

1.3 Health status and health outcomes

“The factors that lead to someone developing disease on a particular day are likely to have roots in a complex chain of environmental events that may have begun years previously, which in turn were shaped by broader socioeconomic determinants.”

The World Health Report 2002¹¹

Determinants of health are the principal focus of this report. However, an initial overview of the health status and health outcomes for all Queenslanders provides the context for the importance of the health determinants that follow in section 1.4.

The aim of this section is to answer the following questions.

- How healthy are Queenslanders?
- Is it the same for everyone?
- Where is the most opportunity for improvement from a population health perspective?

These questions are addressed by reporting on indicators of burden of disease, life expectancy, quality of life and wellbeing, disability, and deaths, hospital separations, incidence and prevalence of key diseases and conditions in the National Health Priority Areas.

Actions to address these health needs are described in section 1.5.

1.3.1 Burden of disease

The burden of disease and injury in Queensland is the sum of the impact to the community of premature mortality, non-fatal outcomes and disability. Aggregating these health status and outcomes measures leads to a more complete understanding of the risks to health in Queensland than by using mortality and hospital separation statistics alone. The combined burden of fatal and non-fatal health outcomes is represented in a single measure: the Disability-Adjusted Life Year or DALY. The DALY adds together the years of life lost due to premature mortality (YLL) and years of life lost due to disability (YLD). The burden of disease techniques enable us to put health priorities in a population perspective.⁴⁸ Data derived can be used to make cost-effectiveness evaluations, rethink service orientation, project infrastructure needs, and guide investment decisions.

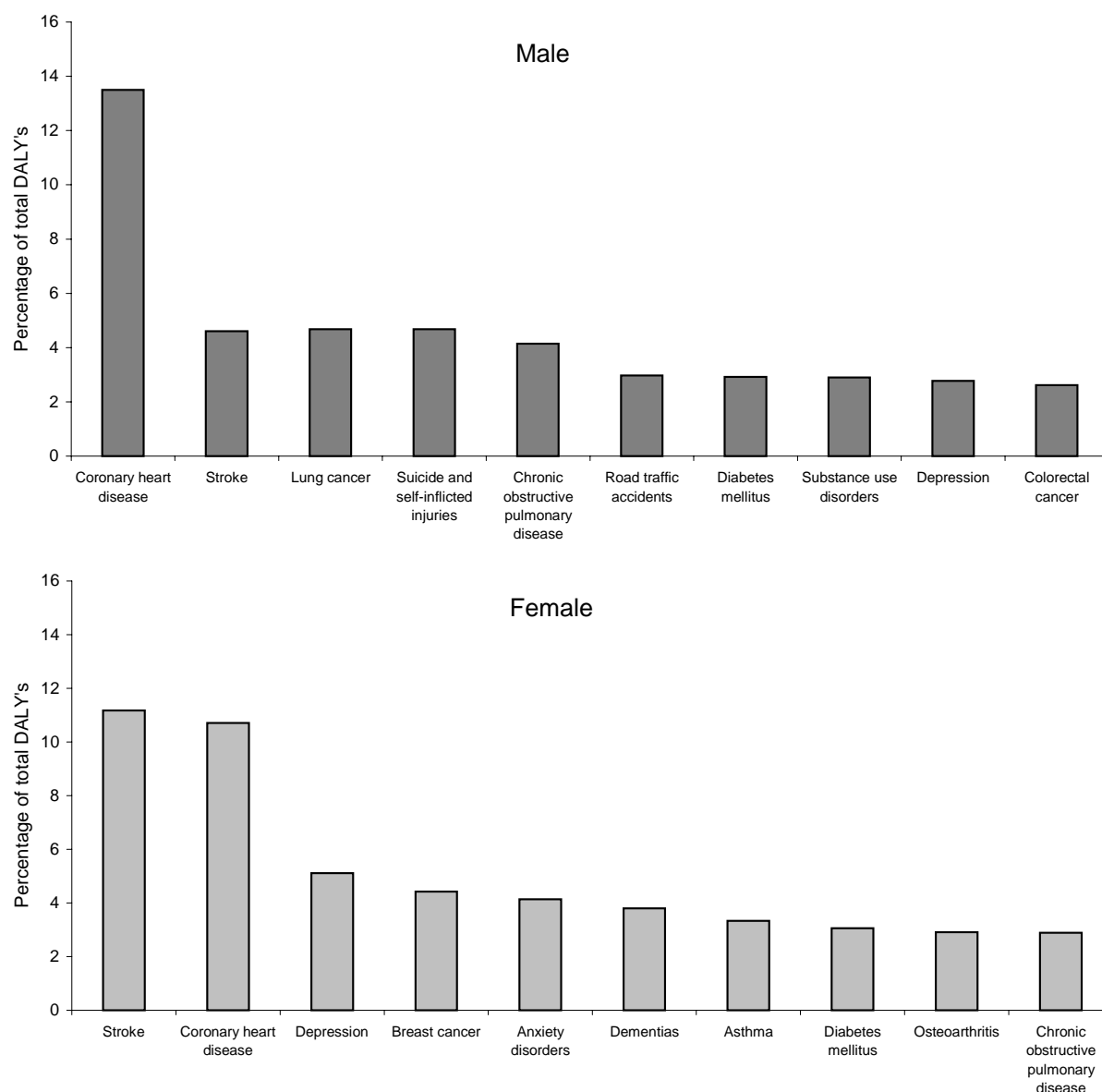
In 1996-98 in Queensland, the burden of disease for males was 17% higher than for females.⁴⁹ Premature mortality (YLL) was responsible for 56% of the total burden of disease for males and 49% for females. Males lost 34% more years of life due to premature mortality than females.

Coronary heart disease (CHD), stroke, lung cancer and suicide were the top four causes of burden of disease among males, due to their very high mortality component (Figure 1.1). For females, mental health conditions of affective disorders (including depression, anxiety disorders, Alzheimer's and dementias) followed stroke and CHD, with breast cancer listed as the fourth largest cause of disease burden. Females generally have greater incidence and prevalence of the more common non-fatal health problems. Males generally have greater incidence of the major diseases and injuries associated with high case mortality.

Between 1996 and 1998, premature mortality was responsible for nearly 240,000 years of life lost on average each year in Queensland. CHD was clearly the largest cause of premature years of life lost among both males and females (Table 1.1). CHD was followed by suicide, lung cancer and stroke among males, and by stroke, breast cancer and lung cancer among females. The top 15 causes of premature mortality comprised 67.2% and 64.8% of the total premature mortality for males and females respectively. Years of life lost due to disability (YLD) represent the disability component of the burden of disease. The non-fatal disease burden presents a very different picture to that provided by traditional mortality statistics (Table 1.1). As a category, mental disorders were the leading cause of YLD, accounting for more than a quarter (27%) of the non-fatal burden of disease in Queensland.

The burden of disease and injury for children, young people and older people is reported in the relevant chapters of Health Determinants Queensland. The burden of disease for Indigenous peoples in Queensland or Australia has not been formally assessed by these methods.

Figure 1.1: Top ten causes of disease and injury burden (DALYs) in total population by sex, Queensland 1996-98



Source: QH Quantifying the burden of disease and injury in Queensland 1996-98

Table 1.1: Top 10 causes of premature mortality (YLL) and years of life lost due to disability (YLD) in total population, Queensland 1996-98

YLL (persons)	% of total	YLD (persons)	% of total
Coronary heart disease	20.1	Affective disorders	9.8
Stroke	6.8	Anxiety disorders	6.7
Lung cancer	6.4	Sense organ disorders	6.5
Suicide and self-inflicted injuries	5.9	Asthma	5.1
Colorectal cancer	4.1	Alzheimer and other dementias	4.9
COPD	3.7	Osteoarthritis	4.8
Road traffic accidents	3.5	Substance use disorders	4.2
Breast cancer	2.8	Diabetes - type 2	3.4
Diabetes - type 2	2.0	COPD	3.4
Lower respiratory tract infections	1.9	Stroke	3.2

Source: QH Quantifying the burden of disease and injury in Queensland 1996-98

Australian data suggests that at least 17% of the total disease burden in 1996 can be attributed to socioeconomic disadvantage.⁵⁰ The burden for males in areas of greatest socioeconomic disadvantage was 37% greater than in areas of lowest disadvantage and 27% higher for females. There were significant differences in DALYs per 1,000 population for almost all disease categories for males and females (Table 1.2). Males in socioeconomically disadvantaged areas had more than 50% excess burden of disease due to diabetes, diseases of the digestive system, intentional and unintentional injuries. Females in socioeconomically disadvantaged areas had more than 50% excess burden of disease due to diabetes, mental disorders, diseases of the digestive system and intentional injuries.

Health risk behaviours such as tobacco smoking, physical inactivity, obesity and high blood pressure contribute to a sizeable proportion of the total burden of disease in Australia (Figure 1.2). The burden of disease due to these risk factors ranks in size with the top ten diseases. The overall burden of disease due to nutrition has not been assessed due to data limitations, although it is estimated to be at least as high as tobacco smoking.⁵¹

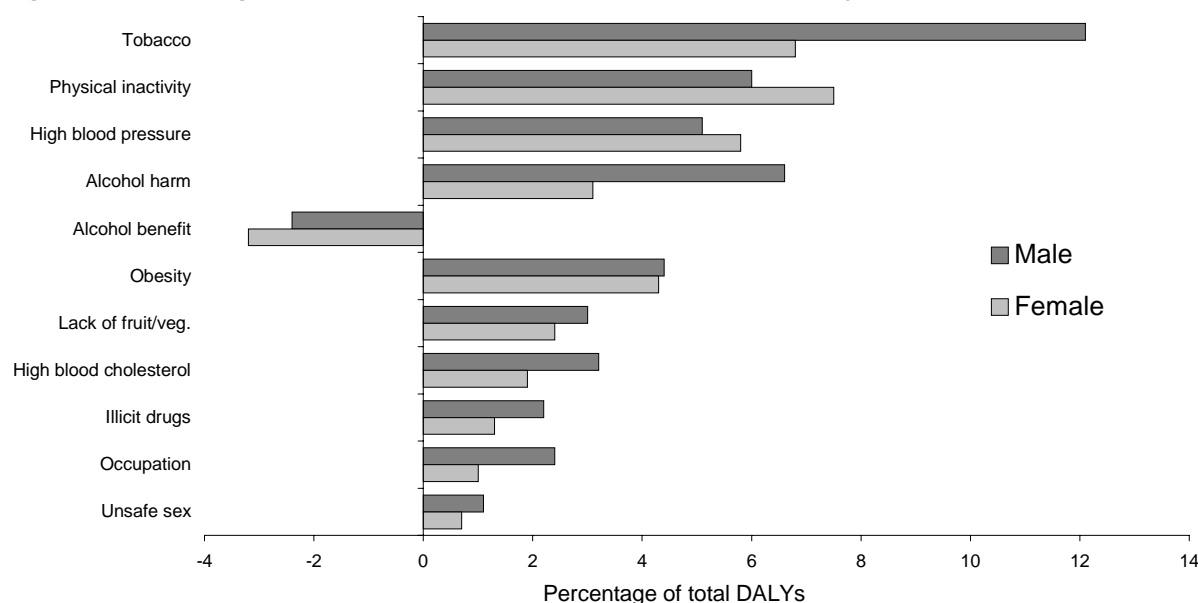
Table 1.2: Differentials in the burden of disease and injury between top and bottom quintile of socioeconomic disadvantage, by selected main disease categories and sex, Australia 1996

Disease category	DALY ratio	
	Male	Female
Infectious and parasitic diseases and acute respiratory infections	1.30 *	1.43 *
Neonatal causes	1.34 *	1.32 *
Malignant neoplasms	1.19 *	1.11 *
Diabetes mellitus	1.64 *	2.26 *
Endocrine and metabolic disorders	1.21 *	1.37 *
Mental disorders	1.43 *	1.53 *
Nervous system disorders	1.32	0.84
Cardiovascular disease	1.30 *	1.22
Chronic respiratory disease	1.48 *	1.34 *
Diseases of the digestive system	2.11 *	1.54 *
Genito-urinary diseases	1.16 *	1.23 *
Musculoskeletal diseases	1.44 *	1.44 *
Unintentional injuries	1.79 *	1.39 *
Intentional injuries	1.76 *	1.54 *
Other causes	1.17	1.20 *
TOTAL	1.37 *	1.27 *

Source: AIHW Burden of disease and injury in Australia 1996

*Rate ratio differs significantly (p<0.05) from 1.0

Figure 1.2: Percentage of total burden attributed to selected risk factors by sex, Australia 1996



Source: AIHW Burden of disease and injury in Australia 1996

1.3.2 Life expectancy

Most Queenslanders can expect to live relatively long and healthy lives. In Queensland in 1999- 2001, life expectancy at birth was 76.9 years and 82.5 years for males and females respectively, similar to that of Australia (Table 1.3).⁵² Australian men and women aged 65 years had a total life expectancy of 82.2 years and 85.7 years respectively, while 85-year-olds could expect to live a further five to seven years (Table 1.4). Australians continue to have one of the highest life expectancies in the world. Australian life expectancies are comparable with those in Japan, which has the highest life expectancy of any country. Australia is in the top 10 OECD countries for life expectancy.⁴⁸ Healthy life expectancy for Australian males is 70.1 years and for females 73.2 years, which equals around 9% of life 'lost' due to illness.⁵³ Healthy life expectancy is life expectancy weighted for health status.

Socioeconomic differences are evident, with generally longer life expectancy in areas of lower socioeconomic disadvantage in Queensland (Figure 1.3). Areas of lowest life expectancy at birth in Queensland were areas of greatest proportion of Indigenous population. In 2002, Indigenous life expectancy at birth was about 20 years less than for the total population.⁵⁴ In 2001, in Queensland, the median age at death for Indigenous peoples was 24 years lower than for non-Indigenous peoples.⁵⁵ While the median age at death for non-Indigenous Australians rose steadily over the period 1990 to 2001, the median age for Indigenous Australians remained at a much lower level.⁵⁵

The life expectancy of people of culturally and linguistically diverse backgrounds is unknown. However, in Australia, the proportion of older persons is greater among overseas-born population (17.7%) compared with 10.9% of those born in Australia,⁵⁶ indicating the relatively high impact of such people on the life expectancy of the Australian population.

During the past century, age specific life expectancy in Australia has increased continuously for all age groups, but particularly those aged 45 years and older. The increase has been rapid since the 1970s and has been largely attributed to the decrease in death rates for selected conditions such as cardiovascular disease. There is evidence that about two thirds of the gain in life expectancy over the past decade is taken in a state of disability.⁵⁷ Future progress in population health must increasingly relate to improving quality of life rather than quantity of life.⁵⁸

Table 1.3: Life expectancy at birth by sex, Queensland, Australia and other states 1999-2001

	Male	Female
Queensland	76.9	82.5
New South Wales	76.9	82.4
Victoria	77.5	82.7
South Australia	77.0	82.5
Western Australia	77.3	82.8
Tasmania	76.0	80.2
Northern Territory	70.8	76.5
Australian Capital Territory	78.5	82.9
Australia	77.0	82.4

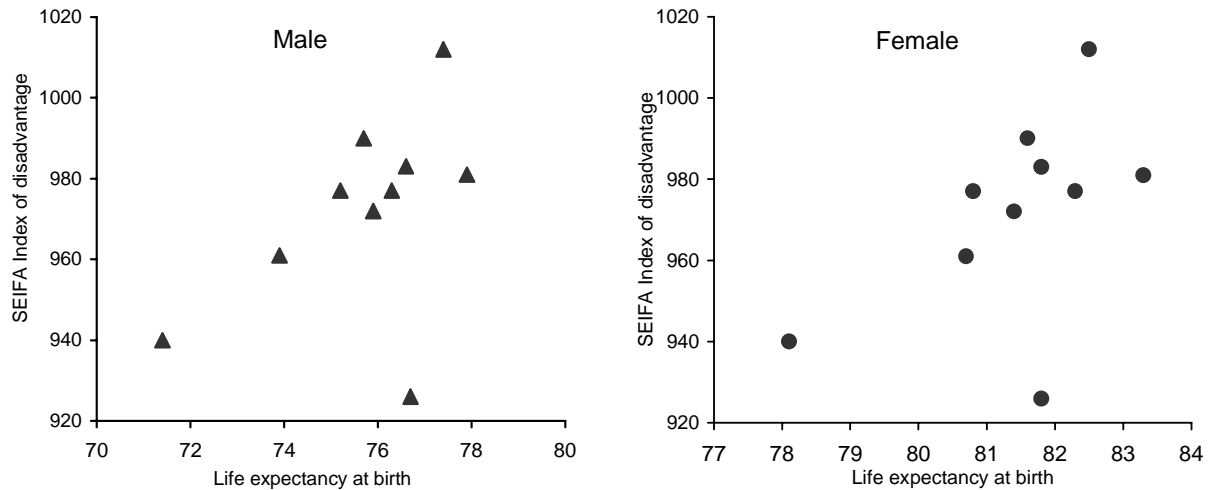
Source: ABS Deaths 2001

Table 1.4: Expectation of life, by age, Australia and selected countries

Expectation of life	Australia 1999-2001		Canada 1995-2000		New Zealand 1995-2000		Japan 1995-2000		USA 1995-2000	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Age 0	77.0	82.4	76.1	81.8	74.1	79.7	76.8	82.9	73.3	80.1
Age 1	76.5	81.8	75.6	81.3	73.6	79.3	76.2	82.3	72.9	79.6
Age 25	53.2	58.2	52.2	57.6	50.6	55.8	52.8	58.6	49.8	56.0
Age 45	35.5	38.8	33.4	38.2	31.9	36.5	33.7	39.2	31.7	36.9
Age 65	17.2	20.7	16.6	20.5	15.3	19.2	16.8	20.9	15.7	19.5
Age 85	5.6	6.8	5.9	7.3	5.1	6.6	5.3	6.7	5.3	6.8

Source: ABS Deaths 2001

Figure 1.3: Life expectancy at birth by sex and area of socioeconomic disadvantage (Statistical Division), Queensland, 1999-2001



Source: ABS Deaths 2001

Infant mortality rate

The infant mortality rate in Queensland in 2000 was 6.2 deaths per 1,000 live births (Table 1.5).⁵⁹ The infant mortality rate in Queensland is higher than Australia and all states and territories excluding the Northern Territory. In 1999-2001, the Aboriginal and Torres Straits Islander infant mortality rate for Western Australia, Northern Territory and South Australia was three times the rate for all Australians.⁶⁰ Infant mortality rates are on average 27% higher in boys than in girls.⁵⁹ Infant mortality is further discussed in the *Indigenous peoples* and *Children* chapters. Infant mortality is recognised internationally as one of the most important measures of the health of a nation and its children. It is also an important indicator of the health of pregnant women. A low infant mortality rate is a major contributor to increased life expectancy.⁵⁹

The rate of infant deaths in Australia has declined dramatically from 10.7 deaths per 1,000 live births in 1900 to 5.2 deaths per 1,000 live births in 2000. These dramatic gains have been achieved through improvements in public sanitation and health education, the development of vaccines and the effective use of antibiotics.

Table 1.5: Infant mortality rate, by state and territory, Australia 1980, 1990 and 2000

State/Territory	1980	1990	2000
Queensland	10.9	7.7	6.2
Australian Capital Territory	8.0	9.4	4.2
Western Australia	11.7	8.6	4.3
Victoria	10.0	7.8	4.5
South Australia	10.1	8.5	4.6
New South Wales	10.9	8.1	5.2
Tasmania	12.8	8.9	5.8
Northern Territory	14.2	15.2	11.7
Australia	10.7	8.2	5.2

Source: ABS Australian social trends 2002.

Rate per 1,000 live births

1.3.3 Quality of life and wellbeing

The majority of Queenslanders rate their quality of life, health status and satisfaction with health as high.

Quality of life

In 2002, 91.5% of adults in Queensland aged 18 years and older rated their quality of life as good or very good, with women more inclined to rate higher quality of life than men (Table 1.6). Young males and females (aged 18-29 years) reported significantly higher quality of life than older males and females (aged 65 years and older). Reported quality of life was significantly lower for people in areas of high socioeconomic disadvantage, however, no significant differences were reported across area accessibility categories.

Using an objective measure of quality of life, in 2003 Australia was rated as the highest in the world.⁶¹ This rating was based on factors including relative income, environmental quality, health status and access to services. Increasing from its ranking in 2002, Australia's quality of life is now ranked ahead of all countries.

Self reported health status

Eighty six per cent of Queensland adults reported their health as either excellent or good in 2002 (Table 1.6).⁶² People in areas of highest socioeconomic disadvantage reported significantly lower health status than people in areas of low disadvantage. Reported health status was generally lower for males, and for Older people than younger people. No significant differences were reported across area accessibility categories. Using alternative data for 2002⁶³ in Australia, 84.1% of people reported excellent, very good or good health. People who were not proficient in English and who were born in other countries were less likely to report health (63%), compared with Australian born people (85%), people born in mostly English speaking countries (86%) and people with proficient English who were born in other countries (84%). The impact of poor proficiency in English on response to this survey question is unknown. People's perception of their own health has been shown to be a powerful, independent predictor of their survival in several populations, including older Australians.^{64,65,66} This association of self rated health and objective health stands even after controlling for demographic factors, a range of illnesses, disability, personality and social supports.

Table 1.6: Self reported quality of life and self rated health (proportion; 95%CI) by sex, age, accessibility and socioeconomic disadvantage, Queensland 2002

		Quality of life	Self reported health	Satisfaction with health
		Very good or good	Excellent, very good or good	Very satisfied, satisfied
Persons	18+	91.5 (90.3-92.6)	86.4 (85.0-87.8)	78.7 (77.0-80.4)
Male	18+	90.4 (88.7-92.1)	85.6 (83.6-87.7)	79.5 (77.1-81.9)
Female	18+	92.6 (91.0-94.7)	87.2 (85.1-89.1)	78.0 (75.5-80.4)
Male	18-29	95.9 (93.6-98.2)	87.5 (83.7-91.4)	79.9 (75.3-84.6)
	30-64	89.7 (87.0-91.3)	86.2 (84.0-88.8)	79.0 (76.2-81.9)
	65+	82.7 (77.1-88.2)	71.4 (64.8-78.1)	77.0 (70.8-80.0)
Female	18-29	95.3 (92.8-97.8)	85.7 (81.6-88.9)	74.0 (68.7-76.1)
	30-64	92.2 (90.3-94.1)	88.9 (86.7-91.1)	80.2 (77.5-83.0)
	65+	87.3 (82.9-91.8)	78.6 (73.2-84.1)	71.8 (65.8-77.8)
Accessibility	Urban	91.8 (90.5-93.1)	86.4 (84.7-88.1)	78.5 (76.5-80.5)
	Rural	90.3 (87.7-92.8)	86.0 (83.1-89.0)	78.5 (74.9-82.0)
	Remote	92.3 (87.0-92.3)	87.5 (80.8-94.1)	83.7 (76.3-91.17)
Socioeconomic disadvantage	quintile 1 (least)	94.0 (91.7-96.2)	89.7 (86.8-92.5)	80.1 (76.3-83.9)
	quintile 2	93.7 (91.6-95.7)	85.8 (82.8-88.8)	78.7 (75.3-82.2)
	quintile 3	92.2 (89.7-94.6)	88.9 (86.0-91.8)	80.4 (76.8-84.1)
	quintile 4	89.9 (87.1-92.7)	86.6 (83.4-89.8)	79.8 (76.1-83.6)
	quintile 5 (most)	86.0 (82.5-89.7)	79.6 (75.3-83.8)	73.4 (68.7-78.1)

Source: QH Social capital survey 2002

Health and life satisfaction

The majority of Queenslanders (78.7%) were satisfied with their health in 2002 (Table 1.6). Self reported satisfaction with health was generally lower for older females (aged 65 years and older) and people in areas of greater socioeconomic disadvantage than comparable groups. However, no significant differences were reported across these sex, age groups, or area accessibility categories.

Queenslanders reported high levels of overall life satisfaction, and also satisfaction with feelings of safety, home and neighbourhood in 2001 (Table 1.7). Significantly more males reported high levels of feelings of safety than females. Less than one third (30%) of Queenslanders reported high levels of satisfaction with their financial situation. In general, more female Queenslanders reported high level of satisfaction than males. In comparison to Australians, Queenslanders reported significantly lower levels of satisfaction with most of the life domains.

Older people, aged 65 years and older, were significantly more likely to report higher satisfaction with life than younger people. People in remote areas of Queensland were significantly more likely to report high levels of satisfaction in a number of domains including employment opportunities (72% compared with 50-53% for metropolitan and rural areas) and feelings of safety (82% compared with 68% for metropolitan and 77% for rural areas). In contrast, people in urban areas were significantly less likely to report high level of satisfaction with feeling part of the community, 36% compared with 49% for metropolitan and rural areas.

Table 1.7: Satisfaction with life by domain (percentage; 95% CI) by sex, persons aged 15 years and older, Queensland and Australia 2001

	Queensland	Australia	Queensland Male	Queensland Female
High satisfaction				
Health	62.2 (62.2-62.3)	62.5 (62.5-62.5)	62.9 (62.8-63)	61.5 (61.4-61.6)
Home	65.9 (65.8-66)	67.5 (67.5-67.5)	65.9 (65.8-66)	65.8 (65.7-65.9)
Employment opportunities	50.3 (50.2-50.4)	50.8 (50.8-50.9)	49.6 (49.5-49.7)	51.1 (51-51.2)
Financial situation	30 (29.9-30.1)	32.5 (32.5-32.5)	28.6 (28.5-28.6)	31.6 (31.5-31.7)
Feelings of safety	69.9 (69.8-70)	68.2 (68.2-68.2)	73.5 (73.4-73.6)	65.9 (65.9-66)
Feeling part of community	38.7 (38.6-38.7)	40.2 (40.1-40.2)	36.9 (36.8-37)	40.6 (40.5-40.7)
Neighbourhood	69.6 (69.5-69.6)	69.3 (69.3-69.4)	69.3 (69.3-69.4)	69.8 (69.7-69.9)
Free time	38.9 (38.9-39)	39.1 (39.1-39.1)	37.6 (37.5-37.7)	40.4 (40.3-40.5)
Overall life satisfaction	67.4 (67.3-67.4)	67.7 (67.7-67.7)	66.5 (66.5-66.6)	68.2 (68.1-68.3)
Low satisfaction				
Health	4 (4-4)	3.3 (3.3-3.3)	3.5 (3.5-3.6)	4.5 (4.5-4.6)
Home	5.2 (5.1-5.2)	3.5 (3.5-3.5)	4.8 (4.8-4.9)	5.6 (5.5-5.6)
Employment opportunities	11.3 (11.3-11.4)	9.5 (9.5-9.5)	11.5 (11.5-11.6)	11.1 (11.1-11.2)
Financial situation	16.5 (16.4-16.5)	13.1 (13-13.1)	16.4 (16.3-16.4)	16.6 (16.5-16.7)
Feelings of safety	2.6 (2.6-2.6)	2.6 (2.6-2.7)	2 (2-2)	3.3 (3.2-3.3)
Feeling part of community	10.2 (10.2-10.2)	8.9 (8.8-8.9)	9.8 (9.7-9.8)	10.7 (10.6-10.7)
Neighbourhood	4 (4-4)	2.6 (2.6-2.6)	4.4 (4.3-4.4)	3.6 (3.5-3.6)
Free time	16.3 (16.3-16.4)	15.9 (15.9-16)	16 (16-16.1)	16.7 (16.6-16.7)
Overall life satisfaction	0.8 (0.8-0.8)	0.9 (0.9-0.9)	0.8 (0.8-0.8)	0.8 (0.8-0.8)

Source: HILDA 2001

low = score of 1-3 on a 10 point scale, high = score 8-10

1.3.4 Activity limitation

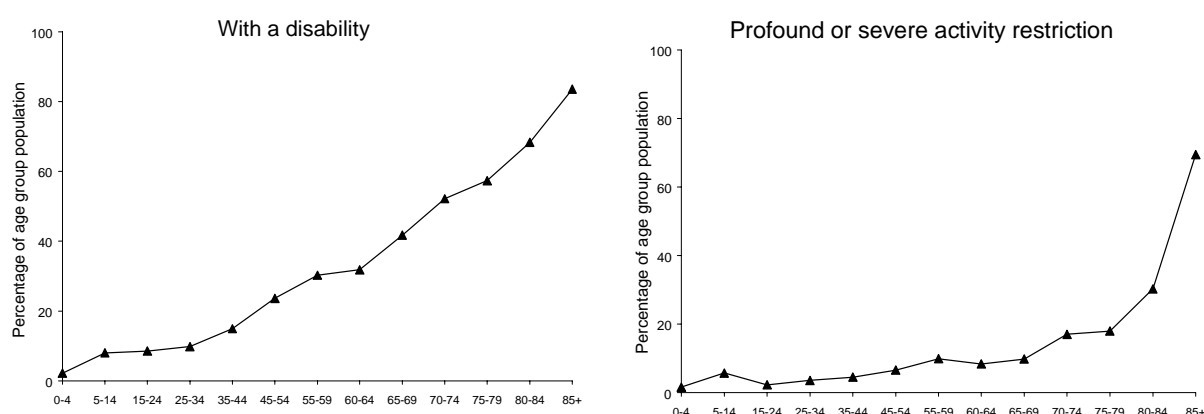
In 1998, the prevalence of severe or profound core activity limitation for all Queenslanders was 6.6%; 6.5% for females and 6.8% for males.⁶⁷ Core activities comprise communication, mobility and self care. In Australia the prevalence of severe or profound activity limitation for people was similar in 1988 and 1993 (about 4%), however this rate increased to 6.1% in 1998.^{68,69} Much of this increase was attributed to changes in survey methods. The prevalence of severe or profound activity limitation increases markedly with advancing age (Figure 1.4).

One in five (19.9%) Queenslanders reported they had a disability, including those with profound/severe, moderate or mild activity restriction, or a schooling or employment restriction. The Queensland age standardised prevalence was 20.4%, in comparison to 19.3% in Australia.⁶⁷ The prevalence of disability increases markedly with advancing age (Figure 1.4).

From a more recent Australian survey in 2002,⁶³ 12.5% of Australians reported a disability or long term health condition (with core activity limitation). The prevalence of such disability was 20.7% for people born in non English speaking countries and who were not proficient in English. This compares with 12.6% in Australian born people, 13.6% in those born in mainly English speaking countries, and 9.2% in people who were born in non English speaking countries but had good proficiency in English. The impact of poor proficiency in English to answer this question correctly is unknown.

Almost 2% (1.9%) of the burden of disease in Queensland for 1996-98 was attributed to adult-onset hearing loss, 70% of which was in males.⁴⁹ For males aged 65 years and older, adult-onset hearing loss is the ninth leading cause of disease burden in Australia.⁵⁰ In 2001, almost one in five (19.7%) adult males reported partial or complete deafness, compared to 10% for females (Table 1.8). Almost 1% (0.8%) of the burden of disease in Queensland in 1996-98 was attributed to age related vision disorders, of which 78% was in females.⁴⁹ For females aged 65 years and older, adult-onset hearing loss is the 8th leading cause of disease burden in Australia.⁵⁰ In 2001, about half of adults reported either short or long sightedness (Table 1.8).

Figure 1.4: Age specific percentage of population reporting a disability and severe or profound core activity limitations, Queensland 1998



Source: ABS Disability, ageing and carers 2000

Table 1.8: Prevalence of vision and hearing loss disorders, by age and sex, Queensland 2001

	Persons		18+ years	
	0-17 years	18+ years	Male	Female
Short sightedness	3.9	25.9	22.7	29.1
Long sightedness	4.1	30.8	27.3	34.2
Deafness (complete/partial)	2.0	14.7	19.7	10.0

Source: ABS National health survey 2001

1.3.5 National health priority area conditions

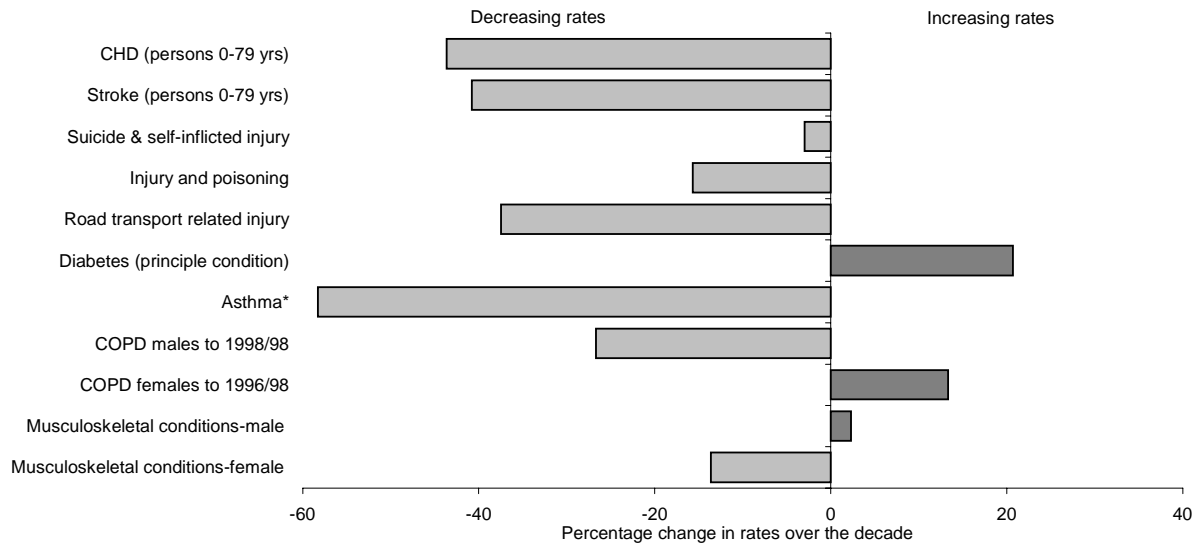
The seven National Health Priority Areas (NHPA) are asthma, cancer control, cardiovascular health, diabetes mellitus, injury prevention and control, mental health, and arthritis and musculoskeletal conditions. In 1996-98, the NHPAs account for 76% of the burden of disease and injury in Queensland, as measured by disability adjusted life years (DALYs).⁴⁹ The NHPAs were chosen as priorities for Australia because of the:

- importance of the 'area' to the community
- high overall burden of disease in terms of mortality, morbidity and disability
- potential for health gain through prevention or lessening of the impact
- measurability of the impact of interventions undertaken in relation to the 'area'.

This report includes indicators for key NHPA conditions, where mortality and hospital separation indicators provide useful data to assess the burden of disease attributed to the NHPA. Further information on NHPAs was reported in *Health Indicators Queensland 2001*.⁸⁻¹⁰

There have been substantial gains in mortality and hospital separation rates for most of the NHPAs, in the period 1989 to 2001 (Figure 1.5 and Figure 1.6). The change in mortality and hospital separation rates for each NHPA are discussed below. Age standardised rates for Torres Statistical Local Area (SLA) and areas of increasing proportion of Indigenous peoples are discussed where annual case numbers are greater than one. Due to small numbers in these SLAs for some conditions, the results should be interpreted with caution. Further discussion of the health status of Aborigines and Torres Strait Islanders is included in the *Indigenous peoples* chapter.

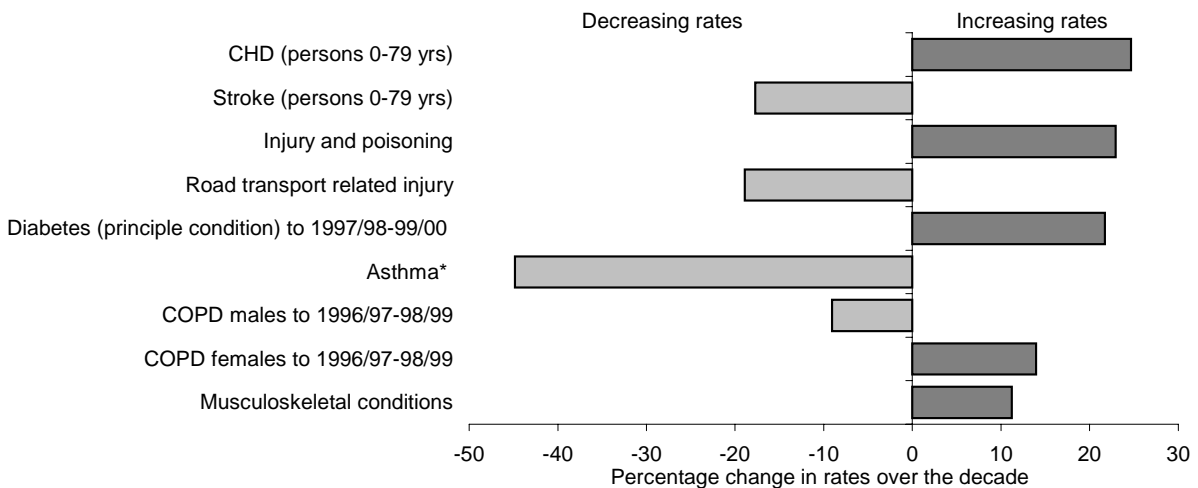
Figure 1.5: Percentage change in age standardised mortality rates for key National Health Priority Area conditions in Queensland between 1989-91 and 1999-2001



Source: ABS Cause of death

Note: * ICD-9 to ICD-10 change in 1999 reduces comparability

Figure 1.6: Percentage change in age standardised hospital separation rates for key National Health Priority Area conditions in Queensland between 1989/90-91/92 and 1999/2000-01/02**



Source: Queensland hospital admitted patient data collection

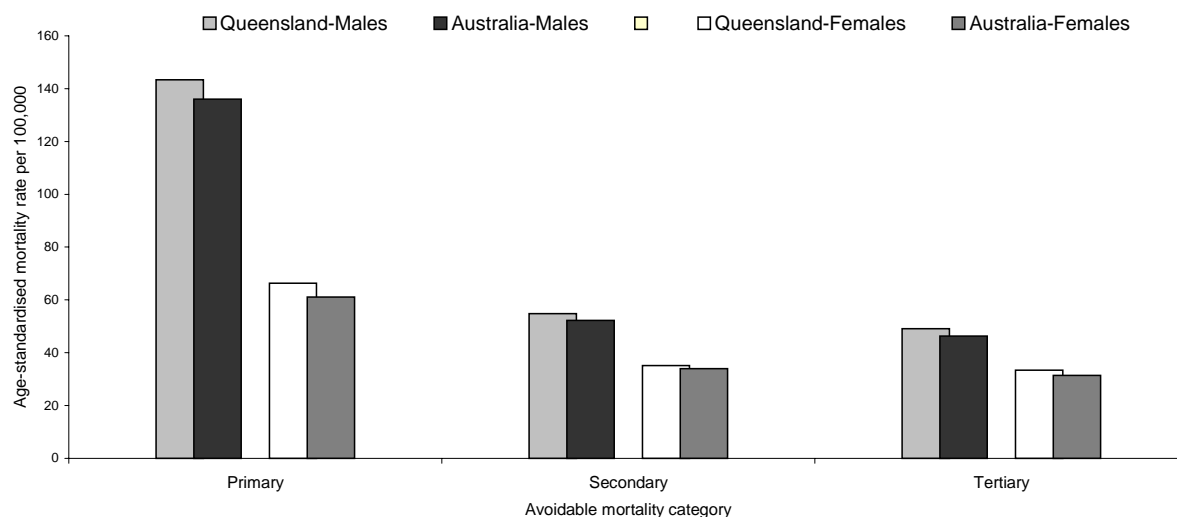
Note: *ICD-9-CM to ICD-10-AM change in 1999/00 reduces comparability

**Trends are from 1989/90-91/92 to 1999/2000-01/02 unless specified

For the total population in 2001, the rate of mortality avoidable through primary prevention is significantly higher in females in Queensland, than the national average (Figure 1.7).⁵⁵ In addition, Queensland has higher than the national average rates for mortality avoidable through secondary and tertiary prevention for females, and through primary, secondary and tertiary prevention for males. It was estimated in 2001, using current methodology, that 2380 deaths in Queensland males were avoidable through primary prevention interventions (143.4 deaths per 100,000), and 1,106 deaths in females (66.3 deaths per 100,000). An additional 1,496 deaths were avoidable through secondary prevention and 1,380 through tertiary prevention. The level of overall preventable mortality is twice as high in men as women. As the highest avoidable mortality is due to primary prevention, targeted efforts to reduce overweight and obesity, increase physical activity and improve nutrition among men and women would result in significant improvements in mortality.

There were 116,847 potentially avoidable hospital separations in Queensland in 2001/02,⁷⁰ a rate of 32.4 per 1,000 population. This rate is statistically higher than Australia as a whole. In Queensland, as in the rest of Australia, this large proportion of hospitalisations is potentially avoidable through primary, secondary and tertiary prevention. Queensland had significantly higher rates of preventable separations due to dental conditions, ear, nose and throat infections, all chronic conditions, and specifically chronic obstructive pulmonary disease and hypertension. The rate of preventable hospital separations due to asthma in Queensland was significantly less than Australia.

Figure 1.7: Primary, secondary and tertiary avoidable mortality: age standardised mortality rates by sex, Australia 2001



Source: ABS Cause of death

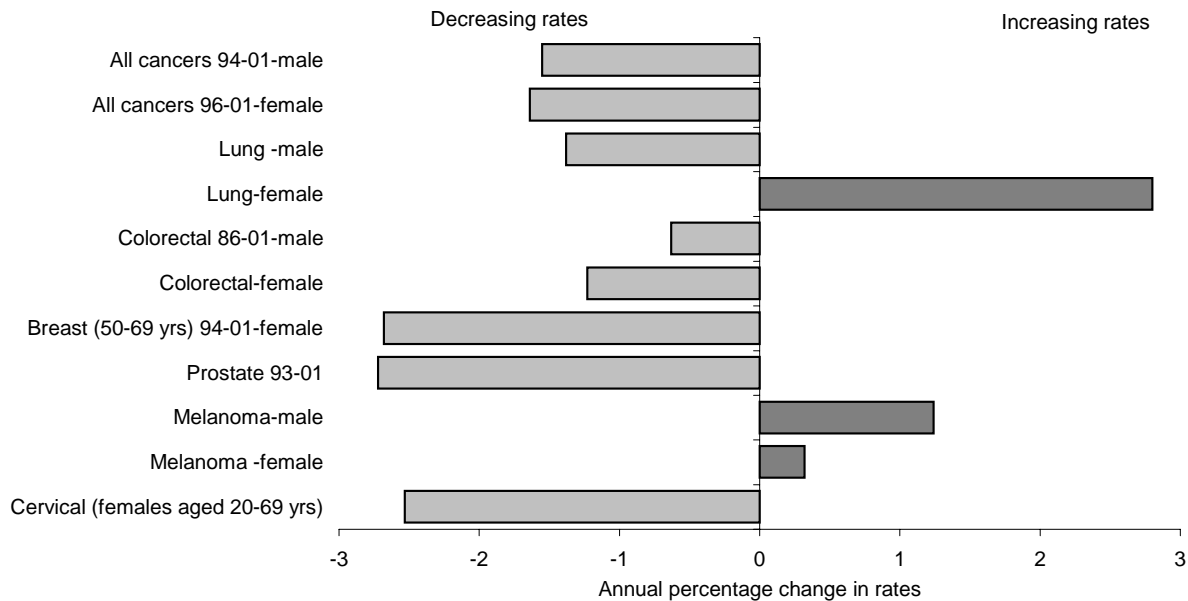
Cancer

Cancer accounted for 19% of the burden of disease and injury in Queensland in 1996-98, as measured by DALYs.⁴⁹ This section presents aggregated trends for six of the seven National Health Priority cancers: lung, colorectal (large bowel), prostate, breast, cervix and melanoma. Non-Hodgkin's lymphoma, a National Health Priority cancer, is not reported. Additional data for age, gender and population specific cancers are presented in the *Children, Older people and Indigenous peoples* chapters. Age standardised cancer mortality and incidence rates for Queensland and 16 smaller geographic areas for 1986-98 and Queensland age specific mortality and incidence rates have previously been reported.⁸⁻¹⁰ Detailed information on trends are reported in Health Information Centre (Queensland Health) Information Circulars.^{71,72, 73}

In 1999-2001, there were on average 6,247 deaths per year due to malignant neoplasms in Queensland, where males contributed 58.4% of those deaths. The age standardised mortality rate was significantly higher for males than females. Between 1996 and 2001, mortality rates for all cancers changed by -1.6% per year for males and females (Figure 1.8).⁷³ Mortality rates for all cancers in both males and females were increasing prior to the mid-1990s. Compared with other developed countries, mortality rates for the NHPA cancers in Queensland were within the middle third of the range, with the exception of melanoma.

For women, the recent mortality decline was due to decreases in mortality from breast cancer; continuing decreases in mortality from cervical and stomach cancer; and, to a lesser extent, decreases in colorectal and ovarian cancer. For men, the recent mortality decline was due to a decrease in mortality from prostate cancer; continuing decreases in lung and stomach cancer; and, to a lesser extent, colorectal cancer.

In 2001, there were 17,125 cancers diagnosed among Queenslanders, 54.4% for males. During the 1982-2001 period, incidence rates for all cancers combined have increased among females (driven by breast and lung cancer and non-Hodgkin's lymphoma), while there has been a recent decrease in cancer incidence among males (driven by prostate, stomach and lung cancer).⁷³

Figure 1.8: Annual percentage change in age standardised mortality rates for priority cancers in Queensland between 1982 and 2001*

Source: Queensland cancer registry

Note: *Trends are from 1982 to 2001 unless specified

While the specific causal pathways of cancers remain largely unclear, a large number of modifiable determinants of the condition have been identified. Diet and tobacco smoking are the leading preventable determinants of cancer.^{74,75} Around 30% of all cancers are estimated to be preventable by dietary means.⁷⁵ Other leading factors known to play a role in carcinogenesis or associated with cancer incidence are harmful alcohol consumption, physical inactivity,⁷⁶ endogenous synthesis of carcinogens, pre-existing pathological conditions, and exposure to environmental hazards such as UV radiation, exogenous chemicals, and infectious agents.⁷⁴

In identifying social determinants of cancer, a recent analysis of Australia-wide data on survival by geographic and socioeconomic categories indicates that people who live outside metropolitan areas and large rural centres in Australia have lower five year survival rates.⁷⁷ Males living in these areas had relative survival rates significantly below the national average for all cancers. Females living in some of these areas were significantly below the national relative survival average for lung and cervical cancer. Possible influences on poorer survival in these areas include relatively poorer access to and appropriateness of both primary healthcare and detection and treatment services; and the effect of greater proportion of Aboriginal and Torres Strait Islander people living in remote areas.

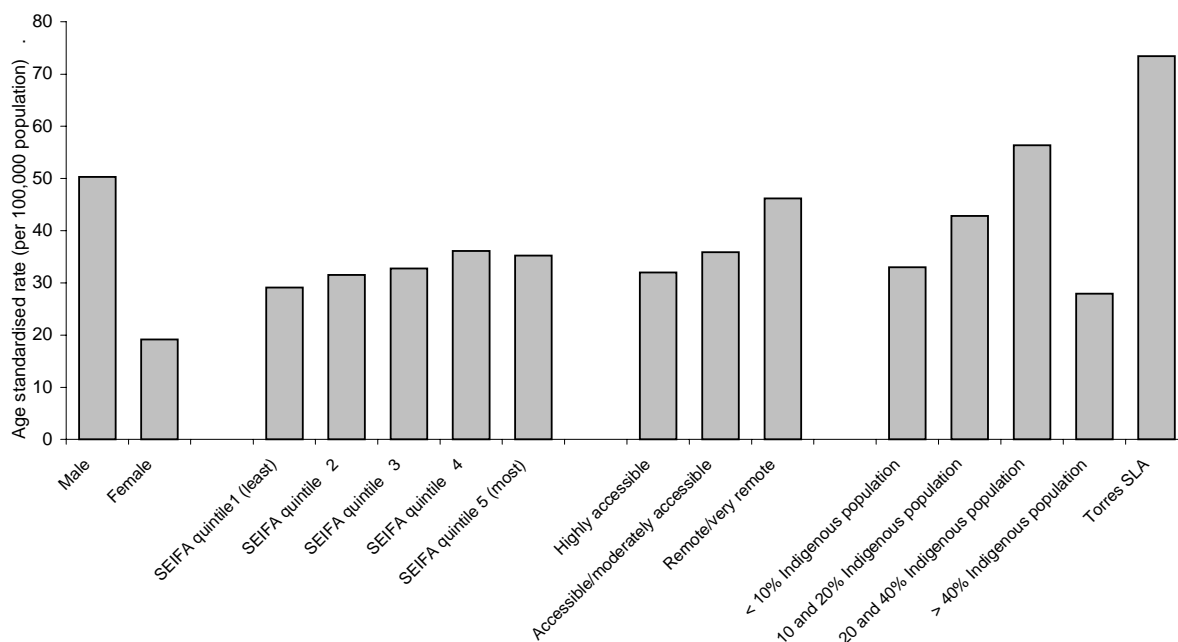
Lung cancer

In 2001, there were 1,578 new cases of trachea, bronchus and lung cancer (lung cancer) diagnosed in Queensland, a male to female ratio of 2:1. Incidence rates in males were significantly greater than in females. Between 1982 and 2001, lung cancer incidence rates continued to decrease among males (-1.5% per year) and increase among females (2.5% per year).⁷³ Lung cancer mortality among Queensland men is 7% higher than the Australian average.

Since survival from lung cancer is poor, mortality rates have followed similar trends to those reported for incidence. That is, decreased mortality rates for men, but increased mortality for women. In 1999-2001, there were on average 1,260 deaths per year due to lung cancer in Queensland, where men accounted for 69.9% of those deaths. Between 1982 and 2001, mortality rates for lung cancer decreased annually for men (-1.4% per annum), but increased for women (2.8% per annum: Figure 1.8). In 1999-2001, mortality due to lung cancer was significantly higher in males than females; in areas with greater than 10% Indigenous population; the Torres Strait; moderately accessible and remote areas; and areas of high socioeconomic disadvantage (Figure 1.9). The proportion of Indigenous population, socioeconomic disadvantage and rurality of an area are not independent factors. However, the independent effect of each factor is not clear. The greater lung cancer mortality in these areas may be partially due to an interplay between some or all of these factors. This is further discussed in the *Indigenous peoples* chapter and must also be considered in the implementation of interventions described in section 1.5.

More than 90% of cases of lung cancer are caused by smoking⁷⁸ with incidence trends reflecting smoking patterns more than 20 years ago. Smoking cessation leads to a marked and rapid fall in the risk of heart, stroke and vascular disease.⁷⁹ Within two to five years of cessation of smoking, the risk of a coronary event or stroke among former smokers approaches that of people who have never smoked.^{80,81}

Figure 1.9: Lung cancer in total population, age standardised mortality rate by sex, socioeconomic disadvantage, accessibility and proportion Indigenous peoples, Queensland 1999-2001



Source: ABS Cause of death

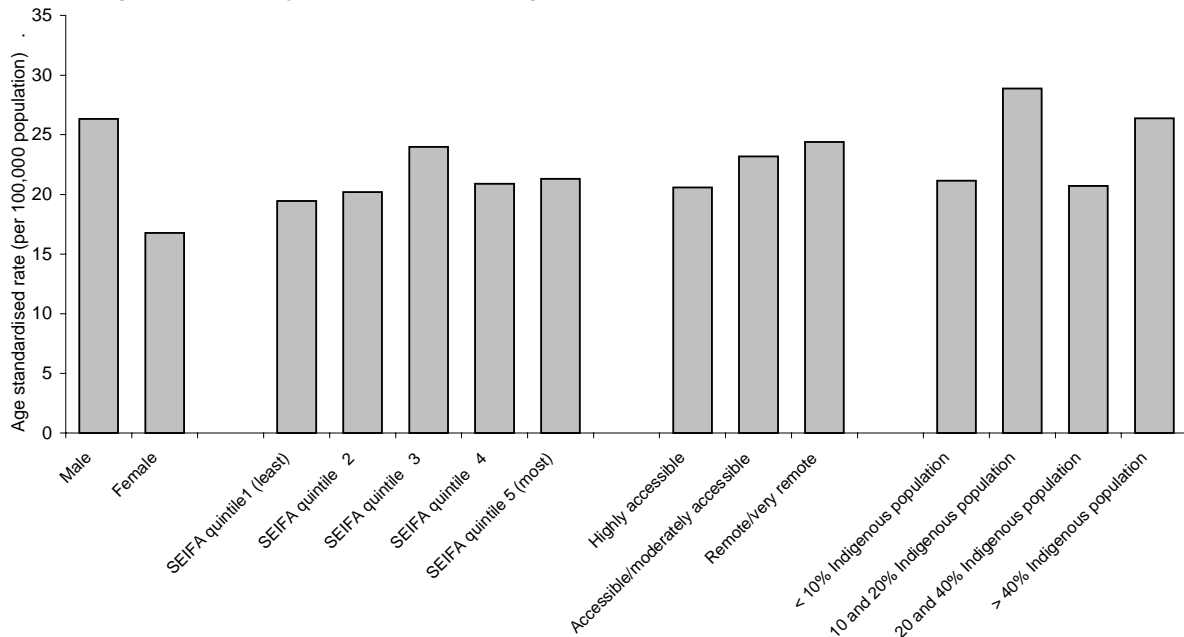
Colorectal cancer

In 2001, there were 2,380 new cases of colorectal cancer diagnosed in Queensland, a male to female ratio of 1.3:1. Between 1982 and 2001, colorectal cancer incidence rates increased by 1.1% per year for males (significant increased) and 0.3% for females.⁷³

In 1999-2001, on average there were 866 deaths per year due to colorectal cancer in Queensland, with men accounting for 56.4%. Mortality due to colorectal cancer has decreased in recent years. Between 1986 and 2001, mortality rates for colorectal cancer annually decreased for men and women between 1982 and 2001 (-0.6% and -1.2% per annum respectively: Figure 1.8). The mortality decline might be due to gains in case survival as a result of earlier detection and advances in clinical management. In 1999-2001, mortality due to colorectal cancer was significantly higher in males than females (Figure 1.10). No statistically significant differences were observed between areas of socioeconomic disadvantage, accessibility or proportion of Indigenous population.

Inadequate intake of fruit and vegetables⁸² and physical inactivity⁸³ have been specifically linked to incidence of colorectal cancer. Little is known of the precise mechanisms whereby chemically disparate nutrients affect the development and progression of tumours at various sites.⁸²

Figure 1.10: Colorectal cancer in total population, age standardised mortality rate by sex, socioeconomic disadvantage, accessibility and proportion Indigenous peoples, Queensland 1999-2001



Source: ABS Cause of death

Note: <1 case pa for Torres SLA

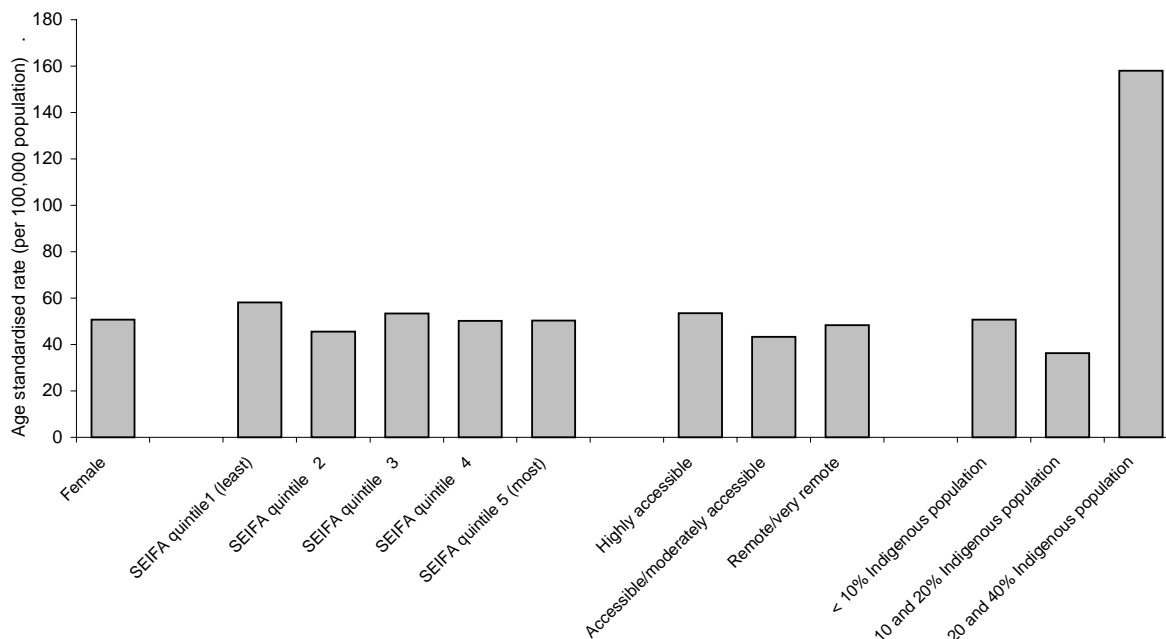
Breast cancer

Breast cancer is the most common cancer diagnosed among women in Queensland. About 1 in 10 women in Queensland will be diagnosed with breast cancer before the age of 75, based on 2001 data.⁸⁴

During 2001, there were 2,182 new cases of breast cancer diagnosed in Queensland women. Between 1982 and 2001, female breast cancer incidence rates significantly increased by 2.0% per year.⁷³ This increase in incidence is mainly due to increased screening.

In 1999-2001, there were on average 170 deaths per year due to breast cancer in Queensland women aged 50-69 years. In 1999-2001, mortality due to breast cancer in women 50-69 years was significantly higher in areas of 20-40% Indigenous population in comparison to all of Queensland (Figure 1.11). In this period, mortality due to breast cancer in women 50-69 years was not significantly different between areas of accessibility or socioeconomic disadvantage. Between 1982 and 1994, mortality rates for breast cancer in the total female population increased annually by 0.5%, however in the latter period 1994-2001, the mortality rate decreased annually (- 2.7% per year: Figure 1.8). These reductions in mortality are due to both regular mammography screening and better treatments, although the extent of reduction by each cause is unclear. However, many experts consider that mammography screening has made a substantial contribution to the decline in breast cancer mortality.⁷² The causes of breast cancer are unclear, and there is no known cure for the disease. Nine out of 10 women who get breast cancer do not have a family history of breast cancer.⁸⁵

Figure 1.11: Breast cancer in women aged 50-69 years, age standardised mortality rate by sex, socioeconomic disadvantage, accessibility and proportion Indigenous peoples, Queensland 1999-2001



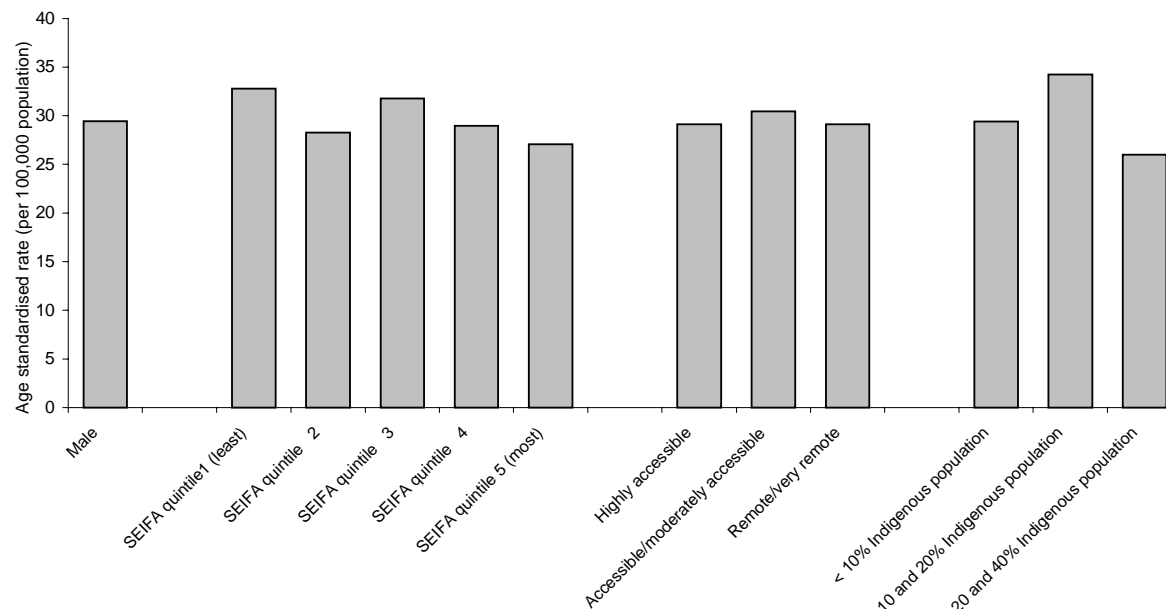
Source: ABS Cause of death

Note: <1 case pa for areas of >40% Indigenous pop. & Torres SLA

Prostate cancer

In 2001, there were 1,868 new cases of prostate cancer diagnosed in Queensland. During 1999-2001, there were on average 489 deaths per year due to prostate cancer in Queensland. Between 1982 and 1993, mortality rates for prostate cancer in the total male population increased annually by 3.9%, however, in the latter period 1993-2001, the mortality rate decreased annually; -2.7% per year (Figure 1.8). In 1999-2001, mortality due to prostate cancer was not significantly different between areas of accessibility, socioeconomic disadvantage or proportion of Indigenous population (Figure 1.12).

Figure 1.12: Prostate cancer in total male population, age standardised mortality rate by socioeconomic disadvantage, accessibility and proportion Indigenous peoples, Queensland 1999-2001



Source: ABS Cause of death

Note: <1 case pa for areas of >40% Indigenous pop. & Torres SLA

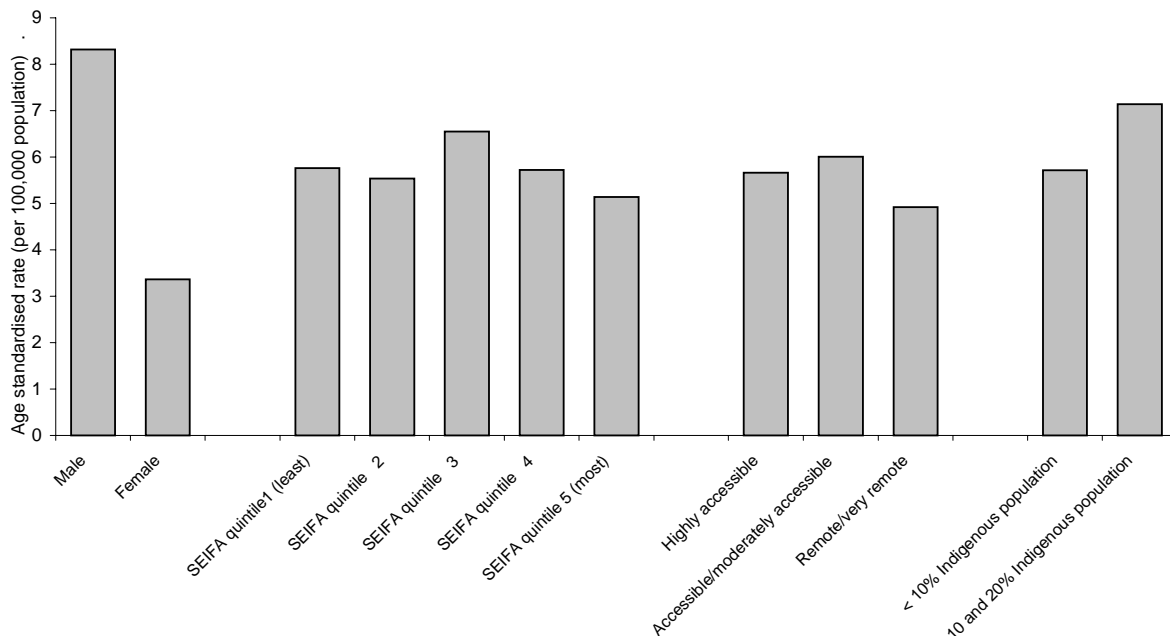
Melanoma of the skin

In 2001, there were 2,336 new cases of melanoma of the skin diagnosed in Queensland. Males continue to be more likely than females to develop the disease, with a male/female ratio of 1.4:1.0 in 2001. Between 1982 and 2001, melanoma incidence rates significantly increased by 2.5% per year for males and 1.1% for females, where these increases were statistically significant.⁷³

In 1999-2001, there were on average 214 deaths per year due to melanoma in Queensland. Males accounted for 68% of those deaths. Between 1982 and 2001, mortality rates for melanoma annually increased by 1.2% for males (significant increase) and 0.3% for females (Figure 1.8). In 1999-2001, mortality due to melanoma was significantly higher in males than females (Figure 1.13). In this period, mortality due to melanoma was not significantly different between areas of accessibility, socioeconomic disadvantage or proportion Indigenous population.

Queensland has the highest rates of melanoma incidence and mortality of any country or Australian state.² Exposure to sunlight is the primary risk factor for both melanocytic and non-melanocytic skin cancer.⁸⁶ Exposure to the sun in childhood and teenage years potentially accounts for a large proportion of skin cancer risk.⁸⁷ Incidence rates of melanoma can fluctuate according to public awareness, which makes incidence trends difficult to interpret. The best measures of progress in controlling this disease are mortality trends.

Figure 1.13: Melanoma of the skin in total population, age standardised mortality rate by sex, socioeconomic disadvantage, accessibility and proportion Indigenous peoples, Queensland 1999-2001



Source: ABS Cause of death

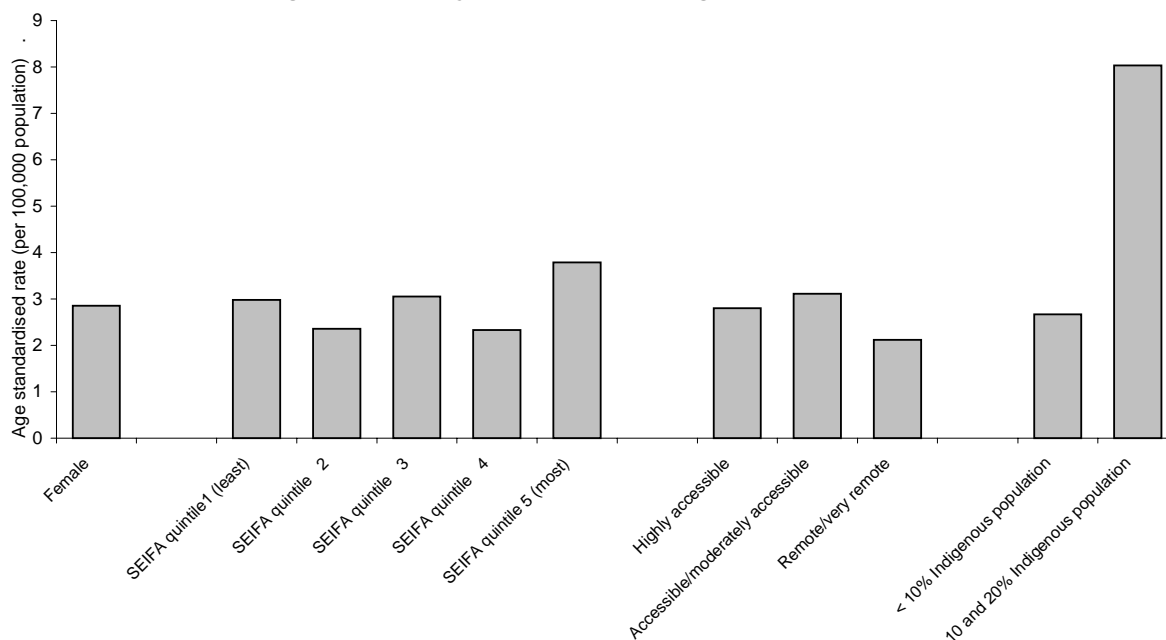
Note: <1 case pa for areas of >20% Indigenous pop. & Torres SLA

Cervical cancer

In 2001, there were 150 new cases of cervical cancer diagnosed in Queensland. Between 1982 and 2001, cervical cancer incidence rates significantly decreased (-3.4% per year).⁷³ In 1999-2001, there were on average 33 deaths per year due to cervical cancer in Queensland women aged 20-69 years and a total of 50 deaths per year for women of all ages. Between 1982 and 2001, mortality rates for cervical cancer for Queensland women decreased; an average rate of -2.5% per year (Figure 1.8). In 1999-2001, mortality due to cervical cancer was not significantly different between areas of accessibility, socioeconomic disadvantage or proportion Indigenous population (Figure 1.14). However, the incidence of cervical cancer among women living in discrete Indigenous communities was five times the Queensland average, with mortality 13 times the Queensland average.⁸⁸

Regular Pap smears are known to reduce the incidence and mortality rates of invasive cervical cancer. Three out of four women who develop cancer of the cervix have not had regular two-yearly screening, or have never had a Pap smear.⁸⁹

Figure 1.14: Cervical cancer in women aged 20-69 years, age standardised mortality rate by sex, socioeconomic disadvantage, accessibility and proportion Indigenous peoples, Queensland 1999-2001



Source: ABS Cause of death

Note: <1 case pa for areas of >20% Indigenous pop. & Torres SLA

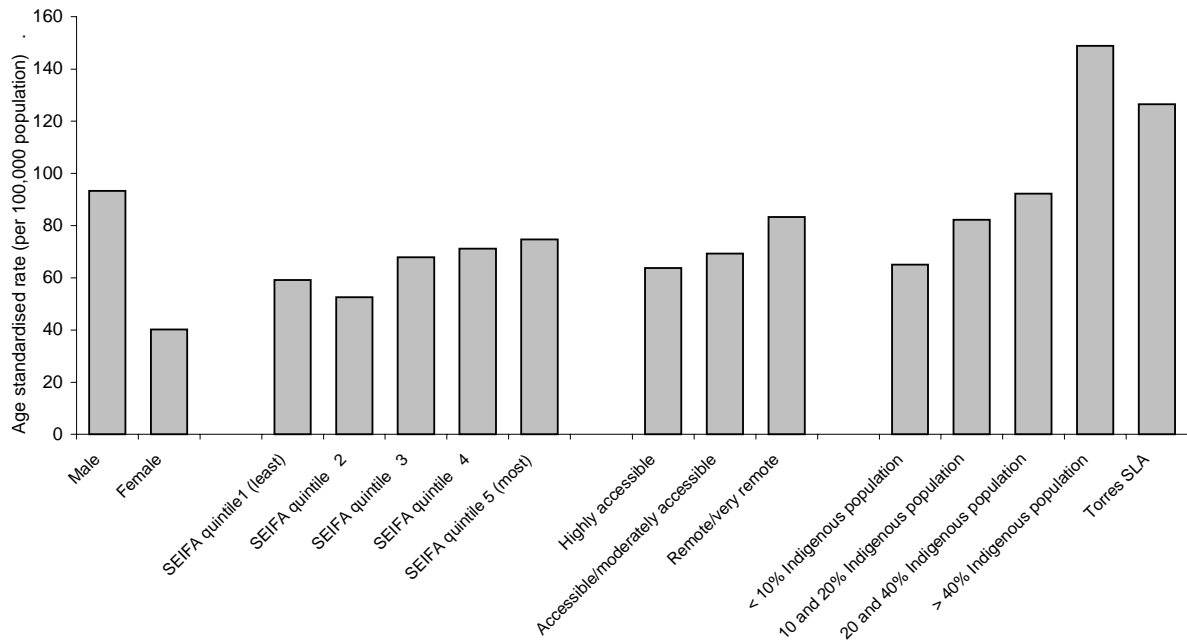
Coronary heart disease

Coronary heart disease (CHD) accounted for 12.4% of the burden of disease and injury in Queensland in 1996-98, as measured by DALYs.⁴⁹ CHD is the largest cause of burden of disease in Queensland and Australia.

Among people aged 0-79 years, there were on average 2,387 deaths per year due to CHD in Queensland in 1999-2001. Men accounted for 68% of those deaths. In 1999-2001, mortality due to CHD was significantly higher in males than females; in areas with greater than 20% Indigenous population; the Torres Strait; moderately accessible and remote areas; and areas of high socioeconomic disadvantage (Figure 1.15). The proportion of Indigenous population, socioeconomic disadvantage and rurality of an area are not independent factors. However, the independent effect of each factor is not clear. The greater CHD mortality in these areas may be partially due to an interplay between some or all these factors. This is further discussed in the *Indigenous peoples* chapter and must also be considered when implementing interventions described in section 1.5. Between 1989-91 and 1999-2001, age standardised mortality rates due to CHD declined by 43.1% in males and by 46.1% in females, an estimated rate of -3.6% and -3.9% per year respectively (Figure 1.5). In that period, males aged 0-79 years, remained at least twice as likely as females in the same age bracket to die of CHD. This fall in mortality has been due to both a fall in the incidence of CHD, and better survival.⁹⁰ Between 1993-94 and 2000-01 the incidence of CHD for Australians aged 40 to 90 years fell 23%.⁹¹ It is estimated that about half of the dramatic decline in CHD between 1980 and 1990 is attributed to reductions in risk factors.

The CHD mortality rate in Queensland was 10% higher than the Australian average in 1997-99, and Queensland has the highest rate of CHD of all the Australian states.⁹² The mortality rate due to CHD in Australia ranked 15th highest, when compared with 30 other developed countries, and were about five times that of Korea (which had the lowest rate) and about three times those of Japan and France.⁵⁵

Figure 1.15: Coronary heart disease in persons aged 0-79 years, age standardised mortality rate by sex, socioeconomic disadvantage, accessibility and proportion Indigenous peoples, Queensland 1999-2001



Source: ABS Cause of death

In the three years 1999/2000-01/02, there were on average 25,668 hospital separations each year due to CHD among 0-79 year olds, 68% for males. Between 1989/91-91/92 and 1999/2000-01/02, age standardised hospital separation rates due to CHD increased by 24.4% in males and 24.6% in females, at an estimated rate of 4.6% per year for males and females (Figure 1.6). An estimated 25-30% of hospitalisations for CHD are for second, third or fourth CHD events.⁹³

The burden of CHD in Queensland is further discussed in the *Indigenous peoples* and *Older people* chapters. Age standardised CHD mortality and hospital separation rates for Queensland and 16 smaller geographic areas for 1986-98, and Queensland age specific mortality and hospital separation rates have previously been reported.⁸⁻¹⁰

There is convincing epidemiological evidence that there are substantial opportunities to reduce CHD mortality and morbidity rates through life style changes to tobacco smoking, nutrition and physical activity. These changes can both prevent these diseases and reduce the incidence of further events or death in people with existing disease. About 40% of the current deaths and more than 30% of hospital episodes can be avoided through better use of existing knowledge.⁵⁵ The MONICA studies show that mortality rates from CHD in Australia are not going to be reduced to the levels of Southern Europe through improved hospital treatment services,⁹³ as the standards of hospital care in Australia are already world class. A recent Cochrane systematic review concluded that dietary advice to those with cardiovascular disease can reduce mortality and morbidity, as well as modify risk factors.⁹⁴ Specifically, following dietary intervention, a 72% reduction in cardiac deaths and non-fatal CHD events was reported.⁹⁵

Key risk factors for CHD are overweight and obesity, smoking, high blood cholesterol, inadequate vegetable and fruit consumption, physical inactivity and hypertension. There is a continuous association between risk of CHD and healthy and excess weight (as assessed by body mass index),⁹⁶ serum cholesterol,⁹⁶ fruit and vegetable intake⁹⁷ and diastolic blood pressure.⁹⁶ In addition, there is strong and consistent evidence of an independent causal association between depression, social isolation, work-related stressors (job control, demands and strain) and lack of quality of social support, and causes and prognosis of CHD.⁹⁸ The increased risk contributed by these psychosocial factors is of similar order to the more conventional CHD risk factors, such as smoking, dyslipidaemia and hypertension. These risk and protective factors are all discussed in the sections below.

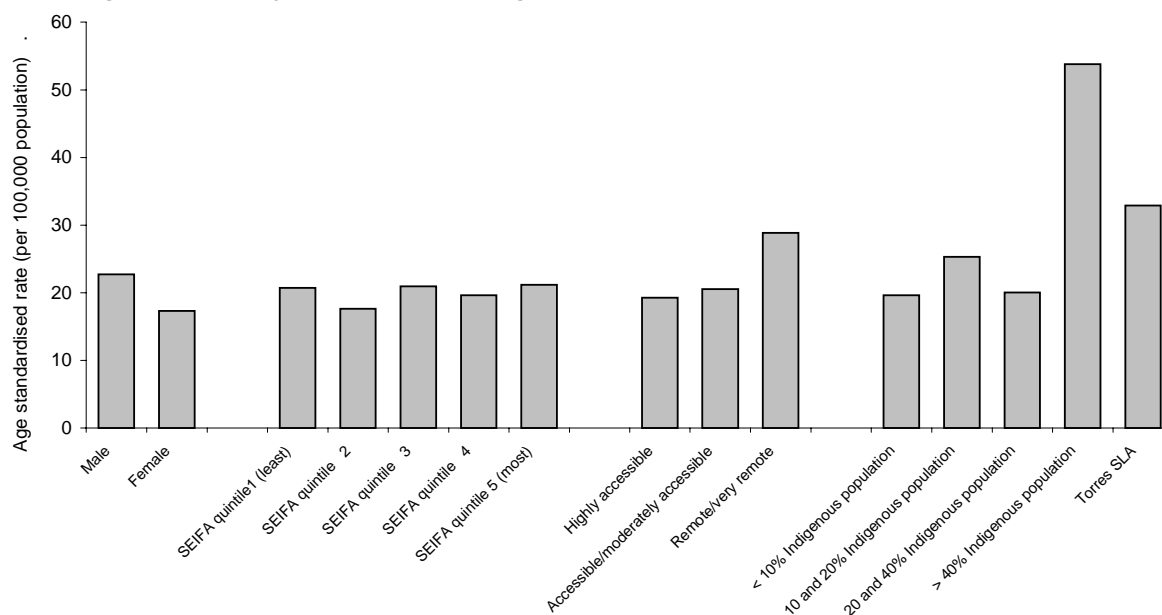
Along with Queensland having the highest rate of CHD of all the Australian states,⁹² Queensland has correspondingly high rates of smoking, overweight and physical inactivity. A steady increase in the proportion of Australians and Queenslanders who were overweight was noted in the 1980s and this has continued. As overweight children are more likely to develop chronic diseases such as CHD, type 2 diabetes and some forms of cancer,⁹⁹ CHD prevention must include prevention of unhealthy weight in children and young people. The *Children* and *Young people* chapters discuss this further.

Stroke

Stroke accounted for 5.0% of the burden of disease and injury in Queensland in 1996-98 (12.4% CHD and 5.0% stroke), as measured by DALYs.⁴⁹

In Queensland in 1999-2001, there were on average 726 deaths per year due to stroke among people aged 0-79 years, where males accounted for 54% of deaths. In 1999-2001, mortality due to stroke was significantly higher in males than females; in areas with greater than 40% Indigenous population; and remote areas (Figure 1.16). Between 1989-91 and 1999-2001, there was a decline in stroke mortality for both males (39.0%) and females (43.0%). The decline occurred at a rate of -4.8% per year for males and -5.5% for females (Figure 1.5). The mortality rates for stroke in Queensland are similar to the Australian average for both males and females.²

Figure 1.16: Stroke in persons aged 0-79 years, age standardised mortality rate by sex, socioeconomic disadvantage, accessibility and proportion Indigenous peoples, Queensland 1999-2001



Source: ABS Cause of death

There were on average 6,056 hospital separations due to stroke for Queenslanders aged 0-79 years in 1999/2000-01/02, 59% for males. In the period from 1989/90-91/92 to 1999/2000-01/02, stroke separation rates declined by 17.6% in males and 18.8% in females, annual rates of -1.6% and -1.7% respectively (Figure 1.6). Hypertension is the single most important risk factor for stroke.¹⁰⁰

The risk of stroke can be reduced by up to 30% through participation in moderate levels of physical activity.¹⁰¹ There is a continuous association between healthy and excess levels of diastolic blood pressure and risk of haemorrhagic and ischaemic stroke.¹⁰² Age standardised stroke mortality and hospital separation rates for Queensland and 16 smaller geographic areas for 1986-98, and Queensland age specific mortality and hospital separation rates have previously been reported.⁸⁻¹⁰

Hypertension

In Australia in 1996, hypertension was the cause of 5.1% of the total burden for males and 5.8% for females.⁴⁹

The prevalence of untreated hypertension, as assessed through clinical measurement in 2000, in Queensland males aged 25 years and older was 16.0%, and 12.0% prevalence of treated hypertension (Table 1.9). For females, the prevalence of untreated hypertension was 8.7%, and 13.7% for treated hypertension. Untreated and treated hypertension rates in Queensland were similar to Australia. Untreated and treated hypertension prevalence increases markedly with age, with prevalence higher in males than females in all age groups. The proportion of treated hypertension of total prevalence in males was 40% and in females 58%, where these ratios were similar in all age groups. Over the period 1980-99, the prevalence of measured high blood pressure in Australia declined steadily for both males and females. In males, prevalence more than halved, from 46.7% to 21.3%. In females, prevalence dropped by half, from 31.7% to 16.4%.

Table 1.9: Prevalence of treated and untreated hypertension by age and sex, Australia and Queensland 2000

Male	Australia		Queensland		Female	Australia		Queensland	
	Untreated	Treated	Untreated	Treated		Untreated	Treated	Untreated	Treated
25+	19.1	11.5	16	12	25+	11.8	15.3	8.7	13.7
25-34	7	0	7.6	0	25-34	2.7	1.2	2	0
35-44	14	2.9	8	0.8	35-44	4.3	3.2	6.3	3
45-54	20	10.5	16.9	14.5	45-54	11.1	11.9	8.6	7.1
55-64	26.3	20.5	24.5	22	55-64	21.1	21.7	16	21.3
65-74	33.3	34.5	28.3	34.5	65-74	25.1	41.8	20.2	44.1
75+	44.8	33.3	40.2	35.6	75+	25.8	48.7	14.7	48.2

Source: AusDiab 2000

Considering categories of hypertension, the prevalence of borderline mild hypertension, as assessed through clinical measurement in 2000, in Queenslanders aged 25 years and older was 13.3% for males and 7.4% for females (Table 1.10). Mild hypertension prevalence (above borderline) was 3.9% for males and 2.3% for females, and moderate and severe hypertension prevalence was 0.9% for males and 0.2% for females. Prevalence of all hypertension categories increases markedly with age, with male prevalence higher than female prevalence in all age groups.

In 1998, more than one fifth of adult Queenslanders aged 18 years and older (22.1%) reported having been diagnosed with hypertension at any stage of their lives. This included 16.1% chronic, 2.9% temporary and 3% during pregnancy. A third of these people had been advised by their doctor to modify their diet or initiate physical activity to control their hypertension.¹⁰³

The factors contributing to high blood pressure include stress,¹⁰⁴ obesity, alcohol misuse, physical inactivity, high dietary salt intake and nutrition patterns which involve a low intake of fruit and vegetables and a high intake of saturated fat.

Table 1.10: Prevalence of hypertension by severity (clinical and self report) by age and sex, Queensland 1998, 2000

		Prevalence (%) of clinical hypertension			Self report (%)
		Borderline mild hypertension	Mild (above borderline) hypertension	Moderate and severe hypertension	Hypertension
Male	25+	13.3	3.9	0.9	17.4
Female	25+	7.4	2.3	0.2	17.5
Male	25-34	6.7	0.9	0.0	7.5
	35-44	4.9	1.9	1.4	11.9
	45-54	16.4	3.3	0.0	19.2
	55-64	27.5	3.3	0.0	29.4
	65-74	27.4	11.6	3.4	33.4
	75+	28.4	28.5	5.6	25.8
Female	25-34	2.0	0.0	0.0	5.9
	35-44	2.7	1.0	0.0	8.5
	45-54	8.4	0.8	0.0	20.3
	55-64	15.1	4.6	0.7	27.1
	65-74	22.3	13.0	1.0	39.5
	75+	22.7	5.1	0.0	36.0

Source: Clinical measurement - AusDiab 2000

Self report - QH Omnibus 1998

Mental health

Mental disorders accounted for 13.0% of the burden of disease and injury in Queensland in 1996-98, as measured by DALYs.⁴⁹ Almost the entire burden of disease due to mental disorders relates to years of life lost due to disability (96%), rather than mortality. Mental disorders were the leading cause of disability burden in Queensland, accounting for 26.7% of the burden. Affective disorders (including depression and bipolar affective disorder) were the largest specific cause of disability within mental disorders among males and females, accounting for 35% of the total burden attributed to mental disorders.⁵⁰

Mental health is the embodiment of social, emotional and spiritual wellbeing. Mental health provides individuals with the vitality necessary to achieve goals and to interact with one another in ways that are respectful and just.¹⁰⁵ There is evidence that having strong social support, being free from discrimination and violence, and having a satisfying job provides protection for mental health and wellbeing.¹⁰⁶ Unemployed people and people who are socially isolated have higher prevalence of mental health disorders than do people who are employed and socially connected.¹⁰⁶ It is widely accepted that experiences in childhood and negotiation of life changes have profound effects on mental health across the life span. However these effects can be minimised within a strong and supportive community environment. In addition, there is strong and consistent evidence of an independent causal association between depression, social isolation, work-related stressors (job control, demands and stress), and causes and prognosis of coronary heart disease (CHD).⁹⁸ The increased risk contributed by these psychosocial factors is of similar order to the more conventional CHD risk factors, such as smoking, dyslipidaemia and hypertension.

It is acknowledged that mental illness results from complex causal interactions and is influenced by a number of risk and protective factors, as discussed in section 1.4.3; Community Capacity indicators. However, there is not an established standard set of indicators with which to measure and monitor these factors. Work is currently underway at national and state levels to define indicative data, integrate data collection tools and coordinate information systems. This section reports on available indicators of incidence and prevalence of mental disorders and illnesses in Queensland.

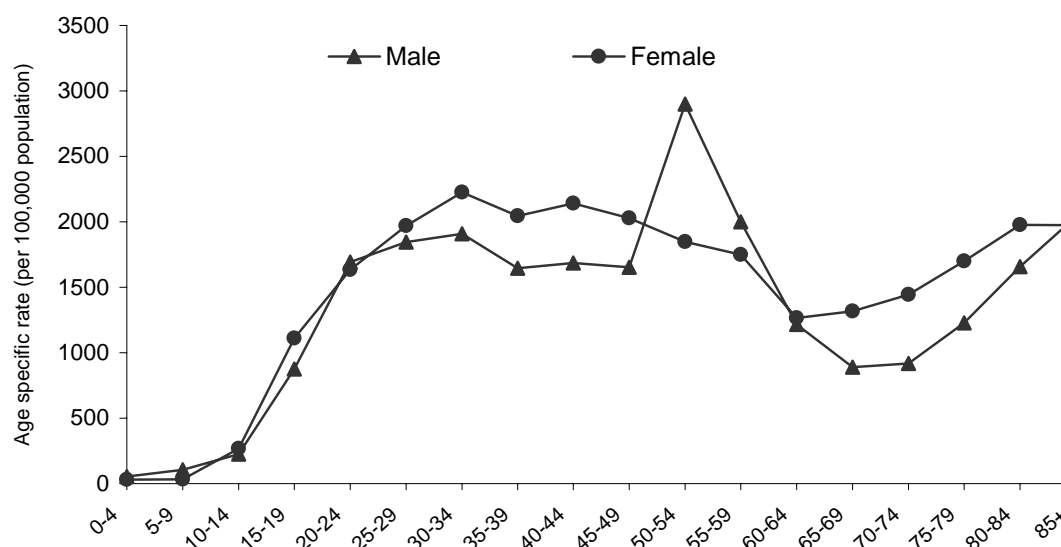
Mental disorders have defined diagnostic criteria that must be met for a disorder to be diagnosed, including symptoms that cause clinically significant impairment in ability to function. Mental health problems also affect the individual's ability to function, but are defined at a lower threshold of symptoms than mental disorders.

Relatively few people die of mental disorders. In the period 1999-2001, there were on average 381 deaths per year in Queensland due to all mental disorders. Of these, organic conditions (arising from cerebral disease or brain injury) were the main cause (89% of female deaths and 62% of male deaths). In males, psychoactive substance use was the second major cause of death, with an average of 56 deaths per year (34% of total).

In contrast, there were on average 49,683 hospital separations per year in the three-year period 1999/2000-01/02 due to all mental disorders. The separation rate in females was significantly higher than for males. Affective disorders including depression, mania and bipolar disorders were the major component of this burden, representing 24% of total male separations and 41% of female. Mental and behavioural disorders due to psychoactive substance use accounted for a further 24% of male and 12% of female separations. This latter group of disorders includes substance use disorders such as mental conditions due to alcohol, illicit drugs, tobacco, volatile solvents, as well as psychotic disorders following psychoactive substance use. Schizophrenia represented the third major component, accounting for 15% of male separations for mental disorders and 8% of female separations. There is a sharp rise in hospital separation rates due to all mental disorders in the teenage years with a plateau from 20-24 to 50-54 years, and a rise in older age groups (Figure 1.17). The peak in male rates in the age group 50-54 can be attributed to a peak in hospitalisation for psychoactive substance use.

The age profile of specific mental conditions varies considerably and is reported in the companion document *Health Determinants Queensland 2004: Statistical report*. Age standardised mental disorders mortality and hospital separation rates for Queensland and 16 smaller geographic areas for 1986-98 have previously been reported.⁸⁻¹⁰ Hospital separation rates for mental disorders must be interpreted with caution as variable admission practices and access to services, re-admissions and coding methods substantially affect rates. In addition, hospital separations due to mental disorders represent a very small proportion of the burden of mental disorders in the community.

Figure 1.17: Mental disorders in total population, age specific hospital separation rate by sex, Queensland 1999/2000-01/02



Source: Queensland hospital admitted patient data collection

In 1997, almost one in five Queenslanders (17.2%) had a mental disorder during the 12 months prior to the survey (Table 1.11), where anxiety, affective, alcohol use and drug use disorders were the subset of mental disorders considered. Depression prevalence was 4.5% for males and 7.3% for females, where depression accounted for the majority (90%) of affective disorders in males and females (95%). The prevalence of mental disorders generally decreased with age (Figure 1.18). Young people aged 18-24 years had the highest prevalence (22%), with prevalence decreasing steadily to 7% for those aged 65 years and older. The overall prevalence of mental disorders was similar for both males and females between Brisbane and the rest of the state. Queenslanders born in non English speaking countries were more likely to report anxiety and affective disorders than those born in Australia,¹⁰⁷ based on point estimates, although due to small relatively small numbers these differences should be interpreted with caution.

Table 1.11: Prevalence of mental disorders and physical conditions, in persons aged 18 years and older by sex, Queensland and Australia 1997

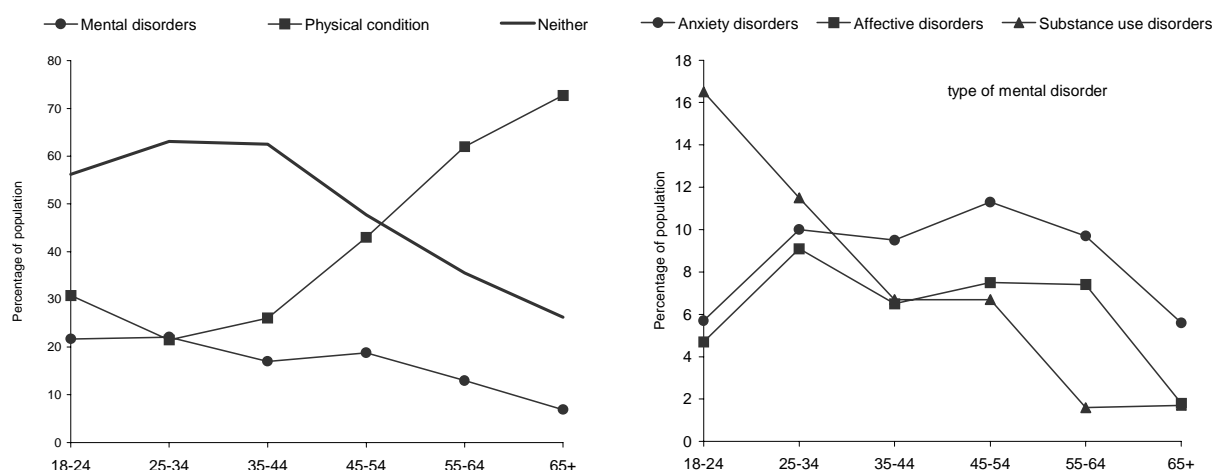
	Australia			Queensland		
	Male	Female	Persons	Male	Female	Persons
Mental disorders total	17.4	18	17.7	17.6	16.7	17.2
Anxiety disorders*	7.1	12.1	9.7	7	10.7	8.9
Affective disorders*	4.2	7.4	5.8	5	7.8	6.4
Substance use disorders*	11.1	4.5	7.7	11.5	4.2	7.8
Physical conditions	36.2	41.3	38.8	37	42.3	39.7
Neither	53.3	49	51.1	52.4	49.2	50.8

Source: ABS Survey of mental health and wellbeing 1997

*Individuals may report multiple disorders

While males and females had similar overall prevalence of the mental disorders included in the survey, there were differences by type of mental disorder. Females were more likely to have experienced anxiety disorders and affective disorders. In contrast, males were more than twice as likely as females to have substance use disorders. Substance use disorders were markedly higher in young people, while affective disorders and anxiety disorders were generally maximal in the age group 25-64 (Figure 1.18). The prevalence of different types of mental disorders was similar between Brisbane and the rest of the state.

Figure 1.18: Prevalence of mental disorders and physical conditions in persons aged 18 years and older by age, Queensland 1997



Source: ABS Survey of mental health and wellbeing 1997

The occurrence of more than one disorder is commonly found among people with mental disorders.¹⁰⁸ For example, in Australia in 1997, nearly one in three people with an anxiety disorder also had an affective disorder, and one in five also had a substance use disorder. Comorbidity with a physical condition is also commonly found among people with mental disorders. Almost 43% of people with a mental disorder had one or more physical conditions, such as heart problems, diabetes or cancer, which is higher than the rate for Australia as a whole (39%). There is strong consensus that the impact of substance abuse on individuals with a serious mental illness such as schizophrenia is profound and has implications for assessment, the course of the illness and clinical management.¹⁰⁹⁻¹¹¹ The significance of this area is supported by the increasing prevalence estimates of 'dual diagnosis',¹¹² reported to be as high as 51% among those with psychotic disorders.¹¹³

In Queensland in 2001, a greater proportion of females (13.5%) than males (9.9%) reported high or very high levels of psychological distress over the previous four week period (Table 1.12). In all age groups under 55 years, a greater proportion of women reported high or very high levels of psychological distress than males. Females aged 18-24 years reported highest levels of psychological distress followed by 25-34 years, with the rate declining with age. Male rates varied between age groups, with peaks in the age group 25-34 years and 55-64 years, before declining in older age groups. The prevalence of high levels of psychological distress was higher in areas of most socioeconomic disadvantage. In Australia, the proportion of adults reporting high or very high levels of psychological distress in the 2001 National Health Survey (12.6%) was higher than in the 1997 Survey of Mental Health and Wellbeing (8.2%). Some of this difference may be due to methodological issues.¹¹⁴

The burden of mental health in Queensland is further discussed in each of the population specific chapters; *Children, Young people, Older people and Indigenous peoples*. Age standardised and age specific hospital separation rates for depression, dementia, bipolar affective disorders and schizophrenia in Queensland and 16 smaller geographic areas for 1992-99 have previously been reported.⁸⁻¹⁰

Table 1.12: Prevalence of high or very high levels of psychological distress, percentage of population, by age, sex, socioeconomic disadvantage and region, Queensland 2001

	Male	Female	Persons		Male	Female	Persons
18+	9.9	13.5	11.9	Major cities	9.4	13.5	11.5
				Inner regional	11.3	13.6	12.5
18-24	8.9	17.9	13.3	Remainder	9.9	14.9	12.3
25-34	15.2	17.0	16.1	Socioeconomic disadvantage			
35-44	8.4	16.4	12.5	Quintile 1 (least)	3.9	10.1	6.9
45-54	7.8	13.5	10.6	Quintile 2	5.6	12.3	9.1
55-64	12.1	9.9	10.9	Quintile 3	7.9	12.0	9.9
65-74	7.1	6.0	6.5	Quintile 4	13.0	14.8	13.9
75 +	5.6	7.8	6.9	Quintile 5 (most)	16.2	17.9	17.1

Source: ABS National health survey 2001

Suicide

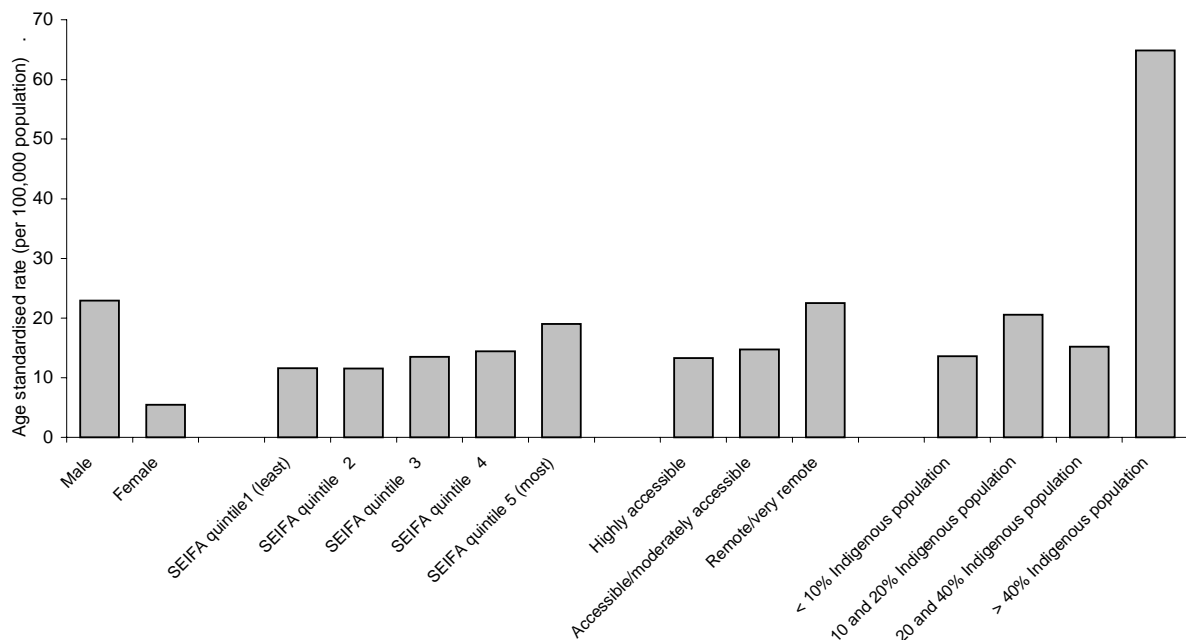
Intentional injuries accounted for 3.7% of the burden of disease and injury in Queensland in 1996- 98, as measured by DALYs.⁴⁹

There were on average 504 suicides per year in Queensland in 1999-2001. Men accounted for 80% of those deaths. In 1999-2001, suicide rates were significantly higher in males than females; in areas with greater than 10% Indigenous population; areas of highest socioeconomic disadvantage; and, remote areas (Figure 1.19). The proportion of Indigenous population, socioeconomic disadvantage and rurality of an area are not independent factors. However, the independent effect of each factor is not clear. The greater suicide rates in these areas may be partially due to an interplay between some or all of these factors. This is further discussed in the *Indigenous peoples* chapter and must also be considered when implementing interventions described in section 1.5. Between 1989-91 and 1999-2001, age standardised suicide rates declined by 3.6% in males and by 1.4% in females; an estimated rate of 0.4% and 0.1% respectively per year (Figure 1.5). Suicide rates for males are greatest in the age group 20-39 years.⁸⁻¹⁰ In 1997-98, the suicide rate in Queensland was 8% higher than the national average.²

Suicide is the final outcome of a complex, cumulative and interacting set of risk factors.¹¹⁵ Protective factors include connectedness to family and school,¹¹⁶ responsibility for children,¹¹⁷ the presence of a significant other,¹¹⁷ personal resilience and problem solving,¹¹⁸ good physical and mental health¹¹⁹ and economic security in older age.¹¹⁹ There is compelling evidence that having a mental disorder places a person, whatever their age, at considerably higher risk of suicide.¹²⁰ A significant proportion of people (28-98%) who die by suicide are suffering from mental illness at the time. Depression is the largest single risk factor for suicide and suicidal behaviour.¹²¹ The relationship between depression and suicide becomes increasing strong with age, although depression becomes less common among Older people.¹²⁰

The burden of suicide in Queensland is reported in the *Indigenous peoples* and *Young people* chapters. Age standardised mental disorders, suicide and self-inflicted injury mortality and hospital separation rates for Queensland and 16 smaller geographic areas for 1986-98 and Queensland age specific mortality and hospital separation rates have previously been reported.⁸⁻¹⁰

Figure 1.19: Suicide in total population, age standardised mortality rate by sex, socioeconomic disadvantage, accessibility and proportion Indigenous peoples, Queensland 1999-2001



Source: ABS Cause of death

Note: <1 case pa in Torres SLA

Injury and poisoning

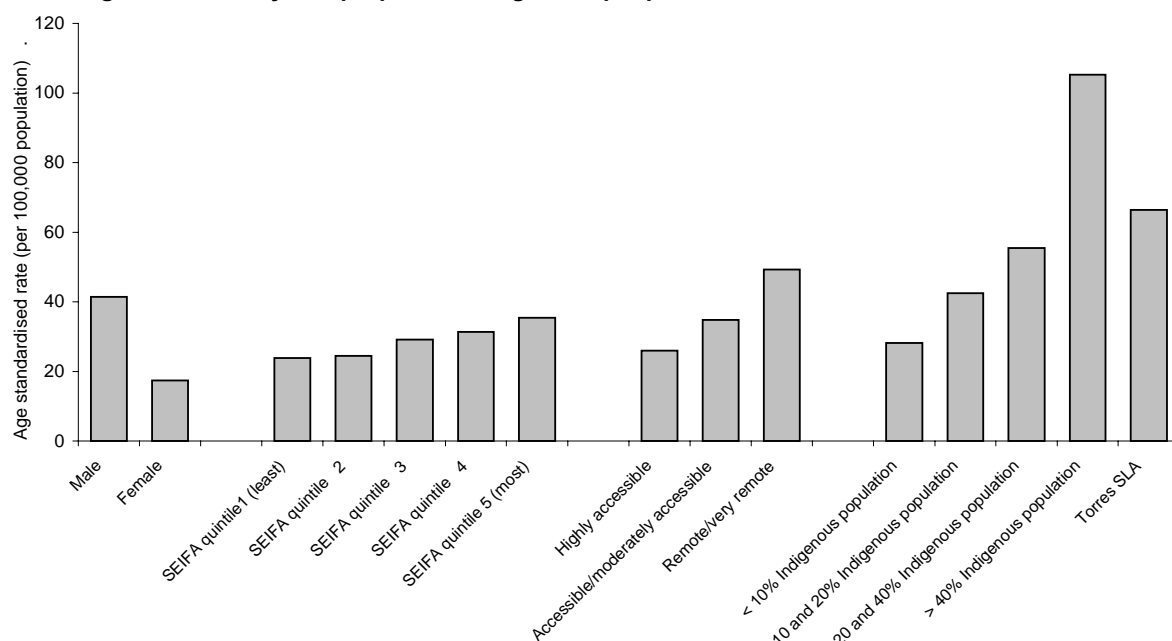
Injury and poisoning, excluding suicide, accounted for 6.5% of the burden of disease and injury in Queensland in 1996-98, as measured by DALYs.⁴⁹ As with the burden of disease study, this section relates to mortality and morbidity associated with injury and poisoning, excluding suicide and complications of medical and surgical care.

In Queensland in 1999-2001, there were on average were 1,087 deaths per year due to injury, and males accounted for 66% of these deaths. Mortality due to injury was significantly higher in males; in areas of greater than 10% Indigenous population; remote areas; and areas of high socioeconomic disadvantage (Figure 1.20). The proportion of Indigenous population or socioeconomic disadvantage and rurality of an area are not independent factors. However, the independent effect of each factor is not clear. The greater unintentional injury mortality burden in these areas may be partially due to an interplay between some or all of these factors. This is further discussed in the *Indigenous peoples* chapter and must also be considered in the implementation of interventions described in section 1.5. Between 1989-91 and 1999-2001, age standardised injury and poisoning mortality rates decreased by 18% in males and by 15% in females, an estimated rate of -1.9% and -1.6% respectively per year (Figure 1.5).

There were on average 92,655 injury and poisoning related hospital separations per year in the three years 1999/2000-01/02 in Queensland. Men represented 62% of those separations. In the period from 1989/90-91/92 to 1999/2000-01/02, injury and poisoning separation rates increased by 23% and 24% in males and females respectively, annual rate increases of 2.1% and 2.2% (Figure 1.6).

The greater burden of injury and poisoning in the Indigenous population is fully discussed in the *Indigenous peoples* chapter. In addition, key injury and poisoning outcomes for specific ages are discussed in the *Children, Young people* and *Older people* chapters. Age standardised injury and poisoning mortality and hospital separation rates for Queensland and 16 smaller geographic areas for 1986-98 and Queensland age specific mortality and hospital separation rates have previously been reported.⁸⁻¹⁰

Figure 1.20: Injury and poisoning in total population, age standardised mortality rate by sex, socioeconomic disadvantage, accessibility and proportion Indigenous peoples, Queensland 1999-2001



Source: ABS Cause of death

Road transport injury

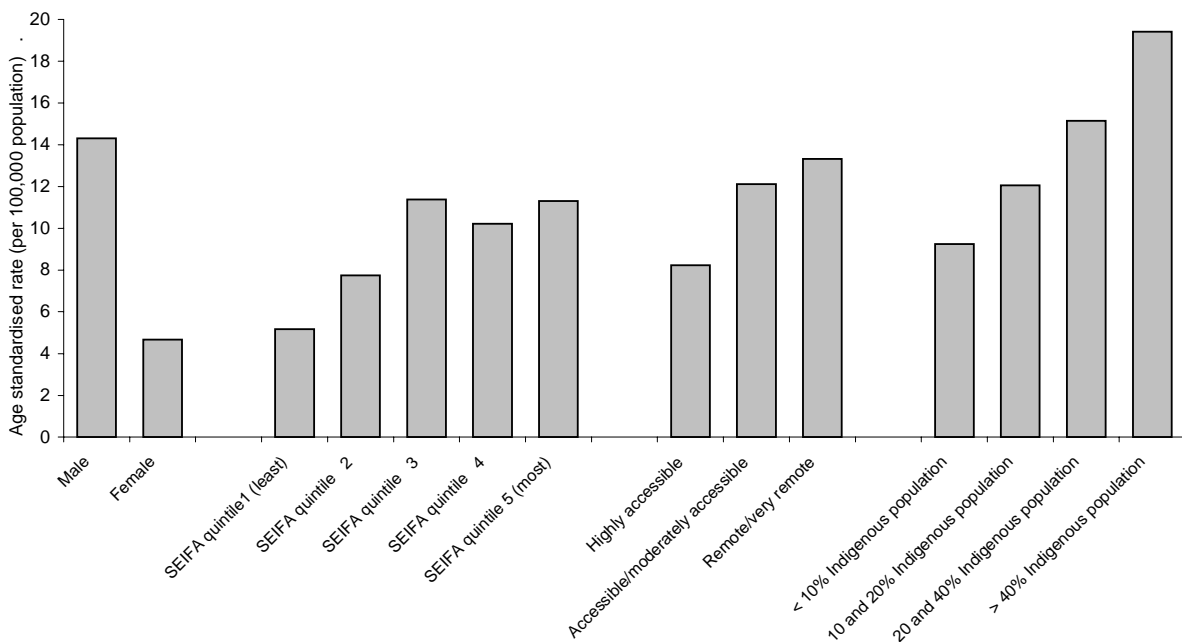
Road transport injury, accounted for 2.3% of the burden of disease and injury in Queensland in 1996-98, as measured by DALYs.⁴⁹ Road traffic related injuries were the major cause of unintentional injury (38.0%). In Queensland in 1999-2001, there were on average 316 deaths per year due to road traffic related injury and males accounted for 73% of deaths. In 1999-2001, mortality rates due to road transport injury were significantly higher in males than females; in areas with greater than 10% Indigenous population; areas of higher socioeconomic disadvantage; and, moderately accessible and remote areas

(Figure 1.21). The proportion of Indigenous population, socioeconomic disadvantage and rurality of an area are not independent factors. However, the independent effect of each factor is not clear. The greater road transport injury mortality in these areas may be partially due to an interplay between some or all of these factors.

This is further discussed in the *Indigenous peoples* chapter and must also be considered when implementing the interventions described in section 1.5. Between 1989-91 and 1999-2001, age standardised mortality rates due to road transport injury declined by 32.8% in males and by 47.5% in females; an estimated rate of -3.9% and -6.2% per year respectively (Figure 1.5). This reduction can be attributed to random breath tests, speed cameras, better roads and improved safety of motor vehicles.¹²²

In the three years 1999/2000-01/02, there were on average 8,827 hospital separations each year due to road transport injury, 67% for males. Between 1989/91-91/92 and 1999/2000-01/02, age standardised hospital separation rates due to road transport injury decreased by 17.6% in males and by 21% in females, average annual changes of -1.9% and -2.3% respectively (Figure 1.6).

Figure 1.21: Road transport related injury in total population, age standardised mortality rate by sex, socioeconomic disadvantage, accessibility and proportion Indigenous peoples, Queensland 1999-2001



Source: ABS Cause of death

Note: <1 case pa in Torres SLA

Diabetes

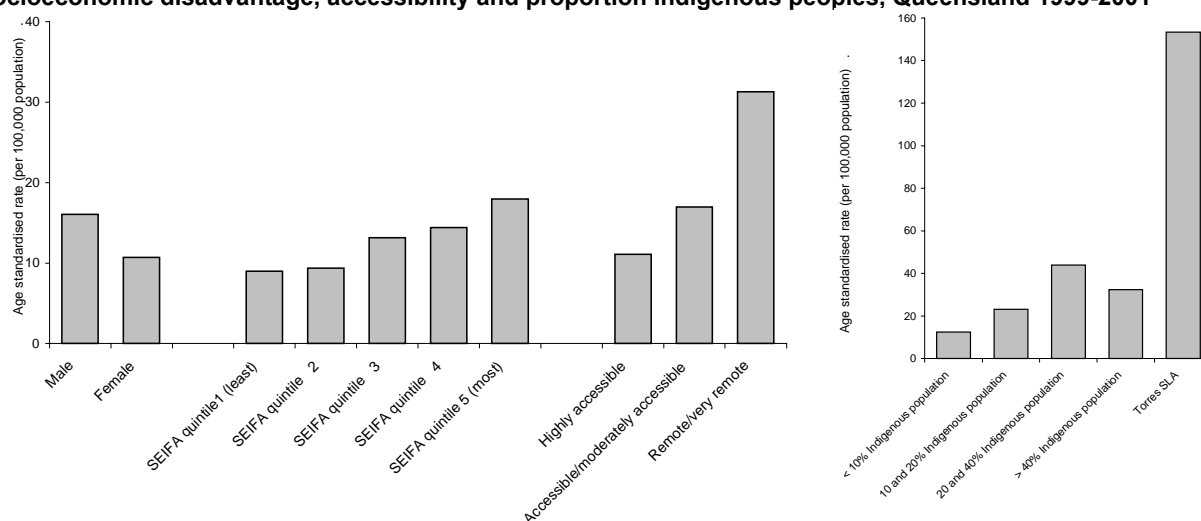
Diabetes accounted for 3.0% of the burden of disease and injury in Queensland in 1996-98,⁴⁹ and Australia in 1996,⁵⁰ as measured by DALYs. If the burden of cardiovascular diseases attributable to diabetes in Australia is included with diabetes, its total attributable burden increases to 4.9%.

In Queensland in 1999-2001, there were on average 522 deaths where diabetes was the principal diagnosis. Males accounted for 53% of these deaths. In this period the ratio of deaths due to diabetes as a principal diagnosis compared with deaths due to diabetes as principal diagnosis or other diagnosis was 1:3.1. As diabetes is variably reported as an underlying cause in hospital separations and deaths, such data must be interpreted with caution. In 1999-2001, mortality rates due to diabetes as the principal diagnosis were significantly higher in males than females; in areas with greater than 10% Indigenous population; the Torres Strait; areas of higher socioeconomic disadvantage; and in moderately accessible and remote areas (Figure 1.22). The diabetes mortality rate in the Torres Strait is more than 10 times that of Queensland as a whole. The proportion of Indigenous population, socioeconomic disadvantage and rurality of an area are not independent factors. However, the independent effect of each factor is not clear and thus the greater diabetes mortality in these areas may be partially due to an interplay between some or all of these factors. This is further discussed in the *Indigenous peoples* chapter and must also be considered in the implementation of interventions described in section 1.5. In the decade 1989-91 to 1999-2001, there was an increase of 31.5% in diabetes (principal cause) mortality for males and 8.2% for females; an annual increase of 2.8% and 0.8% per year respectively (Figure 1.5).

Numerous epidemiological studies have highlighted the susceptibility of certain ethnic groups to high rates of diabetes.¹²³ In 2003, overseas-born Australians at highest risk of diabetes were those born in the South Pacific region, the Middle East/North Africa, Southern Asia and Southern Europe.¹²⁴ Hospitalisation and death rates were highest in South Pacific Islanders (about twice the rates of Australian born people), followed by Middle East and North Africa. Prevalence rates, hospitalisation and death rates for diabetes varied across all groups of overseas-born people.

Queensland has similar diabetes mortality rates to the national average for both males and females. Diabetes mortality rates in Australia were in the top third when ranked against other developed countries, and were more than twice the rate of Greece, the best of the comparison countries.¹²⁵

Figure 1.22: Diabetes (principal cause) in total population, age standardised mortality rate by sex, socioeconomic disadvantage, accessibility and proportion Indigenous peoples, Queensland 1999-2001



Source: ABS Cause of death

Note: Y axis of different scale

There were on average 6,777 hospital separations each year in Queensland in the three years 1999/2000-01/02 due to diabetes (principal diagnosis) and 33,113 separations where diabetes was the principal or other diagnosis. In this period, the ratio of hospital separations due to diabetes as principal diagnosis compared to those due to diabetes as principal diagnosis or other diagnosis was 1:4.9. Between 1989/90-91/92 and 1997/98-99/00, there was a 32% increase in diabetes (principal diagnosis) hospital separations for males and 13% for females, an annual increase of 3.5% and 1.5% per year respectively (Figure 1.6). Changes in the practice of coding diabetes as a principal cause of hospital separations in 2000/01 preclude comparisons between the most recent period and the years preceding this change.

In 2000, an estimated 7.0% of adults aged 25 years and older in Queensland had diabetes, based on blood sugar levels.¹²⁶ The prevalence of diabetes was similar in males (7.1%) and females (7.0%: Table 1.13), similar to Australia. The prevalence of diabetes increased dramatically with age. Due to methodological considerations, the data may underestimate the true prevalence of diabetes.¹²⁷

In 2000, 7.9% of adults aged 18 years and older in Queensland reported that they have ever been told they have diabetes and have had a blood test to confirm this diagnosis (Table 1.14). When gestational diabetes was excluded, the prevalence was 7.0%. Self reported diabetes prevalence was lower in males (6.8%) than in females (8.9%), where most of this difference was due to gestational diabetes in females. Self reported diabetes prevalence increased dramatically with age. Self reported diabetes prevalence generally increased with increasing socioeconomic disadvantage. Self reported diabetes prevalence has increased dramatically in the past two decades.¹²⁷ This five to six fold rise since 1980 may be partly due to an increase in awareness of diabetes in the community and an increase in screening levels. However, consistent with international findings, this increase also partly reflects an increase in the incidence of diabetes over this period.

The greater burden of diabetes in the Aboriginal and Torres Strait Islander populations is further discussed in the *Indigenous peoples* chapter. Age standardised diabetes (principal and underlying cause) mortality and hospital separation rates for Queensland and 16 smaller geographic areas for 1986-98 and Queensland age specific mortality and hospital separation rates have been reported previously.^{8-10,127}

Modifiable risk factors contribute a large component of the death and disability associated with diabetes. These risk factors include overweight and obesity, current high blood pressure, poor diet, physical inactivity, tobacco smoking and alcohol intake,¹²⁷ and are all described latter in this chapter. There is a continuous association between healthy and excess weight, as assessed by body mass index, and risk of diabetes.⁹⁶

Table 1.13: Diabetes prevalence based on blood glucose levels, by age and sex, Queensland 2000

	25+	25-34	35-44	45-54	55-64	65-74	75+
Male	7.1	0	1.8	9.3	13.4	12.4	27.1
Female	7	0	1.7	5.9	7.2	20	26.7

Source: AusDiab 2000

Table 1.14: Prevalence of self reported diabetes: percentage who ever been told by a nurse or doctor they have diabetes, high blood sugar or a touch of sugar and have had a blood test for diabetes, by age, sex, remoteness and socioeconomic disadvantage, Queensland 2000

	Male	Female	Persons		Persons
18+	6.8	8.9	7.9	18-29	3.2
				30-39	8.0
18-64	5.4	8.8	7.1	40-49	5.6
65-74	16.8	8.9	12.8	50-59	11.6
75 +	12.9	10.5	11.5	60-64	13.5
				65-74	12.8
				75 +	11.5
Remoteness	Persons		Socioeconomic disadvantage		Persons
Capital City	7.9		quintile 1 (least)		6.0
Other major urban	7.4		quintile 2		7.7
Rural major	7.6		quintile 3		9.9
Rural other	8.4		quintile 4		6.5
Remote major	na		quintile 5 (most)		9.2
Remote other	14.4				

Source: QH General population survey 2000

In 2000, three quarters (78.2%) of the adult Queensland population were able to describe a least one of the basic features of diabetes, such as: raised blood sugar/glucose levels; poor control of blood sugar; need insulin; or malfunctioning pancreas. This was defined as a reasonable or good understanding of the basic symptoms and causes of diabetes (Table 1.15). There was little difference in this understanding in the 10 year age groups to 64 years of age. In contrast, in the older age groups of 75-74 years and 75 years and older, a smaller proportion had a reasonable understanding of diabetes, which is in direct contrast to the increasing prevalence of diabetes with age. The long term outcomes of diabetes were less well known. Of those adults who had a basic understanding of diabetes, only 28.7% could nominate at least two long term complications of diabetes. Considering risk factors for diabetes, of those adults who had a reasonable understanding of diabetes, almost half (48%) of adults could nominate at least two risk factors for the disease. 'Family history' was the most commonly named risk factor (32%). However, the second most common response, 'high sugar diet' (30%), is not a recognised diabetes risk factor. Overweight and obesity was correctly identified by 24% of people. Almost half (47.8%) of all adults had ever had a full blood test for diabetes or high blood sugar, and this increased markedly with age (Table 1.16).

Based on blood sugar levels, in 2000, 126 an estimated 15.9% of males and 17.9% of females in Queensland had some form of impaired glucose metabolism, either impaired glucose tolerance (IGT) or impaired fasting glycemia (IFG). Both IGT and IFG are highly predictive of subsequent development of type 2 diabetes¹²⁸ and are significant short and long term risk factors for cardiovascular disease.¹²⁹ The prevalence of metabolic syndrome is reported in section 1.4.4.

Table 1.15: Diabetes knowledge; percentage who have a reasonable/good idea of what diabetes is, by age and sex, Queensland 2000

	Male	Female		Persons
18+	77.3	79.0	18-29	79.0
18-64	78.7	81.8	30-39	83.9
65-74	74.5	68.0	40-49	80.9
75 +	59.7	61.2	50-59	78.3
			60-64	75.2
			65-74	71.2
			75 +	60.6

Source: QH General population survey 2000

Table 1.16: Diabetes blood test; percentage who have ever had a full blood test for diabetes or for high blood sugar (not just a finger prick test), by age and sex, Queensland 2000

	Male	Female		Persons
18+	45.6	49.9	18-29	31.5
18-64	42.7	48.0	30-39	45.2
65-74	63.8	60.2	40-49	45.3
75 +	61.3	58.2	50-59	62.0
			60-64	59.6
			65-74	62.0
			75 +	59.5

Source: QH General population survey 2000

Asthma

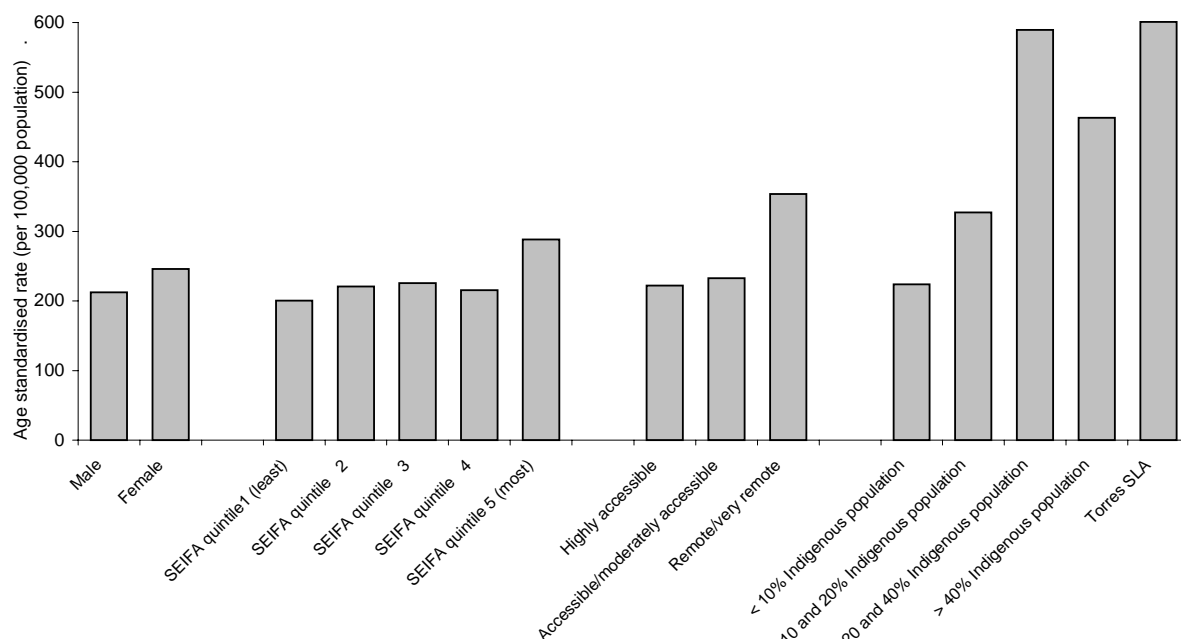
Asthma accounted for 2.8% of the burden of disease and injury in Queensland in 1996-98, as measured by DALYs.⁴⁹ Years of life lost due to disability account for the majority of the burden of disease due to asthma (87%).

There were on average 72 deaths per year due to asthma in Queensland in 1999-2001, where males accounted for 36% of those deaths. Between 1989-91 and 1999-2001, age standardised asthma mortality rates declined by 63% in males and 56% in females, an estimated rate of -9.6% and -7.9% respectively per year (Figure 1.5). However, this decrease must be interpreted with caution as the international classification for diseases changed in 1999 from ICD-9 to ICD-10 and the comparability ratio for asthma across these classifications was less than 1 (Table 1.83). Furthermore, caution must be used in the interpretation of this data, as recording of asthma on death certificates is known to be problematic.

There were on average 8,088 asthma hospital separations per year in the three year period 1999/2000-01/02. Males represented 46% of those separations. Hospital separations due to asthma were significantly higher in females than males; in areas of greater than 10% Indigenous population; Torres SLA: moderately accessible and remote areas; and areas of higher socioeconomic disadvantage (Figure 1.23). In the period from 1989/90-91/92 to 1999/2000-01/02, asthma separation rates decreased by 48% in males and 42% in females; annual rates of -6.3% and -5.3% respectively (Figure 1.6). Again this change must be interpreted with caution, as the disease group classification change from version 9 to version 10 reduced comparability of asthma rates over the reporting period.

The large burden of asthma for children is more fully discussed in the *Children* chapter. Age standardised asthma mortality and hospital separation rates for Queensland and 16 smaller geographic areas for 1986-98 and Queensland age specific mortality and hospital separation rates have been reported previously.⁸⁻¹⁰

Figure 1.23: Asthma in total population, age standardised hospital separation rate by sex, socioeconomic disadvantage, accessibility and proportion Indigenous peoples, Queensland 1999-2001



Source: ABS Cause of death

In 2000, 10.9% of Queenslanders aged 18 years and older reported a diagnosis of asthma that remains a current problem, as determined by symptoms or treatment for asthma in the last 12 months (Table 1.17). One in five adults (21.4%) have ever been told they have asthma, 20.6% for males and 23.8% for females (Table 1.18). This diagnosis was on the basis of being told by a doctor, nurse or someone at a hospital that they had asthma. Overall, the prevalence of asthma does not differ substantially between cities, regional and remote areas, or between areas of differing socioeconomic disadvantage. It is however, higher among Indigenous adults compared to non Indigenous adults based on a recent national report.¹³⁰ The self reported prevalence of asthma in Queensland is consistent with that reported nationally.¹³⁰ The prevalence of asthma in Australia is high by international standards.

The environmental causes of asthma have been extensively investigated and reviewed.¹³¹⁻¹³³ Exposure to environmental tobacco smoke in childhood is a recognised risk factor for the development of asthma symptoms, and also for the worsening of pre-existing asthma. Smokers with asthma have additional morbidity. Environmental and other related factors, such as diet and lifestyle, may affect the risk of acquiring asthma; change the course of the disease; or trigger attacks of airway narrowing and symptoms.

Table 1.17: Prevalence of self reported asthma: percentage who have had symptoms of asthma or been treated for asthma in the last 12 months, by age, sex and remoteness, Queensland 2000

	Male	Female		Male	Female	Persons
18+	8.1	13.7	Capital city	7.3	15.1	11.2
18-29	7.6	21.6	Other major urban	10.0	11.3	10.7
30-39	6.7	12.7	Rural major	5.2	11.7	8.8
40-49	6.5	14.6	Rural other	9.1	14.5	11.6
50-59	9.9	12.3	Remote major	-	26.5	19.3
60-64	16.4	7.1	Remote other	16.3	19.5	17.3
65-74	8.9	6.5				
75 +	8.1	6.0				

Source: QH Chronic diseases survey 2000

Table 1.18: Prevalence of self reported asthma: percentage who have ever been told by a doctor, nurse or at a hospital that they have asthma, by age, sex and remoteness, Queensland 2000

	Male	Female		Male	Female
18+	20.6	23.8	Capital city	19.4	25.9
18-29	24.6	32.8	Other major urban	23.6	21.1
30-39	21.1	23.2	Rural major	16.4	20.4
40-49	21.3	24.9	Rural other	21.5	24.2
50-59	18.3	21.6	Remote major	0.0	26.5
60-64	21.8	16.7	Remote other	34.2	38.9
65-74	13.7	12.8			
75 +	14.5	16.5			

Source: QH Chronic diseases survey 2000

Chronic obstructive pulmonary disease

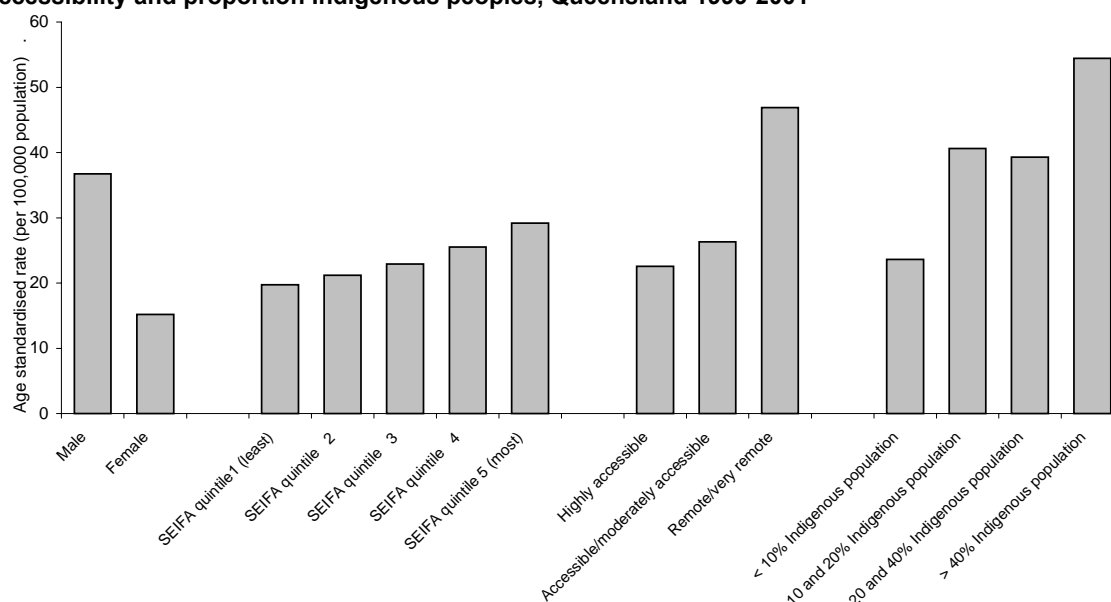
Chronic obstructive pulmonary disease (COPD) accounted for 3.5% of the burden of disease and injury in Queensland in 1996-98, as measured by DALYs.⁴⁹

There were on average 947 deaths per year due to COPD in Queenslanders in 1999-2001, where males accounted for 65% of those deaths. Mortality due to COPD was significantly higher in males than females; in areas of high proportion of Indigenous population; moderately accessible and remote areas; and, areas of high socioeconomic disadvantage (Figure 1.24). The proportion of Indigenous population, socioeconomic disadvantage and rurality of an area are not independent factors. However, the independent effect of each factor is not clear. The greater COPD mortality in these areas may be partially due to an interplay between some or all of these factors. This is further discussed in the *Indigenous peoples* chapter and must also be considered when implementing the interventions described in section 1.5. Between 1989-91 and 1996-98, age standardised mortality rates due to COPD declined by 26.7% in males and increased by 13.3% in females, an estimated change of -4.3% and 1.8% per year respectively (Figure 1.5). Lack of comparability between international classification of diseases versions 9 and 10 preclude comparison of mortality rates for COPD in the most recent period with rates prior to the change.

In 1999/2000-01/02, in Queensland, there were on average 9,328 hospital separations per year due to COPD, 62% for males. In the period from 1989/90-91/92 to 1996/97-98/99, there was a 9.1% decrease in hospital separations rates due to COPD for males and an increase of 13.9% in rates for females, annual changes of -1.4% and 1.9% respectively (Figure 1.6). Rates prior to the change from international classification of diseases version 9 to version 10, cannot be compared with rates in the most recent period due to lack of comparability of coding for COPD between the two versions.

Age standardised COPD mortality and hospital separation rates for Queensland and 16 smaller geographic areas for 1986-98 and Queensland age specific mortality and hospital separation rates have been reported previously.⁸⁻¹⁰ Additional data for COPD is presented in the *Older people* chapter.

Figure 1.24: COPD in total population, age standardised mortality rate by sex, socioeconomic disadvantage, accessibility and proportion Indigenous peoples, Queensland 1999-2001



Source: ABS Cause of death

Note: <1 case pa in Torres SLA

Musculoskeletal disease

Musculoskeletal diseases accounted for 3.6% of the burden of disease and injury in Queensland in 1996-98, as measured by DALYs.⁴⁹ Osteoarthritis is the cause of 63% of the burden attributed to musculoskeletal diseases. Almost the entire burden due to musculoskeletal diseases relates to years of life lost due to disability (92.4%), rather than mortality.

In Queensland, there were on average 152 deaths per year due to musculoskeletal diseases (including osteoporosis, rheumatism and osteoarthritis) in the period 1999-2001, with 88% of these in people 65 years and older. Females accounted for 66% of all deaths due to musculoskeletal disease, both in the total population and in Older people. Between 1989-91 and 1999-2001, age standardised mortality rates due to musculoskeletal diseases increased by 2.3% in males and decreased by 13.6% in females, an increase of 0.2% per year in males and decrease of 1.5% per year in females over the decade (Figure 1.5). In the period 1999/2000- 01/02, there were on average 53,851 hospital separations per year due to musculoskeletal diseases, and of these 52% were for males. Thirty one per cent of all separations in this period were in the age group 65 years and older. In the decade, 1989/90-91/92 to 1999/2000-01/02, there was an increase in hospital separations due to musculoskeletal diseases of 13.4% for males and 9.4% for females (Figure 1.6).

In 2001, one in three Queenslanders reported a long-standing musculoskeletal condition (six months or greater: Table 1.19). Back pain and neck/disc disorders were the most prevalent conditions reported. Arthritis was reported by one in seven people and was more prevalent in females than males, people living in regional Australia, people living in areas of greater socioeconomic disadvantage and among healthcare card-holders (Table 1.20). Prevalence of arthritis was similar in people born in Australia and those born overseas, and between those who spoke English only at home or those whose main language spoken at home was not English.

Regular physical activity is necessary for maintaining normal muscle strength, joint structure and joint function.¹³⁴ Physical activity has a beneficial effect on bone development and the maintenance of bone density.^{135,136} Participation in physical activity throughout life can maintain and reduce the decline in musculoskeletal health associated with ageing.¹³⁷

Table 1.19: Prevalence of musculoskeletal disease as a long term condition, percentage of population, Queensland and Australia 2001

	Queensland	Australia
Total musculoskeletal disease	33.7	32.0
Arthritis	14.1	13.6
Rheumatism	1.1	1.3
Back pain/problems neck/disc disorders	22.8	20.8
Osteoporosis	1.6	1.6
Other	4.6	5.0

Source: ABS National health survey 2001

Table 1.20: Prevalence of arthritis as a long term condition, percentage of population by selected sociodemographic indicators, Queensland 2001

	Male	Female		Male	Female
Country of birth			Socioeconomic disadvantage		
Australia	11.5	15.4	Most	12.9	18.4
Overseas	12.8	15.9	Least	8.6	11.0
Main language spoken at home			Government health card		
English only	15.9	21.1	With card	31.4	29.5
Language other than English	15.7	16.8	Without card*	5.6	8.0
Location					
Major cities of Australia	10.7	14.9			
Inner regional Australia	13.2	18.1			
Outer regional Australia/other areas	12.7	14.0			

Source: ABS National health survey 2001

*Includes small number of not known card status

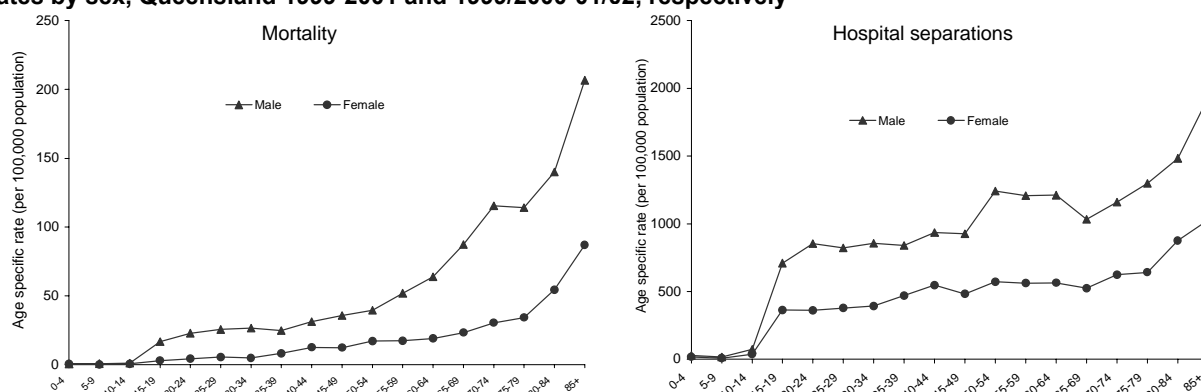
1.3.6 Health behaviour outcomes

The effect of a health determinant on mortality and hospital separation rates is estimated using aetiological fractions.^{138,139} An aetiological fraction is the estimated proportion of cases of the disease that would be eliminated in the absence of the risk factor. Aetiological fractions are available only for four health behaviours: risky alcohol consumption, tobacco smoking, illicit drug use and physical inactivity.

Alcohol

In 1999-2001, there were on average 812 deaths per year attributed to hazardous and harmful alcohol consumption in Queensland, of which 74% were male. The risk of death attributed to hazardous and harmful alcohol consumption increases with age for both men and women, with a steep rise from age 60-64 years (Figure 1.25). However, the mortality rate gap between males and females is obvious from youth and widens from age 50-54 years. Mortality rates due to hazardous or harmful alcohol consumption were significantly higher in males than females; in socioeconomically disadvantaged areas than advantaged areas; in remote and very remote areas than in accessible or highly accessible areas in Queensland; and, in areas with greater than 10% Indigenous population (Figure 1.26). Of the deaths attributed to risky alcohol consumption, suicide was the leading cause (19%), followed by alcoholic liver cirrhosis (15%) and oesophageal cancer (9.4%). In women alone however, breast cancer was the leading cause of deaths attributed to risky alcohol consumption, accounting for 22% of cases.

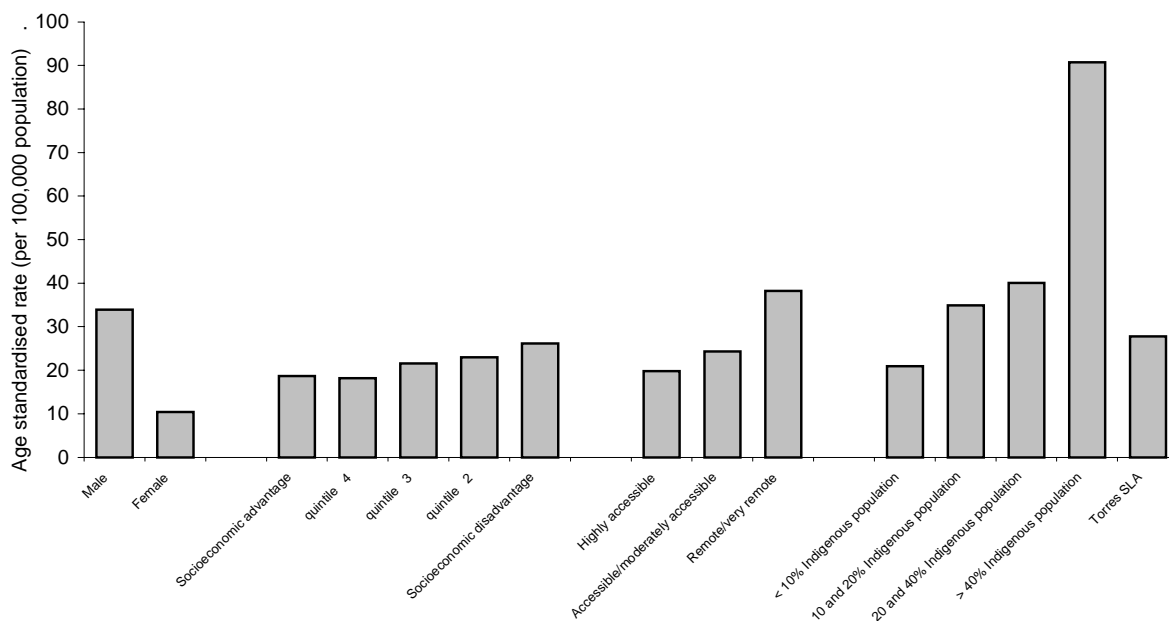
Figure 1.25: Hazardous and harmful alcohol consumption; age specific mortality and hospital separation rates by sex, Queensland 1999-2001 and 1999/2000-01/02, respectively



Source: ABS Cause of death

Source: Queensland hospital admitted patient data collection

Figure 1.26: Deaths attributed to hazardous and harmful alcohol consumption; age standardised mortality rates by sex, socioeconomic advantage/disadvantage*, accessibility and proportion Indigenous peoples, Queensland 1999-2001



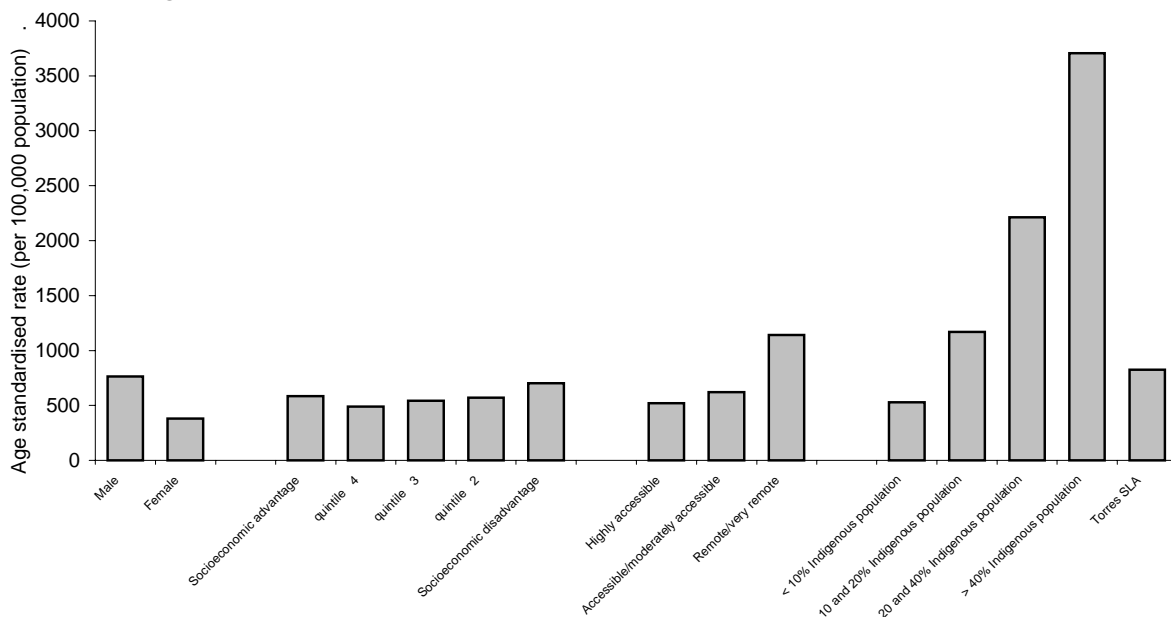
Source: ABS Cause of death

*ABS Index of relative socioeconomic advantage/disadvantage 2001

In the three years 1999/2000-01/02, there were on average 20,912 hospital separations per year attributed to hazardous and harmful alcohol consumption in Queensland, of which 66% were male. A sharp rise in rates is evident in males in the age group 15-19 years, with a similar sharp rise of smaller magnitude in female rates. This is followed by a steady increase in rates for both sexes (Figure 1.25), with males experiencing higher rates at all ages. Rates of hospitalisation for conditions attributed to risky alcohol consumption were significantly higher in males; socioeconomically disadvantaged areas than advantaged areas; in remote and very remote areas than in accessible or highly accessible areas; and, in areas with greater than 10% Indigenous population (Figure 1.27). Of the hospital separations attributed to risky alcohol consumption, alcohol dependence was the leading cause (18%), followed by injuries due to falls (13%) and assault (11%).

Some 37 conditions have been identified as significantly affected by hazardous and harmful alcohol consumption.^{140,138} Using the 2001 fractions,¹⁴⁰ which were an update on the 1995 fractions,¹³⁸ it was estimated that 43% of road injuries in males aged 25 to 29 years and 34% of falls injuries in females aged 70 years and older were directly attributable to such alcohol consumption.¹³⁹

Figure 1.27: Hospital separations attributed to hazardous and harmful alcohol consumption; age standardised hospital separation rates by sex, socioeconomic advantage/disadvantage*, accessibility and proportion Indigenous peoples, Queensland 1999/2000-01/02



Source: Queensland hospital admitted patient data collection

*ABS Index of relative socioeconomic advantage/disadvantage 2001

Tobacco smoking

In 1999-2001, there were on average 3,402 deaths per year attributed to tobacco smoking in Queensland, of which 69% were male. This represents 19% of all male deaths and 10% of all female deaths in Queensland.¹⁴¹ Mortality rates attributed to tobacco smoking increase dramatically with age after age 50, particularly for males (Figure 1.28), with 76% of deaths occurring in the age group 65 years and older. The greatest difference between genders is observed in the 75-79 year old group, where males are three times more likely to die of a smoking related condition than women. Mortality rates due to tobacco smoking were significantly higher in males than females; socioeconomically disadvantaged areas than advantaged areas; in remote and very remote areas than in accessible or highly accessible areas; and, in areas with greater than 10% Indigenous population and Torres SLA (Figure 1.29). Lung cancer accounted for 31% of the deaths attributed to tobacco smoking, followed by CHD (22%) and COPD (21%). This pattern was evident in males and females.

In 1999/2000-01/02, there were on average 30,453 hospital separations per year attributed to tobacco smoking in Queensland, of which 67% were male. Hospital separation rates increase with age due to duration of exposure, with 49% occurring in people aged 65 years and older (Figure 1.28). A steady increase in tobacco smoking related morbidity requiring hospital admission occurs from age 45-49 for both sexes, with males experiencing higher rates at all ages. Rates of hospitalisation for conditions attributed to smoking were significantly higher in males; socioeconomically disadvantaged areas; remote and very remote areas; and, in areas with greater than 10% Indigenous population and Torres SLA (Figure 1.30). CHD and COPD together accounted for nearly 50% of hospital separations attributed to tobacco smoking (24% and 24% respectively), and lung cancer accounted for a further 9% of separations.

Figure 1.28: Smoking; age specific mortality and hospital separation rates by sex, Queensland 1999-2001 and 1999/2000-01/02, respectively

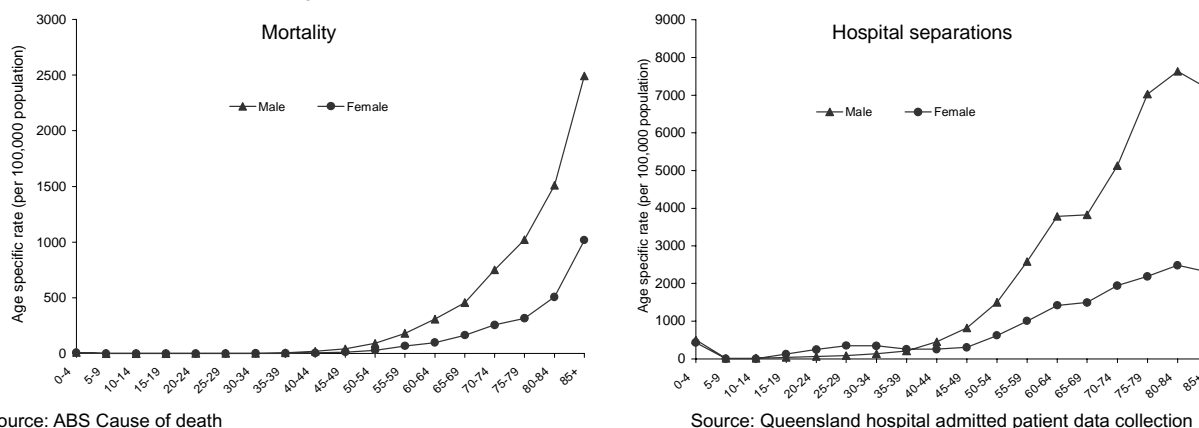
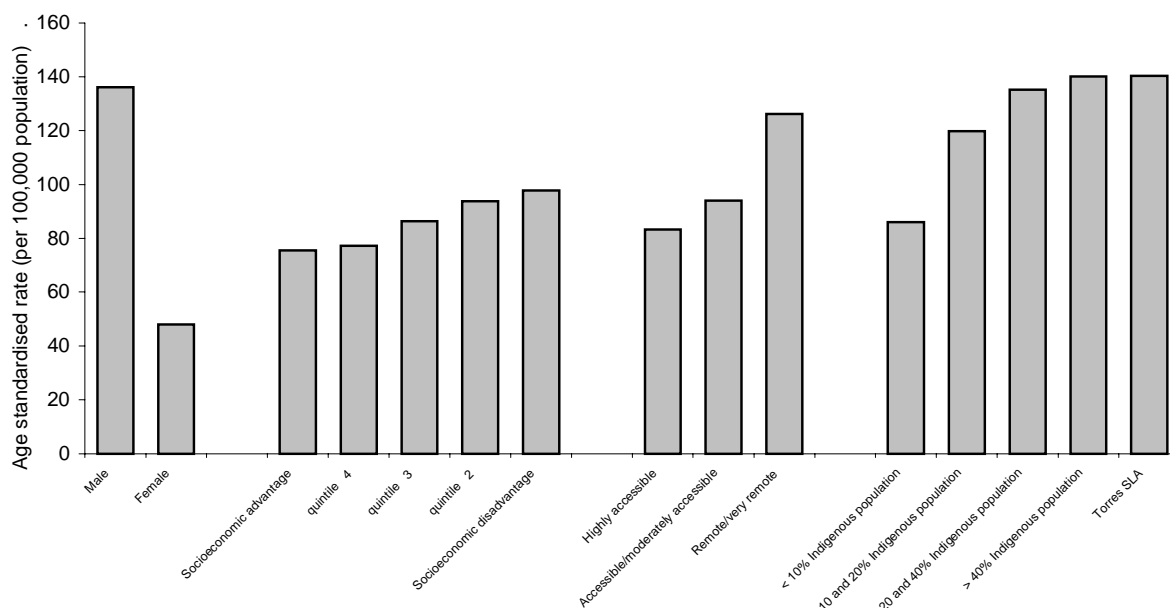
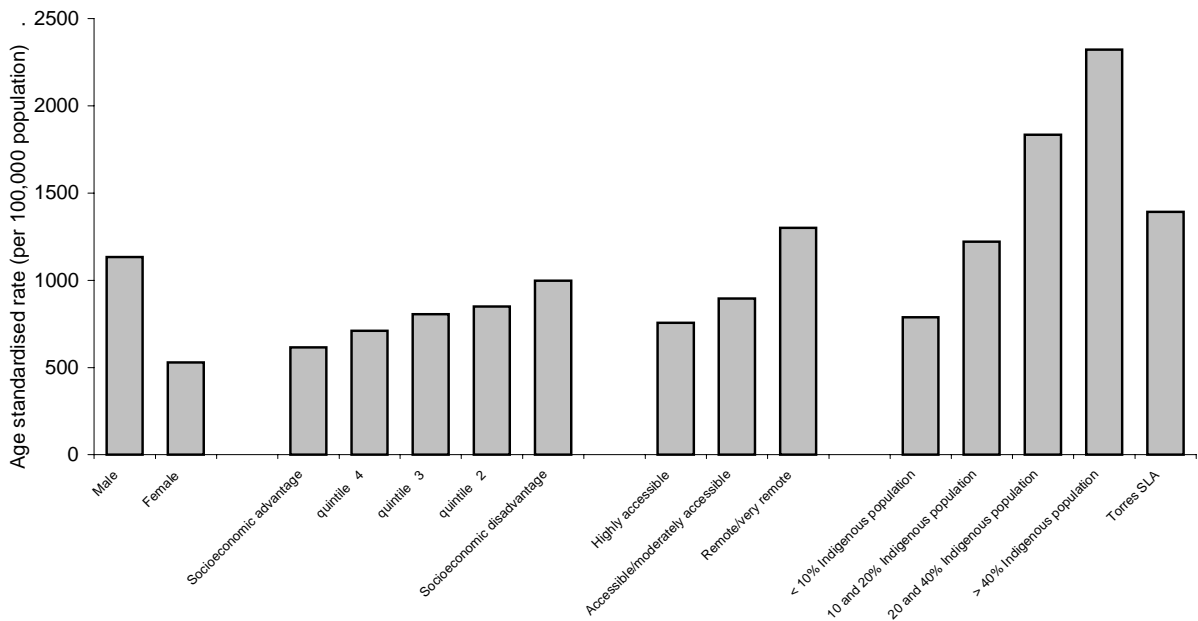


Figure 1.29: Deaths attributed to smoking; age standardised mortality rates by sex, socioeconomic advantage/disadvantage*, accessibility and proportion Indigenous peoples, Queensland 1999-2001



*ABS Index of relative socioeconomic advantage/disadvantage 2001

Figure 1.30: Hospital separations attributed to smoking; age standardised hospital separation rates by sex, socioeconomic advantage/disadvantage*, accessibility and proportion Indigenous peoples, Queensland 1999/2000-01/02



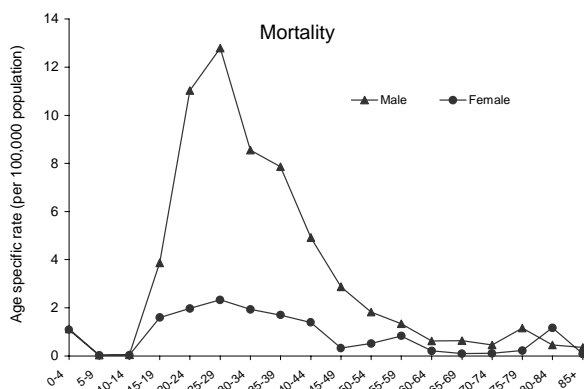
Source: Queensland hospital admitted patient data collection

*ABS Index of relative socioeconomic advantage/disadvantage 2001

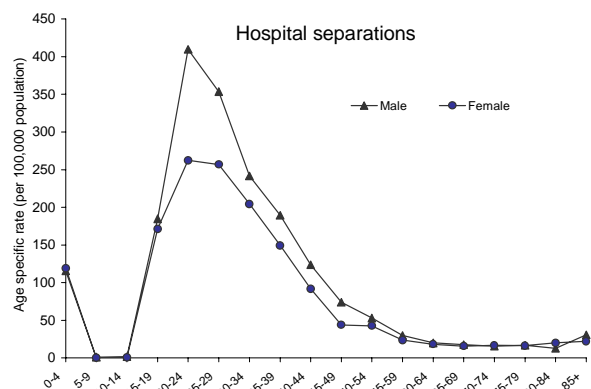
Illicit drugs

In 1999-2001, there were on average 94 deaths per year attributed to illicit drug use in Queensland, 78% of which were males. Between 1999 and 2001, men were on average, four to five times more likely than women to die of an illicit drug related condition. Mortality rates attributed to illicit drugs rise rapidly for males from 10-14 years, peak at 25-29 years and decline slowly with increasing age (Figure 1.31). Rates for females follow a similar pattern. Newborns accounted for most of the under four-year olds in hospital due to maternal illicit drug use. The greatest difference between genders is observed in the 25-39 year old group, where males are six times more likely to die of illicit drug related conditions than women. Mortality rates were significantly higher in males than females (Figure 1.32). There was no significant difference in mortality rates across areas of socioeconomic difference, remoteness or proportion Indigenous population. Accidental poisoning by narcotics and hallucinogens, and suicide, accounted for 60% of deaths attributed to illicit drugs.

Figure 1.31: Illicit drugs; age specific mortality and hospital separation rates by sex, Queensland 1999-2001 and 1999/2000-01/02, respectively

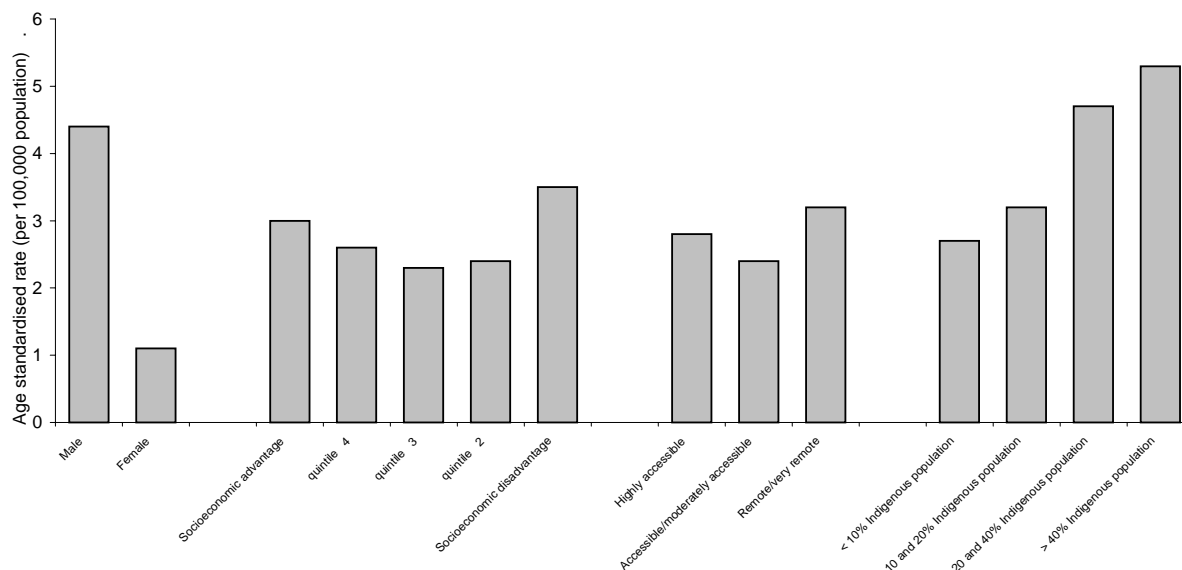


Source: ABS Cause of death



Source: Queensland hospital admitted patient data collection

Figure 1.32: Deaths attributed to illicit drugs; age standardised mortality rates by sex, socioeconomic advantage/disadvantage*, accessibility and proportion Indigenous peoples, Queensland 1999-2001



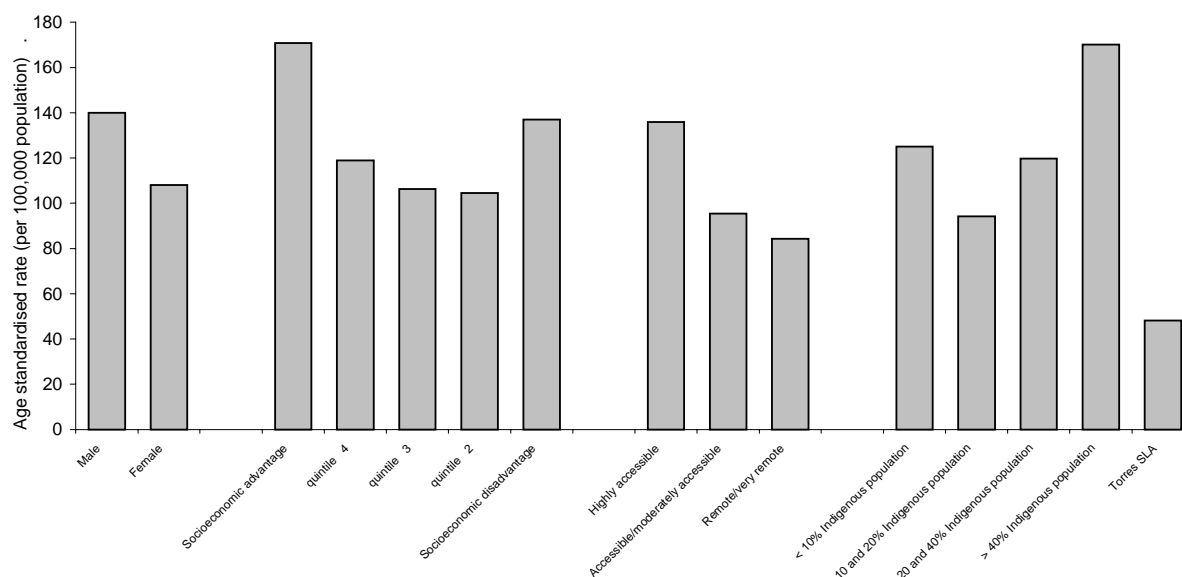
Source: ABS Cause of death

Note: <1 average case pa in Torres SLA

*ABS Index of relative socioeconomic advantage/disadvantage 2001

In the three years 1999/2000-01/02, there were on average 4,187 hospital separations per year attributed to illicit drug use in Queensland, 57% of which were male. Hospital separation rates follow the same pattern as mortality rates for males and females (Figure 1.31), with 7% of all cases occurring in the newborn and 52% occurring in the age group 15-29 years. Rates of hospitalisation for conditions attributed to illicit drugs were significantly higher in males; socioeconomically advantaged areas than disadvantaged areas; and, in accessible or highly accessible areas than more remote areas (Figure 1.33). The principal conditions caused by illicit drug use were mental and behavioural disorders, although for females, self harm was a leading cause accounting for one in ten hospital separations attributed to illicit drug use.

Figure 1.33: Hospital separations attributed to illicit drugs; age standardised hospital separation rates by sex, socioeconomic advantage/disadvantage*, accessibility and proportion Indigenous peoples, Queensland 1999/2000-01/02



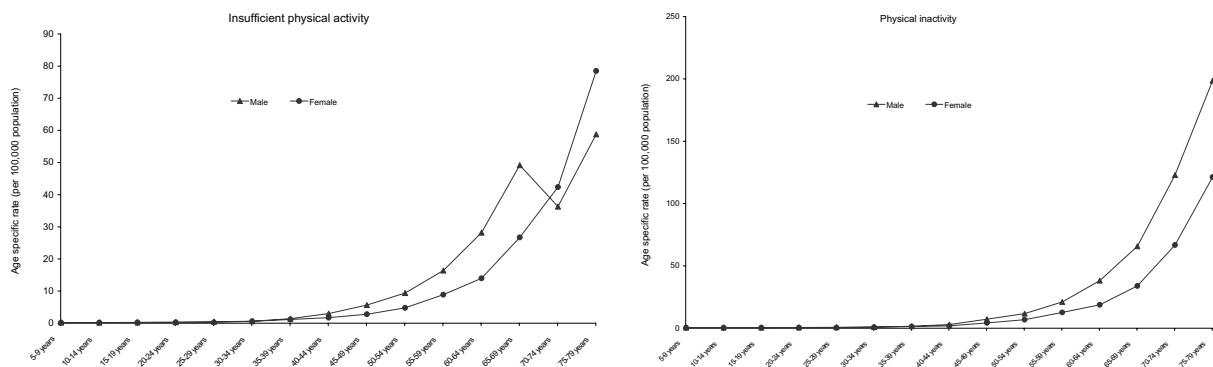
Source: Queensland hospital admitted patient data collection

*ABS Index of relative socioeconomic advantage/disadvantage 2001

Physical inactivity

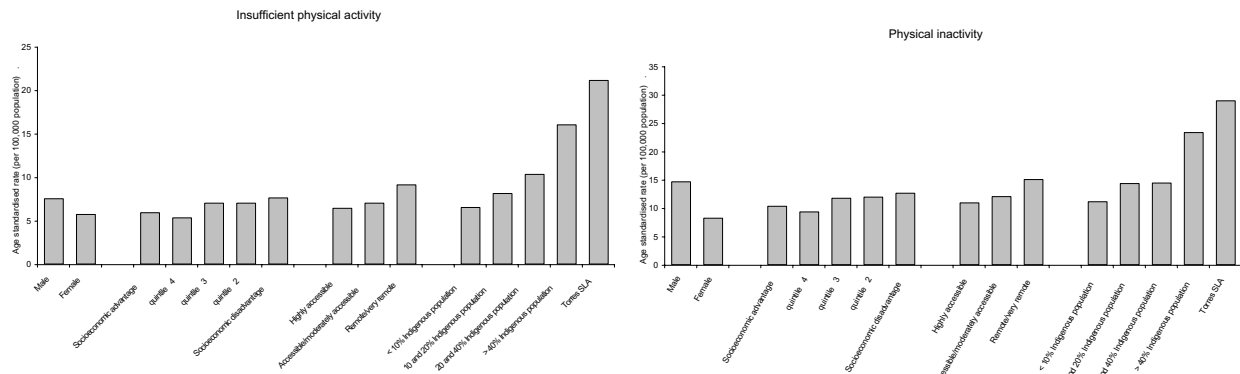
In 1999-2001, in Queensland, there were on average 408 deaths per year attributed to no physical activity or sedentary behaviour in the age group 0-79 years. Physical activity refers to activity which includes walking, or moderate or vigorous activity.¹⁴² There were on average 238 deaths each year due to insufficient physical activity for a health benefit, a total of 646 deaths in people aged 0-79 years. Males accounted for the majority of deaths attributed to physical inactivity (62%) and insufficient physical activity (56%), and the mortality rates were significantly higher in males in both categories of physical activity. Mortality rates attributed to physical inactivity and insufficient physical activity rise with increasing age for both males and female (Figure 1.34). There was no significant difference in mortality rates for either no physical activity or insufficient physical activity across areas of socioeconomic difference, remoteness or proportion Indigenous population (Figure 1.35). Coronary heart disease (CHD) accounted for 81% of male deaths and 66% of female deaths attributed to either insufficient physical activity or physical inactivity, with colon cancer the second leading cause in males (10%) and breast cancer the second leading cause in females (12%).

Figure 1.34: Deaths attributed to insufficient physical activity and physical inactivity in people 0-79 years; age specific mortality rates by sex, Queensland 1999-2001



Source: ABS Cause of death

Figure 1.35: Deaths attributed to insufficient physical activity and physical inactivity in people 0-79 years; age standardised mortality rates by sex, socioeconomic advantage/disadvantage*, accessibility and proportion Indigenous peoples, Queensland 1999-2001



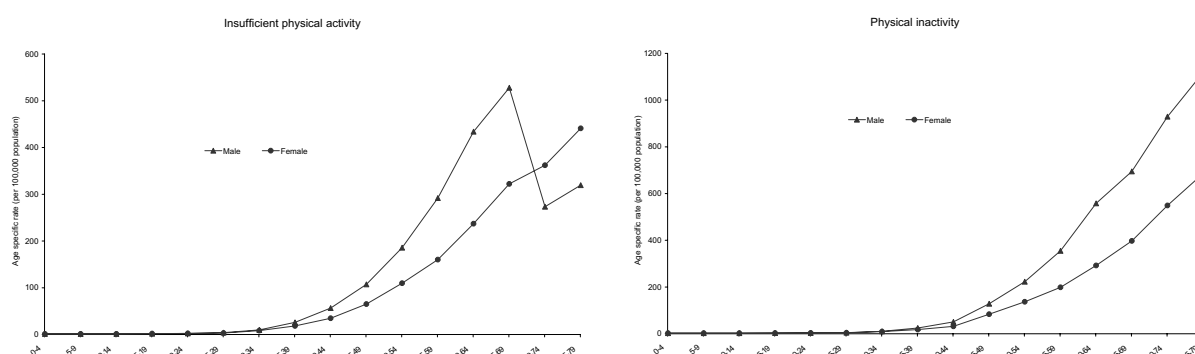
Source: ABS Cause of death

*ABS Index of relative socioeconomic advantage/disadvantage, 2001

In the three years 1999/2000-01/02 in Queensland, there were on average 4,165 hospital separations per year attributed to no physical activity and 2,840 separations due to insufficient physical activity for a health benefit in people aged 0-79 years, a total of 7,004. Males accounted for the majority of separations attributed to physical inactivity (62%) and insufficient physical activity (58%). As for mortality rates, separation rates attributed to physical inactivity and insufficient physical activity rise rapidly with increasing age, particularly for males (Figure 1.36). Hospital separation rates for conditions attributed to physical inactivity or insufficient physical activity were significantly higher in males; socioeconomically disadvantaged areas; remote and very remote areas; and, in areas with greater than 40% Indigenous population (Figure 1.37). CHD accounted for 82% of male separations and 67% of female separations attributed to either insufficient physical activity or physical inactivity, with stroke the second leading cause in males (8%) and breast cancer the second leading cause in females (11%).

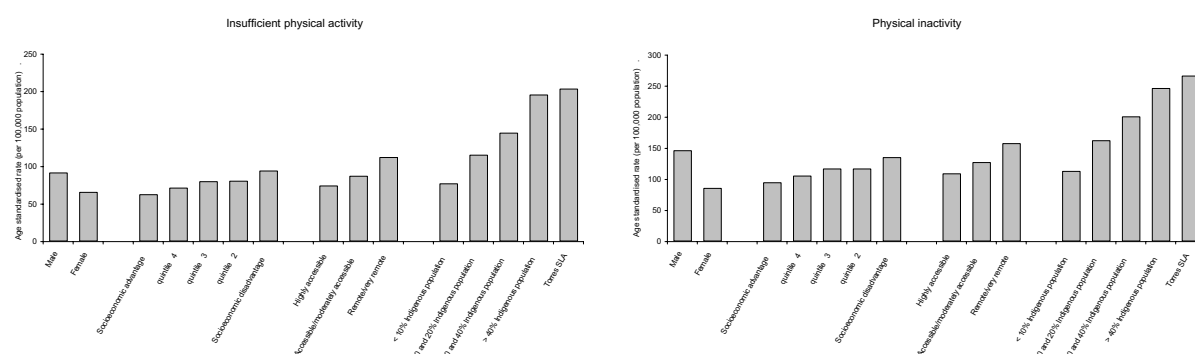
Sedentary behaviour or no physical activity is defined for measurement purposes as no leisure time physical activity in the one week period prior to survey.¹⁴² Insufficient physical activity is defined as less than 150 minutes of moderate or vigorous intensity activity occurring over five sessions in the week prior to survey. In this latter definition, vigorous intensity time is weighted by a factor of two accounting for additional benefit accrued. This time and intensity is deemed as sufficient for a health benefit.¹³⁴ It is likely that the number of deaths and hospital separations attributed to physical inactivity and insufficient physical activity is an underestimate of the total impact of diabetes. This is because diabetes is often not coded as a principal cause of death, or principal diagnosis.

Figure 1.36: Hospital separations attributed to insufficient physical activity and physical inactivity in people 0-79 years; age specific hospital separation rates by sex, Queensland 1999-2001



Source: Queensland hospital admitted patient data collection

Figure 1.37: Hospital separations attributed to insufficient physical activity and physical inactivity in people 0-79 years; age standardised hospital separation rates by sex, socioeconomic advantage/disadvantage*, accessibility and proportion Indigenous peoples, Queensland 1999-2001



Source: Queensland hospital admitted patient data collection

*ABS Index of relative socioeconomic advantage/disadvantage 2001

1.3.7 Oral health

Oral health accounted for 1.0% of the burden of disease and injury in Queensland in 1996-98, as measured by DALYs.⁴⁹ Oral health problems are very common in the population, ranked as the fourth most frequent illness condition, behind headache, hypertension and colds.¹⁴³ In Australia in 1996, dental caries was the most prevalent reported condition affecting health.⁶⁶ Oral health is integral to general health, and oral health status can be regarded as a risk marker for general health.

No clinical epidemiological surveys of the oral health status of the Queensland adult population have been conducted since 1987-88. From self report in 2002, the majority of adult Queenslanders (79.9%) reported they had a functional dentition, or at least 21 natural teeth (Table 1.21). The proportion declined with age, with only 36% of those aged 70 years and older possessing a functional dentition. While there is little difference between men and women overall, men aged 50-69 years are more likely to have a functional dentition. This difference is, however, reversed in those aged 70 years and older. The proportion of adults with a functional dentition decreases as socioeconomic disadvantage increases. The effect is most marked in those aged 50 years and older. In general, accessibility to services appears to have little effect on whether adults retain a functional dentition.

Table 1.21: Percentage of population with a functional dentition (>20 natural teeth) by age, sex, socioeconomic disadvantage and accessibility, Queensland 2002

	Male	Female		Persons
18+	78	79	Socioeconomic disadvantage	
			Quintile 1 (least)	87
18-29	94	92	Quintile 2	78
30-39	92	93	Quintile 3	79
40-49	87	87	Quintile 4	74
50-59	73	68	Quintile 5 (most)	74
60-69	57	52		
70+	31	43	Accessibility	Persons
			Highly accessible	79
			Accessible	79
			Moderately accessible	79
			Remote/very remote	76

Source: QH Omnibus survey 2002

In 2002, less than 10% of adults had no natural teeth (Table 1.22). The loss of natural teeth increases with age, and 35% of adults aged 70 years and older have no natural teeth. Women aged 70 years and older are most likely to have no natural teeth. Disadvantaged adults are more likely to have no natural teeth, and there is a clear negative gradient from least to most disadvantaged. The effect becomes more marked in older adults. In adults aged 18-59 years, the proportion without any natural teeth is largely unaffected by difficulties in access to services. In adults aged 60 and older, however, there is a trend for the proportion with no natural teeth to increase as access to services becomes more difficult.

Table 1.22: Percentage of population with no natural teeth by age, sex, socioeconomic disadvantage and accessibility, Queensland 2002

	Male	Female		Persons
18+	7	9	Socioeconomic disadvantage	
			Quintile 1 (least)	5
18-29	1	0	Quintile 2	5
30-39	0	1	Quintile 3	8
40-49	2	1	Quintile 4	10
50-59	8	6	Quintile 5 (most)	13
60-69	17	19		
70+	28	42	Accessibility	Persons
			Highly accessible	8
			Accessible	6
			Moderately accessible	10
			Remote/very remote	7

Source: QH Omnibus survey 2002

Oral health in Australia has shown considerable improvement over recent decades, including a decline in adult tooth loss¹⁴⁴ and the number of deciduous decayed, missing and filled teeth in children.¹⁴⁵ The oral health of a population is affected by age, exposure to fluoride, dietary patterns, preventive dental behaviours, smoking, alcohol consumption, stress, infection and immunity, access to and use of preventive and dental restorative services, and attitudes towards treatment preferences.⁶⁶ The lack of water fluoridation in Queensland is discussed in section 1.4.1.

1.3.8 Communicable diseases

In the five-year period 1997-2001 in Queensland, 115,014 notifications of more than 50 communicable diseases were received (Table 1.23). This was an average of 23,003 per year. Although notified cases are likely to represent only a percentage of the total cases in the community, they provide an estimate of the burden of disease. The Notifiable Disease Report 1997-2001¹⁴⁶ includes detailed analysis of notifiable conditions in Queensland and national comparisons.

Care needs to be exercised in drawing conclusions from trends in the numbers of notifications. While the figures for some conditions can be highly indicative of temporary or long term changes in incidence, this cannot be applied to all conditions. Factors influencing numbers of notifications differ from condition to condition. Such factors include: the symptomatic to asymptomatic ratio; the proportion of those becoming ill seeking medical advice; the physician's diagnostic skill; and the seriousness of the condition and its public health implications. The selection and timing of tests and the pathology laboratories success in establishing the diagnosis, and even the lack of successful transport media from remote communities in north Queensland, can also play a role. Awareness programs directed at the public or physicians and the development of new and better tests may also influence notification rates.

Invasive meningococcal disease

About 100 cases per year of invasive meningococcal disease (IMD) are notified in Queensland, with rates (3-4 cases per 100,000 people) similar to national levels (Table 1.23). These data reflect the true burden of disease, as ascertainment of cases for this disease is complete. Notifications include laboratory-confirmed cases and a small number of clinically probable cases. Year to year fluctuations in case numbers and deaths are typical of this disease. About three quarters of cases are in people aged less than 25 years, with young children aged under five years (36%) and older teenagers (15 to 19 years – 19%) comprising the largest groups. Cases occur throughout the year, although winter to early spring is the peak season. Cases are mostly sporadic, as outbreaks or related cases occur infrequently.

In Queensland, the two most common types of the bacterium isolates of IMD are serogroup B (about 50% of cases annually) and serogroup C (about 36% of cases annually). Serogroup C is more common in southern states of Australia.^{147,148} In recent years, serogroup C has been more common in late teen and young adult age groups. The case fatality rate averages about 9%, but varies from year to year. Serogroup C cases have a higher risk of death, as do cases presenting with septicaemia. The risk of death generally increases with the delay in presenting to hospital for treatment.

The risk of infection is higher in individuals exposed to cigarette smoke, both active and passive smoking.¹⁴⁹ Close contacts, in particular household contacts of cases, have a small but significant increased risk of infection.¹⁴⁹

Invasive pneumococcal disease

Invasive pneumococcal disease (IPD) is relatively uncommon, although more common than invasive meningococcal disease (IMD). IPD notification rates peaked in 2000 at about 12 cases per 100,000 people rates (Table 1.23). National rates, available only since 2001, are lower than Queensland rates, at about 9 cases per 100,000 people. IPD rates have increased since 1997, most likely due to improved case ascertainment, and perhaps from improved surveillance and awareness. As with IMD, there is a clear seasonal pattern with most notifications occurring in late- winter and spring.

Males are more commonly reported with IPD than females (1.3:1). In recent surveillance, children under five years comprised the largest single age group (40%), followed by people aged at least 50 years (32%). The most common presentation across all age groups was pneumonia (46%) and bacteraemia (32%). In children less than five years, bacteraemia (42%) was more common than pneumonia (26%). IPD can also present as meningitis. Smoking and smoking near children are known risk factors for IPD. The reported death rate for IPD was 1.1% in 1997-2001; slightly higher in children aged less than five years. This rate is lower than the Australian average of 9%,¹⁵⁰ although the death rate for people with an underlying chronic illness may be as high as 20- 40%. The death rate for cases presenting with meningitis varies between 10-30%, but may be as high as 80% in the elderly.¹⁵¹

Table 1.23: Notifications and crude notification rates, by year and sex, Queensland 1997-2001

	1997		1998		1999		2000		2001	
	notifications	rate	notifications	rate	notifications	rate	notifications	rate	notifications	rate
Blood borne conditions										
Hepatitis B	887	26.1	945	27.3	887	25.3	941	26.4	818	22.9
Hepatitis C	2,874	84.5	2,784	80.5	3,069	87.4	3,341	93.7	3,128	87.7
Hepatitis D	6	0.2	4	0.1	5	0.1	5	0.1	3	0.1
Total	3,767	110.8	3,733	107.9	3,961	112.8	4,287	120.2	3,949	110.7
Gastrointestinal conditions										
<i>Campylobacter</i> enteritis	4,087	120.2	4,387	126.9	3,202	91.2	3,676	103.1	3,964	111.1
Cholera			1	0.0						
Cryptosporidiosis	528	15.5	962	27.8	335	9.5	459	12.9	419	11.7
Enterohaemorrhagic <i>E. coli</i>	4	0.1	4	0.1	5	0.1	6	0.2	14	0.4
Hepatitis A	917	27.0	1,050	30.4	360	10.2	133	3.7	119	3.3
Listeriosis	9	0.3	4	0.1	11	0.3	13	0.4	20	0.6
Salmonellosis	1,909	56.1	2,836	82.1	2,245	63.9	1,825	51.2	2,198	61.6
Shigellosis	208	6.0	152	4.5	129	3.6	108	3.0	108	3.0
Typhoid	8	0.2	11	0.3	3	0.1	2	0.1	9	0.3
Yersiniosis	181	5.3	133	3.8	101	2.9	59	1.7	51	1.4
Total	7,851	230.7	9,540	276.0	6,391	181.8	6,281	176.3	6,902	193.4
Sexually transmitted conditions										
<i>Chlamydia</i> infection	3,508	103.1	4,076	117.9	4,475	127.4	4,931	138.3	5,632	157.9
Donovanosis	6	0.2	9	0.3	5	0.1	11	0.3	19	0.5
Gonorrhoea	934	27.5	1,119	32.4	1,183	33.7	1,138	31.9	1,102	30.9
Syphilis- data collected in 2001									189	5.3
Total	4448*	130.8	5204*	150.6	5,663*	161.2	6,080*	170.5	6,942	194.6
*No Syphilis data										
Vector borne conditions										
Barmah Forest	362	10.6	332	9.6	309	8.8	346	9.7	603	16.9
Dengue fever	129	3.8	475	13.7	62	1.8	84	2.4	44	1.2
Malaria	376	11.1	297	8.6	304	8.7	409	11.5	300	8.4
Ross River	2,366	69.6	1,946	56.3	2,306	65.7	1,477	41.4	1,573	44.1
Total	3,233	95.1	3,050	88.2	2,981	85.0	2,316	65.0	2,520	70.6
Zoonotic conditions										
Anthrax			1	0.0						
Brucellosis	34	1.0	35	1.0	49	1.4	26	0.7	17	0.5
Chryptococcus	39	1.1	28	0.8	28	0.8	34	1.0	38	1.1
Hydatid disease	13	0.4	10	0.3	5	0.1	8	0.2	7	0.2
Leptospirosis	45	1.3	112	3.2	221	6.3	134	3.8	129	3.6
Q fever	244	7.2	249	7.2	294	8.4	391	11.0	450	12.6
Total	375	11.0	435	12.5	597	17.0	593	16.7	641	18.0
Vaccine preventable										
<i>Haemophilis influenza</i> type b	14	0.4	12	0.3	12	0.3	12	0.3	6	0.2
Measles	268	7.9	35	1.0	33	0.9	28	0.8	11	0.3
Mumps	16	0.5	31	0.9	12	0.3			3	0.1
Influenza*									391	11.0
Pertussis	1,902	55.9	1,393	40.3	963	27.4	535	15.0	1,632	45.8
Rubella	539	15.8	372	10.8	157	4.5	46	1.3	134	3.8
Tetanus	2	0.1	1	0.0	1	0.0	2	0.1		
Total	2,741	80.6	1,844	53.3	1,178	33.4	623	17.5	2,177	61.2
*Influenza became notifiable in July 2001										
Others										
Invasive Meningococcal	72	2.1	108	3.1	93	2.6	66	1.9	128	3.6
Invasive Pneumococcal	154	4.5	259	7.5	271	7.7	435	12.2	424	11.9
Legionellosis	11	0.3	36	1.0	34	1.0	47	1.3	37	1.0
Melioidosis*					20	0.6	39	1.1	13	0.4
*Melioidosis (notifiable condition since mid 1999)										
Acute rheumatic fever					18	0.5	36	1.0	35	1.0
Atypical mycobacterial disease	137	4.0	166	4.8	153	4.4	144	4.0	130	3.6
Cigateura	11	0.3	13	0.4	19	0.5	61	1.7	35	1.0
Lysa/rabies			1	0.0						
Tuberculosis (all)	110	3.2	98	2.8	94	2.7	90	2.5	92	2.6

Source: QH Notifiable diseases report 1997-2001

Note: Rates per 100,000 population

Blood-borne conditions

Blood-borne conditions such as hepatitis B, C, D and E (not hepatitis A) comprised more than 15% of all notifications between 1997 and 2001, with hepatitis C comprising the third most commonly notifiable condition (12%).

Notification rates for hepatitis C ranged between 80–94 cases per 100,000 people during the five-year period 1997-2001 (Table 1.23), with Queensland rates generally below the national rates (which ranged between 84-112 cases per 100,000 people). Fluctuations in rates relate more to changes in screening and detection patterns than a change in the burden of disease. Hepatitis C is more commonly reported in males than females (1.8:1), with most cases (81%) reported in the 20-44 year age group. Annual notification rates should not be used to estimate the year of the acquisition, as it is not possible to differentiate between chronic and acute infections. Within Queensland, notification rates were highest in the Southern Zone, with rates generally increasing over time. Annual notification rates should not be used to estimate trends in incident cases, as information on recency of infection is not collected. The national rate for incident hepatitis C cases was reported at 2.8 cases per 100,000 people.

There are 800-930 notifications of hepatitis B each year (3.4% of all notifications: Table 1.23). Males outnumbered females 1.3:1 and people aged 15-39 years comprised 63% of all cases. Between 1997 and 2001, annual rates in Queensland varied between 23 and 27 cases per 100,000 people, which is lower than the national rates (38-45 cases per 100,000). Over the same period, notification rates for acute cases ranged between 1.2-1.6 cases per 100,000 people in Queensland, slightly less than national rates at 1.4-2.2 per 100,000. Rates in north Queensland were more than twice the Queensland rate, although there were small numbers overall.

In 2003, a range of 24% to 59% of Queensland adults could correctly identify potential risk factors for hepatitis C.¹⁵² There remains considerable ignorance and confusion regarding risk factors for acquiring hepatitis C and hepatitis A, which is of concern for health policy makers and service providers.

Gastrointestinal conditions

Gastrointestinal diseases, notably campylobacteriosis and salmonellosis, are common notifiable diseases in Queensland. Notifications of laboratory-confirmed infections with these organisms fluctuate from year to year depending on environmental, behavioural and other factors. A recent survey indicated both that notified cases represent only a small proportion of the community illness (most going untested and therefore unreported) and that there is a bias in testing of young children compared with adults.¹⁵³ Less than 9% of children and less than 3% of adults (half of which were carers of children) with gastroenteric illness submitted a stool specimen for laboratory testing. Deaths, while rare, may occur in the immuno-compromised.

It has been estimated that about one third of all gastroenteric illness is food-borne, and that there are between 1.6 and 1.9 million cases of food-borne illness in Queensland per year.¹⁵⁴ Of these, 0.1% to 1.0% has a confirmed diagnosis with a notifiable pathogen.

Between 1997 and 2001, notification rates of campylobacteriosis ranged between 91-127 cases per 100,000 people in Queensland (Table 1.23). Over the same period, national rates were generally lower, ranging between 84-107 notifications per 100,000 people. Slightly more males than females were notified (1.2:1), with children under five years comprising 17% of notifications and young adults aged 20-24 years comprising 11% of notifications. Notification rates in the Northern Zone of Queensland were generally lower than other zones for most years. In years of peak activity, notifications tend to peak in hotter months. Inadequate handling of food (particularly poultry), contamination of food, water and milk, person-to-person contact and animal-to-person contact are accepted risk factors for campylobacteriosis.

Salmonellosis constituted about 10% of notifications in Queensland and was the fourth most commonly notified condition. In 1997-2001 notification rates ranged between 51 and 82 per 100,000 people (Table 1.23). A seasonal pattern for notifications is evidenced by a peak in late summer/early autumn each year. As noted above, a bias in testing children contributes to the high proportion of notified salmonellosis for children aged less than five years (47%). In contrast to campylobacteriosis, highest notification rates for salmonellosis were in north Queensland. While Indigenous identification data was poorly provided, notification rates for salmonellosis were generally higher in areas where Indigenous peoples represent a higher proportion of the population. Most notified cases are sporadic, although a number of outbreaks are identified each year and many others may go unreported. Most identified outbreaks result from poor food preparation, handling and storage.

Hepatitis A notifications in Queensland have declined significantly after peaking in 1998, dropping by at least eight fold in recent years (from 30.4 to 3.4 per 100,000 people: Table 1.23). Hospitalisation rates for this condition also fell over the same period. Specifically, notifications from northern Queensland have declined in recent years and reflect the success of an Indigenous hepatitis A vaccination program. National notification rates were lower than Queensland rates and also fell over the same period. National death rates are low at 0.2 per 100,000 people. Hepatitis A was more commonly reported in males compared with females (1.6:1.0) and in adults aged 20-39 years. Recent enhanced surveillance determined that overseas travel, consumption of shellfish, contact with known cases and attendance at child care are the most frequent identified risk factors for this disease.¹⁴⁶

Notifications for cryptosporidiosis may vary markedly from year to year. Very high numbers were reported in 1998 and again in 2003 (Table 1.23), with late summer/early autumn being the peak periods. Documented outbreaks of this infection have occurred through contaminated bodies of water including swimming pools.^{155,156} In addition, person-to-person transmission (faecal-oral) is very common. During peak periods, it is likely that heightened community awareness increases case ascertainment. Equal numbers of males and females are notified. More than half of all cases during 1997 and 2001 were aged less than five years, although higher numbers in this age group may relate to a bias in faecal testing of young children compared with adults.

Sexually transmitted conditions

Chlamydia infections were the most commonly notified sexually transmitted infection in Queensland in all years between 1997 and 2001, and account for nearly a quarter of all notifications. It is recognised that notifications significantly underestimate burden of disease, as 70% or more infections in women and at least 50% of infections in men, are asymptomatic.¹⁵⁷ Notifications increased significantly each year during this period in Queensland and throughout Australia. The increases are largely due to improved case ascertainment, resulting from improved testing methods, increased awareness of the disease, and screening programs (particularly the Indigenous Urinary PCR Screening Program). The male to female ratio of chlamydial notifications was 1:1.9 in all years except in 1997, when it was 1:2.2. Notification rates ranged between 103.1 per 100,000 and 157.9 per 100,000 in the period 1997 and 2001 (Table 1.23). Highest rates were amongst 15-19 year-old females, and in north Queensland (2.5-3 times higher), reflecting active screening programs. Notification rates were highest in areas where Indigenous peoples represent a higher proportion of the population (up to 25 times more), reflecting at least in part, active screening programs. Safer sex practices (particularly among young people) are required to reduce the incidence of chlamydial infections. Early detection and treatment of cases and their contacts are vital to the control of this sexually transmitted infection.

In 2001, gonococcal infections were the seventh most commonly notified condition accounting for 4.6% of all notifications. In 1997-2001, notification rates ranged between 27.5 and 32.4 per 100,000 people (Table 1.23). National rates were similar at 25.3-33.4 per 100,000. As with chlamydial infections, highest rates were reported in north Queensland, but unlike chlamydia, male to female ratio for gonorrhoea was reversed (1.5:1). In males the highest rates were in the age group 20-24 years, while in females, highest rates were in the age group, 15-19 years. Notification rates were highest in areas of higher Indigenous population (up to 35 times more). Limited enhanced surveillance of gonococcal infections indicates that one risk group for gonococcal infections are men who have sex with men.

In 2002, there were 117 new HIV notifications, the highest number since 1996 (119 cases).¹⁵⁸ The number of cases living with HIV/AIDS in Queensland is increasing each year due to better treatment and outcomes for cases. The peak year for notifications of new AIDS diagnoses in Queensland was 1995, with 102 new cases, the highest number since was in 1997 (119 cases). By 2002, new diagnoses have declined to less than half the cases from 1995. Males have predominated in each year comprising more than 90% of new HIV/AIDS diagnoses. More than 40% of new male AIDS cases were aged 30-39 years, and more than 30% aged 40-49 years. Since 1993, there has been a slow but continuous increase in the proportion of AIDS cases who are late presenters. There was an increase in sero-converters in 2002 and this has been most marked in the 20-29 age group. In 2002, the number of cases living with HIV/AIDS that were receiving treatment declined from 42% in 2001 to 30%, most likely reflecting a desire to delay starting treatment as long as possible. Also in 2002, there was an increase in the number of people never on treatment.

Vector-borne conditions

Ross River Virus infection was the most common vector-borne disease notified in Queensland in the 1997-2001. It was the sixth most common notified condition in Queensland in 2001, and accounted for 6.5% of notifications. Adults aged 25-54 years comprised 69% of all cases. In 1997-2001, notification rates ranged between 41.1 and 69.6 per 100,000 people (Table 1.23), twice as high as national rates (16.7-35.9 per 100,000 people). Rates were highest in north Queensland in most years. Highest notification rates occur in late summer/early autumn.

Barmah Forest Virus notification rates ranged between 8.8-16.9 per 100,000 people, higher than national rates (2.8-6.0 per 100,000 people: Table 1.23). Males slightly outnumbered females 1.2:1.0. As with Ross River Virus, most notifications were in adults aged 30-59 years and were in central and north Queensland.

Between 1997 and 2003, dengue rates in Queensland were generally higher than national rates. They ranged between 1.2 cases per 100,000 persons in 2001 (a year when there was no local transmission in Queensland) and 19.6 cases per 100,000 persons in 2003 (a year in when there were two major outbreaks involving local transmission). More than half the cases were aged between 25 and 49 years.

Dengue has emerged as a disease of global importance¹⁵⁹ and is transmitted within Australia where the vector mosquito *Aedes aegypti* is endemic. *Aedes aegypti* mosquitoes breed around the house and bite indoors. In recent years, there has been local transmission dengue fever in several outbreaks, predominantly in Cairns and the Torres Strait, and to a lesser extent in Townsville.¹⁶⁰ Most imported cases are sourced from Papua New Guinea and southeast Asia. Serotypes involved in the outbreaks in recent years have been type 2 (in largest numbers), type 1 and type 4. Two cases of dengue hemorrhagic fever were notified in late 2003, due to an outbreak in the Torres Strait.

Sustained increases in the number of cases of dengue worldwide are likely to occur through increasing urban populations and ineffective mosquito control efforts.¹⁶¹ Computer modelling suggest that the number of people living in areas of higher dengue risk will increase from 1.5 billion in 1990 to over seven billion in 2085, as a result of the effects of climate change.¹⁶²

Between 1997 and 2003, Queensland rates for malaria were generally higher than national rates, ranging between 3.5 and 11.5 cases per 100,000. More than half of all cases between 1997 and 2001 were aged between 15 and 34 years. Most imported cases are sourced from Papua New Guinea. In Australia, the mosquito *Anopheles farauti*, which occurs near the coast in the Northern Territory and north of the 18th latitude in Queensland, is the most significant potential vector for malaria.¹⁶¹

Vector-borne diseases are usually seasonal, with cases varying over time due to different weather and tidal patterns. Notifications also may be affected by mosquito control programs run by Local Government and by changes in peoples behaviour such as use of repellent, avoidance of mosquito-areas and high biting times. Dengue fever and malaria outbreaks continue to occur in north Queensland, usually through importation by an overseas traveller. Notification rates need to be interpreted with caution as people may be bitten by mosquitoes outside their normal place of residence in areas where they work or engage in recreational activity.

Zoonotic conditions

Q-Fever was the most commonly notified zoonosis in all years between 1997 and 2001, and the tenth most common of all notifiable diseases in Queensland (2% of all notifications). Between 1997 and 2001, notification rates ranged between 7.2-12.6 per 100,000 (Table 1.23), higher than national rates (2.7-3.6 per 100,000 people). More males than females were notified (4.6:1.0). This infection is uncommon in children (<2%) and most common in the 15-49 year age group. The increasing rate (especially among older males) may be due in part to raised awareness of the disease, particularly in rural areas. Southern and Central Zones have more cases than north Queensland.

In recent years, the notification rate for Q-Fever has declined significantly, particularly in younger males. This decrease may be partially due to the introduction of the *National Q-Fever Management Program* in November 2001. Other factors that may contribute to the decrease include: a change in climatic conditions, a decrease in stock numbers (including calving and lambing numbers), greater public awareness about risk factors, and a decrease in the number of animals sent for slaughter.

Vaccine preventable conditions

In addition to invasive pneumococcal disease, invasive meningococcal disease and hepatitis B discussed above, vaccine preventable conditions are fully discussed in the *Children* and *Young people* chapters. Specifically measles, pertussis and Haemophilus influenza type B (Hib), are discussed in the *Children* chapter and measles, pertussis and rubella in the *Young people* chapters. Vaccination rates for children and Older people are reported in the health behaviour sections of the respective chapters.