

Foreword

This State of Health report is the third in a series, expanding on its predecessor 'State of Health 2001' which was produced to support the 'Health 2020' agenda. It provides an overview of trends in health and health services, and how Queensland compares with other Australian states and territories and other developed countries. Comparisons are based on the most significant health issues for the people of Queensland, including the seven National Health Priority Areas and other key health areas.

Queensland Health is one of the nation's leaders in the areas of hospital services reforms, advances in quality of health care and investment in health infrastructure. This report breaks new ground in setting a standardised method for national and international benchmarking, fostering a culture of excellence. It complements 'Health Determinants Queensland' which provides a detailed analysis of health issues within Queensland. The State of Health report provides an overview of hospital usage and Medicare. It provides for the first time an overview of the quality and safety of health services, and of health and medical research in Queensland. The report provides information in support of Queensland Health's strategic intents for 'a healthier Queensland'.

Internationally, Queensland performs in the top third of developed countries, or better, for life expectancy, mortality for land transport accidents, and mortality for respiratory disease. Hospital admission rates, non-admitted occasions of service per capita and immunisation rates are above the national average, while cost per casemix adjusted hospital separation have been maintained at among the lowest in Australia.

In many areas, the health of Queenslanders mirrors that of the Australian population. The major causes of disease and injury in Queensland are similar to the rest of Australia. In areas such as lung cancer in men, breast and cervical cancer in women, colorectal cancer and cardiovascular disease there has been significant reduction in mortality in Queensland.

In the national and international setting, areas in which there is considerable potential for continuing gain, include cardiovascular and related chronic conditions, trauma associated with accidents, suicide, depression, child health and sudden infant death syndrome, and Indigenous health. Many of these conditions are preventable or avoidable and must be areas of priority. At the same time, the way individuals and society view health needs to be addressed.

Health status results from a complex interaction of social, economic, environmental, behavioural and genetic factors. Global forces, government policies and culture impact on the living and working conditions of individuals, families and communities which in turn, impact on their psychosocial well-being, and the levels of risk-taking versus preventive behaviours. These factors, as well as genetic factors, directly or indirectly impact on morbidity, mortality, quality of life and life expectancy.

Dr Gerry FitzGerald
Chief Health Officer

Executive summary

By almost any yardstick, Queenslanders and Australians enjoy health and wellbeing that ranks among the world's best. Life expectancies improved dramatically through the twentieth century and continue to improve, as do the expectations of health, functioning and quality of life throughout those additional years.

Population profiles

Queensland's population was estimated at 3.7 million in June 2003 – a little over 18% of the national total. Queensland is the 3rd most populous state after NSW and Victoria.

It has the fastest growing population of the Australian states at 2.3% per year – over one third of the nation's total growth and 86,000 people more than in the previous year.

The population is widely dispersed – with high concentrations in the south eastern corner, populous provincial cities and towns along the east coast and smaller and more isolated communities in the north and west.

Like developed countries around the world and other Australian states, the population is ageing. At the 1971 Census, 13.2% of Queenslanders were aged 60 years and over. The proportion of the population aged 60 years and over in Queensland is expected to grow from 16% in the year 2003 to 33.5% in 2051. Indigenous Queensland has a much younger profile, reflecting higher mortality rates and higher fertility rates.

The age structure, composition, distribution and rapid growth of the population have major implications for health and health services.

Life expectancy

A Queensland male born in 2002 has a life expectancy of 77.2 years – a female has an expectancy of 82.4 years. These increases represent gains of 9.3% for males and 6.6% for females over the last 20 years.

Australia ranked sixth in the world for life expectancy in 2000. Queensland rates are only marginally below the national average, though several months shorter than those of Australian Capital Territory and Western Australia.

On average, Indigenous Queenslanders die 20 years younger than their non-Indigenous counterparts. This reflects patterns of mortality that are higher in every age group, with differences peaking in middle age.

Infant, maternal and child health

Around 50,000 babies are born in Queensland every year.

Infant mortality rates (death rates in children in the first year of life) have fallen from 10.4 per 1,000 live births in 1981 to 5.9 in 2001. This is above the Australian rate and slightly above the OECD average.

Mortality rates for Indigenous infants in Queensland have fallen dramatically in recent decades, but remain twice those of their non-Indigenous counterparts.

Maternal mortality has been reduced to a small number in any year. Most maternal deaths are now due to external causes and pre-existing conditions in the mother rather than complications of pregnancy and childbirth.

Rates of low birth weight are relatively constant over time at around 7%, but are 12% in babies born to Indigenous mothers. Prematurity patterns are similar.

All babies born in Queensland are screened in the first week of life for hypothyroidism, galactosaemia, phenylketonuria and cystic fibrosis. Neonatal screening for these diseases is carried out in all states.

Early diagnosis and treatment or management improves quality of life and life expectancy for those infants who are affected.

Immunisation rates for very young children in Queensland exceed the national target of 90%, but rates for 6-year-olds are marginally below the national average.

Rates of overweight and obesity in children have risen rapidly in recent decades. These conditions can have their origins in pregnancy and early childhood and have important implications for future health.

Heart disease and stroke

Heart disease and stroke are leading causes of mortality. Rates for both have halved in the last fifteen years

Australia ranks among the mid-range of OECD countries on heart disease. Queensland rates are around 8% above the national average.

For stroke, Australian rates are towards the lower end of international rankings. Queensland performs marginally better than total Australia.

Queensland males die from heart disease at twice the rate of females, similar to the pattern in other states.

Indigenous Queenslanders have rates of heart disease and stroke that are several times higher than those of other Queenslanders.

Queensland's health services achieve world class outcomes in the management of heart disease and stroke. The greatest potential for health gains lies in reducing risk factors, such as smoking, overuse of alcohol, overweight and obesity and high blood pressure, and ensuring those who have experienced heart attacks and strokes get access to effective rehabilitation and secondary prevention programs.

Cancer

Queensland rates for cancer are generally comparable with rates elsewhere in Australia and the developed world. A notable exception is melanoma, where we have the world's highest rates.

Lung cancer accounts one-third of the total burden of cancer in Queensland. Over two-thirds of this is in males, whose rates are falling, while female rates are rising.

Colorectal cancer is being identified earlier. While the number of new cases is rising, mortality rates are continuing to fall for both men and women.

Melanoma incidence has increased by 55% for males and 20% for females over the last 15 years. In that time, mortality has also risen, but at lower rates – 6% and 9% respectively.

Breast cancer is the major cause of cancer death in Queensland women. While incidence continues to increase, mortality has been decreasing since the mid-1990s, principally as a result of increased screening activity and improved treatment. The proportion of women aged 50-69 participating in the BreastScreen Queensland program has risen from 43% in 1996-97 to 62% in 2001-02.

Around 60% of eligible women participate in cervical screening programs. Cervical cancer rates have fallen significantly as a consequence of effective screening programs and treatments. Rates among indigenous women are many times higher than in the general population.

Prostate cancer is the second largest cause of cancer deaths in men, with two-thirds of these occurring in men 75 years and over. Incidence rates have stabilised following a peak in the mid-1990s, which coincided with the widespread introduction of the prostate specific antigen (PSA) test. Death rates increased steadily through the early 1980s but have declined slightly from the mid-1990s.

Mental health

While suicide and the consequences of harmful use of alcohol and drugs are the major causes of deaths classified as mental health problems and disorders, the vast burden of mental health problems and disorders is characterised by illnesses of long duration that adversely affect people's functioning and quality of life.

Mental health problems affect people of all ages.

Suicide accounts for around 19% of the burden of mental health problems and disorders in Queensland, where rates are significantly higher than the national average. As in other states, suicide rates are higher in males than females.

Depression and anxiety disorders, alcohol and drug dependence and schizophrenia are the major causes of mental health disability and hospitalisation.

Around one-quarter of the total burden of years of life lost due to disability in Queensland is attributable to mental health problems.

Injury

Injury accounts for around 7% of total deaths, but its impact is much higher because of the prematurity of many deaths, the years of life lost and the disabling consequences.

For most indicators of injury, rates have fallen considerably in recent decades.

The incidence and impact of transport injuries has fallen steadily since the 1970s, with land transport mortality among the lowest third of developed countries.

Rates for males are much higher than for females in all states, especially in the younger age groups.

Falls in older people remain a major cause of death and disability.

Drowning accounts for several childhood deaths each year. Some of these occur in domestic swimming pools and the decline achieved through pool fencing legislation and pool safety awareness campaigns in the early 1990s has not been maintained.

Diabetes mellitus

Diabetes prevalence has risen steadily in Queensland in recent decades. It affects many bodily systems, causing heart disease and stroke and other complications resulting in blindness, kidney disease and amputations.

Queensland rates are similar to the national average for both males and females.

The condition is most prevalent in Indigenous Queenslanders and is particularly high in Torres Strait Islander people.

As the population ages, the burden of diabetes can be expected to increase considerably.

Asthma and chronic obstructive lung disease

Asthma usually originates in childhood and can have a lifelong effect on quality of life. Other respiratory conditions can also be of long duration and cause considerable disability.

Deaths from respiratory diseases have fallen steadily, especially in males, reflecting lower smoking rates in men. Queensland mortality rate from respiratory diseases is among the third lowest of developed countries.

Mortality rates for females are close to the national average, but those for males are a little higher.

Asthma death rates are falling, but it remains a major cause of hospitalisation, especially for younger children, and of doctor consultations and pharmaceutical use.

Musculoskeletal disease

Musculoskeletal disease causes a relatively small number of deaths, but is a major cause of hospitalisation, doctor visits and medicine use.

Over 4,000 hip replacements and 5,000 knee replacements are performed in Queensland each year.

Osteoporosis is a major risk factor for fractures of the back and hip. It affects 50% of women and 30% of men aged 65 years or over.

Communicable diseases

Queensland and Australia have relatively low rates of most communicable diseases, but increasing mass travel, mass production of food, and other social changes present many challenges and require a sophisticated system of public health services.

Threats to public health in recent years have included HIV/AIDS, Severe Acute Respiratory Distress Syndrome (SARS), potential threats due to bioterrorism and the re-emergence of 'old' diseases such as tuberculosis and influenza.

Free influenza vaccines have been available to older Queenslanders since the late 1990s and many influenza deaths have thus been averted.

Sexually transmitted diseases and hepatitis B and C remain as major challenges.

Health Risk Factors

Tobacco smoking is the single risk factor responsible for the greatest burden of disease. Although smoking rates have been declining for some years, Queensland has the highest rate of adult male smokers (28%).

Overweight and obesity rates in Australia are second only to the USA. In 2001, Queensland rates were the highest in the country for both men (56%) and women (41%).

Fewer than 15% of Queensland men and 21% of women met the recommended daily intake of vegetables while 42% and 55% respectively met the recommended intake of fruit.

Lack of regular physical activity is similar to the national pattern, with around 55% of Queensland adults not meeting levels consistent with physical activity guidelines.

Hypertension is a risk factor for heart disease, stroke and renal disease. The AusDiab study of 2000 estimated that a quarter of Queenslanders had hypertension based on physical measurement, and almost one half of adult Queenslanders had high blood cholesterol.

Within Australia, Queensland had the highest proportion of males (15.7%) and the third highest proportion of females (8.1%) who were risky/high risk drinkers.

Unsafe sex contributes to a range of conditions including HIV/AIDS. Rates of HIV in Queensland have been kept low through programs aimed at safe sex and needle exchanges, but in recent years, rates of HIV diagnosis have increased. The group most at risk is men who have sex with men.

Deaths from illicit drug use in Queensland are the lowest of the Australian states and territories. Over three-quarters of the 94 deaths per year occur in males, with highest rates in the 25-29 year age group.

Use of health services

Queenslanders are lower users of Medicare services (mainly general practitioner consultations and pharmaceuticals) than the national average. Levels of use and Medicare outlays fall rapidly with increasing remoteness and increase steeply with age.

Medicare use has increased over time, with the average Queenslanders now using close to 11 services a year – up from around 7 in the mid 1980s.

At 352 per 1,000 population, hospital admission rates in Queensland in 2002-03 were 5% above the national average.

A relatively high proportion of admissions are to private hospitals – 46% compared with an Australian average of 39%.

Areas with high Indigenous populations had much higher hospitalisation rates, reflecting worse health status and lower access to primary health care.

For every person in Queensland, there are around 2 non-admitted patient occasions of service provided by public hospitals each year.

Government health expenditure is around the national average, but non-government expenditure is significantly less than in other states.

Total government expenditure for Indigenous persons is estimated at around 20% higher than for their non-Indigenous counterparts. Relative to their health status, this figure is low. Most of it is in hospital services, where admissions are 2-3 times the rate of the general population. Expenditure on Medicare services is less than 40% of that expended on non-Indigenous people.

Public hospital activity, quality and outcomes

There were 733,699 admitted patient episodes of care in 2002-03.

Emergency department and elective surgery waiting times are generally comparable with national levels and reflect the constant pressure experienced by health services around the country.

Queensland performs favourably compared to other jurisdictions in terms of utilisation and outcomes.

Queensland hospitals operate very efficiently, achieving the lowest cost per casemix adjusted separation of all the states and territories.

Patient satisfaction surveys indicate that 90% of those surveyed are fairly satisfied with the services they have received.

Health and Medical Research

Investment in health and medical research is associated with significant improvements in health and health care. Research and development is a major potential source of innovation and future wealth. A vibrant research culture attracts leading health scientists and clinicians. Queensland has extensive research infrastructure and ranks third of the states in terms of attracting external research funding. Gains remain to be made in research output as measured by publication rate, where Queensland underperforms relative to the other states.

1. A profile of Queensland's population

Overall view

Queensland's population was estimated to be 3.7 million (18% of Australia's population) in June 2003 [1]. Like developed countries around the world and other Australian states, the population is ageing.

By the year 2051 the population is expected to increase by 69% to 6.4 million [2]. At the 1971 census, 13.2% of Queenslanders were aged 60 years and over. With higher life expectancy and declining birth rates, the proportion of the population aged 60 years and over in Queensland is expected to grow from 16% in the year 2003 to 33.5% in 2051 [2]. Figure 1 shows the projected increase in the proportion of older people in the population by 2051 compared with 2003. Whilst older people access health care more frequently than younger groups, experience in other developed countries suggests that the relative proportion of the aged population is not correlated with health care expenditure [3].

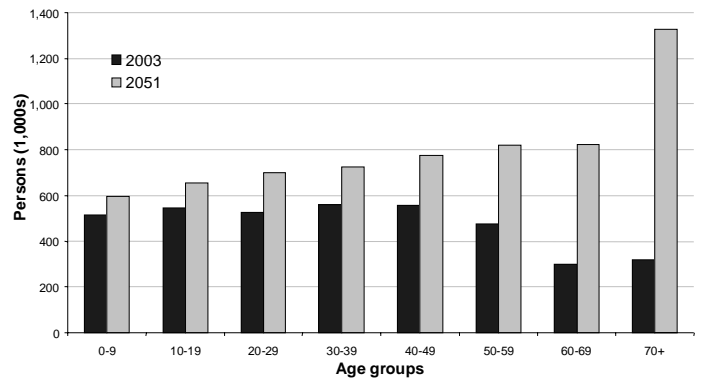
Queensland is the third most decentralised jurisdiction in Australia, after the Northern Territory and Tasmania, with 22.3% of the population living in outer regional or remote areas, compared with the national average of 13.5%.

Note: Projections assume 'medium' fertility.

Life expectancy at birth

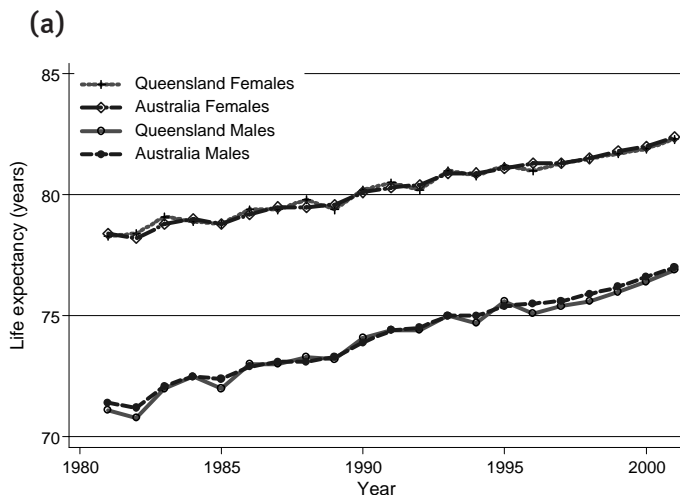
Between 1981 and 2001, Queenslanders' life expectancy at birth increased by 5.8 years from 71.1 to 76.9 years for males, and by 4 years from 78.3 to 82.3 years for females (Figure 2(a)) [1].

Figure 1. Queensland population by age group, 2003, and projected population, 2051 [2]

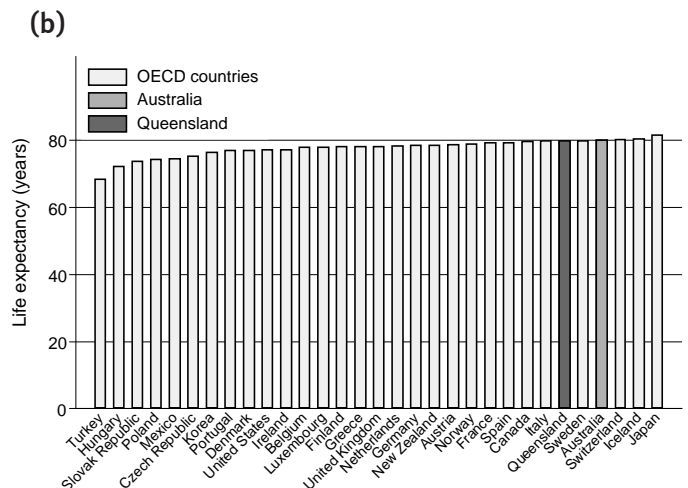


Data Source: Queensland Government Office of Economic and Statistical Research

Figure 2. (a) Queensland life expectancy at birth, 1981-2001. (b) Life expectancy in Australia compared with selected OECD countries.



Data Source: Australian Bureau of Statistics: Australian Historical Population Statistics



Data Source: OECD data 2004 Standardised to the total OECD population 1980

Queensland had the sixth and Australia the fourth highest life expectancy compared to OECD countries in 2001 (Figure 2(b)) [4]. Life expectancy at birth in Queensland in 2001 ranked equal third of the states with NSW for males, and fifth for females [5].

The experimental life table for Indigenous peoples estimates that life expectancy at birth (1999-2001) for Queensland Indigenous peoples is 56.6 years for males and 62.5 years for females, comparable to estimates for the other states, and about 20 years lower than for the general population [6]. These estimates are classed as 'experimental' because they may be affected by inadequacies in the coverage of Indigenous deaths, and the varying propensity to identify as Indigenous [6].

The gap in life expectancy between Indigenous peoples and the general population has been found to be greatest in Australia, compared with that in New Zealand, Canada, and the United States [7]. In contrast to many developing countries, low life expectancy of Indigenous Australians is the result of relatively high and early adult mortality, rather than high infant mortality [8].

Infant mortality

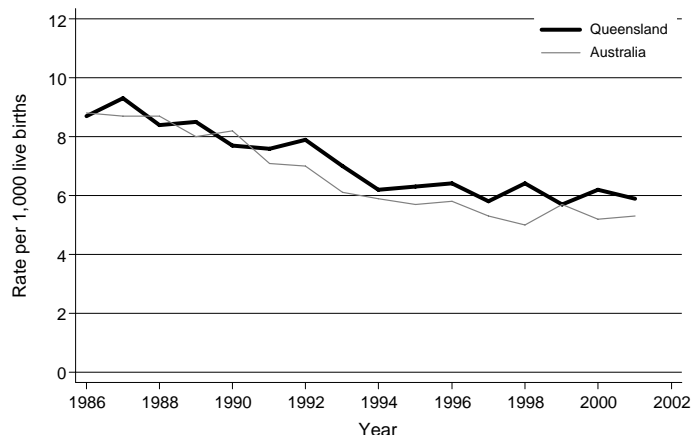
Infant mortality (deaths in children in the first year of life) is an indicator of the general health and well-being of a population.

The infant mortality rate in Queensland has improved steadily from 10.4 per 1,000 live births in 1981 to 5.9 per 1,000 births in 2001, but has remained higher than the corresponding Australian rates, which improved from 10.0 in 1981 to 5.3 in 2001 (Figure 3) [5, 6].

The Australian infant mortality rate is favourable compared with the average rate of 8.0 per 1,000 births in other developed countries (Europe, North America, New Zealand and Japan) [6], but was ranked in the second half of selected OECD countries in 2001 (Figure 4).

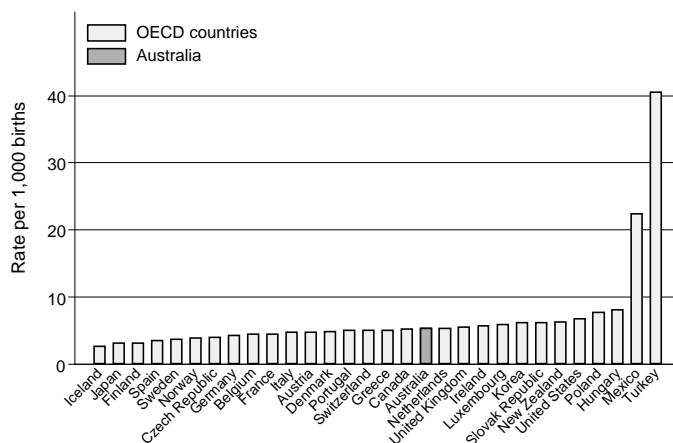
The mortality rate for Indigenous infants in Queensland in 2001 was 10.6 per 1,000 births, over twice as high as the rate for non-Indigenous infants of 4.9 per 1,000 births, and higher than the rates for New Zealand Indigenous infants (Figure 5). The Indigenous infant mortality rate in other Australian states, where available, ranged from 7.1 per 1,000 births in NSW to 16.3 per 1,000 births in Western Australia. The non-Indigenous rates for other states ranged from 4.4 per 1,000 births in Victoria to 6.6 per 1,000 births in Western Australia [6].

Figure 3. Infant mortality rates from 1981 to 2001 in Queensland and Australia.



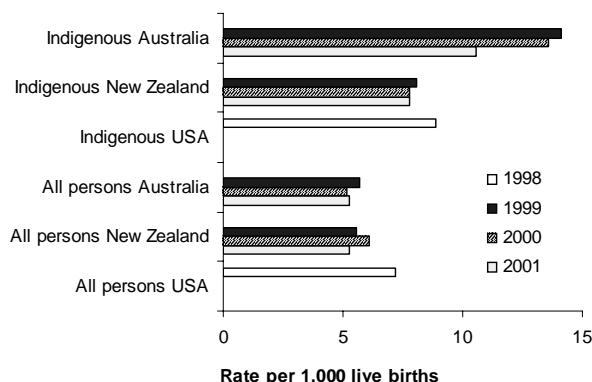
Data Source: Australian Bureau of Statistics

Figure 4. Infant mortality in Australia, and OECD countries, 2001.



Data Source: OECD data 2004

Figure 5. Infant mortality rates in Indigenous and non-Indigenous infants, Australia, New Zealand, and the USA, selected years.

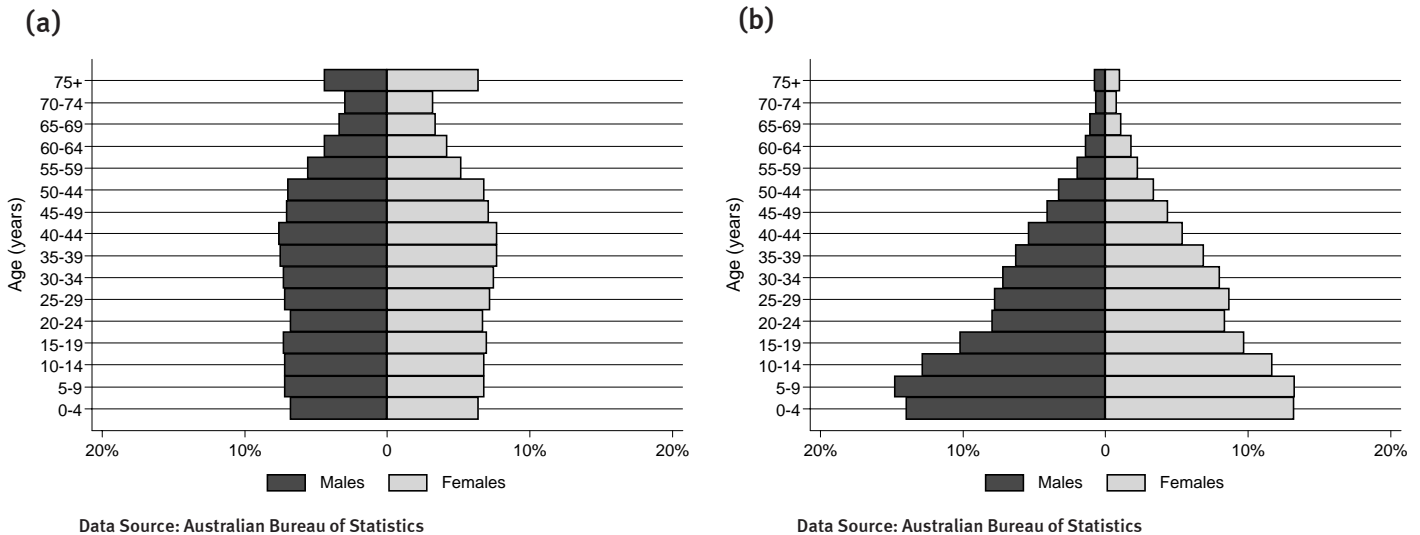


Data Source: Australian Bureau of Statistics

Age structure of the population: a comparison between Indigenous and non-Indigenous populations

The age structure of Queensland's non-Indigenous population reflects low infant mortality rates and high life expectancies, and is similar to that of other developed countries (Figure 6(a)).

Figure 6. Population distribution for (a) non-Indigenous and (b) Indigenous peoples in Queensland 2001 [9].



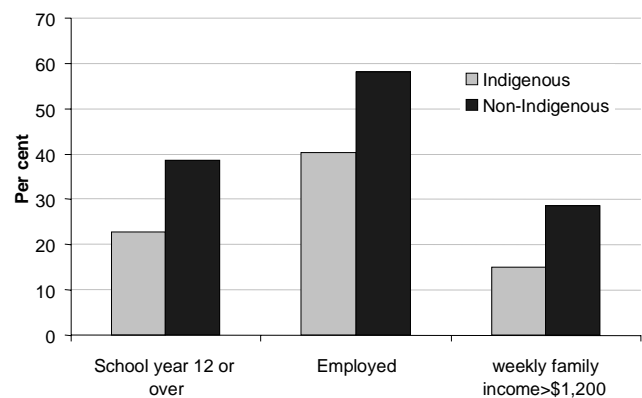
At June 2001, it was estimated that there were 112,772 Aboriginal people and Torres Strait Islanders resident in Queensland. Indigenous peoples comprised 3.1% of Queensland's total population and, and Queensland Indigenous peoples about 27.5% of Australia's total Indigenous population [9].

Queensland's Indigenous population was substantially younger than the non-Indigenous population. Half of the Indigenous population were aged under 20 years, compared with just over a quarter (27.8%) of the non-Indigenous population. Only 4% of the Indigenous population were aged 60 years or over compared with 16% of the non-Indigenous population (Figure 6(b)) [9].

These differences in the age distribution are mainly caused by higher fertility rates and high levels of premature death in Aboriginal and Torres Strait Islander populations.

Fewer Indigenous Queenslanders completed year 12 at school, were employed, or had weekly family incomes over \$1,200 per week than non-Indigenous Queenslanders in 2001 (Figure 7) [10].

Figure 7. Proportion of Indigenous and non-Indigenous Queenslanders aged 15 years or older, who completed school to grade 12 or were employed, and proportion of Indigenous and non-Indigenous families with a weekly income over \$1,200.



Comparison of premature mortality in non-Indigenous and Indigenous people

Over the period 1989 to 2001, the estimated median age at death for non-Indigenous people in Australia increased consistently for both males and females (Figure 8) [6].

During the same period, there was no overall increase in the median age at death for Australian Indigenous males and females. The median age at death for Indigenous people has remained at least 20 years below that of non-Indigenous people.

The lack of improvement in the median age at death among Indigenous people suggests that there has been little or no improvement in death rates.

The greatest differences in the age-specific death rates between the Indigenous and non-Indigenous populations (Figure 9) are in the 40-59 years age group.

In this age group the mortality rates are five to seven times higher for the Indigenous population than the non-Indigenous population. Much of this excess can be attributed to premature onset of chronic diseases such as heart disease, diabetes and chronic respiratory disease, and to injury.

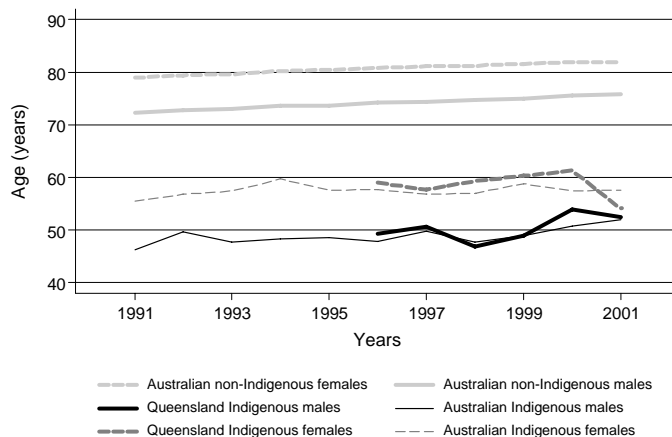
Mortality data for the Indigenous population before 1996 in Queensland are not available because of the lack of an Indigenous identifier on death certificates. Australian data are available from 1989, but before 1996 these data do not include Queensland.

Geographic and socioeconomic population distribution in Queensland

Queensland and Australia differ from other countries in that the population is distributed over a wide area. To systematically tailor services to meet the needs of Australians living in regional Australia, 'remoteness' needs to be defined. The Australian government has developed the Accessibility/Remoteness Index of Australia (ARIA) [11].

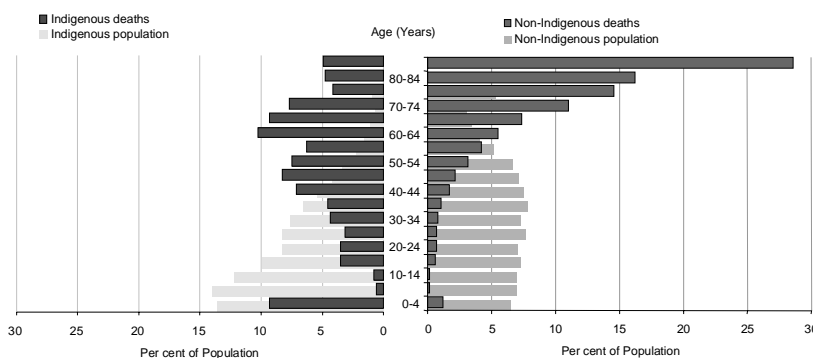
Forty five percent of Indigenous peoples in Queensland live in urban areas, 38% in rural areas, and 17% in remote areas. Of non-Indigenous people, 69% live in urban, 29% in rural and 2% in remote areas.

Figure 8. Median age at death, Indigenous and non-Indigenous, Queensland and Australia, 1991 to 2001 [6].



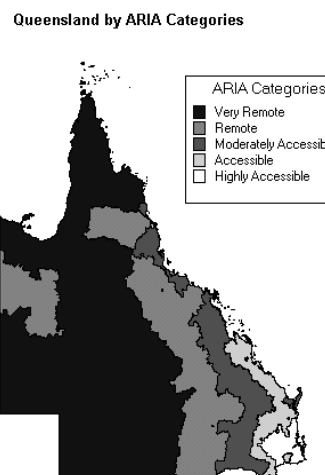
Data Source: Australian Bureau of Statistics

Figure 9. Age distribution of deaths and population, for Indigenous and non-Indigenous peoples, Queensland, 2000-01.



Data Source: Australian Bureau of Statistics

Map 1. Queensland by Accessibility and Remoteness Index of Australia (ARIA) categories



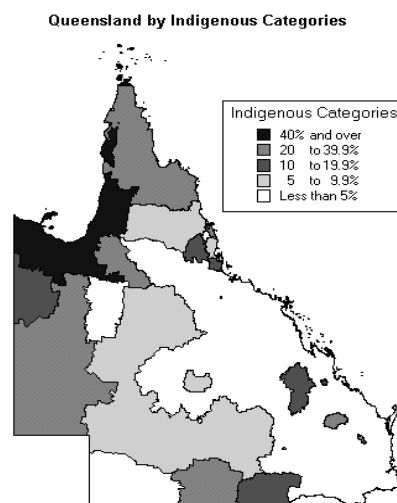
Health differentials exist within Queensland between specific population subgroups such as:

- males and females,
- five levels of socio-economic disadvantage defined according to the Socio-Economic Indexes for Areas (SEIFA) [12],
- five levels of accessibility and remoteness [11] (see Map 1),
- four categories representing the proportion of the population self-identified as Aboriginal people and Torres Strait Islanders (Map 2). [Note that some small areas with high proportions of Indigenous people in the south-east corner of the State are not visible in the map.]

The patterns of health differentials reflected in these groupings are not necessarily mutually exclusive. For example, areas of socio-economic disadvantage and very remote areas can have higher proportions of Aboriginal people and Torres Strait Islanders in the population. Mortality rates are significantly higher among Indigenous peoples for most conditions, and, as a result, overall increasing mortality with increasing remoteness reflects higher proportions of Indigenous people.

In 2001, over 600,000 Queensland residents had been born overseas. This proportion (17% of the population) is slightly lower than the average for Australia (22%). Over 20 languages other than English are spoken at home, the most common being Italian, used at home by 9.8% of Queenslanders who speak languages other than English, compared with 12.4% of all Australians [13]. The relative numbers of those born overseas are small, and not sufficient to provide reliable estimates of health status.

Map 2. Queensland by the proportion of the population who are Indigenous.



2. How healthy are Queenslanders? Is it the same for everyone?

The aim of this section is to provide an overview of the health status of Queenslanders relative to other Australian States and other developed countries, and to identify areas where potential health gains can be made.

Australian health ministers have identified seven National Health Priority Areas where significant health gains can be made or where the conditions are largely preventable. These are cardiovascular health, cancer, mental health, injury prevention and control, diabetes mellitus, asthma, arthritis, and musculoskeletal conditions including osteoporosis. Each of these areas will be addressed specifically in this report. An overview of other key health areas in Queensland, including health of children, and communicable disease, is also included.

Burden of disease – an overall measure of health status

The concept of “Burden of Disease” has been used to estimate the number of years lost because of premature mortality, as well as disability caused by a non-fatal disease or condition. For some conditions, such as lung cancer, the burden of disease is made up primarily of premature mortality, while for others, such as asthma and depression, the burden of disease comprises mainly disability.

Disability is defined as any departure from full health, and this can include short-term disability such as a common cold through to a long-term disability such as quadriplegia [14]. This is a much broader definition of disability than is often used in common language.

Estimates of the burden of disease from disability are based on factors such as the age at which the disease or injury happened and the severity and duration of the disease or injury. These factors are summarised into single numbers to enable comparisons and analysis of the burden of selected diseases or injuries across populations.

A formal analysis of the burden of disease in Australia has been published [14], and applied to Queensland.

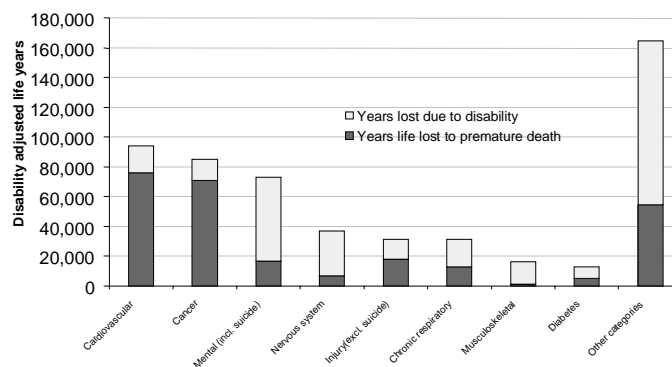
Cardiovascular disease and cancer were the greatest causes of premature death. Mental disorders (including suicide and self-harm) were the third largest cause of burden of disease, and the largest causes of non-fatal disability in the Queensland burden of disease study. This is primarily because of the high prevalence of major depression. Most of the premature mortality for mental disorders was from suicide. Nervous system disorders caused the fourth largest burden of disease. This group includes dementia, age-related vision disorders and adult-onset hearing loss. As the population ages, the burden of disease for these disorders is expected to increase. Figure 10 provides a summary of premature mortality and disability for major disease groups in Queensland.

Injury (excluding suicide and intentional self-harm) was the fifth largest disease group, and was a significantly larger contributor to the overall burden of disease in Queensland than the national average [15].

In general, the major causes of diseases and injury in Queensland were similar to Australia. Australian data suggests that at least 17% of the total burden of disease is due to socioeconomic disadvantage [14].

As a group, health conditions listed as National Health Priority Areas contribute substantially to the burden of disease and injury in Queensland [15].

Figure 10. Annual burden of disease by disease group, Queensland, 1996-1998.



Data Source: Health Information Branch, Queensland Health

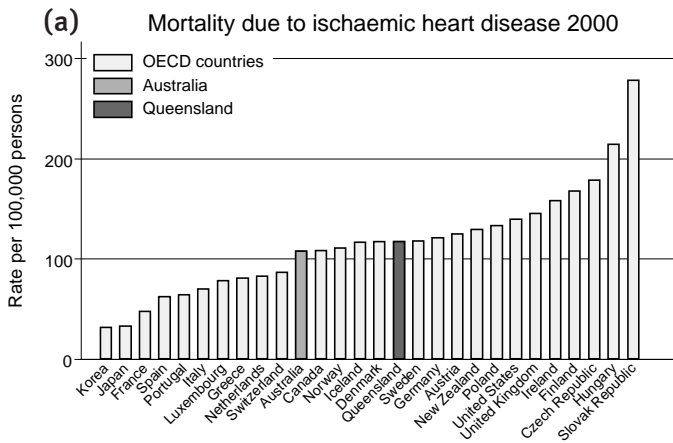
MEASURING HEALTH STATUS AND DIFFERENTIALS: THE SEVEN NATIONAL HEALTH PRIORITY AREAS.

Cardiovascular disease

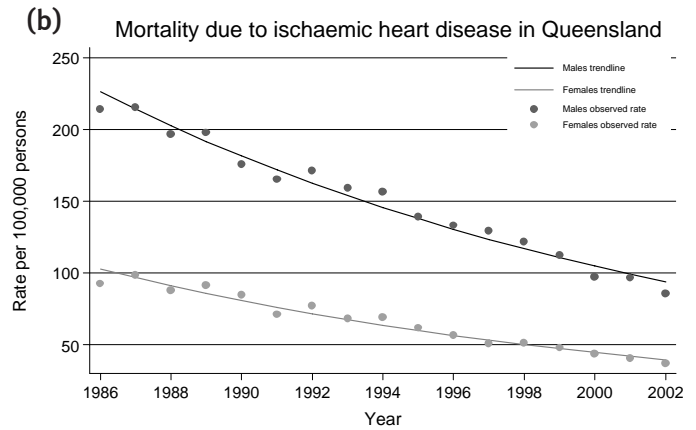
Ischaemic heart disease (heart attack and angina) and cerebrovascular disease (stroke) were the leading causes of death in both non-Indigenous and Indigenous Queenslanders in 2002 [16]. In 2001, 2.4% of Queenslanders had ischaemic or other heart disease [17].

Figure 11. Ischaemic heart disease mortality.

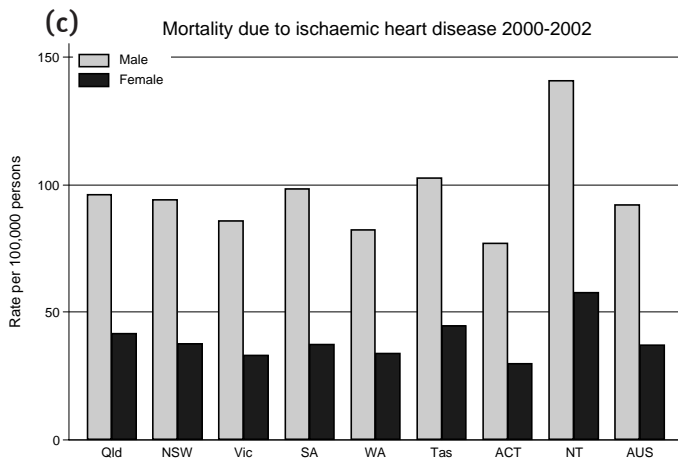
(a) Comparison of mortality due to ischaemic heart disease in OECD countries, 2000 (b) Trends in mortality due to ischaemic heart disease (males and females aged 0-79 years), Queensland, 1986 to 2002. (c) Mortality due to ischaemic heart disease (males and females aged 0-79 years) by state, 2000-2002. (d) Mortality due to ischaemic heart disease (persons all ages) by sex, SEIFA index and Indigenous distribution, Queensland, 2000 - 2002.



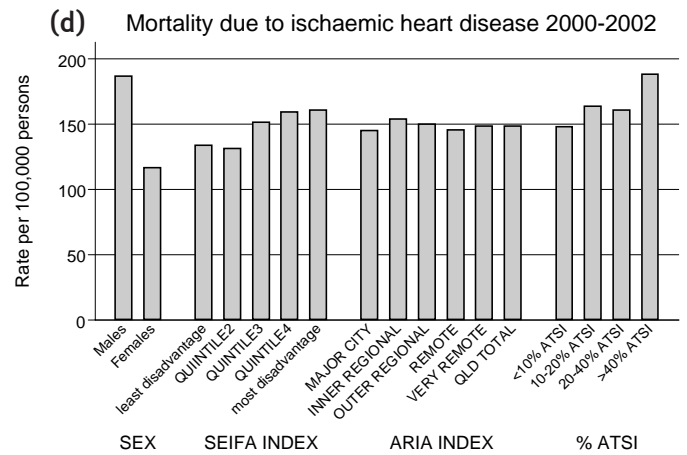
Data Source: OECD Data 2004
Standardised to the total OECD population 1980



Data Source: Australian Bureau of Statistics
Standardised to the 2001 Australian population



Data Source: Australian Bureau of Statistics
Standardised to the 2001 Australian population



Data Source: Australian Bureau of Statistics
Standardised to the 2001 Australian population

Ischaemic heart disease (heart attack and angina)

The mortality rate due to ischaemic heart disease in Australia (2000) ranked eleventh lowest and Queensland sixteenth lowest when compared with other developed countries, was about three times that of Korea (which had the lowest rate), and about twice that of Japan and France (Figure 11(a)) [18].

In the past 17 years, rates of mortality from ischaemic heart disease in Queenslanders aged 0-79 years have halved in both males and females, falling by an average of 5.3% and 5.8% per year respectively (Figure 11(b)).

The mortality rate for males 0-79 years due to ischaemic heart disease in Queensland was 8% higher than the Australian average between 2000 and 2002, and third highest of the states after Tasmania and South Australia (Figure 11(c)) [18]. When all ages are included, the mortality rate for males of all ages from ischaemic heart disease was higher than in other states [5].

The mortality rate from ischaemic heart disease for all ages was higher in males, in those with lower socioeconomic status, and in areas with a greater proportion of Indigenous people (Figure 11(d)).

Risk factors for ischaemic heart disease include smoking, high cholesterol and blood pressure, nutritional factors, physical inactivity and diabetes. Depression, social isolation and lack of social support are also independent risk factors. Males, older Australians, Indigenous people and those in lower socioeconomic groups are at greater risk [19].

It is estimated that up to 40% of coronary events (heart attacks) could be prevented using existing interventions such as lifestyle changes (reduced smoking, improved diet, physical activity), drug therapy and surgery [20].

Based on the current risk structure of the population, most of the gains would be made in those with existing ischaemic heart disease (14.6%) and those with hypertension or high blood cholesterol (15.0%). However, 'In the long term, primary prevention, especially to reduce smoking, lower blood cholesterol and blood pressure and increase physical activity, has the potential to reduce the population levels of risk and contain the cost of ischaemic heart disease' [20].

Cerebrovascular disease (stroke)

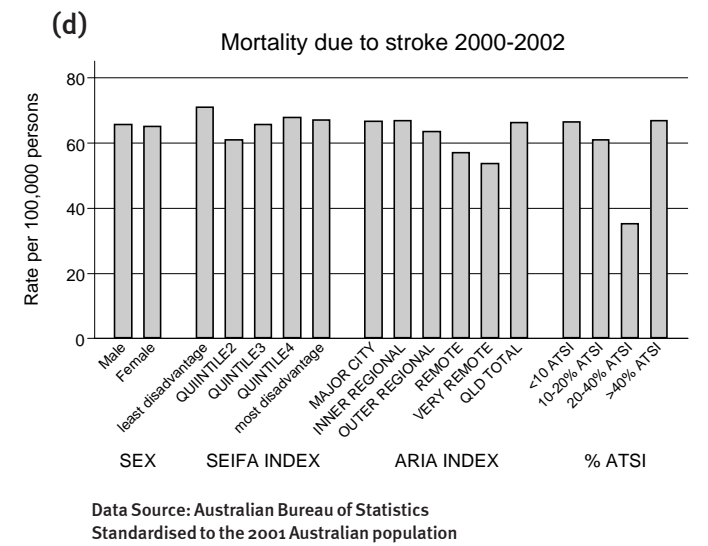
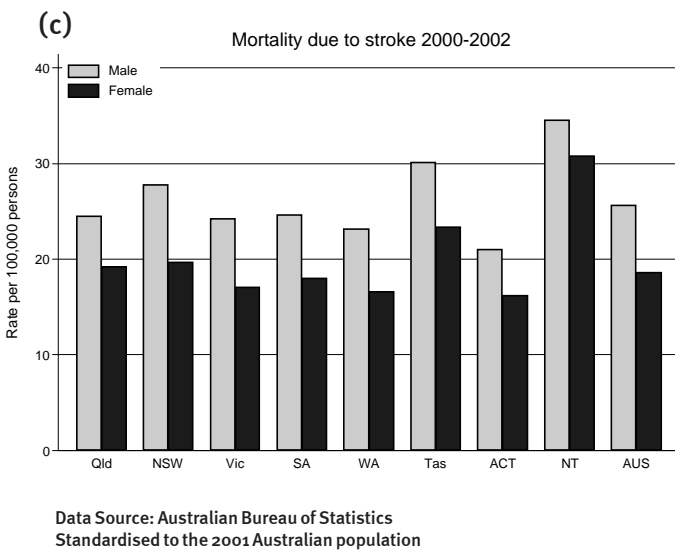
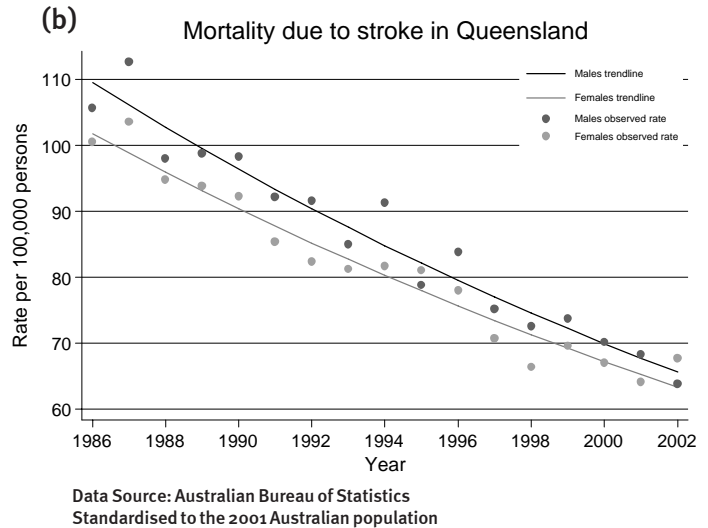
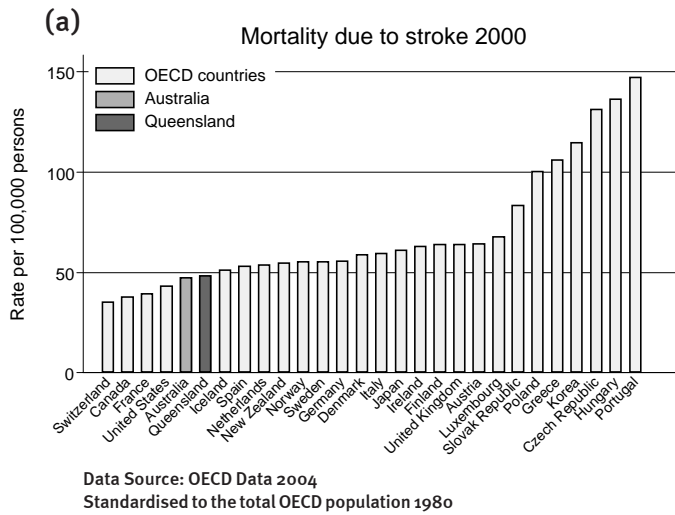
When compared with other developed countries, the mortality rate for stroke in Australia was fifth and in Queensland sixth lowest, and about 34% higher than Switzerland, the country with the lowest rate (Figure 12(a)) [21].

In the past 18 years, mortality rates for stroke have halved for both males and females, falling by an average of 3.2% per year in males and 2.9% per year in females since 1986 (Figure 12(b)).

In 2001, 1.2% of Australians surveyed (estimated 217,500 of population) reported having suffered a stroke at some time [19]. The mortality rates for stroke in Queensland are similar to the Australian average for both males and females [18] (Figure 12(c)). Mortality rates from stroke were similar in males and females, and there were no marked differences in mortality rate for rural areas or areas of low socioeconomic status (Figure 12(d)). Mortality rate in areas with more than 40% Aboriginal people and Torres Strait Islanders were similar to the Queensland population as a whole (Figure 12(d)).

Figure 12. Cerebrovascular disease mortality

Comparison of mortality due to stroke in OECD countries. (b) Trends in mortality due to stroke (males and females 0-85+ years), Queensland, 1986 to 2002. (c) Mortality due to stroke (males and females 0-79 years), by state and sex, 2000 - 2002. (d) Mortality due to stroke (persons all ages) by sex, SEIFA index, ARIA index and Indigenous distribution, 2000 - 2002.



Risk factors for stroke include high blood pressure, smoking, diabetes, alcohol consumption, high blood cholesterol, atrial fibrillation, other heart disease, and carotid stenosis (narrowing of the carotid arteries). Therefore greatest potential gains in reducing the incidence of stroke are from lowering blood pressure, increasing physical activity, lowering smoking levels and reducing hazardous levels of alcohol consumption [22].

Cancer

Eight cancers - lung, melanoma and non-melanoma skin cancer, colorectal, cervical, female breast, prostate and non-Hodgkin's lymphoma - have been selected for individual attention because of their contribution to the burden of disease and/or potential amenability to prevention [23]. In Queensland, colorectal, female breast, prostate, lung cancer, lymphoma and melanoma accounted for 63% of all new cancers diagnosed between 1982 and 2001, and for 56% of all cancer deaths over the same period [23]. In 1996-98 lung cancer was responsible for more than a third of the combined disease burden caused by these six cancers, with the majority (69%) among males.

Breast cancer was the major cause of the burden of cancer among females (37%), and was third most common overall. Cervical cancer had the twelfth most common incidence in females in 2001, and was the thirteenth most common cause of cancer mortality in females in 2001 [23].

Compared with other developed countries, the cancer mortality rate in Australians and Queenslanders falls within the lowest third of the range (Figure 13).

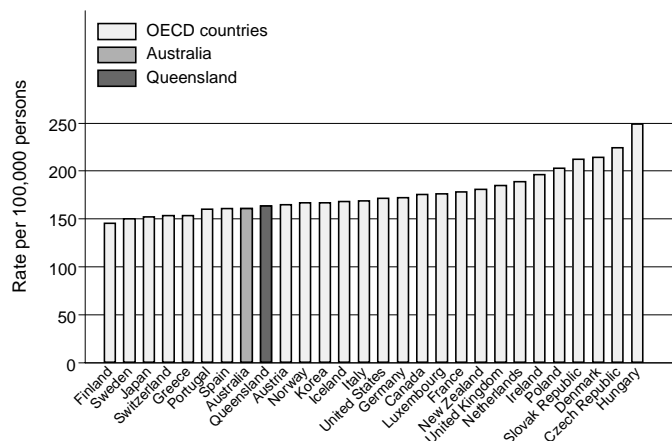
Queensland five year survival rates for selected cancers are shown in Figure 14. Melanoma has the highest percentage of people surviving more than 5 years and lung cancer has the lowest percentage of people surviving 5 years.

Lung cancer

In 2001, lung cancer was the leading cause of cancer death in Queensland males and the second leading cause of cancer death in females after breast cancer (Figure 15) [23].

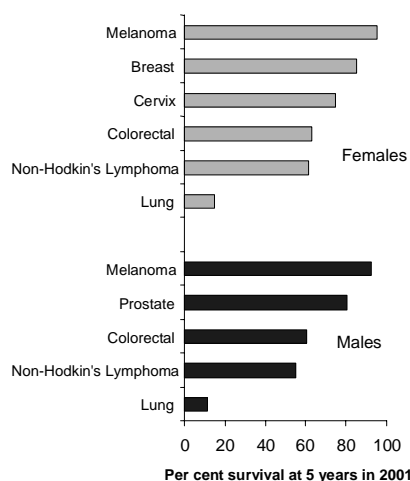
In 2001 there were 882 lung cancer deaths for males and 394 for females in Queensland [23]. Over the past 17 years, mortality rates from lung cancer have decreased by 1.4% per year among males, but increased by 2.8% per year among females (Figure 16). Since 1982, this corresponds to a 23.2% decrease in the mortality rate for males in Queensland, but a 69.0% increase for females. These trends reflect a reduction in past smoking rates among males and an increase in smoking rates among females. Lung cancer mortality among Queensland men is slightly higher than the Australian average [5].

Figure 13. Total malignant neoplasm, OECD countries, 2002.



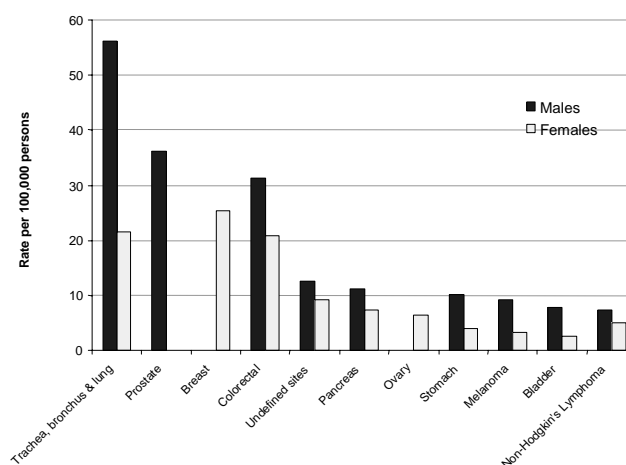
Data Source: OECD Data 2004
Standardised to the total OECD population 1980

Figure 14. Five year survival for selected cancers, by sex, Queensland, 2001.



Data Source: Health Information Branch

Figure 15. Mortality due to selected cancers Queensland, 2001.



Data Source: Queensland Cancer Registry
Standardised to the 2001 Australian population

Colorectal cancer

Colorectal cancer was the third highest cause of cancer death for males (after lung and prostate) and the third highest among females after breast and lung (Figure 15).

During 2001 there were 494 deaths for males and 394 deaths among females in Queensland [23].

There has been a steady increase in the incidence rate of colorectal cancer for both men (1.1% per year) and women (0.2% per year) since 1982. In contrast, mortality rates have decreased significantly for both men and women, with a decrease of 0.6% per year for males from the mid-1980s and 1.2% per year for females. This represents an overall improvement in the mortality rate of 9.0% for men since 1986 and 21.0% for women since 1982 [24].

Melanoma

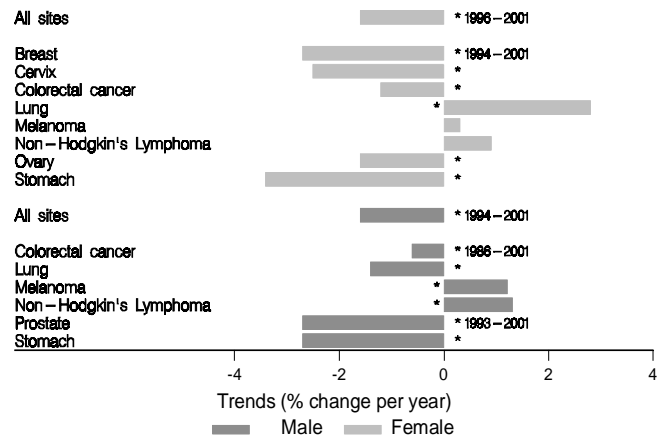
In 2001, Queensland had the highest melanoma mortality rate of the Australian states (6.5 per 100,000 (151 deaths for males and 62 deaths for females), compared with New South Wales which had the second highest rate of 5.6 per 100,000 [25]. Mortality rates due to melanoma have tended to increase between 1982 and 2001 for both sexes. However the rate of change was only statistically significant for men, at 1.2% annually, giving an overall increase of 26.4% in the mortality rate for males [24].

Female breast cancer

Breast cancer was the leading cause of cancer deaths among females in Queensland, causing 471 deaths in Queensland women in 2001. Breast cancer is the most common cancer among women in terms of incidence. The incidence of breast cancer has continued to increase by 2.0% per year (Figure 17). Much of the apparent increase is due to increased screening [24].

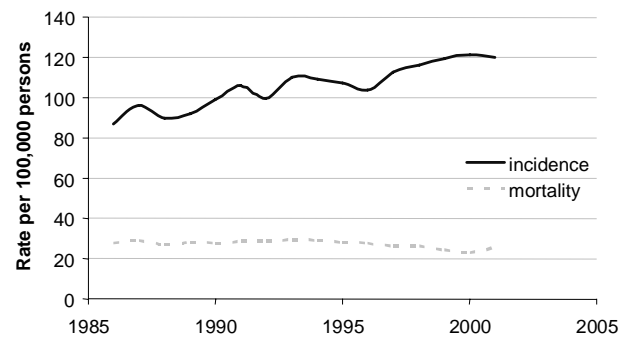
Breast cancer incidence and mortality increases with age, however since 1994 the mortality rates have been decreasing by 2.7% per year (Figure 18) [24]. This is consistent with the impact of the BreastScreen Queensland Program and improvements in clinical management and treatment.

Figure 16. Recent trends in mortality by type of cancer and sex.



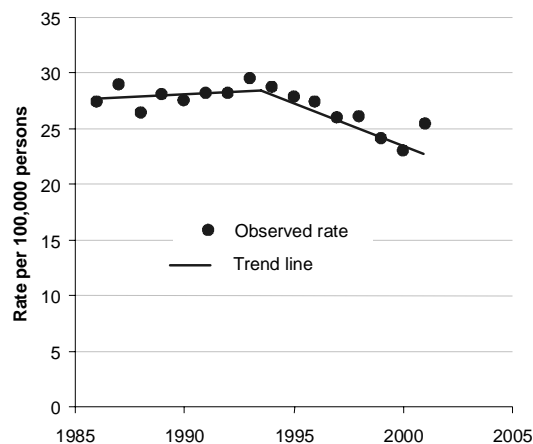
Data Source: Queensland Cancer Registry
Standardised to the 2001 Australian population

Figure 17. Incidence and mortality, female breast cancer, Queensland, 1986 to 2001.



Data Source: Queensland Cancer Registry

Figure 18. Female breast cancer mortality rates, females, Queensland, 1986 to 2001.



Data Source: Queensland Cancer Registry

Cervical cancer

Both incidence and mortality rates for cervical cancer have shown a steady decline in Queensland. Between 1982 and 2002 the incidence rate for cervical cancer decreased by a total of 48.4% from 16.2 to 8.2 per 100,000 females, and the mortality rate by 38.5% from 4.5 to 2.8 per 100,000 females. In 2001 there were 51 cervical cancer deaths among Queensland women.

The incidence rate of cervical cancer among women living in discrete Indigenous communities was five times the Queensland average, while for mortality there was a 13-fold excess [26].

About 90% of the most common form of cervical cancer (squamous cell) can be prevented at an acceptable cost by routine biennial screening if conducted in the context of an organised screening program [27].

Prostate Cancer

In 2001, prostate cancer was the second most common cause of cancer death in men, after lung cancer. The sharp increase in the incidence rate of prostate cancer in Queensland between 1988 and 1994 coincided with increases in the use of prostate-specific antigens (PSAs) and allied testing. Since 1997 there has been a slight increase of 1.1% per year, but this trend has not achieved statistical significance. The mortality rate from prostate cancer peaked in Queensland in 1993, and has been decreasing by 2.7% per year since then. The total drop in mortality rate for the eight years to 2001 was 19.8% (Figure 19).

A large proportion of new cases (36%) and the majority of deaths (67%) occur in men aged 75 years and older. Fewer than 1% of men who died from prostate cancer were younger than 50 years.

In 2001 there were 1,868 newly diagnosed cases of prostate cancer and 509 deaths from prostate cancer in Queensland men.

Non-Hodgkin's lymphoma

Incidence rates for non-Hodgkin's lymphoma in Queensland are rising, with an annual increase of 2.2% for males and 1.8% for females since 1982. Mortality rates for this disease are also rising, although at a slower rate compared to the rise in incidence: 1.3% per year for males and 0.9% per year for females. This corresponds with a significant overall increase of 28.1% in the mortality rate for males since 1982 [24]. In 2001 there were 114 deaths in men and 94 deaths in women due to non-Hodgkin's lymphoma.

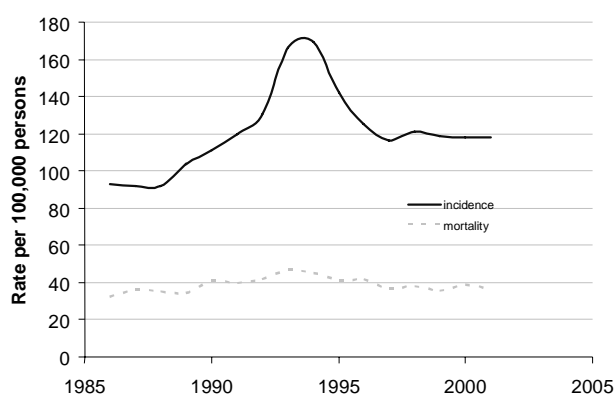
Mesothelioma

Mesothelioma is a fatal form of cancer, in most cases associated with exposure to asbestos. There is usually a very long period between exposure and diagnosis. It occurs more frequently in males, who are more likely to have been involved in industries which used asbestos in past decades.

The number of cases of mesothelioma is low, however it is an important health condition because it is becoming more common. The incidence of mesothelioma in Queensland has increased from 1.1 cases per 100,000 persons in 1982-86 to 3.2 cases per 100,000 persons in 2001. The mortality rate has increased from 0.9 deaths per 100,000 persons in 1982-86 to 2.5 deaths per 100,000 persons in 2001 [23].

The incidence rates for Australia have been increasing since 1965. Western Australia and South Australia have incidence rates above the national average, while New South Wales and Queensland have incidence rates approximating to the national average of 44-63 cases per million males. Rates for the Australian Capital Territory, Northern Territory and Tasmania are imprecise, because they are based on low numbers, but the true underlying rates are likely to be well below the national average [28].

Figure 19. Incidence and mortality, prostate cancer, Queensland, 2001.



Data Source: Queensland Cancer Registry

Due to the long lag period between asbestos exposure and development of cancer, people 50 years of age and over have the highest age specific incidences of mesothelioma [28].

Oesophageal cancer

The epidemiology of oesophageal cancer has undergone a dramatic change over the last two decades. There are two main types of oesophageal cancer, squamous cell carcinoma and adenocarcinoma. In the 1980s, almost all oesophageal cancers were squamous cell carcinomas, mainly caused by cigarette smoking and alcohol consumption. In 2001, about 44% of oesophageal cancers in Queensland were adenocarcinomas, associated with reflux (heartburn) and obesity.

Over the past 20 years in Queensland, incidence and mortality from adenocarcinoma of the oesophagus have increased by about 4% to 7% per year, which is faster than any other cancer except mesothelioma. Similar rates of increase have been reported in other Australian states and in other established market economies.

Oesophageal cancers are renowned for poor survival. Less than 20% of patients are alive five years after the diagnosis.

Adenocarcinoma of the oesophagus is not a common cancer but its sharp rate of increase is potentially important from a public health perspective. Increasing levels of obesity may mean that this cancer will become more frequent [29].

Mental health

Mental health problems and disorders have a major impact, either directly or indirectly, on the lives of many Australians. It is estimated that one in five adult Australians are affected by a mental health disorder at some time during their life [30, 31]. The major mental disorders are depression, schizophrenia, anxiety disorders and substance abuse.

In Queensland 1996-98, one quarter or more of the total years of life lost due to disability (YLD) were attributable to mental disorders (25% for males and 28% for females) [15]. In the Queensland sector of the 2001 National Health Survey, 8.1% of males and 9.8% of females self-reported as having mental and behavioural problems [17]. In the same survey, level of psychological distress was measured on the Kessler-10 scale. In Queensland among those 18-64 years old, 22.4% had moderate and 12.4% had high or very high distress levels, comparable with the Australian national levels of 23.5% and 13.0% respectively [32].

In 2002-03, 3.3% of admissions to Queensland hospitals were for a mental health disease or disorder, comparable to 3.2% of admissions in Australia as a whole [33]. 'Depressive episode', 'reaction to severe stress and adjustment disorders', and 'disorders due to alcohol' were the most common causes of day admissions for a mental health disorder in 2000-01 in Queensland, and in Australia overall [34]. 'Schizophrenia', 'depressive episode' and 'disorder due to alcohol' were the most common principal diagnosis for overnight admission for a mental health disorder in Queensland, similar to the pattern for Australia overall [34].

The National Survey of Mental Health of Young People in Australia, conducted in 1998, identified 14% of children and adolescents (ages 4 to 17 years) as having mental health problems [35].

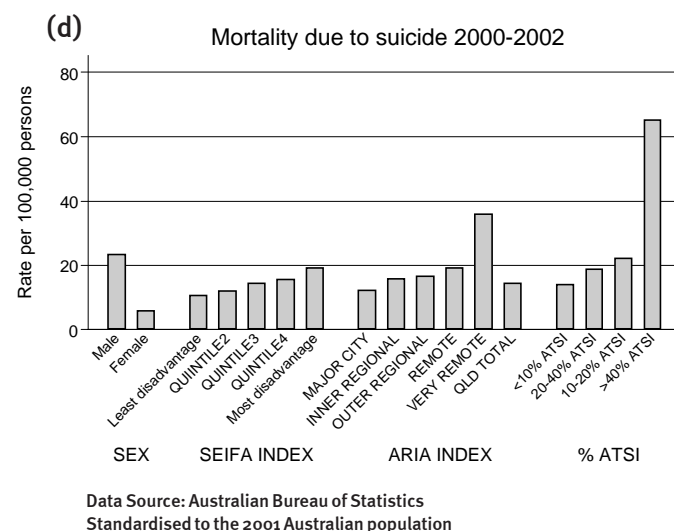
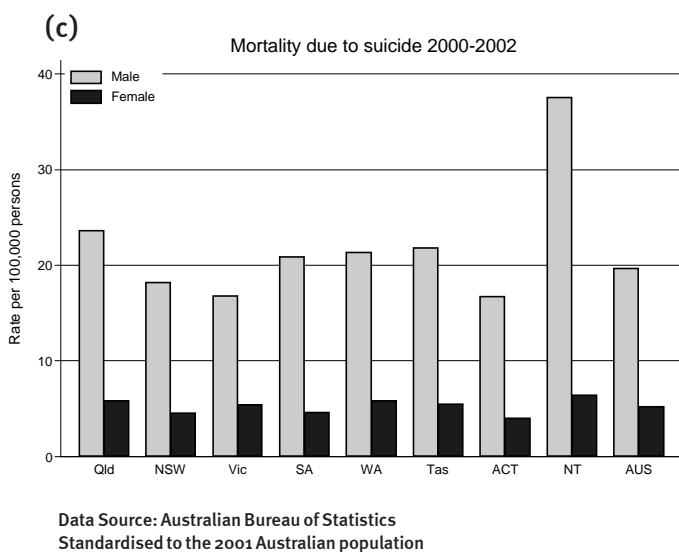
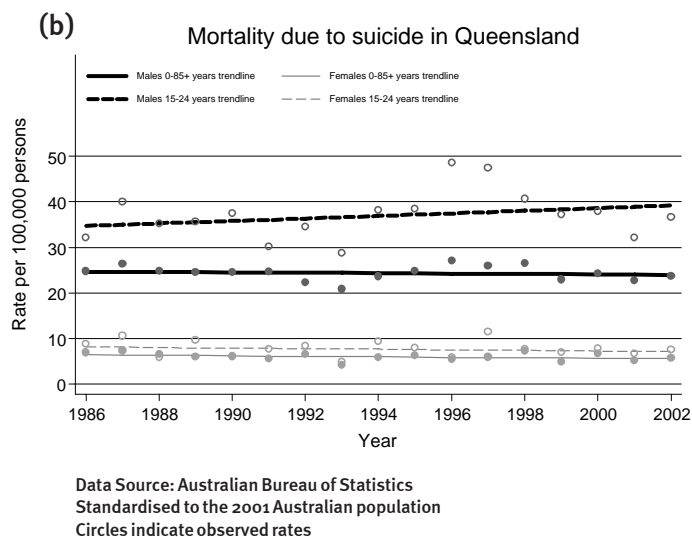
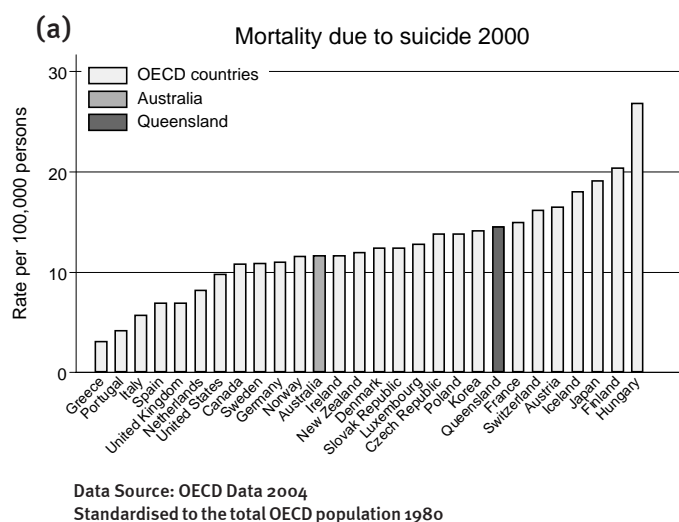
Suicide

While suicide and self-inflicted injury are not classified as mental conditions, it is estimated that about 88% of people who died from suicide suffered from a diagnosable mental disorder at the time of their death [36].

The Queensland Government has adopted a whole of government approach, to specifically target mental health problems and 'at risk' groups [37].

Figure 20. Suicide

(a) Comparison of mortality due to suicide in OECD countries, 2000. (b) Trends in mortality due to suicide (males and females 15-24 and all ages), Queensland, 1986 to 2002. (c) Mortality due to suicide (males and females all ages), by sex and state, 2000-2002. (d) Mortality due to suicide (persons all ages) by sex, SEIFA index, ARIA index and Indigenous distribution, Queensland, 2000-2002.



Suicide rates in Queensland were in the top third and Australia in the middle third compared with other developed countries. Queensland's suicide rate was 4 times that of Greece, the lowest of the comparison countries, but just over half the rate of suicide in Hungary, the highest of the comparison countries (Figure 20(a)) [21].

There has been no change in the suicide rate for either males or females of any age group in Queensland between 1986 and 2002, with young males at higher risk (Figure 20(b)). The Queensland male suicide rate was 8% higher than the national average (Figure 20(c)). Mortality from suicide was higher among males and people living in socio-economically disadvantaged or remote areas (Figure 20(d)). The suicide rate in areas with more than 40% Aboriginal people and Torres Strait Islanders is over 4 times the Queensland average (Figure 20(d)).

Injury prevention and control

With the exception of injury from fire, burns and scalds, the burden of disease from injury in Queensland was higher than that for Australia as a whole over 1996-98 [15]. Over one third (35%) of the burden of disease due to injury (excluding suicide and self-inflicted injury) was accounted for by road traffic accidents, with the remainder accounted for by falls, homicide violence and war, poisoning, drowning, fires/burns/scalds and other conditions [15].

Hospital admissions for injury

During the 2002-03 financial year, there were 103,688 admissions to Queensland hospitals due to injury and poisoning. Falls accounted for 21% of episodes of care for injuries due to external causes (including self-inflicted injury) [38].

Hospitalisation rates for injury have decreased for transport injuries in 15-24 year old males, and for poisonings and near drownings in children under 5 years, but increased in other categories since 1981 [18] (Figure 21).¹

Injury mortality

Mortality rates have fallen substantially for most injury indicators since 1981-83. Increases were observed in mortality from falls in people over 65 years, as were slight increases in mortality from homicide in children under 9 years and drowning in children under 5 years [18] (Figure 22).

Transport related mortality

Transport related mortality includes road traffic accidents, non-traffic accidents and other transport accidents.

Queensland had the eighth lowest and Australia the tenth lowest transport accident mortality rates of OECD countries in 2000 (Figure 23(a)).

Mortality from transport related injury in Queensland has fallen by an average of 4.4% per annum for males and 5.6% per annum for females between 1986 and 2002. This represents a reduction of the mortality rate by 51% and 56% for males and females respectively [18]. For males 15-25 years mortality rates have fallen by an average of 4.8% and for females by 5.6% per annum over the same time period (Figure 23(b)).

The mortality rate for males aged 15 to 24 was over three times that for females in the same age group in 2002 (24.6 vs 6.4 deaths per 100,000 population). Mortality in these young males is nearly twice that of the male population as a whole [18].

Queensland had the third highest mortality rate for motor vehicle accidents for 15-24 year old males among the states (Figure 23(c)).

Rates of mortality from transport related injury were higher among people living in socio-economically disadvantaged areas, and in more remote areas (Figure 23(d)).

Figure 21. Changes in hospital admission rates for specific injury types, Queensland, between 1981 and 2002.

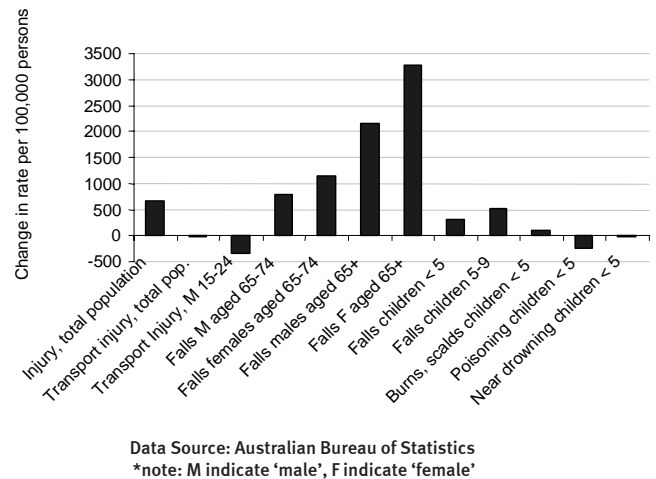


Figure 22. Comparisons for mortality for specific injury types in Queensland between 1981-83 and 2000-02.

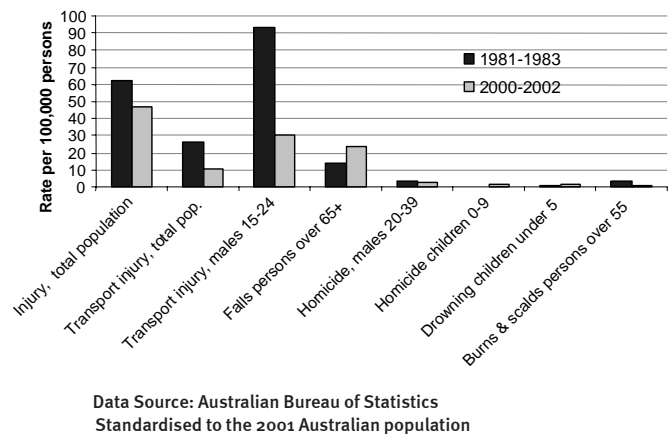
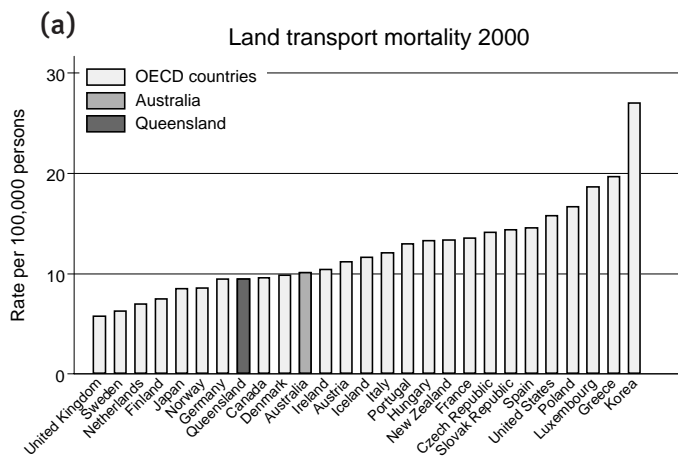
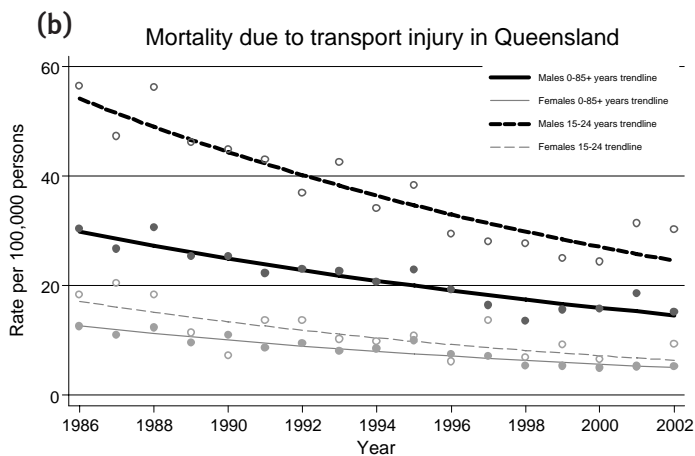


Figure 23. Transport related mortality

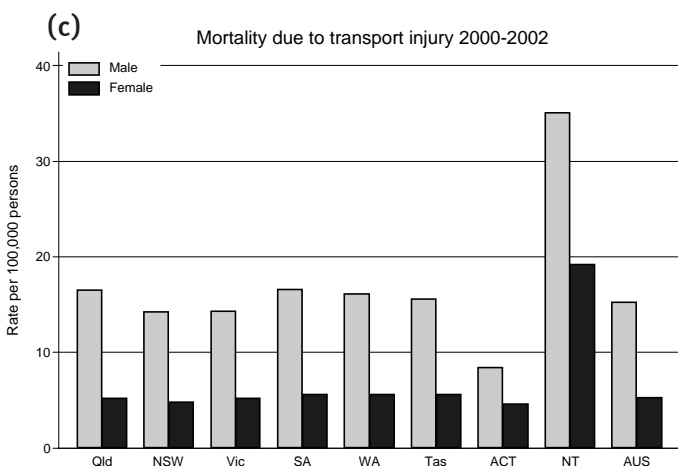
(a) Comparison of mortality due to land transport accidents in OECD countries. (b) Trends in mortality due to transport injury (males and females aged 15-24 years and all ages), Queensland, 1986 to 2002. (c) Mortality due to transport injury (males and females all ages), by sex and state, 2000-2002. (d) Mortality due to transport injury (persons all aged), by sex, SEIFA index, ARIA index and Indigenous distribution, Queensland during 2000-2002.



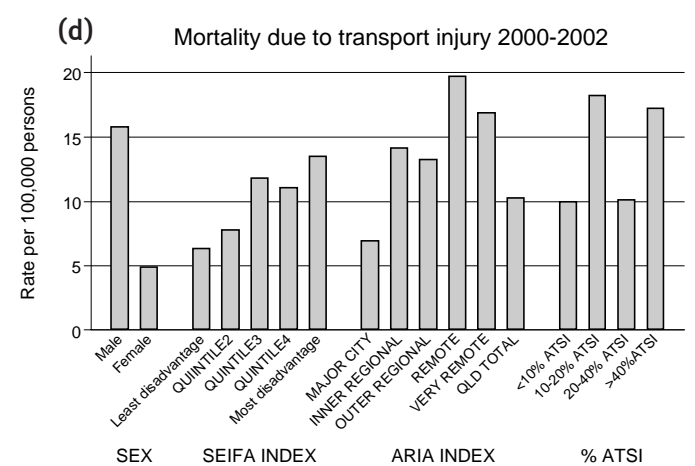
Data Source: OECD Data 2004
Standardised to the total OECD population 1980



Data Source: Australian Bureau of Statistics
Standardised to the 2001 Australian population
Circles indicate observed rate



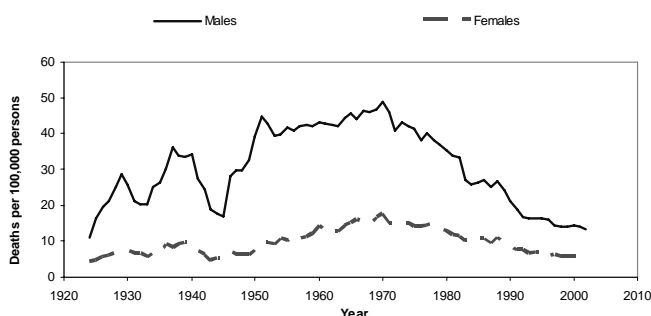
Data Source: Australian Bureau of Statistics
Standardised to the 2001 Australian population



Data Source: Australian Bureau of Statistics
Standardised to the 2001 Australian population

Some reduction in transport mortality in recent decades can be attributed to the introduction of compulsory wearing of seat belts in the 1970s (Figure 24), random breath testing, speed cameras, better roads and, improved safety of motor vehicles [39].

Figure 24. Road transport related mortality in Australia 1920 to 2000 [40].



Data Source: RTA's GRIM Editor
Standardised to the 2001 Australian population

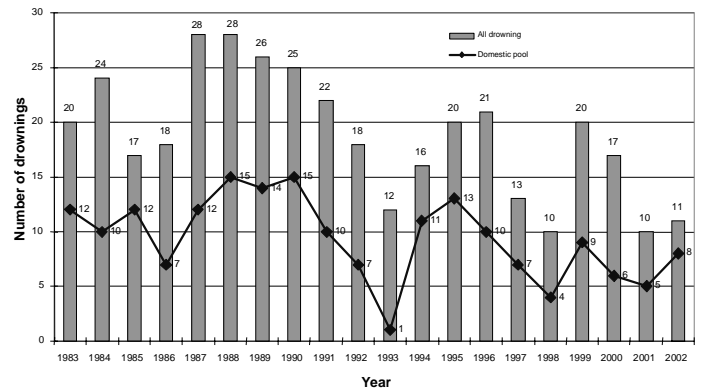
Drowning

Between 1983 and 2001, 359 children aged 0- 4 drowned in Queensland, with about half (174) of these occurring in domestic swimming pools [41] (Figure 25).

The decline in pool drownings from 1991 to 1993 has not been maintained, highlighting the need for ongoing pool safety awareness campaigns (Figure 25). Lack of adult supervision has been identified as a common causal factor in most toddler drownings [42].

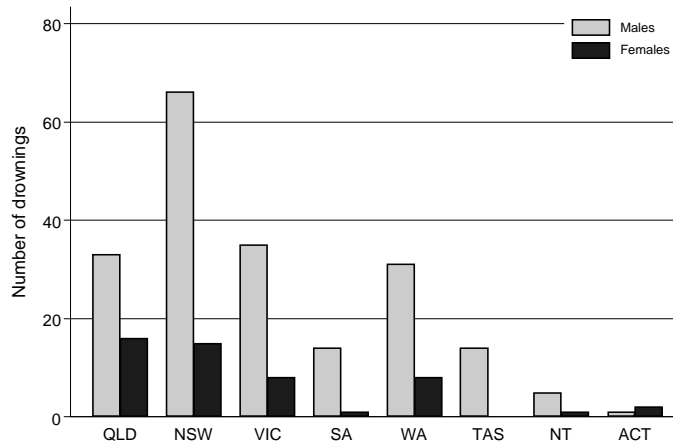
Forty-nine deaths due to drowning occurred in Queensland in the 2002-03 financial year (Figure 26). Australia-wide, the number of deaths due to drowning has decreased from 2.0 per 100,000 people to 1.3 per 100,000 people between 1992 and 2002-03 [43].

Figure 25. Number of deaths of 0-4 year old children due to drowning in Queensland. 1983 to 2002.



Data Source: Queensland Injury Surveillance Unit

Figure 26. Mortality due to drowning, all ages, by state, 2002-03.



Data Source: Royal Lifesaving Society of Australia

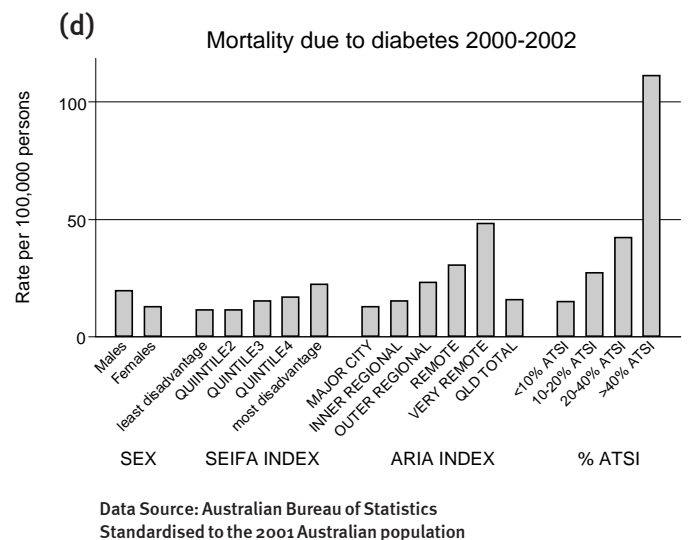
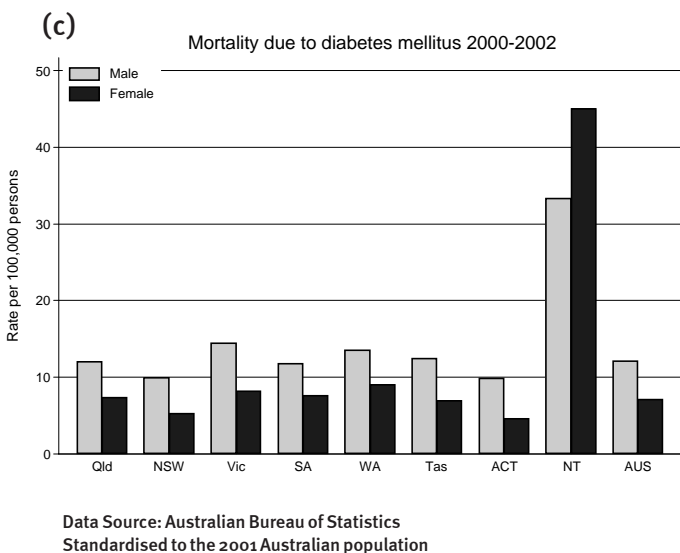
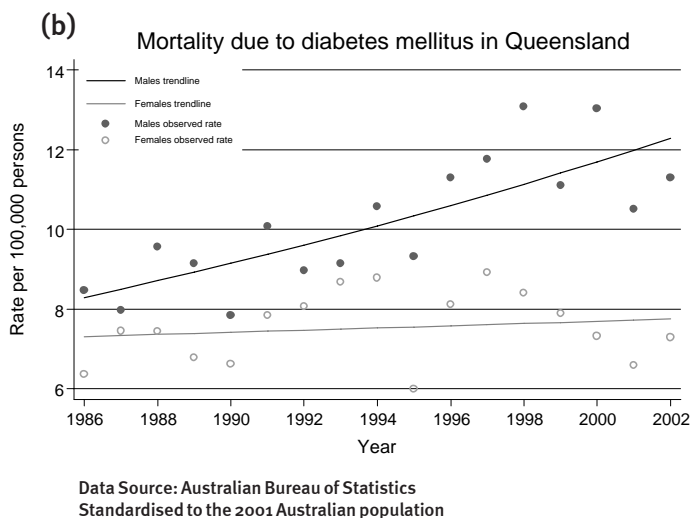
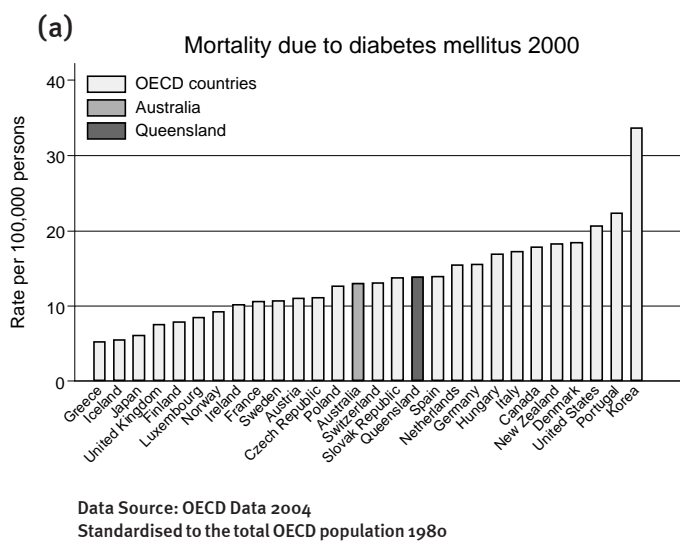
Public education campaigns on road and pool safety have saved many lives. It is important to maintain pool safety awareness

Diabetes Mellitus

Diabetes is one of the highest health priority issues for Australia, because of the resulting burden of heart disease, stroke, blindness, kidney failure and amputations. Torres Strait communities have the highest recorded prevalence of diabetes in Australia (25% of adults over the age of 15) [44].

Figure 27. Diabetes mortality

(a) Comparison of mortality due to diabetes in OECD countries. (b) Trends in mortality rates due to diabetes mellitus (males and females 0-79 years), Queensland, 1986 to 2002. (c) Mortality due to diabetes mellitus (males and females 0-79 years), by state, 2000-2002, by state. (d) Mortality due to diabetes mellitus (persons aged all ages), by sex, SEIFA index, ARIA index and Indigenous distribution, Queensland, 2000-2002.



Diabetes mortality rates in Australia were ranked fourteenth lowest, and Queensland seventeenth lowest of 29 developed countries, and were just over twice the rate of Greece, the best of the comparison countries (Figure 27(a)) [21].

Between 1986 and 2002, diabetes mortality rates have increased by an average of 2.5% per year for males, but there has been no change in females (Figure 27(b)) [18]. Queensland has similar diabetes mortality rates to the national average for both males and females (Figure 27(c)) [18].

Mortality rates from diabetes increased with age, increasing socioeconomic disadvantage and remoteness. Areas with more than 40% Aboriginal people and Torres Strait Islanders had almost 7 times the rate of the Queensland population as a whole (Figure 27(d)).

The AusDiab national study of diabetes measured prevalence using blood glucose testing, which is more accurate than self-reporting. In 2000, 1634 Queenslanders 25 years or over participated in the study [45]. Seven percent of participants had diabetes (half of whom had not been previously diagnosed). Fifteen percent had impaired glucose tolerance and 1.9% had an impaired fasting blood glucose level. Thus 23.9%, or nearly one in four Queenslanders surveyed, had an abnormality of glucose metabolism.

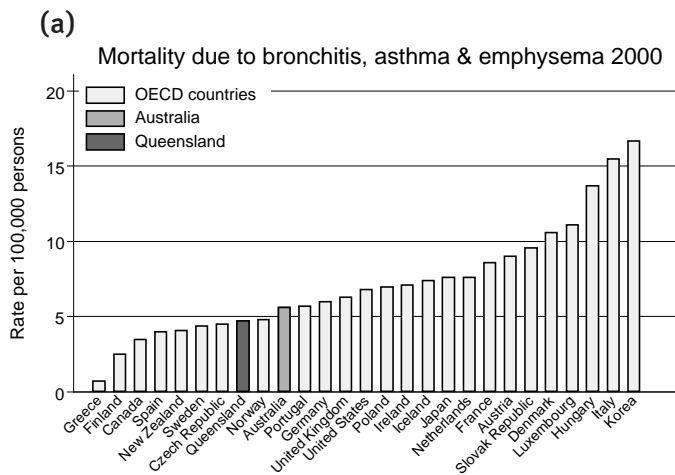
Asthma and chronic obstructive pulmonary disease

Asthma is the only chronic respiratory disease formally identified as a National Health Priority Area condition. However, because of the considerable disease burden from chronic obstructive pulmonary disease (COPD) [46], this condition has also been included in this section.

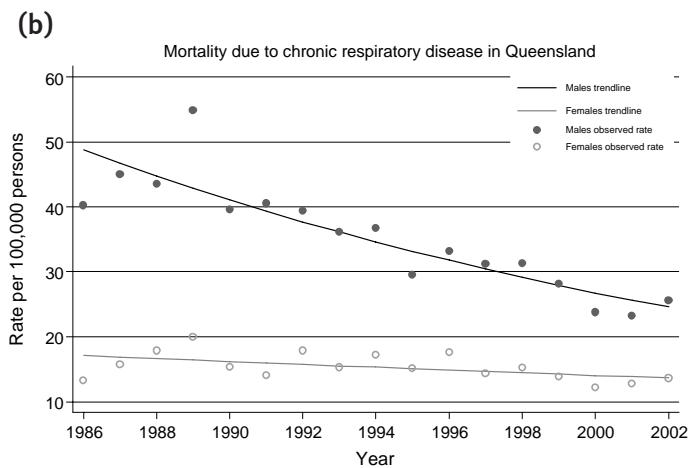
When comparing mortality rates for chronic respiratory conditions (bronchitis, emphysema and asthma) against other developed countries, Australia ranked eighth, and Queensland tenth lowest of 29 OECD countries, with rates approximately four times that of Greece, the best of the comparison countries (Figure 28(a)) [21].

Figure 28. Chronic respiratory disease mortality

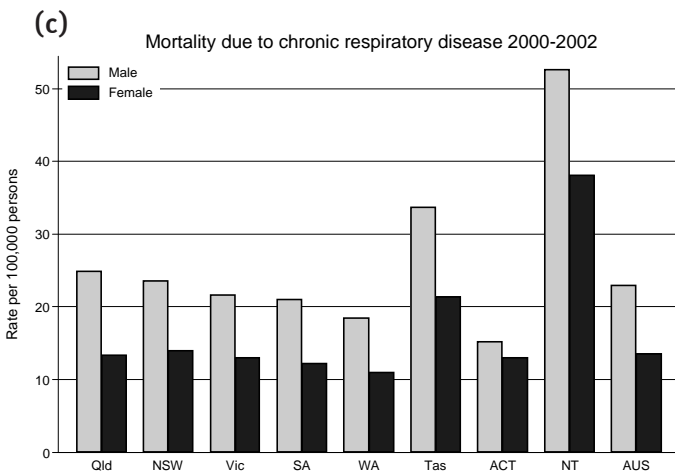
(a) Comparison of mortality due to bronchitis, emphysema and asthma in OECD countries. (b) Trends in mortality due to chronic respiratory disease (chronic obstructive pulmonary disease, including asthma, males and females 0-79 years), Queensland, 1986 to 2002. (c) Mortality rates due to chronic obstructive pulmonary disease (including asthma, males and females 0-79 years), by sex and state, 2000-2002. (d) Mortality due to chronic respiratory disease (persons all ages), by sex, SEIFA index, ARIA index and Indigenous distribution, Queensland, 2000-2002.



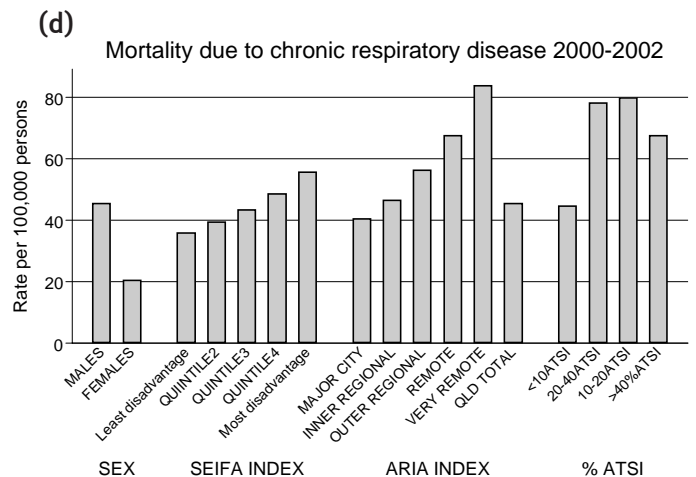
Data Source: OECD Data 2004
Standardised to the total OECD population 1980



Data Source: Australian Bureau of Statistics
Standardised to the 2001 Australian population



Data Source: Australian Bureau of Statistics
Standardised to the 2001 Australian population



Data Source: Australian Bureau of Statistics
Standardised to the 2001 Australian population

In the past 15 years, mortality from chronic respiratory disease decreased by an average of 4.2% per year for males and by 1.4% per year for females [18] (Figure 28(b)). When compared with the national average, Queensland's mortality rates in 2000-2002 were similar for females, but 8.7% higher for males, (Figure 28(c)).

Mortality rates from chronic respiratory disease in Queensland are higher among males and among those living in more remote areas and areas of socioeconomic disadvantage (Figure 28(d)).

In 2001-2002 there were 17,151 hospital admissions for asthma (6,507) and COPD (10,644) in all Queensland hospitals [33].

Admissions for asthma are concentrated in children, whereas those for COPD are concentrated in older groups (Figure 29).

It is estimated that more than 64% of the burden of disease due to COPD is attributed to smoking [14]. Although specific estimates were not available for asthma, exposure to cigarette smoking has been identified as both a contributing factor and a trigger factor for exacerbation of asthma [47].

Musculoskeletal disease

Musculoskeletal disease, the seventh National Health Priority, is a major cause of morbidity, and includes osteoporosis, osteoarthritis, rheumatoid arthritis, back pain and musculoskeletal trauma.

From 1998-2002, an average of 194 older Queenslanders (67% women) died per year due to diseases of the musculoskeletal system and connective tissue. Between 1989-91 and 1999-2001 hospital admission rates for musculoskeletal diseases have increased by 26% for older men and 21% for older women [38]. Arthritis and musculoskeletal diseases are the second most common reason for visiting a doctor (after respiratory disorders, mainly colds and 'flu) and the third most common reason for using medication (after respiratory and circulatory disorders) [48].

Arthritis

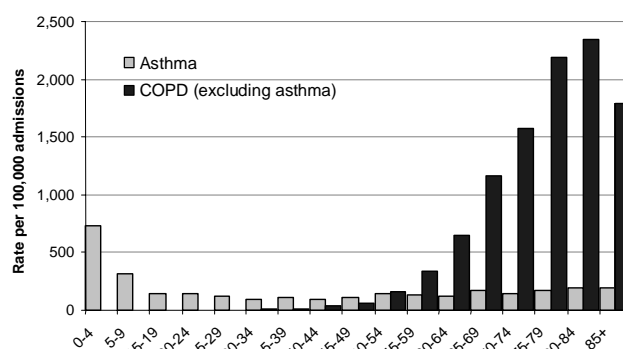
Arthritis is the major cause of disability with chronic pain in Australia, affecting over 3 million people, or 16.5% of the population. Arthritis is currently more prevalent than asthma, injuries, mental disorders, diabetes and cancers, and will become an escalating public health issue with ageing of the population. Sixty percent of those affected are women [48]. Arthritis costs the community at least nine billion dollars every year, including two billion dollars in direct costs each year [48, 49].

Osteoarthritis (the commonest form of arthritis) is associated with overweight or obesity, and low levels of exercise. It is the main indication for hip and knee replacement, now one of the most common forms of routine surgery, and among the most cost-effective operations available [49]. At least 4,100 hip and 5,100 knee replacements were performed in Queensland in 2003, although the rate of surgical procedures is among the lower of the states (Figure 30 (a)). Surgery outcome is improved by pre-operative exercise programs and weight reduction.

Queensland had the greatest percentage increase in hip replacements and the second highest increase in knee replacements of the states between 1994-95 and 2001-02, although the ACT/Northern Territory combined had the greatest increase in knee replacements of any jurisdiction (Figure 30(b)).

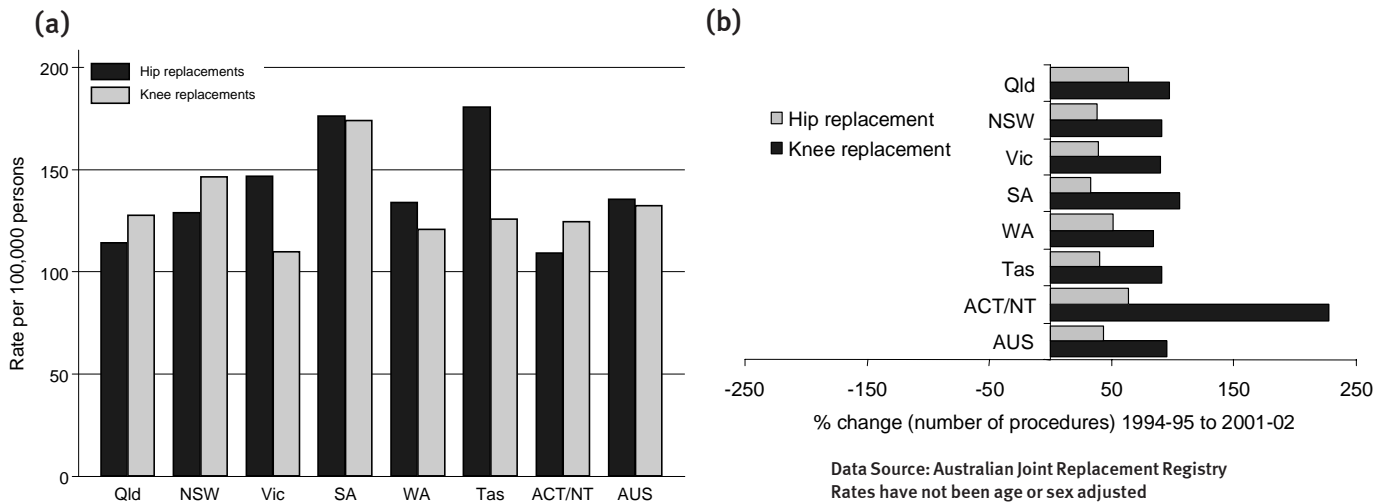
Arthritis can be managed by appropriate exercise, medication, and in some cases diet. Only one quarter of those reporting arthritis have received medical advice or medication, thus there is considerable scope for reduction in the burden of disease [48].

Figure 29. Hospital admissions due to chronic respiratory disease (chronic obstructive pulmonary disease and asthma) by age group, Queensland, 2001-02.



Data Source: Queensland Hospital Admitted Patient Data Collection

Figure 30. (a) Incidence of hip and knee replacements by state, 2001-02. (b) Percentage change in hip and knee replacement procedures 1994-95 to 2001-02.



Osteoporosis

The prevalence of osteoporosis in Australian women 65-74 years in 1995 was 105 per 1,000, increasing to 123 per 1,000 among those aged 75 and older [22]. It is more expensive than diabetes or asthma [50]. More recent data estimates the prevalence of osteoporosis in 2001, in those over 65 years of age, at over 50% for women and nearly 30% for men. This estimate is comparable to those for Europe and the United States [50].

Around 1,000 Queenslanders have been admitted to hospital each year since 1999 with osteoporosis as a primary diagnosis. Of these people, 60-70% have had a pathological bone fracture [38]. Osteoporosis is a major risk factor for vertebral and hip fracture. Hip fracture is associated with a 33% mortality rate in the following 12 months [51]. Osteoporosis cost \$1.9 billion per annum in health care in Australia in 2000-01, 68% of which was due to hospital and nursing home costs.

Healthy bones are developed during childhood and adolescence, so it is important that young people have adequate nutrition, especially calcium, and appropriate physical activity. Osteoporosis can be reduced or prevented by appropriate weight-bearing exercise, adequate calcium intake, adequate vitamin D, and medication, thus reducing the likelihood of hip fracture in older women.

Fall prevention strategies are also important in reducing the rate of hip fracture [50]. It is important that older people, particularly those residing in care facilities, receive adequate sunlight exposure for vitamin D synthesis [52].

MEASURING HEALTH STATUS AND DIFFERENTIALS: OTHER KEY HEALTH ISSUES

Communicable disease

Decline in infectious disease mortality in the first half of the 20th century has made a significant contribution to the increases in life expectancy that have occurred in the last 100 years. New challenges are now arising, associated with rapid mass travel, overuse of antibiotics, mass production of food, and other social changes [53]. These challenges include diseases such as HIV/AIDS, 'emerging' infectious diseases such as Severe Acute Respiratory Distress Syndrome (SARS), potential threats due to bioterrorism, and re-emergence of conditions such as tuberculosis and influenza.

Australians and Queenslanders are protected by a sophisticated system of vaccination, disease surveillance, and public health policies. Queensland Health includes specialised units for prevention and control of communicable diseases, specifically including food-borne illnesses, Meningococcal disease, Dengue fever, Q Fever, tuberculosis, HIV/AIDS and potential threats such as SARS.

Notifiable diseases

Communicable diseases of public health importance are classified as notifiable diseases. Lead poisoning is the one notifiable condition which is not communicable, but is included in this category because of its special importance.

In 2001, Chlamydia was the most common notifiable disease in Queensland, followed by Campylobacter and viral hepatitis.

Figure 31 shows the rates of notifications per 100,000 persons for the most common notifiable diseases (where the rate was over 2.0 cases per 100,000 persons) [54].

Influenza

Influenza became notifiable in July 2001. Children 0-4 years of age had the highest rate (17%) of notifications between July-December 2001.

Between 1997-98 and 2001 all-age hospitalisation rates for influenza have fallen from approximately 30 cases per 100,000 population to 11 per 100,000. The vaccination program for people aged 65 years and over began in 1999. There was only one death in this age group in 1999-2000, compared with 27 deaths in 1997-1998, illustrating the success of the vaccination program [54].

Tuberculosis

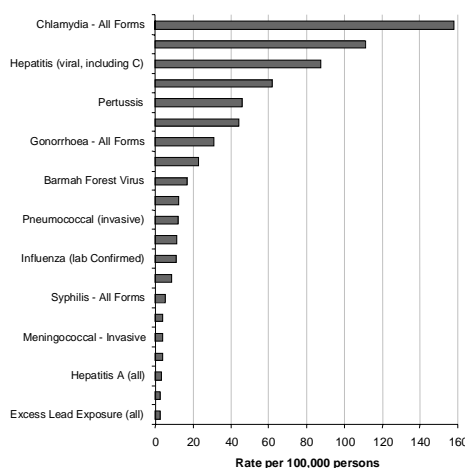
Australia has one of the lowest incidence rates of tuberculosis (TB) in the world. The incidence rate for TB in 2002 was highest in Indigenous (8.5 per 100,000 persons) and overseas-born Australians (ranging from 1.3 - 619.4 per 100,000 for selected countries), compared with Australian-born non-Indigenous people (1.1 per 100,000 persons) [55].

Sexually transmitted infections

Chlamydia is the most common sexually transmitted infection in Queensland. Frequently asymptomatic, particularly in women, the infection can result in the long-term effects of infertility and ectopic pregnancy. The chlamydia notification rate has increased for all states and territories. The Queensland rate increased from 135 per 100,000 persons in 1998 to 180 per 100,000 in 2002. Increased notification may reflect increased detection. The Northern Territory, Queensland and Western Australia have substantially higher rates than the other Australian states. Indigenous Australians have higher rates of chlamydia infection than non-Indigenous people.

Queensland had the third highest reported rate for gonorrhoea and second highest reported rate for syphilis in 2002, compared with other states, although rates in Queensland have declined since 1998 for both these diseases [56].

Figure 31. Notifiable diseases in Queensland 2001, rate per 100,000 persons



Data Source: Queensland Health notifiable diseases report 1997-2001

HIV/AIDS

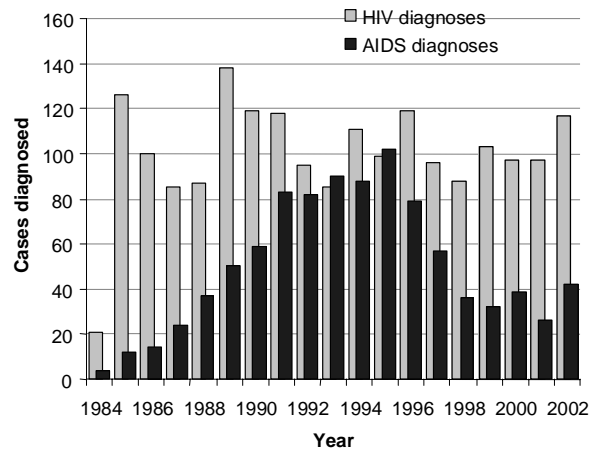
Human Immunodeficiency Virus (HIV) infection causes the development of acquired immune deficiency syndrome (AIDS) months or years later. HIV infected persons may be free of clinical signs or symptoms for many months or years before other clinical manifestations develop. The severity of HIV related opportunistic infections and cancers (associated with AIDS) is usually related to the infected person's degree of immune dysfunction. In Queensland in the last 5 years, the most commonly reported AIDS defining illnesses have been *Pneumocystis carinii* pneumonia, oesophageal candidiasis and Kaposi's sarcoma.

There is currently a global pandemic of HIV/AIDS which is gaining momentum in the developing world, particularly Papua New Guinea, Africa and Asia, increasing the risks for the spread of disease in the process. Australia has relatively low rates of HIV/AIDS compared with other countries [56].

Queensland data for HIV and AIDS in recent years have continued to reflect national trends. There has been a decline in AIDS diagnoses in Queensland since 1996, although trends in recent years suggest that the number of AIDS diagnoses has reached a plateau and may be increasing (Figure 32).

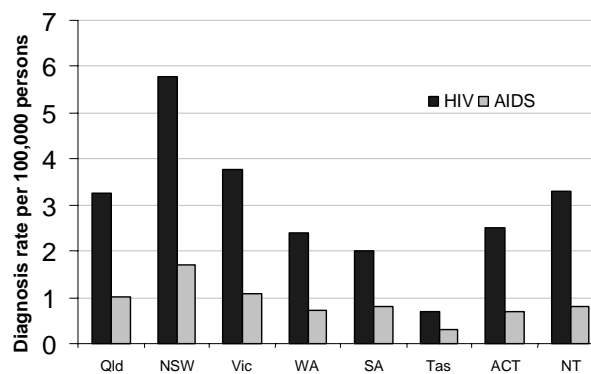
This decline is due to increasingly effective treatment for people living with HIV. Queensland has the third highest rate of newly diagnosed AIDS cases of the states in 2002 (22%) (Figure 33). Thirty eight percent of cases were diagnosed in NSW and 23.1% in Victoria [31].

Figure 32. AIDS and HIV, where first diagnosis was in Queensland, from 1984-2002.



Data Source: Queensland Health HIV/AIDS Report 2002

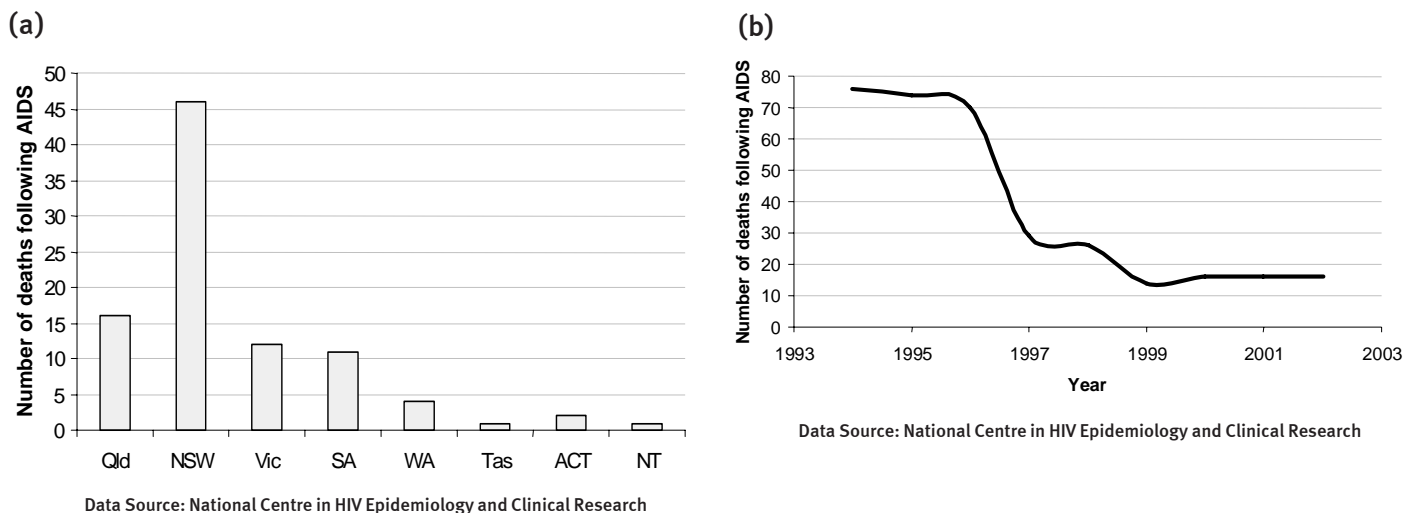
Figure 33. Average annual incidence of diagnosis of HIV infection and AIDS, by state/territory, 1998 to 2002 [56].



Data Source: National Centre in HIV Epidemiology and Clinical Research

Among the states, Queensland had the second highest number of deaths following AIDS in 2002 (Figure 34(a)). The number of deaths following AIDS in Queensland has decreased since 1996 (Figure 34(b)), similar to the pattern in other states [56].

Figure 34. Deaths following AIDS (a) by state/territory and (b) Queensland, 1993 to 2002.

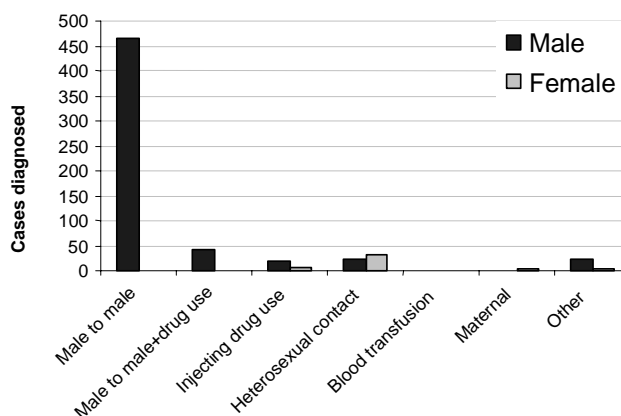


The number of diagnoses of HIV per year for Australia overall was highest in 1985 and decreased until around 1998 [56]. In Queensland, the number of HIV diagnoses per year has shown no consistent trend since 1984 (Figure 32). However, between 2001 and 2002 there was a 20% increase in HIV diagnoses. Queensland had the third highest rate per capita diagnosis rate of the states over 1998 – 2002 for both HIV and AIDS (Figure 33).

As throughout Australia, transmission of HIV in Queensland is predominantly through sexual contact between homosexually active men. Over the last 5 years, more than 75% of diagnoses of HIV infection in males were related to men having sex with men (Figure 35). Heterosexual transmission, although at low levels, needs to be monitored.

Needle sharing during injecting drug use is also an important potential mode of transmission [57]. Fewer than 5% of male diagnoses were related to injecting drug use alone. Rates of HIV are kept at a low level by successful harm minimisation strategies such as the Queensland Needle and Syringe Program and ongoing programs aimed at safer sex behaviour.

Figure 35. Exposure categories for HIV diagnoses where first HIV diagnosis was in Queensland, 1998 to 2002.



Data Source: Queensland Health HIV/AIDS Report 2002

Hepatitis C

Hepatitis C is a blood borne virus and is one of the most common of the notifiable conditions in Queensland. It causes chronic infection in 80% of those who are infected, and can be clinically silent for many years. The long-term outcomes of hepatitis C infection (after 20 to 40 years) can include cirrhosis, liver failure and hepatocellular carcinoma.

Ninety percent of newly acquired hepatitis C cases are related to injected drug use [30, 31]. The prevalence of cirrhosis and incidence of liver failure are estimated to triple by 2020 [58]. Notification rates for hepatitis C in Queensland ranged between 80-94 cases per 100,000 people during the 4 year period 1997-2000, with Queensland rates generally below the national rates (84-112 cases per 100,000 people) [59].

Renal disease and dialysis

End stage renal failure is managed by dialysis or kidney transplantation, and frequently associated with underlying conditions such as obesity and diabetes.

Dialysis is the most common reason for hospital admission in all states and territories [33]. In 2002, 1,187 Queenslanders (320 per 1,000,000 persons) were dialysis-dependent and 1,178 people (318 per 1,000,000 persons) had functioning kidney transplants. The Queensland rate for dialysis or transplant dependency was lower than the rate for Australia as a whole (366 per 1,000,000 and 293 per 1,000,000 persons respectively). Use of renal dialysis in Queensland has increased from 254 per 1,000,000 in 1998 to 320 per 1,000,000 persons in 2002 [60].

In 2002, Queensland had the third lowest dialysis rate of the states and the Northern Territory. Renal failure is a particular problem in Indigenous people [61], demonstrated where the Northern Territory has the highest dialysis rate of any Australian jurisdiction (1,172 per 1,000,000 persons in 2002) [60].

Transplantation and organ donation

Organ and tissue donation is a community service, which saves lives, improves quality of life and has cost benefits for society. Every organ donor can assist up to 10 recipients to enjoy renewed or improved life.

Australia has one of the highest transplant success rates in the world. Since 1965, more than 30,000 Australians have received life-giving or life-preserving transplants of organs (heart, heart/lung, liver, kidney, pancreas) and tissue (corneas, heart valves, skin, bone tissue) [62].

An average of 37 Queenslanders have donated organs (not including kidneys, which may originate from a live donor) for transplant each year from 1994-2003. In 2003, 40 Queenslanders donated organs which allowed 19 heart, 4 heart/lung, 15 lung, and 5 pancreas transplant operations [63]. In 2003, Queensland had the third highest organ donor rate after ACT and South Australia.

Health of mothers and children

Most common causes of death in infancy and childhood

Leading causes of death in children 0-4 include conditions originating in the perinatal period, congenital malformations, deformations and chromosomal abnormalities. In children 5-19 years, leading causes of death include external causes of morbidity and transport accidents [6].

Leading causes of hospital admission from 1999-00 to 2001-02 in children 0-4 years include conditions originating in the perinatal period and diseases of the respiratory system. In children 1-14 years, injury due to external cause and diseases of the respiratory and digestive systems are included in the most common three causes of hospitalisation. Infectious disease is the third most common cause of hospitalisation in children 1-4 years [64].

Perinatal health

Between 48,285 and 49,940 babies have been born each year in Queensland between 1998 and 2002. The perinatal death rate is very low, with 99.6% of infants surviving the perinatal period (28 days after birth) in 2001 [65].

In 2001, of 49,690 births in Queensland

- 40,994 (82.5%) were breastfed on discharge
- 5,783 (11.6%) were born to single mothers
- 1,534 (3.1%) were born of multiple births
- about 2,700 (5.4%) were Indigenous

Among the states, Queensland had the second highest perinatal mortality rate for non-Indigenous babies, but the third lowest perinatal mortality rate for Indigenous babies over 2000-2002. The perinatal mortality rate for Indigenous infants (21.5 per 1,000 births for Aboriginal infants and 17.2 per 1,000 birth for Torres Strait Island infants) was approximately twice that of non-Indigenous infants (9.7 per 1,000 births) [66].

Perinatal mortality in Queensland infants has declined by 2-3% over the last 16 years, but the gap between non-Indigenous and Indigenous mortality has not narrowed over this period. Perinatal mortality is associated with premature birth (birth before 37 weeks) and low birthweight (less than 2,500 grams), conditions which are also associated with both short and long term health problems [67].

From 1989 to 2002, rates of premature birth and low birthweight (under 2,500g) were relatively constant, but higher in babies of Indigenous women. In 2000-02, 8.1% of non-Indigenous babies were born pre-term and 6.6% had low birthweight, compared with 13.2% of Indigenous babies born preterm and 13% with low birthweight. The perinatal mortality rates for non-Indigenous and Indigenous infants with the same degree of prematurity or low birthweight are similar, suggesting that the difference in mortality between non-Indigenous and Indigenous infants is likely to be attributable to these factors, rather than inadequacy of hospital care [68].

Preventive initiatives, including improved access to culturally appropriate antenatal care, are required to reduce the prevalence of risk factors such as smoking, poor diet, and infections in Indigenous women to reduce the inequalities in birthweight and mortality.

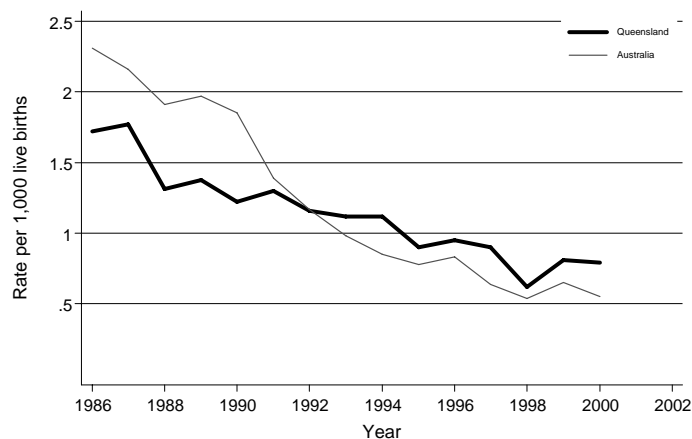
Sudden Infant Death Syndrome

The incidence of Sudden Infant Death Syndrome (SIDS) has decreased in Queensland from 1.72 to 0.79 deaths per 1,000 live births, and Australia from 2.31 to 0.55 deaths per 1,000 live births between 1986 and 2001, following the 'Reduce the Risk' education programs [69].

Maternal health

Australia has a low rate of maternal mortality. In a WHO analysis of 60 countries, the maternal mortality rate for Australia in 2000 was 8 deaths per 100,000 births, comparable with other developed countries. There were no maternal deaths in Iceland (the lowest rate) and 160 maternal deaths per 100,000 births (the highest rate) in Panama and Trinidad and Tobago [70].

Figure 36. SIDS, Queensland and Australia, 1986 to 2002.



Data Source: Australian Bureau of Statistics

Maternal deaths (defined as deaths while pregnant or within 42 days of termination) are now very rare. The Australian maternal mortality ratio for 1997-99 was 8.2 deaths per 100,000 confinements. The maternal mortality rate for Indigenous women in this triennium was 23.5 deaths per 100,000 confinements, consistent with the disparities of previous years, and is a continuing cause for concern [71].

In Queensland between 1988 and 1999 there were between 0 and 5 deaths in any year due to pregnancy-related complications or childbirth. During this time period there were also a small number (3-10) of incidental maternal deaths per year due to potentially avoidable causes [71]. Transport accidents, deaths due to infection and drug-related deaths are the most common cause of incidental maternal deaths in Australia [72].

Obesity in children

Overweight and obesity in childhood is predictive of both overweight and obesity and increased mortality in adulthood [72]. The 2001 AusDiab study, where weight and height were measured rather than self-reported, provided evidence that already nearly half of Australian (45%) and Queensland (48%) adults are overweight or obese [45].

The prevalence of overweight and obesity in Australian children and adolescents increased from 11.25% in 1985 to 21.05% in 1995. Children in 1995 were 1.8 times as likely to be overweight and 3.3 times as likely to be obese than children in 1985 [73]. In 2000 24% of 4,441 Australian (including Queensland) school children surveyed were overweight or obese [74].

Interventions for prevention of overweight and obesity in children are currently unproven, but are likely to include reduction in sedentary behaviour, increase in physical activity [75], decreased consumption of high sugar foods and social and environmental change [76]. Intervention is important at the levels of family, community, and the whole population.

Mental health in children and adolescents

Depressive disorders, attention deficit hyperactivity disorder (ADHD), conduct disorder and eating disorders are important public health problems in Australian children and adolescents [77]. Results from the National Survey of Mental Health of Young People in Australia, conducted in all states in 1998, showed that 3.0% of children and adolescents aged 6-17 years have depressive disorder, 3.0% have conduct disorder and 11.2% (15.4% boys, 6.8% girls) have ADHD [35]. Overall, 14.0% of children were identified as having mental health problems. No data is currently available on eating disorders.

Key conclusions from this survey were:

- Male children and adolescents were more likely than females to have a mental disorder;
- mental disorders were associated with step/blended or sole parent families, lower income households, families where parents were not in paid employment, or where parents had left school at an earlier age;
- only 17% of those with problems had attended a mental health service in the past 6 months;
- the high prevalence of problems and limited availability of trained clinicians makes it imperative to identify alternate sources of help;
- parents identified counselling in schools as a service frequently used by children.

Children and adolescents under 20 years accounted for 10.6% (9.2% for males and 12.5% for females) of all admissions for mental health disorders in Queensland acute care public hospitals in 2002-03 [38].

Of admissions for mental disorders in children and adolescents under 20 years, 19% were associated with substance abuse, 15% with schizophrenic disorders, 18% for mood disorders and 4% for eating disorders [38].

3. Are the factors determining the health of Queenslanders changing for the better? Is it the same for everyone?

HEALTH RISK FACTORS AND THE NATIONAL HEALTH PRIORITY AREAS

Health outcomes reflect the accumulation of exposures to advantageous and disadvantageous experiences and environments over varying stages of life. In recent years, a life course approach to the study of health and illness has identified an association between many of the health inequalities of morbidity and mortality and socioeconomic factors. Evidence suggests that adverse exposures accumulate throughout life, and increase the risk of illness and premature death.

Ten major health risk factors make a significant contribution to the burden of disease in Australia [14]. Tobacco use, alcohol overuse, physical inactivity, hypertension, high blood cholesterol, overweight and obesity, and low intake of fruit and vegetables are risk factors which impact on the national health priority areas of cardiovascular health, diabetes, cancer, mental health, injury and some musculoskeletal conditions.

These risk factors were estimated to account for somewhere between one-third and one-half of the burden of disease and injury in Australia in 1996 [14].

Tobacco smoking is the single risk factor responsible for the greatest burden of disease and injury in Australia. This is followed by physical inactivity, hypertension or high blood pressure, harmful alcohol consumption in males, and overweight and obesity. In subgroups of the population, mainly men over 40 years and postmenopausal women, low to moderate alcohol consumption confers a small benefit related to protection from hypertension, ischaemic heart disease and stroke (Figure 38) [14].

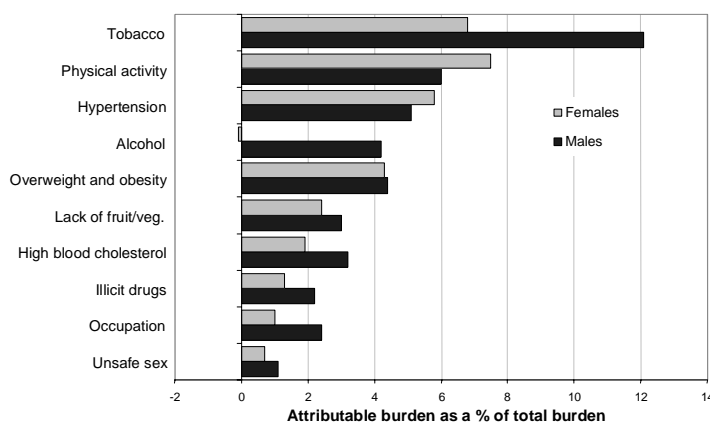
Dietary factors have been shown to be an important risk factor for 56% of all deaths in Australia. The overall burden of disease associated with diet is difficult to assess from available evidence and was not determined in the 1996 Australian Burden of Disease study [14].

Prevention of the National Health Priority Area conditions requires a reduction in the risk factors of tobacco smoking, physical inactivity, hypertension, harmful alcohol consumption, overweight and obesity, high blood cholesterol and poor diet in the population.

These estimates are complicated by the co-prevalence and interactions between the different health risk factors. For example, the lack of regular physical activity is directly linked with hypertension, and overweight and obesity are key risk factors for hypertension. To the extent possible, estimates capture the independent contribution of the risk factor, controlling for the effects of other risk factors.

Reduction of risk factors may be linked to lowering of morbidity and a reduction in hospital admissions. In Queensland, as in the rest of Australia, a large number of hospital admissions are potentially avoidable. The 'avoidable admission' rate in Queensland in 2002-03 (32.4 per 1,000 admissions) was higher than the national average (30.8 per 1,000 admissions) [33].

Figure 37. Relative burden of disease due to the most common risk factors.



Data Source: Mathers et al 1999. The Burden of Disease and Injury in Australia

Tobacco smoking

Tobacco smoking is the single biggest risk factor responsible for the greatest burden of disease in Australia [14]. In particular, smokers have increased risk of lung cancer, ischaemic heart disease and stroke. Mortality attributable to smoking is higher in males, in remote areas, and in areas with a high proportion of Indigenous peoples (Figure 38).

In Queensland in 2001, males aged 18 years and over had a higher prevalence of current smoking (30.5%) than the other Australian states. Prevalence of current smokers was 20.7% in Queensland women (Figure 38) [5].

Smoking rates have been declining in males since the early 1970s, and in females since the mid-1980s [78]. There is a time lag between exposure to tobacco smoke and some of its ill-effects. For cancers, this may be many decades. The health risk posed by smoking increases the earlier a smoker takes up the habit, and the longer they are exposed to tobacco.

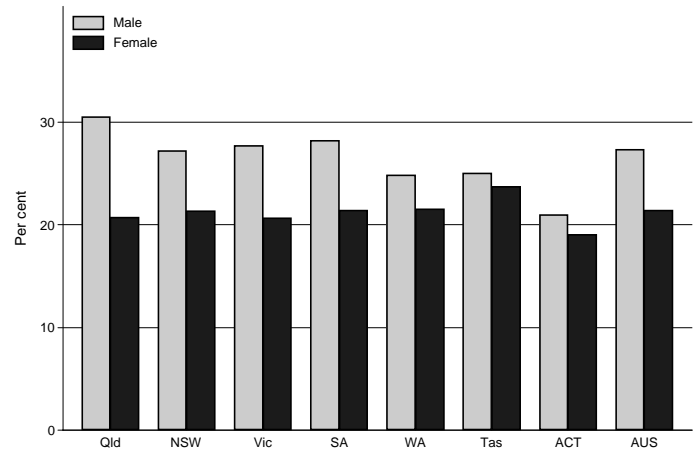
Overweight and obesity

Overweight and obesity have been identified as key risk indicators of preventable morbidity and mortality for many diseases, particularly hypertension, cardiovascular disease, Type 2 diabetes, and bone and joint diseases.

In 1995, one fifth of Australian children were overweight or obese, which may be one of the highest proportions in the world [72]. Since 1985, the proportion of children overweight or obese has almost doubled in Australia [73].

- Australia had the second highest prevalence of obesity compared with OECD countries for which data were available (Figure 39(a)) [21].
- Queensland had a higher percentage of overweight or obese adults than other states in 2001 (Figure 39(b)) [5].
- The prevalence of overweight and obesity for Australians has increased since 1989-90 (Figure 39(c)) [79].

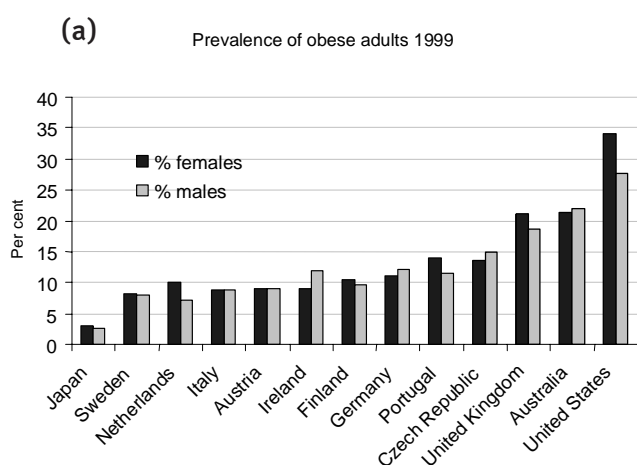
Figure 38. Percentage of adults 18 years and over who were current smokers, by state, 2001.



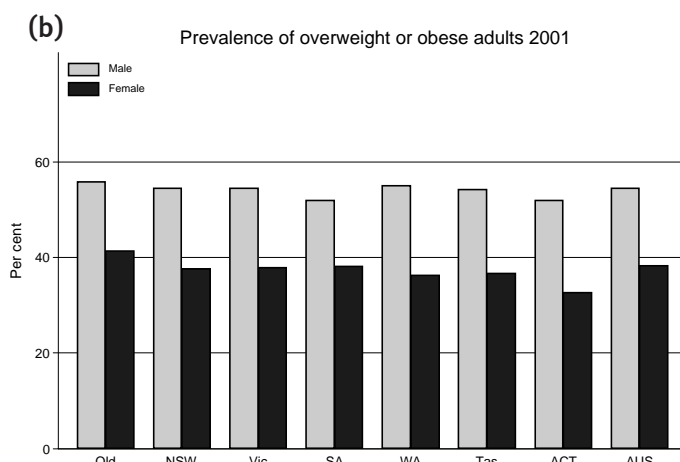
Data Source: Australian Bureau of Statistics
Standardised to the 2001 Australian Population

Figure 39. Prevalence of overweight and obesity

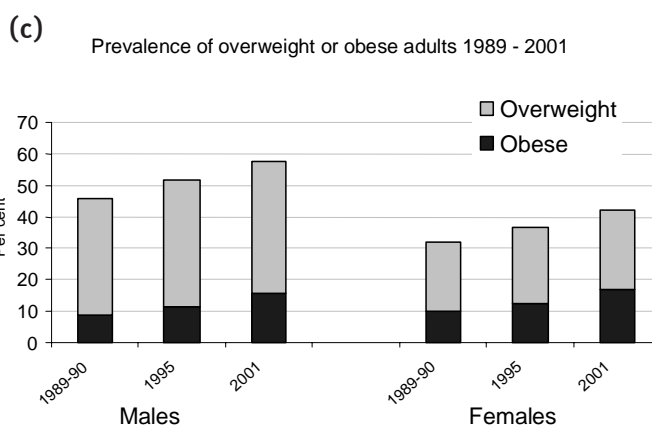
(a) Percent of obese (BMI 30 kg/m² or greater) adults in OECD countries, 1999. (b) Percent of adults who were overweight or obese (BMI 25 kg/m² or greater), by state, 2001. (c) Trends in the prevalence of overweight and obese adults in Australia 1989-90 to 2001.



Data Source: OECD Health Data 2004
Standardised to the total OECD population 1980



Data Source: Australian Bureau of Statistics
Standardised to the 2001 Australian Population



Data Source: Australian Bureau of Statistics
Standardised to the 2001 Australian population

Inadequate vegetable and fruit intake

Inadequate intake of vegetables and fruit has been linked to increased rates of cardiovascular disease, certain cancers, particularly colorectal cancer and possibly diabetes.

It is recommended that five serves or more of vegetables and two serves or more of fruit be eaten each day for a protective effect against these diseases [80]. In 2001, fewer than 15% of adult males and fewer than 21% of adult females in Queensland met the recommended daily intake of vegetables, while 42% of males and 55% of females met the recommended daily intake of fruit [81]. Of the states, Queensland had the second highest percentage of men (49.7%) and the highest percentage of women (60.4%) with adequate fruit intake, compared with other states [5].

Physical inactivity

The lack of regular physical activity is directly linked with several chronic diseases including cardiovascular disease, Type 2 diabetes, hypertension, colon cancer, depression and obesity. Weight-bearing physical activity reduces the risk of osteoporosis and falls, and improves postural stability [82].

In 2001 about 31% of Queensland males and 33% of Queensland females self-reported as being physically inactive. Queensland had the second highest prevalence of physical inactivity of the states (Figure 40) [5].

Current evidence indicates that 150 minutes of accumulated physical activity in at least five sessions over a week can provide a health benefit [83, 84]. A Queensland Health survey in 2001 showed that 55% of Queensland adults did not meet these guidelines, with 15.2% being sedentary and 39.8% achieving insufficient activity [85].

Hypertension

Hypertension or high blood pressure is a major risk factor for ischaemic heart disease, stroke, peripheral vascular disease and renal failure.

The AusDiab study indicated that in late 2000 25.1% of Queenslanders 25 years and over had hypertension, with 12.9% taking anti-hypertensive medication [45]. The prevalence of both untreated and treated hypertension increased with age.

Queensland males in 2001 had the lowest proportion of self-reported hypertension among Australian states, while the proportion of females was second highest of the states (Figure 41) [5]. Self-reports may underestimate the prevalence of hypertension, as some people may be unaware they have the condition.

High blood cholesterol

High blood cholesterol levels are a major risk factor for coronary heart disease and stroke. In the AusDiab study, 49.7% of Queenslanders 25 years and over had elevated cholesterol (5.5 mmol/L), or were being treated for high cholesterol [45]. Rates of high cholesterol levels were highest among people aged 65-74 years [45]. There was little difference in the prevalence of high cholesterol between males and females or by socioeconomic category.

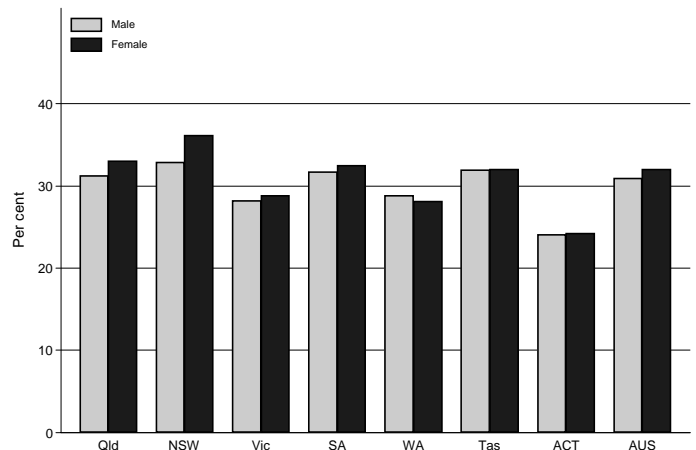
Alcohol consumption

Excessive alcohol use is a major risk factor for morbidity and mortality [31]. Road traffic accidents and liver cirrhosis were the leading causes of deaths from alcohol in the Australian burden of disease study [14].

Low to moderate alcohol consumption has some beneficial effects in lowering the risk of cardiovascular disease, mainly in those aged over 65 years [14]. Conversely, alcohol consumption can contribute to causes of premature death.

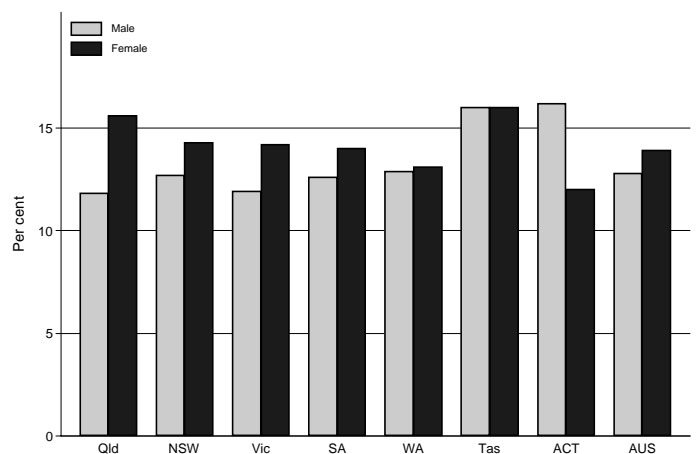
In 2001, 8.3% of Australians drank alcohol daily and 74.1% occasionally. These proportions have been fairly stable since 1993 [31].

Figure 40. Percentage of adults 18 years and over who are physically inactive, by state, 2001.



Data Source: Australian Bureau of Statistics

Figure 41. Percentage of males and females with self-assessed hypertension, by state, 2001.



Data Source: Australian Bureau of Statistics

HEALTH RISK FACTORS FOR OTHER KEY HEALTH CONDITIONS

Illicit drug use in Queensland

Illicit drug use can result in death from overdose and is associated with needle sharing and transmission of blood-borne conditions, in particular hepatitis C and HIV infection.

In 1999-2001 there were on average 94 deaths per year in Queensland attributed to illicit drug use, 78% of which were males. Males 25-29 years of age are at most risk of death from illicit drug use. Mortality rates from opiate overdose in Queensland were well below the national average (Figure 42) [86].

Mortality due to opiate overdosage peaked in 1998 to 2000 and has been declining since, both in Queensland and Australia as a whole (Figure 43) [86].

Unsafe sex

Unsafe sex is an important risk behaviour for HIV as well as other sexually transmitted infections such as chlamydia and syphilis. In Queensland, male to male sex is the most common mode of transmission for HIV.

Health related actions

Surveillance for communicable disease

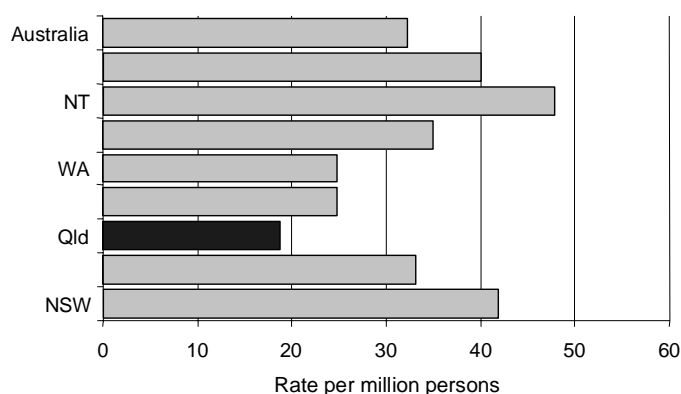
Australia has low rates of communicable disease compared with developing countries. Serious outcomes have been averted because Australia has well established systems for surveillance and control of communicable diseases [53].

Queensland is particularly at risk from some communicable diseases compared with other states, due to the presence of mosquitoes and other insect vectors in the north, and also because of the short distance between the Far North Queensland mainland and areas which have endemic exotic or tropical diseases. Queensland Health, in collaboration with Commonwealth Departments, carries out surveillance and monitoring for both old and emerging infectious diseases which could have serious public health and economic consequences.

Such conditions include mosquito and other vector-transmitted diseases (Ross River virus, Barmah Forest virus, Murray Valley encephalitis and kunjin, dengue, malaria, and Japanese B encephalitis). A malaria outbreak was averted in late 2002 in Cape Tribulation, due to the vigilance of Queensland Health in identifying the primary infected source and contacts, and treating local mosquitoes [53]

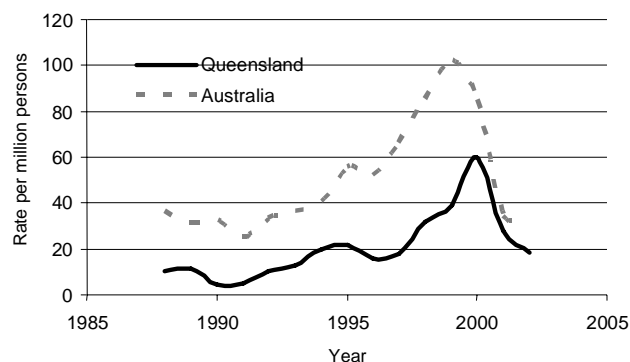
Severe acute respiratory distress syndrome (SARS) is an emergent infectious disease which first appeared in 2003. It caused a cluster of deaths in Hong Kong, and subsequent deaths in people in other countries, which were traced back to the Hong Kong source. SARS caused significant economic disruption throughout the world. After March 2003 Queensland Health issued a SARS 'Guidelines for Preparedness and Response', and all health centres participated in active surveillance. No cases have been reported in Queensland.

Figure 42. Opiate overdose death rates among people aged 15-54 years in 2002, by state.



Data Source: Australian Bureau of Statistics
Standardised to the 2001 Australian Population

Figure 43. Mortality rates from opiate overdose among people aged 15-54 years, Queensland and Australia, from 1988-2002.



Data Source: Australian Bureau of Statistics
Standardised to the 2001 Australian Population

Immunisation

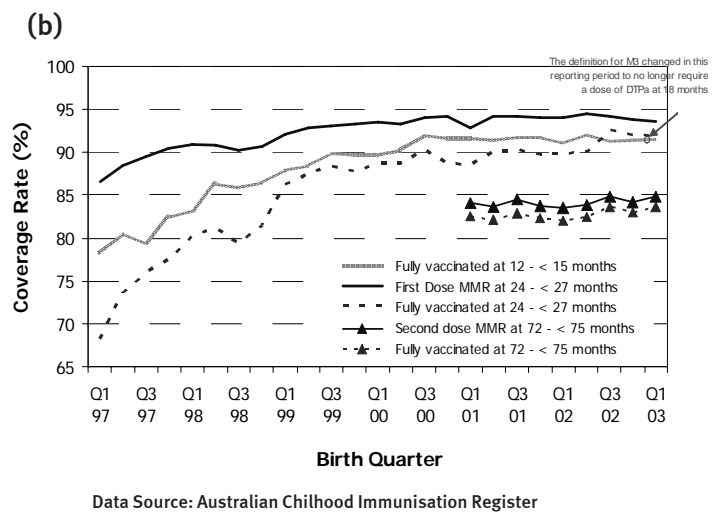
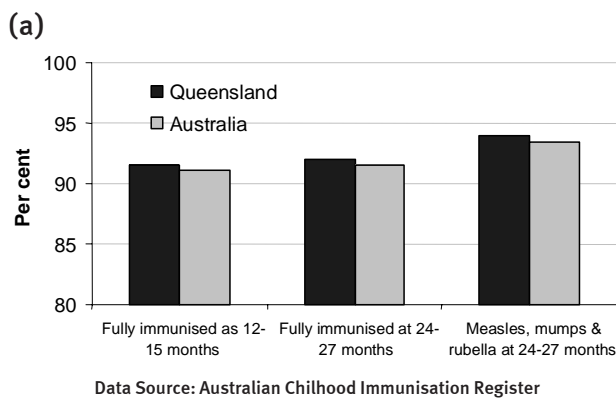
A large number of diseases are vaccine preventable. These include diseases routinely covered by childhood immunisation (measles, mumps, rubella, pertussis, hepatitis B, polio, haemophilus influenza type B meningitis), as well as tetanus, pneumococcal meningitis, Q fever, meningococcus, hepatitis A, and influenza.

Childhood immunisation

Substantial increases in childhood immunisation rates have occurred in recent years

Queensland and Australia have achieved the national target for immunisation of greater than 90% immunisation by two years of age (Figure 44(a) and (b)).

Figure 44. (a) Queensland and Australia, childhood immunisation rates, 2003. (b) Childhood immunisation rates from 1996 to 2002.



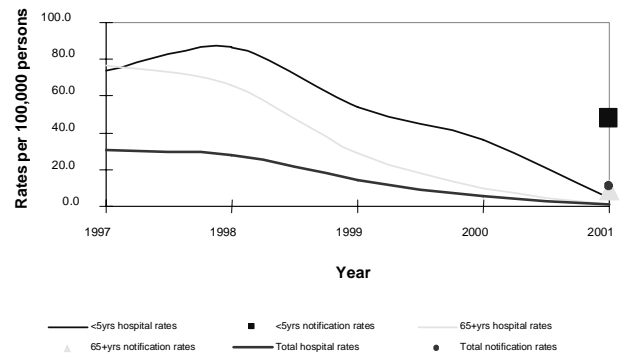
Adult immunisation (influenza)

Influenza vaccine is free for all people in Queensland aged 65 years or over, and Aboriginal or Torres Strait Islander people aged 50 years or over.

There were 27 deaths due to influenza in those over 65 in 1997 and 1998, but only one death in this age group in 1999-2000, illustrating the success of the vaccine program. Hospitalisation rates for influenza fell overall between 1997 and 2001 for all age groups (Figure 45) [54].

Figure 45. Hospitalisation rates for influenza, 1997 to 2001, with notification rates for 2001 for selected age groups.

Figure 45. Hospitalisation rates for influenza, 1997 to 2001, with notification rates for 2001 for selected age groups.



Screening programmes

Neonatal screening.

All babies born in Queensland (over 48,000 per year) are screened in the first week of life for hypothyroidism, galactosaemia, phenylketonuria and cystic fibrosis. For infants with hypothyroidism, galactosaemia, phenylketonuria, devastating consequences of disease and lifetime disability are avoided by early diagnosis and treatment. In those with cystic fibrosis, early diagnosis and management improves quality of life and life expectancy. Between 1987 and 1999, 265 infants have been diagnosed with hypothyroidism, 98 with phenylketonuria, 21 with galactosaemia and 259 with cystic fibrosis.

Children's Hearing Screening

Permanent childhood hearing impairment (PCHI) is a common congenital abnormality. The incidence of PCHI in the newborn population is greater than all other combined neonatal conditions currently screened, with approximately 1 in 500 children diagnosed per year with hearing impairment of 40 decibels or more in the better ear. The detection of hearing loss in a child in the first 12 months of life can be difficult, and is often missed by both the infant's parents and/or the physician. Those who do not receive intervention before 6 months of age experience psychological, sociological and economic disadvantage, including impaired speech and language development. In Queensland, the average age of identification of hearing deficit is currently approximately 30 months, with the average age of intervention being two years.

Queensland Health is currently implementing a universal hearing screening program. The program has been introduced in three tertiary hospitals and will incorporate all public hospitals with more than 200 births annually by the end of July 2006. Screening services will be provided using an outreach/ community based program for smaller birthing centres, and births in private hospitals. A targeted Ear, Nose and Throat screening service for the Cape York and Torres Strait region will be in place by July 2005 [87].

Breast cancer screening

Eligible Queensland women receive free breast cancer screening. In 2001-2002, 330,423 (62% of eligible women) were screened. The vast majority (93%) were reassured that there was no sign of breast cancer, and further assessment was recommended for 7% of women screened. In 2002, 965 breast cancers were detected through the BreastScreen Queensland Program, representing an overall cancer detection rate of 54.5 per 10,000 women screened. Of the 811 invasive cancers detected, 64% were less than 15mm in size, illustrating that the program is achieving its aim of early detection.

The participation rate for women in Queensland aged 50-69 years (the target group) rose from 43% in 1996-97 to 59% in 2001-2002. The Queensland participation rate is higher than the national rate of 56.9% for 2000-2001 [88].

Cervical cancer screening

During 2001-2002, 575,760 women 20-69 years were screened for cervical cancer in Queensland, representing 56.5% of this target population. Comparative data at a national level are only available to 1998. In 1997-98, the participation rate for women in Australia aged 20-69 was 64%.

4. Patterns of use of health services in Queensland

Queensland's public health system protects the health and wellbeing of Queenslanders throughout the state. Queensland Health has the largest operating budget of any Queensland organisation, and is the state's largest employer with approximately 63,000 staff. Queensland Health operates through 37 health service districts, with around 200 hospitals and outpatient facilities, 70 community health centres and 21 state government residential facilities. In 2002-03 there were 702,166 admissions to public hospitals [33]. Queensland Health also provides services for child health, school based youth health nurses, aged care and care for people with disabilities, oral health, mental health and alcohol and drug services, services targeted to needs of Indigenous Queenslanders, and immunisation and other population-wide services.

There are 103 private hospital facilities licensed by Queensland Health, including 49 day hospitals. In 2002-03 there were 602,165 admissions to private hospitals [33].

Hospital and Medicare general practitioner usage

Admitted patients

In 2002-03, Queensland had the third highest admission rate of the five states for which the information was available (Tasmania was excluded). Of these states, Queensland had the highest admission rate for private hospitals and lowest admission rate for public hospitals (Figure 46) [33].

Queensland tended to have a lower proportion of public patients than other states for appendectomy, coronary artery bypass graft, coronary angioplasty, cholecystectomy, diagnostic gastrointestinal endoscopy, hip replacement, hysterectomy, lens insertion, myringotomy, knee replacement, prostatectomy, arthroscopy procedures, and tonsillectomy [33].

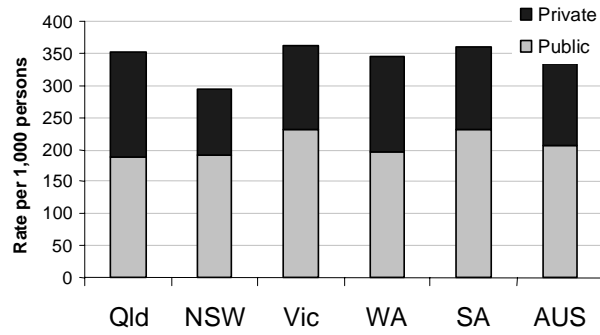
Rates of admissions to Queensland hospitals were higher among people living in very remote areas (Figure 47).

Areas with more than 40% Indigenous population had 1.4 times the rate of hospital admissions of the Queensland population as a whole (Figure 47).

Non-admitted patients (public hospitals)

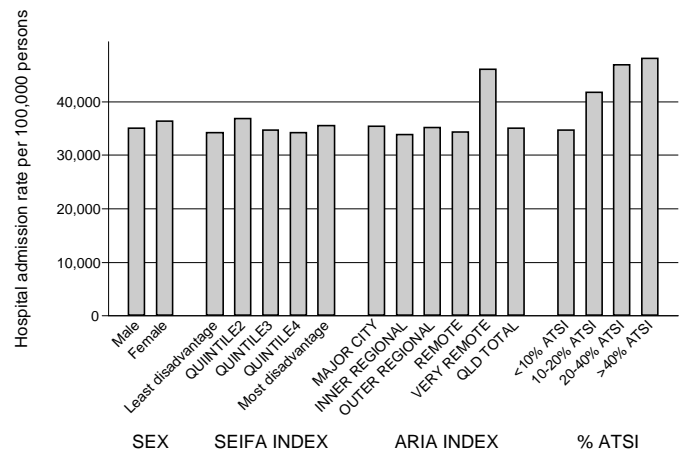
In Queensland in 2002-03 there were 2.0 non-admitted patient occasions of service per head of population compared to the national average of 1.8 [33]. The decentralised nature of Queensland's population creates a higher dependence on the hospital system to provide primary health care services, especially in remote and very remote areas.

Figure 46. Public and private hospital admission rates, by state, 2001-02



Data Source: Australian Hospital Statistics 2002-03, 2003, AIHW Standardised to the 2001 Australian Population

Figure 47. Queensland hospitals rates from all causes, 2000-01, by sex, SEIFA index, ARIA index, and Indigenous distribution.

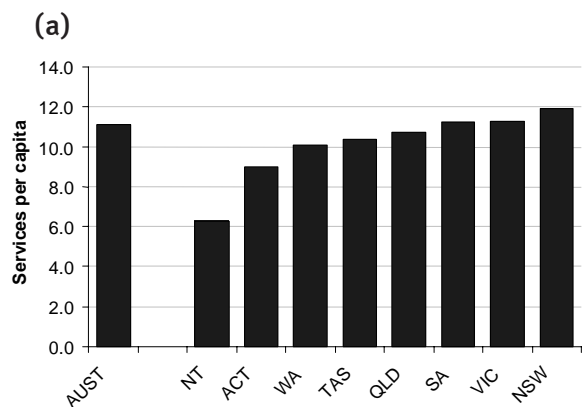


Data Source: Qld Hospital Admitted Patients Data Collection Standardised to the 2001 Australian Population

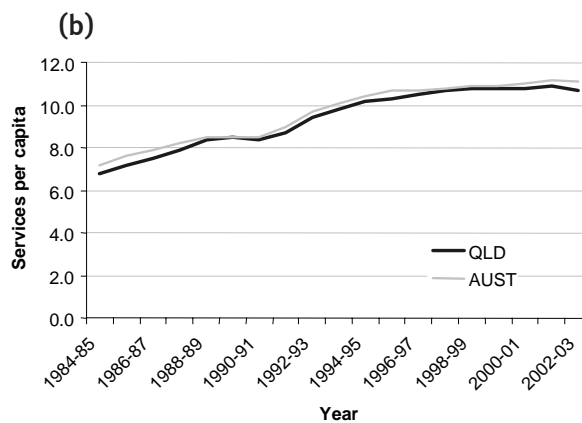
Medicare use

In 2002-03, each person in Queensland used 10.7 services covered by Medicare per year, just under the Australian average of 11.1 services per year (Figure 48(a)) [89]. Medicare use has increased by nearly 53% since 1984-85 (Figure 48(b)).

Figure 48. Use of Medicare services per capita, 2002-03, (a) Australia, by state and (b) 1994-95 to 2002-03.



Data Source: Commonwealth Department of Health and Ageing



Data Source: Commonwealth Department of Health and Ageing

Levels of Medicare use and associated costs fall rapidly with increasing remoteness, a result of a shortage of general practitioners in the remote and very remote areas (Figure 49) [90]. The level of use also increases rapidly with age.

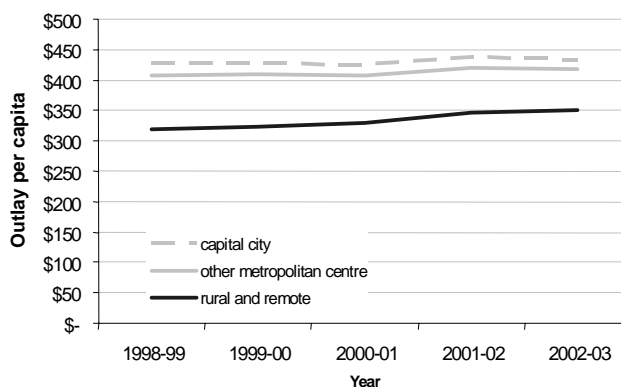
Resourcing of Health Services in Queensland Funding

In 2000-01, Queensland ranked fourth in government health expenditure per person, after the Northern Territory, South Australia, and Tasmania (Figure 50(a)), but lowest of the States and Territories in terms of total (government and non-government) health expenditure (Figure 50(b)) [32].

The most recent estimates of health services expenditure for Indigenous Australians are for 1998-99. Total recurrent expenditure was \$3,065 per Indigenous person compared with \$2,518 per non-Indigenous person - a ratio of 1.22:1.

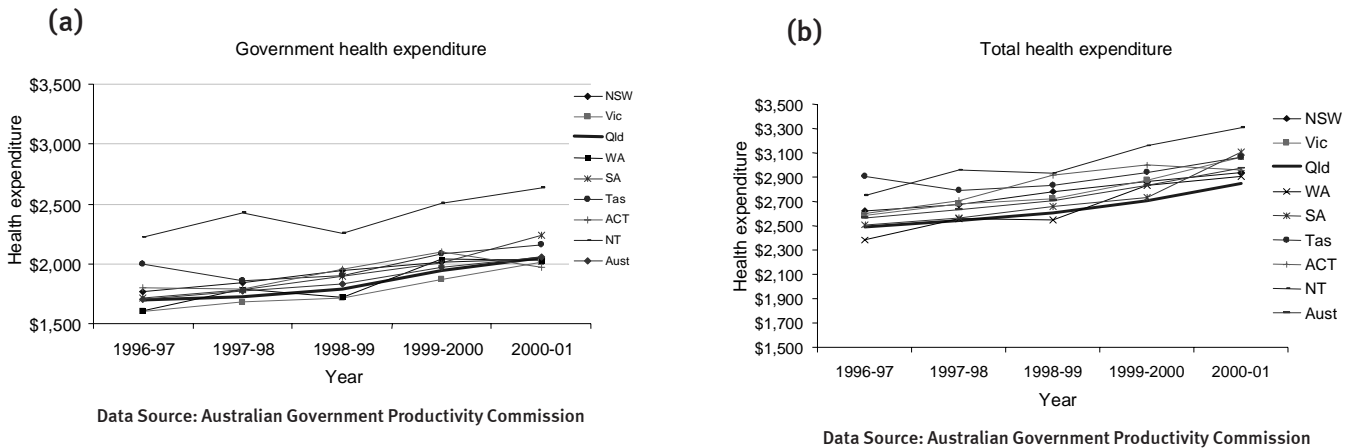
Health expenditure for Indigenous people is disproportionately low, compared with their higher level of poor health. Expenditure per person on Medicare and the Pharmaceutical Benefits Scheme in 1998-99 was only 39% of that for non-Indigenous people. Indigenous people were higher users of publicly provided health services in 1998-99, but used fewer privately provided services. Governments funded 90.8% of Indigenous health costs, compared with 67.5% in non-Indigenous populations.

Figure 49. Medicare outlay by regional category, Australia, 2002-03



Data Source: Australian Government Department of Health and Ageing Annual Report 2002-03

Figure 50. (a) Government total recurrent health expenditure, \$ per person, 1996-67 to 2000-01 [32]. (b) Total recurrent health expenditure, \$ per person, 1996-97 to 2000-02 [32].



Indigenous people used secondary and tertiary care at a higher rate than primary care [32]. These statistics reflect lower access to general practitioner services in rural and remote areas, and consequent greater use of hospital facilities, as well as health inequalities.

Bed availability

Queensland had 2.7 beds available per 1,000 persons (public hospitals), equivalent to the Australian average. South Australia had the highest number of available beds (3.3 per 1,000) and the Australian Capital Territory the lowest (2.1 per 1,000).

Staff

Queensland ranked seventh of the Australian jurisdictions in terms of staff, with 8.9 Full Time Equivalent staff per 1,000 persons in 2001-02, above Tasmania which had 8.3 staff per 1,000 persons. The Northern Territory had the highest relative number of staff (11.8 per 1,000 persons).

There has been little change in staffing levels in Queensland since 1998-99. Nursing staff make up the majority of hospital staff in all states, ranging from 3.7 to 5.0 per 1,000 persons (3.9 per 1,000 persons in Queensland), with salaried medical officers at the level of 0.9 per 1,000 persons in Queensland (range 0.7 per 1,000 persons in Tasmania to 1.3 per 1,000 persons in the Northern Territory). There have been no marked changes in staffing levels in any of the States or Territories since 1998-99 [32].

Quality and Key Performance Indicators (Public Hospitals)

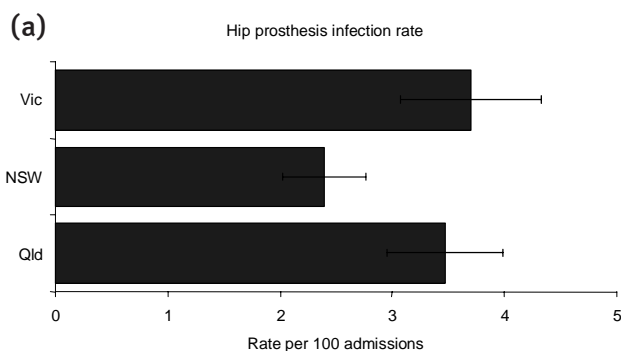
Quality is defined as 'the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge' [91]. Quality is assessed (using the performance indicators for public hospitals) as safety, responsiveness and capability [32].

Standard quality and performance indicators for public hospitals include specific surgical site infection rates, emergency department and elective surgery waiting times, and measures of hospital activity.

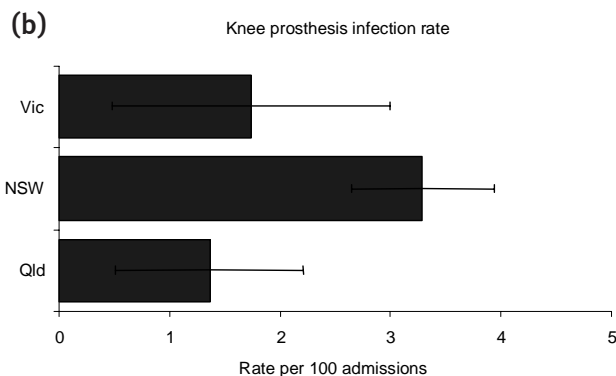
Surgical site infection rates

In 2002-03, Queensland had fewer infections following knee replacements and intermediate rates for infections following hip replacements compared with NSW and Victoria (Figure 51).

Figure 51. Post surgical infection rates for (a) hip prosthesis and (b) knee prosthesis in three states, 2004 [32].



Data Source: Australian Government Productivity Commission



Data Source: Australian Government Productivity Commission

Emergency department waiting times

In 2002-03, 99-100% of triage category 1 ('resuscitation') patients were seen immediately in Queensland and all other States except Western Australia and Tasmania. Data need to be interpreted with caution due to different methods of recording waiting times.

For Queensland, 55% of triage category 3 ('urgent') patients were seen 'on time' (within 30 minutes), ranking fifth of the states, with the greatest proportion of patients seen on time (76%) in Victoria [33].

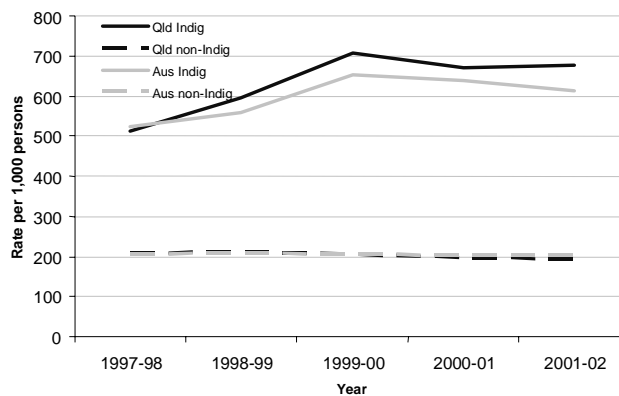
Elective surgery waiting times

Queensland had the shortest median waiting time for elective surgery in 2002-03, compared with other states. Fifty percent of Queensland patients in principal referral and women's and children's hospitals waited less than 20 days, compared with the Australian average for this hospital peer group of 26 days [33].

Hospital admissions by Indigenous status in public hospitals.

People reported as Indigenous have 2-3 times the hospital admission rates of the general population (Figure 52). However this is likely to reflect the availability of access to care as well as difference in the complexity, incidence and prevalence of disease in Indigenous and non-Indigenous communities.

Figure 52. Hospital admission rates, Indigenous and non-Indigenous, Queensland and Australia, 1997-98 to 2001-02 [32]



Data Source: Australian Government Productivity Commission

Balanced Scorecard

Health care quality can be assessed using the Kaplan and Norton 'Balanced Scorecard' approach [92], which has been adapted from business applications [93].

Queensland Health used the balanced scorecard method to provide a 'snapshot' of the performance of its public hospitals in the years leading up to 2003.

The balanced scorecard uses measurements (indicators) in four 'quadrants':

- i **Clinical utilisation and outcomes**, measured by indicators such as mortality, long stay and complication rates;
- ii **Patient satisfaction**, measured using patient questionnaires;
- iii **Efficiency**, measured by admissions, bed availability and costs of care; and
- iv **System integration and change**, measured by accreditation rates, nursing staff retention, use of electronic technology, adverse events, and use of 'clinical pathways', or standard operating procedures.

Clinical utilisation and outcomes

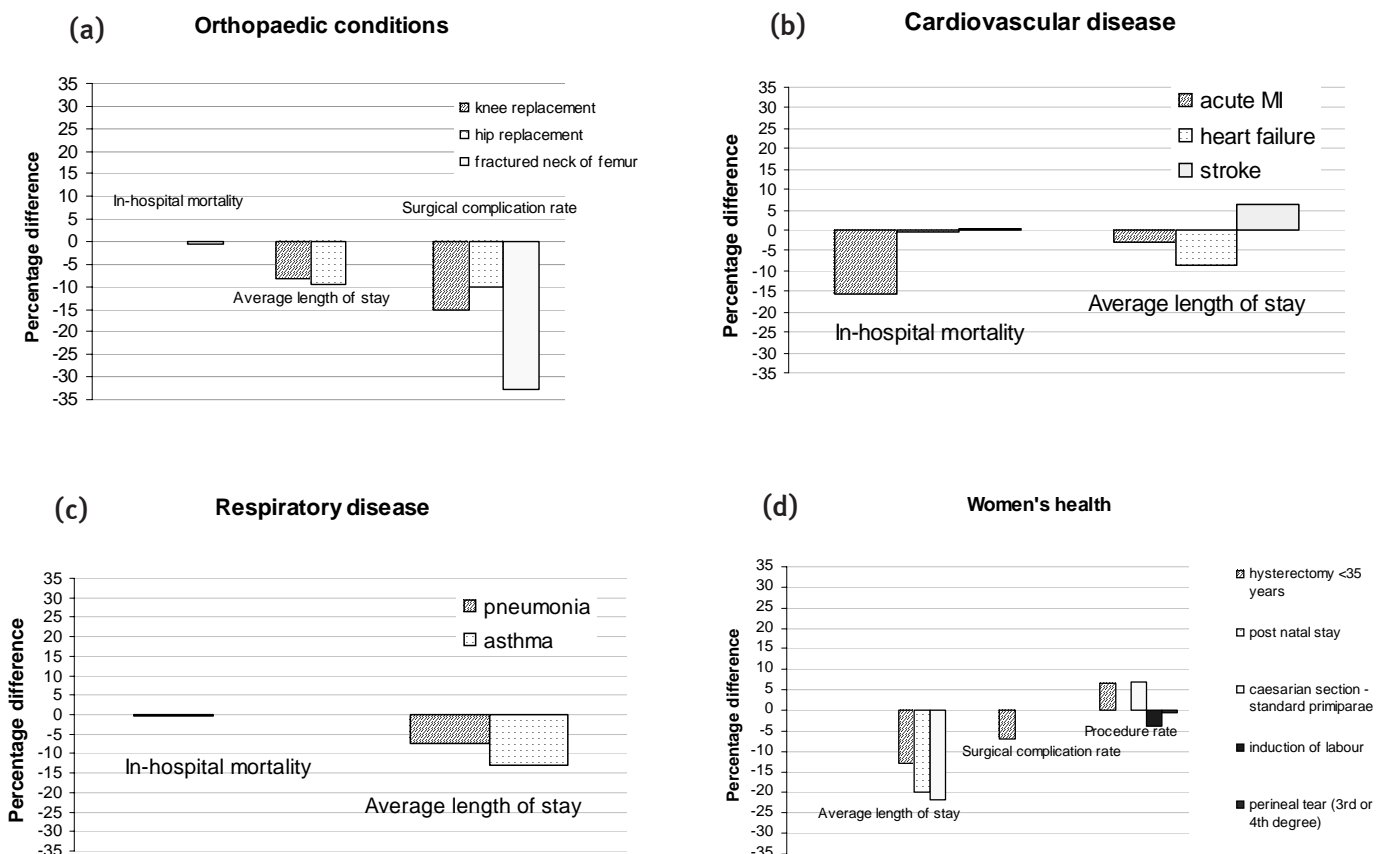
Findings for 'Clinical utilisation and outcomes' are based on 1999-2000 data from 60 Queensland public hospitals, representing 86% of the available beds.

Indicators that represent the quality of health care have been developed within a number of clinical areas. These are representative of a large part of hospital activity and include

- Cardiovascular disease (acute myocardial infarction (heart attack), heart failure and stroke);
- women's health (hysterectomy and maternity);
- orthopaedic surgery (knee and hip replacement and fractured neck of femur);
- respiratory conditions (pneumonia and asthma);
- general surgery (colorectal carcinoma and diabetic foot).

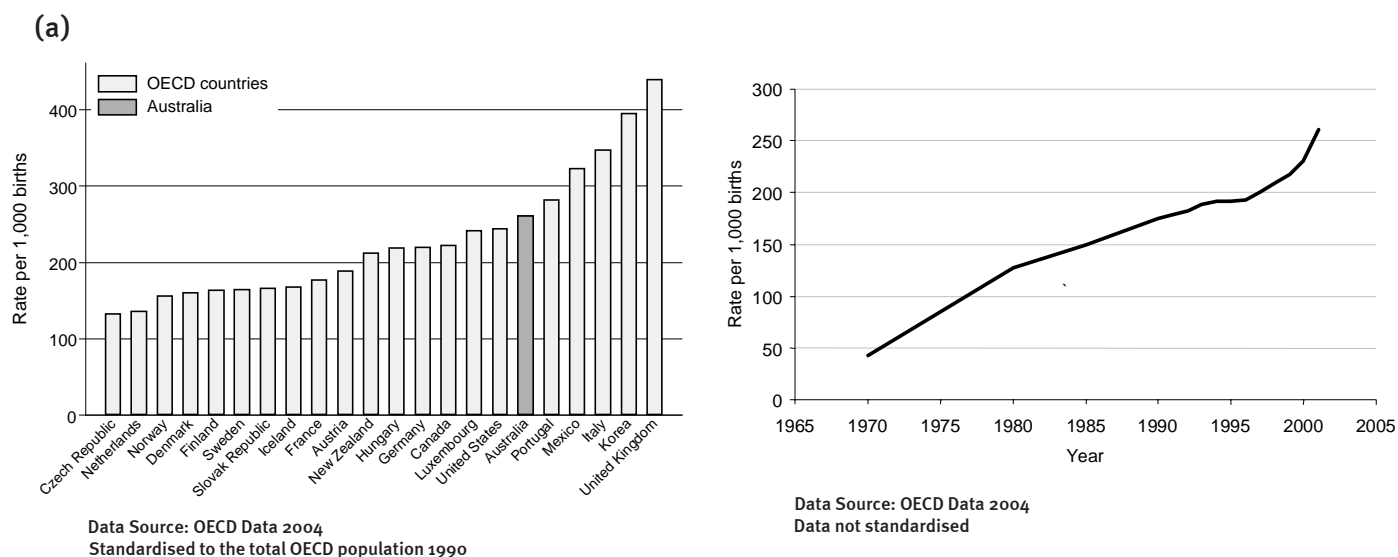
Indices measured for various conditions include in-hospital mortality, long stay rate or average length of stay, and surgical complication rate. Queensland generally performed better than the Australian average in nearly all categories, except for longer average length of stay for stroke, higher rate of hysterectomy in women under 35 years, and higher rate of caesarean section (Figure 53) [94].

Figure 53. Clinical utilisation and outcomes indicators in Queensland hospitals for (a) orthopaedic conditions, (b) cardiovascular disease, (c) respiratory disease and (d) women's health, compared with the Australian average.



Australia had the sixth highest rate of caesarian section of OECD countries in 2001 (Figure 54(a)). Australia's caesarian section rate has increased over the last decade (Figure 54(b)).

Figure 54. (a) Comparison of Australia's caesarian section rate with other OECD countries. (b) Caesarian section rate, Australia, 1970 to 2002.



Patient satisfaction

Patient satisfaction was measured by Queensland Health, using a questionnaire administered to 10,414 respondents over 55 public hospitals in 2001. The results of this statewide survey showed that overall, most patients (89%) were satisfied with their hospital stay, with 59% being very satisfied [95].

Efficiency

Measures of activity

Admissions

In 2002-03 there were 702,166 public hospital admissions in Queensland. In 2002-03 the admission rate per 1,000 population for Queensland was 352.1, compared with 333.9 for the total Australian population [33].

Length of stay

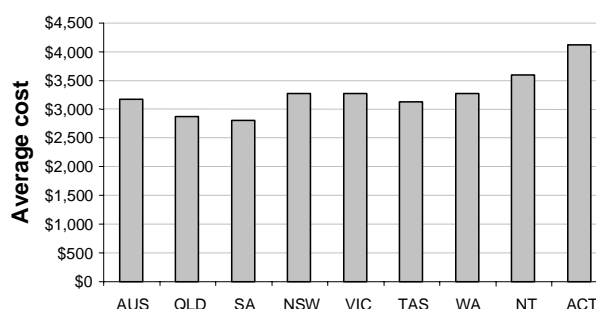
In 2002-03, average length of stay was 3.4 days in Queensland public and private hospitals, lower than the national average of 3.5 days [33].

Costs of service

Median cost per casemix adjusted separation in Queensland in 2003-03 was \$2,885.00, approximately 91% of the mean national cost of \$3,184.00. This was lower than all the states except South Australia (Figure 55) [33].

Medical labour costs accounted for 16.8% of total adjusted costs, compared with an average of 18.3% for other states excluding Queensland.

Figure 55. Average cost per casemix adjusted separation, by state, 2002.



Data Source: Australian Hospital Statistics 2002-03

System integration & change

System integration and change describes how the hospital system adapts to new technology, growth, and increasing complexity. Adaptation is measured using:

- Accreditation rates.
- Workforce characteristics.
- Use of information (electronic record systems and recording of adverse events).
- Telehealth use.
- Use of clinical pathways (standard procedures for common health problems).
- Benchmarking (comparisons between hospitals).
- Continuity of care.

'System integration and change' was evaluated using a survey of 59 eligible hospitals in November 2001 [94].

- 73% of hospitals were fully accredited, and a further 15% partially accredited.
- As in other states, there is a shortfall in qualified staff in Queensland, particularly nursing staff. High turnover and increasing age of the nursing workforce have been identified as problems. From August 2000 to August 2001, 77%–85% of registered nurses (excluding new graduates) were retained after one year in a given hospital. Median age of nurses at August 2001 was 41 years.
- Electronic records were used in up to 48% of hospitals, with maximum use in principal referral and specialised hospitals.
- Telehealth facilities (videoconferencing or similar) were available in 240 Queensland Health sites in 2001, used by 200–300 patients a month in 2001. However telehealth facilities are currently capable of more usage.
- Clinical pathways (written protocols which potentially improve outcomes for common procedures) are used in up to 48% of large hospitals.
- All principal referral and specialised hospitals participate in benchmarking, or comparison with other similar hospitals.

Research

Advances in health over the last century have been brought about by economic progress with higher standards of living, concomitant with increased knowledge of public health and infrastructure such as a clean, safe environment, food and water.

Investment in research and development is a major potential source of innovation and future wealth for Australia, and health and medical research is a key driver of research and development generally. International studies suggest that the return on investment in research and development can be as high as 50% annually.

A vibrant health and medical research sector is critical for fostering improvements in population health and health care, as well as for attracting and retaining leading scientists and clinicians. In turn, the community in Queensland derives a direct benefit from improved quality of health care, and employment opportunities for our brightest students.

Queensland Health, together with the (then) Department of Innovation and Information Economy (DIIE) performed an internal review of health and medical research early in 2003. The review found that total expenditure from all sources on health and medical research in Queensland is approximately \$150 million per annum. An estimated one third derives from the State government, one third from the Australian Government and one third from remaining sources. The total expenditure per head of population is lower than other mainland states (Table 1).

The publication rate in peer reviewed journals as reflected in Medline citations per 10,000 population was correspondingly lower than other states for the period 1998-2002 (Table 2).

Queensland Health has an extensive research infrastructure within the public hospital system, with significant competitive advantage provided by the concentration of pathology services into the statewide 'Queensland Health Pathology and Scientific Services'.

There is scope for improvement in Queensland's research productivity, and to this end the Smart State Research Facilities Fund, and other mechanisms, have resulted in a significant and well-recognised improvement in the capital infrastructure.

Table 1. Health Research & Development (R&D) Funding 2000

State	Health R&D Funding 2000 Per capita value
New South Wales	\$37.75
Victoria	\$64.70
Queensland	\$37.21
South Australia	\$72.78
Western Australia	\$38.02
ACT	\$172.21
Australia	\$48.79

Source: AIHW

Table 2. Medline citations per 10,000 population.

State	Research citations Per 10,000 pop	Total citations Per 10,000 pop
Queensland	21.9	97.4
New South Wales	46.5	201.5
Victoria	62.2	267.2
South Australia	74.9	331.7
Western Australia	41.9	186.4
Tasmania	23.0	122.2

Source: Medline

Summary

Queensland Health aims to capitalise on opportunities for research expansion by following the strategic directions outlined in 'Smart State: Health 2020: a Vision for the Future' by

- building a strong research culture by strategically investing in research opportunities, encouraging innovation and developing strong collaborative partnerships between the public sector, private sector, universities and research organisations;
- supporting an environment which pursues the commercialisation of significant medical research discoveries and appropriately rewards researchers;
- ensuring evidence-based approaches to evaluation and adoption of new practices in health care;
- encouraging a continuous improvement model at all levels of Queensland Health and actively supporting the conversion of research results into implementation priorities; and
- ensuring the most appropriate investment in new technologies, taking into account the cost effectiveness of individual technologies and ensuring appropriate training of the workforce to make the most of new development [96].

This summary of the state of health of the Queensland population will aid in achievement of these goals, not only by identifying areas where Queensland excels, but also by identifying areas of health inequality. It underpins the broader aims of Queensland Health, according to the 'Smart State: Health 2020 Directions Statement' of

- taking a wider perspective on health;
- targeting areas for ongoing health improvement in future years;
- reducing health inequalities, and
- involving Queensland communities in better health and health care.

Notes on methods

SEIFA index (Socio-Economic Indexes for Areas) – divides populations into 5 categories of socioeconomic disadvantage. The categories are sorted from highest to lowest index of disadvantage according to quintiles, i.e. the least disadvantaged group represents the top 20%, the second least disadvantaged group is the second-top 20%; those with most disadvantage represent the bottom 20% on the scale of disadvantage.

ARIA index (Accessibility/Remoteness Index of Australia) – divides Australia into 5 regions according to level of remoteness: major city, inner regional, outer regional, remote, and very remote.

Annual rates of change for mortality indicators were calculated using Poisson regression, and reported as percent change per year.

In the AusDiab study, glucose tolerance testing was performed according to the World Health Organisation Definitions ('Definition, diagnosis and classification of diabetes mellitus and its complications', World Health Organisation 1999. www.who.int/diabetes/) People with known diabetes receiving treatment were classified as 'diabetic', without undergoing glucose tolerance testing.

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1 1981 hospital morbidity data for specific injuries is not directly comparable with corresponding data for 2001-02, due to changes in collection and coding practices. For example, hospital admissions in 1981 were based on separations, but in 2001-02 they were based on episodes of care. Also in 1981 hospital admissions for injury were chosen from the principal external cause, whereas in 2001-02 the first external cause was chosen.