62.1
	Females	239	66.7	58.5	75.8
	Persons	445	60.3	54.8	66.1
Wentworth	Males	160	82.2	70.0	96.0
	Females	48	25.9	19.1	34.4
	Persons	208	54.7	47.5	62.6
Central Coast	Males	63	40.5	31.2	51.9
	Females	30	20.2	13.6	28.8
	Persons	93	30.6	24.7	37.5
Hunter	Males	103	35.8	29.2	43.4
	Females	80	29.2	23.2	36.4
	Persons	183	32.6	28.0	37.7
Illawarra	Males	56	30.1	22.7	39.0
	Females	27	15.1	9.9	22.0
	Persons	83	22.7	18.1	28.2
Northern Rivers	Males	68	49.0	38.0	62.2
	Females	51	39.1	29.0	51.4
	Persons	119	44.2	36.6	52.9
Mid North Coast	Males	84	61.3	48.8	76.0
	Females	43	33.0	23.8	44.5
	Persons	127	47.5	39.5	56.5
New England	Males	43	41.0	29.7	55.3
	Females	36	36.0	25.2	49.8
	Persons	79	38.5	30.5	48.0
Macquarie	Males	53	80.8	60.5	105.7
	Females	33	52.9	36.4	74.3
	Persons	86	67.3	53.8	83.1
Far West	Males	48	163.6	120.6	217.0
	Females	21	80.7	49.9	123.4
	Persons	69	124.4	96.8	157.4
Mid Western	Males	48	48.7	35.9	64.6
	Females	37	39.6	27.9	54.6
	Persons	85	44.3	35.3	54.7
Greater Murray	Males	72	47.4	37.1	59.7
	Females	34	23.4	16.2	32.7
	Persons	106	35.6	29.1	43.1
Southern	Males	33	31.9	22.0	44.8
	Females	23	24.0	15.2	36.0
	Persons	56	28.1	21.2	36.5
Urban	Males	922	36.4	34.1	38.9
	Females	602	25.0	23.0	27.1
	Persons	1524	30.9	29.3	32.5
Rural	Males	449	54.2	49.3	59.5
	Females	278	35.3	31.3	39.8
	Persons	727	45.0	41.8	48.4
NSW	Males	1377	40.9	38.8	43.1
	Females	887	27.7	25.9	29.6
	Persons	2264	34.5	33.1	35.9

Note: Hospital separations were classifed by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Records relating to acute hospital transfer and statistical discharge were excluded. Hospital separation rates were age-adjusted using the Australian population as at 30 June 1991. LL/UL 95% CI = Lower and upper limits of 95% confidence interval for the standardised rate.

Source: NSW Department of Health Inpatient Statistics Collection (ISC) and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health

Burns and scald injury hospital separations by sex, persons of all ages and children aged 0-4 years, NSW 1989-90 to 1999-00



			Sex	89–90	90–91	91–92	92–93	93–94	94–95	95–96	96–97	97–98	98–99	99–00
Number	0–4 years	Scalds	Males	229	248	228	232	215	206	359	464	380	440	371
			Females	164	163	155	135	161	140	224	356	263	296	316
			Persons	393	411	383	367	376	346	583	820	643	736	687
	All ages	All burns	Males	1096	1118	1067	1107	1118	1040	1361	1412	1431	1541	1430
			Females	569	598	550	523	646	622	763	840	868	947	922
			Persons	1665	1716	1617	1629	1764	1662	2124	2252	2299	2488	2352
Rate per 100,000 population	0–4 years	Scalds	Males	105.0	112.8	102.4	103.2	95.2	91.1	159.2	206.1	169.6	198.0	167.7
			Females	78.6	78.0	73.4	63.3	75.3	65.3	104.5	166.4	123.5	140.1	150.2
			Persons	92.1	95.8	88.3	83.8	85.5	78.6	132.6	186.8	147.2	169.8	159.2
	All ages	All burns	Males	37.7	38.2	36.2	37.3	37.9	34.5	44.9	46.4	46.9	49.9	46.4
			Females	19.5	20.3	18.4	17.3	20.7	20.4	25.1	27.4	28.2	30.7	29.8
			Persons	28.8	29.4	27.4	27.4	29.2	27.5	35.0	37.0	37.5	40.4	38.1

Note: Hospital separations were classifed by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Records relating to acute hospital transfer and statistical discharge were excluded. Hospital separation rates were age-adjusted using the Australian population as at 30 June 1991.

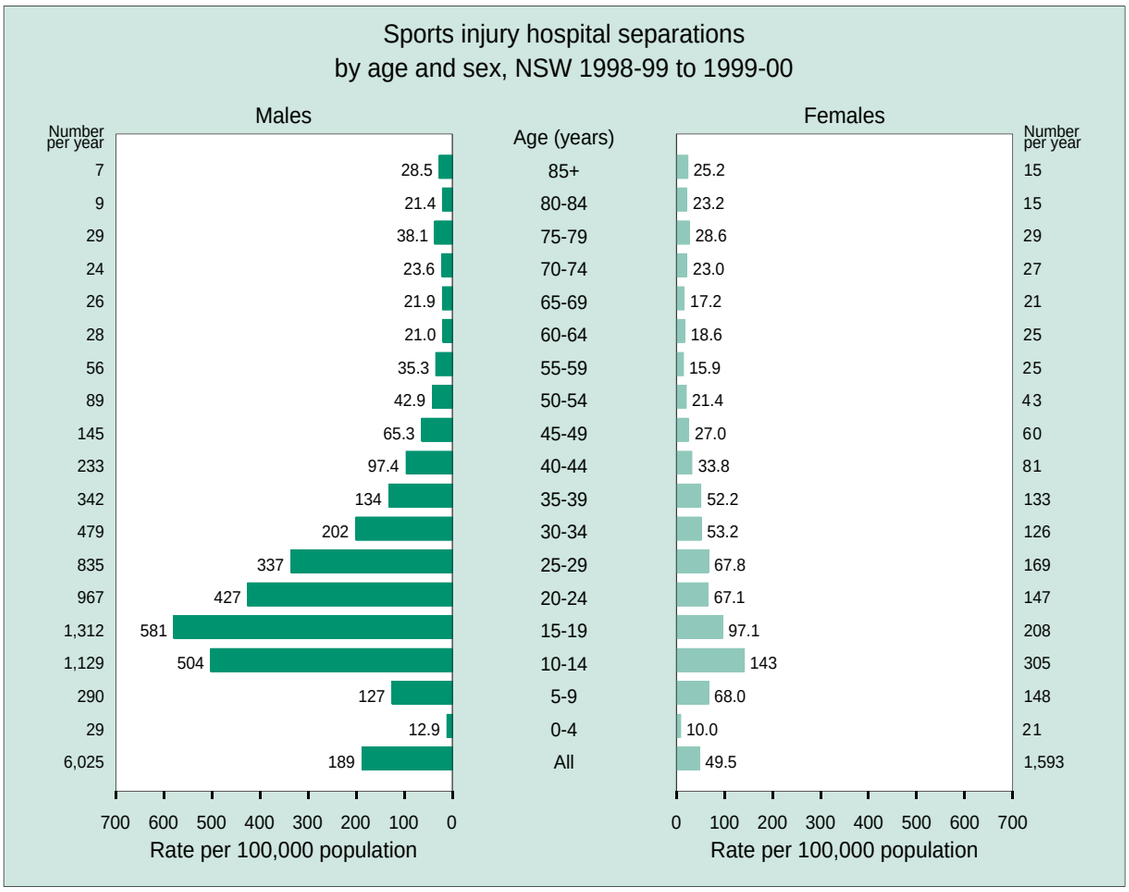
Source: NSW Department of Health Inpatient Statistics Collection (ISC) and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health

- In 1999–00, there were 2352 hospitalisations of NSW residents for injuries resulting from fire, burns, and scalds. Just under one-third of these (29.2%) 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 burns and scalds rose between 1989–90 and 1999–00, from 28.7 to 38.1 per 100,000.
- Among children aged 0–4 years, the hospitalisation rate rose sharply in 1995–96. This was largely due to a rise in day-only admissions for burns 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 regulating the temperature of hot water, 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: 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.



Note: Hospital separations were classifed by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Records relating to acute hospital transfer and statistical discharge were excluded. Hospital separation rates were age-adjusted using the Australian population as at 30 June 1991. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Department of Health Inpatient Statistics Collection (ISC) and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

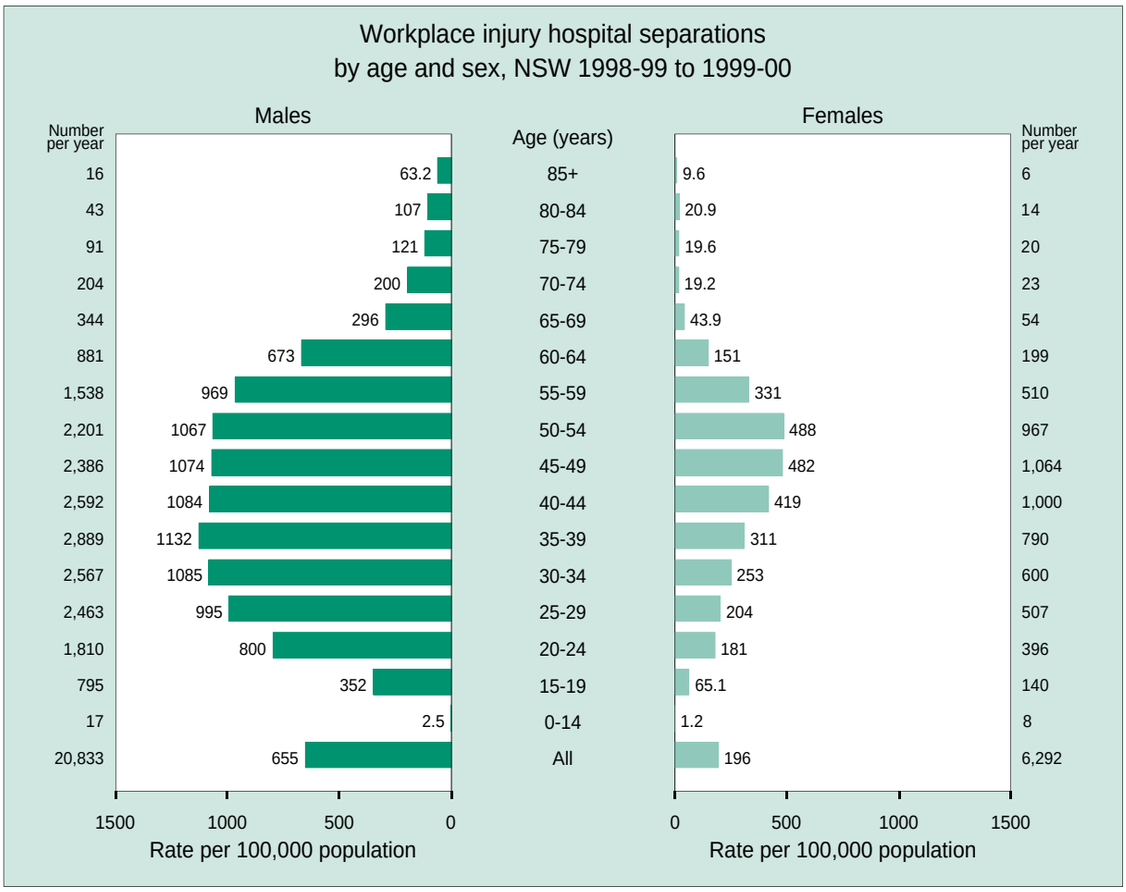
- Between 1998–99 and 1999–00, there were around 7600 hospitalisations of NSW residents for sporting injuries each year. The hospitalisation rate for these injuries among males was almost 4 times the female rate.
- Hospitalisation rates for sporting injuries increased with age up to around 20 years of age, but then declined in older age groups.
- As 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 1999–00, around 1 in 4 (28.4%) NSW residents reported taking part in some form of organised sporting activity during the previous 12 months (ABS, 2000).
- A survey of NSW students aged 11 to 17 years found that the 10 sports with the highest proportion of players reporting an injury over a 6 month period were: rugby league, rugby union, gymnastics, netball, hockey, Australian rules football, grass skiing, soccer, horse riding, and martial arts (North Sydney Area Health Service, 1997). Nationally, the 10 most frequent sports and recreational activities leading to adult presentations to emergency departments between 1989 and 1993 were Australian rules football, bicycling, soccer, rugby, cricket, basketball, netball, hockey, martial arts, and dancing (Finch et al., 1995).

For more information:

Australian Bureau of Statistics. *Participation in Sport and Physical Activities*. ABS Catalogue no. 4177.0. Canberra: ABS, 2000.

Finch C, Ozanne-Smith J, Williams F. *The Feasibility of Improved Data Collection Methodologies for Sports Injuries*. Victoria: Monash University Accident Research Centre, 1995.

North Sydney Area Health Service. *NSW Youth Sports Injury Report*. Sydney: NSAHS, 1997.



Note: Hospital separations were classifed by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Records relating to acute hospital transfer and statistical discharge were excluded. Hospital separation rates were age-adjusted using the Australian population as at 30 June 1991. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Department of Health Inpatient Statistics Collection (ISC) and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Between 1998–99 and 1999–00, there were on average 27,125 hospitalisations of NSW residents for injuries sustained in the workplace. The male hospitalisation rate for these injuries was just over 3 times the female rate.
- For males, the highest rates of hospitalisation following a workplace injury were among those aged 30–54 years. For females, the highest rates occurred in those aged 45–54 years.
- The most common principal diagnoses among hospitalisations for work-related injuries 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 on the total population of NSW, so underestimate the rate of injury in the working population. In 2001, around 63% of people aged 15 years and over in NSW were in paid employment (ABS, 2001).
- In NSW during 1989–1992, the death rate from workplace injuries was 5.3 per 100,000 workers per year. Industries in NSW that had high rates of death from workplace injuries, compared to the state average, were forestry and logging, fishing and hunting, mining, agriculture, transport and storage, and construction (Mitchell et al., 1999).

For more information:

Australian Bureau of Statistics. *Labour Force Australia—Preliminary*. ABS Catalogue no. 6202.0. Canberra: ABS, 2001.

Mitchell R, Driscoll T, Healey S, et al. *Work-related Traumatic Fatalities in NSW, 1989 to 1992*. Sydney: National Occupational Health and Safety Commission, 1999.

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. www.health.nsw.gov.au/public-health/phb/phb.html.

WorkCover NSW www.workcover.nsw.gov.au.

Chapter 4.6

Mental health

- Psychological distress has a major effect on the ability of people to work, study, and manage their day-to-day activities. As a result of psychological distress:
  - —around 7% of adults are totally unable to perform their usual activities for 1 or more days each month;
  - —an average of just under half a day of usual activities is lost per person each month;
  - —a total of just over 2 million person-days of usual activities per month, or 26 million person-days per annum, are lost.
- Around 1 in 7 older people report high levels of psychological distress.
- Around 1% of children take stimulant medication for attention deficit hyperactivity disorder (ADHD). Although this figure has increased in the last 10 years, it is well below the estimated prevalence of ADHD.
- Around 800 people die from suicide each year and there are around 3500 hospitalisations each year for suicide attempts. In recent years:
  - —around three-quarters of suicides have been in males;
  - —suicide rates have fluctuated from year to year;
  - —around 55% of those hospitalised for attempted suicide have been females;
  - —attempted suicides have been most common among males and females aged 15–24 years.

In this chapter

- Population burden of psychological distress
- Suicide deaths
- Suicide attempts
- Attention deficit hyperactivity disorder
- Psychological distress in older people

Introduction

Mental disorders (including substance use disorders) are the leading cause of disability burden in Australia, and account for about 30% of the total years lost due to disability (Mathers et al., 1999). In NSW, depression is the leading cause of years lost due to disability and ranks fourth in terms of total disease burden. The 1997 National Survey of Mental Health and Wellbeing reported that 18% of adults had a mental disorder in the 12 months preceding the survey, with depression being the most common disorder reported (3.4% of males and 6.8% of females) (ABS, 1997). The National Survey of Mental Health and Wellbeing, Child and Adolescent section, showed significant levels of depression, conduct disorder, and attention deficit hyperactivity disorder affecting a total of 14.5% of children and young people (Sawyer et al, 2000).

This chapter uses data from the NSW Department of Health's Health Survey Program to describe the burden of psychological distress in the community. For the first time, it provides information on the effect of these disorders on the ability of people to work, study, and manage their day-to-day activities, and updated information on trends in suicide and attempted suicide. It also provides information on the prescribing of stimulants for attention deficit hyperactivity disorder (ADHD) in children, and on psychological distress and depression among older people.

Mental health policy initiatives in NSW are addressing these problems through policy, prevention, and treatment strategies. The *Getting in Early* (2000) strategy for addressing the mental health of young people is one of several initiatives through the Government Action Plan and the Mental Health Implementation Group. Another Government Action Plan initiative is in response to emergency mental health needs. This strategy involves locating mental health liaison nurses in emergency departments, and the release of guidelines *The Mental Health Handbook for Emergency Departments*. All area health services now have single 24-hour access lines to assist them with emergency mental health care.

Key areas for mental health services also include support for those with chronic and disabling mental illnesses. Reports on evidence-based rehabilitation and supported accommodation programs, as well as NGO (non-government organisation) strategies for support, have been prepared. Networks for child and adolescent mental health and non-acute inpatient care are currently being developed. Current programs and initiatives in mental health are being reviewed by the Select Committee Parliamentary Inquiry into Mental Health Services in NSW.

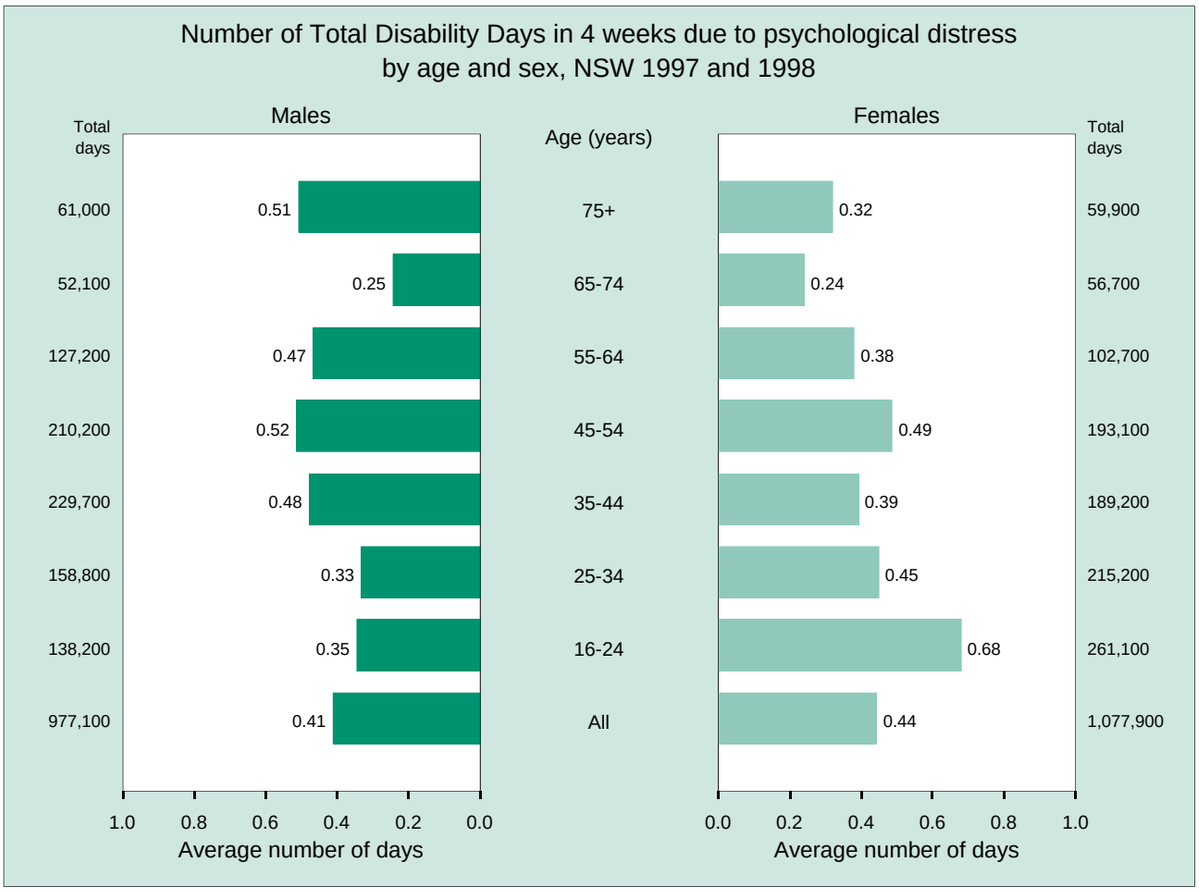
For more information:

NSW Department of Health Web site at www.health.nsw.gov.au/pubs.

Australian Bureau of Statistics. *Mental health and wellbeing of adults, Australia 1997.* Catalogue no. 4360.0. Canberra: ABS, 1997. Available at www.abs.gov.au.

Sawyer MG, Arney FM, Baghurst PA, Clark JJ, Graetx BW, Kosky RJ et al. *The Mental Health of Young People in Australia: The Child and Adolescent component of the National Survey of Mental Health and Wellbeing.* Canberra: AGPS, 2000.

Mathers C, Vos T, Stevenson C. The burden of disease and injury in Australia. Canberra: Australian Institute of Health and Welfare, 1999. Online: www.aihw.gov.au.



Note: Average number of days lost for those with >= 1 day lost: All = 6.14, Males = 6.81 and Females = 5.64. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

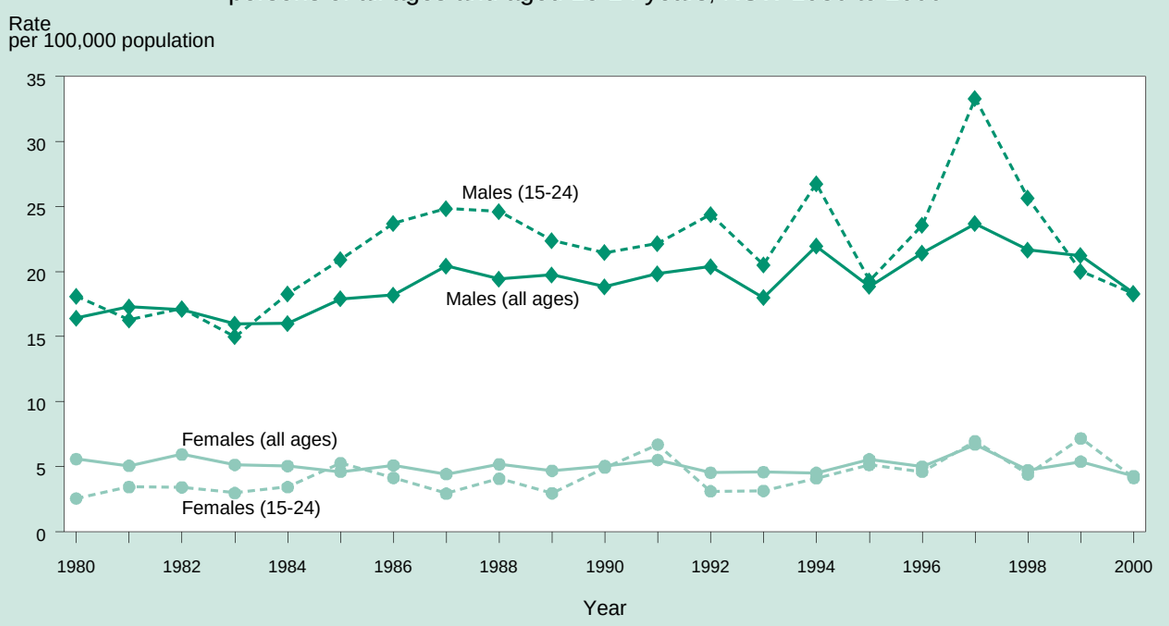
Source: NSW Health Surveys, 1997 and 1998 (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- The 1997 and 1998 NSW Health Surveys used 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. For more information on the K10, see the Methods section.
- 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% of respondents reported 1 or more Total Disability Days due to psychological distress in the last 4 weeks. The average reported number of Total Disability Days was almost identical for males and females, despite the fact that high levels of psychological distress are reported more often by females.
- The NSW population burden of psychological distress in people aged 16 and over was just over 2 million days per 4 weeks, or 26 million days per annum, when people were 'totally unable' to perform their usual functions.
- People who were employed full-time reported fewer Total Disability Days due to psychological distress than average, as did females employed part-time or retired.

For more information:

Epidemiology and Surveillance Branch. *1997 and 1998 NSW Health Surveys Report.* Sydney: NSW Department of Health, 2000. www.health.nsw.gov.au/public-health/nswhs.

Deaths from suicide and self-inflicted injury,
persons of all ages and aged 15-24 years, NSW 1980 to 2000



			1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Number	All ages	Males	544	561	538	575	599	535	655	572	656	732	677	680	594
		Females	151	138	151	165	140	143	143	176	161	217	155	173	143
		Persons	695	699	689	740	739	678	798	748	817	949	832	853	737
Rate	All ages	Males	19.4	19.7	18.9	19.8	20.4	18.0	22.0	18.9	21.4	23.7	21.7	21.2	18.3
per 100,000		Females	5.2	4.7	5.0	5.5	4.5	4.6	4.5	5.6	5.0	6.7	4.7	5.4	4.3
populatioin		Persons	12.2	12.1	11.8	12.5	12.3	11.2	13.1	12.1	13.1	15.1	13.1	13.1	11.2

Note: Cause of death was classified using ICD-9 up to 1998 and ICD-10 from 1999 onwards. Data are reported by year of death. Numbers for 2000 include an estimate of the small numbers of deaths that were registered in 2001, data for which were unavailable at the time of production.

Source: ABS mortality data (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Within Australia, suicide rates do not vary a great deal between jurisdictions, and the rates and trends in NSW are at or below the Australian average. The Australian average was in the mid range of 51 countries reporting to WHO in the latest data available (Steenkamp and Harrison, 2000).
- The figure shows the most recent available data on deaths by suicide, by year of occurrence. This differs from reports based on year of registration of death.
- Full-year data for 1998 and 1999 show all-age rates of death lower than in 1997, and similar to those seen through the earlier 1990s. In particular, the rate for males 15–24 in 1999, the last complete year of data, was the lowest observed since 1985 in NSW.
- The rate of suicide can fluctuate considerably from year to year, especially in small population groups. Overall, the suicide rate in males in general, and young males in particular, has been relatively high for the last 15 years. A sustained effort in suicide prevention is required, whatever changes in rate may be observed from one year to the next. A 'whole-of-government', 'whole-of-community' strategy for suicide prevention is currently being implemented in NSW across local area health services.

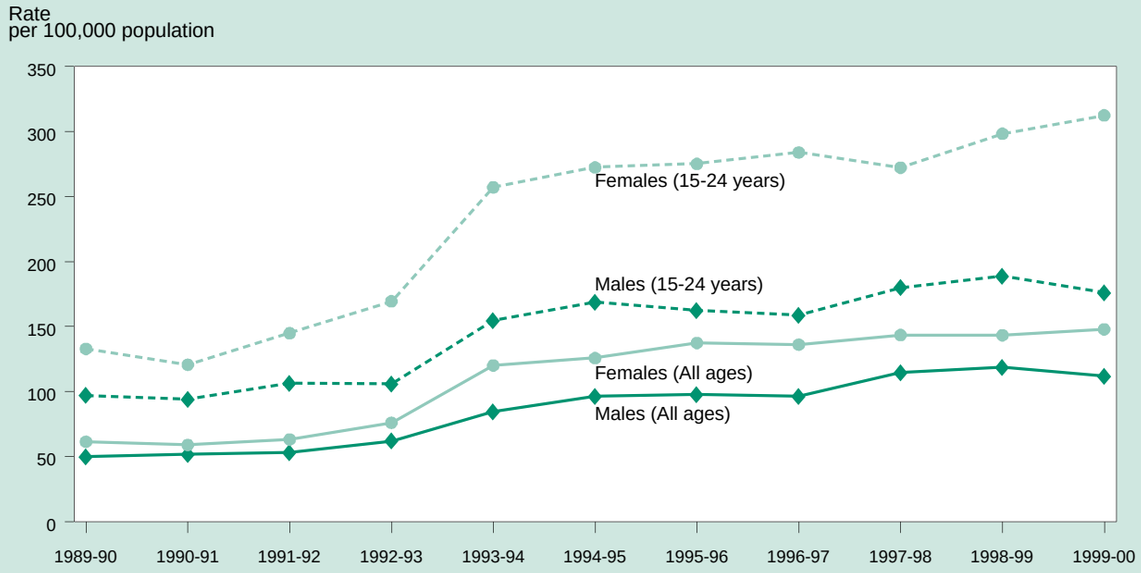
For more information:

Steenkamp M, Harrison J. *Suicide and hospitalised self-harm in Australia. Injury Research and Statistics Series.* Adelaide: Australian Institute of Health and Welfare, 2000. AIHW Catalogue no. INJCAT 30.

Policy Division. *We need to know more: NSW suicide data report.* Sydney: NSW Department of Health, 1999. www.health.nsw.gov.au/pubs.

Policy Division. *The NSW Whole of Government Suicide Prevention Strategy.* Sydney: NSW Department of Health, 1999.

Hospital separations for attempted suicide,
persons of all ages and aged 15-24 years, NSW 1989-90 to 1999-00



			89–90	90–91	91–92	92–93	93–94	94–95	95–96	96–97	97–98	98–99	99–00
Number	All ages	Males	1435	1506	1563	1838	2510	2876	2960	2934	3533	3679	3515
		Females	1763	1704	1841	2228	3513	3723	4123	4117	4373	4403	4575
		Persons	3198	3211	3404	4066	6023	6599	7083	7052	7906	8082	8090
Rate	All ages	Males	49.8	51.7	53.1	61.9	84.7	96.3	97.8	96.3	114.5	118.5	112.0
per 100,000		Females	61.5	58.9	63.2	76.1	120.1	125.8	137.5	136.2	143.5	143.3	147.9
population		Persons	55.4	55.1	58.0	68.8	101.9	110.7	117.3	115.9	128.7	130.6	129.6

Note: Attempted suicide and self-inflicted injury hospital separations were classified using ICD-9-CM up to 1997–98 and ICD-10-AM from 1998–99 onwards. Hospital separation rates were age-adjusted using the Australian population as at 30 June 1991.

Source: NSW Inpatients Statistics Collection and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- In the National Survey of Mental Health and Wellbeing (1997), 3.5% of respondents aged 18 and over reported suicidal thoughts in the previous 12 months, and about 12% of that group also reported having made a suicide attempt (Pirkis et al., 2000). This corresponds to about 18,000 attempts in NSW each year. Many people do not contact services after an attempt, and the only data routinely available are those shown in the figure. In recent years there have been about 8000 separations per annum following suicide attempts.
- Most people who contact services are seen by emergency departments. They may or may not be admitted as inpatients, and the injury may or may not be identified as intentional. Accordingly, the reported rates of hospital separation can vary considerably among hospitals.
- Between 1989–90 and 1992–93, the reported rate of separation was stable, at about half the rate currently observed. The increase between 1992–93 and 1994–95 appears to be a combination of both admission and classification factors. The smaller increase after 1996–97 may reflect the requirements of revised protocols for management of suicide that were issued in 1998.
- The current rates of hospital separation in NSW are similar to those reported for Australia in 1997–98 (Steenkamp and Harrison, 2000).

For more information:

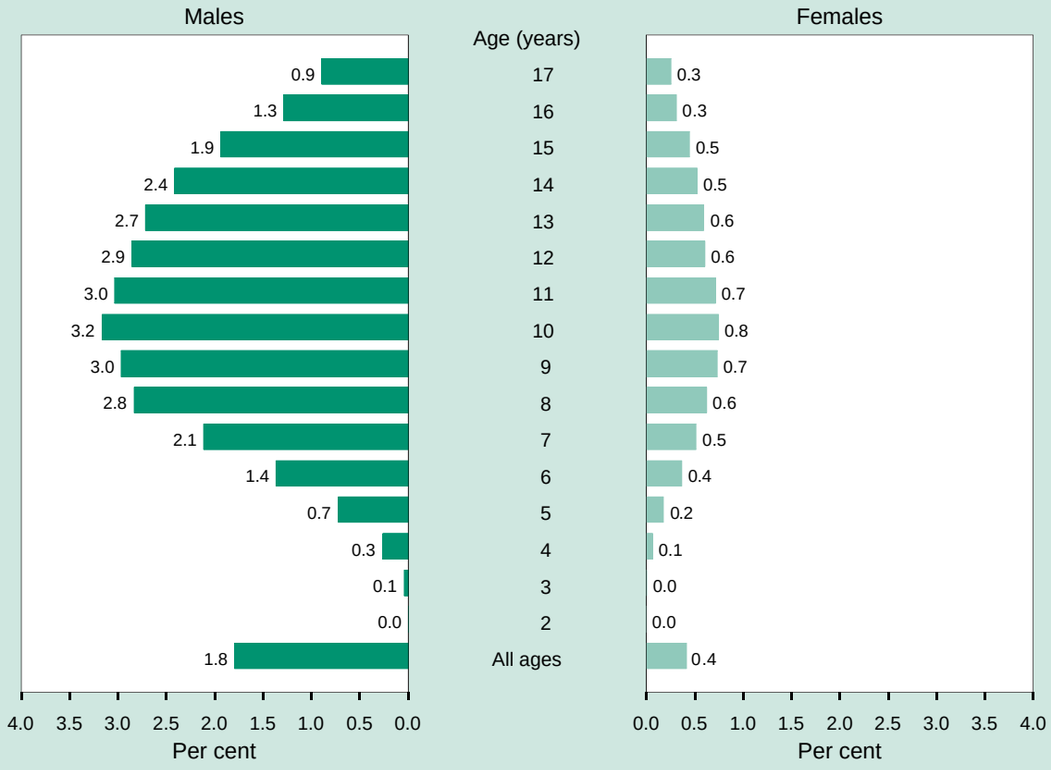
Policy Division. *The NSW Whole of Government Suicide Prevention Strategy.* Sydney: NSW Department of Health, 1999.

Policy Division. *Policy guidelines for the management of patients with possible suicidal behaviour for NSW Health staff and staff in private hospital facilities.* Sydney: NSW Department of Health. Circular 98/31, 1998.

Pirkis J, Burgess P, Dunt D. Suicidal ideation and suicide attempts among Australian adults. *Crisis* 2000; 21: 16–25.

Steenkamp M, Harrison J. *Suicide and hospitalised self-harm in Australia. Injury Research and Statistics Series.* Adelaide: Australian Institute of Health and Welfare, 2000. AIHW Catalogue no. INJCAT 30.

Treatment with stimulant medication for attention deficit hyperactivity disorder by age, children aged 2-17 years, NSW, 1 December 2000



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. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

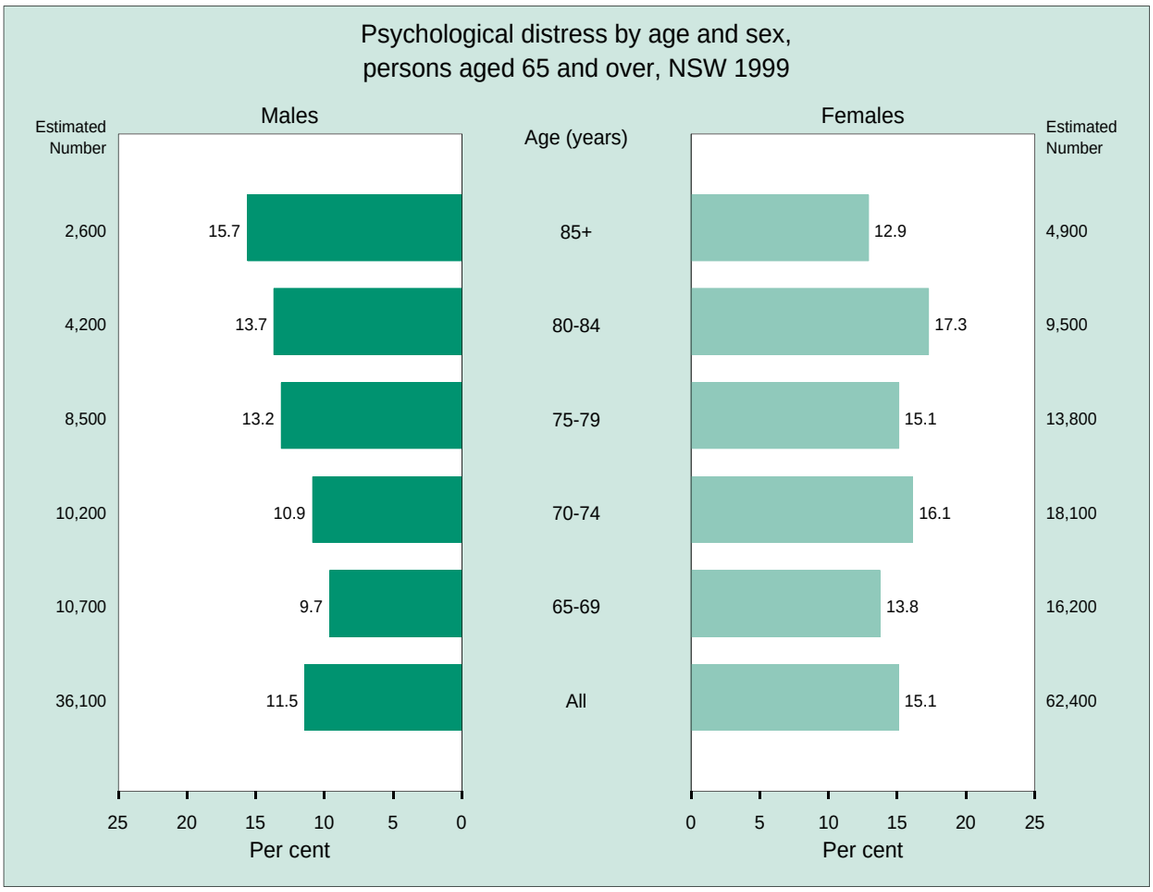
Source: Pharmaceutical Drugs of Addiction System, Pharmaceutical Service Branch, NSW Department of Health.

- 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. 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).
- Stimulant medication results in a reduction in symptoms in up to 90% of children with ADHD treated. 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. 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).
- Although prescribing of stimulant medication for ADHD increased in the 1990s, this increase was from a very low baseline level. The treatement rate in 2000 (1.1% of children aged 2–17 years) was well below the estimated prevalence of ADHD, and below the estimated treatment rate of 3% in the United States. Reasons for the increase in prescribing during the 1990s 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.



Note: Psychological distress was measured using the Kessler 6 (K6) questionnaire (Kessler and Mroczec 1992; 1994). Raw K6 scores were transformed so that the NSW mean was 50 and the standard deviation was 10. Estimates were based on 8881 respondents. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Older People's Health Survey, 1999 (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- The 1999 NSW Older People's Health Survey used the Kessler 6 (or K6) instrument (Kessler and Mroczec 1992; 1994) to measure psychological distress among older people. The K6 comprises 6 questions about the level of anxiety and depressive symptoms in the most recent 4-week period. For a more detailed description of the K6 measure, see the Methods section.
- The figure shows the percentage of each age group and sex that had scores in a range similar to the proportion of people meeting diagnostic criteria for anxiety and depression in other population studies. The scale, therefore, considers levels of psychological distress that are about as rare as the anxiety and depressive disorders but does not mean that the individuals have diagnostic levels of these symptoms.
- Females reported higher levels of psychological distress than males at all ages except for those aged 85+ years. Reported levels of psychological distress increased between ages 65–69 years (13.8%) and 80–84 years (16.0%), but declined in the 85+ years age group (13.5%).
- The NSW Department of Health strategy for the delivery of mental health care to older people includes a specific service planning group; development of evidence-based service models, especially in rural areas; depression screening; suicide prevention guidelines; coordination of mental health and aged care; and specific assessment and outcome monitoring.

For more information:

Kessler R, Mroczec D. *An* update of the development of mental health screening scales for the US National Health Interview Survey. Ann Arbor MI: Survey Research Centre of the Institute for Social Research, University of Michigan, Memo dated December 22, 1992.

Kessler R, Mroczec D. Final versions of our non-specific psychological distress scale. Ann Arbor MI: Survey Research Centre of the Institute for Social Research, University of Michigan, Memo dated March 10, 1994.

Public Health Division. New South Wales Older People's Health Survey 1999. Sydney: *N S W Public Health Bull* 2001; 12(S-2). www.health.nsw.gov.au/public-health/ophs99/index.htm.

NSW Department of Health. *Caring for older people's mental health.* Sydney: NSW Department of Health, 1999.

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;
  - —those in Grade 6 have on average less than 1 decayed tooth, while those in Kindergarten have on average 1.4 decayed teeth;
  - —half have a dental check-up each year;
  - —less than 1 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 1 in 10 have no natural teeth, increasing to more than one-third among people aged 75 years or more;
  - —around one-third have a dental check-up each year;
  - —around 1 in 5 have a filling each year;
  - —hospitalisations for the removal or restoration of teeth have increased in recent years.
- Oral health is worse in rural 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 (AHMAC, 2001). Factors such as changes in diet, reduced sugar consumption, exposure to fluoride, and changes in disease management, have improved oral health significantly. Although Australians enjoy a relatively high standard of oral health, this is not distributed equally among different age and social groups.

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). Information on the oral health of disadvantaged populations is presented in Chapters 3.1, 3.2 and 3.5 of this report.

Data presented in this chapter come from 4 main sources. The NSW Health Survey 1998 supplied data on dental status and treatment patterns in adults; the NSW Child Health Survey 2001 provided data on treatment patterns in children. Data on hospitalisations for the removal or restoration of teeth came from the NSW Inpatient Statistics Collection; data on the dental status of children came from the Save Our Kids Smiles (SOKS) program, a schools-based risk assessment and managed care program. From 2001, the SOKS program has been replaced with a clinic-based risk assessment program. SOKS data reported by several area health services for 2000—the last year of the SOKS program under the old rules—are incomplete and were excluded from the analysis.

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.* Adelaide: South Australian Department of Human Services, 2001.

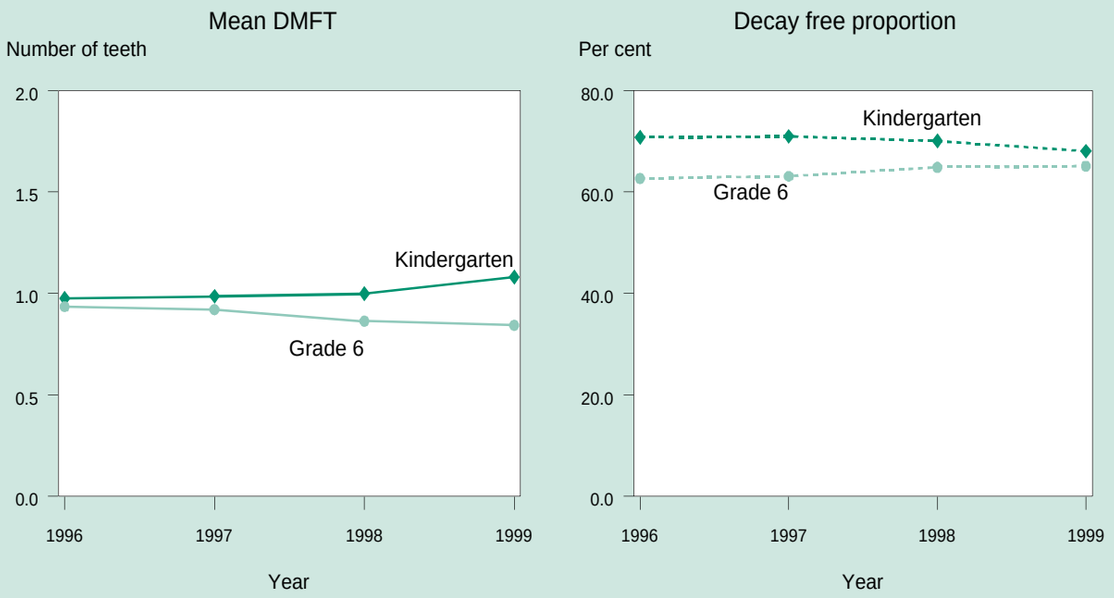
Oral Health Branch. *Review of the Save Our Kids Smiles program Volume I.* Sydney: NSW Department of Health, 2001.

Public Health Division. *Report on the 1997 and 1998 NSW Health Surveys.* Sydney: NSW Department of Health, 2000. Web site at www.health.nsw.gov.au/public-health/nswhs.

Australian Institute of Health and Welfare. Dental Statistics and Research Unit Web site at www.adelaide.edu.au/socprev-dent/dsru.

Australian Dental Association Web site at www.ada.org.au.

Decayed, missing or filled teeth and decay-free proportion, children in kindergarten and grade 6, NSW 1996 to 1999



		1996	1997	1998	1999
Mean DMFT	Kindergarten	1.0	1.0	1.0	1.1
	Grade 6	0.9	0.9	0.9	0.8
Decay free proportion	Kindergarten	70.8	70.9	70.0	68.0
	Grade 6	62.7	63.1	64.9	65.1

Note: Mean DMFT score = mean number of decayed, missing, or filled deciduous and permanent teeth. Decay-free proportion = no decayed, missing, or filled teeth. Ages above 4 standard deviation from the mean for Kindergarten children and ages below or above 4 SD from the mean for Grade 6 children were excluded.

Source: NSW Save our Kids Smiles (SOKS) data (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Oral health of children is most commonly assessed by their caries (decay) experience. The figures for 1996 to 1999 from the Save Our Kids Smiles (SOKS) program reveal a marked difference in the experience of decay between age groups over the years.
- The caries experience of children in Grade 6 has improved. The mean number of teeth affected by decay has decreased (from 0.9 to 0.8 per child) and the proportion of children with no experience of decay has risen (from 62.7% to 65.1%). These children belong to the cohort born between 1984 and 1987. This is consistent with evidence at the national level of a steady decrease in DMFT scores of children who were born between 1971 and 1989 (AHMAC, 2001).
- In contrast, children in Kindergarten display a worsening caries experience. In this age group, the average number of teeth affected by decay rose between 1996 and 1999 (from 1.0 to 1.1) and the proportion of children who did not experience decay diminished (from 70.8% to 68.0%). A suggested reason for this has been a change in child-rearing practices, resulting in the prolonged use of nursing bottles.
- A review of the SOKS program in 1999 found that it underestimated active decay in comparison to assessment conducted in clinic conditions (NSW Department of Health, 2001). The figures shown here are not adjusted for this underestimation. Adjusted figures have been published elsewhere (AIHW Dental Statistics and Research Unit, 2001).

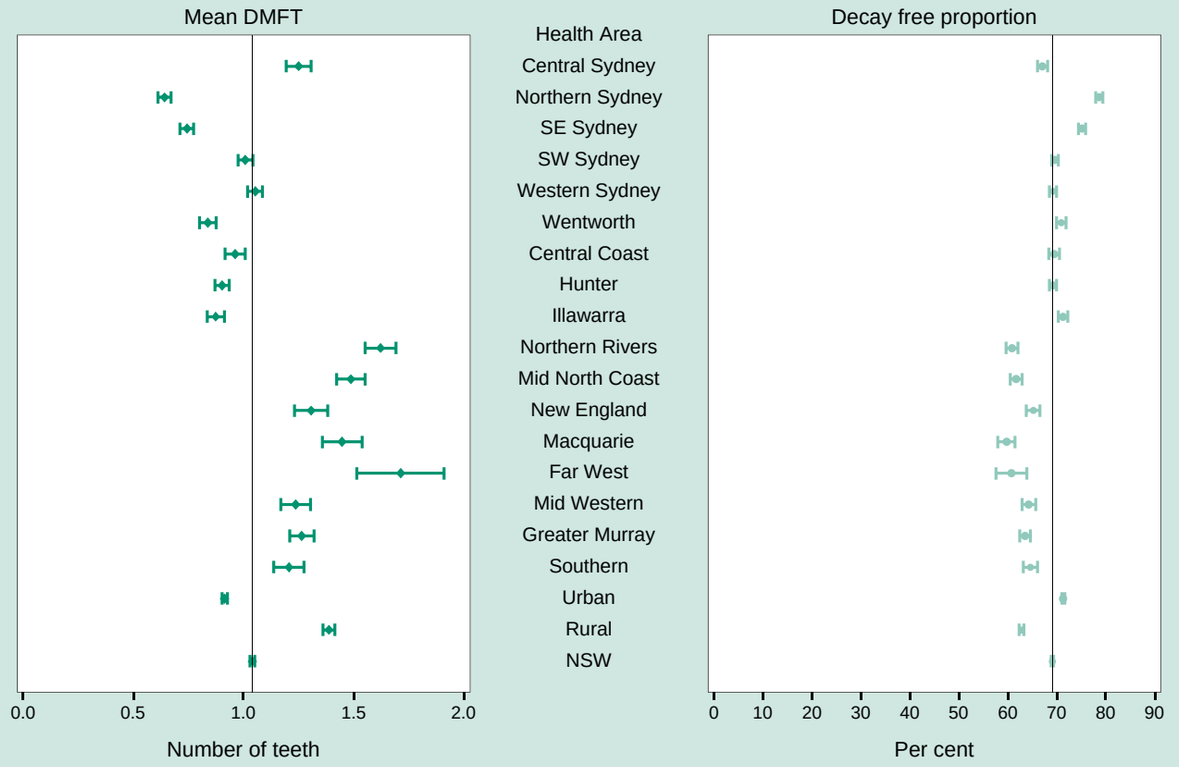
For more information:

AIHW Dental Statistics and Research Unit. *Child Dental Health Survey, NSW, 1999.* Adelaide: AIHW, 2001.

Australian Health Ministers Advisory Council. *Oral Health of Australians. National Planning for Oral Health Improvement.* Adelaide: South Australian Department of Human Services, 2001.

Oral Health Branch. *Review of the Save Our Kids Smiles (SOKS) program.* Volume II: Technical Report. Sydney, NSW Department of Health, 2001.

Decayed, missing or filled teeth and decay free proportion
by health area, children in kindergarten, NSW 1998 and 1999



Note: Ages greater than 4 standard deviations from the mean were excluded. Mean DMFT = mean number of decayed, missing, or filled deciduous and permanent teeth. Decay-free proportion = persons with no decayed, missing, or filled teeth. Health area refers to area of dental service. Lower and upper limits of 95% confidence interval for the point estimate are shown.

Source: NSW Save Our Kids Smiles (SOKS) data and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Oral health of children is most commonly assessed by their caries (decay) experience. In 1998 and 1999, 142,201 Kindergarten children were assessed by the SOKS program, representing about 40% of all 4 and 5 year old children in NSW. The median age of the assessed children was 5 years.
- Based on SOKS assessments, Kindergarten children had on average just over 1 tooth affected by caries. As a group, children living in rural health areas experienced higher rates of dental caries (average DMFT score = 1.38) than children from metropolitan areas (average DMFT score = 0.91). Central Sydney Health Area was an exception, with Kindergarten age children there having on average 1.25 teeth affected by decay. The average number of teeth affected by decay varied from 0.64 in the Northern Sydney Health Area to 1.71 in the Far West Health Area.
- In 1998 and 1999, almost 70% (69.0%) of children in Kindergarten assessed by the SOKS program had not experienced tooth decay. Again, children living in rural areas had worse experience (62.7% decay-free proportion) than children living in metropolitan areas (71.3%). The proportion of children who were decay-free varied from 59.7% in Macquarie Health Area to 78.6% in North Sydney Health Area.

For more information:

AIHW Dental Statistics and Research Unit. *Child Dental Health Survey, NSW, 1998*. Adelaide: AIHW, 2001.

AIHW Dental Statistics and Research Unit. *Child Dental Health Survey, NSW, 1999*. Adelaide: AIHW, 2001.

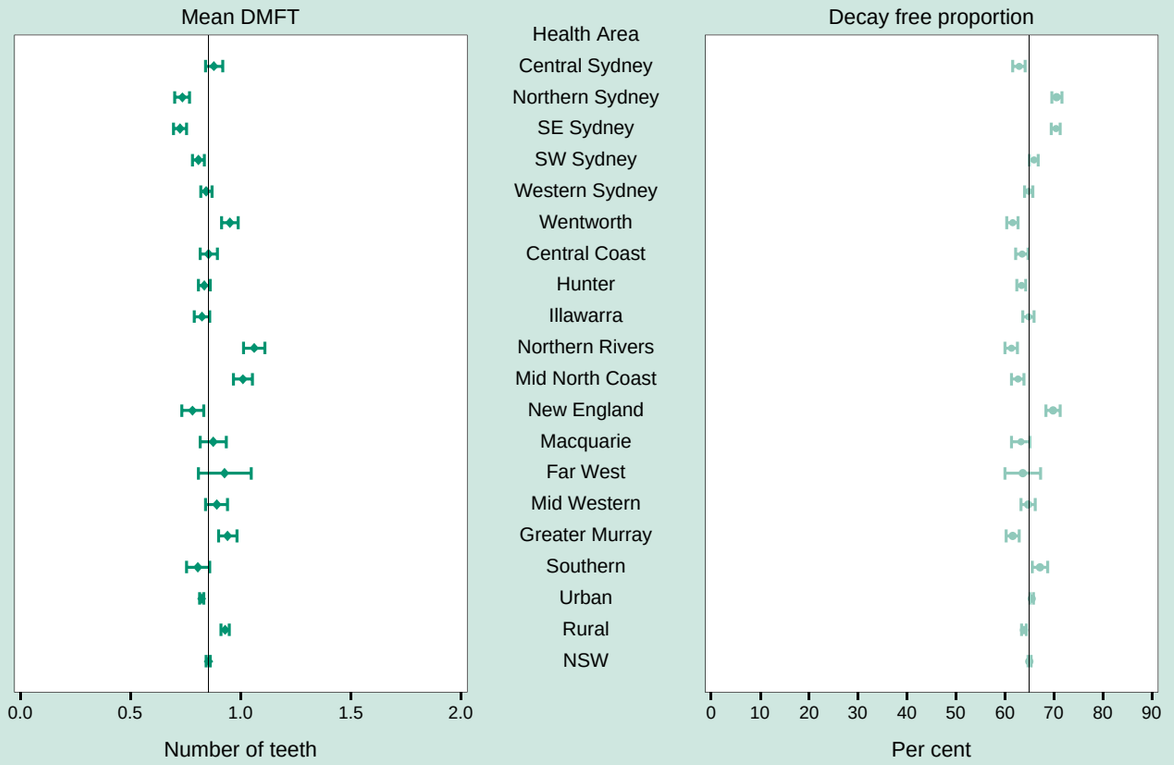
Decayed, missing or filled deciduous and permanent teeth and decay free proportion, by health area, children in Kindergarten, NSW 1998 to 1999

Health area	Mean DMFT	LL95%CI	UL95%CI	Decay free proportion	LL95%CI	UL95%CI
Central Sydney	1.3	1.2	1.3	67.0	66.0	68.1
Northern Sydney	0.6	0.6	0.7	78.6	77.9	79.3
SE Sydney	0.7	0.7	0.8	75.1	74.4	75.9
SW Sydney	1.0	1.0	1.0	69.6	68.9	70.3
Western Sydney	1.1	1.0	1.1	69.2	68.4	69.9
Wentworth	0.8	0.8	0.9	70.8	69.9	71.8
Central Coast	1.0	0.9	1.0	69.4	68.4	70.5
Hunter	0.9	0.9	0.9	69.2	68.4	70.0
Illawarra	0.9	0.8	0.9	71.3	70.3	72.2
Northern Rivers	1.6	1.6	1.7	60.8	59.6	62.0
Mid North Coast	1.5	1.4	1.5	61.7	60.5	62.8
New England	1.3	1.2	1.4	65.1	63.7	66.5
Macquarie	1.4	1.4	1.5	59.7	58.0	61.5
Far West	1.7	1.5	1.9	60.7	57.6	63.8
Mid Western	1.2	1.2	1.3	64.3	62.8	65.6
Greater Murray	1.3	1.2	1.3	63.5	62.3	64.6
Southern	1.2	1.1	1.3	64.5	63.1	66.0
Urban	0.9	0.9	0.9	71.3	71.0	71.6
Rural	1.4	1.4	1.4	62.7	62.2	63.2
NSW	1.0	1.0	1.0	69.0	68.8	69.3

Note: Ages greater than 4 standard deviations above the mean were excluded. Health area refers to area of dental service. Lower and upper limits of 95% confidence interval for the point estimate.

Source: NSW Save Our Kids Smiles (SOKS) data (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

Decayed, missing or filled teeth and decay free proportion
by health area, children in grade 6, NSW 1998 and 1999



Note: Ages greater than 4 standard deviations from the mean were excluded. Mean DMFT = mean number of decayed, missing or filled deciduous and permanent teeth. Decay-free proportion = persons with no decayed, filled or missing teeth. Health area refers to area of dental service. Lower and upper limits of 95% confidence interval for the point estimate are shown.

Source: NSW Save Our Kids Smiles (SOKS) data and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Oral health of children is most commonly assessed by their caries (decay) experience. In 1998 and 1999, 109,565 Grade 6 children were assessed by the SOKS program, representing about 63% of all 11 year old children in NSW.
- According to SOKS assessments, Grade 6 children had on average 0.85 teeth affected by caries. As a group, Grade 6 children living in rural health areas experienced higher rates of dental caries (average DMFT score = 0.93) than children from metropolitan areas (average DMFT score = 0.82). The average number of teeth affected by decay varied from 0.72 in South Eastern Sydney Health Area to 1.06 in Northern Rivers Health Area.
- In 1998 and 1999, almost two-thirds (65.0%) of Grade 6 children assessed by the SOKS program had not experienced tooth decay. Children living in rural areas had worse experience (63.9% decay-free proportion) than children living in metropolitan areas (65.4%). The proportion of children who were decay free varied from 61.2% in the Northern Rivers Health Area to 70.5% in the Northern Sydney Health Area.

For more information:

AIHW Dental Statistics and Research Unit. *Child Dental Health Survey, NSW, 1998.* Adelaide: AIHW, 2001.

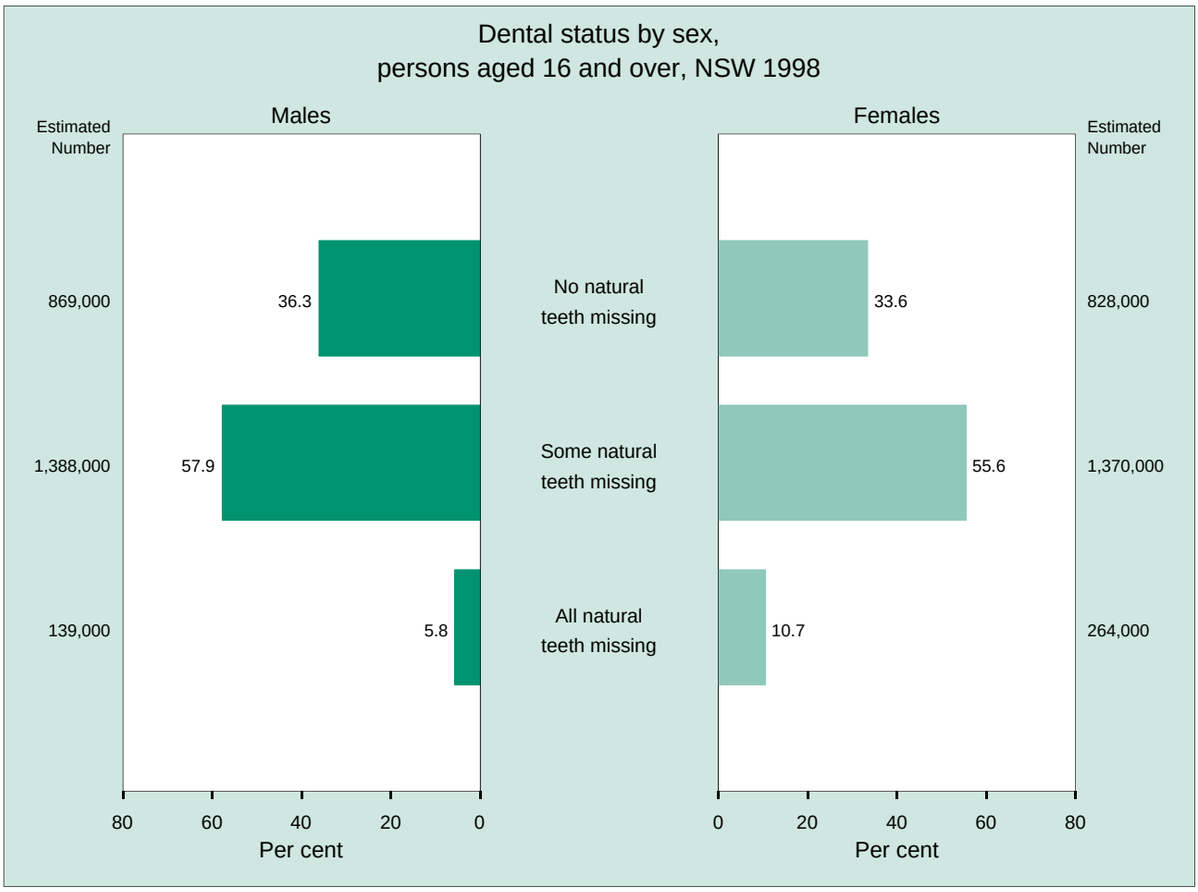
AIHW Dental Statistics and Research Unit. *Child Dental Health Survey, NSW, 1999.* Adelaide: AIHW, 2001.

Decayed, missing or filled deciduous and permanent teeth and decay free proportion, by health area, children in Grade 6, NSW, 1998 to 1999

Health area	Mean DMFT	LL95%CI	UL95%CI	Decay free proportion	LL95%CI	UL95%CI
Central Sydney	0.9	0.8	0.9	62.8	61.6	64.1
Northern Sydney	0.7	0.7	0.8	70.5	69.5	71.6
SE Sydney	0.7	0.7	0.8	70.3	69.4	71.3
SW Sydney	0.8	0.8	0.8	65.9	65.0	66.7
Western Sydney	0.8	0.8	0.9	64.8	63.9	65.6
Wentworth	1.0	0.9	1.0	61.5	60.4	62.7
Central Coast	0.9	0.8	0.9	63.4	62.2	64.7
Hunter	0.8	0.8	0.9	63.3	62.4	64.2
Illawarra	0.8	0.8	0.9	64.8	63.6	65.9
Northern Rivers	1.1	1.0	1.1	61.2	59.9	62.6
Mid North Coast	1.0	1.0	1.1	62.6	61.4	63.8
New England	0.8	0.7	0.8	69.8	68.3	71.3
Macquarie	0.9	0.8	0.9	63.2	61.2	65.1
Far West	0.9	0.8	1.0	63.6	60.0	67.2
Mid Western	0.9	0.8	0.9	64.7	63.2	66.2
Greater Murray	0.9	0.9	1.0	61.5	60.2	62.8
Southern	0.8	0.8	0.9	67.1	65.5	68.7
Urban	0.8	0.8	0.8	65.4	65.1	65.8
Rural	0.9	0.9	0.9	63.8	63.3	64.4
NSW	0.9	0.8	0.9	65.0	64.7	65.3

Note: Ages greater than 4 standard deviations above the mean were excluded. Health area refers to area of dental service. Lower and upper limits of 95% confidence interval for the point estimate are shown.

Source: NSW Save Our Kids Smiles (SOKS) data (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.



Note: Estimates based on 17,494 respondents. 28 (0.2%) not stated for natural teeth missing. Estimated counts are rounded to the nearest 1000. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Health Survey 1998 (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Tooth loss and the wearing of dentures reflect the cumulative effects of past oral disease and dental treatment practices. In Australia in 1988, people from all age groups over 45 years old had an average of fewer than 20 teeth, which is regarded as the minimum required for good oral functioning (AHMAC, 2001).
- In 1998, among NSW residents aged 16 years and over, 34.9% reported that they had all of their natural teeth, 56.8% reported some teeth missing and 8.3% reported all teeth missing (edentulism). As expected, rates of edentulism increased with age. Less than 2% of respondents of both sexes aged up to 44 years reported having no natural teeth, but past this age the rate of edentulism increased rapidly, to almost one-third of males (31.2%) and half of females (49.7%) aged 75 years and over.
- Respondents from rural areas (11.5%) were more likely than those from urban areas (7.4%) to report edentulism. Rates of edentulism were lower than the state average respondents living in 'highly accessible' areas, as defined using the ARIA classification, and higher than the state average among respondents living in 'accessible' areas. This probably reflects the older average age of populations living in semi-urban areas such as the Central Coast Area.

For more information:

Public Health Division. *Report on the 1997 and 1998 NSW Health Surveys.* Sydney: NSW Department of Health, 2000. www.health.nsw.gov.au/public-health/nswhs.

Australian Health Ministers' Advisory Council. *Oral health of Australians. National planning for oral health improvement.* Adelaide: South Australian Department of Human Services, 2001.

Hospital separations for removal and restoration of teeth by sex, persons aged 0-4 and 5-14 years, NSW 1989-90 to 1999-00

			89–90	90–91	91–92	92–93	93–94	94–95	95–96	96–97	97–98	98–99	99–00
Number	0–4 years	Males	649	647	725	661	674	557	658	727	770	744	741
		Females	503	552	554	565	550	456	507	635	672	521	604
		Persons	1152	1199	1279	1226	1224	1013	1165	1362	1442	1265	1345
	5–14 years	Males	813	905	950	942	955	923	1099	1175	1224	1222	1244
		Females	1052	1016	969	1146	1061	982	1160	1339	1361	1264	1380
		Persons	1865	1921	1920	2087	2016	1905	2259	2514	2585	2486	2624
Rate per 100,000 population	0–4 years	Males	296.9	294.4	325.7	293.8	298.5	246.5	291.8	322.9	343.7	334.8	335.0
		Females	241.7	263.4	261.9	265.0	257.2	212.7	236.6	296.8	315.6	246.6	287.0
		Persons	270.0	279.3	294.6	279.8	278.4	230.0	264.9	310.2	330.0	291.8	311.6
	5–14 years	Males	189.9	210.5	219.8	216.8	219.0	210.0	247.3	262.6	272.2	270.6	274.8
		Females	257.8	248.9	235.8	276.9	255.1	234.0	273.5	313.2	317.3	293.8	320.0
		Persons	223.1	229.2	227.6	246.0	236.6	221.7	260.1	287.3	294.2	282.0	296.9

Note: Hospital separations were classified by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Hospital separation rates were age-adjusted using the Australian population as at 30 June 1991.

Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

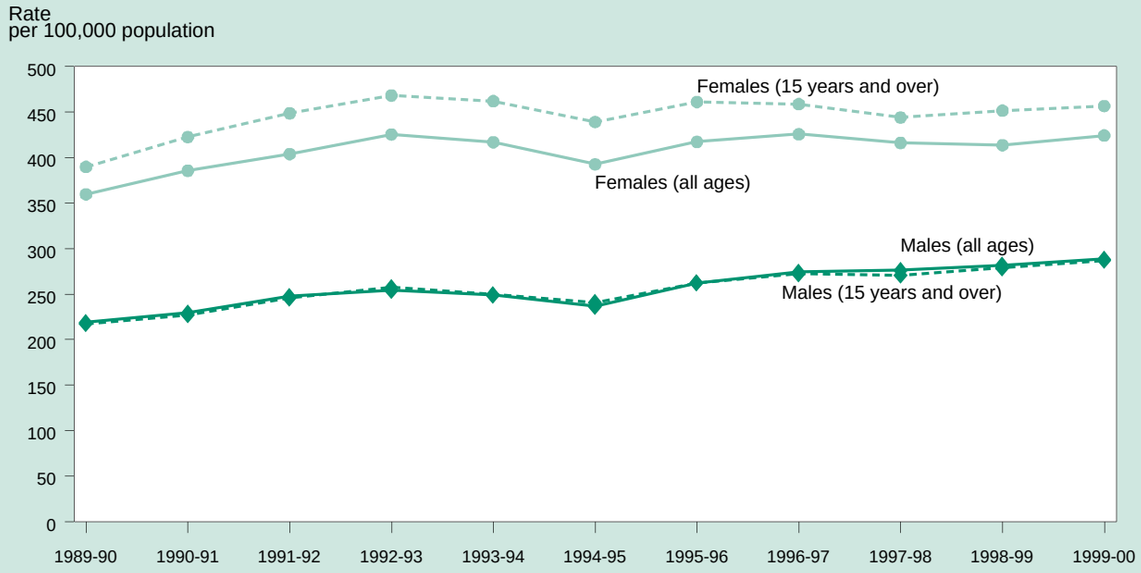
- Hospitalisations for the removal or restoration of teeth among children under the age of 5 years increased by 15.4% between 1989–90 and 1999–00. Rates for both males and females diminished till 1994–95 and then increased again.
- The main dental procedure performed in infants and young children was extraction of a tooth using forceps (43.0%), followed by restoration of a tooth by filling (31.5%). 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.
- Hospitalisations for the removal or restoration of teeth among children aged 5–14 years increased by 33.0% over the period 1989–90 to 1999–00. The main procedures performed in older children were surgical extraction of teeth (57.3%), extraction using forceps (29.3%), and restoration of tooth by filling (11.0%). Poor dietary and oral hygiene practices are likely to be major contributing factors to dental caries at this age. Some children may be admitted to hospital because dental procedures may be more difficult to perform in outpatient settings.

For more information:

AIHW Dental Statistics and Research Unit. *Child Dental Health Survey, NSW, 1998*. Adelaide: AIHW, 2001.

AIHW Dental Statistics and Research Unit. *Child Dental Health Survey, NSW, 1999*. Adelaide: AIHW, 2001.

Hospital separations for removal and restoration of teeth by sex, persons aged 15 years and over and persons of all ages, NSW 1989-90 to 1999-00



			89–90	90–91	91–92	92–93	93–94	94–95	95–96	96–97	97–98	98–99	99–00
Number	15 years and over	Males	4972	5195	5633	5889	5691	5500	6013	6267	6300	6536	6793
		Females	8657	9406	10012	10416	10237	9746	10254	10261	10018	10237	10450
		Persons	13629	14602	15645	16305	15928	15246	16267	16552	16318	16773	17243
	All ages	Males	6433	6747	7308	7492	7320	6980	7770	8169	8294	8503	8778
		Females	10212	10974	11535	12126	11848	11184	11921	12235	12051	12022	12434
		Persons	16645	17721	18844	19618	19168	18164	19691	20428	20345	20525	21212
Rate per 100,000 population	15 years and over	Males	217.3	227.1	245.7	257.2	249.6	240.8	262.4	272.2	270.8	278.8	287.0
		Females	389.9	422.6	448.8	468.3	462.2	439.2	461.2	458.9	444.1	451.7	456.8
		Persons	301.9	322.8	345.4	361.0	354.1	338.5	360.2	364.7	356.1	363.9	370.4
	All ages	Males	219.2	229.7	247.8	254.0	248.8	236.7	262.3	274.5	276.3	281.8	288.8
		Females	359.8	385.7	404.1	425.5	417.0	392.7	417.4	425.8	416.2	413.7	424.4
		Persons	288.1	306.0	324.5	338.3	331.5	313.5	338.6	349.4	345.2	346.7	355.4

Note: Hospital separations were classified by ICD-9-CM up to 1997–98 and by ICD-10-AM from 1998–99 onwards. Hospital separation rates were age-adjusted using the Australian population as at 30 June 1991.

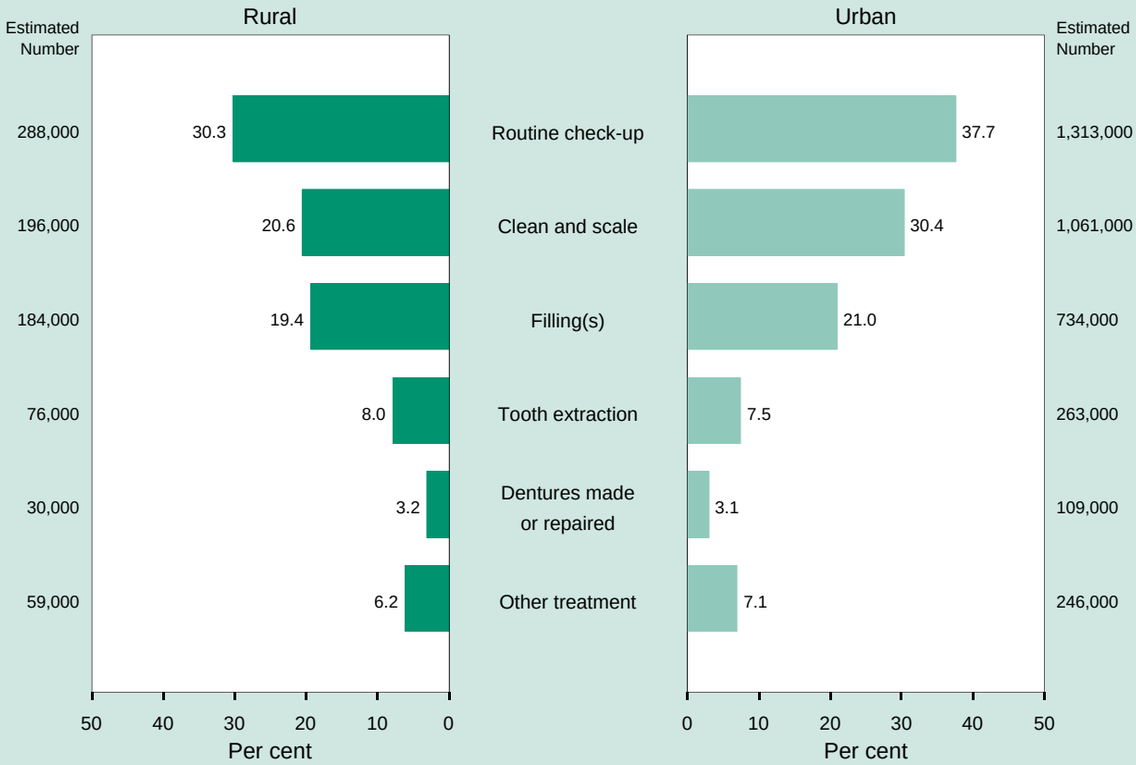
Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Between 1989–90 and 1999–00, the rate of hospitalisation for the removal or restoration of teeth in people aged over 15 years increased by almost one-quarter (23.4%). The hospitalisation rate for females in this age group was consistently around 50% higher than the male rate.
- The majority of hospitalisations among adults were for surgical removal of teeth. Half of all admissions for surgical removal of teeth were among people between 15 and 34 years old. Most of these were for removal of wisdom teeth, classified as 'unerupted or partly erupted tooth, with removal of bone or tooth division'.

For more information:

Australian Health Ministers' Advisory Council. *Oral health of Australians. National planning for oral health improvement.* Adelaide: South Australian Department of Human Services, 2001.

Type of dental treatment in previous 12 months
by urban-rural area of residence, persons aged 16 and over, NSW 1998



Note: Estimates based on 15,557 dentate respondents (with at least 1 natural tooth). Sixty-one (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 1 treatment type. Estimated counts are rounded to the nearest 1000. Urban areas include the Sydney, Hunter, and Illawarra Health Areas. Percentages may total more than 100.

Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Health Survey 1998 (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

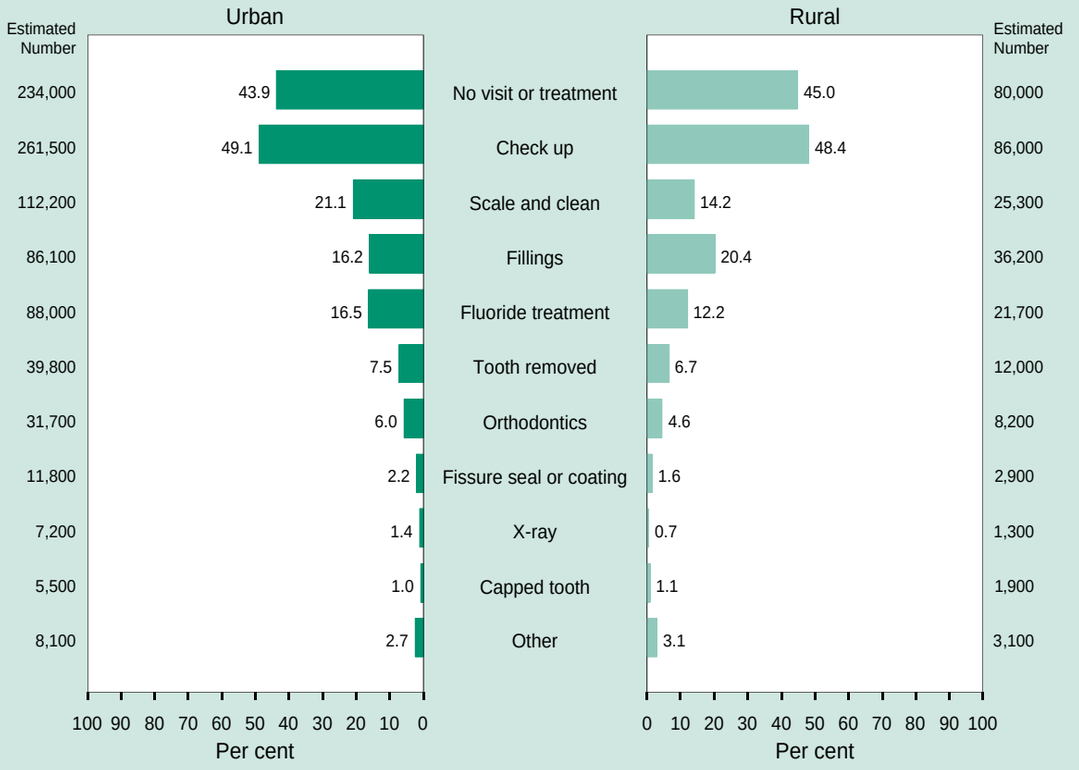
- People making 'check-up' dental visits are more likely to receive preventive treatment and timely interventions, while others making 'problem' visits are more likely to have unfavourable outcomes such as extractions.
- In the 1998 NSW Health Survey, residents of urban areas (37.8%) were more likely to report having a check-up than those from rural areas (30.3%). Urban residents reported more clean-and-scale treatments (30.4% compared to 20.6%) and fillings (21.0% compared to 19.4%) in the previous 12 months. Rural residents reported more tooth extractions (8.0% compared to 7.5%).
- Other data from the NSW Health Survey showed that the likelihood of reporting a routine check-up in the previous 12 months decreased with increasing level of socioeconomic disadvantage, based on area of residence. It ranged from 49.3% in the least disadvantaged to 27.5% in the most disadvantaged areas. A similar pattern was seen with decreasing level of educational attainment. Respondents who were unemployed, unable to work, retired, or engaged in home duties, were less likely than others to report a routine check-up.

For more information:

Public Health Division. *Report on the 1997 and 1998 NSW Health Surveys*. Sydney: NSW Department of Health, 2000. www.health.nsw.gov.au/public-health/nswhs.

Australian Health Ministers' Advisory Council. *Oral health of Australians. National planning for oral health improvement*. Adelaide: South Australian Department of Human Services, 2001.

Dental visits and treatments in past 12 months, by urban-rural health area of residence, children aged 5-12 years, NSW 2001



Note: Estimates based on 5887 respondents. Respondents could name more than 1 treatment type. Therefore, percentages will total more than 100.

Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Child Health Survey 2001 (HOIST). Epidemiology and Surveillance Branch, 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 (AHMAC, 2001; AIHW, 1998).
- At the 2001 Child Health Survey, more than 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%), flouride treatment (15.4%), removal of teeth (7.3%), and orthodontics (5.6%). Fillings were more commonly reported among children resident in rural areas, while preventive treatments (scale-and-clean and flouride treatment) were more frequently reported among children resident in urban areas.

For more information:

Australian Health Ministers' Advisory Council, Steering Committee for National Planning for Oral Health. *Oral health of Australians: National planing 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. *Australia's oral health and dental services.* Adelaide: AIHW, 1998.

Chapter 4.8

Pregnancy and the newborn

- The health of NSW mothers and babies is generally good, though Aboriginal and Torres Strait Islander mothers and babies, and those from socioeconomically disadvantaged areas, continue to have poorer health than other NSW mothers and babies.
- Around 87,000 births are registered in NSW each year.
- The birth rate in NSW is declining, but not as steeply as in Australia as a whole. Currently, the average woman in NSW can expect to give birth to 1.7 babies in her lifetime.
- Around 3% of teenagers become pregnant each year. The teenage pregnancy rate is gradually declining.
- Among NSW mothers:
  - —three-quarters take folate supplements prior to and/or early in pregnancy to prevent neural tube defects. Less than one-third change their diet to increase folate intake;
  - —there are around 8 deaths due to pregnancy or its management each year, representing less than 1 per 10,000 pregnancies;
  - —just under two-thirds place their babies on their back to sleep from birth, which is the preferred position for prevention of sudden infant death syndrome (SIDS).
- 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 16% are admitted to a neonatal special care nursery, and 2.5% are admitted to neonatal intensive care;
  - —the rate of perinatal deaths (stillbirths and deaths in the first 4 weeks of life) has declined by more than one-third in the last 10 years;
  - —perinatal deaths in remote areas of NSW—while small in number—occur at double the rate of other areas.

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 birth rates, fertility rates, teenage pregnancy, periconceptional folate supplementation, prenatal diagnosis, perinatal mortality, prematurity, low birthweight, infant sleeping position, and neonatal morbidity. Information on breastfeeding is given in Chapter 1.4.

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 Chapters 3.1 and 3.4.

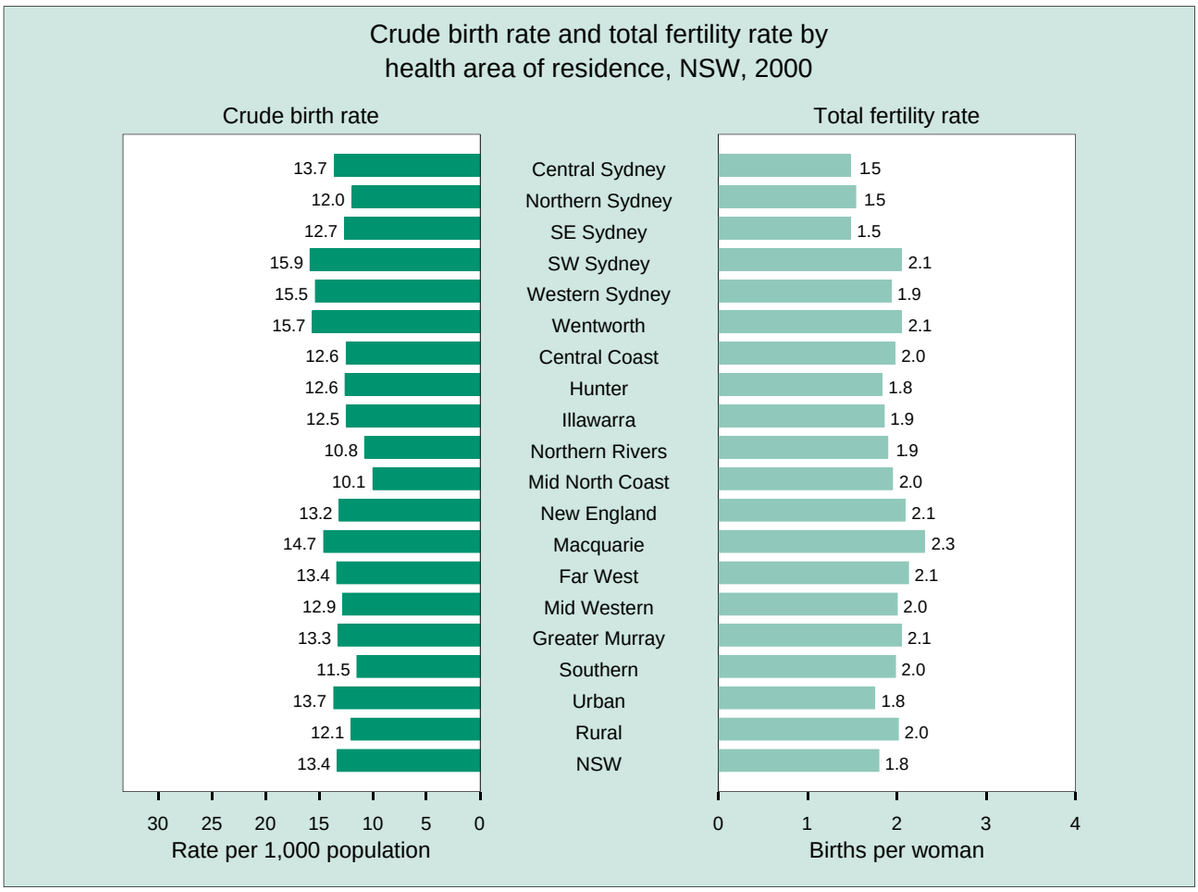
As well as data on births and deaths obtained from the Australian Bureau of Statistics, this chapter uses data from the NSW Midwives Data Collection, the NSW Birth Defects Register, and the NSW Child Health Survey 2000. More information on these data collections and the analytic methods used is given in the Methods section.

For more information:

Australian Bureau of Statistics. *Births, Australia 2000*. Catalogue no. 3301.0. Canberra: ABS, 2001.

Public Health Division. *New South Wales Mothers and Babies 2000. N S W Public Health Bull* 2001; (S-3). www.health.nsw.gov.au/public-health/mdc/mdcrepoo.html.

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



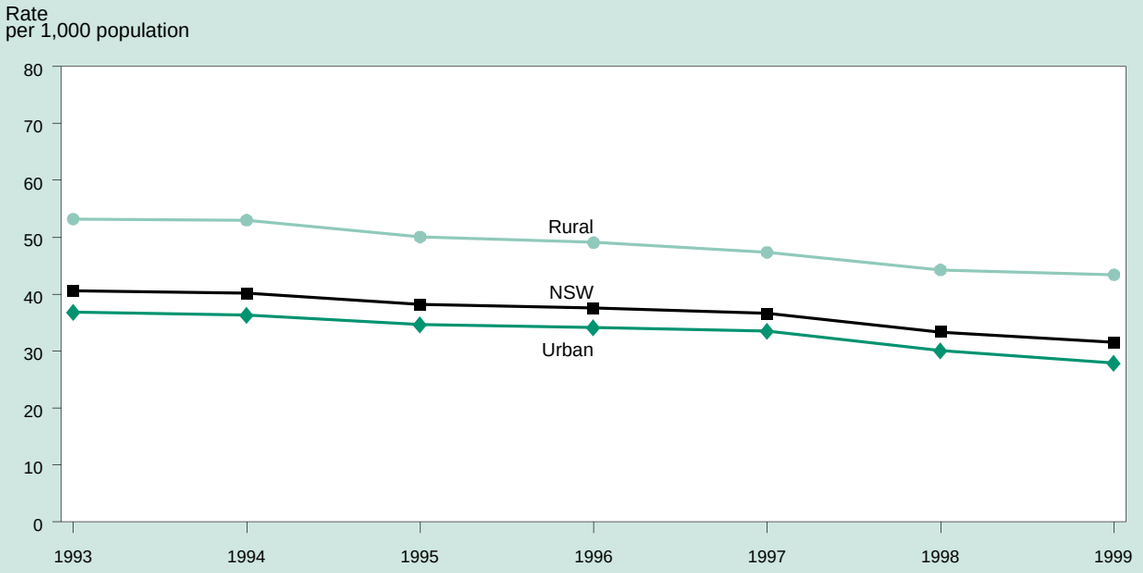
		1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Number of births	NSW	87367	92585	89354	87977	87849	86595	87156	85499	86784	86752
	Australia	257247	264151	260229	258051	256190	253834	251842	249616	248870	249636
Crude birth rate	NSW	14.8	15.5	14.9	14.5	14.4	14.0	13.9	13.5	13.5	13.4
per 1000 population	Australia	14.9	15.1	14.7	14.5	14.2	13.9	13.6	13.3	13.1	13.0
Total fertility rate	NSW	1.874	1.975	1.912	1.879	1.867	1.827	1.832	1.797	1.820	1.809
(Births per woman)	Australia	1.855	1.893	1.864	1.846	1.825	1.797	1.776	1.758	1.751	1.749

Source: Australian Bureau of Statistics. *Births, Australia.* Catalogue no. 3301.0. Canberra: ABS, [1992 to 2001].

- In NSW in 2000, 86,752 births were registered, giving a crude birth rate of 13.4 livebirths per 1000 population. The crude birth rate in NSW declined steadily from 14.8 per 1000 population in 1991. Nationally, the crude birth rate fell from 14.9 to 13.0 per 1000 over the same 10 year period, a greater relative fall than seen in NSW.
- In 2000, the crude birth rate varied from 10.0 per 1000 in the Mid North Coast Health Area to 15.9 per 1000 in the South Western Sydney Health Area.
- The total fertility rate is the average number of babies that a woman could expect to give birth to in her reproductive life. The total fertility rate has declined in both NSW and in Australia over the last decade. In 2000, the total fertility rate in NSW was 1.7 births per woman, which varied from 1.5 in Central and South Eastern Sydney Health Areas to 2.3 in the Macquarie Health Area.
- Australia has had 'below replacement level' fertility since 1976. That is, the average number of babies born to a woman during her life has been insufficient to replace herself and her partner. In Australia, the total fertility rate required for replacement is about 2.1 babies per woman (ABS, 2001).

For more information:
Australian Bureau of Statistics. *Births, Australia 2000.* Catalogue no. 3301.0. Canberra: ABS, 2001.

Teenage pregnancy by urban-rural health area of residence, NSW, 1993 to 1999



	Region	1993	1994	1995	1996	1997	1998	1999
Number	Urban	5951	5770	5468	5443	5388	4890	4583
	Rural	2528	2494	2335	2303	2260	2167	2161
	NSW	8479	8264	7803	7746	7648	7057	6744
Rate per 1000 women	Urban	36.8	36.3	34.6	34.1	33.4	30.0	27.9
	Rural	53.2	53.0	50.1	49.1	47.4	44.3	43.4
	NSW	40.6	40.1	38.2	37.5	36.6	33.3	31.5

Note: Teenage pregnancy rate is the number of miscarriages, terminations of pregnancy, stillbirths, and live births, among women aged less than 20 years, reported from NSW public and private hospitals per 1000 female population aged 15–19 years.

Source: NSW Midwives Data Collection, NSW Inpatient Statistics Collection, ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- The health risk of pregnancy and childbirth are higher for teenage mothers (less than 20 years of age) than mothers in their 20s. For the mother, there is a higher risk of some medical complications such as hypertension (high blood pressure); for the baby, there is a greater risk of low birthweight, prematurity, and stillbirth.
- Between 1993–1999 the teenage pregnancy rate in NSW fell by 14%—from 40.6 to 31.5 per 1000 teenage women.
- Since 1993, the teenage pregnancy rate has been higher in rural areas than in urban areas, but rates in both urban and rural areas have shown similar decreases over the 7-year period.
- The teenage pregnancy rate calculated here falls below reported rates for South Australia of 47.3 in 1996 and 40.8 per 1000 in 2000 (Van der Klis et al., 2002). The difference may be real or may be due to relative under-enumeration of terminations of pregnancy in NSW.
- The teenage fertility rate—that is, the number of livebirths per 1000 female population—in Australia in 1999 was 18.1 per 1000. This is the lowest since 1921, following a peak of 55.5 per 1000 in 1971.
- In NSW, the proportion of births (including stillbirths and live births) to teenage mothers has declined from 5.6% to 4.4% over the period 1990 to 2000.

For more information:

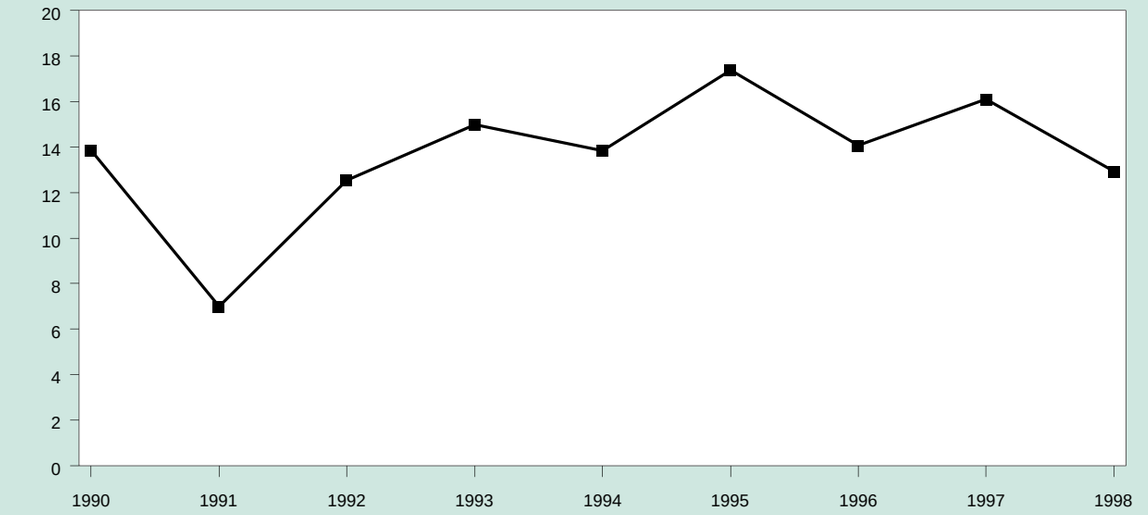
Australian Bureau of Statistics. *Births Australia 1999.* Catalogue no. 3301.0. Canberra: ABS, 2000.

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.

Public Health Division. New South Wales Mothers and Babies 2000. *N S W Public Health Bull* 2001; (S-3). www.health.nsw.gov.au/public-health/mdc/mdcrep00.html.

Moon L, Meyer P, Grau J. *Australia's young people: Their health and wellbeing 1999.* Canberra: AIHW, 1999.

Maternal death ratios,
NSW, 1990 to 1998



		1990	1991	1992	1993	1994	1995	1996	1997	1998
Number	Direct	4	4	5	6	8	7	6	7	4
	Indirect	6	1	1	1	1	2	1	2	4
	Incidental	2	1	5	6	3	6	5	5	3
	Total	12	6	11	13	12	15	12	14	11
Maternal death ratio per 100,000 confinements		13.9	7.0	12.5	15.0	13.8	17.4	14.1	16.1	12.9

Note: Includes all deaths of women who were pregnant at the time of death, or who died within 42 days of childbirth. The maternal death ratio is the number of maternal deaths per 100,000 pregnancies resulting in a live birth or stillbirth (confinements).

Source: NSW Maternal and Perinatal Committee, NSW Department of Health.

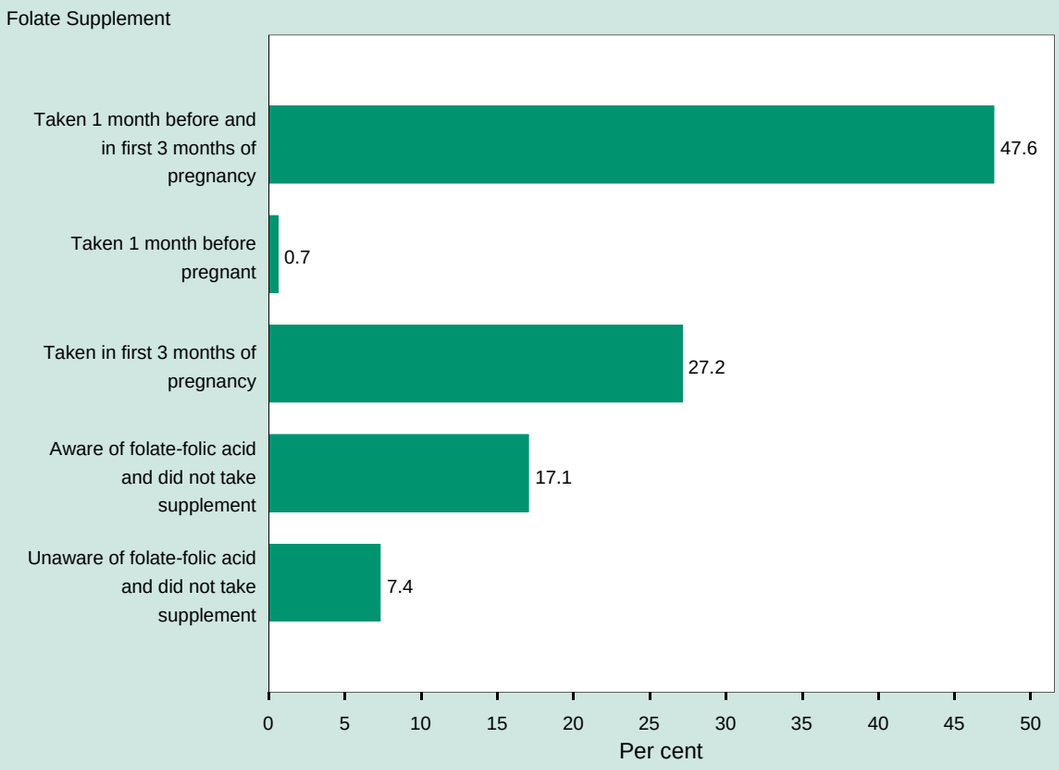
- In the period 1990–1998 in NSW, 106 deaths were reported among pregnant women or women who gave birth less than 6 weeks previously. The maternal mortality ratio varied from 7.0 to 17.4 per 100,000 confinements over the 9-year period. The maternal mortality ratio for Australia in the 3 years 1994–1996 was 13.0 per 100,000 confinements.
- Maternal deaths are classified as direct, indirect, or incidental. Direct deaths include those from obstetric complications. Indirect deaths include those from pre-existing disease or disease that developed during pregnancy and was not due to direct obstetric causes, but which may have been aggravated by pregnancy. Incidental deaths are those due to conditions occurring during pregnancy, where the pregnancy is unlikely to have contributed significantly to the death.
- Of the 106 deaths reported in NSW in 1990–1998, 51 (48.1%) were found to be directly due to pregnancy or its management; 19 (17.9%) were found to have indirect causes, and 36 (34.0%) women died of incidental causes not related to the pregnancy or its management.
- In 1994–1996, there were 100 maternal deaths in Australia. Forty-six deaths were classified as direct, with the most common causes being pulmonary embolism (*n*=8) and amniotic fluid embolism (*n*=8). Twenty deaths were classified as indirect, with cardiovascular disease being the principal cause in 10 deaths. Incidental causes accounted for 34 deaths, with the most common being injuries (*n*=17) and cancer (*n*=5) (National Perinatal Statistics Unit, 2001).

For more information:

Public Health Division. *New South Wales Mothers and Babies 2000. N S W Public Health Bull* 2001; (S-3). www.health.nsw.gov.au/public-health/mdc/mdc00rep.pdf.

National Perinatal Statistics Unit, Australian Institute of Health and Welfare. *Report on Maternal Deaths in Australia: 1994–96.* Canberra: NHMRC, 2001. AIHW Catalogue no. PER 13.

Folate tablets-capsules taken before or during pregnancy, mothers with babies less than 12 months of age, NSW, 2001



Note: Estimates based on 647 respondents.
Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

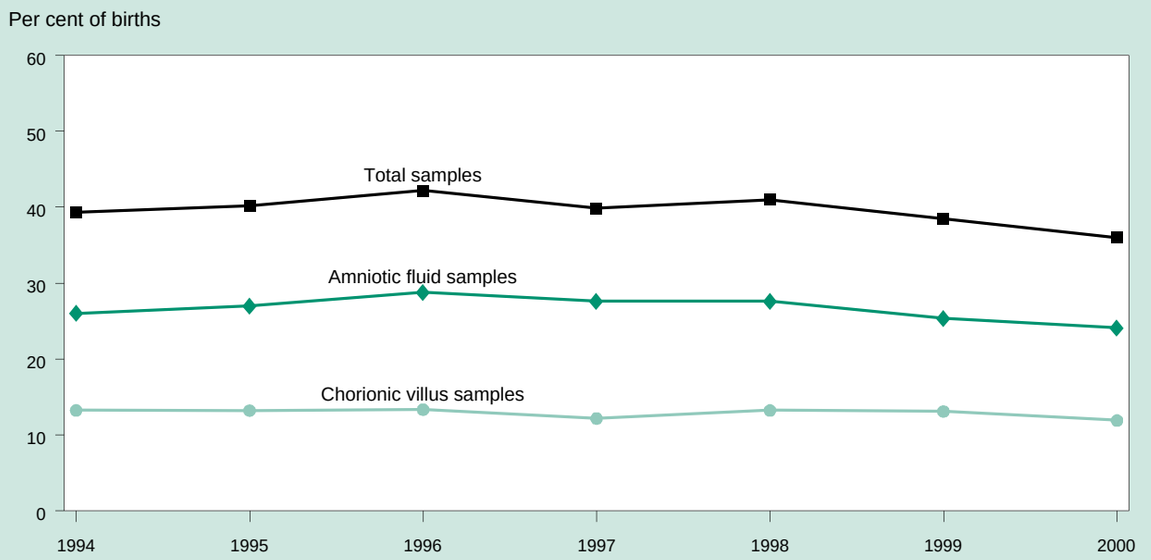
Source: NSW Child Health Survey 2001 (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Folate is a B group vitamin that is found naturally in foods such as fresh vegetables and fruit, orange juice, 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 (Lumley et al., 1999).
- In the 2001 Child Health Survey, mothers of babies aged less than 12 months were asked a series of questions about their folate intake.
- Half (47.6%) of mothers reported that they had taken folate tablets or capsules both 1 month before and in the first trimester of pregnancy. A further one-quarter (27.2%) reported that they had taken these supplements in the first trimester but not prior to pregnancy. One-quarter (24.5%) reported that they had not taken folate supplements. Mothers aged less than 20 years, who had 3 or more children, or were current smokers, were less likely than other mothers to report taking folate supplements.
- Less than one-third of mothers (29.7%) reported that they had changed their diet to increase folate intake around the time of conception. One quarter (25.2%) reported that they did not change their diet but considered that they already had an adequate folate intake, while the remainder (45.1%) reported that they did not change their diet.

For more information:

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; (4).

Prenatal diagnosis tests for women 35 years and over, NSW, 1994 to 2000



		1994	1995	1996	1997	1998	1999	2000
Amniotic fluid samples	Number	3007	3264	3722	3781	3903	3797	3781
	Per cent of births	26.0	27.0	28.8	27.6	27.6	25.4	24.1
Chorionic villus samples	Number	1528	1597	1720	1664	1867	1958	1865
	Per cent of births	13.2	13.2	13.3	12.1	13.2	13.1	11.9
Other samples	Number	14	6	11	21	25	4	2
	Per cent of births	0.1	0.0	0.1	0.2	0.2	0.0	0.0
Total samples	Number	4549	4867	5453	5466	5795	5759	5648
	Per cent of births	39.3	40.2	42.2	39.9	41.0	38.5	36.0

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). Epidemiology and Surveillance Branch, NSW Department of Health.

- The risk of some chromosomal abnormalities in the baby, particularly Down syndrome, increases with maternal age. In NSW in 1994–2000, the rate of chromosomal abnormalities was 8.0 per 1000 among babies born to mothers aged 40–44 years, compared to a rate of 1.3 per 1000 among babies of 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. The most common types of procedures carried out for cytogenetic testing are amniocentesis and chorionic villus sampling (CVS).
- The number of cytogenetic tests carried out for prenatal diagnosis among women aged 35 years and over in NSW rose from 4549 in 1994 to 5795 in 1998, an increase of 24%; then declined slightly to 5648 tests in 2000. This pattern of change was seen for both amniocentesis and CVS. Amniocentesis remained about twice as common as CVS throughout the period.
- Similarly, the number of cytogenetic tests as a percentage of babies born rose to a high of 42% in 1996 and declined to 36% in 2000. This recent decline is probably due to greater use of ultrasound examination for increased 'nuchal translucency' as a screening test for Down syndrome.

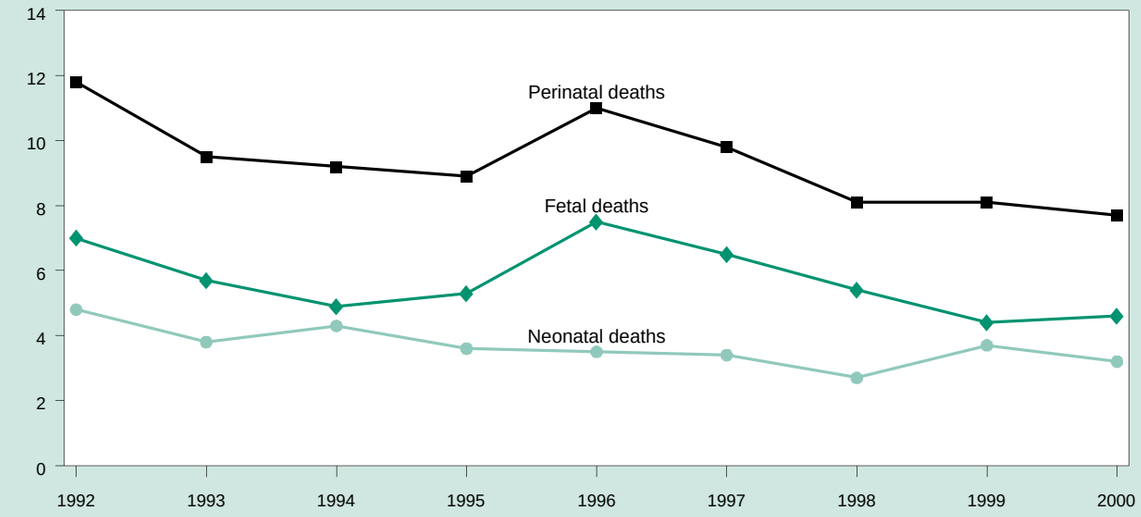
For more information:

NSW Department of Health. *Guidelines for testing for Genetic Disorders*. Circular no. 1997/48. www.health.nsw.gov.au/fcsd/rmc/cib/circulars/1997/cir97–48.pdf.

NSW Department of Health. *Specialised Testing for Genetic Disorders. Part 2—Guidelines for Specialised Testing for Genetic Disorders.*. Sydney: NSW Department of Health, 2000. www.health.nsw.gov.au/health-public-affairs/publications/gentest.

NSW Department of Health. *Ethical Code Governing the Provision of Genetics Services.*. Sydney: NSW Department of Health, 1998. www.health.nsw.gov.au/policy/ssdb/genetics/gen_code.pdf.

Perinatal mortality rate,
NSW, 1992 to 2000



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 1000 births including both stillbirths and live births. Data are by year of death registration. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: Nassar N, Sullivan EA. *Australia's Mothers and Babies 1999*. Sydney: AIHW National Perinatal Statistics Unit (Perinatal Statistics Series no. 11), 2001; Day P, Sullivan EA, Ford J, Lancaster P. *Australia's Mothers and Babies 1997*. Sydney: AIHW National Perinatal Statistics Unit (Perinatal Statistics Series no. 9), 1999; Australian Bureau of Statistics. *Causes of Death, Australia, 2000*. Catalogue no. 3303.0. Canberra: ABS, 2001.

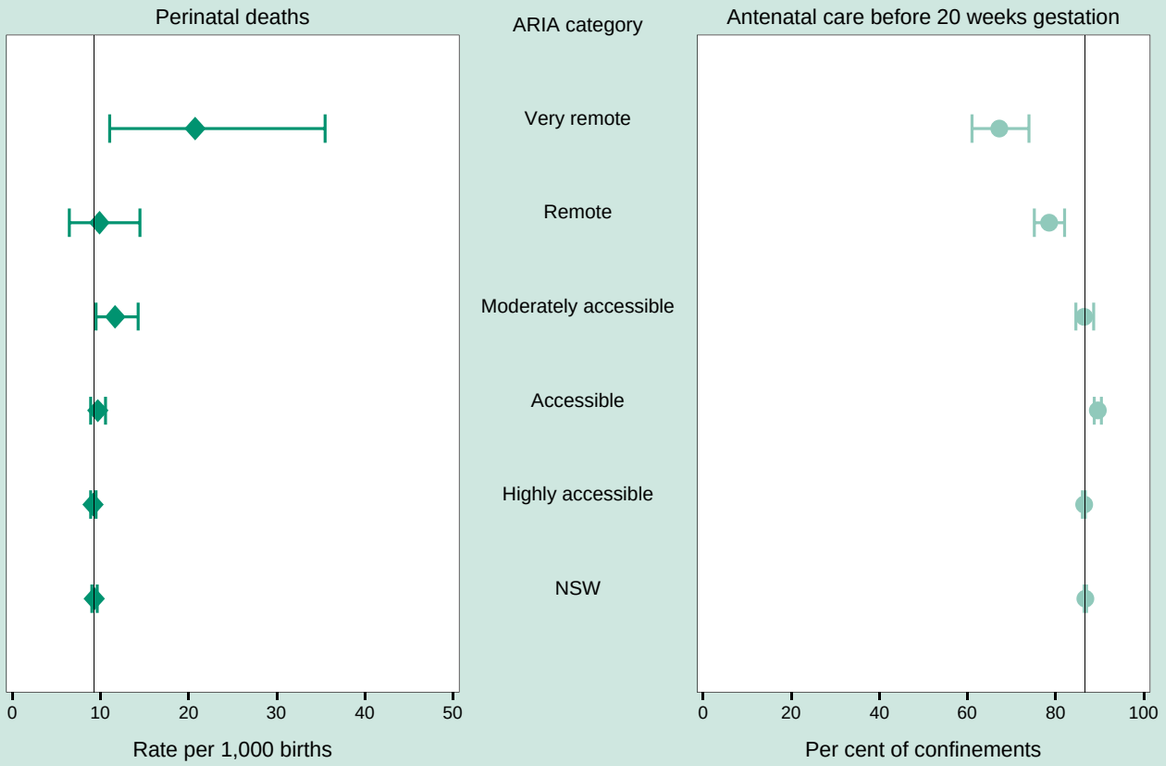
- Perinatal deaths include stillbirths and deaths in the first 4 weeks of life. Over the past 9 years perinatal mortality has decreased in Australia. In NSW, perinatal mortality rates have decreased from 11.8 perinatal deaths per 1000 births in 1992, to 7.7 per 1000 births in 2000. Of the 675 perinatal deaths reported in NSW in 2000, 399 (59.1%) were stillbirths and 276 (40.9%) were neonatal deaths.
- In NSW, the number of perinatal deaths declined by over one-third, from 1097 in 1992 to 675 in 2000.
- A review of the obstetric causes of perinatal deaths among infants of at least 22 weeks gestation or 500 grams birthweight in 2000, found that about one-third (34.6%) of perinatal deaths were unexplained stillbirths; and among infants born at term over half (56.8%) were unexplained. The most common causes of death were: spontaneous preterm labour (less than 37 weeks gestation) (17.6%), congenital abnormality (13.6%), infection (9.0%), antepartum haemorrhage (7.7%), and hypertension (high blood pressure) (6.0%). For neonatal deaths, extreme prematurity was found to be the most common cause of death (43.9%), followed by cardio-respiratory conditions (12.8%), neurological disease (11.7%), and infection (6.1%).
- Improvements in perinatal mortality are related to improvements in obstetric and paediatric care with increasing referral of high risk pregnancies, to centres with appropriate specialist services, the availability of genetic counselling, genetic education, and prenatal diagnosis services.
- Survival of babies admitted to neonatal intensive care units has improved. The 6-month survival rate, increased from 87.8% in 1992 to 92.5% in 2000 for infants registered in the NSW Neonatal Intensive Care Units Data Collection who did not have a congenital abnormality.

For more information:

Public Health Division. New South Wales Mothers and Babies 2000. *N S W Public Health Bull* 2001; (S-3). www.health.nsw.gov.au/public-health/mdc/mdcrep00.html.

Donoghue DA, Cust A. *Australian and New Zealand Neonatal Network 1999.* Sydney: NSW Pregnancy and Newborn Services Network, 1999.

Perinatal mortality and duration of pregnancy at first antenatal visit by accessibility/remoteness, NSW, 1996 to 2000



ARIA category	Perinatal mortality Number	Rate per 1000 births	LL 95% CI	UL 95% CI	Antenatal care before 20 weeks gestation Number	Per cent of confinements	LL 95% CI	UL 95% CI
Highly accessible	3253	9.2	8.8	9.5	302333	86.4	86.1	86.7
Accessible	551	9.7	8.9	10.5	50180	89.5	88.7	90.3
Moderately accessible	96	11.7	9.4	14.2	7022	86.5	84.5	88.5
Remote	26	9.9	6.4	14.4	2039	78.5	75.2	82.0
Very remote	13	20.7	11.0	35.5	420	67.2	60.9	73.9
NSW	3939	9.3	9.0	9.6	361994	86.7	86.4	87.0

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. LL/UL 95% = Lower and upper limits of the 95% confidence interval of the point estimate.

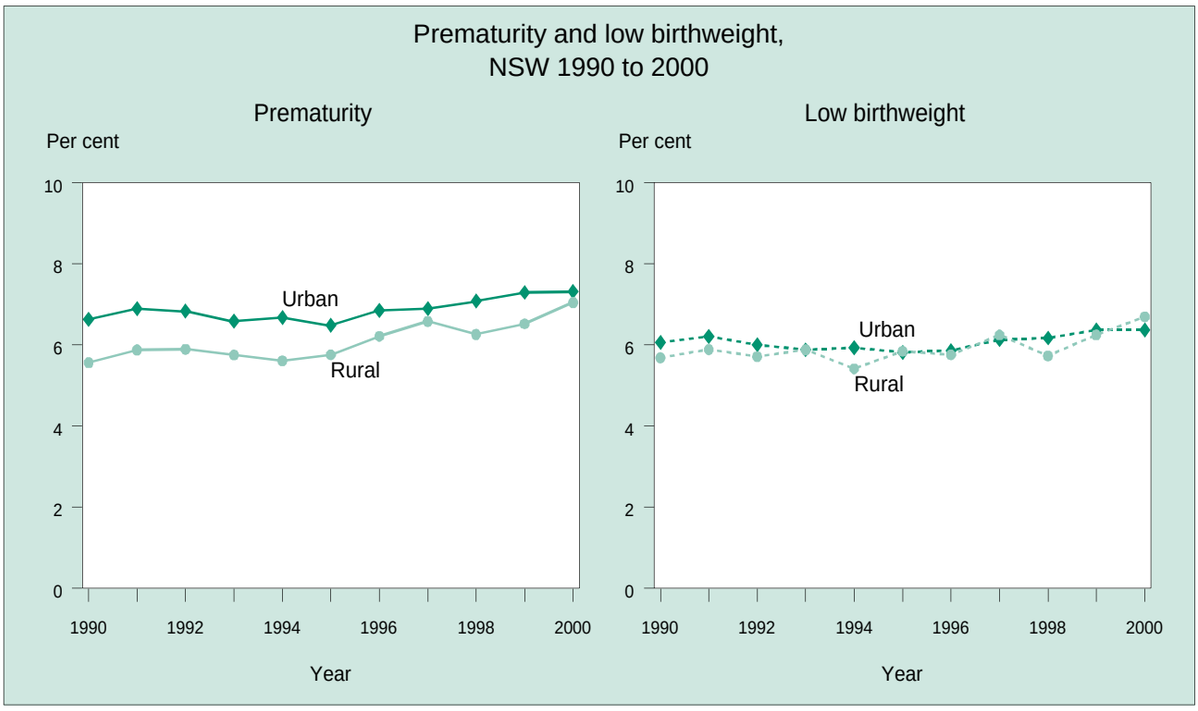
Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- The Accessibility–Remoteness Index for Australia (ARIA) is a measure that takes into account real road distances from places of residence to service centres. Information on the ARIA index can be found in the Methods section.
- In the 5-year period 1998–2000, the perinatal mortality rate was about twice as high for mothers resident in very remote areas compared to other areas. However, the largest number of perinatal deaths occurred in areas rated as being highly accessible to services, while the number of perinatal deaths among babies born to mothers living in very remote areas was very small.
- Over the same period, just over two-thirds of mothers living in very remote areas reported commencing antenatal care before 20 weeks gestation, compared to 78.5% of mothers living in remote areas and over 85% of mothers living in areas more accessible to service centres.

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.

Public Health Division. New South Wales Mothers and Babies 2000. *N S W Public Health Bull* 2001; (S-3). www.health.nsw.gov.au/public-health/mdc/mdcrep00.html.



			1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Premature	Number	Urban	4387	4582	4653	4451	4538	4377	4595	4751	4809	5045	5154
		Rural	1115	1156	1184	1122	1080	1097	1155	1216	1109	1125	1180
		NSW	5502	5738	5837	5573	5618	5474	5750	5967	5918	6170	6334
	Per cent	Urban	6.6	6.9	6.8	6.6	6.7	6.5	6.8	6.9	7.1	7.3	7.3
		Rural	5.6	5.9	5.9	5.7	5.6	5.8	6.2	6.6	6.3	6.5	7.0
		NSW	6.4	6.7	6.6	6.4	6.4	6.3	6.7	6.8	6.9	7.1	7.3
Low birthweight	Number	Urban	4009	4125	4084	3973	4030	3929	3931	4221	4186	4405	4489
		Rural	1139	1158	1148	1147	1042	1113	1070	1154	1015	1078	1121
		NSW	5148	5283	5232	5120	5072	5042	5001	5375	5201	5483	5610
	Per cent	Urban	6.1	6.2	6.0	5.9	5.9	5.8	5.9	6.1	6.2	6.4	6.4
		Rural	5.7	5.9	5.7	5.9	5.4	5.8	5.8	6.2	5.7	6.2	6.7
		NSW	6.0	6.1	5.9	5.9	5.8	5.8	5.8	6.1	6.1	6.3	6.4

Note: Low birthweight: less than 2500 grams. Premature birth: less than 37 weeks gestation. Rates of prematurity and low birthweight include stillbirths and live births of at least 20 weeks gestation or 400 grams birthweight.

Source: NSW Midwives Data Collection (HOIST). Epidemiology and Surveillance Branch. NSW Department of Health.

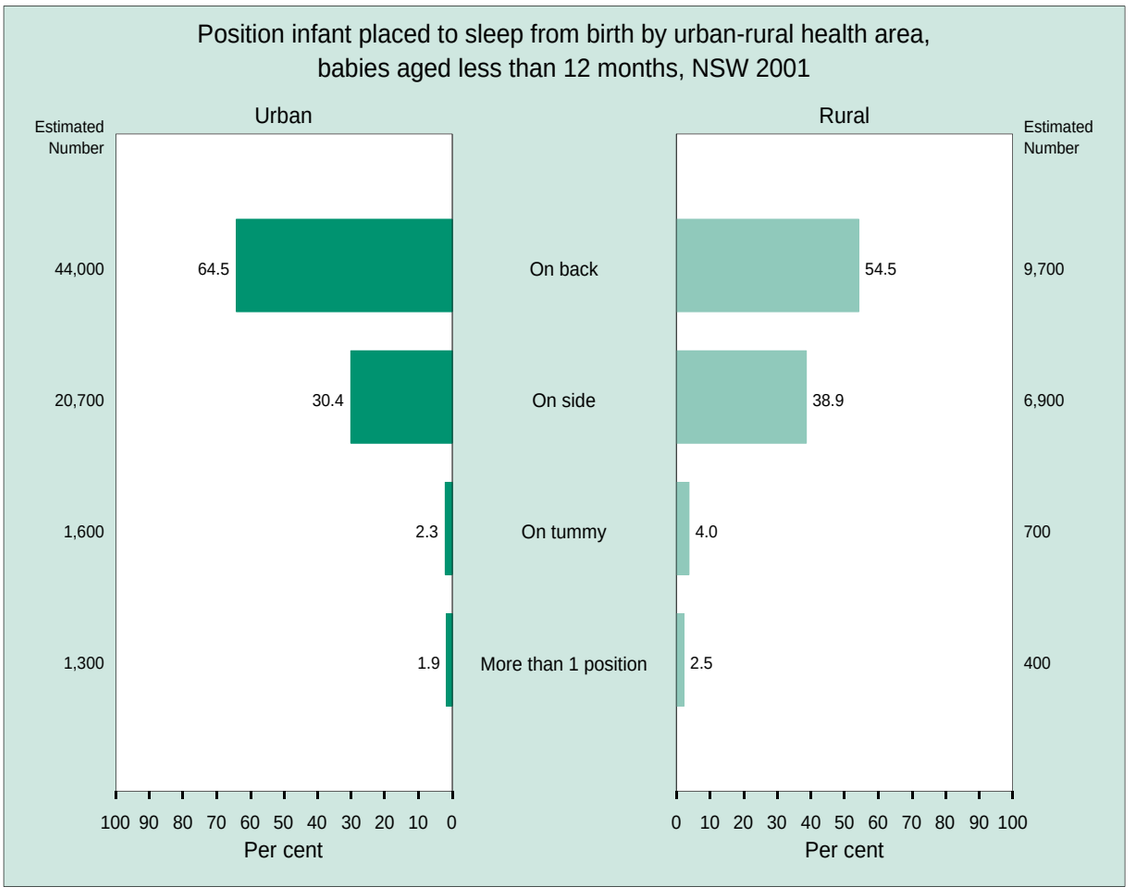
- A premature or preterm birth is a birth occurring before 37 weeks gestation. The risk of mortality and morbidity, including the risk of respiratory conditions, infection, or intra-cerebral haemorrhage, increases with increasing prematurity.
- Over the past 10 years, rates of prematurity have varied between 6.4% and 7.3%. Of all births in 2000, 623 (0.7%) were born at 20–27 weeks gestation, 663 (0.8%) at 28–31 weeks, and 5114 (5.8%) at 32–36 weeks.
- A birthweight of less than 2500 grams is a measure of the health of the mother and her antenatal care. Between 1990 and 2000, rates of low birthweight varied from 5.8 to 6.4% in NSW. Of all babies born in 2000, 653 (0.7%) weighed less than 1000 grams, 546 (0.6%) weighed 1000–1499 grams, and 4462 (5.1%) weighed 1500–2499 grams.
- Since 1990, 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, and the birth of these babies in interstate referral hospitals. For low birthweight babies the urban–rural difference persists but the difference is less than for preterm birth.

For more information:

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

Public Health Division. New South Wales Mothers and Babies 2000. *N S W Public Health Bull* 2001; (S-3). www.health.nsw.gov.au/public-health/mdc/mdcrep00.html.

National Health and Medical Research Council. *Clinical Practice Guidelines: Care around Preterm Birth*. Canberra: NHMRC, 1997.



Note: Health areas of Greater Sydney, Hunter, and Illawarra were classified as urban. Estimates based on 736 respondents. Two (0.3%) urban respondents reported sleeping position as 'other'. One (0.1%) not stated for infant sleeping position.

Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

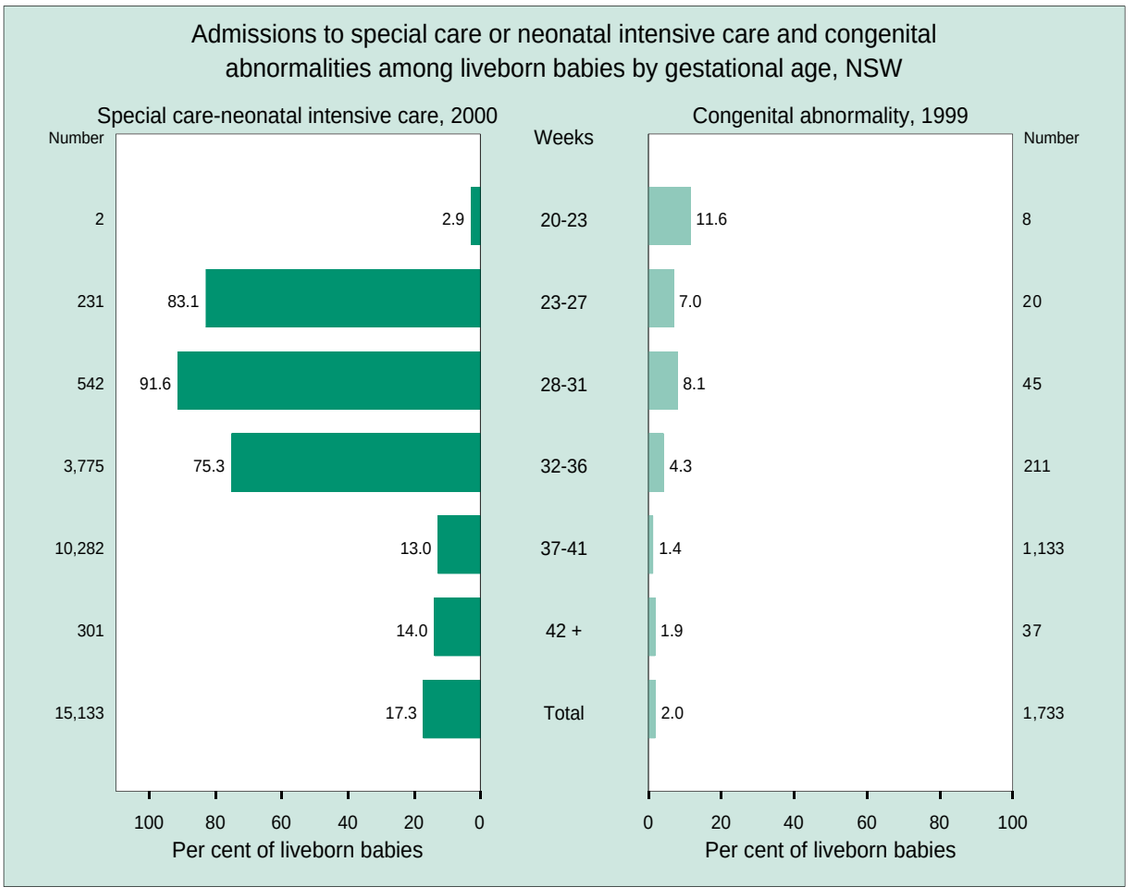
Source: NSW Child Health Survey 2001 (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Infants placed on the back (supine) to sleep are at the lowest risk of sudden infant death syndrome (SIDS). Infants placed on the stomach (prone) to sleep have a much higher risk of SIDS; and those placed on the side also have increased risk, probably because of their tendency to roll into the prone position (Scragg and Mitchell, 1998).
- SIDS deaths have declined by more than 75% in the last decade, mainly as a result of a reduction in the practice of placing infants in the prone position to sleep (Dwyer et al., 1995). However, SIDS remains the single most common cause of death in NSW infants outside the perinatal period.
- In the 2001 Child Health Survey, just under two-thirds (62.4%) of mothers of babies aged less than 12 months reported placing their baby on its back to sleep. The remaining mothers reported placing the infant in other sleeping positions: stomach (2.7%), side (32.1%) or other positions (0.3%). Mothers from rural areas (54.5%) were less likely than those from urban areas (64.5%) to report placing their baby on its back to sleep.

For more information:

Dwyer T, Ponsonby AL, Blizzard L, Newman NM, Cochrane JA. The contribution of changes in the prevalence of prone sleeping position to the decline of sudden infant death syndrome in Tasmania. *JAMA* 1995; 273: 783–789.

Scragg RKR, Mitchell EA. Side sleeping position and bed sharing in the sudden infant death syndrome. *Ann Med* 1998; 30: 345–349.



Note: Information on admissions to special care–neonatal intensive care is for 2000. One per cent of babies were admitted to both a special care nursery and neonatal intensive care. Information on congenital abnormalities is for 1999. Data table for this graph available at www.health.nsw.gov.au/public-health/chorep/choindex.htm.

Source: NSW Midwives Data Collection and NSW Birth Defects Register (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- In 2000, 15.8% of newborn infants were admitted to a neonatal special care nursery and 2.5% were admitted to neonatal intensive care. Thirty-one per cent 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.
- The Neonatal Intensive Care Units (NICUS) data collection provides information on infants admitted to a neonatal intensive care unit in NSW or ACT for 1 of the following reasons: gestational age less than 32 weeks; birthweight less than or equal to 1500 grams; mechanical ventilation or continuous positive airways pressure for 4 hours or more; or major surgery. In 2000, 87.3% of mothers of babies registered in NICUS were found to have an antenatal complication, most commonly threatened preterm labour (45.4%) followed by fetal distress (22.4%), hypertensive disease of pregnancy (18.9%) and antepartum haemorrhage (17.2%). Seventeen per cent of infants had a major congenital abnormality. Of infants without a congenital abnormality, 88.7% required assistance with ventilation.
- In 1999, 2.0% of liveborn babies were reported to have a congenital abnormality. Congenital abnormalities were most common among very premature infants. The most common abnormalities were 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 undescended testis).

For more information:

Public Health Division. New South Wales Mothers and Babies 2000. *N S W Public Health Bull* 2001; (S-3). www.health.nsw.gov.au/public-health/mdc/mdcrep00.html.

Donoghue DA, Cust A. *Australian and New Zealand Neonatal Network 1999.* Sydney: NSW Pregnancy and Newborn Services Network, 1999.

Chapter **4.9**

Communicable diseases

- Immunisation rates in NSW have increased:
  - —in 2001, 90% of children aged 12 months and 86% of children aged 24 months were fully immunised;
  - —71% of people aged 65 years and over reported that they had been immunised for influenza in 1999, compared with 56% in 1997.
- Notifications for some vaccine-preventable diseases declined in 2001:
  - —30 cases of measles were recorded, continuing the historically low rates recorded since 1998;
  - —58 cases of rubella were recorded, compared with 190 cases in 2000, most of which were among adolescent boys and young men;
  - —56 cases of hepatitis B were recorded among children aged 0–14 years, representing a more than four-fold decline in notification rates in this age group over the past 10 years.
- However, 4435 cases of pertussis (whooping cough) were recorded in 2001, continuing a major epidemic that began in 2000. Most cases were in older children and teenagers.
- Trends in sexually-transmissible infections have varied. In 2001:
  - —1341 cases of gonorrhoea were reported, representing a doubling of the notification rate since 1997;
  - —1554 cases of syphilis were notified, representing a halving of the notification rate since 1994.
- Improvements in antiviral therapy for infection have led to a substantial decline in progression to AIDS since the mid-1990s. However, notifications of HIV infection appear to have levelled out recently. In 2001:
  - —348 cases of HIV infection were reported, compared with 359 in 2000 and 536 in 1995;
  - —62 cases of AIDS were notified, compared with 115 in 2000 and 454 in 1995.
- Hepatitis C remains the most commonly reported communicable disease, with 8072 cases notified in 2001, although some of these represent past infections that were only recently identified.
- Notifications for salmonellosis have continued to rise, with 1637 cases reported in 2001.

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 Statitiscs 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 response by the public health unit, such as immunisation or treatment of contacts. Notifications also provide valuable information that is used for planning and evaluation of prevention programs. Summaries are published in the *NSW Public Health Bulletin* on a monthly and annual basis and may be obtained in both PDF and HTML versions from the Department of Health's Web site at www.health.nsw.gov.au/public-health/phb/phb.html.

The number of notifications received is almost always an underestimate of the number of cases that actually occurred. 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 Department or public health unit. 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. The reasons for this include:

- people will be counted more than once if they were admitted to hospital more than once for the same condition;
- a communicable disease may be appear on the hospital admission record, even though it occurred in the past or was not the primary reason for hospital admission;
- only a proportion of disease cases result in hospital admission, and the proportion varies by disease and over time;
- case definitions for conditions notified to public health units cannot be applied to hospital admissions;
- coding of hospital admission diagnoses can be subject to error.

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.

The most common conditions notified to public health units in NSW in 2001 were the blood-borne viruses hepatitis C (age-standardised rate 128 per 100,000) and hepatitis B (71 per 100,000); the sexually transmissible bacterial infections chlamydia (76 per 100,000), and gonorrhoea (22 per 100,000); the droplet spread bacterial disease pertussis (70 per 100,000); and the food-borne bacterial infection salmonellosis (27 per 100,000).

Events that occurred in NSW in 2001 relevant to the control of communicable diseases included:

- the inclusion of 6 new notifiable diseases (anthrax, influenza, lyssavirus infection, invasive pneumococcal disease, psittacosis, and shigellosis);
- the absence of measles transmission in September, November, and December 2001;
- evidence of the mosquito-borne Murray Valley encephalitis virus activity in western NSW (demonstrated by seroconversion of sentinel chickens to the virus, but with no human cases identified);
- an epidemic of mosquito-borne Barmah Forest virus infectious on the Mid North Coast;
- an epidemic of enterovirus 71 causing encephalitis and hand, foot and mouth disease;
- a cluster of 3 cases of serogroup B meningococcal disease among Wollongong college students;
- in the wake of the September 11 terrorist attacks in the United States, hundreds of deliberate hoaxes and accidental incidents that generated concern about the exposure to anthrax contained in white powders sent through the mail. Follow up of these cases found no evidence that anthrax was involved;
- the elapse of 20 years since the identification of AIDS.

For more information:

The *NSW Public Health Bulletin* includes monthly reports of notifiable communicable diseases and is 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.

Year in Review: Communicable Diseases Surveillance, 2000. *N S W Public Health Bull* 2001; 12: 247–254.

Notifications of communicable diseases, persons of all ages, NSW 1997–2001

	Number of notifications					Rate per 100,000				
Condition	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001
Adverse event after immunisation	70	94	13	42	103	1.2	1.6	0.2	0.7	1.7
Anthrax*	–	–	–	–	0	–	–	–	–	0.0
Arboviral infection—Ross River*	1,597	583	953	749	717	25.0	9.0	14.5	11.3	10.6
Arboviral infection—Barmah Forest*	186	134	249	195	398	2.9	2.0	3.7	2.9	5.8
Arboviral infection—other/not specified*	21	63	16	30	66	0.3	1.0	0.3	0.5	1.0
Botulism	–	0	1	0	0	–	0.0	0.0	0.0	0.0
Brucellosis*	3	3	2	1	0	0.0	0.0	0.0	0.0	0.0
Chancroid	–	–	1	0	0	–	–	0.0	0.0	0.0
Chickenpox	–	–	–	–	–	–	–	–	–	–
Chlamydia trachomatis—congenital	–	–	51	23	13	–	–	0.9	0.4	0.2
Chlamydia trachomatis—lymphogranuloma venereum	–	–	0	0	0	–	–	0.0	0.0	0.0
Chlamydia trachomatis—other sexually transmitted	–	–	2,387	3,442	4,438	–	–	40.7	58.1	75.5
Cholera*	1	1	2	0	1	0.0	0.0	0.0	0.0	0.0
Cryptosporidiosis*	–	1,130	121	133	192	–	18.8	2.0	2.2	3.2
Diphtheria*	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Foodborne illness in 2 or more related cases	255	201	151	129	49	4.1	3.2	2.3	2.0	0.7
Gastroenteritis in an institution	939	738	673	697	776	13.4	10.8	9.7	9.5	10.9
Giardiasis*	–	–	1,091	976	965	–	–	17.7	15.7	15.6
Gonorrhoea*	636	1,051	1,279	1,047	1,341	10.6	17.3	20.9	17.0	21.7
Granuloma inguinale (Donovanosis)	–	–	0	0	0	–	–	0.0	0.0	0.0
Haemolytic uraemic syndrome	–	6	11	9	2	–	0.1	0.2	0.1	0.0
Haemophilus influenzae type b*	17	11	13	8	9	0.3	0.2	0.2	0.1	0.1
Hepatitis A*	1,426	926	406	194	195	23.4	15.2	6.7	3.1	3.1
Hepatitis B*	3,207	2,960	3,469	3,949	4,548	51.8	47.2	55.0	62.1	70.6
Hepatitis C*	6,972	7,266	7,724	7,565	8,072	113.3	117.3	124.2	120.7	127.6
Hepatitis D*	11	3	13	10	12	0.2	0.0	0.2	0.2	0.2
Hepatitis E*	6	4	7	9	6	0.1	0.1	0.1	0.2	0.1
Hepatitis—viral, type not specified*	1	2	0	0	0	0.0	0.0	0.0	0.0	0.0
HIV—Human immunodeficiency virus infection*	423	410	384	359	348	6.7	6.5	6.0	5.4	5.1
HIV–Acquired Immune Deficiency Syndrome (AIDS)	203	170	107	115	–	3.1	2.6	1.6	1.7	0.9
Influenza*	–	–	–	–	244	–	–	–	–	3.8
Legionnaires' disease*	33	46	41	41	67	0.5	0.7	0.6	0.6	0.9
Leprosy	0	0	1	2	3	0.0	0.0	0.0	0.0	0.0
Leptospirosis*	33	50	55	53	65	0.5	0.8	0.9	0.8	1.0
Listeriosis*	23	28	22	18	12	0.4	0.4	0.3	0.3	0.2
Malaria*	173	157	173	228	153	2.8	2.5	2.8	3.8	2.4
Measles	273	119	32	32	30	4.6	2.0	0.5	0.5	0.5
Meningococcal disease	219	184	215	249	232	3.7	3.1	3.6	4.2	3.8
Mumps*	29	39	32	92	28	0.5	0.6	0.5	1.6	0.4
Pertussis (whooping cough)	4,250	2,311	1,415	3,681	4,435	69.5	37.2	22.1	58.3	70.1
Plague	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Pneumococcal infection (invasive)*	–	–	–	–	434	–	–	–	–	6.4
Poliomyelitis	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Psittacosis*	–	–	–	–	37	–	–	–	–	0.5
Q fever*	258	235	164	130	139	4.1	3.7	2.6	2.0	2.0
Rabies, lyssavirus*	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Rubella—congenital*	0	0	1	0	0	0.0	0.0	0.0	0.0	0.0
Rubella—other*	153	78	45	190	58	2.6	1.3	0.8	3.3	1.0
Salmonella infection (non-typhoid)*	1,698	1,811	1,424	1,386	1,637	27.9	29.7	23.2	22.6	26.5
Shigellosis*	–	–	–	–	132	–	–	–	–	2.1
Syphilis—congenital	4	1	3	2	3	0.1	0.0	0.1	0.0	0.1
Syphilis—other*	509	596	518	529	499	8.0	9.2	8.0	8.0	7.4
Tetanus	3	3	1	2	0	0.0	0.0	0.0	0.0	0.0
Tuberculosis*	422	383	480	436	425	6.6	6.0	7.4	6.6	6.4
Typhoid and paratyphoid*	33	27	36	39	42	0.5	0.5	0.6	0.6	0.7
Typhus (epidemic)	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Verotoxin-producing *Eschirichia coli* (*E. coli*)*	–	2	0	1	1	–	0.0	0.0	0.0	0.0
Viral haemorrhagic fevers	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. HIV–AIDS data were not available for 2001. 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. Chickenpox was not notifiable but was included for completeness. Rates were age-standardised using the Australian population as at 30 June 1991.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, 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.

Hospital admissions for notifiable communicable conditions, persons of all ages, NSW 1997 to 1999

Condition	Number of admissions			Rate per 100,000		
	1997	1998	1999	1997	1998	1999
Adverse event after immunisation	103	134	81	1.7	2.2	1.3
Arboviral infection—Ross River	–	–	57	–	–	0.9
Arboviral infection—Barmah Forest	–	–	–	–	–	–
Arboviral infection—other/not specified	140	114	29	2.1	1.8	0.5
Botulism	0	0	3	0.0	0.0	0.0
Brucellosis	10	12	7	0.2	0.2	0.1
Chancroid	3	2	0	0.0	0.0	0.0
Chickenpox	547	528	674	9.1	8.8	11.3
Chlamydia trachomatis—congenital pneumonia	–	–	1	–	–	0.0
Chlamydia trachomatis—lymphogranuloma venereum	3	4	3	0.0	0.1	0.0
Chlamydia trachomatis—other sexually transmitted	20	58	113	0.4	1.0	1.8
Cholera	2	3	4	0.0	0.0	0.1
Cryptosporidiosis	87	196	54	1.4	3.2	0.9
Giardiasis	232	221	184	3.8	3.6	2.9
Gonorrhoea	43	66	36	0.7	1.1	0.6
Haemolytic uraemic syndrome	118	125	102	2.0	2.1	1.6
Haemophilus influenzae meningitis	15	10	9	0.2	0.2	0.1
Hepatitis A	459	365	182	7.3	5.7	2.8
Hepatitis B	1,875	1,947	2,013	29.6	30.5	31.0
Hepatitis C	5,960	6,790	7,246	94.7	107.6	112.8
Hepatitis D	35	58	23	0.6	0.9	0.4
Hepatitis E	4	8	8	0.1	0.1	0.1
Hepatitis—viral, type not specified	126	436	743	2.0	7.2	12.2
HIV–Acquired Immune Deficiency Syndrome (AIDS)	5,281	2,501	1,849	83.1	38.7	28.4
Influenza	1,816	1,188	1,465	28.0	18.5	22.4
Legionnaires' disease	–	–	39	–	–	0.6
Leprosy	6	14	7	0.1	0.2	0.1
Leptospirosis	27	28	18	0.4	0.4	0.3
Listeriosis	31	25	30	0.5	0.4	0.4
Malaria	151	105	147	2.4	1.7	2.3
Measles	70	19	14	1.2	0.3	0.2
Meningococcal disease	329	265	296	5.5	4.4	4.9
Mumps	16	31	26	0.3	0.5	0.4
Pertussis (whooping cough)	468	281	116	7.8	4.7	1.9
Pneumococcal infection	2,806	2,176	1,660	42.1	32.5	25.0
Psittacosis	19	18	15	0.3	0.3	0.2
Q fever	82	65	56	1.3	1.0	0.9
Rubella—congenital	13	13	12	0.2	0.2	0.2
Rubella—other	33	19	6	0.6	0.3	0.1
Salmonella infection (non-typhoid)	362	354	327	5.9	5.7	5.2
Shigellosis	24	40	29	0.4	0.6	0.5
Syphilis—congenital	40	13	18	0.6	0.2	0.3
Syphilis—other	255	241	184	3.9	3.5	2.7
Tetanus	11	25	8	0.2	0.4	0.1
Tuberculosis	897	751	792	13.4	10.9	11.3
Typhoid and paratyphoid	21	26	25	0.3	0.4	0.4
Eschirichia coli (*E. coli*)—enterohaemorrhagic	1	2	0	0.0	0.0	0.0

Note: Date of admission rather than separation was used to best approximate date of onset. Data consists of hospital separations 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 1997–2001. Hospital separations were classified using ICD-9-CM up to June 1998 and ICD-10-AM from July 1998. Ross River virus, congenital chlamydial pneumonia, and legionnaires' disease, were not available in ICD-9-CM. Barmah Forest virus was not available in ICD-9-CM or ICD-10-CM. Chickenpox was not notifiable but was included for completeness. Rates were age-adjusted using the standard Australian population as at 30 June 1991.

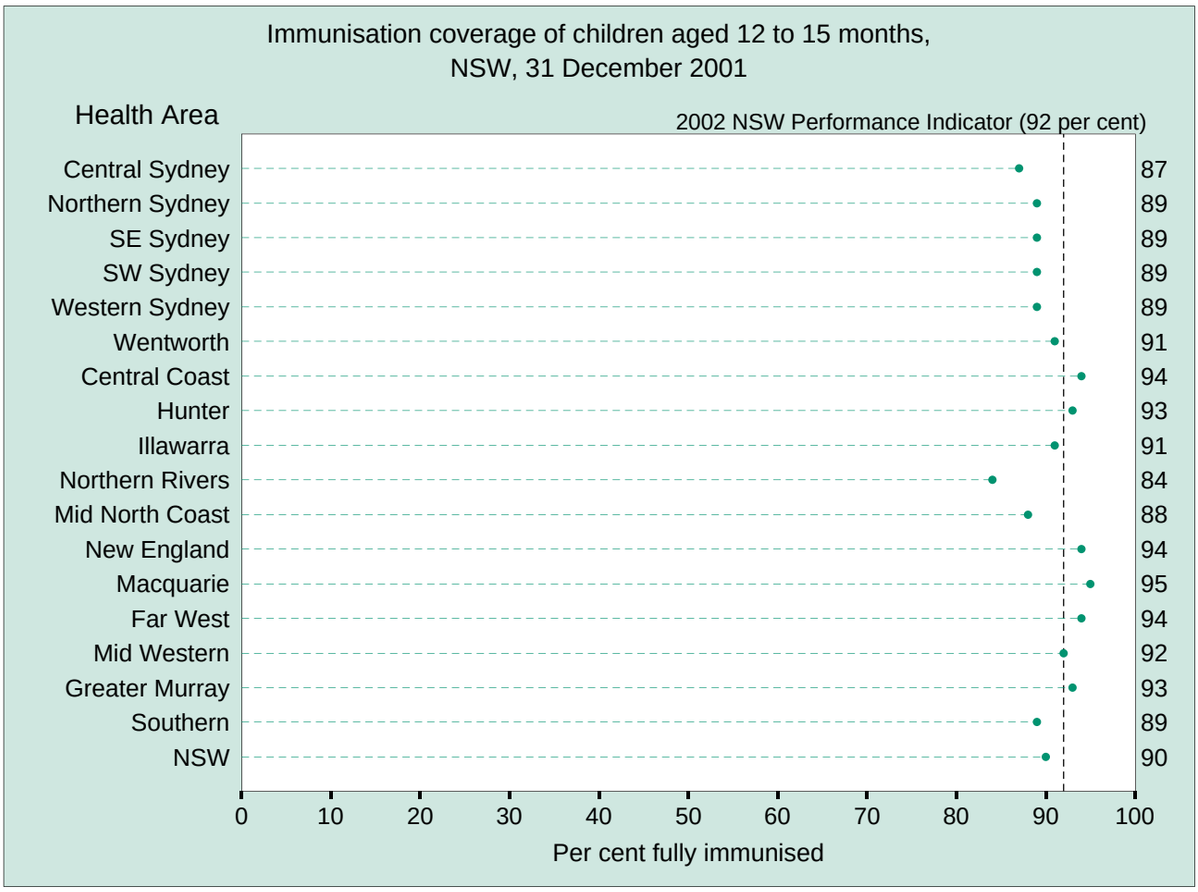
Source: NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

Deaths from notifiable communicable diseases, persons of all ages, NSW 1997 to 2000

	Number of deaths				Rate per 100,000			
Condition	1997	1998	1999	2000	1997	1998	1999	2000
Adverse event after immunisation	0	0	0	0	0.0	0.0	0.0	0.0
Arboviral infection—Ross River	–	–	0	0	–	–	0.0	0.0
Arboviral infection—Barmah Forest	–	–	–	–	–	–	–	–
Arboviral infection—other/not specified	0	0	0	0	0.0	0.0	0.0	0.0
Botulism	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
Chancroid	0	0	0	0	0.0	0.0	0.0	0.0
Chickenpox	8	2	4	1	1.3	0.3	0.6	0.1
Chlamydia trachomatis—congenital pneumonia	–	–	0	0	–	–	0.0	0.0
Chlamydia trachomatis—lymphogranuloma venereum	0	0	0	0	0.0	0.0	0.0	0.0
Chlamydia trachomatis—other sexually transmitted	–	–	0	0	–	–	0.0	0.0
Cholera	0	0	0	0	0.0	0.0	0.0	0.0
Cryptosporidiosis	–	–	0	0	–	–	0.0	0.0
Giardiasis	0	0	0	0	0.0	0.0	0.0	0.0
Gonorrhoea	0	0	0	0	0.0	0.0	0.0	0.0
Haemolytic uraemic syndrome	–	–	2	0	–	–	0.3	0.0
Haemophilus influenzae meningitis	0	0	0	0	0.0	0.0	0.0	0.0
Hepatitis A	1	2	1	0	0.1	0.3	0.1	0.0
Hepatitis B	11	24	6	2	1.7	3.7	0.8	0.3
Hepatitis C	–	–	12	3	–	–	1.7	0.4
Hepatitis D	–	–	0	0	–	–	0.0	0.0
Hepatitis E	–	–	0	0	–	–	0.0	0.0
Hepatitis—viral, type not specified	36	41	20	57	5.2	5.9	2.8	7.7
HIV–Acquired Immune Deficiency Syndrome (AIDS)	108	68	61	69	18.1	11.5	10.4	11.8
Influenza	102	43	39	31	13.2	5.3	4.7	3.7
Legionnaires' disease	–	–	2	2	–	–	0.3	0.3
Leprosy	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
Listeriosis	2	5	1	0	0.3	0.7	0.2	0.0
Malaria	0	0	2	0	0.0	0.0	0.2	0.0
Measles	0	0	0	0	0.0	0.0	0.0	0.0
Meningococcal disease	8	14	13	10	1.3	2.2	2.1	1.7
Mumps	0	0	0	1	0.0	0.0	0.0	0.1
Pertussis (whooping cough)	4	0	0	0	0.7	0.0	0.0	0.0
Pneumococcal infection	127	158	18	26	16.6	20.1	2.7	3.4
Psittacosis	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
Rubella—congenital	0	0	1	1	0.0	0.0	0.1	0.2
Rubella—other	0	0	0	0	0.0	0.0	0.0	0.0
Salmonella infection (non-typhoid)	0	1	1	0	0.0	0.1	0.2	0.0
Shigellosis	0	0	0	0	0.0	0.0	0.0	0.0
Syphilis—congenital	0	0	0	1	0.0	0.0	0.0	0.2
Syphilis—other	0	1	0	0	0.0	0.2	0.0	0.0
Tetanus	1	0	0	1	0.1	0.0	0.0	0.1
Tuberculosis	18	26	15	24	2.5	3.5	1.9	3.0
Typhoid and paratyphoid	0	0	0	0	0.0	0.0	0.0	0.0
Eschirichia coli (*E. coli*)—enterohaemorrhagic	–	–	0	0	–	–	0.0	0.0

Note: Chickenpox is not notifiable but is included for completeness. Rates were age-standardised using the Australian population as at 30 June 1991.

Source: ABS mortality data (except AIDS) and population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health. AIDS deaths were obtained from the HIV–AIDS enhanced surveillance system. Communicable Disease Surveillance and Control Unit, NSW Department of Health.



Health Area	% fully immunised	Health Area	% fully immunised	Health Area	% fully immunised
Central Sydney	87	Central Coast	94	Macquarie	95
Northern Sydney	89	Hunter	93	Far West	94
South Eastern Sydney	89	Illawarra	91	Mid Western	92
South Western Sydney	89	Northern Rivers	84	Greater Murray	93
Western Sydney	89	Mid North Coast	88	Southern	89
Wentworth	91	New England	94	NSW	90

Note: These figures may not reflect actual coverage due to under-reporting.

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 2001, 90% of children aged 12 to less than 15 months were fully immunised. For those aged 24 to 26 months at the end of 2001, 86% were fully immunised. This compares with national figures of 90% for children aged 12 to less than 15 months and 88% for those aged 24 to 26 months.

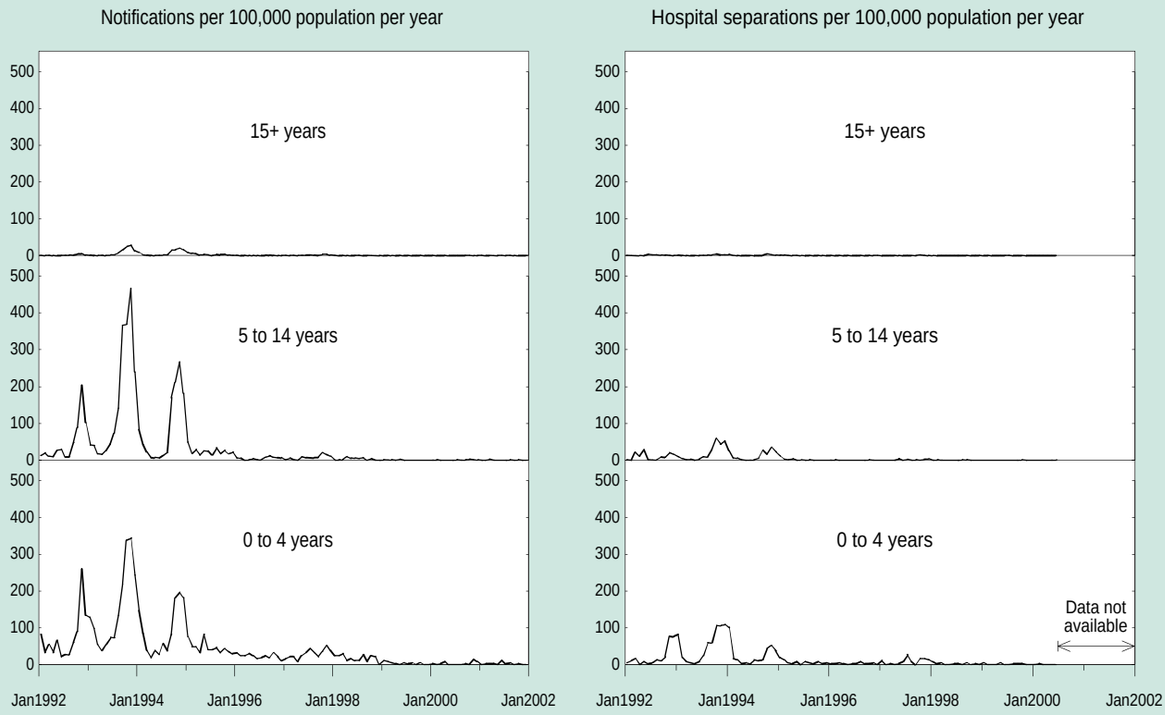
For more information:

National Health and Medical Research Council. *The Australian Immunisation Handbook, 7th edition.* Canberra: NHMRC, 2000.

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.

Measles: notifications and hospital separations by month and age, persons of all ages, NSW 1992 to 2001



Note: Date of admission to hospital was used to best approximate date of onset. Hospital admissions with measles as a principal or additional diagnosis were included. Separations were classified using ICD-9-CM up to June 1998 and ICD-10-AM from July 1998. Hospital data were only available up to June 2000 at the time of publication. Rates were age-adjusted using the standard Australian population as at 30 June 1991.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database, NSW Inpatient Statistics Collection, and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Measles is a communicable disease characterised by fever, rash, runny nose, sore eyes, and cough. Serious complications, including pneumonia, encephalitis, and death, can follow infection. The Australian Standard Vaccination Schedule currently recommends 2 doses of measles, mumps, and rubella (MMR) vaccine, at 1 and 4 years of age.
- Between 1989 and 1998, 6 deaths of NSW residents were attributed to measles and 8 deaths were attributed to subacute sclerosing panencephalitis, a serious long-term complication of measles.
- NSW experienced its last major epidemic of measles in 1993–94. The highest notification rates were in children aged under 15 years, and the highest hospital admission rates in children aged less than 5 years.
- In 1998, the National Health and Medical Research Council recommended that the age for the second dose of MMR vaccine be lowered from age 10–16 years to age 4 years. 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.
- Since 1998, the incidence of measles in NSW has been at historically low levels. September 1999 was the first month, since 1991, in which no cases of measles were reported, indicating that transmission was interrupted: a public health success story. It is likely that this was the first time that transmission was interrupted since colonial times. For all of 2001, there were only 30 cases notified.

For more information:

National Health and Medical Research Council. *The Australian Immunisation Handbook, 7th edition.* Canberra: NHMRC, 2000.

EpiReview: Measles in NSW 1991–2000. *N S W Public Health Bull,* 2001; 12: 200–204.

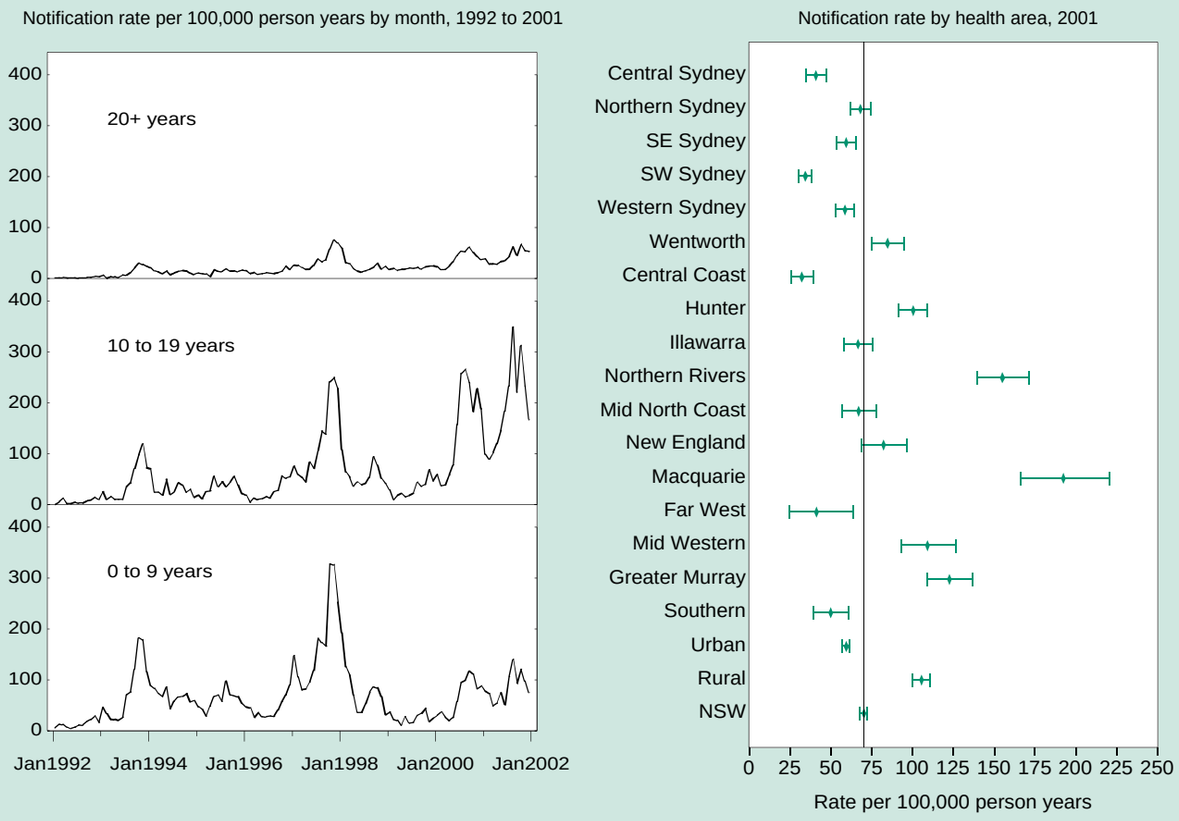
Measles notifications, NSW 1992 to 2001, and hospital admissions, NSW 1992 to 1999

			1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Notifications	Number	0 to 4 years	325	659	401	205	103	128	77	17	14	11
		5 to 14 years	404	1304	737	210	45	68	28	5	7	4
		15+ years	76	385	346	181	43	77	14	10	11	15
		All ages	805	2348	1484	596	191	273	119	32	32	30
	Crude rate	0 to 4 years	74.4	150.1	91.1	46.6	23.4	29.2	17.7	3.9	3.3	2.6
	per 100,000 population	5 to 14 years	47.7	153.4	86.1	24.3	5.2	7.8	3.2	0.6	0.8	0.4
		15+ years	1.6	8.2	7.3	3.8	0.9	1.6	0.3	0.2	0.2	0.3
		All ages	13.5	39.1	24.5	9.7	3.1	4.4	1.9	0.5	0.5	0.5
	Age-standardised rate per 100,000 population	All ages	13.7	40.3	25.5	10.2	3.2	4.6	2.0	0.5	0.5	0.5
Hospital admissions	Number	0 to 4 years	91	217	115	30	14	39	11	7	–	–
		5 to 14 years	84	160	104	16	2	11	3	1	–	–
		15+ years	55	72	64	27	14	20	5	6	–	–
		All ages	230	449	283	73	30	70	19	14	–	–
	Crude rate	0 to 4 years	20.8	49.4	26.1	6.8	3.2	8.9	2.5	1.6	–	–
	per 100,000 population	5 to 14 years	9.9	18.8	12.2	1.9	0.2	1.3	0.3	0.1	–	–
		15+ years	1.2	1.5	1.3	0.6	0.3	0.4	0.1	0.1	–	–
		All ages	3.9	7.5	4.7	1.2	0.5	1.1	0.3	0.2	–	–
	Age–standardised rate per 100,000 population	All ages	3.9	7.7	4.8	1.2	0.5	1.2	0.3	0.2	–	–

Note: Hospital separation data were only available to June 2000. Rates were age-adjusted using the standard Australian population as at 30 June 1991. Hospital separations with measles as a principal or additional diagnosis were included.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database, NSW Inpatient Statistics Collection, and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

Pertussis: notifications, persons of all ages, NSW



Note: Rates for health areas in the graph were age-standardised. Rates were age-adjusted using the Australian population as at 30 June 1991.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, 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, 6 and 18 months and 4 years of age, but protection wanes over time. A vaccine suitable for use in adults is currently being evaluated.
- Epidemics of pertussis tend to occur every 3 or 4 years. A large and sustained outbreak occurred across NSW in 2000 and 2001, during which 1 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 between 1992 and 2001 from 1 to 43 per 100,000.
- In 2001 in NSW, an age-standardised rate of 70 cases of pertussis were reported per 100,000 population, but the highest rates (>100 per 100,000) were seen in rural areas of the state. The area with the highest rate was Macquarie Health Area, with an age-standardised rate of 192/100,000.

For more information:

National Health and Medical Research Council. *The Australian Immunisation Handbook, 7th edition*. Canberra: NHMRC, 2000.

The *NSW Public Health Bulletin* includes monthly reports of notifiable communicable diseases available at www.health.nsw.gov.au/public-health/phb/phb.html.

Pertussis notifications by age, NSW, 1992 to 2001

Notifications			1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number	0 to 9 years	Males	53	325	305	251	183	724	356	105	279	354
	0 to 9 years	Females	60	335	290	270	198	781	349	114	295	376
	0 to 9 years	Persons	113	661	595	522	384	1507	707	219	574	730
	10 to 19 years	Males	25	175	136	145	90	510	244	118	662	794
	10 to 19 years	Females	25	190	133	146	124	564	262	150	657	879
	10 to 19 years	Persons	50	366	269	291	214	1077	509	268	1319	1673
	20+ years	Males	18	213	208	230	196	682	481	353	702	811
	20+ years	Females	36	293	331	326	362	977	613	575	1086	1218
	20+ years	Persons	54	506	541	557	558	1666	1095	928	1788	2032
	All	Males	96	713	649	626	469	1916	1081	576	1643	1959
	All	Females	121	818	754	742	684	2322	1224	839	2038	2473
	All	Persons	217	1533	1405	1370	1156	4250	2311	1415	3681	4435
Crude rate	0 to 9 years	Males	12.0	73.2	68.4	56.1	40.7	160.5	79.0	23.3	62.2	79.5
per 100,000 population	0 to 9 years	Females	14.2	79.3	68.4	63.4	46.3	182.1	81.4	26.6	69.2	89.0
	0 to 9 years	Persons	13.1	76.3	68.4	59.8	43.8	171.3	80.4	24.9	65.6	84.1
	10 to 19 years	Males	5.7	40.2	31.3	33.3	20.5	115.3	54.6	26.3	146.0	174.0
	10 to 19 years	Females	6.0	45.8	32.2	35.2	29.6	133.7	61.7	35.1	152.1	202.1
	10 to 19 years	Persons	5.8	43.0	31.7	34.2	25.0	124.6	58.4	30.6	149.0	187.7
	20+ years	Males	0.9	10.1	9.8	10.6	8.9	30.7	21.4	15.5	30.4	34.7
	20+ years	Females	1.7	13.4	15.0	14.5	15.9	42.3	26.3	24.3	45.4	50.2
	20+ years	Persons	1.3	11.8	12.5	12.6	12.5	36.8	23.9	20.0	38.0	42.7
	All	Males	3.2	23.9	21.5	20.6	15.2	61.5	34.4	18.1	51.1	60.5
	All	Females	4.0	27.1	24.7	24.1	21.9	73.5	38.4	26.1	62.7	75.3
	All	Persons	3.6	25.5	23.2	22.4	18.6	67.8	36.5	22.1	57.0	68.0
Age-standardised rate	All	Males	3.2	23.7	21.6	20.5	15.2	61.9	34.5	18.2	51.6	61.6
per 100,000 population	All	Females	4.2	28.0	25.5	24.9	22.5	76.8	39.8	26.1	65.1	78.8
	All	Persons	3.7	25.9	23.6	22.7	18.9	69.5	37.2	22.1	58.3	70.1

Note: Rates were age-adjusted using the Australian population as at 30 June 1991.

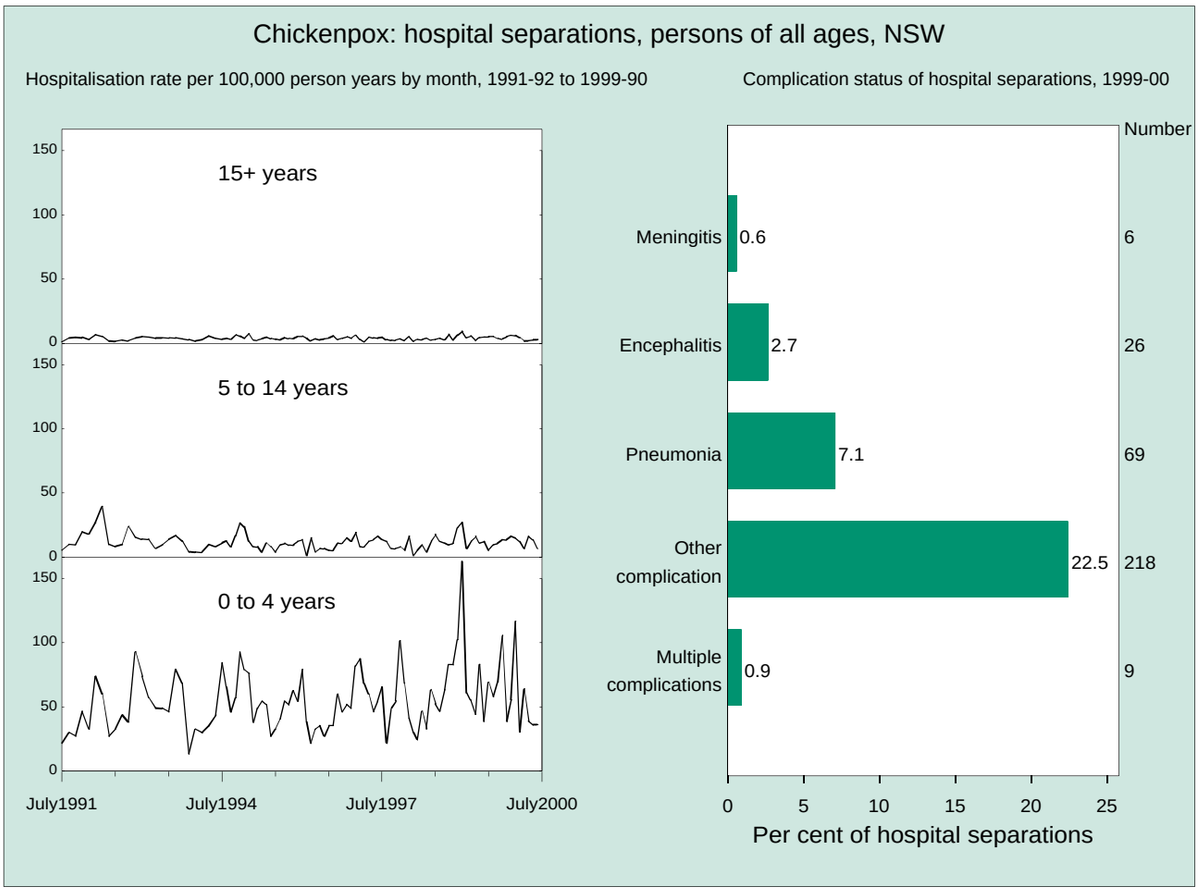
Source: Communicable Diseases Branch NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

Pertussis notifications by health area, persons of all ages, NSW, 2001

Health area	Number	Crude rate per 100,000 population	Age-standardised rate per 100,000 population	LL 95% CI	UL 95% CI
Central Sydney	181	36.5	40.7	34.9	47.3
Northern Sydney	486	62.3	68.1	62.0	74.5
SE Sydney	408	52.6	59.3	53.6	65.5
SW Sydney	282	35.3	34.3	30.4	38.6
Western Sydney	406	58.5	58.6	53.1	64.7
Wentworth	281	87.9	84.6	74.9	95.2
Central Coast	96	32.2	32.2	25.9	39.5
Hunter	530	97.8	100.4	91.9	109.3
Illawarra	228	65.1	66.6	58.1	75.9
Northern Rivers	402	150.8	155.1	140.0	171.4
Mid North Coast	173	65.4	66.9	57.0	78.1
New England	145	83.3	82.2	69.3	96.8
Macquarie	205	197.7	192.4	166.7	221.0
Far West	20	41.5	41.1	25.0	63.7
Mid Western	180	107.3	109.2	93.7	126.5
Greater Murray	320	123.9	122.5	109.4	136.8
Southern	92	49.6	49.8	39.9	61.4
Urban	2898	57.3	59.4	57.3	61.7
Rural	1537	104.7	105.6	100.3	111.1
NSW	4435	68.0	70.1	68.1	72.2

Note: Rates were age-adjusted using the Australian population as at 30 June 1991.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.



Note: 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 1991.

Source: NSW Inpatient Statistics Collection and ABS population data (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Chickenpox is a common communicable 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 1999–00, the age-standardised rate of admission was 9.7 per 100,000. The highest rate of admission was among young children (60 per 100,000 aged 0–4 years), reflecting the age group most at risk of infection.
- Between 1992 and 2000, 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 1999–00, 1% of chickenpox-related admissions had a single complication of meningitis recorded, 3% had encephalitis, and 7% had pneumonia. One per cent had multiple complications recorded.

For more information:

National Health and Medical Research Council. *The Australian Immunisation Handbook, 7th edition.* Canberra: NHMRC, 2000.

Chickenpox hospital admissions by age and sex, 1992–1999, persons of all ages, NSW

Hospital separations			1992–93	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
Number	0 to 4 years	Males	108	122	133	115	133	118	186	143
		Females	82	94	132	81	112	101	133	117
		Persons	190	216	265	196	245	219	319	260
	5 to 14 years	Males	79	48	59	46	51	38	68	57
		Females	59	39	49	31	51	37	56	47
		Persons	138	87	108	77	102	75	124	104
	15+ years	Males	85	99	91	84	91	82	110	107
		Females	77	90	112	97	113	71	127	109
		Persons	162	189	203	181	204	153	237	216
	All ages	Males	272	269	283	245	275	238	364	307
		Females	218	223	293	209	276	209	316	273
		Persons	490	492	576	454	551	447	680	580
Crude rate per 100,000 population	0 to 4 years	Males	48.0	54.0	58.8	51.0	59.1	52.7	83.7	64.6
		Females	38.5	44.0	61.6	37.8	52.4	47.4	63.0	55.6
		Persons	43.4	49.1	60.2	44.6	55.8	50.1	73.6	60.2
	5 to 14 years	Males	18.2	11.0	13.4	10.3	11.4	8.4	15.1	12.6
		Females	14.3	9.4	11.7	7.3	11.9	8.6	13.0	10.9
		Persons	16.3	10.2	12.6	8.9	11.7	8.5	14.1	11.8
	15+ years	Males	3.7	4.2	3.9	3.5	3.8	3.3	4.4	4.2
		Females	3.2	3.7	4.6	3.9	4.5	2.8	5.0	4.2
		Persons	3.4	4.0	4.2	3.7	4.1	3.1	4.7	4.2
	All ages	Males	9.1	9.0	9.3	8.0	8.9	7.6	11.5	9.6
		Females	7.2	7.4	9.6	6.7	8.8	6.6	9.9	8.4
		Persons	8.2	8.2	9.5	7.4	8.8	7.1	10.7	9.0
Age-standardised rate per 100,000 population		Males	9.0	9.0	9.3	8.1	9.0	7.9	11.9	10.1
		Females	7.6	7.7	10.0	7.1	9.4	7.1	10.8	9.3
		Persons	8.3	8.3	9.7	7.6	9.2	7.4	11.3	9.7

Note: 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.

Source: NSW Inpatient Statistics Collection and ABS population data (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

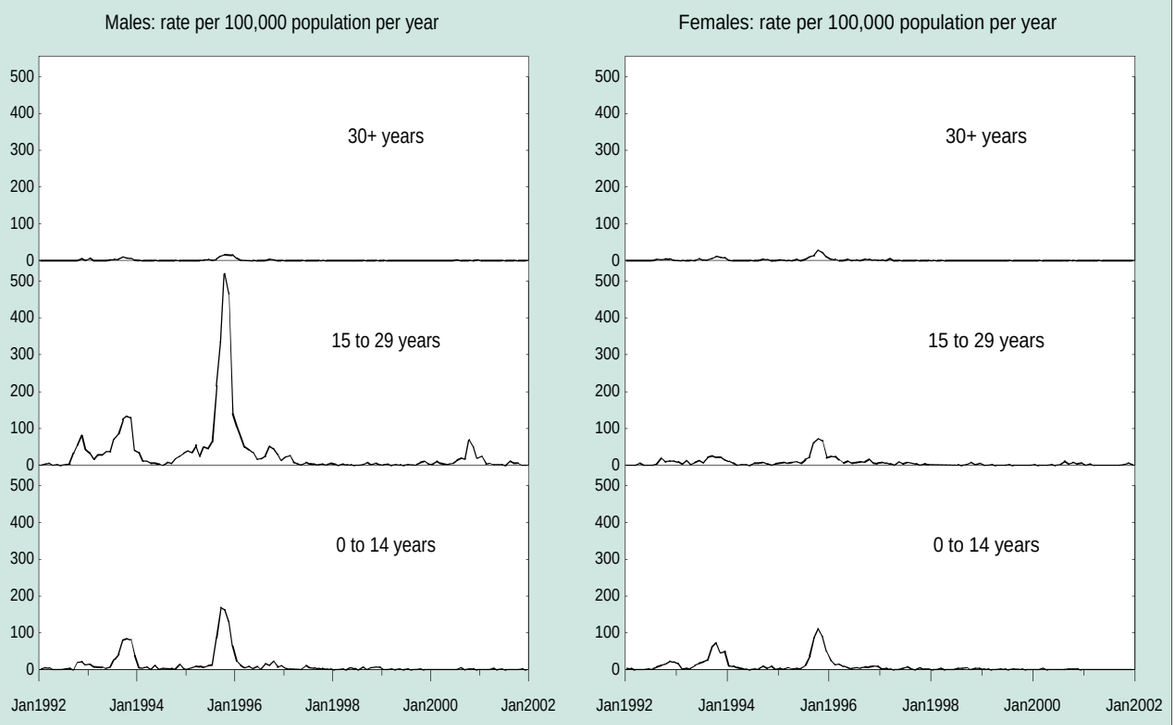
Chickenpox hospital admissions by complication status, persons of all ages, NSW 1999–00

Complication status	Number	%of separations
Meningitis	6	0.6
Encephalitis	26	2.7
Pneumonia	69	7.1
Other complication	218	22.5
Multiple complications	9	0.9
None specified	643	66.2
Total	971	100

Note: Hospital admissionss with chickenpox as a principal or additional diagnosis were included. Date of admission rather than separation was used to best approximate date of onset.

Source: NSW Inpatient Statistics Collection and ABS population data (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

Rubella: notifications by month, sex and age, persons of all ages, NSW 1992 to 2001



Note: Rates were age-adjusted using the Australian population as at 30 June 1991.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Rubella is a communicable disease caused by the rubella virus. Rubella is generally a mild illness, characterised by a fever and rash. It is of major public health concern because fetal infection (resulting from infection in non-immune pregnant women) can cause birth defects. The Australian Standard Vaccination Schedule currently recommends two doses of measles, mumps, and rubella (MMR) vaccine at 1 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. A smaller epidemic occurred in 2000, also mainly affecting adolescent boys and young men. The rate of laboratory-confirmed disease in 2001 was 1 per 100,000, down from 41 per 100,000 in 1995.
- From 1971, rubella vaccination was routinely offered to teenage girls in early high school in an attempt to minimise the risk of fetal infections. In 1989, to more completely control rubella transmission, MMR vaccination was recommended for all children at age 12 months, and MMR was introduced for high school girls. In 1994, the high school dose of MMR 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, offered MMR vaccination to those children who would otherwise have missed out on their second dose.

For more information:

National Health and Medical Research Council. *The Australian Immunisation Handbook*, *7th edition*. Canberra: NHMRC, 2000.

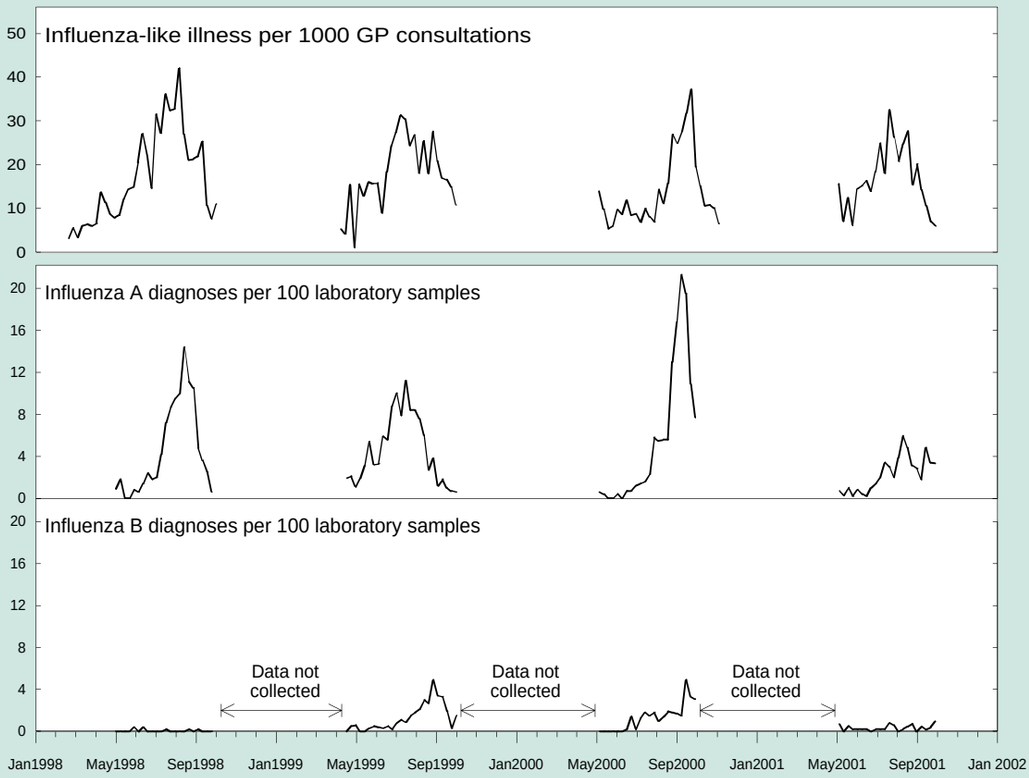
Rubella notifications by sex and age, persons of all ages, NSW 1992 to 2001

	Sex		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number	Males	0–14 years	40	220	32	373	74	24	21	4	5	4
	Males	15–29 years	131	436	89	1134	287	50	16	20	127	34
	Males	30+ years	5	33	3	59	16	3	2	1	5	2
	Males	All ages	208	811	150	1756	432	89	40	27	153	48
	Females	0–14 years	47	174	30	215	62	16	13	7	5	.
	Females	15–29 years	33	88	25	165	75	28	16	2	20	7
	Females	30+ years	14	43	8	85	26	10	2	1	3	1
	Females	All ages	114	371	81	559	201	64	38	19	37	10
	Persons	0–14 years	88	395	62	642	137	40	34	11	10	4
	Persons	15–29 years	164	525	115	1305	363	78	32	22	147	41
	Persons	30+ years	19	76	11	144	42	13	4	2	8	3
	Persons	All ages	324	1186	233	2376	636	153	78	46	190	58
Crude rate	Males	0–14 years	6.1	33.3	4.8	55.8	11.0	3.6	3.1	0.6	0.7	0.6
per 100,000	Males	15–29 years	18.7	63.1	13.0	165.6	41.8	7.2	2.3	2.9	18.0	4.9
population	Males	30+ years	0.5	3.5	0.3	6.0	1.6	0.3	0.2	0.1	0.5	0.2
	Males	All ages	7.0	27.2	5.0	57.7	14.0	2.9	1.3	0.8	4.8	1.5
	Females	0–14 years	7.5	27.7	4.8	33.8	9.7	2.5	2.0	1.1	0.8	.
	Females	15–29 years	4.9	13.1	3.7	24.7	11.2	4.1	2.4	0.3	2.9	1.0
	Females	30+ years	1.4	4.2	0.8	8.0	2.4	0.9	0.2	0.1	0.3	0.1
	Females	All ages	3.8	12.3	2.7	18.1	6.4	2.0	1.2	0.6	1.1	0.3
	Persons	0–14 years	6.9	30.6	4.8	49.2	10.4	3.0	2.6	0.8	0.8	0.3
	Persons	15–29 years	11.9	38.5	8.5	96.5	26.7	5.7	2.3	1.6	10.6	3.0
	Persons	30+ years	1.0	3.9	0.5	7.0	2.0	0.6	0.2	0.1	0.3	0.1
	Persons	All ages	5.4	19.8	3.8	38.8	10.3	2.4	1.2	0.7	2.9	0.9
Age-standardised	Males	All ages	7.1	27.7	5.2	60.5	14.8	3.0	1.3	0.9	5.2	1.6
rate per 100,000	Females	All ages	4.0	12.8	2.8	19.0	6.8	2.1	1.3	0.6	1.3	0.3
population	Persons	All ages	5.6	20.5	4.0	41.2	10.9	2.6	1.3	0.8	3.3	1.0

Note: Rates were age-adjusted using the Australian population as at 30 June 1991.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

Influenza consultations and laboratory diagnoses, by week, NSW 1998 to 2001



	1998	1999	2000	2001
Influenza-like illness per 1000 GP consultations	17.0	17.8	14.0	16.7
Influenza A diagnoses per 100 laboratory samples	4.5	4.5	5.5	2.3
Influenza B diagnoses per 100 laboratory samples	0.1	1.3	1.3	0.3

Note: Data were only collected during the influenza season May–September each year.

Source: NSW Sentinel GP Network and all major public health laboratories. Communicable Disease Surveillance and Control Unit, NSW Department of Health.

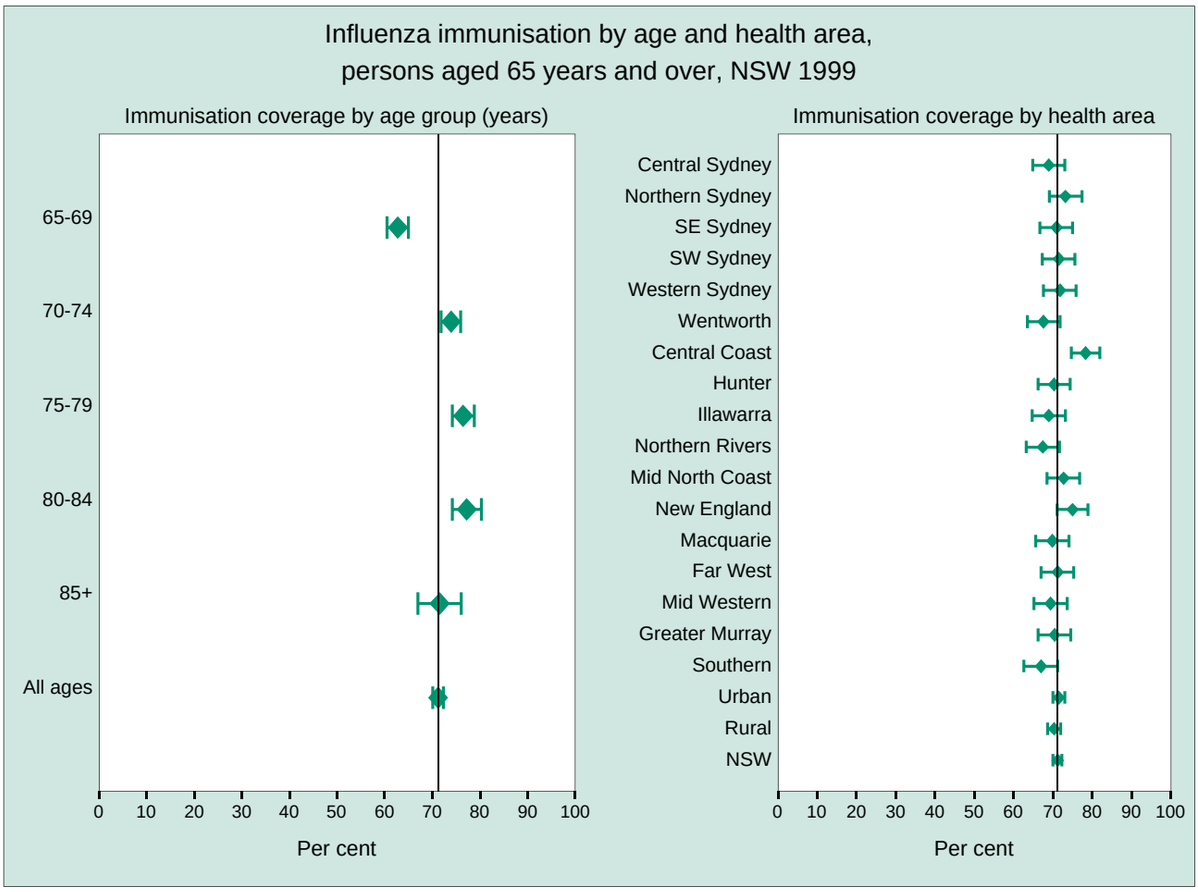
- The influenza virus causes illness characterised by abrupt onset of fever, myalgia, headache, sore throat, and acute cough, and can cause extreme malaise lasting several days. Secondary bacterial pneumonia and decompensation (physiological dysfunction that can lead to organ failure) can complicate 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 2001. Surveillance is enhanced during the winter months, when 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. Enhanced surveillance data since 1998 shows fairly stable overall rates of disease each winter in NSW, although diagnoses of the influenza A virus showed a brief but sharp increase during September 2000.
- The enhanced surveillance data show that the influenza A virus was more commonly diagnosed by laboratories (2.3 per 100,000 samples in 2001) than the influenza B virus (0.3 per 100,000 in 2001).

For more information:

National Health and Medical Research Council. *The Australian Immunisation Handbook*, *7th edition*. Canberra: NHMRC, 2000.

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.



Note: Based on self-reported influenza immunisation in the 12 months prior to being interviewed. Estimates based on 8881 respondents. 13 (0.1%) not stated for immunisation. LL/UL95%CI = Lower and upper limits of 95% confidence interval of the point estimate.

Source: NSW Older Person's Health Survey 1999 (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- The self-reported influenza immunisation rate for those aged 65 years and over in NSW increased from 56% at the 1997 NSW Health Survey to 71% at the 1999 NSW Older Person's Health Survey. In 1999, people aged 65–69 years had a significantly lower coverage (63%) than those in older age groups (71–77%). Immunisation coverage in area health services did not differ significantly from the state average, except for residents of the Central Coast Area, with 78% coverage. Men and women reported similar immunisation rates (70% and 72%, respectively).
- Influenza vaccination, for those at risk of serious complications, has been shown to be among the most cost–effective interventions in the older population. Under the National Influenza and Pneumococcal Vaccination Program, influenza vaccine is provided free to all people aged 65 years and over. For Aboriginal and Torres Strait Islander people, the vaccine is provided free to those aged 50 years and over, and those aged 15–49 years who may be at increased risk because of chronic illness.

For more information:

National Health and Medical Research Council. *The Australian Immunisation Handbook*, *7th edition*. Canberra: NHMRC, 2000.

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/pubhlth/cdi/ozflu/ozflu.htm.

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.

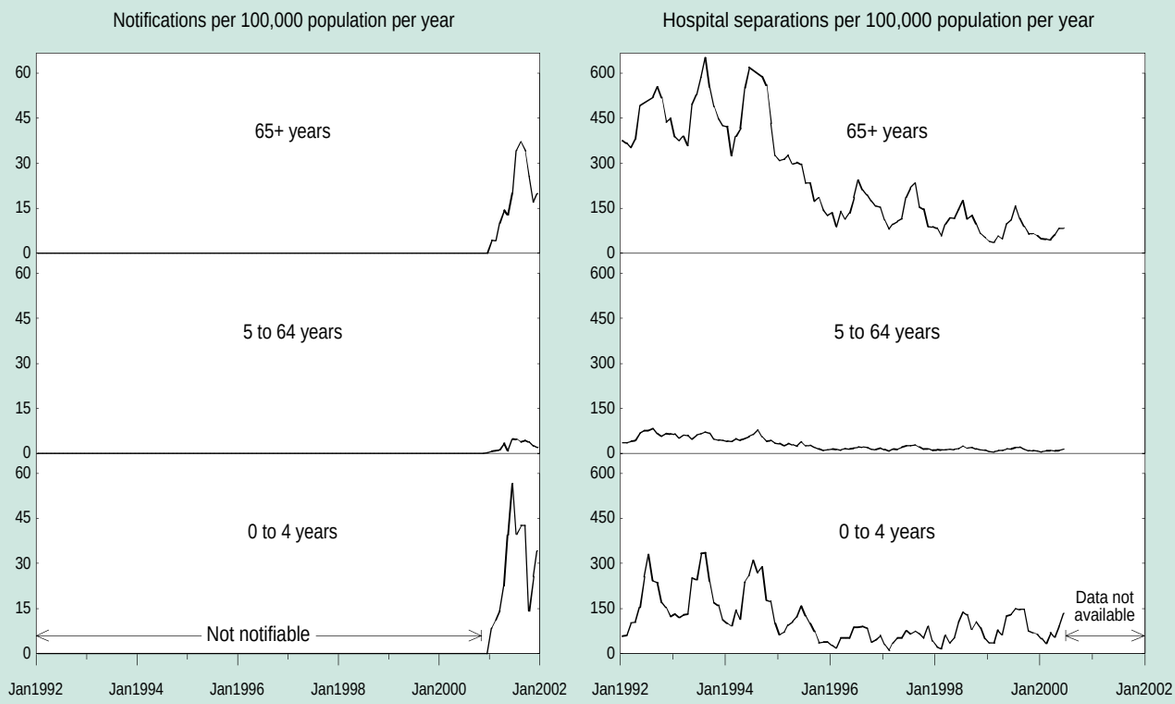
Influenza immunisation coverage, persons aged 65 years and over, NSW 1999

Age group (years)	Health Area		Per cent	LL 95% CI	UL 95% CI
65–69		Persons	62.7	60.5	65.0
70–74		Persons	73.9	71.8	76.0
75–79		Persons	76.4	74.1	78.8
80–84		Persons	77.2	74.2	80.2
85+		Persons	71.5	67.0	76.1
All ages		Persons	71.2	70.0	72.3
All ages	Central Sydney	Persons	68.9	64.9	72.9
All ages	Northern Sydney	Persons	73.2	69.0	77.3
All ages	SE Sydney	Persons	70.8	66.6	75.0
All ages	SW Sydney	Persons	71.4	67.3	75.6
All ages	Western Sydney	Persons	71.8	67.6	75.9
All ages	Wentworth	Persons	67.6	63.4	71.8
All ages	Central Coast	Persons	78.3	74.6	81.9
All ages	Hunter	Persons	70.3	66.2	74.3
All ages	Illawarra	Persons	68.9	64.7	73.1
All ages	Northern Rivers	Persons	67.4	63.2	71.6
All ages	Mid North Coast	Persons	72.7	68.5	76.8
All ages	New England	Persons	74.9	71.0	78.9
All ages	Macquarie	Persons	69.9	65.6	74.1
All ages	Far West	Persons	71.1	67.0	75.3
All ages	Mid Western	Persons	69.4	65.2	73.6
All ages	Greater Murray	Persons	70.4	66.2	74.5
All ages	Southern	Persons	66.9	62.6	71.3
All ages	Urban	Persons	71.5	70.0	72.9
All ages	Rural	Persons	70.3	68.6	71.9
All ages	NSW	Persons	71.2	70.0	72.3
All ages		Men	70.3	68.6	72.1
All ages		Women	71.8	70.3	73.3
All ages		Persons	71.2	70.0	72.3

Note: Based on self-reported immunisation in the 12 months prior to being interviewed. LL/UL95%CI = Lower and upper limits of 95% confidence interval of the point estimate.

Source: NSW Older Person's Health Survey 1999 (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

Pneumococcal disease: notifications and hospital separations by month and age, persons of all ages, NSW 1992 to 2001



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 admissions were classified using ICD-9-CM up to June 1998 and ICD-10-AM from July 1998. Hospital data were only available up to June 2000. Rates were age-adjusted using the Australian population as at 30 June 1991.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database, NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, 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. In 2001, the age-standardised notification rate was 6 per 100,000. Rates were highest among small children and the elderly.
- The hospitalisation data shown here are not restricted to invasive infections. Changes in coding procedures may explain the apparent decline in admissions after 1995. These data demonstrate a clear seasonal pattern with winter peaks. The age pattern of admissions was similar to notifications for invasive infection, with the highest admission rates occurring in young children and in the elderly.
- Immunisation against pneumococcal disease every 5 years is recommended for all people aged over 65 years, Aboriginal and Torres Straight Islander people aged over 50 years, and people with compromised immune systems, chronic illness, or who have had their spleen removed. A new vaccine for use in children became available in 2001; it is recommended for all Aboriginal and Torres Strait Islander children up to 2 years old, and children under 5 years old who have certain medical conditions.

For more information:

National Health and Medical Research Council. *The Australian Immunisation Handbook*, *7th edition.* Canberra: NHMRC, 2000.

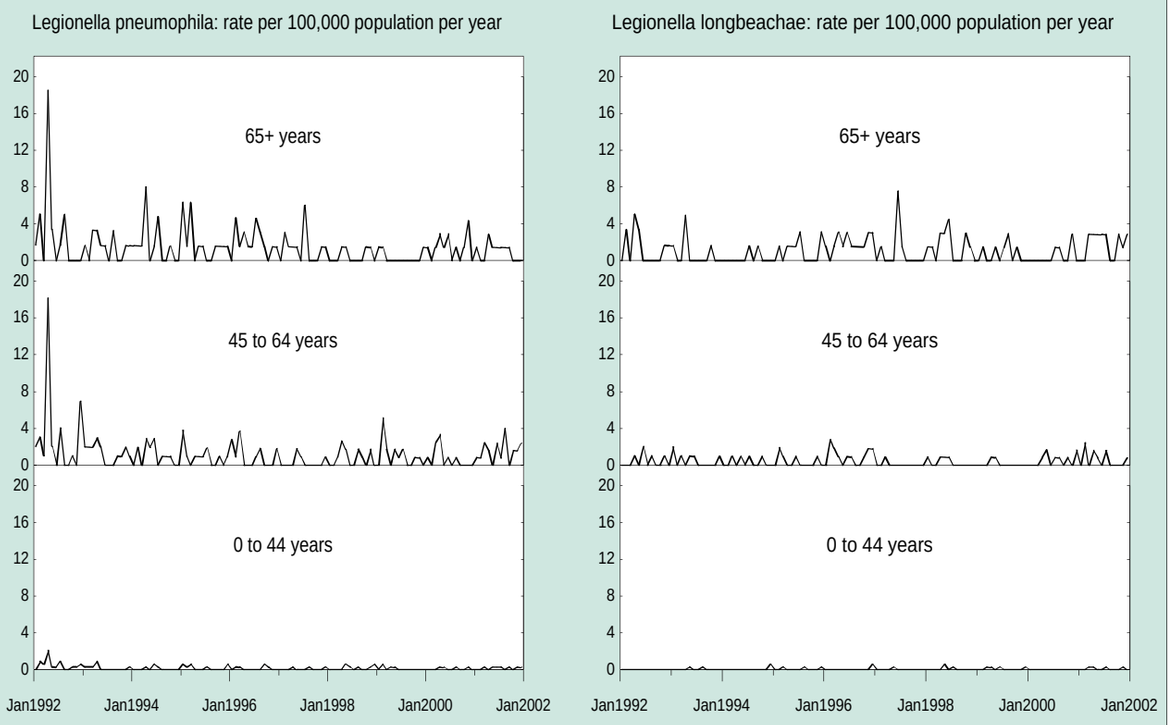
Invasive pneumococcal disease notifications, NSW 1992 to 2001, and hospital admissions, NSW 1992 to 1999

			1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Notifications	Number	0 to 4 years	–	–	–	–	–	–	–	–	–	124
		5 to 64 years	–	–	–	–	–	–	–	–	–	146
		65+ years	–	–	–	–	–	–	–	–	–	164
		All ages	–	–	–	–	–	–	–	–	–	434
	Crude rate	0 to 4 years	–	–	–	–	–	–	–	–	–	29.3
	per 100,000 population	5 to 64 years	–	–	–	–	–	–	–	–	–	2.8
		65+ years	–	–	–	–	–	–	–	–	–	19.5
		All ages	–	–	–	–	–	–	–	–	–	6.7
	Age–standardised rate per 100,000 population	All ages	–	–	–	–	–	–	–	–	–	6.4
Hospital separations	Number	0 to 4 years	755	901	873	408	426	416	395	404	–	–
		5 to 64 years	2854	2780	2437	1237	951	1087	857	613	–	–
		65+ years	3491	3490	4012	1896	1414	1303	924	643	–	–
		All ages	7100	7171	7322	3541	2791	2806	2176	1660	–	–
	Crude rate	0 to 4 years	172.9	205.3	198.3	92.7	97.0	94.9	90.8	93.4	–	–
	per 100,000 population	5 to 64 years	59.3	57.5	50.0	25.1	19.1	21.6	16.8	11.9	–	–
		65+ years	487.1	475.3	534.4	247.7	180.8	163.7	114.5	78.6	–	–
		All ages	119.1	119.4	120.8	57.8	45.0	44.7	34.4	26.0	–	–
	Age–standardised rate per 100,000 population	All ages	115.5	114.7	114.0	54.4	42.2	42.1	32.5	25.0	–	–

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 admissions were classified using ICD-9-CM up to June 1998 and ICD-10-AM from July 1998. Hospital data were only available up to June 2000. Rates were age-adjusted using the Australian population as at 30 June 1991.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database, NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

Legionnaires' disease: notifications by species, month and age, persons of all ages, NSW 1992 to 2001



Note: Standardised rates were age-adjusted using the standard Australian population as at 30 June 1991.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database, NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, 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 gender, smoking, and underlying medical conditions.
- In 2001, the age-standardised notification rate for all legionnaires' disease in NSW was 1 per 100,000. For *L. pneumophila*, the age-standardised rate was 0.5 per 100,000 and for *L. longbeachae*, 0.4 per 100,000. Between 1987 and 2001, 7 outbreaks were identified in NSW, most linked to cooling towers, 6 in the western part of Sydney, and 1 in Wollongong.
- In NSW, the highest rates are seen in urban areas, probably because of the association with cooling towers in modern buildings. The disease is more common in males (70% of cases were male, in the 5 years to May 2002), and among people over 45 years (87% 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/phb/phb.html

EpiReview: Legionnaires' disease NSW 1991–2000. *N S W Public Health Bull* 2001; 12(10): 282–285.

NSW Government. *Public Health Act 1991—Regulation (Public Health Regulation) 1991, NSW: Part 6—Microbial Control 2000* available at www.health.gov.au/pubhlth/cdi/cdihtml.htm.

***Legionella pneumophila* and *longbeachae* notifications by age, persons of all ages, NSW 1992–2001**

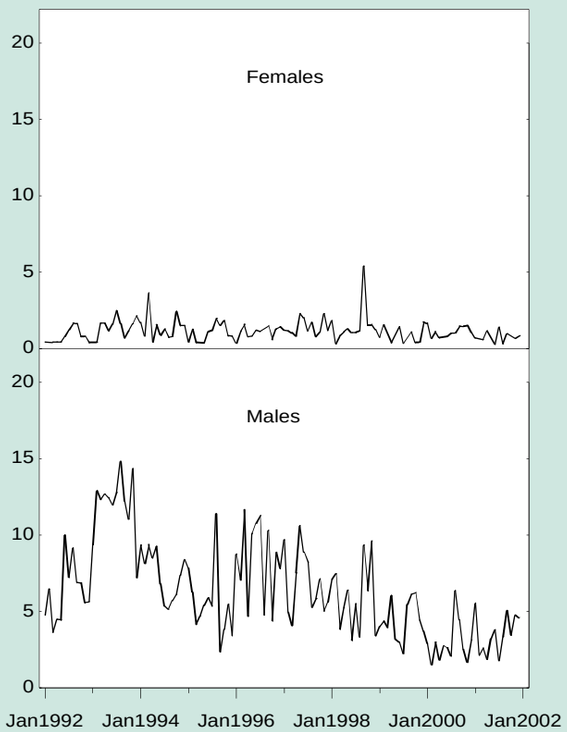
Species			1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
L. pneumophila	Number	0 to 44 years	21	7	4	8	5	3	7	4	4	7
		45 to 64 years	38	16	13	12	13	4	11	15	10	23
		65+ years	21	11	13	15	16	11	4	3	12	8
		All ages	80	34	30	35	34	18	22	22	26	38
	Crude rate	0 to 44 years	0.5	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.2
	per 100,000 population	45 to 64 years	3.2	1.3	1.0	0.9	1.0	0.3	0.8	1.1	0.7	1.5
		65+ years	2.9	1.5	1.7	2.0	2.0	1.4	0.5	0.4	1.4	1.0
		All ages	1.3	0.6	0.5	0.6	0.5	0.3	0.3	0.3	0.4	0.6
	Age-standardised rate per 100,000 population	All ages	1.3	0.5	0.5	0.5	0.5	0.3	0.3	0.3	0.4	0.5
L. longbeachae	Number	0 to 44 years	0	2	2	3	2	1	3	4	0	4
		45 to 64 years	5	6	4	5	13	1	4	2	8	9
		65+ years	9	5	2	8	15	7	12	6	4	15
		All ages	14	13	8	16	30	9	19	12	12	28
	Crude rate	0 to 44 years	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.1
	per 100,000 population	45 to 64 years	0.4	0.5	0.3	0.4	1.0	0.1	0.3	0.1	0.5	0.6
		65+ years	1.3	0.7	0.3	1.0	1.9	0.9	1.5	0.7	0.5	1.8
		All ages	0.2	0.2	0.1	0.3	0.5	0.1	0.3	0.2	0.2	0.4
	Age-standardised rate per 100,000 population	All ages	0.2	0.2	0.1	0.2	0.5	0.1	0.3	0.2	0.2	0.4

Note: Rates were age-adjusted using the standard Australian population as at 30 June 1991.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database, NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

Q fever: notifications, persons of all ages, NSW

Notification rate per 100,000 person years by month, 1992 to 2001



Notification rate by health area, 1997 to 2001

Note: Age-standardised rates were age-adjusted using the Australian population as at 30 June 1991.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, 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 cases.
- Laboratories are required by law to notify cases of Q fever to the NSW Department of Health. In 2001, the overall age-standardised notification rate was 2 per 100,000. The age-standardised rate in males was more than 3 per 100,000 compared with less than 1 per 100,000 in females. Overall, rates were higher in rural areas of NSW. For 1997 to 2001 combined, the highest rates were reported from the Macquarie Area (age-standardised rate 39 per 100,000 per year), the Far West (22 per 100,000), New England (15 per 100,000), Northern Rivers, and the Mid North Coast (both 12 per 100,000).
- 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 NSW in the 1990s. However, the rate of notifications has declined in recent years, perhaps due to promotion of vaccination, especially among abattoir workers and others who are exposed to infected animals.

For more information:

Mandell, Bennet and Dolin. *Principles and practice of infectious diseases.* New York: Churchill Livingstone, 1995.

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.

Q fever notifications by sex, persons of all ages, NSW 1992–2001

Notifications		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number	Males	185	354	222	170	256	214	186	140	96	119
	Females	22	40	43	30	31	44	48	22	34	20
	Persons	213	404	267	202	287	258	235	164	130	139
Crude rate	Males	6.2	11.9	7.4	5.6	8.3	6.9	5.9	4.4	3.0	3.7
per 100,000 population	Females	0.7	1.3	1.4	1.0	1.0	1.4	1.5	0.7	1.0	0.6
	Persons	3.6	6.7	4.4	3.3	4.6	4.1	3.7	2.6	2.0	2.1
Age-standardised rate	Males	6.3	12.0	7.5	5.5	8.4	6.9	5.9	4.4	2.9	3.5
per 100,000 population	Females	0.7	1.3	1.4	1.0	1.0	1.4	1.5	0.7	1.0	0.6
	Persons	3.6	6.9	4.5	3.3	4.7	4.1	3.7	2.6	2.0	2.0

Note: Rates were age-adjusted using the Australian population as at 30 June 1991.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

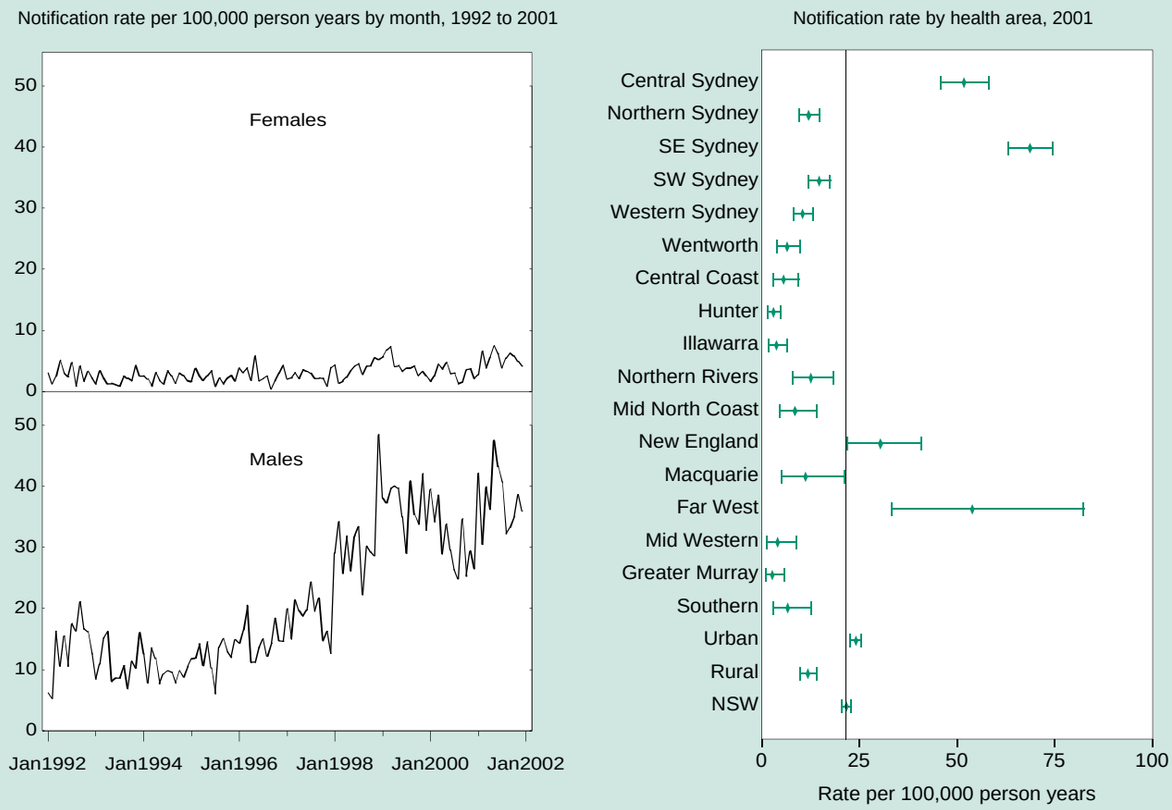
Q fever notifications by health area, persons of all ages, NSW 1997–2001 combined

Health Area	Number	Crude rate per 100,000 population	Age-standardised rate per100,000 population	LL 95% CI	UL 95% CI
Central Sydney	4	0.2	0.1	0.0	0.4
Northern Sydney	5	0.1	0.1	0.0	0.3
SE Sydney	9	0.2	0.2	0.1	0.4
SW Sydney	8	0.2	0.2	0.1	0.4
Western Sydney	5	0.1	0.1	0.0	0.3
Wentworth	5	0.3	0.3	0.1	0.8
Central Coast	11	0.8	0.8	0.4	1.5
Hunter	47	1.8	1.7	1.3	2.3
Illawarra	12	0.7	0.7	0.4	1.2
Northern Rivers	159	12.3	12.3	10.4	14.5
Mid North Coast	149	11.6	12.0	10.0	14.2
New England	120	13.7	14.8	12.3	17.8
Macquarie	187	36.3	39.0	33.5	45.1
Far West	48	19.8	22.1	16.2	29.4
Mid Western	64	7.7	8.3	6.3	10.6
Greater Murray	42	3.3	3.6	2.6	4.9
Southern	49	5.4	5.8	4.2	7.7
Urban	106	0.4	0.4	0.3	0.5
Rural	818	11.3	12.1	11.2	13.0
NSW	926	2.9	2.9	2.7	3.1

Note: Rates were age-adjusted using the Australian population as at 30 June 1991.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

Gonorrhoea: notifications, persons of all ages, NSW



Note: Rates were age-adjusted using the Australian population as at 30 June 1991.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Gonorrhoea is a sexually-transmissible infection caused by the *Neisseria gonorrhoea* bacteria. 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.
- In NSW, laboratories are required by law to notify cases of gonorrhoea to public health units.
- Case reports of gonorrhoea declined sharply in the 1980s, perhaps because of safe-sex campaigns. In the 1990s, rates of disease stabilised and then began to increase. The age-standardised rate of notifications doubled between 1997 and 2001, from 19 to 38 per 100,000 in males, and from 2.5 to 5 per 100,000 in females. Of the 1341 cases notified in NSW in 2001, 88% were male.
- Notification rates were highest in South Eastern Sydney Area (age-standardised rate 69 per 100,000), Far West (54 per 100,000), Central Sydney (52 per 100,000), and New England (30 per 100,000).
- Available data indicate that a major risk factor for gonorrhoea in Sydney is male-to-male sex. Surveys have shown that the reported rate of unprotected anal intercourse among men who have sex with men is also increasing, and may be a harbinger of increases in other sexually-transmissible infections, including the human immunodeficiency virus (HIV).
- 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.

EpiReview: Notifiable sexually transmitted diseases, NSW 1991–1999. *N S W Public Health Bull* 2001; 12(1): 16–18.

Gonorrhoea notifications by sex, persons of all ages, NSW 1992 to 2001

Notifications		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number	Males	405	322	294	365	442	564	945	1139	961	1182
	Females	81	55	61	62	80	71	105	124	86	153
	Persons	491	382	357	428	522	636	1051	1279	1047	1341
Crude rate	Males	13.7	10.8	9.8	12.0	14.3	18.1	30.0	35.8	29.9	36.5
per 100,000 population	Females	2.7	1.8	2.0	2.0	2.6	2.2	3.3	3.9	2.6	4.7
	Persons	8.2	6.4	5.9	7.0	8.4	10.1	16.6	20.0	16.2	20.6
Age-standardised rate	Males	13.7	10.9	9.9	12.3	14.7	18.6	30.9	37.0	30.9	38.0
per 100,000 population	Females	2.8	1.9	2.2	2.2	2.8	2.5	3.6	4.3	2.9	5.2
	Persons	8.4	6.6	6.1	7.3	8.8	10.6	17.3	20.9	17.0	21.7

Note: Age-standardised rates were age-adjusted using the Australian population as at 30 June 1991.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

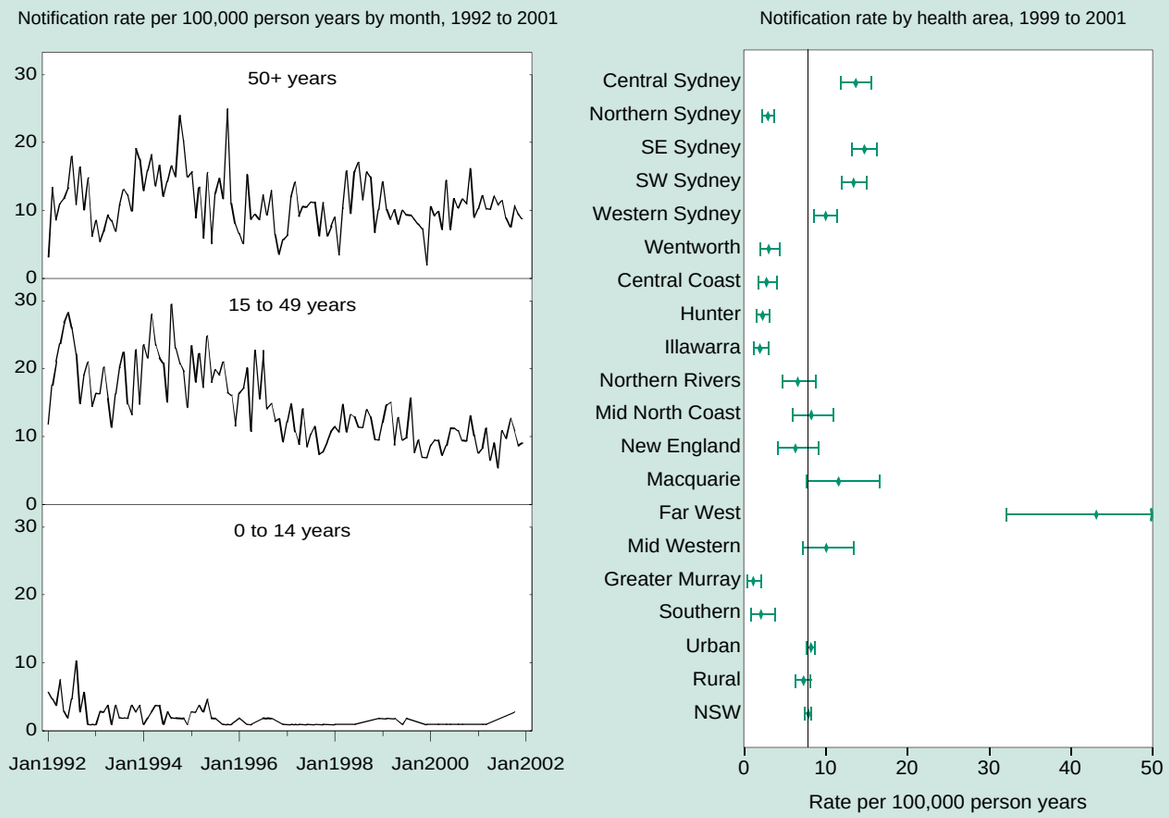
Gonorrhoea notifications by health area, persons of all ages, NSW 2000 to 2001 combined

Health Area	Number	Crude rate per 100,000 population	Age-standardised rate per100,000 population	LL 95% CI	UL 95% CI
Central Sydney	288	58.1	51.8	45.9	58.2
Northern Sydney	90	11.5	12.0	9.6	14.8
SE Sydney	576	74.3	68.7	63.2	74.6
SW Sydney	115	14.4	14.7	12.1	17.7
Western Sydney	72	10.4	10.5	8.2	13.2
Wentworth	20	6.3	6.5	3.9	10.0
Central Coast	13	4.4	5.6	2.9	9.6
Hunter	15	2.8	3.0	1.7	4.9
Illawarra	12	3.4	3.8	1.9	6.6
Northern Rivers	25	9.4	12.5	8.0	18.6
Mid North Coast	15	5.7	8.5	4.7	14.2
New England	44	25.3	30.4	22.0	41.0
Macquarie	9	8.7	11.2	5.1	21.4
Far West	21	43.5	53.9	33.2	82.6
Mid Western	6	3.6	4.1	1.5	8.9
Greater Murray	6	2.3	2.7	1.0	5.9
Southern	9	4.8	6.6	2.9	12.8
Urban	1201	23.8	24.1	22.7	25.5
Rural	135	9.2	11.8	9.9	14.0
NSW	1341	20.6	21.7	20.6	22.9

Note: Age-standardised rates were age-adjusted using the Australian population as at 30 June 1991.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

Syphilis: notifications, persons of all ages, NSW



Note: Rates for health areas in the graph were age-standardised. Age-standardised rates were age-adjusted using the Australian population as at 30 June 1991. Lower and upper limits of 95% confidence interval for the standardised rate.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, 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 fetuses, 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.
- Between 1994 and 2001 in NSW, the age-standardised rate of syphilis notification halved, from 16 to 8 per 100,000 in NSW.
- For 1999 to 2001 combined, the highest age-standardised rates were seen in remote communities, notably the Far West (43 per 100,000). Among males, the highest rates were in the Far West (35 per 100,000), South Eastern Sydney (21 per 100,000), Central Sydney (17 per 100,000), and South Western Sydney (16 per 100,000). The high rates in inner Sydney men may be associated with male-to-male sex. Among women, the highest infection rates were in the Far West (53 per 100,000) and the Macquarie Area (18 per 100, 000).
- Cases reported among children are most often congenital, and these are usually identified in rural and remote areas where access to antenatal health care for some population groups may be inadequate.

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.

Syphilis notifications by age, persons of all ages, NSW 1992 to 2001

Notifications			1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number	0 to 14 years	Persons	55	33	25	25	11	6	4	8	5	5
	15 to 49 years	Males	341	279	387	299	257	167	186	179	162	165
	15 to 49 years	Females	297	233	279	302	246	172	191	170	166	137
	15 to 49 years	Persons	646	538	691	607	507	341	387	354	328	304
	50+ years	Males	123	111	193	146	104	130	154	105	146	144
	50+ years	Females	49	48	59	50	39	34	49	50	51	49
	50+ years	Persons	176	167	258	200	144	166	205	158	197	193
	All	Males	490	402	592	460	368	299	340	286	312	312
	All	Females	371	300	347	361	288	209	244	226	219	188
	All	Persons	877	738	974	832	662	513	597	521	531	502
Crude rate	0 to 14 years	Persons	4.3	2.6	1.9	1.9	0.8	0.5	0.3	0.6	0.4	0.4
per 100,000	15 to 49 years	Males	21.5	17.5	24.2	18.5	15.8	10.2	11.3	10.8	9.7	9.9
population	15 to 49 years	Females	19.1	14.9	17.7	19	15.3	10.7	11.8	10.4	10.1	8.3
	15 to 49 years	Persons	20.6	17	21.8	19	15.7	10.5	11.9	10.8	9.9	9.2
	50+ years	Males	17.1	15.2	25.8	19.1	13.3	16.1	18.5	12.3	16.7	16
	50+ years	Females	6	5.8	7	5.8	4.4	3.8	5.3	5.3	5.3	4.9
	50+ years	Persons	11.5	10.7	16.2	12.3	8.7	9.7	11.7	8.8	10.7	10.2
	All	Males	16.5	13.5	19.7	15.1	11.9	9.6	10.8	9	9.7	9.6
	All	Females	12.4	9.9	11.4	11.7	9.2	6.6	7.7	7	6.7	5.7
	All	Persons	14.7	12.3	16.1	13.6	10.7	8.2	9.4	8.1	8.2	7.7
Age-standardised rate	All	Males	16.6	13.4	19.3	14.9	11.7	9.3	10.5	8.9	9.2	9.3
per 100,000 population	All	Females	12.7	10.1	11.6	12.1	9.6	6.8	7.8	7.3	6.9	5.8
	All	Persons	14.8	12.3	15.9	13.6	10.7	8	9.2	8.1	8	7.5

Note: Rates were age-adjusted using the Australian population as at 30 June 1991.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

Syphilis notifications by health area, persons of all ages, NSW 1999 to 2001 combined

Health Area	Number	Crude rate per 100,000 population	Age-standardised rate per100,000 population	LL 95% CI	UL 95% CI
Central Sydney	220	14.9	13.7	11.9	15.6
Northern Sydney	72	3.1	2.9	2.2	3.7
SE Sydney	373	16.1	14.7	13.3	16.3
SW Sydney	304	12.9	13.4	11.9	15.0
Western Sydney	202	9.8	9.9	8.6	11.4
Wentworth	27	2.9	3.0	2.0	4.4
Central Coast	26	3.0	2.7	1.7	4.0
Hunter	34	2.1	2.2	1.5	3.1
Illawarra	20	1.9	1.9	1.2	3.0
Northern Rivers	45	5.7	6.5	4.7	8.9
Mid North Coast	53	6.8	8.2	6.0	10.9
New England	28	5.4	6.3	4.1	9.1
Macquarie	29	9.4	11.5	7.7	16.7
Far West	53	36.7	43.2	32.2	56.6
Mid Western	44	8.8	10.0	7.3	13.5
Greater Murray	8	1.0	1.1	0.5	2.1
Southern	10	1.8	2.0	0.9	3.8
Urban	1278	8.5	8.2	7.7	8.6
Rural	270	6.2	7.2	6.4	8.2
NSW	1554	8.0	7.9	7.5	8.3

Note: Rates were age-adjusted using the Australian population as at 30 June 1991. LL/UL 95% CI = Lower and upper limits of 95% confidence interval for the standardised rate.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

HIV and AIDS: notifications, persons of all ages, NSW 1991 to 2000

Note: HIV=Human Immunodeficiency Virus. AIDS=Acquired Immune Deficiency Syndrome. 'Male-to-male sexual contact' includes injecting drug users who report male-to-male sexual contact. 'Other' includes blood transfusion, haemophilia, injecting drug use without reported male-to-male sexual contact, mother to baby transmission (vertical), and unknown. Rates were age-adjusted using the Australian population as at 30 June 1991.

Source: 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.

- Human immunodeficiency virus (HIV) was 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.
- HIV diagnoses declined steadily through the early 1990s, but began to level out in the late 1990s. The major risk factor for infection was male-to-male sexual contact, which was reported in 80% of notifications between 1991 and 2000, where a risk factor was determined. Five per cent of these also involved injecting drug use. Male-to-female sexual contact was reported in 14% of HIV notifications in the same period, and injecting drug use in 8%. Between 1992 and 2000, the rate of infection with a risk factor of male-to-male sexual contact halved.
- A substantial decline in progression to AIDS has been achieved since the mid-1990s, attributable to improvements in antiviral therapy for HIV infection. In 2000, the rate of AIDS was one-fifth of the rate in 1994.
- Safe sex practices, avoidance of contaminated blood and blood products, contact tracing, and early case identification and treatment, all contribute to the control of HIV.

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.

National Centre in HIV Epidemiology and Clinical Research Web site 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.

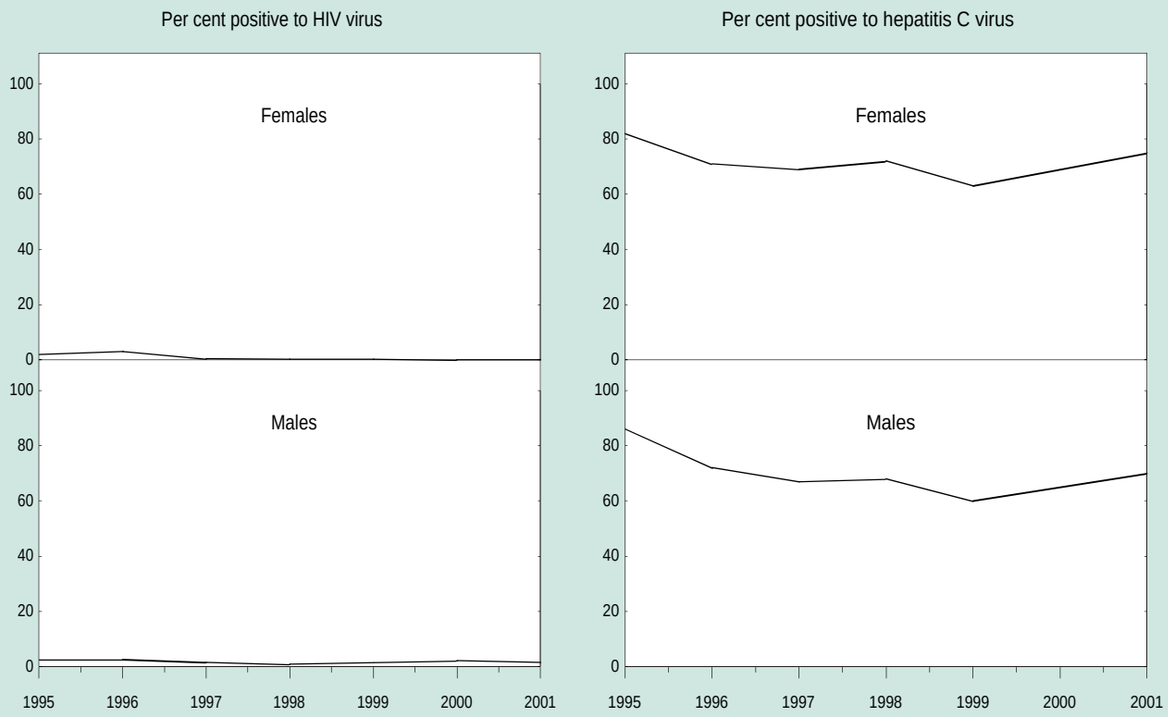
HIV and AIDS notifications by risk category, persons of all ages, NSW 1991 to 2001

				1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
HIV	Number	Heterosexual	Males	38	29	35	39	39	31	42	52	33	31	30
HIV		contact	Females	22	19	22	25	29	26	21	36	26	27	28
HIV			Persons	61	48	57	64	68	57	64	90	59	59	58
HIV		Male-to-male	Males	457	465	416	344	357	297	274	244	237	229	214
HIV		sexual contact	Persons	460	466	419	349	361	299	276	246	238	234	219
HIV		Other	Males	249	172	101	79	100	90	75	68	84	58	63
HIV			Females	22	12	14	8	6	6	4	4	3	2	6
HIV			Persons	286	191	120	91	107	99	83	74	87	66	71
HIV		All	Males	744	666	552	462	496	418	391	364	354	318	307
HIV			Females	44	31	36	33	35	32	25	40	29	29	34
HIV			Persons	807	705	596	504	536	455	423	410	384	359	348
HIV	Crude rate	Heterosexual	Males	1.3	1.0	1.2	1.3	1.3	1.0	1.3	1.7	1.0	1.0	0.9
HIV	per 100,000	contact	Females	0.7	0.6	0.7	0.8	0.9	0.8	0.7	1.1	0.8	0.8	0.9
HIV	population		Persons	1.0	0.8	0.9	1.1	1.1	0.9	1.0	1.4	0.9	0.9	0.9
HIV		Male-to-male	Males	15.6	15.7	13.9	11.4	11.7	9.6	8.8	7.8	7.5	7.1	6.6
HIV		sexual contact	Persons	7.8	7.8	7.0	5.8	5.9	4.8	4.4	3.9	3.7	3.6	3.4
HIV		Other	Males	8.5	5.8	3.4	2.6	3.3	2.9	2.4	2.2	2.6	1.8	1.9
HIV			Females	0.7	0.4	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.2
HIV			Persons	4.8	3.2	2.0	1.5	1.7	1.6	1.3	1.2	1.4	1.0	1.1
HIV		All	Males	25.3	22.5	18.5	15.3	16.3	13.6	12.6	11.6	11.1	9.9	9.5
HIV			Females	1.5	1.0	1.2	1.1	1.1	1.0	0.8	1.3	0.9	0.9	1.0
HIV			Persons	13.7	11.8	9.9	8.3	8.7	7.3	6.7	6.5	6.0	5.6	5.3
HIV	Age-standardised	Heterosexual	Males	1.3	1.0	1.1	1.3	1.2	1.0	1.3	1.6	1.0	0.9	0.9
HIV	rate per 100,000	contact	Females	0.8	0.6	0.8	0.9	1.0	0.9	0.7	1.2	0.8	0.9	0.9
HIV	population		Persons	1.0	0.8	0.9	1.1	1.1	0.9	1.0	1.4	0.9	0.9	0.9
HIV		Male-to-male	Males	15.4	15.1	13.9	11.3	11.7	9.5	8.7	7.8	7.5	7.0	6.4
HIV		sexual contact	Persons	7.8	7.6	7.0	5.7	5.9	4.8	4.4	3.9	3.8	3.6	3.2
HIV		Other	Males	8.3	5.4	3.2	2.6	3.2	2.8	2.2	2.1	2.6	1.7	1.8
HIV			Females	0.7	0.4	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.2
HIV			Persons	4.8	3.0	1.9	1.5	1.7	1.6	1.2	1.2	1.3	0.9	1.0
HIV		All	Males	25.1	21.6	18.2	15.2	16.1	13.4	12.3	11.5	11.1	9.6	9.0
HIV			Females	1.5	1.0	1.2	1.1	1.2	1.1	0.8	1.3	0.9	0.9	1.1
HIV			Persons	13.7	11.5	9.9	8.3	8.7	7.3	6.7	6.5	6.0	5.4	5.1
AIDS	Number	Heterosexual	Males	18	14	18	17	18	15	17	20	10	10	4
AIDS		contact	Females	2	11	9	7	8	11	3	2	5	9	2
AIDS			Persons	20	25	27	24	27	26	20	22	15	19	6
AIDS		Male-to-male	Males	359	336	376	424	363	268	143	110	68	69	47
AIDS		sexual contact	Persons	360	338	376	426	363	268	143	111	68	69	47
AIDS		Other	Males	41	41	53	57	57	47	24	24	14	21	5
AIDS			Females	14	11	6	13	7	7	7	8	8	6	4
AIDS			Persons	55	52	61	70	64	54	31	32	22	27	9
AIDS		All	Males	418	391	447	498	438	330	184	154	92	100	56
AIDS			Females	16	22	15	20	15	18	10	10	13	15	6
AIDS			Persons	435	415	464	520	454	348	194	165	105	115	62
AIDS	Crude rate	Heterosexual	Males	0.6	0.5	0.6	0.6	0.6	0.5	0.5	0.6	0.3	0.3	0.1
AIDS	per 100,000	contact	Females	0.1	0.4	0.3	0.2	0.3	0.4	0.1	0.1	0.2	0.3	0.1
AIDS	population		Persons	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.3	0.1
AIDS		Male-to-male	Males	12.2	11.3	12.6	14.1	11.9	8.7	4.6	3.5	2.1	2.1	1.5
AIDS		sexual contact	Persons	6.1	5.7	6.3	7.0	5.9	4.3	2.3	1.8	1.1	1.1	0.7
AIDS		Other	Males	1.4	1.4	1.8	1.9	1.9	1.5	0.8	0.8	0.4	0.7	0.2
AIDS			Females	0.5	0.4	0.2	0.4	0.2	0.2	0.2	0.3	0.2	0.2	0.1
AIDS			Persons	0.9	0.9	1.0	1.2	1.0	0.9	0.5	0.5	0.3	0.4	0.1
AIDS		All	Males	14.2	13.2	15.0	16.5	14.4	10.7	5.9	4.9	2.9	3.1	1.7
AIDS			Females	0.5	0.7	0.5	0.7	0.5	0.6	0.3	0.3	0.4	0.5	0.2
AIDS			Persons	7.4	7.0	7.7	8.6	7.4	5.6	3.1	2.6	1.6	1.8	1.0
AIDS	Age-standardised	Heterosexual	Males	0.6	0.5	0.6	0.6	0.6	0.5	0.5	0.6	0.3	0.3	0.1
AIDS	rate per 100,000	contact	Females	0.1	0.4	0.3	0.2	0.3	0.4	0.1	0.1	0.2	0.3	0.1
AIDS	population		Persons	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.3	0.1
AIDS		Male-to-male	Males	12.1	11.2	12.4	13.8	11.6	8.5	4.5	3.3	2.0	2.1	1.4
AIDS		sexual contact	Persons	6.1	5.7	6.2	7.0	5.8	4.3	2.2	1.7	1.0	1.0	0.7
AIDS		Other	Males	1.4	1.4	1.7	1.9	1.8	1.5	0.8	0.8	0.4	0.6	0.1
AIDS			Females	0.5	0.4	0.2	0.4	0.2	0.2	0.2	0.3	0.3	0.2	0.1
AIDS			Persons	0.9	0.9	1.0	1.2	1.0	0.8	0.5	0.5	0.4	0.4	0.1
AIDS		All	Males	14.1	13.0	14.7	16.2	14.0	10.4	5.8	4.7	2.7	3.0	1.6
AIDS			Females	0.5	0.7	0.5	0.7	0.5	0.6	0.3	0.3	0.4	0.5	0.2
AIDS			Persons	7.4	6.9	7.7	8.5	7.3	5.5	3.1	2.6	1.6	1.7	0.9

Note: 'Male-to-male sexual contact' includes injecting drug users who report male-to-male sexual contact. 'Other' includes blood transfusion, haemophilia, injecting drug use without reported male-to-male sexual contact, mother to baby transmission (vertical), and unknown. Rates were age-adjusted using the Australian population as at 30 June 1991.

Source: NSW HIV database. Communicable Diseases Branch, NSW Department of Health. AIDS data registry. National Centre in HIV Epidemiology and Clinical Research, University of New South Wales, Sydney.

HIV and hepatitis C: prevalence in clients of needle and syringe programs, NSW, 1995 to 2001



		1995	1996	1997	1998	1999	2000	2001
Hepatitis C	Males	86.0	72.0	67.0	68.0	60.0	65.0	70.0
	Females	82.0	71.0	69.0	72.0	63.0	69.0	75.0
	Persons	85.0	72.0	68.0	69.0	61.0	66.0	72.0
HIV	Males	2.4	2.5	1.6	0.9	1.5	2.1	1.5
	Females	2.0	3.1	0.4	0.3	0.3	0.0	0.0
	Persons	2.4	2.7	1.1	0.7	1.1	1.3	0.9

Note: Prevalence was based on the presence of antibodies to HIV or hepatitis C in a blood sample.

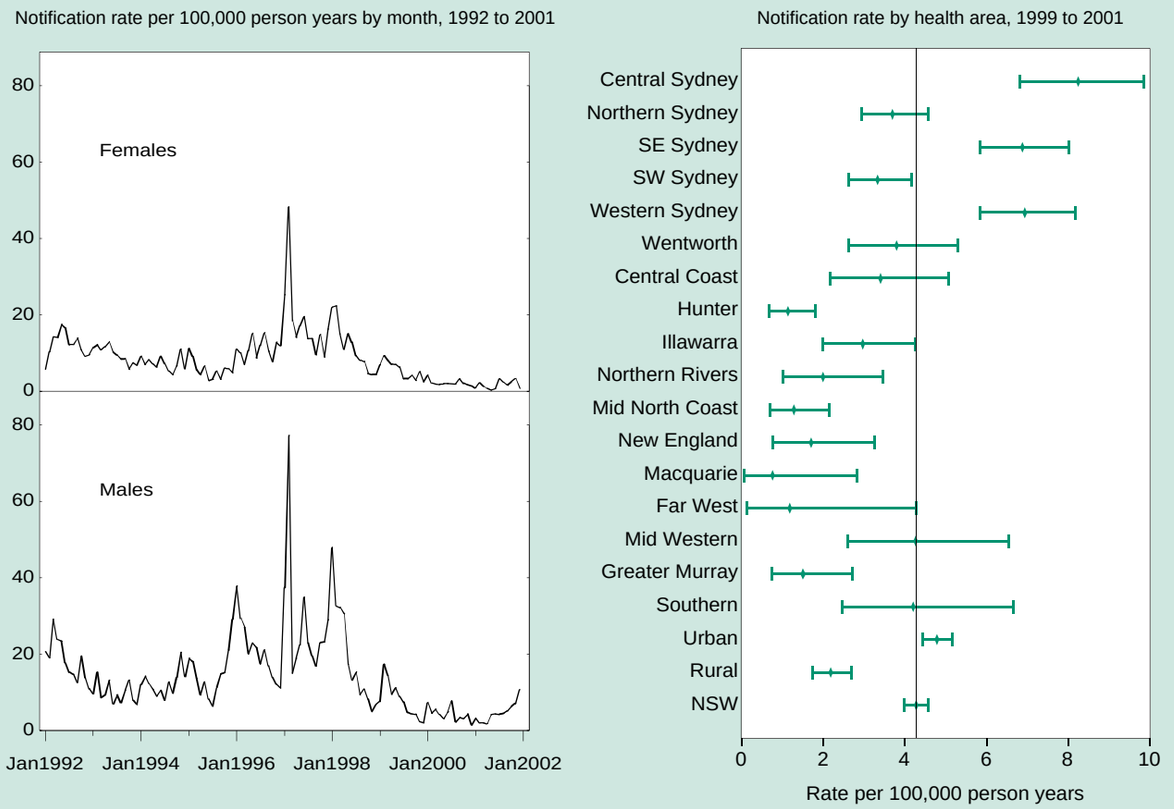
Source: Annual Surveillance Report 2001. National Centre in HIV Epidemiology and Clinical Research, University of New South Wales, Sydney. Data for 2001 were unpublished.

- 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 blood sample for testing for HIV and hepatitis C. Response rates ranged from 37–66%.
- These studies found that HIV prevalence among injecting drug users is low (1.5% in males and 0% in females in 2001), except in men reporting male-to-male sexual contact. Around one-quarter of drug users who reported male-to-male sexual contact were HIV positive in each test period.
- The prevalence of hepatitis C among injecting drug users was highest (85%) in 1995. Prevalence declined to 61% in 1999, but then increased to 72% in 2001. Prevalence among people who reported injecting for less than 3 years rose from 26% in 1998 to 43% in 2001.
- The proportion of respondents who reported using a syringe after someone else in the last month declined from 31% to 15% between 1995 and 2001 (National Centre in HIV Epidemiology and Clinical Research, 2001).

For more information:

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.

Hepatitis A: notifications, persons of all ages, NSW



Note: Rates were age-adjusted using the standard Australian population as at 30 June 1991. LL/UL95%CI = Lower and upper limits of 95% confidence interval of the point estimate.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, 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 have sex with men. A large epidemic in 1997 was traced to eating contaminated oysters. Historically low levels of hepatitis A were reported in 2000 and 2001 across NSW.
- For 1999 to 2001 combined, age-standardised rates were highest in Central Sydney (8 per 100,000), South Eastern Sydney and Western Sydney (both 7 per 100,000).
- 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 endemic countries, certain occupational groups, men who have sex with men, people with chronic liver disease, and blood product recipients.

For more information:

EpiReview: Hepatitis A in New South Wales 1991–2000. *N S W Public Health Bull* 2001; 12(9): 255–258.

Hepatitis A notifications by sex, persons of all ages, NSW 1992–2001

Notifications		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number	Males	544	293	366	446	630	869	584	239	133	144
	Females	352	281	211	168	327	552	341	165	61	51
	Persons	904	579	586	614	958	1426	926	406	194	195
Crude rate	Males	18.3	9.8	12.2	14.6	20.4	27.9	18.6	7.5	4.1	4.4
per 100,000 population	Females	11.7	9.3	6.9	5.5	10.5	17.5	10.7	5.1	1.9	1.6
	Persons	15.2	9.6	9.7	10.0	15.4	22.7	14.6	6.3	3.0	3.0
Age-standardised rate	Males	18.3	9.8	12.3	14.9	20.9	28.3	19.1	7.8	4.3	4.6
per 100,000 population	Females	12.2	9.6	7.2	5.6	11.0	18.3	11.4	5.4	2.0	1.6
	Persons	15.4	9.8	9.9	10.3	16.0	23.4	15.2	6.7	3.1	3.1

Note: Rates were age-adjusted using the Australian population as at 30 June 1991.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

Hepatitis A notifications by health area, persons of all ages, NSW 1999–2001 combined

Health Area	Number	Crude rate per 100,000 population	Age-standardised rate per100,000 population	LL 95% CI	UL 95% CI
Central Sydney	124	8.4	8.2	6.8	9.9
Northern Sydney	86	3.7	3.7	3.0	4.6
SE Sydney	166	7.2	6.9	5.9	8.0
SW Sydney	78	3.3	3.3	2.6	4.2
Western Sydney	141	6.8	6.9	5.8	8.2
Wentworth	34	3.6	3.8	2.6	5.3
Central Coast	25	2.8	3.4	2.2	5.1
Hunter	18	1.1	1.1	0.7	1.8
Illawarra	30	2.9	3.0	2.0	4.3
Northern Rivers	13	1.7	2.0	1.0	3.5
Mid North Coast	14	1.8	1.3	0.7	2.2
New England	9	1.7	1.7	0.8	3.3
Macquarie	2	0.6	0.8	0.1	2.8
Far West	2	1.4	1.2	0.1	4.3
Mid Western	21	4.2	4.3	2.6	6.6
Greater Murray	11	1.4	1.5	0.7	2.7
Southern	19	3.5	4.2	2.5	6.7
Urban	702	4.7	4.8	4.4	5.2
Rural	91	2.1	2.2	1.7	2.7
NSW	795	4.1	4.3	4.0	4.6

Note: Rates were age-adjusted using the Australian population as at 30 June 1991. LI/UL 95% CI = Lower and upper limits of 95% confidence interval for the standardised rate.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

Hepatitis B: notifications, persons of all ages, NSW

Note: Rates for health areas in the graph were age-standardised. Age-standardised rates were age-adjusted using the Australian population as at 30 June 1991. Lower and upper limits of 95% confidence interval for the standardised rate.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, 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 active and inactive hepatitis B infection patterns.
- In 2001, the age-standardised rate of hepatitis B notifications was 71 per 100,000. The highest rates were in people aged between 15 and 44 years. Between 1992 and 2001, notifications declined substantially in children under 15 years of age, most likely due to targeted immunisation. However, in the same period, notification rates increased in people aged over 65 years.
- For 1999 to 2001 combined, the highest rates were in the central, south western and western parts of Sydney, most likely reflecting larger numbers of people born in countries where hepatitis B is endemic. The Far West Area also exhibited a high rate.
- Prevention depends on immunisation of all children at birth, 2, 4, and 6 months of age, catch up immunisation of 10 to 13 year-olds who may have missed out on immunisation earlier, 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.

Hepatitis B notifications by age, NSW 1992 to 2001

Notifications		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number 0 to 14 years	Males	111	73	82	86	72	61	37	42	42	34
0 to 14 years	Females	87	68	56	58	40	48	34	35	29	22
0 to 14 years	Persons	226	148	140	147	115	109	71	80	72	56
15 to 44 years	Males	1119	1397	1612	1673	1388	1274	1231	1323	1555	1714
15 to 44 years	Females	1217	1313	1406	1388	1220	1081	906	1168	1319	1581
15 to 44 years	Persons	2454	2765	3059	3098	2634	2386	2154	2533	2890	3312
45+ years	Males	321	475	548	500	498	423	446	531	616	716
45+ years	Females	171	244	276	288	292	279	276	315	368	459
45+ years	Persons	525	734	834	800	798	707	728	855	987	1180
All	Males	1551	1945	2242	2259	1958	1760	1717	1896	2213	2464
All	Females	1475	1625	1738	1734	1552	1410	1220	1519	1716	2062
All	Persons	3205	3647	4033	4045	3547	3207	2960	3469	3949	4548
Crude rate0 to 14 years	Males	16.9	11.0	12.3	12.9	10.7	9.1	5.5	6.2	6.2	5.1
per 100,0000 to 14 years	Females	13.9	10.8	8.9	9.1	6.3	7.5	5.3	5.5	4.5	3.4
population0 to 14 years	Persons	17.6	11.5	10.8	11.3	8.8	8.3	5.4	6.1	5.5	4.3
15 to 44 years	Males	80.1	100.4	115.7	119.6	98.7	90.1	86.6	92.5	107.9	119.2
15 to 44 years	Females	88.9	96.0	102.5	100.7	87.7	77.3	64.5	82.8	93.0	111.1
15 to 44 years	Persons	88.7	100.2	110.7	111.6	94.2	84.8	76.2	89.2	101.1	115.8
45+ years	Males	35.2	50.9	57.4	51.1	49.7	41.2	42.5	49.4	56.1	63.5
45+ years	Females	17.1	23.8	26.4	27.0	26.7	25.0	24.2	27.0	31.0	37.6
45+ years	Persons	27.4	37.5	41.7	39.1	38.1	33.0	33.2	38.1	43.1	50.3
All	Males	52.3	65.1	74.4	74.2	63.5	56.5	54.6	59.6	68.9	76.1
All	Females	49.2	53.8	57.0	56.3	49.7	44.6	38.3	47.2	52.8	62.8
All	Persons	53.8	60.7	66.5	66.0	57.2	51.1	46.7	54.2	61.1	69.7
Age-standardised All	Males	52.1	64.8	74.1	74.1	63.4	56.5	54.6	59.6	68.6	75.4
rate per 100,000 All	Females	50.4	55.2	58.8	57.9	51.3	46.0	39.2	48.8	54.9	65.2
population All	Persons	54.2	61.3	67.2	66.8	57.9	51.8	47.2	55.0	62.1	70.6

Note: Rates were age-adjusted using the Australian population as at 30 June 1991.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

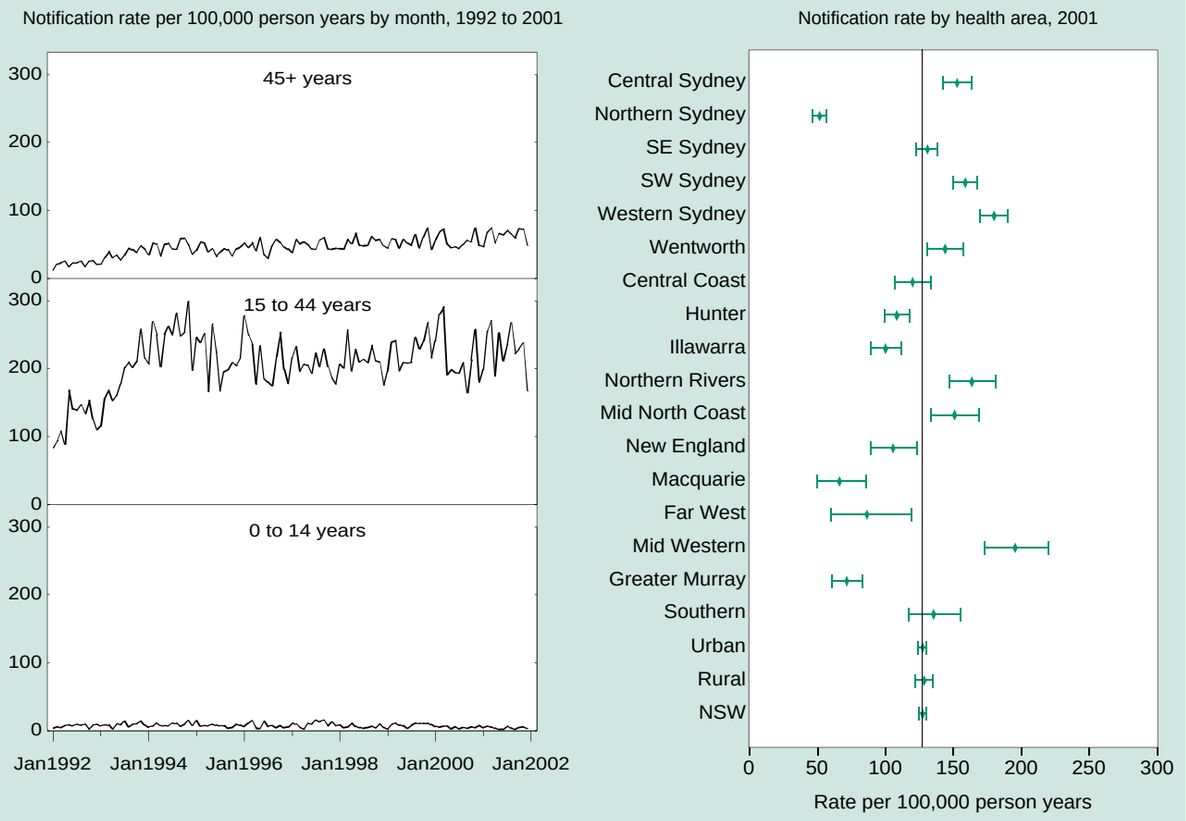
Hepatitis B notifications by health area, persons of all ages, NSW 1999 to 2001 combined

Health Area	Number	Crude rate per 100,000 population	Age-standardised rate per100,000 population	LL 95% CI	UL 95% CI
Central Sydney	1838	124.4	114.8	109.5	120.2
Northern Sydney	1167	50.0	48.4	45.6	51.3
SE Sydney	1646	71.0	66.9	63.6	70.2
SW Sydney	3788	161.3	162.1	156.9	167.3
Western Sydney	1984	96.2	95.7	91.5	100.0
Wentworth	221	23.4	23.2	20.2	26.5
Central Coast	134	15.3	17.3	14.4	20.5
Hunter	213	13.2	13.9	12.1	15.9
Illawarra	237	22.7	23.8	20.8	27.1
Northern Rivers	97	12.4	14.2	11.4	17.5
Mid North Coast	73	9.3	11.7	9.0	14.9
New England	118	22.6	26.8	22.1	32.1
Macquarie	49	15.8	19.6	14.4	26.0
Far West	130	90.1	104.7	87.2	124.6
Mid Western	53	10.6	12.4	9.2	16.2
Greater Murray	94	12.2	13.6	11.0	16.7
Southern	84	15.3	17.0	13.4	21.2
Urban	11228	74.7	74.0	72.6	75.4
Rural	698	16.0	19.0	17.6	20.5
NSW	11966	61.7	62.6	61.5	63.7

Note: Rates were age-adjusted using the Australian population as at 30 June 1991. LL/UL 95% CI = Lower and upper limits of 95% confidence interval for the standardised rate.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

Hepatitis C: notifications, persons of all ages, NSW



Note: Rates for health areas in the graph were age-standardised. Rates were age-adjusted using the Australian population as at 30 June 1991. Lower and upper limits of 95% confidence interval for the standardised rate.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Hepatitis C is caused by infection with the 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. New or active infections are notified by doctors and hospitals. For these reasons, the notification data presented here represent a mix of active and inactive hepatitis C infection patterns.
- Hepatitis C is the most commonly reported communicable disease in NSW, with 8072 cases notified in 2001 (127.6 per 100,000). The highest rates are among young men.
- Hepatitis C is a serious health problem in NSW prisons. In 2001, 9% of all hepatitis C notifications in NSW were from prisoners held in NSW correctional facilities. Variations in notification rates by health area are influenced by the size of the area's prison population.
- There is no vaccine against hepatitis C. Prevention depends on not sharing contaminated needles and syringes, through education of injecting drug users, and provision of sterile needles through needle and syringe programs.

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.

EpiReview: Hepatitis C in NSW 1991–1999. *N S W Public Health Bull* 2001; 12(9): 139–141.

Hepatitis C notifications by age, NSW 1992 to 2001

Notifications			1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number	0 to 14 years	Males	65	77	68	68	47	75	51	61	44	36
	0 to 14 years	Females	24	34	39	30	45	52	29	47	23	18
	0 to 14 years	Persons	91	116	114	102	97	133	81	113	67	54
	15 to 44 years	Males	2060	3067	4278	3686	3863	3713	3818	4091	4063	4017
	15 to 44 years	Females	1334	2024	2466	2244	2052	2028	2148	2189	2145	2493
	15 to 44 years	Persons	3436	5129	6851	5977	5972	5794	6015	6398	6226	6532
	45+ years	Males	227	414	571	527	571	642	730	753	841	1000
	45+ years	Females	178	283	355	337	409	395	415	434	427	482
	45+ years	Persons	412	705	935	866	983	1038	1149	1212	1269	1486
	All	Males	2352	3558	4917	4281	4481	4433	4611	4906	4949	5053
	All	Females	1536	2341	2860	2611	2506	2476	2598	2670	2596	2993
	All	Persons	3939	5950	7900	6945	7052	6972	7266	7724	7565	8072
Crude rate	0 to 14 years	Males	9.9	11.7	10.2	10.2	7.0	11.1	7.6	9.1	6.5	5.4
per 100,000	0 to 14 years	Females	3.8	5.4	6.2	4.7	7.0	8.1	4.5	7.3	3.6	2.8
population	0 to 14 years	Persons	7.1	9.0	8.8	7.8	7.4	10.1	6.2	8.6	5.1	4.1
	15 to 44 years	Males	147.4	220.4	307.2	263.6	274.6	262.5	268.5	286.1	282.0	279.3
	15 to 44 years	Females	97.4	148.0	179.9	162.8	147.6	144.9	153.0	155.2	151.2	175.2
	15 to 44 years	Persons	124.2	185.9	247.9	215.2	213.5	205.9	212.8	225.3	217.7	228.3
	45+ years	Males	24.9	44.4	59.8	53.9	57.0	62.6	69.5	70.0	76.5	88.6
	45+ years	Females	17.8	27.6	34.0	31.6	37.4	35.4	36.4	37.2	35.9	39.5
	45+ years	Persons	21.5	36.0	46.7	42.3	46.9	48.4	52.4	54.1	55.5	63.3
	All	Males	79.3	119.2	163.2	140.6	145.4	142.3	146.6	154.3	154.0	156.0
	All	Females	51.3	77.5	93.8	84.7	80.2	78.4	81.5	83.0	79.9	91.2
	All	Persons	66.1	99.1	130.4	113.4	113.7	111.1	114.7	120.7	117.1	123.8
Age-standardised rate	All	Males	79.2	119.3	163.9	141.3	146.6	143.9	148.5	157.3	157.0	158.4
per 100,000 population	All	Females	52.1	79.0	95.8	86.9	82.2	80.8	84.3	86.3	83.7	96.0
	All	Persons	66.5	100.0	131.9	114.9	115.4	113.3	117.3	124.2	120.7	127.6

Note: Rates were age-adjusted using the Australian population as at 30 June 1991.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

Hepatitis C notifications by health area, persons of all ages, NSW 2001

Health Area	Number	Crude rate per 100,000 population	Age-standardised rate per100,000 population	LL 95% CI	UL 95% CI
Central Sydney	827	166.7	152.7	142.4	163.6
Northern Sydney	416	53.3	51.7	46.8	57.0
SE Sydney	1072	138.3	130.8	123.1	139.0
SW Sydney	1248	156.4	158.7	150.0	167.8
Western Sydney	1236	178.1	180.0	170.1	190.4
Wentworth	453	141.6	143.9	130.9	157.9
Central Coast	316	106.0	120.0	106.9	134.2
Hunter	544	100.4	108.5	99.5	118.1
Illawarra	323	92.2	100.1	89.4	111.8
Northern Rivers	383	143.7	163.5	147.0	181.3
Mid North Coast	317	119.9	150.9	134.1	169.1
New England	160	91.9	105.8	89.8	123.7
Macquarie	57	55.0	66.2	49.8	86.1
Far West	37	76.7	86.5	60.6	119.6
Mid Western	278	165.8	195.3	172.9	219.9
Greater Murray	164	63.5	71.5	60.9	83.5
Southern	213	114.7	135.5	117.4	155.6
Urban	6435	127.3	127.6	124.5	130.8
Rural	1609	109.6	128.5	122.2	135.1
NSW	8072	123.8	127.6	124.8	130.4

Note: Rates were age-adjusted using the Australian population as at 30 June 1991. LL/UL 95% CI = Lower and upper limits of 95% confidence interval for the standardised rate.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

Meningococcal disease: notifications and hospital separations by month and age, persons of all ages, NSW 1992 to 2001

Note: Date of admission to hospital was used to best approximate date of onset. Hospital admissions with meningococcal infection or (post) meningococcal arthritis as a principal or additional diagnosis were included. Admissions were classified using ICD-9-CM up to June 1998 and ICD-10-AM from July 1998. Hospital data were only available up to June 2000 at the time of publication. Standardised rates were age-adjusted using the standard Australian population as at 30 June 1991.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database, NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Meningococcal disease, caused by *Neisseria meningitidis* bacteria, is uncommon in NSW. Population studies have found that around 10% of people can carry the bacteria in their throat, but invasive disease is rare. Symptoms vary according to site of infection, but may include high fever, headache, nausea and vomiting, neck stiffness, drowsiness, coma, and a characteristic rash.
- Notifications and admissions for meningococcal disease follow a seasonal pattern, peaking each year in winter and spring. There were 232 cases notified in 2001, 296 admissions in 1999 (cases can be hospitalised more than once) and 10 deaths registered in 2000. In 2001, the highest notification rates were in 0–5 year-olds, adolescents and young adults. In NSW, age-standardised notification rates increased between 1995 and 2001. The reasons are unclear, but possibly relate to new meningococcal strains, better recognition, or new diagnostic tests.
- Almost two-thirds of notifications between 1997 and 2001 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 vaccine is available for the meningococcal group C strain only.

For more information:

EpiReview: Meningococcal disease in NSW 1991–1999. *N S W Public Health Bull* 2000; 11(7): 128–130.

Meningococcal disease notifications, NSW 1992 to 2001, and hospital admissions, NSW 1992 to 2001

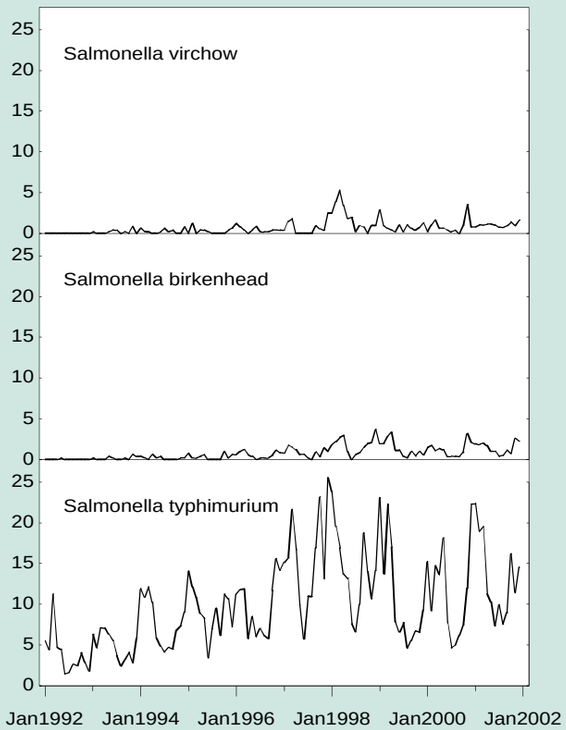
			1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Notifications	Number	0 to 4 years	72	78	63	55	68	79	77	76	74	70
		5 to 24 years	35	50	52	30	51	105	73	86	119	82
		25+ years	15	25	27	28	42	35	34	53	56	80
		All ages	122	153	142	113	161	219	184	215	249	232
	Crude rate per 100,000 population	0 to 4 years	16.5	17.8	14.3	12.5	15.5	18.0	17.7	17.6	17.2	16.5
		5 to 24 years	2.0	2.9	3.0	1.7	2.9	6.0	4.1	4.9	6.7	4.6
		25+ years	0.4	0.7	0.7	0.7	1.0	0.9	0.8	1.3	1.3	1.9
		All ages	2.0	2.5	2.3	1.8	2.6	3.5	2.9	3.4	3.9	3.6
	Age-standardised rate per 100,000 population	All ages	2.1	2.6	2.4	1.9	2.7	3.7	3.1	3.6	4.2	3.8
Hospital separations	Number	0 to 4 years	72	86	73	72	88	132	116	106	–	–
		5 to 24 years	37	54	65	33	66	132	91	120	–	–
		25+ years	19	36	33	34	45	65	58	70	–	–
		All ages	128	176	171	139	199	329	265	296	–	–
	Crude rate per 100,000 population	0 to 4 years	16.5	19.6	16.6	16.4	20.0	30.1	26.7	24.5	–	–
		5 to 24 years	2.1	3.1	3.7	1.9	3.8	7.5	5.2	6.8	–	–
		25+ years	0.5	0.9	0.9	0.9	1.1	1.6	1.4	1.7	–	–
		All ages	2.1	2.9	2.8	2.3	3.2	5.2	4.2	4.6	–	–
	Age-standardised rate per 100,000 population	All ages	2.2	3.0	2.9	2.3	3.3	5.5	4.4	4.9	–	–

Note: Admission data were only available to June 2000. Rates were age-adjusted using the standard Australian population as at 30 June 1991. Hospital admissions with meningococcal infection or (post)meningococcal arthritis as a principal or additional diagnosis were included.

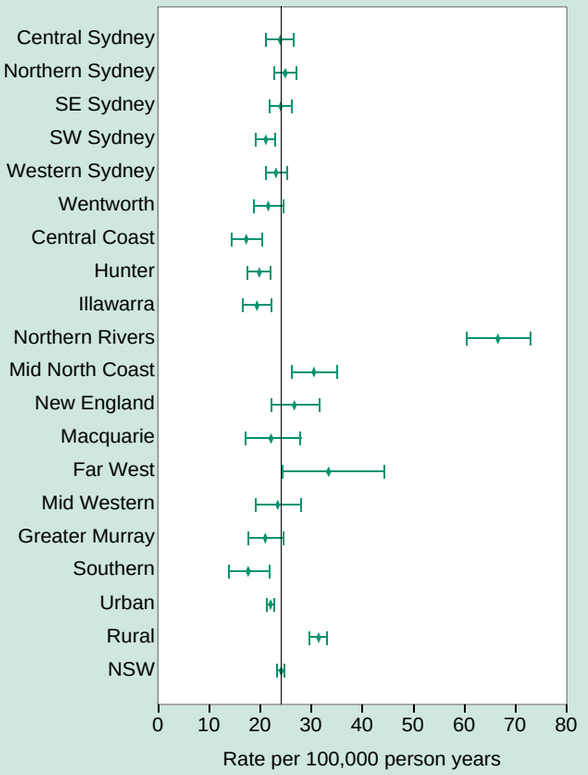
Source: Communicable Diseases Branch NSW Notifiable Diseases Database, NSW Inpatient Statistics Collection and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

Salmonella: notifications, persons of all ages, NSW

Notification rate per 100,000 person years by month, 1992 to 2001



Notification rate by health area, 1999 to 2001



Note: Rates were age-adjusted using the Australian population as at 30 June 1991. Lower and upper limits of 95% confidence interval for the standardised rate.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

- Numerous species of *Salmonella* bacteria cause disease in both humans and animals. Salmonellosis is mainly a food-borne 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 para-typhoid, more serious forms of salmonellosis, are uncommon in Australia and are not included in these data.
- In recent years, the highest rates of infection were among small children, with seasonal peaks in the summer months. Notifications more than doubled in NSW from 1992 (rate of 14 per 100,000) to 1998 (30 per 100,000), but have since declined a little (27 per 100,000 in 2001). For 1999 to 2001 combined, the highest rates were seen among residents in the rural north of the state (Northern Rivers 67 per 100,000 per year, Mid North Coast 31 per 100,000 per year) and the Far West (33 per 100,000 per year). In 2001, the most common species notified in NSW were *Salmonella typhimurium* (49%), *S. birkenhead* (5%) and *S. virchow* (4%).
- 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.
- The rise in incidence of salmonellosis in recent years has also been observed nationally and in many industrialised nations. This may be explained partly by changing patterns of food consumption—including the increasing popularity of takeaway and pre-prepared foods—and the increasing variety and availability of food products.

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.

Salmonella notifications for selected species, persons of all ages, NSW 1995 to 2001 combined

Species	Notifications	1995	1996	1997	1998	1999	2000	2001
	Number	547	580	934	853	662	688	808
S. typhimurium	Crude rate per 100,000 population	8.9	9.3	14.9	13.5	10.3	10.6	12.4
	Age-standardised rate per 100,000 population	9.1	9.6	15.5	14.1	10.9	11.4	13.2
S. birkenhead	Number	20	35	53	110	81	77	90
	Crude rate per 100,000 population	0.3	0.6	0.8	1.7	1.3	1.2	1.4
	Age-standardised rate per 100,000 population	0.3	0.6	0.9	1.8	1.3	1.2	1.4
S. virchow	Number	16	27	41	116	52	54	64
	Crude rate per 100,000 population	0.3	0.4	0.7	1.8	0.8	0.8	1.0
	Age-standardised rate per 100,000 population	0.3	0.4	0.7	1.9	0.9	0.9	1.0
All *Salmonella*	Number	1365	1224	1698	1811	1424	1386	1637
	Crude rate per 100,000 population	22.3	19.7	27.1	28.6	22.3	21.4	25.1
	Age-standardised rate per 100,000 population	22.6	20.2	27.9	29.7	23.2	22.6	26.5

Note: Rates were age-adjusted using the Australian population as at 30 June 1991.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

Salmonella notifications for all species by health area, persons of all ages, NSW 1999 to 2001 combined

Health Area	Number	Crude rate per 100,000 population	Age-standardised rate per100,000 population	LL 95% CI	UL 95% CI
Central Sydney	315	21.3	23.9	21.3	26.7
Northern Sydney	514	22.0	24.9	22.7	27.2
SE Sydney	497	21.4	24.0	21.9	26.3
SW Sydney	507	21.6	21.1	19.3	23.0
Western Sydney	474	23.0	23.1	21.0	25.3
Wentworth	209	22.1	21.6	18.7	24.7
Central Coast	139	15.8	17.2	14.4	20.4
Hunter	308	19.0	19.8	17.6	22.1
Illawarra	190	18.2	19.3	16.6	22.3
Northern Rivers	478	61.1	66.5	60.6	73.0
Mid North Coast	207	26.5	30.5	26.3	35.2
New England	132	25.3	26.7	22.3	31.7
Macquarie	69	22.3	22.1	17.1	28.0
Far West	48	33.3	33.4	24.5	44.3
Mid Western	115	23.0	23.4	19.3	28.1
Greater Murray	156	20.3	21.0	17.8	24.6
Southern	84	15.3	17.6	14.0	21.9
Urban	3153	21.0	22.0	21.3	22.8
Rural	1289	29.6	31.4	29.7	33.2
NSW	4447	22.9	24.1	23.4	24.8

Note: Rates were age-adjusted using the Australian population as at 30 June 1991. LL/UL 95% CI = Lower and upper limits of 95% confidence interval for the standardised rate.

Source: Communicable Diseases Branch NSW Notifiable Diseases Database and ABS population estimates (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

Appendices

- Methods
- Disease and procedure codes
- Glossary
- List of local government areas by health area
- 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 and Statistical Toolkit (HOIST)

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 is 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 Central Sydney and South Eastern Sydney 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 1996 Census at the collection district level. The estimated resident populations (ERPs) used were the latest available at the time of preparation of the report. However, around the time of publication, these ERPs will have been revised in the light of the results of the 2001 Census of Population and Housing. In most cases, the differences between the populations used in this report and the revised populations, will be negligible.

The 1991 Australian mid-year ERP, shown in Table 1, was used as the standard population for age-adjustment (see Methods section 3.2).

Country-of-birth (COB)-specific populations used in Chapter 3.2 (Country of birth) were derived from annual age-, sex- and COB-specific ERPs for all of Australia supplied by the Australian Bureau of Statistics.

Table 1 Australian standard population (30 June 1991)

Age	Persons	Age	Persons
0–4 yrs	1,271,703	50–54 yrs	846,934
5–9 yrs	1,272,208	55–59 yrs	725,950
10–14 yrs	1,241,619	60–64 yrs	736,868
15–19 yrs	1,364,074	65–69 yrs	671,390
20–24 yrs	1,396,764	70–74 yrs	510,755
25–29 yrs	1,399,663	75–79 yrs	384,495
30–34 yrs	1,425,735	80–84 yrs	229,828
35–39 yrs	1,328,387	85+ yrs	154,247
40–44 yrs	1,294,271		
45–49 yrs	1,029,145	All ages	17,284,036

Source: ABS population estimates (HOIST), Epidemiology and Surveillance Branch, NSW Department of Health.

Equivalent populations for NSW were derived from these national populations by estimating the proportion of immigrants in each age, sex, and COB strata who reside in NSW, based on cubic splines fitted to age-, sex-, COB- and specific state–territory-counts from the 1981, 1986, 1991, and 1996 ABS Censuses of Population and Housing, and then applying these proportions to the national age-, sex-, and COB-specific ERPs 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

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.

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.

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.

At the time of preparation of this report, the most recent mortality data available from ABS included only those deaths registered in 2000. The 2000 numbers were adjusted to include an estimate of the number of deaths due to that cause that occurred in 2000 but were not registered until 2001. These estimates were calculated for each age-sex stratum, by multiplying the number of deaths registered in 2000 by the proportion of deaths from that cause over the period 1997–1999 that were registered in the following year. Where deaths were further categorised by geographical place of residence or country of birth, this imputation procedure was carried out separately for each category, thus accounting for the typically greater delays in registering deaths of people resident in rural areas.

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 which occurred in hospitals interstate. The only exception to this is that data from Queensland hospitals for the year 1999–00 are missing. This may affect analyses involving uncommon diagnoses or procedures, particularly in health area analyses.

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 US 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 20 other diagnoses;
- up to 20 procedures;
- up to 3 external cause codes for injury and poisoning.

For this report, the ISC was accessed via HOIST. ISC data on HOIST are for periods of stay in hospital. A period of stay in hospital ends with a discharge, transfer, or death of a patient. Data are presented by financial year.

ICD-9-CM codes were used to classify separations for years up to and including 1997–98 and ICD-10-AM codes were used from 1998–99 onwards. 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 MDC 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.

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 1 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, conducted 2 population health surveys using 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 1000 NSW residents aged 16 years and over from each of the 17 NSW health areas (total sample 17,000 people each year). A stratified two-stage cluster sample design was used, with simple random sampling of all potentially active telephone numbers within each NSW 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, conducted a survey of the health of older people in NSW, using CATI (Public Health Division, 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. 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, Italian) by trained interviewers at the NSW Department of Health's CATI facility. A total of 9418 interviews were completed (including proxy interviews), while 3906 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, 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 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 9933 interviews were completed, while 1770 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 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 and 1995 National Health Surveys are presented in this report. For this report, data were accessed via HOIST, or were obtained as special tabulations from the ABS, or were from published reports.

2.12 School surveys

The NSW Department of Health has conducted surveys focusing on drug and alcohol use in NSW secondary schools on a 3-yearly basis since 1993, and in NSW primary schools (Years 5 and 6) every 3 years since 1986. The most recent secondary school surveys (1996 and 1999) were conducted in conjunction with the NSW Cancer Council and the Anti-Cancer Council of Victoria. They collected information on a wide range of health issues including sun protection, nutrition, physical activity, mental health, and injuries.

Data from school surveys were obtained from published reports (Cooney, Dobbinson and Flaherty, 1994; Bauman et al., 1994; Schofield et al., 1998; Lovelace et al., 200).

2.13 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 has been administered by The Cancer Council NSW, under contract, since 1986.

Notification of all newly-diagnosed cases of and deaths due to malignant neoplasm 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.

2.14 Save Our Kids Smiles data

The Save Our Kids Smiles (SOKS) program was a school-based oral health risk assessment and managed care program for all NSW children in years K, 2, 4, 6, and 8. Dental therapists conducted a short assessment of children's oral health in schools, and code participating children according to the urgency of their need for oral health care. Caries status of all teeth (whether teeth are decayed, missing, or filled) was also recorded.

SOKS data were collected annually between 1996 and 2000. SOKS was reviewed by the NSW Department of Health in 1999. The review found that the SOKS assessments under field conditions consistently underestimated active decay compared to assessments conducted in clinic conditions. The mean decay scores from SOKS assessments were around 40% lower than those from clinic-based assessments (Oral Health Branch, NSW Department of Health, 2000). SOKS was replaced by a clinic-based risk assessment program from 2001.

For this report, SOKS data were accessed via HOIST. Data reported for 2000 by several health areas were incomplete or unavailable, and were excluded from trend analysis. Records were excluded where the age of the child was more than 4 standard deviations from the mean age for a given school grade. Data were not adjusted for under-reporting of decay. Adjusted figures for the NSW data have been produced by the AIHW Dental Statistics and Research Unit (AIHW Dental Statistics and Research Unit, 2001).

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 (PHUs) 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 PHUs from general practitioners, hospitals, and pathology laboratories. Data are transferred weekly from PHUs 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 Ageing).

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 (HIC) 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.

ACIR supplies the NSW Department of Health with monthly coverage data that identifies 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 Prison Inmate Survey

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 6000 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 >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, eye sight, hearing, blood sugar level, Mantoux tuberculin skin test, and Pap smear. Shortly after the main survey, prison dentists completed a dental assessment.

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, or considered by custodial staff as 'too dangerous'.

The 1996 survey was repeated in late 2001. The 2001 data, when available, will enable longitudinal health patterns to be explored.

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 1991 was used as the standard population (this is given in Table 1 on page 321). 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 to 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 1997 and 1998, NSW Older People's Health Survey 1999, and NSW Child Health Survey 2001

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).

The 'Lifetest procedure' in SAS version 8.02 was used to perform survival analysis on the breastfeeding data from the NSW Child Health Survey 2001. Survival analysis models data that specifies a time between an initial event and a terminating event. The length of time for which babies received any breastfeeding and full breastfeeding was modelled. The time babies were fully breastfed was determined from the date breastfeeding started (initial event) to the introduction of either solids or a milk substitute, or to the date of survey (terminating event). For any breastfeeding, the terminating event was the cessation of breastfeeding or the date of survey. The survival analysis determined the non-parametric estimates of the survival distribution function using the Kaplan-Meier method. The procedure calculated proportions and 95% confidence intervals at time intervals, allowing for the weighting of the dataset.

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 1996 to 2000 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.

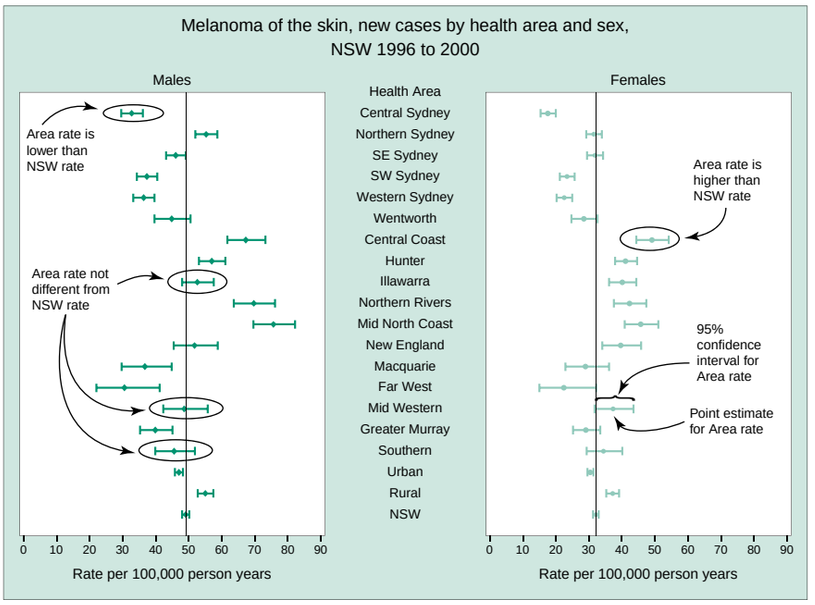


Figure 1 Sample graph demonstrating point estimates and 95% confidence intervals.

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 methods section of the electronic version of this report (www.health.nsw.gov.au/public-health/chorep).

Aetiologic fractions were applied to ABS Mortality data for NSW for the period 1989–2000, and NSW Inpatient Statistics data for the period 1989–90 to 1999–00.

4.2 Rural and remote populations

Chapter 3.3 presents a range of health indicators for NSW according to Accessibility–Remoteness Index of Australia (ARIA) category. ARIA is derived from the road distance of 11,338 populated localities to 201 towns of specified size ('service centres') across Australia. For each locality, distances are converted to a continuous measure from 0 (high accessibility) to 12 (high remoteness) and grouped into 5 categories: 'highly accessible', 'accessible', 'moderately accessible', 'remote' and 'very remote' (Commonwealth Department of Health and Aged Care and GISCA, 1999).

4.3 Country of birth

The country-of-birth groups used in Chapter 3.2 are given in Table 2 below. These are based on geographic regions used by the United Nations (see www.un.org/depts/unsd/methods/m49regin.htm), modified so that Australia, New Zealand, and other countries of Oceania, are presented separately.

Table 2 Country-of-birth groups

Country-of-birth group	Country of birth	Country-of-birth group	Country of birth
Africa	Egypt	Northern & Western Europe	United Kingdom & Ireland
	Other North Africa		Estonia
	Mauritius		Latvia
	South Africa		Lithuania
	Other Africa		Austria
Eastern Asia	China		Denmark
	Hong Kong & Macau		Finland
	Japan		France
	Korea		Germany
	Other Northeast Asia		Netherlands
South Asia	Iran		Switzerland
	India		Other Europe
	Sri Lanka	Southern Europe	Greece
	Other Southern Asia		Italy
South Eastern Asia	Burma		Malta
	Indonesia		Portugal
	Cambodia		Spain
	Laos		Former Yugoslav Republics
	Malaysia & Brunei		Cyprus
	Philippines	Latin America	Argentina
	Singapore		Chile
	Vietnam		Uruguay
	Thailand		Other South America
Middle East	Israel	Central America	
	Lebanon		The Caribbean
	Turkey	Northern America	Canada
	Other Middle East		United States Of America
Eastern Europe	Ukraine		Other Northern America
	Other USSR	Australia	Australia
	Czech & Slovak Republics	New Zealand	New Zealand
	Hungary	Melanesia, Micronesia & Polynesia	Fiji
	Poland		Papua New Guinea
	Romania		Other Oceania

Table 3 below gives the numbers of respondents in the 1997 and 1998 NSW Health Survey, by country of birth.

Table 3 Respondent numbers by country of birth, NSW Health Surveys 1997 and 1998

Country	Males	Females	Persons
Australia	11509	16320	27829
China	146	195	341
Former Yugoslav Republics	89	81	170
Germany	92	144	236
Greece	87	92	179
India	85	64	149
Italy	150	197	347
Lebanon	83	121	204
Netherlands	111	92	203
New Zealand	222	296	518
Philippines	65	153	218
United Kingdom & Ireland	1020	1211	2231
Vietnam	100	133	233
Other countries	1037	1132	2169
Total	14796	20231	35027

4.4 Socioeconomic status

The following relate to methods in Chapter 3.4 on socioeconomic status:

Avoidable mortality

The method used to calculate avoidable mortality was based on that developed by the Ministry of Health in New Zealand (Tobias and Jackson, 2001). Avoidable deaths are those attributed to conditions that are considered preventable or otherwise avoidable through earlier intervention or action. These were 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.

Tobias and Jackson (2001) defined conditions using ICD-9 codes only. The appropriate groupings of ICD-10 codes were developed for this report. The codes used can be found in the methods section of the electronic version of this report (www.health.nsw.gov.au/public-health/chorep).

Avoidable hospitalisations

The method used to calculate avoidable hospitalisations in this chapter used the concept of ambulatory care sensitive (ACS) conditions. These are hospitalisations that could have been avoided through the use of prevention and/or early disease management.

The categories used for the ambulatory care sensitive conditions are based on those used by the Victorian Department of Human Services (2001), which were defined according to ICD-9-CM codes. The appropriate groupings of ICD-10-AM codes were developed for this report. The codes used can be found in the methods section of the electronic version of this report (www.health.nsw.gov.au/public-health/chorep).

Socioeconomic status measures

Socioeconomic (SES) groups used in this chapter were constructed using the index of relative socioeconomic disadvantage (IRSD), which is one of the Australian Bureau of Statistics (ABS) socioeconomic indices for areas (SEIFA) (ABS, 1998). Non-overlapping geographical areas covering all of NSW are assigned an IRSD score calculated from ABS census data based 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.

Three sets of indices have been released by the ABS using data from the censuses conducted in 1986, 1991, and 1996. The IRSD score is an ordinal measure based on a standard score of 1000 for Australia. Therefore, the areas can be ranked by IRSD score but other arithmetic comparisons using the score are not valid. It also means that only ranks, and not the scores calculated using data from different censuses, can be compared. For instance, the score for NSW was 1006 using 1996 census data, which means that the SES of NSW is slightly better than Australia as a whole. The score for NSW in 1991 was 1002; 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.

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 three SES quintiles, which is referred to as the 'rest' or 'balance of NSW population'.

Poisson regression models

Poisson regression models (Armitage et al., 2002) were used to study the effect of time and SES on death rates. The models were used to assess whether there had been an increase over time in the gaps between SES groups. Trends in each indicator by SES group were 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.

The models included age, SES group, and year. They assessed change in death rates by SES group over time, after adjusting for age differences. A relative change in the health gap was determined by comparing the ratios of the fitted mortality rates of the first year of data to the last year of data. An increase in the rate ratio indicates the relative gap has widened and a decrease indicates the relative gap has narrowed. The significance of the change was assessed by testing the difference between the slopes of the trends.

4.5 Psychological distress

The K10 (Kessler and Mroczek, 1992, 1994; Kessler et al., unpublished) was included in the 1997 and 1998 NSW Health Surveys as a relatively short measure of psychological distress that allowed comparison against international survey data and validation against concurrent diagnostic data in the National Survey of Mental Health and Wellbeing (NSMHW) (ABS, 1997; Andrews and Slade, 2001). The K10 (and a briefer K6 measure) were specifically designed for

use in the 'core' of the annual US National Health Interview Survey (NHIS, *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.

The K10 is currently being used in a series of surveys similar to the Australian NSMHW, in 20 countries, under the auspices of the WHO. These surveys have a total sample size of about 200,000. The WHO 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, that 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 use, there are also 4 follow-up questions, that 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'). For presentation, these scores were converted to a 'T-score', calculated for respondents who answered 9 or more questions by subtracting the mean score (for all respondents) from the individual total raw score, then dividing by the standard deviation, multiplying by 10 and finally adding 50. The T-score has a mean of 50 and a standard deviation of 10.

Following standard conventions for instruments of this type, we chose a score of 1 standard deviation above the mean (that is, 60) as a useful level for further comparisons. This should not be regarded as a cut-off score for 'illness', since it is an arbitrary choice. However, it classifies about the same proportion of males and females as having high levels of psychological distress as are found to meet diagnostic criteria for anxiety and depression in other population studies.

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 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 converted to encapsulate postscript (EPS) files, and 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 subroutines). 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.

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 JNS. *Statistical Methods in Medical Research*, 4th edition. Oxford: Blackwell Science, 2002.

Australian Bureau of Statistics. *Information paper: 1996 census socioeconomic indices for areas*. Catalogue no. 29120. Canberra: ABS, 1998.

Australian Bureau of Statistics. *Mental health and wellbeing of adults, Australia 1997*. Catalogue no. 4360.0. Canberra: ABS, 1997.

Bauman A, Chen JC, Cooney A, Dobbinson S, Flaherty B. 1993 *Survey of drug use by NSW primary school children*. Sydney: NSW Department of Health, 1994.

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 (GISCA), *Accessibility–Remoteness Index of Australia*, Occasional Papers Series no 5. Canberra: Department of Health and Aged Care, 1999.

Cooney A, Dobbinson S, Flaherty B. *1992 Survey of Drug Use by NSW Secondary School Students*. Sydney: NSW Department of Health, 1994.

Dobson A, Kuulasmaa K, Eberle E, Schere J. Confidence intervals for weighted sums of Poisson parameters. *Statistics in Medicine 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. Manderscheid RW, Henderson MJ (editors) *Mental Health, United States, 2000*. 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 MI: 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 MI: 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.

Lovelace KS, Schofield WN, Mckenzie JE. *Self-reported behaviours of secondary students. NSW 1999 Statistical Bulletin-Tobacco*. Sydney: The Cancer Council NSW and NSW Department of Health, 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.

Public Health Division. *New South Wales Older People's Health Survey 1999*. *N S W Public Health Bull* 2000; 11(S-2).

Public 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, NC: SAS Institute, 2001.

Schofield WN, Lovelace KS, McKenzie JE, Burns L. *Self reported tobacco and alcohol use among NSW secondary school students. The 1996 Australian School Students Alcohol and Drugs Survey*. Sydney: NSW Department of Health and NSW Cancer Council, 1998.

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: Victorian Department of Human Services, 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 used in this report

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 1-to-1 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 which 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 Table 1 on pages 338–339.

Disease codes

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

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. Procedure codes are shown in Table 2 on page 340. 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.

For more information:

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.

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.

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
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
Botulism	005.1	A05.1
Brucellosis	023	A23
Burns and scalds	E890–E899, E924.0, E924.2, E924.8, E924.9	X00–X19
Cancer (all)	140–208	C00–C97
Cancer: breast	174	C50
Cancer: cervical cancer	180	C53
Cancer: colorectal	153–154	C18–C21
Cancer: lung	162	C33–C34
Cancer: melanoma	172	C43
Cancer: prostate	185	C61
Cardiovascular disease (all)	390–459	I00–I99, G45, G46
Chancroid	099.0	A57
Chickenpox	052	B01
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-9-CM: 099.41, 099.5	A56,A74.8,K67.0,N74.4
Cholera	001	A00
Chronic obstructive pulmonary disease	416.0, 416.8, 416.9, 490–492, 495–496	I27.0, I27.8, I27.9, J40–J44, J67
Coronary heart disease	410, 411, 412, 413, 414	I20, I21, I22, I23, I24, I25
Cryptosporidiosis	ICD-9: no separate code	A07.2
Cutting or piercing injury (unintentional)	ICD-9-CM: 007.4 E920.3, E920.4, E920.8, E920.9, E986	W25–W27,W29,W45, Y28
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 complications	250.1–250.9	E10–E14 with fourth character not = 9
Diabetic coma	250.2, 250.3	E10.0, E11.0, E12.0, E13.0, E14.0
Diphtheria	032	A36
Drowning (death)	E910, E830, E832	W65–W74, V90, V92, T75.1
Eschirichia coli (*E. coli*)—enterohaemorrhagic	ICD-9: no separate code ICD–9–CM: 008.04	A04.3
Falls	E880–E888	W00–W19
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
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
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: n/a; ICD-9-CM: 070.41,070.44, 070.51,070.54	B17.1,B18.2
Hepatitis D	ICD-9: n/a ICD-9-CM: 070.21,070.23, 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–Acquired Immune Deficiency Syndrome (AIDS)	042	B20, B21, B22, B23, B24, F02.4
Homicide	E960–E969	X85–Y09, X87.1
Influenza	487	J10, J11
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, Y87.1, Z61.6

Note 1: External cause codes: ICD-9 or ICD-9-CM codes that begin with E, and ICD-10 or ICD-10-AM codes that begin with V–Z, are external cause codes.

Note 2: Deaths data do not include ICD-9 codes in the range 800–999. External cause codes are used instead.

Table 1 Disease codes (continued)

Group	ICD-9 and ICD-9-CM	ICD-10 and ICD-10-AM
Legionnaires disease	no separate code	A48.1, A48.2
Leprosy	030	A30, B92
Leptospirosis	100	A27
Listeriosis	027.0	A32, P37.2
Malaria	084, 647.4	B50, B51, B52, B53, 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
Motor vehicle crash injury	E810–E825	V20–V79, V02–V04, V09.0, V09.2, V12–V14, V19.0, V19.1, V19.2, V19.4, V19.5, V19.6, V80.3–V80.5, V81.0, V81.1, V82.0, V82.1, V84–V86, V87.0, V87.8, V88.0–V88.8, V89.0,V89.2
Mumps	ICD-9: 072, 321.5 ICD-9-CM: 072	B26
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
Pedestrian injury	E814.7	V02–V04 with fourth character = 1
Pertussis (whooping cough)	033, 484.3	A37
Plague	020	A20
Pneumococcal infection	ICD-9, ICD-9-CM to 1995: 038.2, 041.2, 320.1, 481, 567.1 ICD-9-CM from 1996: 038.2, 041.06, 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	X40–X49
Psittacosis	073	A70
Q fever	083.0	A78
Rabies, lyssavirus	071	A82
Respiratory diseases	460–519	J00–J99
Rubella—congenital	771.0	P35.0
Rubella—other	056, 647.5	B06, M01.4
Salmonella infection (non-typhoid)	003	A02
Scalds	E924.0, E924.2	X10–X13
Shigellosis	004	A03
Sports injury	no equivalent	V00–Y99 with fifth character = 0, in any external cause variable
Stroke	430–438	I60–I69, G45,G46
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, A52, A53, I98.0, K67.2, M03.1, M73.1, N74.2, O98.1
Suicide	E950–E959	X60–X84, Y87.0
Tetanus	037, 771.3	A33, A34, A35
Tuberculosis	ICD-9: 010–018, 137, 320.4, 647.3, 730.4, 730.5, 730.6 ICD-9-CM: 010–018,137, 320.4, 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
Workplace injury	no equivalent	financial status = Workers compen sation or V00–Y99 and fifth charac ter = 2 (in principal external cause code) or Z04.2 (in any diagnosis code) or Z57(in any diagnosis code) or Y93.2 (in any external cause code) or Y96 (in any external cause code)
Yellow fever	060	A95

Note 1: External cause codes: ICD-9 or ICD-9-CM codes that begin with E, and ICD-10 or ICD-10-AM codes that begin with V–Z, are external cause codes.

Note 2: Deaths data do not include ICD-9 codes in the range 800–999. External cause codes are used instead.

Table 2 Procedure codes

Procedure	ICD-9 and ICD-9-CM	ICD-10 and ICD-10-AM
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
Dental: Removal or restoration of teeth	23	97313–00, 97312–00, 97311–00, 97241–00, 97321–00, 97322–00, 97323–00, 97324–00, 97325–00, 97326–00, 97511–00, 97512–00, 97513–00, 97514–00, 97515–00, 97516–00, 97551–00, 97552–00, 97553–00 , 97554–00, 97555–00, 97556–00, 97561–00, 97562–00, 97563–00, 97564–00, 97565–00, 97566–00, 97567–00, 97568–00, 97569–00, 97611–00, 97573–00, 97576–00, 97642–00, 97579–00, 97642–00, 97572–00, 97571–00, 97387–00, 97388–00, 52627–00, 52630–00, 97782–00, 97666–00, 97419–00, 97432–00, 97434–00, 97436–00, 97457–00 or procedure block 462, 463, 469, 470, 471, 478
Myringotomy (insertion of grommet)	20.01, 20.09 in any procedure code	41632–01 or 41632–00 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

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 using registration procedures.

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. Includes only foetuses weighing at least 500 grams or, where birthweight was unknown, of at least 22 weeks gestation.

Hospital separation See SEPARATION

Illicit drugs The following drugs used for non-medicinal purposes: speed, cocaine, sleeping pills–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. Includes only infants weighing at least 400 grams at birth or, where birthweight is unknown, of at least 20 weeks gestation.
Notification	Certification in an approved form of a case of 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 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 an 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).

Health Area	LGA
Central Sydney	Ashfield
Central Sydney	Burwood
Central Sydney	Canterbury
Central Sydney	Canada Bay
Central Sydney	Leichhardt
Central Sydney	Marrickville
Central Sydney	South Sydney
Central Sydney	Strathfield
Central Sydney	Sydney
Northern Sydney	Hornsby
Northern Sydney	Hunters Hill
Northern Sydney	Ku-ring-gai
Northern Sydney	Lane Cove
Northern Sydney	Manly
Northern Sydney	Mosman
Northern Sydney	North Sydney
Northern Sydney	Pittwater
Northern Sydney	Ryde
Northern Sydney	Warringah
Northern Sydney	Willoughby
Western Sydney	Auburn
Western Sydney	Baulkham Hills
Western Sydney	Blacktown
Western Sydney	Holroyd
Western Sydney	Parramatta
Wentworth	Blue Mountains
Wentworth	Hawkesbury
Wentworth	Penrith
South Western Sydney	Bankstown
South Western Sydney	Camden
South Western Sydney	Campbelltown
South Western Sydney	Fairfield
South Western Sydney	Liverpool
South Western Sydney	Wingecarribee
South Western Sydney	Wollondilly
Central Coast	Gosford
Central Coast	Wyong
Hunter	Cessnock
Hunter	Dungog
Hunter	Lake Macquarie
Hunter	Maitland
Hunter	Merriwa
Hunter	Murrurundi
Hunter	Muswellbrook
Hunter	Newcastle
Hunter	Port Stephens
Hunter	Scone
Hunter	Singleton
Illawarra	Kiama
Illawarra	Shellharbour
Illawarra	Shoalhaven
Illawarra	Wollongong
South Eastern Sydney	Botany
South Eastern Sydney	Hurstville
South Eastern Sydney	Kogarah
South Eastern Sydney	Randwick
South Eastern Sydney	Rockdale
South Eastern Sydney	South Sydney
South Eastern Sydney	Sutherland
South Eastern Sydney	Sydney
South Eastern Sydney	Waverley
South Eastern Sydney	Woollahra
South Eastern Sydney	Lord Howe Island
Northern Rivers	Ballina
Northern Rivers	Byron
Northern Rivers	Copmanhurst
Northern Rivers	Grafton
Northern Rivers	Kyogle
Northern Rivers	Lismore
Northern Rivers	Maclean
Northern Rivers	Pristine Waters
Northern Rivers	Richmond Valley
Northern Rivers	Tweed
Mid North Coast	Bellingen
Mid North Coast	Coffs Harbour
Mid North Coast	Gloucester
Mid North Coast	Greater Taree
Mid North Coast	Great Lakes
Mid North Coast	Hastings
Mid North Coast	Kempsey
Mid North Coast	Nambucca
New England	Armidale Dumaresq
New England	Barraba
New England	Bingara
New England	Glen Innes
New England	Gunnedah
New England	Guyra
New England	Inverell
New England	Manilla
New England	Moree Plains
New England	Narrabri
New England	Nundle
New England	Parry
New England	Quirindi
New England	Severn
New England	Tamworth
New England	Tenterfield
New England	Uralla
New England	Walcha
New England	Yallaroi
Macquarie	Bogan
Macquarie	Cobar
Macquarie	Coolah
Macquarie	Coonabarabran
Macquarie	Coonamble
Macquarie	Dubbo
Macquarie	Gilgandra
Macquarie	Mudgee
Macquarie	Narromine
Macquarie	Warren
Macquarie	Wellington
Mid Western	Bathurst
Mid Western	Blayney
Mid Western	Cabonne
Mid Western	Cowra
Mid Western	Evans
Mid Western	Forbes
Mid Western	Lithgow
Mid Western	Lachlan
Mid Western	Oberon
Mid Western	Orange
Mid Western	Parkes
Mid Western	Rylstone
Mid Western	Weddin
Far West	Balranald
Far West	Bourke
Far West	Brewarrina
Far West	Broken Hill
Far West	Central Darling
Far West	Walgett
Far West	Wentworth
Far West	Unicorp Far West
Greater Murray	Albury
Greater Murray	Berrigan
Greater Murray	Bland
Greater Murray	Carrathool
Greater Murray	Conargo
Greater Murray	Coolamon
Greater Murray	Cootamundra
Greater Murray	Corowa
Greater Murray	Culcairn
Greater Murray	Deniliquin
Greater Murray	Griffith
Greater Murray	Gundagai
Greater Murray	Hay
Greater Murray	Holbrook
Greater Murray	Hume
Greater Murray	Jerilderie
Greater Murray	Junee
Greater Murray	Leeton
Greater Murray	Lockhart
Greater Murray	Murray
Greater Murray	Murrumbidgee
Greater Murray	Narrandera
Greater Murray	Temora
Greater Murray	Tumbarumba
Greater Murray	Tumut
Greater Murray	Urana
Greater Murray	Wagga Wagga
Greater Murray	Wakool
Southern	Bega Valley
Southern	Bombala
Southern	Boorowa
Southern	Cooma–Monaro
Southern	Crookwell
Southern	Eurobodalla
Southern	Goulburn
Southern	Gunning
Southern	Harden
Southern	Mulwaree
Southern	Queanbeyan
Southern	Snowy River
Southern	Tallaganda
Southern	Yarrowlumla
Southern	Yass
Southern	Young

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