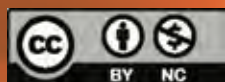


THE Health OF Queenslanders 2012

Advancing good health

Fourth report of the Chief Health Officer Queensland





This document is licensed under a Creative Commons Attribution 3.0 Australia licence.
To view a copy of this licence, visit www.creativecommons.org/licenses/by/3.0/au

©State of Queensland (Queensland Health) 2012.

You are free to copy, communicate and adapt the work, as long as you attribute the State of Queensland (Queensland Health).

For copyright information contact ip_officer@health.qld.gov.au

This document is available on the Queensland Health internet at www.health.qld.gov.au/CHO_report. There is the potential for minor revisions of data in this report. Please check the online version for any amendments.

Suggested citation: Queensland Health. *The health of Queenslanders 2012: advancing good health. Fourth report of the Chief Health Officer Queensland*. Brisbane 2012.

Steering Committee: Jeannette Young (Chair), Taryn Black (Diabetes Australia-Queensland), Michael Cleary, Sophie Dwyer, Rachelle Foreman (Heart Foundation Queensland), Bill Glasson (Queensland Clinical Senate), Catherine Harper, Erin Lalor (National Stroke Foundation), Kevin Lambkin, Terry Mehan, Keith McNeil, Jan Phillips, David Strain.

The health of Queenslanders 2012 was prepared by Epidemiology, Preventive Health Unit, Chief Health Officer Branch, with advice and assistance from others in Queensland Health. The following list indicates the key roles in the production of this report with organisational location as at June 2012.

Editor: Catherine Harper

Epidemiology team: Margaret Bright (manager), Anne Maree Baldwin, Noore Alam, Lani Knight, Lucy Stanley

Publications: Bron Robinson

Epidemiological assistance and review:

Division of the Chief Health Officer

- Preventative Health Directorate:
 - Population Epidemiology Unit: Susan Clemens, Nelufa Begum, Darren White, James Weir
 - Tobacco and Alcohol Branch: Helen Taylor, Mark West
 - Healthy Living Branch: Christina Stubbs, Peter Abernathy, Paul Vardon, Nikki Bushel, Michelle Harrison, Cathie Gillan, Liz Good, Mathew Dick
- Health Protection Directorate
 - Communicable Diseases Branch: Angela Wakefield, Karen Peterson, Frank Beard
- Health Coordination Services
 - Cancer Screening Services: Nathan Dunn, Damin Si

Policy, Strategy and Resourcing Division:

- Aboriginal and Torres Strait Islander Branch: Marianna Serghi, Daniel Williamson, Lucy Stanley
- Strategic Policy, Funding and Intergovernmental Relations Branch: Stephen Begg
- Office of the Chief Dental Officer: Linda Bertram, Ben Stute

Queensland Cancer Control Analysis Team: Dannie Zarate

Health Statistics Centre: Christine Smerdon, Ron Webster, Tania Eden, Stuart Howell and Melanie Watson

For further information:

Director, Epidemiology, Preventive Health Unit
Chief Health Officer Branch,
Health Services and Clinical Innovation Division
Queensland Health
Email: PEU_reports@health.qld.gov.au

Review:

Division of the Chief Health Officer

- Health Coordination Services Directorate
 - Cancer Screening Services
 - Multicultural Services
- Health Protection Directorate
 - Communicable Diseases Branch
 - Environmental Health Branch
- Mental Health, Alcohol and Other Drugs Directorate
- Governance and Capability Directorate
 - Central Regional Services
 - Southern Regional Services
 - Tropical Regional Services
- Preventative Health Directorate
 - Tobacco and Alcohol Branch
 - Healthy Living Branch

Policy, Strategy and Resourcing Division

- Aboriginal and Torres Strait Islander Branch
- Maternity, Child Health and Safety Branch
- Office of the Chief Dental Officer

Integrated Communications Branch

Southern Queensland Ear Health Program (Deadly Ears Program)

Foreword



Good health is valued highly by all of us and, while most Queenslanders are healthy, there is room for improvement. In this fourth report in the series, The health of Queenslanders, opportunities and challenges to achieve better health across the whole population are identified and discussed. Good health means more than prevention and treatment of disease, it is a goal in its own right and one that I would like to see all Queenslanders embrace.

There have been substantial improvements over the past two years since my last report. Life expectancy continues to increase and death rates due to smoking related conditions are decreasing. But there are real challenges ahead with health inequality, particularly for children, continuing to pervade almost all disease and health risk factors across the state. For gains to be made, we need to understand the causes of ill health and the factors that influence them.

Queenslanders would be healthier if they were to eat well, be active, prevent weight gain, not smoke, take care that alcohol consumption doesn't exceed guidelines, be sun safe, invest in good oral healthcare, practise safe sex, keep up with recommended immunisation and screening schedules and look after their mental health. The result would be less chronic disease, less pressure on health services and systems and the state would be wealthier through improved productivity.

Obesity is the biggest public health challenge of the century. It places people at risk of a number of diseases and lowers life expectancy. The obesity epidemic reflects changes in lifestyles such as eating habits and physical activity. We live in an environment that encourages and promotes high energy intake, and does not support us to be active in everyday life such as leisure time and travel to work and school.

The World Health Organization recognises that prevention of obesity is a major international issue. Actions across the globe include regulations, industry initiatives and broad based education programs. New York City has introduced menu labelling and is considering imposing a limit to the serving size of regular soft drinks. Ireland is looking at a proposal to ban junk food advertising during children's television programs and by 2015 the Walt Disney Company will ban junk food advertising on all their television, online and radio outlets.

Here in Queensland, the number of people who are overweight or obese is burgeoning, and this threatens to undermine the many gains we have achieved over recent decades. We too are making changes to improve our environment and offering services for groups and individuals to support healthy living. But more can be done.

There is a wealth of advice available on healthy eating and physical activity. We need to find ways for individuals to take responsibility for their weight and to be supported by families and the community to maintain a healthy weight at all stages of life.

Access to healthy food is vital. We have some of the best locally grown produce in the nation and a climate that encourages outdoor activity. We can harness these assets to reduce obesity, maintain healthy weight and enhance the quality of our lives in this great state.

Infectious diseases were a major public health challenge early in the 20th century, yet death rates have been reduced by 96 per cent. Smoking rates too have been reduced significantly and are now down to less than 15 per cent as a result of concerted action over decades and sustained population health interventions. I believe that if we treat obesity as the public health challenge of the 21st century it is possible to turn around the behaviours that are contributing to this epidemic and, over time, reverse the upward trend.

Dr Jeannette Young
Chief Health Officer
Queensland

Contents

At a glance	iii
Overview—advancing health in Queensland	iv
1. Indicators of progress	1
A snapshot of Queensland's population in 2011	7
Data sources and methods	8
2. How do we achieve good health?	9
What is good health?	10
The factors that influence health	11
Taking action to advance health	14
3. How healthy are we?	15
Health expenditure— an overview	18
Burden of disease for all Queenslanders	21
Burden of disease for Indigenous Queenslanders	24
All causes	26
Avoidable deaths and potentially preventable hospitalisations	28
All cancers and selected cancers	30
Coronary heart disease	34
Stroke	36
Diabetes	38
Mental health and wellbeing	40
Self-inflicted injury and suicide	42
Selected injuries	44
Asthma and chronic obstructive pulmonary disease	46
Communicable diseases	48
Dental disease	50
4. What are we doing to build good health?	51
Partnerships	52
Laws and regulations	53
Tax and price interventions	54
Improving the built environment	54
Public awareness campaigns	55
Community based interventions	57
School based interventions	60
Workplace interventions	61
Screening	61
Group based programs	63
Brief interventions	64
5. Monitoring progress to good health	65
Healthy weight	67
Good nutrition	75
Being active	83
Smokefree	90
Low risk drinking	96
Illicit drug use	101
Promoting mental health and wellbeing	103
High blood pressure and cholesterol	109
Cancer screening	111
Being sun safe	113
Improving oral health	116
Immunisation	119
6. Advancing health in Queensland	121
Getting a healthy start	122
Healthy ageing	125
Achieving and sustaining gains in Indigenous health	126
Improving the nutritional quality of the food supply	128
Terminology, definitions and abbreviations	131
References	133

At a glance

The health of the Queensland population continues to improve, and compares well nationally and internationally.

This fourth report of the Queensland Chief Health Officer details progress towards good health for all Queenslanders, and highlights opportunities to improve. However, progress may be compromised because the prevalence of obesity and associated diseases is increasing.

We need to arrest these trends and reduce the prevalence of chronic disease risk factors in order to contain Queensland's growing burden of chronic disease.

Advancing health

- Life expectancy increased by 2.7 years in a decade
- Death rates for many diseases are declining
- Smoking rate decline has resulted in about 10,000 fewer smokers per year since 2001

Challenges

- Hospitalisations are increasing faster than population growth and ageing, and are projected to double in 17 years
- There is a high prevalence of many unhealthy behaviours
- Not all children have a healthy start
- Healthy ageing must accompany increased years of life

Taking action

- Increase the number of children who receive a good start in life
- Make healthy ageing an achievable goal for all
- Improve and sustain the health of Indigenous Queenslanders
- Improve the nutritional quality of the food supply

What is good health?

Good health means different things to different people—but it is always more than the absence of disease.

It is determined by many factors including genes, background, personal choices, access to services and factors outside the health sector. They include employment, education, housing, community, and characteristics of the built and natural environments. These factors are not usually direct causes of illness, they cause the causes.

A wide range of agencies in the non-government, voluntary and private sectors have a role in population health.

How healthy are Queenslanders?

- Life expectancy is now 79.4 years for males and 83.9 years for females, but for Indigenous Queenslanders it was lower by 10.4 years for males and 8.9 years for females in 2005–2007.
- Although Australian life expectancy is fourth highest in the OECD, national health spending as a proportion of GDP is twentieth.
- Death rates, including for premature deaths, continue to fall, with major gains in cardiovascular disease and in smoking related diseases for males.
- Chronic disease (non-communicable disease), causes 88% of the burden of disease and 91% of all deaths and costs \$45.8 billion nationally or 87% of recurrent allocated health expenditure.
- One-quarter of the burden of disease and injury in Queensland is due to socioeconomic disadvantage—the largest cause of burden and greatest source of inequality.
- The burden of disease and injury for Indigenous Queenslanders is 2.1 times that of others.
- For Indigenous Queenslanders the burden of disease is higher outside major cities, by 30% in regional areas and 50% in remote areas.
- Diabetes prevalence continues to increase with about 60 new cases diagnosed each day. Diabetes burden rate for Indigenous Queenslanders was 4.7 times the non-Indigenous rate.
- One-third of death and illness is caused by modifiable risk factors which are responsible for 84% of coronary heart disease, 69% of stroke and 74% of diabetes.
- Unhealthy diets and physical inactivity caused about 16% of total burden of disease and injury.

- The 2010–11 natural disasters affected 62% of adults in some way, 15% had their home or income producing property damaged, while 32% were affected by flooding of the home of a family member or friend or by flooding in their suburb. About 40% participated in clean-up.

What are we doing to build population health?

- Partnerships across government, the health sector and society support and encourage healthy habits.
- A comprehensive suite of interventions as recommended by the World Health Organization ensures a system wide approach.
- Laws, regulations and taxes, have broad impact, affecting tobacco, alcohol and unsafe food, and improving oral health.
- Improvements to the built environment such as neighbourhood design and public spaces support healthy lifestyle choices.
- Public awareness campaigns through communication channels such as television promote a healthy lifestyle.
- Community, school and workplace interventions support good health.
- Group and individual services provide advice and support to prevent disease.
- Population screening detects disease early.

Monitoring progress

- Smoking continues to decrease—now at 14.3% with similar declines across socioeconomic groups. As a result, at least 2,000 deaths have been averted since 2001, but smoking still causes 1 in 7 deaths.
- Obesity rates for adults have doubled in 16 years—overweight and obesity is now at 57.7% for adults and 26.6% for children, a total of 2.2 million Queenslanders—an extra 55,000 overweight or obese adults each year on average since 1993, about 1,000 each week.
- Physical activity continues to increase—now at 56.1% for adults and 44.0% for children.
- Gains are not being made in fruit, vegetables or risky alcohol consumption.

Overview—advancing health in Queensland

■ The health of Queenslanders is generally very good—life expectancy is increasing and death rates for many conditions are declining.

For good health to be advanced we need to understand what it is and how it is achieved. Health is regarded as a 'state of complete physical, mental and social wellbeing and not merely the absence of disease and infirmity'.³² Health status is determined by a multitude of factors recognised internationally by the World Health Organization—global forces, government policies, natural and built environments, and social, cultural and economic factors—as well as early life development and lifestyle behaviours.^{33–37}

The role of government is critical and government spending on health is very important to most Australians. In 2011, 49% identified it as top priority and 24% as second priority, a total of 73%.³⁸ Furthermore, 87% broadly supported the notion that preventing disease is more important than curing illness. While nearly all Australians (98%) approve of spending public money on prevention and agree that it is an effective way to improve the health of the population, only 43% considered that government spending on prevention was sufficient.

The growth and ageing of the population is a considerable challenge for the health system. At 4.474 million people in 2011, the population of Queensland has grown 9% since 2006. There are now 0.58 million people aged 65 years and older³⁸, and this number is projected to increase markedly. From 2001 to 2011, the 85 years and older age group was one of the fastest growing segments of the Queensland population (along with the 60–69 year age group).

The greatest relative difference in health status among Queenslanders is between Indigenous and non-Indigenous populations—reducing this gap is a national priority. However, socioeconomic differences have the greatest impact as measured by the number of excess premature deaths and preventable hospitalisations. Addressing such differences will advance good health and also significantly reduce the life expectancy gap between Indigenous and non-Indigenous Australians.²² The social gradient in health is evident in health outcomes and risk factors, indicating that investment across the continuum is needed.

In the Queensland Health Strategic Plan 2012–2016, one of the strategic outcomes for the health system and health services is that 'Queenslanders live longer, healthier and more independent lives'.³⁹ The long term objective of the National Healthcare

Agreement is that 'Australians are born healthy and remain healthy'.⁴⁰ To achieve these goals we need to protect health as well as harness the power of prevention.^{41,42} Investing in awareness and prevention campaigns to reduce rates of chronic disease in the community is a priority of the Queensland Government.⁴³

National spending on health accounted for 9.3% of GDP in 2010–2011.¹ A tripling of the national expenditure on health and residential aged care is projected from 2002–03 to 2032–33.⁴⁴ Total per capita health expenditure (recurrent and non-recurrent) in Queensland in 2010–11 was \$5,850, 1% above the Australian average of \$5,796.¹ This reflected higher capital expenditure in Queensland rather than recurrent spending which was 1.6% below the national average. Recurrent health expenditure for Indigenous Queenslanders was 10% lower than the national average.⁴⁵ Preliminary estimates by the national Independent Hospital Pricing Authority show that the cost of delivering public hospital services in Queensland is 11% above the national efficient price, that is, it costs Queensland 11% more, on average, to deliver public hospital services compared to the Australian average.

Economic benefits could be achieved if a reduction in the prevalence of six major risk factors could be achieved. Modest reductions would generate \$2.334 billion in savings over the lifetime of the 2008 Australian population, with 64% of the savings related to the health sector.⁴⁶ The benefits would include fewer deaths, reduced burden of disease, improved productivity and increased leisure time.

The challenge to reduce the ever-increasing burden on the health system has been well documented and efforts to address it are necessary if we are to mitigate the ongoing and expensive demand for more beds in Queensland hospitals—disease and illness prevention strategies can harness that demand. In 2012, key challenges to advance the good health of Queenslanders and provide early gains are discussed in Chapter 6 under the following headings:

- Getting a healthy start
- Healthy ageing
- Achieving and sustaining gains in Indigenous health
- Improving the nutritional quality of the food supply to address obesity and enhance health and wellbeing.

Health outcomes

■ Cancer caused the greatest burden of disease and injury in 2007, followed by cardiovascular disease and mental disorders. These three broad causes accounted for about half the burden. While mental disorders cause relatively few deaths, they are the largest cause of disability burden in Queensland. The burden is unevenly distributed across the state—the burden rate was 40% higher in disadvantaged areas than advantaged areas, 50% higher in remote areas than cities and at least double for Indigenous Queenslanders. About 25% of the total burden is due to socioeconomic disadvantage across the whole population. The burden of disease for Indigenous Queenslanders begins much earlier in life, and is principally due to the excess burden of chronic disease—the burden rate in the age group 35–54 years was about 2.8 times that of non-Indigenous Queenslanders.

Prevention of coronary heart disease provides the greatest opportunity to make the health of Queenslanders the best in the world based on life expectancy. If the death rate due to coronary heart disease in Queensland was similar to that of Japan, at least 2,000 deaths each year would be averted.

All causes

- Of the 27,289 deaths in 2010, 39% were premature (before 75 years), the median age of death was 78.4 years for males and 84.2 years for females—all-cause death rates decreased by 1.4% per year over the decade.
- Death rates were 45% higher in males, 25% higher in the most disadvantaged areas and 2.7 times higher for Indigenous Queenslanders.
- About 2,200 premature deaths were due to socioeconomic disadvantage in 2006–2007.
- 1.77 million hospitalisations occurred in 2010–11, and have increased by 60,000 per year since 2000–01, with the number projected to double by 2026–27.

Avoidable deaths and potentially preventable hospitalisations

- Of the 10,544 premature deaths in 2010, 68% were avoidable—26% of premature deaths were amenable to healthcare and 43% were preventable.
- Avoidable death rates were 74% higher in socioeconomically disadvantaged areas than advantaged areas.

- Of the 2,200 premature deaths due to socioeconomic disadvantage, 1,700 (77%) were avoidable.
- The avoidable death rate for Indigenous Queenslanders was 3 times the non-Indigenous rate.
- 8% of all hospitalisations were potentially preventable with non-hospital care, and many more could have been prevented with improved risk and protective factors.
- Potentially preventable hospitalisations were 67% higher in the most disadvantaged areas, twice as high in remote areas and 3 times higher for Indigenous Queenslanders.
- Chronic conditions caused 52% of potentially preventable hospitalisations, with diabetes complications the largest cause at 29% for all ages and, for those aged 50–69 years, 50% of male preventable hospitalisations were for diabetes complications and for females, 35% were for diabetes complications.

Cancer

- 1 in 2 males and 1 in 3 females will be diagnosed with cancer before the age of 79 years.⁴⁷
- 34.6% of the burden of cancer is due to 11 factors, the top four being tobacco, physical inactivity, high body mass and alcohol consumption.
- Cancer caused the death of 8,260 people in 2010 and was the leading cause of premature death (39%).
- Cancer death rates are declining but as the population ages a greater number of cancer cases will be diagnosed.
- The lung cancer death rate in males has fallen steadily since the 1980s, while for females the rate increased up until 2002 and has been steady since.
- For cancers with a population screening program, the breast cancer incidence rate is steady and death rates fell 1.7% each year between 2000 and 2007, colorectal cancer death rates fell 36% between 2000 and 2010 with a steady incidence rate, and cervical cancer death and incidence rates were steady.

Coronary heart disease and stroke

- Cardiovascular disease accounted for 32% of all deaths, and about 20% were premature.
- It is the most expensive disease in Australia, accounting for about 11% of total allocated recurrent national health

expenditure⁴⁸, yet is highly preventable with 66.9% of the burden due to the joint effect of 12 modifiable risk factors.

- About 30% of the burden occurs in those aged less than 65 years, with coronary heart disease death rates 24% higher in disadvantaged areas, 40% higher in remote areas, and 80% higher for Indigenous Queenslanders.
- The death rate for coronary heart disease is 7% higher than the national rate, and the stroke rate is 5% higher.
- The combined death rate for coronary heart disease and stroke has decreased by 65% in 25 years, resulting in about 12,000 fewer deaths for these diseases in 2010 than would be expected based on the 1986 rate. Further declines are expected, with the burden rate projected to decrease by 26.4% between 2007 and 2016, the largest for any disease.

Diabetes

- Diabetes has increased, and will continue to do so while obesity rates increase.
- The self reported prevalence of diabetes and high blood sugar has increased by 35% over 12 years.
- An estimated 60 new cases of type 2 diabetes are diagnosed each day in Queensland and the burden of disease increases markedly with age from 25–29 years.
- Prevalence of type 2 diabetes for Indigenous Queenslanders was at least double that of non-Indigenous Queenslanders, and the burden rate was 4.7 times.²⁴
- 69% of the diabetes burden is due to high body mass and physical inactivity, obesity being the dominant influence.
- Prevalence is projected to double between 2003 and 2033, resulting in a fivefold increase in expenditure between 2003 and 2033 and the largest individual cause of projected proportional change in expenditure.⁴⁴

Mental health and wellbeing

- One-quarter of the disability burden in Queensland in 2007 was due to mental disorders, the largest specific cause being anxiety and depression which accounted for 44% of the mental disorder burden.
- In 2006, the burden of mental disorders was half the total burden at age 15–24 years and a third in those aged 25–44 years.

- Twice as many adults in the most advantaged areas had above average positive mental health compared to those in disadvantaged areas in 2011.
- 91% of adults reported good or very good quality of life in 2012, 83% rated their health to be excellent or good and 80% were satisfied with their health.
- 14% of adult Queenslanders were at high or very high risk of psychological distress in 2011.

Suicide and self-inflicted injury

- There were 572 suicides in 2010, 429 males and 143 females, with no change in the suicide rate since 2006.
- The male suicide rate rises sharply in the teenage years, and 54% of all suicides are in the age group 15–44 years.
- Of the 7,367 hospitalisations for self-inflicted injury, 62% were for females.

Selected injuries

- There were 1,882 injury deaths in 2010 and two-thirds were males—32% of the burden of unintentional injury was due to road traffic injuries and 20% to falls.
- Excessive alcohol consumption accounted for 19% of the total injury burden in Queensland in 2007.
- Across the state there were substantial differences in death rates due to road traffic injury—2.9 times higher in the most disadvantaged areas, 3 to 4 times higher in remote areas and 2.4 times higher for Indigenous Queenslanders.
- On average, 37 males and 13 females drowned each year between 2001 and 2010, about 10% were aged 0–4 years.
- Hospitalisation rates for falls increased by 26% over the decade—in 2010, 58% of falls for females and 32% for males were in those aged 65 years and older.
- The hospitalisation rate for falls for Indigenous Queenslanders aged 15–64 years was 2.5 times that of others.

Asthma and chronic obstructive pulmonary disease

- Asthma prevalence was 11.8% in 2007–08 based on self report, and 1 in 5 reported they had a current management plan.²¹
- For males the chronic obstructive pulmonary disease (COPD) death rate decreased by 8% between 2000 and 2010, with no change for females—the rate decline for males was largely due to declining smoking rates.

- The COPD and asthma death rate was 80% higher in the most disadvantaged areas.
- Tobacco smoking accounts for about 70% of COPD burden in males and 60% in females.

Communicable diseases

- Notifications of whooping cough remain at high levels—increased awareness and better tests contributed to this.
- In 2011, there were 195 notifications of new HIV diagnoses in Queensland. While this was less than the 205 notifications in 2010, there has been a general upward trend since the late 1990s.
- There were 18,340 notifications of chlamydia in 2011, the highest rates being in 15–29 year olds. The number of notifications has increased by 44% since 2007, consistent with national trends.
- 2011 saw an unprecedented 10 outbreaks of Hendra virus infection in horses. Although 89 people were exposed to infected horses none became infected, probably due to increased awareness of preventive measures.
- Leptospirosis notifications increased in 2011 as a result of extensive flooding events in central and southern Queensland—notifications are usually from north Queensland.
- Notifications of tuberculosis (TB) have increased over the past 10 years, due to changes in the region of origin of migrants to Australia. The majority of notifications in Australia are in people born in high prevalence countries.
- The majority of notifications of infectious syphilis in Queensland were in young Indigenous Queenslanders and men who have sex with men.

Dental disease

- In 2007, 61% of children had decay experience in either deciduous or permanent teeth—10% higher than the national rate.
- 1 in 4 people aged 15 years and older had untreated decay, and 1 in 4 had periodontal or gum disease.
- There were 12,083 potentially preventable hospitalisations for dental conditions in 2010–11. Rates were 80% higher in remote areas and 30–40% higher in disadvantaged areas.
- There were 3,666 hospitalisations for dental decay in children aged 0–9 years.
- The burden of oral health conditions for Indigenous Queenslanders was more than double the non-Indigenous burden.

Risk and protective factors

One-third of the total burden of disease and injury in Queensland was caused by 13 measurable and modifiable risk factors. Individuals have the power to mitigate their risk of developing disease by adopting healthy behaviours. At the population level, even very small changes in risk or protective factors can have a big impact on the incidence of many diseases. But making these changes is dependent on many determinants. As the World Health Organization states, 'Individual responsibility can have its full effect only when individuals have equitable access to healthy life, and are supported to make healthy choices.'⁴²

Healthy weight

- Queenslanders are becoming much heavier. High body mass is now the leading cause of premature death and disability in Queensland, overtaking tobacco in 2007.
- 1 in 3 adults (35.0%) was overweight and nearly 1 in 4 (22.7%) obese in 2012, based on self report.
- Obesity prevalence was about 70% higher in the most disadvantaged areas, 45% higher in remote areas and double for Indigenous Australians.
- 1 in 5 children (18.1%) was overweight and 1 in 10 (8.5%) obese in 2011, based on self report.
- 13% of babies were of high birth weight in 2010, a 13.5% increase over 20 years.
- Adult obesity prevalence doubled between 1996 and 2012.
- The number of overweight or obese adults has increased by about 55,000 each year on average in Queensland since 1993, which, taking into account the increase in prevalence and population growth, equates to about 1,100 adults each week.
- By 2017 about 63% of adults will be overweight or obese.
- Median life expectancy reduces by 2 to 4 years for obese people and 8 to 10 years for the severely obese.
- Obesity was estimated to cost \$11.6 billion in Queensland in 2008 and health system costs were 3.3% of the total.^{49,50}
- Ensuring a healthy start to life, curtailing the marketing of junk food and improving awareness of obesity are prime areas to address the increasing prevalence of overweight and obesity.

Good nutrition

- In 2007, 16% of the total burden of disease in Queensland was due to the joint effect of measurable risk factors that have substantial dietary determinants (high blood pressure, high cholesterol, overweight and obesity, and low fruit and vegetable intake) and physical inactivity. The specific impact of poor diet has not been assessed in Queensland or in Australia.
- Only 7.4% of adults reported consuming fruit and vegetables at the recommended levels per day, although 9.7% consumed five or more serves of vegetables and 53.7% two or more serves of fruit.
- Average daily fruit consumption increased by 0.9% per year between 2001 and 2012, but no trend was clear for vegetables.
- Children do not eat enough fruit and vegetables, particularly as they get older—less than 1 in 5 aged 16–17 years eat the recommended serves.
- A third of adults and half of children eat takeaway food weekly and 14% of adults and 7% of children have soft drink daily.
- At discharge from hospital in 2009, 79% of babies were exclusively breastfed although 91% received some breast milk. However, by 6 months of age, only 62% of infants were breastfed, well short of the 90% target.
- Improving capacity to choose and enabling better access to healthy food, as well as promoting the new Dietary Guidelines for Australians, are opportunities to enhance Queenslanders' health.

Being active

- Insufficient physical activity was responsible for 6% of the burden of disease in Queensland in 2007. It is associated with weight gain, type 2 diabetes, some cancers, abnormal glucose metabolism and other cardiovascular disease risk factors.
- In 2012, 56% of Queenslanders aged 18–75 years reported achieving levels of physical activity sufficient for health benefit—at least 150 minutes of moderate intensity physical activity over at least five days each week—an increase of 3.6% per year between 2004 and 2012.
- In 2011, about 1 in 8 adults was sitting or doing other low energy activity for an average of seven or more hours every day, and 39% were sedentary on weekdays.

- 1 in 3 adults walked for transport at least five days per week and 6% cycled at least once a week.
- 44% of children were active for 60 minutes every day, and 30% walked or cycled to school at least once a week but 47% always travelled to school by car.
- 2 in 5 children exceeded the recommended maximum of two hours of screen viewing for entertainment per day.
- Active transport and getting physical activity into work will help to enhance the upwards trends in physical activity.

Smokefree

- Queensland is progressively becoming smokefree. In 2012, 14.3% of Queensland adults reported smoking daily.
- Smoking rates in Queensland were similar to national rates in 2010 for the first time.
- Adults living in disadvantaged areas are twice as likely to smoke daily as those in advantaged areas.
- Smoking rates declined by 4% per year between 2001 and 2012, equivalent to about 10,000 fewer adult smokers per year, and if the current trend continues the smoking prevalence will be about 10% in 2017.
- 7.3% of 14–19 year olds smoked daily in 2010, 6% higher than the national rate.
- The average age of first full cigarette was 15.8 years.
- In 2008, 44% of Indigenous Queenslanders were current smokers.
- 1 in 6 of all pregnant women smoked at some time during their pregnancy in 2010. The rate for Indigenous women was 1 in 2 and the rate for teenage mothers was triple that of other women.
- Tobacco smoking caused 7.2% of the burden of disease in 2007, 1 in 7 of all deaths and 1 in 6 premature deaths.
- Smoking resulted in about 3,400 deaths per year in 2006–2007 and about 36,000 hospitalisations per year between 2006–07 and 2008–09.
- At least 2,000 deaths due to COPD and lung cancer have been averted since 2001 as a result of smoking decline.
- Tobacco smoking cost an estimated \$31.5 billion in Australia in 2004–05, about 1% of this was spent in the healthcare system.⁹
- About 10% of deaths due to tobacco smoke are of non-smokers exposed to second-hand smoke.⁵¹

- Preventing uptake of smoking, increasing the quit rate especially for high risk groups, and reducing exposure to second-hand smoke will reduce the health impact of tobacco smoking in Queensland.

Low risk drinking

- In 2012, 21.1% of Queensland adults—1 in 3 males and 1 in 10 females—were drinking more than two standard drinks on any one day even if it was every day. These are levels that put their health at risk over a lifetime.
- 15.3% had more than four drinks on any occasion at least weekly and another 35.5% at least once a year, levels that put them at risk of injury.
- About 1 in 3 males aged 18–24 drank to excess for both lifetime and single occasion risk, as did 1 in 7 females. Rates for such risky drinking were higher in disadvantaged areas and very remote areas.
- 1 in 20 of 12–17 year olds drank at lifetime risk levels and rates for single occasion risk were similar—4% were drinking at very risky levels, that is, combined lifetime and weekly single occasion risky drinking.¹²
- Between 2004 and 2012, for males and females the rates of risky/high risk drinking for long term harm did not change.
- Alcohol related expenditure in Australia was estimated to be about \$15.3 billion in 2004–05, about 13% of this was spent in the healthcare system.⁹
- Achieving change in attitudes, beliefs and behaviours will affect the wider social and economic impact of alcohol.

Illicit drug use

- 15% of persons 14 years and older reported illicit drug use in the previous 12 months.
- Cannabis was the most commonly reported illicit drug (11.3%), followed by the non-medical use of pain killers (3.1%) and ecstasy (2.7%).
- There has been a downward trend in illicit drug use since 1998, in Queensland and nationally.

Promoting mental health and wellbeing

- In 2011, 80% of adults reported that people in their neighbourhood were willing to help each other, 90% liked living

in their neighbourhood and did not want to move and 80% reported general trust in their community and the people living in it.

- 30% of children in their first year of school were developmentally vulnerable on at least 1 of 5 domains, with levels of vulnerability 25% higher than the national rate across all domains.
- The natural disasters of 2010–11 affected 62.3% of adults in some way, with 9.2% reporting damage to their own home and 11.7% to an income-producing property. Higher levels of reciprocity and cohesion were found among those with damaged homes.

Blood pressure and cholesterol

- In 2012, 29% of Queensland adults reported being told by a doctor or nurse that they had high blood pressure and similarly, 29% that they had high blood cholesterol.
- 37% of the burden of cardiovascular disease was caused by high blood pressure, and 33% by high blood cholesterol.
- Rates of premature death due to coronary heart disease and stroke differed markedly by socioeconomic status and remoteness, indicating there are substantial gains to be made in management of these risk factors.
- Reducing dietary salt and adopting other beneficial lifestyle behaviours, as well as increasing people's knowledge of their levels and hence risk, are important prevention measures.

Cancer screening

- Bowel cancer screening participation in the three years, July 2008 to June 2011 was 39.9% for women and 34.8% for men.
- BreastScreen Queensland participation rate in the target group of women aged 50–69 years was 57.3% in the two-year period 2009–2010, higher than the national rate.⁵²
- Cervical screening participation rate in the target group aged 20–69 years was 55.3% in 2009–2010, higher in the most advantaged areas and in the major cities.
- Addressing the barriers to screening combined with more tailored approaches will enhance participation and further reduce the burden of these cancers.

Being sun safe

- Queenslanders have the highest rates of skin cancer in Australia and, along with New Zealand, Australian rates are the highest in the world.⁵³
- 1 in 2 adults reported being sunburnt in the previous 12 months in 2012—those aged 16–24 years had the highest rates with about 3 in 4 sunburnt in the previous 12 months.
- Exposure to ultraviolet radiation increases the risk of skin cancer. The recommended best practice behaviours to reduce unsafe sun exposure are: seeking shade, wearing a broad brimmed hat and long sleeved shirt, wearing wrap-around sunglasses, and using SPF30+ sunscreen.
- 1 in 2 adults practised at least three of these behaviours in summer and 1 in 4 did so in winter, with only 6% doing all five in summer and less than 3% in winter. Seeking shade was the most widespread behaviour, with sunscreen and sunglasses

more common in younger adults and wearing hats more so in older people.

- Sun safety at work, school and play, achieving a balance between ultraviolet radiation risks and benefits, and public awareness campaigns are all opportunities for limiting sun damage.

Improving oral health

- 64% of Australians visited a dentist in the previous 12 months in 2010, with lower rates in those aged 25–44.
- 1 in 20 children did not brush their teeth daily and 1 in 4 brushed only once per day.
- Fluoridation of public water supplies across Queensland is currently being phased in—87% of the population had access to fluoridated water by 30 April 2012.
- Improving oral hygiene and providing access to dental services for children will have benefits.

Immunisation

- In 2011, just over 90%, the target level, of Queensland children were fully immunised at age 1 and 2 years, and there was almost this coverage at 5 years.
- Rates for 1 year old Indigenous Queensland children were about 7 percentage points lower than others.
- Since 1998, vaccination rates for 2 year olds have increased from less than 70% to over 90%, and rates for 5 year olds have also improved since 2010.
- 74.6% of those aged 65 years and older received the seasonal flu vaccination in 2009, for pregnant women the rate was 12.7% nationally.
- Lack of awareness of vaccination status, complacency and poor knowledge of immunisation all threaten to undermine the immunity of the community.

About this report

This is the fourth report from Queensland's Chief Health Officer. The series *The health of Queenslanders* began in 2006 and is released every two years to report on the health status and burden of disease of the Queensland population. The report is intended for decision makers in the health sector, government and non-government agencies and organisations, and universities.

Accompanying the report is a suite of resources. A brochure for the general population promotes healthy behaviours across the life course and there is a set of nine posters based on the brochure for use in public settings. There are also factsheets that convey some of the main findings of the report.

The report and resources are available on the Queensland Health internet site www.health.qld.gov.au/cho_report

The most recent data is included in this report. Data sources are cited and statistical methods are summarised on page 8. Unless otherwise indicated, all data refers to the total population of Queensland.

Content

Chapter 1: Indicators of progress is a listing of the most recent health data on a broad range of population health headline indicators, key determinants and outcome indicators for Queensland. Information back

to 2000 is included where available. While each of the indicators is reported only for all persons in this document, separate data for males and females is available on the website. A snapshot of the Queensland population from the 2011 census is also included.

Chapter 2: How do we achieve good health? provides an overview of the determinants of health and the broad actions to advance good health.

Chapter 3: How healthy are we? includes a summary of health outcomes for Queenslanders and for subpopulations, an overview of health outcome expenditure, and burden of disease for Queensland and for Indigenous Queenslanders. Information is provided in a dashboard format.

Chapter 4: What are we doing to build good health? describes some of the initiatives undertaken by the Queensland Government in partnership with other governments

and agencies to prevent illness and improve health. The scope of interventions reflects the broad areas of investment proposed by the World Health Organization.

Chapter 5: Monitoring progress to good health includes prevalence and trends of the major health risk factors and highlights opportunities for further gain in health outcomes based on the epidemiological and other evidence.

Chapter 6: Advancing health in Queensland describes four key challenges to achieving better health for Queenslanders and identifies opportunities to address these challenges.

CHAPTER 1 Indicators of progress



Monitoring of health provides the evidence for advancing health.

In this chapter:

- Six key progress indicators
- Population health indicators
- A snapshot of Queensland's population in 2011
- Data sources and methods

Monitoring the health of Queenslanders is fundamental to the provision of evidence based services in Queensland to improve health status.

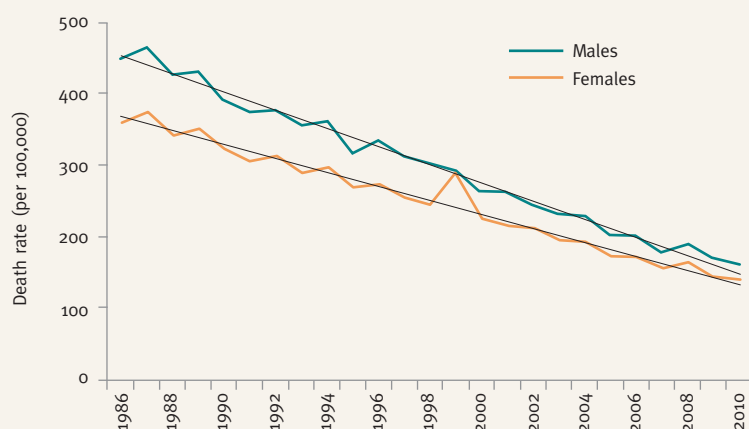
This chapter reports on trends in 67 population health indicators between 2001 and the year when the most recent data was available. While the printed version of this report includes only person-level data for Queensland, the online version includes data since 2000 for males, females and persons with 95% confidence intervals (CIs) where available (Table 1). Six key trends of outstanding or emerging health issues in 2012 are described (Figure 1).

More detailed information on these progress indicators is reported in chapters 3 and 5. In particular, many of these indicators vary markedly between subpopulations, notably between Indigenous and non-Indigenous Queenslanders and between those in socioeconomically disadvantaged and advantaged areas, and between cities and regional and remote areas.

A challenge for the health system in Queensland is the well-documented ageing and growth of the population. In June 2011, the Queensland population was estimated to be 4.474 million people based on data collected in the August census of that year and adjusted for interstate and overseas visitors and other demographic factors (page 7).³⁸ This represented a 9% increase since 2006 or 0.38 million people. One in eight or 12.9% of the population was aged 65 years and older in 2011—about 0.58 million people, with the proportion in older age groups steadily increasing each year for several decades. Over the past 25 years, the number of people aged 65 years and older has doubled, and for those aged 85 years and older it has doubled in the past 15 years, making that population along with the 60–69 year age group the fastest growing segment since 2001. Growth is projected to continue with a projected tripling of the population aged 70 years and older between 2010 and 2050, representing about 1.1 million more older Queenslanders.

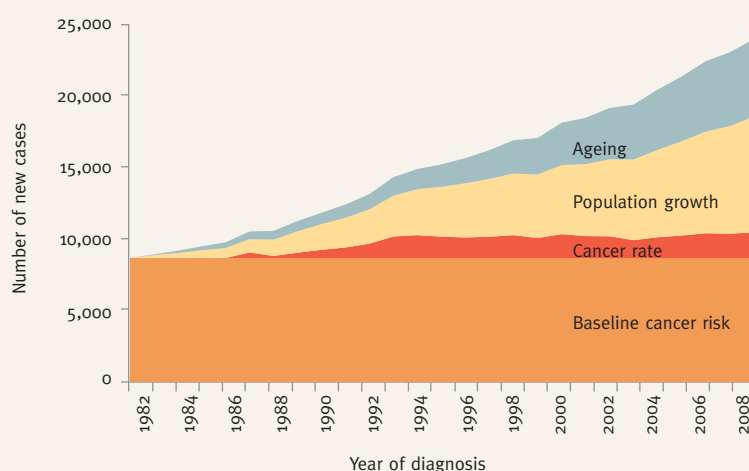
Figure 1: Six key progress indicators, Queensland

A) Coronary heart disease and stroke deaths



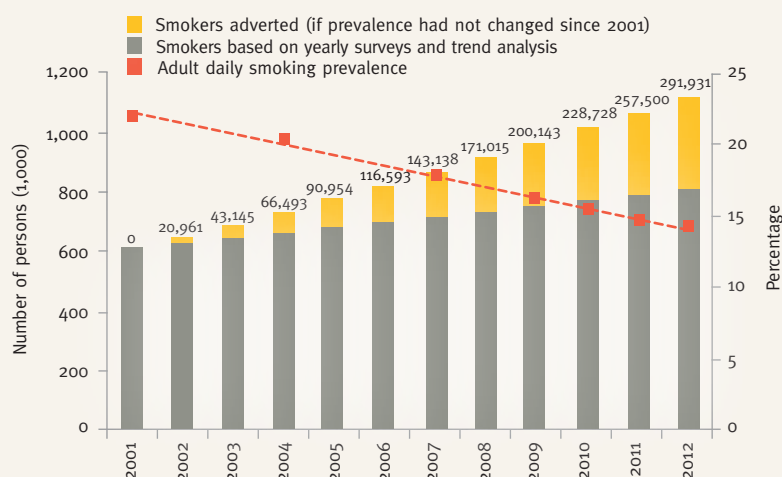
- Death rates have decreased by 65% (68% for males and 63% for females) since 1986—one of the major public health gains of recent decades, resulting in about 12,000 fewer deaths for coronary heart disease and stroke in 2010 than expected based on the 1986 rate.
- Gains are expected to continue with the burden of disease rate projected to decrease 26.4% over 10 years, the largest gain of any disease.
- Death rate for coronary heart disease was 7% higher than national and stroke rate 5% higher.
- Rising rates of diabetes and obesity place these advances at risk.
- Prevention of coronary heart disease will generate the greatest improvement in life expectancy.
- If the Queensland rate was the same as Japan's, the best in the OECD, more than 2,000 deaths per year would be saved.

B) Cancer incidence



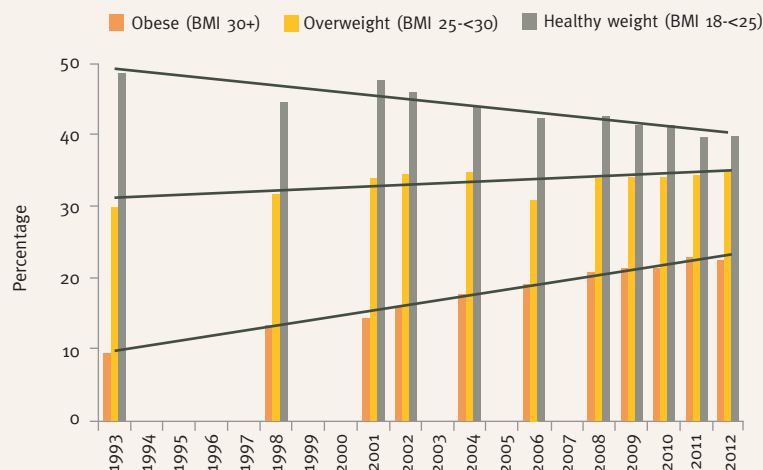
- The number of new cancer cases in Queensland increased by 3.8% each year between 1982 and 2008. However, most of this increase is due to population growth and ageing. When adjusted for these two factors, the overall cancer incidence rate in Queensland remained stable over the past decade.⁵⁴
- The death rate due to cancer decreased by 9% between 2000 and 2010.
- 35% of the burden of death and illness due to cancer is caused by modifiable lifestyle behaviours.
- About 25% of the projected cancer cases in 2025 could potentially be prevented through improvements in diet and physical activity.⁵⁵
- Bowel screening participation is 39.8%, cervical screening is 55.3% and BreastScreen Queensland participation is 57.3%.

C) Smoking



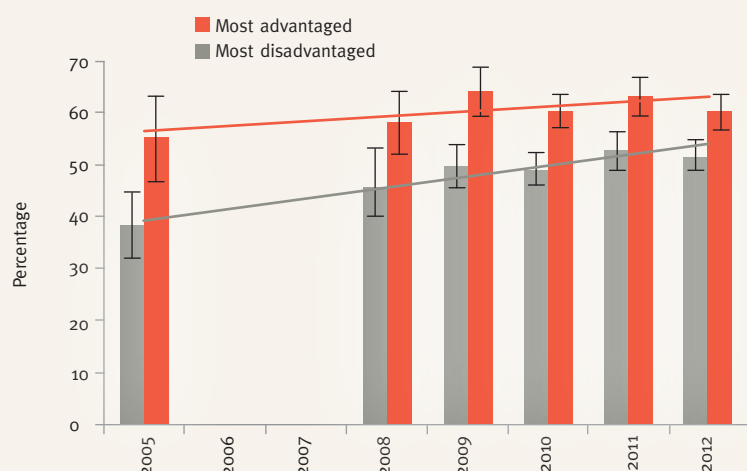
- In 2012, 14.3% of Queensland adults reported smoking daily, a reduction from 22.1% in 2001, equating to about 300,000 smokers averted, or 10,000 fewer per year.
- Rates in disadvantaged areas were double those in advantaged areas with a similar gap over the past decade.
- One in 6 women (17%) reported smoking at some time during pregnancy in 2010.
- Lung cancer and COPD death rates have fallen only in males, consistent with the steady decline in male smoking rates in contrast to female rates which have not.
- As a result of smoking rate decline in Queensland, at least 2,000 deaths due to lung cancer and COPD alone were averted over a decade.

D) Overweight and obesity



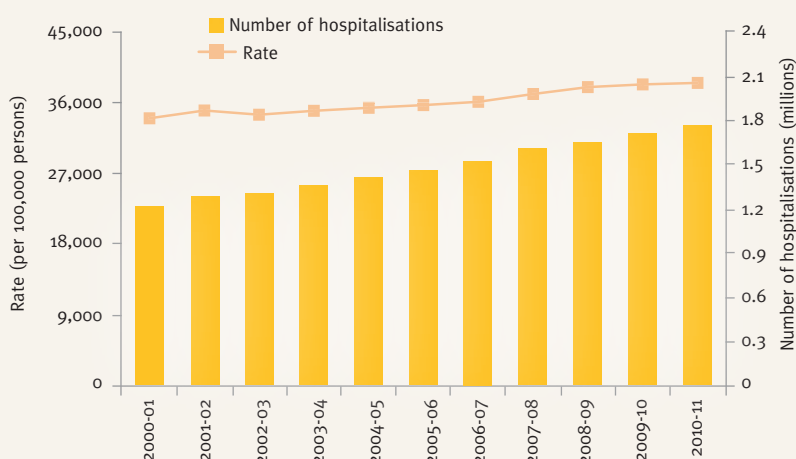
- In 2012, 57.7% of adults were overweight or obese (1 in 3 overweight and 1 in 5 obese) and 26.6% of children in 2011 (1 in 5 overweight and 1 in 10 obese).
- The rate of adult obesity doubled between 1996 and 2012, with about 30,000 more obese adults, on average, each year since 1993. In addition, there are an extra 25,000 overweight adults each year—a total of 55,000 overweight and obese, taking into account population growth and increasing prevalence.
- The rate of obesity in disadvantaged areas is about double that in advantaged areas, with a similar gap over the past decade.
- In 2012, there were an estimated 2.2 million overweight or obese Queenslanders (adults and children).
- The projected prevalence of overweight and obesity in adults in 2017 is about 63%.
- High body mass has now exceeded smoking as the largest single risk factor contributing to the burden of disease in Queensland.

E) Physical activity



- Of adults aged 18–75 years, 56.1% reported doing enough physical activity for health benefit in 2012.
- Physical activity for adults increased by 38% since 2004 (47% for males, 29% females).
- The socioeconomic gap in physical activity prevalence has narrowed by a third since 2005.
- 44% of children were active for the recommended 60 minutes every day.
- 12% of adults were sedentary for at least seven hours each day, and 1 in 3 each weekday—43% of children exceeded the recommended maximum two hours per day screen time for entertainment.
- 1 in 3 adults walked for transport at least five days per week and 6% cycled at least one day per week—but 47% of children travelled only by car to school.

F) All-cause hospitalisations



- There were 1.77 million hospitalisations in 2010–11 in Queensland.
- Over the past 11 years, there was an average increase of 60,000 hospitalisations per year in Queensland public and private hospitals, 4% per year.
- The number of hospitalisations is projected to reach about 3.5 million annually by 2026–27, a doubling over 17 years.
- The annual increase in hospitalisations is greater than population growth and ageing, with age-standardised rates increasing by 1.3% per year.
- The increasing cost of health services per treated case is a key driver of health system expenditure nationally.⁴⁴

Table 1: Population health indicators (persons), Queensland, 2001–2012

Population	Units	Age group	2001	2005	2006	2007	2008	2009	2010	2011	2012
Total population - estimated resident	'000	0-85+	3,628.9	3,994.9	4,090.9	4,177.1	4,270.1	4,365.4	4,424.2	4,474.1	
Queensland - proportion of Australia	%	0-85+	18.7	19.6	19.8	19.9	20	20.2	20.2	20.0	
Brisbane	%	0-85+	45.8	47.1	45.4	45.3	45.3	45.3	45.3		
Outside Brisbane	%	0-85+	54.2	52.9	54.6	54.7	54.7	54.7			
Queensland - by remoteness											
Major cities	'000	0-85+	1,899.4	2,093.6	2,137.8	2,190.6	2,244.5	2,301.5	2,345.4		
Inner regional	'000	0-85+	958.8	1,077.9	1,109.8	1,143.5	1,179.1	1,217.2	1,246.0		
Outer regional	'000	0-85+	659.7	712.8	732.4	750.0	771.6	792.5	807.9		
Remote	'000	0-85+	61.8	61.9	62.5	62.9	64.1	64.2	64.5		
Very remote	'000	0-85+	49.2	48.7	48.5	48.9	49.3	49.3	50.1		
Indigenous Queenslanders											
Census count	'000	0-85+	112.8		127.6					155.8	
Proportion of Qld population	%	0-85+	3.1		3.3					3.6	
Proportion of Aus Indigenous population	%	0-85+	27.5		28.0					28.4	
Queensland Government estimate	'000	0-85+	128.6	141.6	144.9	148.7	152.5	156.5	160.6		
Proportion of Qld population	%	0-85+	3.5	3.5	3.5	3.5	3.5	3.5	3.6		
Births	no.		47,678	51,661	52,665	61,249	63,132	66,097	64,467		
Infants	'000	<1	49.4	52.7	55.2	56.7	61.0	63.7	60.6	60.6	
Young children	'000	1-4	198.3	209.1	213.3	219.1	226.8	236.5	243.1	243.6	
Children	'000	5-14	524.9	559.5	566.3	569.1	572.3	576.4	578.4	583.3	
Young people	'000	15-24	510.0	563.6	578.6	591.5	604.7	619.2	624.3	625.4	
Younger adults	'000	25-44	1,080.5	1,149.6	1,169.2	1,189.8	1,214.2	1,239.7	1,253.6	1,264.3	
Adults	'000	45-64	843.6	980.9	1,014.0	1,041.8	1,069.0	1,091.0	1,105.9	1,119.1	
Older people	'000	65-74	231.5	259.7	267.5	277.2	286.5	299.6	314.3	328.7	
Elderly	'000	75+	190.7	219.8	226.9	231.9	235.7	239.4	243.9	249.1	
Children	%	0-14	21.3	20.6	20.4	20.2	20.1	20.1	19.9	19.8	
Young people	%	15-24	14.1	14.1	14.1	14.2	14.2	14.2	14.1	14.0	
Adults	%	25-64	53.0	53.3	53.4	53.4	53.5	53.4	53.3	53.3	
Older people	%	65-74	6.4	6.5	6.5	6.6	6.7	6.9	7.1	7.3	
Elderly	%	75+	5.3	5.5	5.5	5.6	5.5	5.5	5.5	5.6	
Headline indicators	Unit	Age group	2001	2005	2006	2007	2008	2009	2010	2011	2012
Life expectancy											
Males	years	at birth	76.9	78.3	78.5	78.9	78.9	79.1	79.4		
Females	years	at birth	82.3	83.2	83.4	83.6	83.7	83.8	83.9		
Indigenous life expectancy											
Males	years	at birth		68.3							
Females	years	at birth		73.6							
Health adjusted life expectancy											
Persons	years	at birth			73.3						
Males	years	at birth			71.0						
Females	years	at birth			75.7						
Indigenous people	years	at birth			59.9						
Non-Indigenous people	years	at birth			73.6						
Infant mortality rate - per 1,000 live births	rate		6.0	5.2	5.1	5.1	5.1	5.2			
Indigenous people	rate		11.5	11.1	9.1	7.9	7.6	8.8			
Non-Indigenous people	rate		5.6	4.7	4.8	4.7	4.7	4.7			
Perinatal mortality rate - per 1,000 births	rate		11.3	10.1	10.3	10.6	9.9	10.4	10.5		
Health inequality - avoidable deaths											
Disadvantaged/advantaged	rate	0-74	1.39	1.60	1.73	1.75					
Total burden of disease	rate	0-85+			118.3	120.2					
Indigenous burden of disease	rate	0-85+			285.5	264.9					
Median age at death	years		77.8	79.1	79.5	79.7	80.1	79.9	80.1		
Hospitalisations	Unit	Age group	2001-02	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
All causes	no.	0-85+	1,246,893	1,417,073	1,480,716	1,563,973	1,646,573	1,714,637	1,767,749		
	rate	0-85+	35,050	35,759	36,163	37,142	38,021	38,377	38,589		
Potentially preventable hospitalisations	no.	0-85+	110,718	125,988	131,871	141,740	142,286	148,486	132,201		
	%	0-85+	8.9	8.9	8.9	9.1	8.6	8.7	7.5		
	rate	0-85+	3,132	3,192	3,234	3,381	3,294	3,323	2,888		
Coronary heart disease	rate	0-85+	902	781	789	791	734	677	687		
Stroke	rate	0-85+	272	246	244	239	240	237	241		
Diabetes	rate	0-85+	243	344	368	412	391	391	173		
COPD	rate	0-85+	272	250	239	268	280	269	272		
Asthma	rate	0-85+	182	162	139	165	150	173	157		
	rate	0-14	394	411	349	427	380	460	380		
Road transport injury	rate	0-85+	251	256	260	262	269	244	224		
	rate	15-24	504	480	489	474	476	407	380		
Falls	rate	0-85+	621	624	647	667	713	703	721		
	rate	65+	2,216	2,237	2,382	2,399	2,528	2,568	2,737		
Cancer incidence	Unit	Age group	2001	2005	2006	2007	2008	2009	2010	2011	2012
All Cancers	no.	0-85+	17,585	20,233	21,475	21,855	23,014	23,483			
	rate	0-85+	505	508	520	512	525	519			
Female breast cancer	rate	0-85+	121	117	117	112	122	120			
Target age group for screening	rate	50-69	315	288	298	283	307	306			
Cervical cancer - female	rate	0-85+	8.5	8.7	9.1	6.7	7.0	7.3			
Target age group for screening	rate	20-69	11.9	12.0	12.2	9.3	9.4	9.8			

Note 1: Data for all years from 2000 and for males and females is available on the CHO 2012 report website – www.health.qld.gov.au/cho_report/

Note 2: All rates are age standardised per 100,000 persons unless otherwise noted.

Note 3: Data and/or indicator updates may have occurred since previous reports.

Note 4: Crude rates are reported for breast cancer incidence 50-69 years and cervical cancer incidence 20-69 years.

Cancer incidence (cont)	Unit	Age group	2001	2005	2006	2007	2008	2009	2010	2011	2012			
Prostate cancer - male	rate	0-85+	124	149	166	177	182	178						
Lung cancer	rate	0-85+	47	45	48	45	47	47						
Colorectal cancer	rate	0-85+	69	66	68	66	66	63						
Melanoma	rate	0-85+	66	67	60	63	68	68						
Disease prevalence	Unit	Age group	2001	2005	2006	2007	2008	2009	2010	2011	2012			
Diabetes and high blood sugar - self report	%	18+			7.4			7.7	7.8	9.9	8.6			
Communicable disease notifications	Unit	Age group	2001	2005	2006	2007	2008	2009	2010	2011	2012			
Foodborne pathogens	no.	0-85+	6,340	7,249	6,930	6,996	7,154	7,260	7,997	8,227				
Chlamydia	no.	0-85+	5,586	9,496	11,978	12,696	15,002	16,378	19,048	18,342				
Syphilis	no.	0-85+	111	140	179	258	200	192	228	340				
HIV	no.	0-85+	97	148	143	165	166	182	205	195				
Dengue	no.	0-85+		116	77	119	230	1,028	289	188				
Hendra	no.	0-85+		0	0	0	2	1	0	0				
Influenza - lab confirmed	no.	0-85+		1,689	1,749	4,576	3,703	18,328	3,229	10,400				
Pertussis	no.	0-85+		1,776	2,174	1,535	2,278	6,212	8,222	8,985				
Measles	no.	0-85+	11	1	2	4	11	32	14	17				
Tuberculosis	no.	0-85+	128	118	136	143	143	167	167	206				
Immunisation	Unit	Age group	2001	2005	2006	2007	2008	2009	2010	2011	2012			
Childhood vaccination rates - December quarter	%	12-14 mths	91.5	91.4	90.6	91.7	91.2	92.3	91.4	91.6				
	%	24-26 mths	90.2	92.0	91.8	92.1	92.1	89.6	92.8	92.5				
	%	72-74 mths		81.4	87.5	87.4	Reporting changed to 60-62 months from March 2008							
	%	60-62 mths		Previously reported 72-74 mths				81.6	82.6	89.8		89.9		
Causes of death	Unit	Age group	2001	2005	2006	2007	2008	2009	2010	2011	2012			
All causes	no.	0-85+	22,749	23,508	24,473	25,801	27,335	26,316	27,289					
	rate	0-85+	668	597	599	608	624	582	583					
Premature deaths - all causes	no.	0-74	9,641	9,193	9,327	9,633	10,270	10,164	10,544					
Premature deaths - % of all causes	%	0-74	42.4	39.1	38.1	37.9	37.6	38.6	38.6					
Non-avoidable deaths	no.	0-74	2,647	2,862	3,295	3,605	3,228	3,196	3,357					
	%	0-74	27.5	31.1	35.3	37.4	31.4	31.4	31.8					
Avoidable deaths	no.	0-74	6,994	6,331	6,032	6,028	7,042	6,968	7,187					
	%	0-74	72.5	68.9	64.7	62.6	68.6	68.6	68.2					
Preventable	no.	0-74	4,116	3,788	3,612	3,583	4,303	4,263	4,497					
	%	0-74	42.7	41.2	38.7	37.2	41.9	41.9	42.6					
Healthcare amenable	no.	0-74	2,878	2,544	2,420	2,445	2,739	2,705	2,691					
	%	0-74	29.9	27.7	25.9	25.4	26.7	26.6	25.5					
Premature deaths	rate	0-74	289	246	241	241								
Non-avoidable deaths	rate	0-74	79	77	85	89								
Avoidable deaths	rate	0-74	210	169	168	164						170	162	162
Preventable	rate	0-74	123	101	103	99						104	100	102
Healthcare amenable	rate	0-74	87	68	65	66						66	63	61
All causes	rate	0-85+	668	597	599	608	624	582	583					
Coronary heart disease	rate	0-85+	149	115	115	100	109	95	91					
Stroke	rate	0-85+	65	55	55	53	54	48	46					
Heart failure	rate	0-85+	11	7.2	7.1	12.7								
All cancers	rate	0-85+	186	174	168	165				184	176		179	
Female breast cancer	rate	0-85+	25.6	23.1	19.7	21.8	22.4	19.7	20.0					
Target age group for screening	rate	50-69	50.6	53.1	45.6	45.8								
Cervical cancer - female	rate	0-85+	2.8	1.9	2.5	1.7				2.3	2.0		1.9	
Target age group for screening	rate	20-69	2.8	2.4	2.7	1.8								
Prostate cancer - male	rate	0-85+	36	33	34	32						34	32	35
Lung cancer	rate	0-85+	37	36	35	33	37	35	35					
Colorectal cancer	rate	0-85+	25	20	17	18	18	18	17					
Melanoma	rate	0-85+	6.3	6.9	6.3	6.8	7.8	6.6	7.9					
Diabetes	rate	0-85+	15	16	16	15	19	18	16					
Suicide	rate	0-85+	Data precedes coronal review	coronial review	12.1	12.4	12.9	11.7	12.7					
Asthma	rate	0-85+	2.3	1.6	1.6	1.5	1.8	1.6	1.5					
COPD	rate	0-85+	23	20	22	21	24	24	23					
	rate	65+	169	148	131	127								
Road transport deaths	rate	0-85+	9.4	7.1	8.6	8.8				8.1	7.8		6.2	
Falls	rate	15-24	18.2	11.8	14.9	8.3								
	rate	0-85+	16.8	13.6	14.4	11.4								
	rate	65+	118	101	105	87								
Drowning	rate	0-85+	1.4	0.9	1.2	0.5								
	rate	0-4	4	3.9	6.7	1.5								
Protective factor prevalence	Unit	Age group	2001	2005	2006	2007	2008	2009	2010	2011	2012			
Breastfed at discharge* - total	%	newborn	86.1	87.0	87.3	89.5	89.6	90.6	91.3					
Indigenous infants	%	newborn	80.4	81.1	81.0	84.6	82.8	84.7	86.1					
Non-Indigenous infants	%	newborn	86.4	87.4	87.6	89.7	90.0	90.9	91.6					
* Indicator changed to breastfeeding in 24 hours prior to discharge in 2007														
Ever breastfed	%	0-1					95.3							
Exclusive breastfeeding to 6 months	%	0-1					12.9							
Breastfeeding to 12 months	%	0-1					33.3							
Introduced solid foods at about 6 months	%	0-1					60.9							
5 or more antenatal visits - total	%		91.6	92.9	93.0	93.3	93.2	93.3	93.5					
Indigenous women	%		75.6	74.0	76.3	78.1	77.5	77.8	77.7					
Non-Indigenous women	%		92.5	94	93.9	94.2	94.1	94.2	94.5					
Excellent, very good or good health	%	18+		82.5	83.1	85.2	83.3	84.6		84.0	83.0			
Very good or good quality of life	%	18+		90.8	90.0	88.4	88.7	90.6		89.5	90.9			
Very satisfied or satisfied with health	%	18+												

Note 1. Data for all years from 2000 and for males and females is available on the CHO 2012 report website – www.health.qld.gov.au/cho_report/

Note 2: All rates are age standardised per 100,000 persons unless otherwise noted.

Note 3: Data and/or indicator updates may have occurred since previous reports.

Protective factor prevalence (cont)	Unit	Age group	2001	2005	2006	2007	2008	2009	2010	2011	2012
Healthy weight - self report	%	18+	47.8		42.4		42.7	41.5	41.5	39.8	39.8
Healthy weight in children - proxy report	%	5-15						66.4		64.7	
Healthy weight in children - proxy report	%	5-17						68.4		66.4	
Healthy and underweight - measured	%	18+			42.5		46.1				
Healthy and underweight - measured	%	5-17					73.3				
Sufficient physical activity	%	18-75	49.3		47.6		53.0	55.9	53.9	57.4	56.1
Participated in organised sport in school	%	5-15						64.2		57.1	
Active every day of past week	%	5-17								44.0	
Adequate fruit intake - adults	%	18+	48.7	48.5	52.6	52.6	54.6	57.1	57.4	50.3	53.7
Adequate fruit intake - children	%	5-15						74.3		67.3	
Adequate fruit intake - children	%	5-17						65.6		59.6	
Adequate vegetable intake - adults	%	18+		12.9	11.9	8.9	9.4	10.1	11.3	9.1	9.7
Adequate vegetable intake - children	%	5-15						38.9		31.4	
Adequate vegetable intake - children	%	5-17						35.4		29.2	
Adequate fruit and vegetable intake	%	18+							8.4	6.6	7.4
Mean daily fruit intake	serves	18+		1.6	1.7	1.7	1.8	1.9	1.8	1.6	1.8
Mean daily vegetable intake	serves	18+		2.7	2.7	2.5	2.5	2.5	2.6	2.4	2.4
Mean daily fruit and vegetable intake	serves	18+		4.3	4.4	4.2	4.4	4.4	4.4	4.0	4.2
Any 3 of 5 sun safe behaviours - summer	%	18+							56.5	52.0	52.6
Any 3 of 5 sun safe behaviours - winter	%	18+							33.8	32.1	26.4
BreastScreen Queensland participation	%	50-69	58.4	58.7	57.9		57.4	57.3			
Pap smear screening participation - females	%	20-69	57	58.4	57.7		59.8	55.3			
Bowel screening participation	%	50,55,65						37.4			
Risk factor prevalence	Unit	Age group	2001	2005	2006	2007	2008	2009	2010	2011	2012
Low maternal age - females	%	<20 years	6.4	5.6	5.5	5.5	5.7	5.5	5.5		
Low birth weight - total	%		6.8	7.1	7.3	6.8	6.8	7.1	6.9		
Non-Indigenous people	%		6.5	6.8	7.1	6.5	6.5	6.8	6.6		
Indigenous people	%		12.0	12.6	11.6	12.1	10.9	11.6	12.1		
Smoking after 20 weeks gestation	%				20.3	19.7	16.0	14.2	13.1		
Non-Indigenous people	%				18.4	17.9	14.2	12.4	11.2		
Indigenous people	%				53.2	52.9	48.1	45.4	43.6		
Self rated fair or poor health	%	18+		17.4	16.9	14.7	16.7	15.4		16.0	16.8
Psychological distress - high/very high risk	%	18+		14.7			15.2	12.0		13.6	
Smoke daily	%	14+	21.1			17.2			16.7		
	%	18+				17.9		15.7	15.5	14.8	14.3
Risky/high risk alcohol use - long term harm*	%	18+				12.2		10.6	11.4	12.2	11.3
Short term harm - monthly*	%	18+				20.6		15.5	15.0	17.6	13.9
Short term harm - weekly*	%	18+				8		7.5	9.4	9.9	8.2
* Based on 2001 NHMRC guidelines											
Lifetime risk**	%	18+							24.5	22.7	21.1
Single occasion risk - weekly**	%	18+							19.0	15.9	15.3
Single occasion risk - <yearly to >weekly**	%	18+							27.2	39.6	35.5
** Based on 2009 NHMRC guidelines											
Illicit drugs - used in past 12 months	%	14+	16.3			13.7			15.1		
Underweight - self report	%	18+	3.8		4.0		2.6	3.1	2.8	2.8	2.5
Overweight - self report	%	18+	34.1		31.0		33.9	34.1	34.2	34.5	35.0
Obese - self report	%	18+	14.3		19.1		20.8	21.3	21.4	22.9	22.7
Overweight and obese - self report	%	18+	48.4		50.1		54.7	55.3	55.6	57.4	57.7
Unhealthy weight - self report	%	18+	52.2		54.1		57.3	58.4	57.8	60.2	60.2
Underweight - measured	%	18+			1.9						
Overweight and obese - measured	%	18+			56.8		61.0				
Obese - measured	%	18+			20.5		25.3				
Underweight - proxy report	%	5-17						6.6		7.0	
Overweight - proxy report	%	5-17						16.0		18.1	
Obese - proxy report	%	5-17						8.9		8.5	
Overweight and obese - proxy report	%	5-17						25.0		26.6	
Unhealthy weight	%	5-17						31.6		33.6	
Overweight or obese - measured, children	%	5-17				26.7					
Inadequate fruit intake	%	18+		51.3	47.3	47.4	45.4	42.9	42.6	49.7	46.3
Inadequate vegetable intake	%	18+	51.3	87.0	87.9	91	90.6	89.9	88.7	90.9	90.3
Full cream milk usual consumption	%	18+		45.3	45.6		48.6	44.9		44.8	
Takeaway food once a week or more	%	18+		39.4			41.1	36.8		33.7	
Ran out of food - not afford to buy more	%	18+				7.6	8.3	5.8		7.1	
Insufficient physical activity and sedentary	%	18-75			52.4		47.0	44.1	46.1	42.6	43.9
Sedentary - sitting 7 hours/day, 7 days/week	%	18-65	50.7					13.1		12.1	
Exceeds recommended daily screen time*	%	5-15						22.2		41.8	
Exceeds recommended daily screen time*	%	5-17								43.3	
* Small screen viewing for entertainment											
High blood cholesterol - self report	%	18+			29.1			29.4	28.7		29.0
High blood pressure - self report	%	18+			26.3			28.6	27.5		29.0
Sunburnt on previous weekend	%	18+						13.0	9.2	4.8	9.2
Sunburnt in previous 12 months	%	18+							50.9	52.4	51.6

Note 1: Data for all years from 2000 and for males and females is available on the CHO 2012 report website – www.health.qld.gov.au/cho_report/

Note 2: All rates are age standardised per 100,000 persons unless otherwise noted.

Note 3: Data and/or indicator updates may have occurred since previous reports.

A snapshot of Queensland's population in 2011

How many people are there in Queensland?

On census night, 9 August 2011, there were 4.457 million people in Queensland, including interstate and overseas visitors. When adjusted for visitors and for Queensland residents not in this state on that night, there were 4.333 million usual residents of Queensland. However, the official figures used by the Commonwealth for funding and reporting are based on the estimated resident population at 30 June in each year. Making appropriate demographic adjustments and using the August 2011 census collection and other factors such as births and deaths and those people temporarily not in the state, the estimated resident population of Queensland in 2011 was 4.474 million people.³⁸

What is the sex and age distribution?

In 2011, 50.2% of the estimated resident population were female, 49.8% male, similar to the ratio over the previous decade. One in 5 or 20% of the population were aged 0–14 years, 21% were aged 15–29 years, 21% aged 30–44 years, 25% aged 45–64 years and 13% aged 65 years and older.³⁸

How many Indigenous Queenslanders are there?

Based on 2011 census data, 3.6% or 155,825 people identified as being of Aboriginal and/or Torres Strait Islander origin, an increase of 22.1% compared with the 2006 census.⁵⁶ Of the 548,370 Indigenous Australians, 28.4%

The Queensland population is projected to increase by one million people every 10 years between 2010 and 2050.

lived in Queensland, the second largest state population after New South Wales (31.5%).⁵⁷ Of the states and territories, the proportion identifying as Aboriginal or Torres Strait Islanders or both in 2011 was highest in Northern Territory (26.8%), followed by Queensland (3.6%). Queensland had the greatest proportion of Indigenous people living outside the capital city (72.6%) and the youngest age profile with 37.5% aged 0–14 years (median age 20 years).

How fast is Queensland growing?

Between the two census years of 2006 and 2011, the annual growth rate was 1.8% per year or 383,190 persons over the five-year period.^{58,59} The fastest growing segments of the population in the decade up to 2011 were those aged 60–64 years (5% per year), 85 years and older (4.6% per year), and 65–69 years (4.4% per year).³⁸ The impact of the ageing baby-boomer generation is evident in the higher growth rate of the 60–69 year age group, which resulted in 16,000 more people in this age group each year. While the growth rate in the very oldest age group (85 years and older) is high, it represented only about 2,500 extra people per year.

How does Queensland compare?

Queensland's estimated resident population at 30 June 2011 was 20.0% of the Australian population of 22.324 million people.⁵⁹ This was slightly lower than the previous proportion (20.3%) suggesting relative slowing of growth in Queensland. Compared to other states over recent years, Queensland's rate of population growth was second highest after Western Australia until the past two years. In 2010 and 2011 the annual growth of Queensland and Victoria was very similar at just over 1% per year with these two states jointly second highest after Western Australia.

What are the sources of growth?

The largest source of net population increase in Queensland over the previous five years was overseas migration (46% of total increase), followed by natural increase (births minus deaths) of 36%, and net interstate migration (17%).

How is the population projected to grow?

It is estimated that the Queensland population will grow by about one million people every 10 years over the next 40 years, taking the total population to 8.5 million in 2050.⁶⁰ At that time, about a quarter of the population will be aged 0–24 years, another quarter aged 25–44 years, a quarter aged 45–64 years and a quarter aged 65 years and older. The greatest change is projected to occur in older age groups, a tripling of those aged 70 years and older, representing about 1.1 million more older Queenslanders (an increase from 0.393 million in 2010 to 1.528 million in 2050).

Demographic information from the 2011 census was first released in June 2012, with more detailed releases scheduled over the following 12 months. All census related information is available from the Australian Bureau of Statistics (ABS) website with Queensland specific information and reports released by Queensland Treasury and Trade.⁶¹



Data sources and methods

Many data sources were used to develop this report. The latest available data are presented, including a range of unpublished data from recent Queensland Health surveys and analysis of the Queensland burden of disease. Sources of data are cited. Selected summary information is included below with further information on sources and methods available in a separate methods report.⁶²

Prevalence: The prevalence of a disease or condition is assessed by population survey, conducted nationally or by the Queensland Government. For example, the Self Reported Health Status surveys conducted annually by Queensland Health are used to assess the prevalence of self reported diabetes (noting limitations) and mental health factors as well as a range of health risks, knowledge and attitudes. Most of the prevalence data for children is derived from the Queensland Child Health Status surveys which use parental or guardian reporting, termed proxy reporting.

Deaths: The most recent death data for Queensland was provided by ABS on request by Queensland Health as well as publicly released data.⁶³⁻⁶⁵ Deaths of Queensland residents were included, based on year of registration, whether the death occurred in Queensland or interstate, but not deaths that occurred overseas. All death data is reported according to the underlying cause.⁶⁴ The source data for socioeconomic, remoteness and Indigenous Queensland comparisons were derived from 2006–2007 deaths, were preliminary at the time of the release, and excluded deaths of Queensland residents in New South Wales, Victoria and Tasmania.⁶⁶ The most recent complete set of data for OECD reporting was 2004–2006.

Hospitalisations: Hospitalisation data (separations or episodes of care) were derived from the Queensland Hospital Admitted Patient Data Collection, including admissions of Queensland residents to private and public hospitals, with certain exclusions which are noted.⁶² All disease-specific hospital separations were derived using the principal diagnosis of inpatient episodes of care unless otherwise specified. Length of stay was based on overnight and same day admissions in public and private acute hospitals.

Incidence: Is defined as the number of new health related events, such as cancer cases, in a defined population within a specific period of time. Cancer incidence data is derived from the Queensland Cancer Registry.

Notifications: All notification data comes from Queensland's notifiable conditions system (NOCS), that is maintained in the register legislated by the *Public Health Act 2005*.

Population: Estimated resident population data at 30 June for each year were used for calculation of all rates, including the 2012 self reported prevalence data using the re-based 2011 estimates.⁶⁷

ICD codes: The codesets for all conditions are listed in the methods report.⁶²

Illicit drugs: the National Drug Strategy Household Survey includes questions on the illicit use of the following legal and illegal drugs—painkillers, tranquilisers, steroids, meth/amphetamines, cannabis, heroin, methadone, other opiates, hallucinogens, ecstasy, ketamine, GHB, inhalants and any injected drug.¹⁷

Analysis: A more comprehensive description of analytical methods is included in the methods report. However, selected summaries have been included:

- Reporting of difference between two populations or time points is based on percentage difference or percentage point difference. For example, if the prevalence in population A is 60% and in population B it is 50%, then A is 20% higher than B, and the prevalence in population A is 10 percentage points higher than B.
- Trend analysis for survey and death data is based on line of best fit, assuming a linear relationship. More detailed regression models were used to assess change in hospitalisation rates.
- Excess cases due to socioeconomic and remoteness differences and those due to Indigenous status were based on methods previously published.⁶⁸
- Deaths averted due to reduction in smoking were based on the impact of rate difference on case numbers

adjusted for risk factor attribution by sex, with an adjustment for differences in age structure.

- The impact of risk factor prevalence on the number of prevalent cases (smoking and obesity) was based on expected and observed prevalence in any particular year and estimated resident population for the age group of interest, usually adults.
- Regression modelling was used to assess the relationship between key variables in a multivariable model and is described in the methods report.^{62,69}

Statistical inference: The reporting of difference between categories is noted only when the difference is statistically significant, based on non-overlap of 95% confidence intervals. Estimates for certain population subgroups may be based on small numbers and have large relative standard errors and this is noted in relevant tables. This may include suppression of data where relative standard error of an estimate exceeds 50%. These issues are discussed more fully in the methods report.⁶²

Format for reporting years: Financial and hospitalisation data are reported by financial years and displayed using the format 2006–07. The same format is used for data collected over two years but not the full period. Data which refers to two full years is displayed in the format 2006–2007.

Oral health data: There is currently no national collection system to inform dental service delivery, as most dental services are delivered by private providers. Data for children is based on the school dental services in each state and child dental health surveys.⁷⁰ Data for adults is derived from surveys conducted by the Australian Research Centre for Population Oral Health. There are acknowledged limits on these collections relating to completeness and representativeness of the sample.²⁸



‘Health is a resource for everyday life, not the objective of living.’ World Health Organization⁷¹

In this chapter:

- What is good health?
- The factors that influence health
- Taking action to advance health

The building blocks to achieve and maintain the good health of the population are becoming more defined. Much has been published on the determinants of health and it is well recognised that health is influenced by a complex interplay of societal, environmental, socioeconomic, biological and lifestyle factors.⁷²⁻⁷⁶ Good health is essential to human welfare and to sustained economic and social development. This is reflected in the World Health Organization (WHO) definition of health which places it in the broader social context: ‘a state of wellbeing in which the individual realises his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community’.⁷⁷

Health today reflects the aggregate influence of years of population health determinants. These were extensively reported for Queenslanders in 2004.⁷⁸ The factors that contributed to inequalities in 2004 are similar today—differences in health outcomes based on socioeconomic status, remoteness and disadvantage for Indigenous Queenslanders—as are the underlying causes.⁶⁸ This chapter provides a brief overview of the determinants of good health and, using the data reported throughout the following chapters, identifies opportunities to advance good health in Queensland.

What is good health?

The most famous modern definition of health is in the Preamble to the Constitution of the World Health Organization, adopted by the International Health Conference, New York in 1946 and signed by the representatives of 61 governments, that 'health is a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity'.³² During the development of the Ottawa Charter for Health Promotion in 1986, the WHO said that 'health is a resource for everyday life, not the objective of living', and that it is a positive concept emphasising social and personal resources, as well as physical capacities.⁷¹

Health is important—to each of us as individuals, to our families and to the Queensland community. For the average person, 'good health' might mean being able to live life to the fullest, and wake up in the morning in a clear, happy state of mind, with sufficient energy for the whole day.

Health and illness mean different things to different people and can vary between cultures and over time.^{79,80} Indigenous Australians place the health of the individual firmly in the community: 'Health is not just the physical wellbeing of an individual, but the social, emotional, and cultural wellbeing of the whole



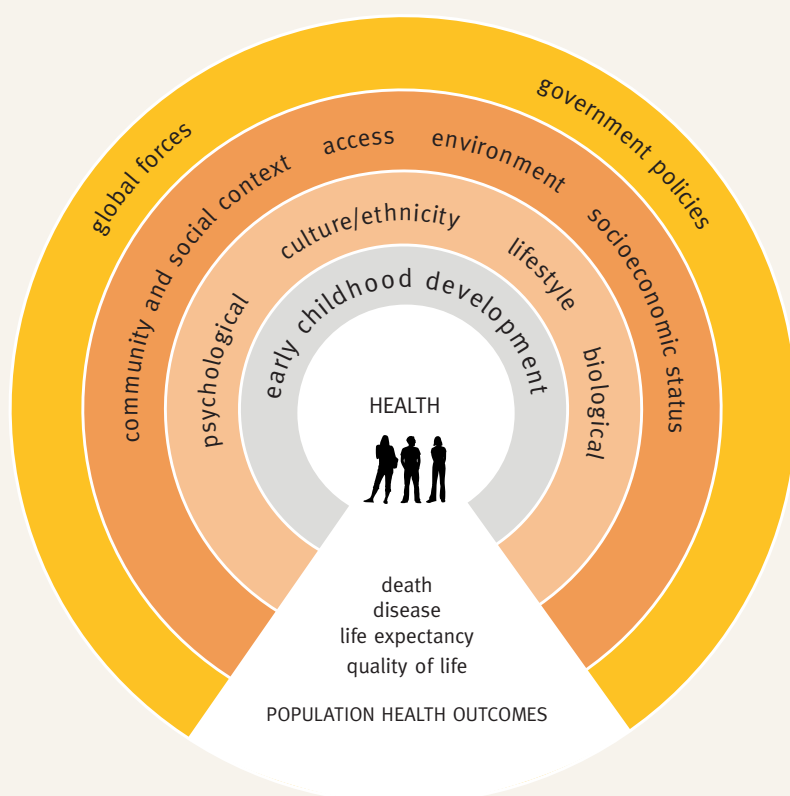
community in which each individual is able to achieve their full potential as a human being thereby bringing about the total wellbeing of their community.'⁸¹ Migrant groups in Queensland have different concepts of health and the causes of illness, so a knowledge of these diverse views is very important when providing culturally appropriate healthcare.⁸²

The general acceptance of what is normal has changed over time. In the 1950s in Australia, measles was regarded as a normal

childhood disease to which young children were intentionally exposed in the belief that it was better to have it earlier, rather than in adulthood. Greater knowledge of the consequences and seriousness of this infectious disease has led to greater efforts to prevent it through a national immunisation program.⁸⁰ Similarly, it is likely that in recent years there has been a normalising of the view of overweight and obesity in Australian cultures.^{83,84} In 2012, the majority of Queensland adults (58%) were overweight or obese, compared with 20 years ago when they were a minority (40% in 1993). There is a tendency for overweight and obese adults, particularly males, to think they are an acceptable weight, and this perception is now evident among parents of overweight and obese children, who often think their child's weight is 'about right' (page 73).

There may be a belief among some Indigenous Australians that chronic diseases, and diabetes in particular, are unavoidable and a normal part of contemporary Indigenous life, largely inherited from families—that getting diabetes is inevitable.⁸⁵ Diabetes is a significant health issue for Indigenous Queenslanders, with children and young people increasingly being diagnosed with type 2 diabetes, and what might be considered a family problem, is likely to be associated with exposure of the fetus to diabetes during pregnancy as well as family and community factors.⁸⁶ Given the relatively poor prognosis once a diagnosis is made and the continuing increase in the prevalence of this condition among Indigenous Queenslanders, prevention needs to play a dominant role in tackling this major problem. This will be achieved through encouraging lifestyle change as well as monitoring the health of women during pregnancy which, to be effective, needs to be culturally appropriate.

Figure 2: A conceptual framework for the determinants of health and wellbeing.



The factors that influence health

The factors that influence health are known as the determinants of health. The complex interplay of determinants may directly affect the individual or indirectly affect the health of the population through their influence on policies, contexts, cultures and norms. There may be a considerable lag period between some determinants of health and health outcomes. A simple diagram of such influences is shown (Figure 2) and discussed in the following sections of this chapter. This diagram is based on one developed by the Australian Institute of Health and Welfare³³ and the Ministry of Health, NSW³⁴ and is consistent with the outline of determinants of health from the WHO³⁵, New Zealand³⁶ and Canada.³⁷ While each factor of Figure 2 is discussed separately in this section, it is their interaction that ultimately determines the health of individuals, families and communities.

The determinants of good health are well documented, as are the risks and hazards that affect certain population groups. The strategies that will benefit the population and advance health are becoming increasingly clear. In this report we focus on the importance of the early years in building a healthy foundation, as well as the need to take action to prevent chronic disease, and protect and promote good health. We recognise that the natural environment and the built environment play a significant part in maintaining good health. From the highest level of influence—global factors and government policies—through to the most proximal—the lifestyle behaviours and early life experience of an infant—the broad determinants of health are discussed and related to other sections of this report.



Global forces, such as world economics, markets and trade, political upheaval and instability, environmental factors and climate change all affect the health of the population. For example, as a result of political instability in certain regions, refugees are seeking asylum in Australia. Such populations are likely to have specific health needs (page 17). The integrity of borders is not only an issue for movement of people—the movement of illegal drugs and controlled medications by internet trafficking is likely to become a challenge for the protection of health in the years ahead.

National and state government policies are designed to influence the health of the population, including Medicare, health funding and capital investment such as new hospitals and health facilities. These are the levers used by governments to address the health needs of population groups, to improve equity and to add quality to health services and outcomes. Healthy public policy is a powerful influence on the health of the population. For example, increasingly stringent changes to smoking legislation in recent years have helped to transform a national culture of smoking, with substantial rates of decline evident in this state (pages 53, 90). It is recognised that greater gains in health may still be achieved through taxation and regulation (pages 52, 73, 100, 128). But

health policy is just one factor—economic policies, welfare, education, housing, taxation and law can all potentially have an effect. The WHO has identified the need to put 'health in all policies'.⁸⁷

Influences that more directly impact on the individual include the natural environment, such as the quality of air we breathe, the water we drink and use, and the safety of food we eat, as well as the built environment (Figure 2). Poor air quality is linked to respiratory and cardiovascular disease and some cancers.⁸⁸ *Queensland's Water Fluoridation Act 2008* aims to protect against dental disease. More than 87% of Queenslanders will have fluoridated water by the end of 2012, and over the next few years it is expected that the oral health of Queensland children will improve as a result of this preventive measure (pages 50, 53, 116). Protection of health through vigilance and monitoring of the natural environment is a priority shared by local and state governments and the community.⁸⁹

The built environment includes roads, parks, housing, schools and workplaces. As these are the places where we live, learn, work and play, they are increasingly being recognised as strategic settings to bring about health improvements. These places have the potential to support or hinder healthy living. Safe walking areas, parklands and dedicated cycle paths are

examples of supportive built environments. This report showcases some initiatives for improving the built environment in Queensland (page 54) and also highlights opportunities to improve health behaviours (pages 87, 114).

People's social and economic circumstances have a powerful effect on their health throughout life. Many of the social determinants of health are beyond the direct control of the individual—they can accumulate over time and across generations. Those in lower socioeconomic groups have higher hospitalisation and death rates compared to those with greater socioeconomic supports (page 27).⁷⁵ Socioeconomic disadvantage was estimated to account for 25% of the total burden of disease and injury in Queensland in 2006 (page 22) and is a major cause of the life expectancy gap between Indigenous and non-Indigenous Australians.²² Factors such as employment, education, income, language and, more recently, access to and use of computers are included in a socioeconomic index developed by the ABS and used throughout this report.⁹⁰ A socioeconomic gradient is evident for many health outcomes and risk factors. This is summarised on page 16 and discussed throughout chapters 3 and 5.

There is generally equitable access to health services in Australia because of the system of universal healthcare in this country. However, there are gaps, particularly among those living in more remote locations and for those who have difficulty navigating the system.



Improving access to a range of healthcare services for rural and remote Australians has been identified as a priority.⁹¹ Taking services to rural and remote communities in Queensland is a challenge because of the size of the state and the relatively decentralised population. People in remote areas have poorer health outcomes for some conditions and higher levels of some risk factors. Redressing the balance will require better access to prevention services as well as to primary and secondary healthcare. In Chapter 4 there are examples of effective interventions that deliver a broad range of prevention services to rural and remote Queenslanders.

Health services are not always easy for people to access, particularly where there are language or cultural barriers. There is evidence that Indigenous Queenslanders are not getting all the potential benefits of their hospital experience or access to specialised services. Medicare expenditure data shows that utilisation of referral services for Indigenous Queenslanders is lower than for others (page 19) and possible difficulties in their ability to navigate the hospital system are discussed in Chapter 6, page 126.

Community factors play a part in enhancing social and mental health and are particularly relevant when dealing with disasters and critical events. Social capital measures—reciprocity and cohesion,

community identity and general sense of trust—have been included in the mental health and wellbeing section of Chapter 5 to describe the ways Queensland communities coped with the 2010–11 natural disasters (page 107).

Determinants which have a direct impact on the individual include biology, lifestyle, psychosocial characteristics, culture and ethnicity (Figure 2). Lifestyle factors such as not smoking, being active and eating a healthy balanced diet are well-recognised determinants of health and feature in this report. An estimated 31% of the total burden of disease and injury in Queensland in 2007 was due to the joint effect of 13 modifiable risk factors such as high body mass, tobacco smoking, risky alcohol consumption and insufficient physical activity.⁸⁸ High body mass has overtaken tobacco smoking in recent years to become the largest single contributing risk factor for the burden of disease and injury in Queensland. In 2012, more than half (58%) of adult Queenslanders were overweight or obese (and 27% of children in 2011), 44% were insufficiently active, 21% consumed alcohol at levels associated with lifetime risk and 14% were daily smokers.⁹² Chapter 5 describes the current prevalence and trends of key lifestyle and behavioural risk factors, and identifies opportunities to improve health behaviours.

Culture and ethnicity are defining factors of many population groups. For some, such as Indigenous Queenslanders, these factors contribute to poorer health status, while in others, their culture can be protective. The health status of many overseas born populations in Queensland has been shown to be generally as good as, if not better than, the Australian born population. Some of this advantage may be due to culture and some to migration criteria for entry into Australia (page 17). In considering this advantage, it should be noted that this does not apply across all immigrants; recent research suggests that there are significant variations in health status for immigrants from different geographical regions.^{27,93,94} This may result from a range of factors including the influence of culture and values on health beliefs and broader social determinants, such as socioeconomic factors and access to services.

Complex psychosocial factors such as self esteem, coping, stress, isolation, anxiety and level of control affect the health of an individual. Social and psychological circumstances can also cause long term stress.⁹⁵ Continuing anxiety, insecurity, social isolation, low self-esteem and lack of control over work and home life appear to undermine both mental and physical health.⁹⁶ Such psychosocial risks accumulate during life and can increase the chances of poor mental health and

premature death.⁹⁷ Long periods of anxiety and insecurity and the lack of supportive friendships are damaging regardless of how they arise. The risk of psychological distress and related indicators is reported on page 40 and also within the mental health and wellbeing section beginning on page 103.

Biological factors such as age, sex and genes are highly influential but not modifiable health determinants. There are very distinct patterns in the profile of many conditions based on age. For the majority of conditions, as people age the prevalence of disease increases, as described throughout Chapter 3. Prevalence differs for males and females, not only through biological and genetic pathways, but also because their behaviours and responses differ in important ways. As a result, the average life expectancy of Queensland males in 2010 was 4.5 years shorter than for Queensland females. Sex related differences are reported throughout chapters 3 and 5.

Pre-birth, early life experiences and early stages of development in childhood are critical periods of life that provide opportunity for significant preventive impact over the life course (Figure 2). Adverse exposures early in life initiate pathways that can lead to chronic disease and mental health problems in adult life.⁹⁸ Prenatal exposure, particularly to

tobacco smoke, alcohol and poor nutrition, is particularly damaging. For example, maternal smoking during pregnancy is associated with low birth weight and adverse developmental outcomes in later childhood, such as behavioural problems, respiratory disease and impaired functioning of the immune system.^{99,100,101} Despite this, 17% of Queensland women reported smoking at some time during pregnancy in 2010 (page 91). Similarly, exposure to drugs, alcohol and poor nutrition during the prenatal period or in childhood can cause irreversible damage and therefore increase susceptibility to adverse health outcomes later in life.¹⁰²

The need for care does not stop at birth. It is essential that the care of mothers and babies continues because the greatest proportion of infant deaths occurs in the first 28 days of life. In 2010, 62,051 babies were born in Queensland to 61,027 mothers. There were 447 still births and 347 babies who died in their first year. Of these, 239 or 69% died in the first 28 days. A further 465 died between the ages of 1 and 4 years.^{63,23} The stillbirth rate has remained steady in Queensland over the past 20 years, while the infant mortality rate (death in the first year of life) and the perinatal death rate (death in the first 28 days) have steadily declined.²³ Continuity of care, including the delicate handover from maternal to child health services is necessary, and this is discussed in Chapter 6, page 122.

Childhood is also a time for establishing healthy behaviours as they are likely to be sustained in the long term. To give just one example, promoting sun protection in childhood and adolescence is crucial as ultraviolet radiation exposure early in life is a strong determinant of future skin cancer and children for whom sun protection becomes a habit are more likely to be sun safe as adults.^{103,104} Interventions that are targeted earlier in life will enhance the chances of success, reduce cumulative adverse exposures and establish sustainable healthy habits. Evidence indicates that the diet, lifestyle choices, behaviour, and life experiences of parents, grandparents, and even great-grandparents can influence the health of descendants through genetic influences passed from one generation to the next.¹⁰⁵



Taking action to advance health

Achieving good health for everyone means not just treating ill-health, but preventing disease and proactively encouraging and helping people to make healthy choices.¹⁰⁶ It means successfully tackling the challenges that have been increasingly evident over the past decade. Major challenges are the impact of the growing and ageing population on the disease burden and hospital system, high levels of lifestyle related diseases such as those linked with obesity, and persistent health inequalities particularly for Indigenous Queenslanders. People rate health as one of their highest priorities. The development of new technologies and procedures to deliver services to meet these needs and expectations is projected to be the largest cause of growth in national health expenditure over the next 30 years.^{44,107}

However, while the health sector has a pronounced influence on the overall health of the population, many of the determinants to promote and sustain good health lie outside the confines of the health sector. For example, the tangible costs of tobacco outside the system were about 38 times the healthcare costs. The circumstances in which people live strongly influence the quality of their life and the nature of their death.⁷⁶ Education, housing,

food and employment all affect the health of the individual and the community. Redressing inequalities in these areas will reduce inequalities in health. Such improvements will be largely achieved through broader policies that focus on equity and consider health impacts. Interventions such as prices, taxes and regulations are discussed in Chapter 4.

But timely access to health services—a mix of protection, prevention, treatment and rehabilitation—cannot be achieved without universal access to a well-functioning health system. The Queensland Government has committed to ensuring that the health system meets the needs of all Queenslanders.⁴³ Furthermore, access to high quality services that meet the needs of the population is a primary objective of governments in Australia.¹⁰⁸ It is acknowledged that shifting the centre of gravity from hospitals to primary healthcare will help to improve access to health services for individuals and communities. Primary healthcare is a more cost effective way to deliver services because it enables people to better manage their health and prevent disease.

Prevention of disease, promotion of good health and empowering individuals to make choices to improve their own health are widely accepted as

effective ways to improve the health of the population.^{106,109,110} Prevention and promotion interventions can be cost effective and reduce the need for subsequent treatment. However, this is often not achieved because the pressure on funding models to deliver treatment services is far greater than to prevent disease and promote healthy behaviours¹⁰⁹, and individuals, when left to their own devices, will often under-invest in prevention. While prevention services are provided across the health continuum, less than 2% of all health spending in Queensland is on public health (as defined, page 131).⁴⁵

There are many examples within this report that demonstrate the multitude of ways in which the health of Queenslanders can be advanced. These include programs that focus on changing knowledge and attitudes through advocacy and public awareness campaigns, population screening to detect a specific disease such as cancer in the early stages, and initiatives that focus more directly on the individual through the community, workplace and school as well as one-on-one interventions. These are discussed in chapters 4 and 5. Making good health the goal will deliver better outcomes for Queenslanders and the economy.

CHAPTER 3

How healthy are we?



By international comparisons the health of Queenslanders is generally very good.

In this chapter:

- Health expenditure
- Burden of disease
- All causes
- Avoidable deaths
- Preventable hospitalisations
- Cancers
- Coronary heart disease
- Stroke
- Diabetes
- Mental health
- Suicide and self-inflicted injury
- Selected injuries
- Asthma and COPD
- Communicable diseases
- Dental disease

Life expectancy is increasing and death rates for many conditions are declining (Table 1, page 4). Queensland fares well in national and international comparisons, although there is potential for improvement. This chapter reports on the prevalence, incidence, hospitalisations and deaths for selected key conditions in Queensland, using the most recent data. Sources are cited, and detail on data collection, methods and analyses are reported on page 8 and in a companion methods report, while terminology and definitions are listed on page 131.⁶² The causes and impact of these key conditions including economic impact were reported extensively in the 2010 Chief Health Officer report.⁶⁶

Life expectancy continues to increase, by three years for Queensland males and females since 2000, and is now at 79.4 years for males and 83.9 years for females. Australia had the

fourth highest life expectancy in the OECD in 2010 and Queensland was slightly lower than Australia.¹¹¹ However, the life expectancy for Indigenous Queensland males was 10.4 years lower than the male non-Indigenous population in 2005–2007, and 8.9 years lower for females (Table 1, page 4).

Chronic disease

In 2007, chronic diseases (all non-communicable diseases) caused 88% of the burden of disease (DALYs) in Queensland (Table 2).⁶⁶ At 87% or \$45.8 billion, it was the leading cause of health expenditure nationally in 2004–05, and is estimated to be about \$9.2 billion in Queensland assuming a rate of spending in Queensland similar to nationally. These non-communicable diseases accounted for 91% of all deaths in Queensland in 2010. In 2010–11, of the 1.77 million hospitalisations in Queensland

Table 2: Relative proportion of health burden and expenditure associated with chronic disease, communicable disease and injury, Queensland^{65,66,112,113}

	Chronic (non-communicable) disease	Communicable, maternal and neonatal conditions	Injury
% Burden of disease (DALYs) 2007	88	5	7
% Recurrent allocated health expenditure 2004-05*	87	7	7
% Deaths 2010	91	2	7
% Hospitalisations 2010-11	85	8	7

* National

public and private hospitals, 85% were due to chronic or non-communicable conditions, 8% were due to communicable, maternal and neonatal conditions and the remaining 7% were due to injuries. Treatment of the selected chronic diseases of cancer, cardiovascular disease, nervous system disorders, mental disorders, diabetes, chronic respiratory conditions, musculoskeletal conditions and oral health accounted for 57% of national allocated health expenditure in 2004–05, compared with 60% in 2001.^{48,66}

In 2007–08, 75% of Queenslanders reported a long term health condition with about one-third (38%) reporting more than three conditions (similar to national).²¹ Eyesight related problems were the most common (26.5% reported long sightedness and 21.5% short sightedness), followed by musculoskeletal problems (15.5% reported back pain and related problems, 14.8% reported arthritis), asthma (11.8%), hayfever (11.6%) and chronic sinusitis (11.4%). The prevalence of these and other long term chronic conditions among older people is discussed on page 125.

Preventability

There is significant scope for advancing good health in Queensland. In 2007, about one-third of the total disease and injury burden (31%) was due to 13 lifestyle, physiological, social, and environmental risk factors.⁸⁸ A greater proportion of some

Health today reflects the influence of many years of determinants.

diseases is caused by these measurable risk factors. For example, 84% of the burden due to coronary heart disease in Queensland was due to the joint effect of 12 risk factors with the main ones being high blood pressure, high blood cholesterol, high body mass, and physical inactivity (Table 3). Two-thirds of the type 2 diabetes burden was due to the joint effect of high body mass and physical inactivity (69%). In contrast, dementia had a very low association with the risk factors, less than 1%. While this chapter includes information on the risk factors associated with the selected key conditions, Chapter 5 (page 65 and following) monitors the progress being made in Queensland to reduce the risk factor burden and to improve the health of the population.

Socioeconomic burden

Most of the leading causes of death have a socioeconomic gradient, with rates of death substantially higher in disadvantaged areas than in advantaged areas. For example, the rate of premature death in disadvantaged populations was 74% higher than in advantaged populations in Queensland in 2006–2007.⁶⁶ This rate difference accounted

for about 2,200 excess deaths (23% of all premature deaths). Most of the 2,200 excess deaths were avoidable (77%). Avoidable deaths are defined as premature deaths that could have been prevented from occurring in first place or avoided by provision of appropriate healthcare. The socioeconomic gradient in avoidable death rates resulted in about 1,700 excess deaths per year in 2006–2007 or 28% of all avoidable deaths.

A socioeconomic gradient is evident for coronary heart disease, stroke, lung cancer, COPD and many other causes of death and disability and is reported in subsequent sections of this chapter. Of the total burden of disease and injury in Queensland, 25% was associated with socioeconomic disadvantage in 2006. Dealing with the causes of health inequality is critical to improving the health of Queenslanders. Chapter 5 provides up-to-date data on the burden of risk behaviours in disadvantaged populations and Chapter 4 features some of the interventions currently being undertaken to address the health disadvantage in Queensland.

Remote burden

Health disadvantage in remote areas of Queensland is seen in higher rates of all-cause deaths, avoidable deaths, and deaths due to smoking related conditions and other causes. While all-cause death rates in remote and very remote areas are about double the rates in major cities, this difference is not due to remoteness alone—it largely reflects health disadvantage associated with a higher proportion of Indigenous Queenslanders living in remote areas as well as socioeconomic disadvantage.⁶⁸ If all Queenslanders aged less than 75 years had the same all-cause death rates as those living in major cities about 450 deaths per year could have been avoided in 2006–2007.⁶⁸ Hospitalisation rates were also higher in remote areas—for all causes they were about 20% higher than rates in major cities. Potentially preventable hospitalisation rates were double, and hospitalisation rates for smoking related conditions were about 50% higher.

Table 3: Selected key specific conditions, by proportion of disease burden and risk factor attribution, Queensland, 2007⁸⁸

	% of total burden	Ranking	% attributed to 13 selected risk factors
Coronary heart disease	8.5	1	84.3
Anxiety and depression	7.7	2	16.5
Type 2 diabetes	5.2	3	73.6
Stroke	4.2	4	69.2
Dementia	3.7	5	0.2
Lung cancer	3.5	6	87.9
COPD	2.9	8	66.3
Asthma	2.5	9	5.6
Colorectal cancer	2.3	10	25.0
Female breast cancer	2.2	11	27.6
Suicide	1.9	12	46.7
Road transport injury	1.5	13	38.5
Prostate cancer	1.5	15	1.0
Personality disorders	1.3	18	0.0
Schizophrenia	1.1	19	5.8
Melanoma	1.0	22	5.0
Falls	0.9	23	16.7
Cervical cancer	0.2	79	100.0

For Queenslanders born in non-English speaking countries, the diabetes death rate was 25% higher than for the Australian born population in 2007.²⁷

Health disadvantage is a complex problem but improvements can be achieved by reducing risk factor prevalence and addressing access issues and some of the underlying causes. Chapter 4 features some interventions that are taking prevention services to people in remote areas.

Indigenous Queensland burden

The rate of burden of disease and injury for Indigenous Queenslanders was 2.1 times that of non-Indigenous Queenslanders in 2007.²⁴ This excess rate varied markedly between broad causes. The greatest difference was for diabetes, where the burden rate for Indigenous people was 4.7 times that for non-Indigenous people. It was 3 times higher for intentional injury, 2.8 times for cardiovascular disease and 2.7 times for chronic respiratory disease (page 24).

Health inequalities between Indigenous and non-Indigenous Queenslanders resulted in about 300 premature Indigenous Queensland deaths per year in 2006–2007, or about 1 in 30 of all premature deaths.⁶⁸ Death rates differ markedly—the all-cause Indigenous Queensland rate was 2.8 times the non-Indigenous rate in 2010.⁶⁴ Indigenous disadvantage was evident in death rate differences for many conditions—for diabetes it was 12.8 times the non-Indigenous rate, for cirrhosis of the liver and associated liver diseases it was 5 times, and similar for urinary system deaths. For coronary heart disease, stroke, suicide, chronic lower respiratory diseases, and deaths caused by transport accidents, death rates for Indigenous Queenslanders in 2010 were 2 to 3 times the non-Indigenous rates.⁶⁴

The poorer health status of Indigenous Queenslanders was also shown in higher hospitalisation rates.⁶⁸ In 2007, the all-cause hospitalisation rate was double the non-Indigenous rate, for potentially preventable hospitalisations it was 3 times, and for smoking related conditions it was 2.7 times the non-Indigenous rate. There is evidence that the gap in all-cause hospitalisation rates between Indigenous and non-Indigenous Queenslanders has widened in the past decade.⁶⁶ The impact of higher rates is seen in the excess number of hospitalisations—if the all-cause hospitalisation rate among Indigenous Queenslanders was the same as the non-Indigenous rate, there would have been about 33,000 fewer hospitalisations in Queensland in 2007–08.⁶⁶ Although hospitalisation rates for Indigenous Queenslanders are higher, there is concern that their hospital stays are not as effective as could be achieved. This is discussed in Chapter 6, page 126.

Actions to narrow the health inequality gap focus on reducing risk behaviours as well as enhancing employment prospects and providing culturally appropriate support and services.¹¹⁴ Selected examples of risk factor reduction interventions for Indigenous Queenslanders are featured in Chapter 4.

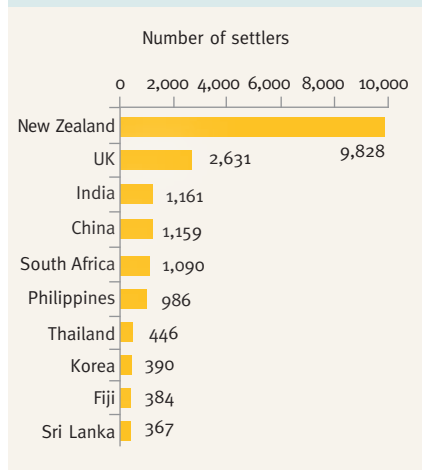
Culturally and linguistically diverse population burden

In 2010–11, 25,827 new settlers arrived in Queensland from overseas countries.¹¹⁵ A new settler is one who indicates their intention to stay in Australia for a minimum period of 12–16 months, but is not necessarily a permanent migrant. While most were born in English speaking countries such as New Zealand and the United Kingdom, there were a number from non-English speaking backgrounds (Figure 3). Of these, 11,090 were permanent arrivals under the migration program, about half of them skilled migrants.¹¹⁶ There is limited data to assess the health status of Queensland's culturally and linguistically diverse population and data are often based solely on country of birth which is not always adequate.¹¹⁷ Overall however, those born outside Australia had lower all-cause death and hospitalisation rates than Australian born Queenslanders—whether from mostly English speaking backgrounds or non-English speaking backgrounds.^{27,65,118–120} This relatively better health status is not unexpected given the migration criteria of the Australian Government.¹²¹ For those born overseas there were comparatively lower rates of avoidable deaths, coronary heart

disease, stroke and diabetes. However, there were some indications of poorer health—for those Queenslanders born in non-English speaking countries, the diabetes death rate was 25% higher than for the Australian born population, and for vaccine preventable potentially preventable hospitalisations it was 20% higher. The more detailed the analysis the more likely regional and country differences will emerge, but the relatively small number of cases in some country of birth populations limits reliable reporting of difference.¹¹⁷ Nevertheless analysis of hospitalisation rates among some regional groups identified higher rates for those born in Oceania, North Africa and the Middle East, for a number of conditions.²⁷ Further analysis among individual population groups such as Samoans, Tongans, Fijians and Australian South Sea Islanders showed higher rates for many conditions.^{93,94} While hospitalisation data is not considered an accurate indicator of health status alone, higher hospitalisation rates would suggest there is a significant burden of disease for Pacific Islander and South Sea Islander communities that could be addressed, and that better primary prevention would be a key to achieving health benefits.⁸⁸

Each year Queensland receives humanitarian entrants under the Refugee and Special Humanitarian program with 2,111 entrants in 2011.¹²² Humanitarian entrants are generally a young population, with 37% of those who arrived between 2007 and 2011 aged less than 16 years. The majority of recent arrivals currently living in Queensland were from southern Asia (34%) and Africa (27%). The majority of recent arrivals who currently live in Queensland had either no English language proficiency (57%) or poor English (38%). The health needs of these populations vary depending on their culture and their experiences prior to arriving in Australia.⁸² Cultural and health profiles of many population groups are prepared by Queensland Health to better understand and meet their health needs.⁸²

Figure 3: New settlers by country of birth, Queensland, 2010–11¹¹⁵



Health expenditure—an overview

Health was the most commonly mentioned priority for government spending in a 2011 survey of Australian adults.¹⁸ One half (49%) mentioned it as their top priority and 24% as their second priority—a total of 73%. Almost all adults approved of spending on prevention measures, such as cancer screening (98%) and infectious disease prevention (96%), with 4 out of 5 approving spending on health promotion relating to obesity (84%), harmful alcohol consumption (79%) and smoking (78%).

A total of \$26,608 million was spent on health in Queensland in 2010–11, 93% of which was recurrent expenditure (\$24,621 million) and the remaining 7% capital expenditure (\$1,987 million).¹ The total reflects spending from all sources, including federal and state governments. Health expenditure in Queensland (from all sources) was 20.6% of Australian health expenditure, a similar rate to Queensland's population as a proportion of national (20.2% in June 2010). The Queensland Government spent \$11,156 million on health in 2011–12¹²³, the largest component of the State Government expenses. Health (25.6% of the total budget) and education (23.9%) accounted for one in every two dollars spent by the Queensland Government.¹²⁴ The information in the remainder of this section is derived almost entirely from AIHW reports, which are the national reporting benchmark of Australian health expenditure.^{1,45,48}

Nationally, spending on health accounted for 9.3% of GDP in 2010–11, an increase of 1.4 percentage points since 1999–2000.¹ Health expenditure has increased each year in real terms (adjusted for inflation) by 5.3% per year, while GDP has increased by 3.1% per year. Assuming a constant rate of increase based on the previous 10 years, national expenditure

For every dollar spent on health in Queensland, less than two cents was spent on public health.¹

will reach 10% of GDP by 2016–17 (Figure 4). Australia's life expectancy is very good for the proportion spent per person. Compared to other countries in the OECD in 2010, Australia was ranked twentieth for health expenditure as a proportion of GDP, and on measures of life expectancy, fourth highest after Japan, Switzerland and Spain.¹¹¹

Total health and residential aged care expenditure nationally is projected to almost triple in the 30-year period from 2002–03 to 2032–33, from \$85 billion to \$246 billion.⁴⁴ Increases in the volume of services per treated case are projected to account for half (\$81.3 billion) the projected \$161 billion increase. Such increases arise as a result of technological change including additional diagnostics, drugs and procedures, as well as changing medical practice and policy, and coverage of health services. Two demographic factors, population ageing (23%) and absolute population increase (21%), will account for most of the remaining 50% increase. Non-demographic factors including health price inflation and an increasing proportion of previously untreated cases now treated, will account for a very small proportion of the total increase. On current trajectories, declining disease rates are projected to save the health system \$2.3 billion over the 30-year period. Rate decline is projected for some of the main disease groups such as cardiovascular disease, injuries, cancer and sense organ disorders, but not for others. Diabetes rates are projected to double, resulting in a fivefold increase in expenditure over the 30 years to 2032–33, the largest single cause of anticipated proportional increase in expenditure.

Recurrent expenditure includes spending on hospitals, medical and dental services, patient transport, community health, public health, medications, aids and appliances, and research. In 2010–11, of the \$24,621 million recurrent expenditure in Queensland, the largest component was hospital services, followed by medical services and medications—together accounting for three out of every four dollars spent (Table 4).¹ This was consistent with other jurisdictions and national expenditure. The smallest proportion was spent on public health—under 2% or less than two cents in every dollar of health expenditure (public health expenditure is

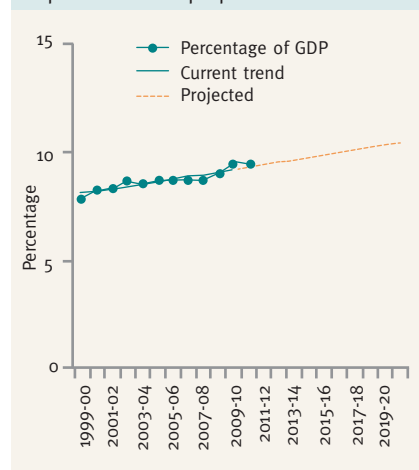
defined, page 131). On a per capita basis, Queensland Government funded expenditure on public health was 14.3% above average (\$48 compared to \$42 nationally), whereas Commonwealth funded expenditure on public health was 2.4% below average (\$41 in Queensland compared to \$42 nationally).

The Australian Government funds 44% of the total recurrent health expenditure in Queensland, with 29% derived from the state and local governments, and 18% from individuals. The remaining 8% is derived from health insurance funds (Table 4). Two-thirds (68%) of Australian Government funding in Queensland is spent on hospital and medical services. Over half (58%) of state funding is spent on hospitals alone. The largest out-of-pocket items paid for by individuals in Queensland in 2010–11 were medications not funded by the Pharmaceutical Benefits Scheme (PBS), followed by hospitals, then medical and dental services. Half the health insurance funding was spent on private hospitals, with a further 20% spent equally on dental and medical services.

Total per capita health expenditure (recurrent and non-recurrent) in Queensland in 2010–11 was \$5,850, which was 1% above the Australian average of \$5,796.¹ This reflected higher capital expenditure in Queensland where the majority (74%) was state government funding. Recurrent health expenditure in Queensland was \$5,413 per capita, 1.6% below the national average of \$5,502. Total Queensland Government funded health expenditure (recurrent and non-recurrent) was 16% above average on a per capita basis compared with other state and territory governments (\$1,781 in Queensland versus \$1,533 nationally). However, Commonwealth funded expenditure in Queensland was 3% below average on a per capita basis, compared with other states and territories (\$2,400 in Queensland versus \$2,475 nationally). Commonwealth under-investment in Queensland included research, public hospital services, medical services, PBS and dental services.

The Queensland Government's per capita spending on health services for Indigenous Queenslanders in 2006–07 was 10% lower than the national average—\$3,460

Figure 4: National total health expenditure as a proportion of GDP^{1,45}



98% of Australians approve spending public money on prevention and agree that it is an effective way to improve the health of the population.¹⁸

Table 4: Total recurrent health expenditure (current prices), percentage, by source of funds and area of expenditure, Queensland, 2010–11¹

	Australian Government	State and local government	Health insurance funds	Individuals	Total
Total hospitals	15.7	15.5	4.6	2.6	40.0
Patient transport services	0.2	2.6	-	-	2.8
Medical services	14.4	-	0.9	2.4	18.2
Dental services	1.0	0.8	0.9	2.3	5.1
Other health practitioners	1.2	-	0.4	1.7	3.5
Community health and other	0.8	5.9	-	0.1	6.8
Public health	0.9	0.6	-	0.1	1.6
Medications	6.9	-	0.0	7.4	14.4
Aids and appliances	0.5	-	0.4	2.0	2.9
Administration	0.5	0.5	0.8	-	1.8
Research	1.9	0.9	-	-	2.9
Total recurrent funding	43.9	26.9	8.0	18.5	100.0

Note: Numbers may not sum to 100 due to rounding

compared to \$3,846—where spending varied from \$1,104 per head in Tasmania to \$6,280 in the Northern Territory, although there are limitations in the comparability of the Tasmanian estimate.¹²⁵ Per capita government expenditure on health for Indigenous Queenslanders was 2.23 times that for non-Indigenous Queenslanders in 2006–07, a little lower than the national ratio of 2.33.

Medicare is an important and distinctive feature of the Australian health system and is funded by the Australian Government through taxation. In 2008–09, \$3,497 million was spent on Medicare for Queensland residents. This represented 18.6% of total Medicare spending nationally. Out-of-hospital expenses accounted for two-thirds of all Medicare spending, followed by in-hospital costs that were principally private hospital expenditure (Table 5). Of note, one-fifth of all Medicare spending was associated with imaging and pathology (21.6%). Per capita Medicare spending for Indigenous Australians was substantially lower than

for non-Indigenous Australians—\$344 compared with \$580 in 2006–07. That is, for every dollar of Medicare spent on Indigenous Australians, \$1.68 was spent on non-Indigenous Australians.¹²⁵ The poorest utilisation of Medicare funded services by Indigenous Australians compared with non-Indigenous Australians was for referred services such as specialists and imaging, and for allied health and dental services. Similarly, PBS spending per head for Indigenous Australians was about 40% lower than for non-Indigenous Australians.¹²⁵

Over two-thirds of total recurrent health expenditure can be allocated to specific disease categories.⁴⁸ This expenditure includes admitted patient services, out-of-hospital medical services, dental and optometric services, prescription pharmaceuticals, community mental health services, public health screening and research. In 2004–05 (the most recent data available), \$52,700 million of national expenditure could be allocated to 18 major disease categories.⁴⁸ Cardiovascular disease was the largest area of health

expenditure (\$5,942 million), with 50% spent on providing hospital services, 28% on pharmaceuticals, 19% on out-of-hospital medical services and the remaining 3% on research. Oral health expenditure was the second largest (\$5,305 million) and was almost entirely for out-of-hospital dental services (95%). For Indigenous Australians in 2006–07 the highest proportion of admitted patient expenditure was for genitourinary diseases (mainly renal dialysis), followed by mental and behavioural disorders and maternal conditions.¹²⁶ In contrast, using the same methodology, the highest proportion of admitted patient expenditure for non-Indigenous Australians was for cardiovascular disease, unintentional injuries and diseases of the digestive system.

Communicable diseases and maternal and neonatal conditions accounted for 7.1% of national allocated health expenditure in 2004–05 and caused 4.8% of disease burden (Table 2, page 15).¹¹² Injuries accounted for 6.5% of national expenditure and 7.1% of disease burden, while non-communicable diseases (largely chronic conditions) accounted for 86% of expenditure and 88% of disease burden. There is no single definition of chronic disease and this report (page 131) is largely based on the burden of disease approach, which is not consistent with the definition used in the 2008 Chief Health Officer report.¹²⁷

Cardiovascular disease, although the largest area of expenditure nationally and one of the most expensive per person (about \$300 per person in 2004–05), has a high degree of preventability. About two-thirds of cardiovascular disease in Queensland was largely due to the joint effect of seven modifiable risk factors in 2007, similar to the national proportion in 2003.^{88,128} In the delivery of health services, there is often a continuum of care varying from interventions for populations to treatment of individuals. Prevention services are delivered across the continuum and include one-on-one services by a GP as well as public health programs. Furthermore, prevention and promotion services are provided in a range of settings by a number of agencies including state and local governments, non-government organisations, community groups and industry. Given this diversity, it is difficult to make a full assessment of expenditure for such services.

Table 5: Medicare expenditure by area of expenditure, Queensland residents, 2008–09⁴⁵

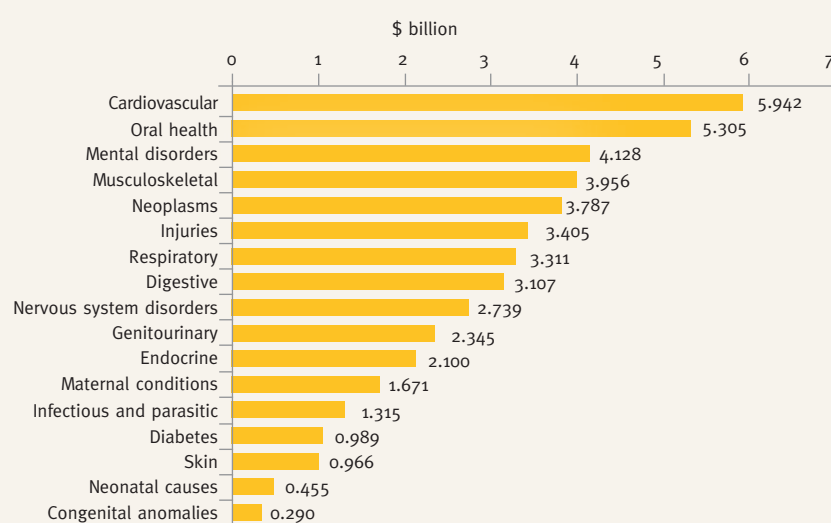
Area of expenditure	% of total (\$3,487 million)
In-hospital	27.6
Public hospitals	2.8
Private hospitals	24.8
Out-of-hospital	67.2
General practitioners	29.6
Specialists	16.1
Imaging/pathology	21.6
Allied health services	3.1
Optometrical services	2.0
Total	100.0

The greatest proportion of recurrent health spending occurs in older age groups—50% of total allocated national health expenditure was spent on providing health services for people aged 55 years and older in 2004–05. The highest spending per head was for people aged 85 years and older, more particularly for older males (Figure 6). Average spending per person for those aged 75 years and older was about 8 times the spending for those aged 5–24 years, excluding spending on maternal services. However, the international evidence, which includes Australia, is that health spending is between 3 and 13 times higher in the last year of life than for the rest of life.^{129–131} The relative difference in spending between countries in this last year of life reflects in part where the healthcare is provided, such as in a nursing home, hospice or other care, in contrast to the acute care setting.

Considering hospital costs alone, care of people aged 65 years and older in their last year of life accounted for 8.9% of all hospital costs in New South Wales in 2002–2003.¹³² The highest per capita spending in the last year of life was for people aged 65–74 years (\$17,927) and spending decreased with age to \$7,028 for those aged 95 years and older. Average inpatient costs increased greatly in the six months before death, from \$646 per person in the sixth month before death to \$5,545 in the last month. Cardiovascular diseases (43% of all deaths) were associated with an average of \$11,069 inpatient costs, while cancer (25% of deaths) accounted for \$16,853. The highest average inpatient cost in the last year of life was for genitourinary system diseases (\$18,948). While these data are for New South Wales, similar differentials and costs are likely for Queensland.

In summary, investment is essential to improve health and reduce inequalities. It is evident that spending on health in Australia

Figure 5: Total allocated expenditure by disease, Australia, 2004–05⁴⁸

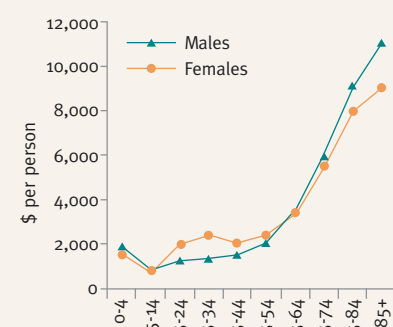


is effective—in 2010 Australia was ranked twentieth among OECD countries for health spending as a proportion of GDP, but fourth highest for life expectancy in 2009. Most health spending is derived from government sources with the Australian Government accounting for 44% of health expenditure in Queensland in 2010–11. Most is spent on providing hospital services, general practice medical services and pharmaceuticals. Individuals contribute 18% to total recurrent expenditure in out-of-pocket expenses and nearly half of this is for medications.

The focus of health spending in Australia is on the treatment of disease. Less than 2% is spent on public health (page 131), the largest component being for organised immunisation (32%).¹³³ Many of the main areas of health expenditure provide substantial opportunities for prevention of disease. For example, the effect of poor diet, physical inactivity and smoking are known factors in the development of cardiovascular disease and some cancers so initiatives to change these behaviours are warranted.

The Australian community supports prevention as a mechanism to improve health, and public spending on prevention services.¹⁸ To achieve change, appropriate funding is needed and so is appropriate integration of prevention services throughout the whole health system.

Figure 6: Total allocated expenditure per person by age, Australia, 2004–05⁴⁸



Burden of disease for all Queenslanders

The most recent available data on the assessment of burden of disease and injury in Queensland are for 2007.⁶⁶ In 2012, the first analysis for Indigenous Queenslanders was undertaken (page 24).²⁴ In 2007, it was estimated that over half a million years of healthy life were lost due to the burden of disease and injury in Queensland. More detailed analyses for Queensland as well as regional reports are in other Queensland Health documents.^{66,88,112,134-138}

Burden of disease is measured using the Disability Adjusted Life Year (DALY). The DALY combines fatal and non-fatal outcomes into a single measure by summing years of healthy life lost to disability (YLD) and years of life lost due to premature death (YLL).¹²⁸ In 2007 just over half (54%) of the total disease and injury burden was due to non-fatal health outcomes, with the remaining 46% due to fatal outcomes (Figure 7).

The vast majority of burden was caused by non-communicable diseases (88.1%), 7.1% was caused by injuries, and 4.8% for communicable, maternal, neonatal and nutritional conditions. Of the broad cause groups, cancers caused the greatest proportion—about a fifth or 18.6% of burden in 2007 (Figure 7). Cardiovascular disease, mental disorders, and nervous system and sense organ disorders were the next three leading broad cause groups. Along with cancer, these four broad cause groups accounted for 60% of the total burden in 2007.

The distribution of burden between fatal and non-fatal health outcomes varied considerably between the leading broad cause groups (Figure 7). Fatal outcomes dominated the cancer and cardiovascular burden causing 80% and 75% respectively. This contrasts with mental disorders, and nervous and sense organ disorders where just 6% and 19% respectively were due to fatal outcomes and the remaining due

to disability. Of the leading broad causes of burden, only mental disorders were dominated by female burden—just over half.

The leading specific causes of disease and injury burden in 2007 were coronary heart disease, anxiety and depression, and type 2 diabetes.¹³⁴ The three leading specific causes of fatal burden were coronary heart disease (14.7%), lung cancer (7.1%) and stroke (6.4%). The three leading non-fatal specific causes were anxiety and depression (14.3%), type 2 diabetes (7.9%) and adult onset hearing loss (5.6%) and these accounted for over a quarter of the years of life lost due to disability or non-fatal health outcomes.

Age and sex

The distribution of burden between fatal and non-fatal outcomes varied by age (Figure 8).¹³⁵ Unsurprisingly, the largest proportion of burden attributed to fatal outcomes was in the oldest age group (65 years and older) while the lowest fatal burden rate was in the 15–24 year age group. The proportion of burden experienced by males was disproportionate to the population, where 49.9% were male but they experienced 52.7% of the burden. Male excess was evident in all age groups (Figure 8).

In the age group 0–14 years, almost three-quarters of the burden was due to non-fatal health outcomes. This is a reflection of the type of conditions that caused the greatest amount of burden in this age group: asthma (16%), anxiety and depression (11.2%), and low birth weight (7.7%)—all conditions that have ongoing associated disability but relatively low case fatality. The leading broad cause groups in this age group were mental disorders (22.8%), chronic respiratory disease (16.8%) and neonatal causes (16.1%).

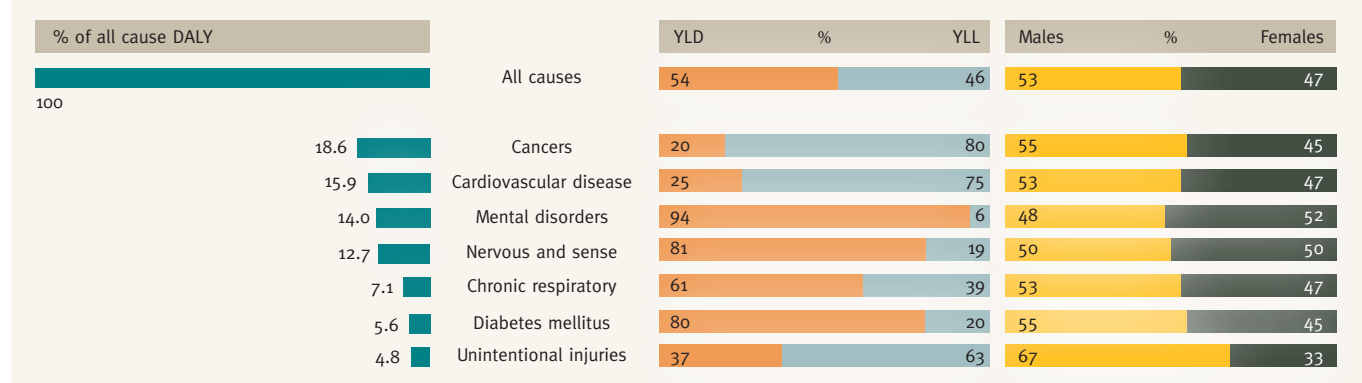
In the age group 15–24 years, burden was also dominated by disability or non-fatal causes (79%). Almost half of the burden experienced by this age group was due to mental disorders (48.9%), the two leading specific causes being anxiety and depression (25.1%) and schizophrenia (7.3%). Unintentional injuries also caused a large proportion of burden (11.9%). The specific causes that were responsible for the third and fourth largest proportion of burden were road traffic injury (6.2%) and suicide and self-inflicted injuries (4.9%).

Mental disorders and unintentional injuries remained the leading broad cause groups in the 25–44 year age group, causing 31.0% and 9.3% of burden respectively. However, this is the age group where the emergence of cancers as a major cause of burden becomes evident. Cancer was the third leading broad cause group in this age group, responsible for 9.2% of burden. Of the specific causes, anxiety and depression (18.6%), suicide and self-inflicted injury (5.9%) and type 2 diabetes (5.7%) were the three leading causes.

The leading broad causes changed markedly in the 45–64 year age group, with mental disorders no longer in the top three broad cause groups and those associated with lifestyle and ageing gaining prominence. Cancer was the leading broad cause, contributing 28.2% of burden. Cardiovascular disease was second, and nervous and sense organ disorders were third, contributing 14.0% and 11.4% to the burden respectively. The leading specific causes were type 2 diabetes (8.4%), coronary heart disease (7.6%), and anxiety and depression (5.8%). Just over half the burden was associated with non-fatal health outcomes.

In the 65 years and older age group, fatal outcomes dominated the burden at 61%. Cardiovascular disease caused the largest

Figure 7: Burden of disease and injury by leading broad cause groups, Queensland, 2007⁶⁶



proportion of burden (27.4%), followed by cancer (22.9%) and nervous system and sense organ disorders (18.6%). The specific causes responsible for the greatest disease and injury burden were coronary heart disease (15.3%), dementia (18.6%) and stroke (7.1%).

Differentials

There are large differentials in the disease and injury burden experience within the Queensland population.¹³⁶ The latest analyses of burden for population groups are for 2006 and are based on Indigenous status, socioeconomic disadvantage and remoteness (Figure 9). As socioeconomic disadvantage increased so too did the rate of burden: those in the most disadvantaged areas had a burden rate 42% higher than the most advantaged areas. Assuming that the burden rate in the most advantaged areas prevailed across the whole population, 24.7% of total burden in 2006 could be considered excess as a result of socioeconomic disadvantage. There are real opportunities for total health gain if the difference in burden between advantaged and disadvantaged populations is addressed. The greatest relative difference in population groups was the burden for Indigenous Queenslanders which was double that for non-Indigenous Queenslanders in 2006 and 2.1 times in 2007 based on the specific study for Indigenous Queenslanders (pages 24,25).²⁴ The burden rate increased outside major cities: in regional areas it was 12% higher, and in remote areas it was 50% higher.

Projections

On the assumption that past trends will continue into the future, the burden rate is projected to decrease by 8.1% between 2007 and 2016 (Table 6).¹³⁷ However, due to population growth and ageing the total burden of disease and injury (that is DALYs, not DALY rates) in Queensland is projected to increase by 19%. Cancer, nervous system and sense organ disorders, and diabetes are the largest contributors to the projected increase in burden. Cancers are projected to remain the leading broad cause group, with nervous system and sense organ disorders overtaking cardiovascular disease to become the second leading broad cause group in 2016. The rate of diabetes burden is projected to increase by 17.3%, greater than for any other broad cause. The greatest improvement in rate of burden is projected to be for cardiovascular disease, which is estimated to decrease by 26.4%.

Overall, the rate of years of life lost due to fatal outcomes is projected to decrease by almost one-fifth over the 10-year period (Table 6). However, the actual number of years of life lost due to fatal outcomes is expected to increase by 10%. Although the fatal burden rate from cancer is projected to decrease 12.4% by 2016, cancer will remain the leading cause of years of life lost between 2007 and 2016.

The non-fatal burden rate is projected to increase by 1.1% between 2007 and 2016, while for years lost due to non-fatal outcomes the projected increase is 27% (Table 6). The three leading broad cause groups associated with the increase are nervous system and sense organ disorders (15.5%), diabetes (12.0%) and cancer (8.4%).

Figure 8: All-cause burden of disease, YLL, YLD and sex distribution by age group, Queensland, 2007⁶⁶

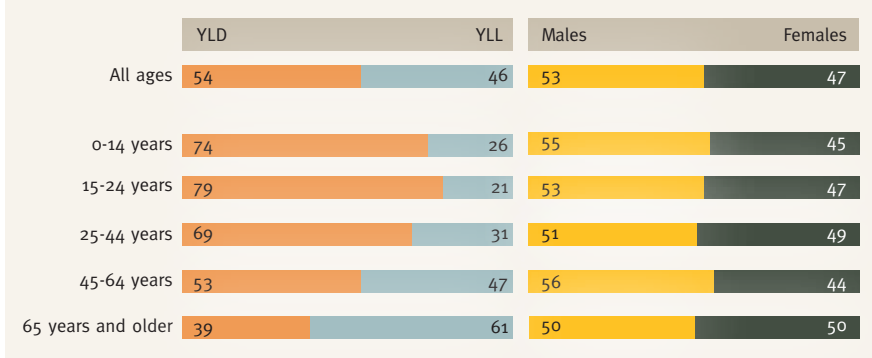
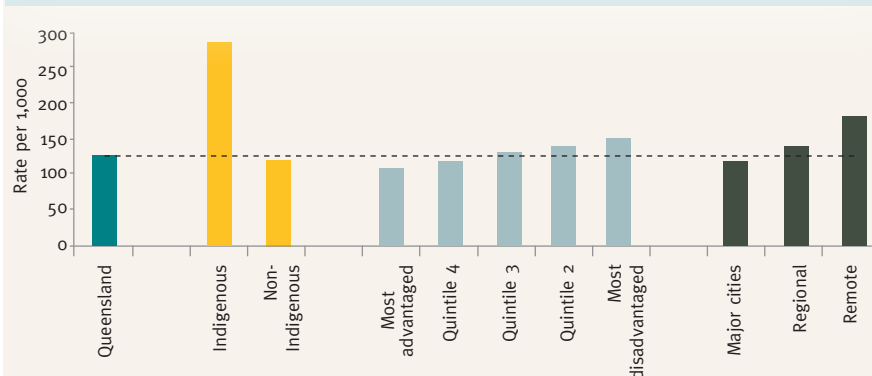


Figure 9: Burden of disease and injury rate by Indigenous status, socioeconomic status and remoteness. Queensland, 2006¹³⁶



Risk factors

An estimated 31% of the total burden of disease and injury in Queensland in 2007 was due to the joint effect of 13 modifiable risk factors, which means there is substantial potential for health gain.⁸⁸ High body mass was the largest single contributing risk factor at 8.5% of the total burden, followed by tobacco and physical inactivity at 7.2% and 6.4% of burden respectively.

For females, high body mass was the leading risk factor at 8.3% (Figure 10). Physical inactivity and high blood pressure were responsible for 6.7% and 5.6% of female burden respectively followed closely by tobacco smoking.

For males, tobacco smoking remained the leading risk factor in 2007, responsible for 8.8% of male burden (Figure 10) and closely followed by high body mass (8.7%). Physical inactivity was the third leading cause of male burden (6.2%).

The combined impact of risks related to food and nutrition is of major interest but has not yet been systematically assessed in Queensland or elsewhere. However, based on a joint effects analysis of physical inactivity, low fruit and vegetable consumption, high cholesterol, high body mass and high blood pressure, 16.0% of the total burden in Queensland was attributed to this group of risk factors in 2007.^{62,66,88}

Figure 10: Burden of disease and injury due to major risk factors, by sex, percentage, Queensland, 2007⁸⁸

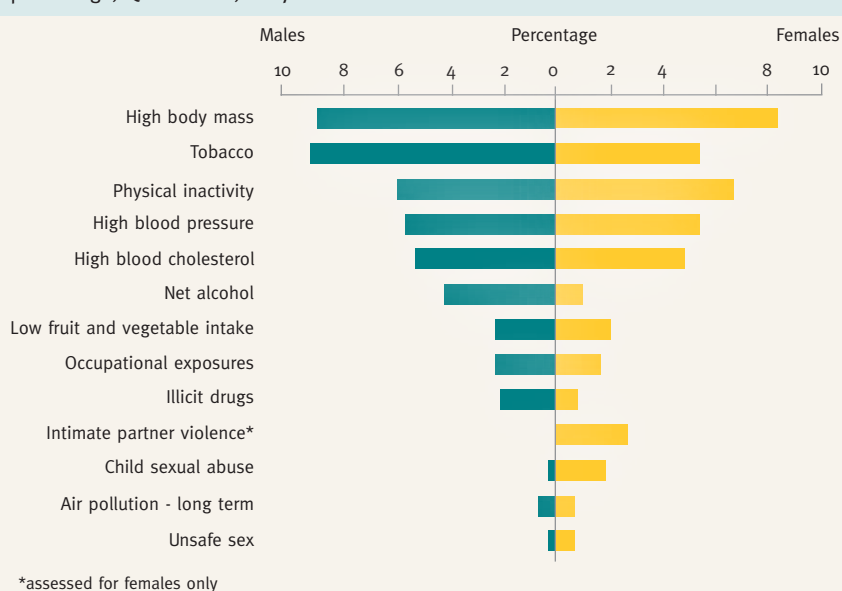


Table 6: Selected burden of disease indicators, Queensland, 2007 and 2016 projection¹³⁷

Condition	% of total	Rank	% of total	Rank	% age standardised rate change		
					DALY	YLL	YLD
Cancer	18.6	1	19.0	1	-9.9	-12.4	0.4
Cardiovascular disease	15.9	2	13.8	3	-26.4	-30.9	-12.5
Mental disorders	14.0	3	13.7	4	-0.3	-16.8	0.9
Neurological disorders	12.7	4	14.3	2	-1.1	-15.4	2.3
Chronic respiratory disease	7.1	5	6.9	6	-11.2	-18.5	-6.6
Injuries	7.1	6	6.0	7	-15.8	-19.7	-5.2
Diabetes mellitus	5.6	7	7.1	5	17.3	2.0	21.1
Musculoskeletal diseases	4.3	8	4.8	8	2.2	3.4	2.2
Diseases of the digestive system	2.5	9	2.3	10	-16.1	-37.7	1.7
Genitourinary diseases	2.3	10	2.5	9	-1.1	-8.6	2.6
Other	10.0	-	9.8	-	-5.9	-13.0	0.0
All causes	100.0	-	100.0	-	-8.1	-18.8	1.1

Burden of disease for Indigenous Queenslanders

The burden of disease and injury for Indigenous Queenslanders was 2.1 times that of non-Indigenous Queenslanders in 2007 (rate ratio), based on updated models and more recent data than that used in the previous section.^{24,136} The updates included new life tables for Indigenous Queenslanders by remoteness categories, cause of death data for 2007, new explicit disease models for anxiety and depression, COPD, asthma, coronary heart disease, hypertensive heart disease, non-rheumatic valvular disease, peripheral vascular disease, and revised prevalence estimates for the risk factor models (except cholesterol, blood pressure, intimate partner violence and child sexual abuse). These technical limitations limit the comparability with the analysis reported in the previous section (pages 21–23). This 2012 analysis of the burden of disease and injury for Indigenous Queenslanders is the first major study of this important population health measure for the Indigenous population of Queensland, and will be extensively reported elsewhere.¹³⁹

The life expectancy for Indigenous Queensland males was 68.3 years and for females 73.6 years in 2005–2007, compared to 78.6 years and 82.5 years for non-Indigenous Queenslanders.¹⁴⁰ The health adjusted life expectancy (HALE) in 2007 was 61.2 years for Indigenous Queenslanders and 73.5 years for non-Indigenous Queenslanders.²⁴

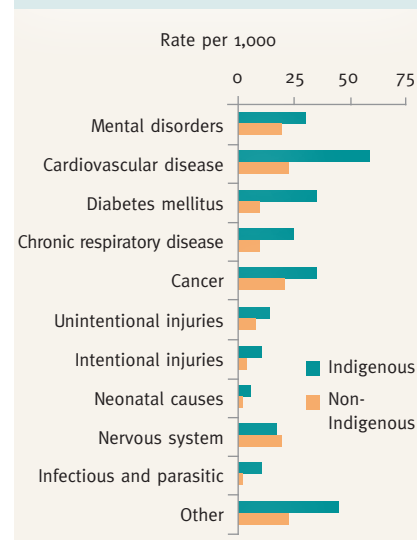
For Indigenous Queenslanders, the vast majority of burden in 2007 was caused by non-communicable diseases (76.8%), 11.6% was caused by injuries and 11.6% by communicable diseases and maternal, neonatal and nutritional conditions, compared with 88.3%, 7.0% and 4.8% respectively for the non-Indigenous population. The profile of leading causes of burden was markedly different for Indigenous and non-Indigenous Queenslanders. For Indigenous Queenslanders,

of the broad cause groups, mental disorders caused the greatest proportion—about a sixth or 17.2%, of burden in 2007. At 14.8%, cardiovascular disease was the second largest cause, then diabetes which, at 9.8%, was about twice that of the non-Indigenous population (5.6%). Chronic respiratory disease and cancer were the next two leading broad cause groups—the proportion due to cancer in Indigenous Queenslanders was about half that of the non-Indigenous population. Anxiety and depression, and type 2 diabetes both caused about 10% of the burden and were the largest specific causes of burden for Indigenous Queenslanders.

While the burden rate for Indigenous Queenslanders was 2.1 times that for non-Indigenous people, this difference varied markedly between broad causes (Figure 11). The greatest rate differences were diabetes, where the burden rate for Indigenous Queenslanders was 4.7 times that of non-Indigenous people, cardiovascular disease at 2.8 times and chronic respiratory disease 2.7 times. These were the major causes of inequality and, of note, were largely lifestyle related conditions. The intentional injury burden for Indigenous people was 3 times the non-Indigenous burden.

The burden of disease and injury for Indigenous Queenslanders begins much earlier in life than for the non-Indigenous population (Figure 12). This younger burden profile was principally due to the excess burden of chronic disease in the Indigenous population. For example, the burden rate for Indigenous Queenslanders was 1.8 times the non-Indigenous rate in the age group 0–4 years, and although decreasing in the 5–19 age group, it was 2.0 times in the 20–29 age group, and 2.7 times in the 35–54 age group. Among these young to middle-aged adults, the major causes of the difference were cardiovascular disease, diabetes and chronic

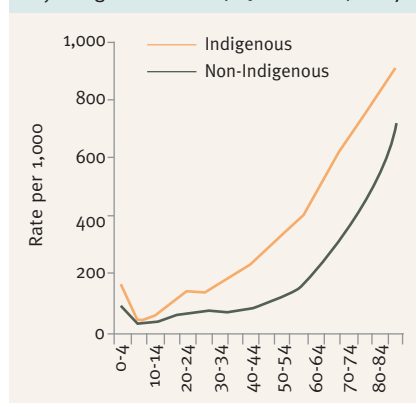
Figure 11: Burden of disease and injury (rate) by broad cause and Indigenous status, Queensland, 2007



respiratory disease. Nearly half (45%) of the burden due to type 2 diabetes was in the age group 25–49 years, as was 41% of the coronary heart disease and 59% of the COPD burden. In contrast, for the non-Indigenous population 28% of the diabetes burden, 9% of coronary heart disease and 19% of COPD burden were in these age groups.

For Indigenous Queenslanders, the burden rate in remote areas was about 50% higher than in major cities and in regional areas it was 30% higher. While the excess burden in regional and remote areas of the state was similar for most broad causes, the burden rate due to intentional injury in remote areas was 4 times that of major cities and in regional areas it was double (Figure 13). The burden due to unintentional injury and to diabetes were each at least twice as high in remote areas as major cities.

Figure 12: Burden of disease and injury by Indigenous status, Queensland, 2007



The burden of disease and injury rate in Indigenous Queenslanders was 2.1 times the non-Indigenous rate in 2007.²⁴

The burden rate for Indigenous Queenslanders was higher outside major cities—by 30% in regional areas and by 50% in remote areas in 2007.²⁴

The epidemic of diabetes for Indigenous Queenslanders is having a significant impact on the health of the population. It is estimated that there were 1,077 new cases of type 2 diabetes in Indigenous Queenslanders in 2007 or about three new cases per day on average. This compares with about 55 new cases diagnosed per day in the non-Indigenous Queensland population in 2006, with about 60 cases per day for the total Queensland population. There were 13,430 prevalent cases of type 2 diabetes among Indigenous Queenslanders in 2007, compared to 205,800 cases of non-Indigenous Queenslanders in 2006.

Risk factors

High body mass caused 12.1% of the burden of disease and injury for Indigenous Queenslanders (Table 7), and was the largest cause of burden. Tobacco smoking at 11.6% was the second largest cause, followed by physical inactivity at 7.9%.

Eleven modifiable risk factors jointly explained 36.1% of the burden of disease and injury for Indigenous Queenslanders in 2007 (Table 7). This is similar to the 31% of burden explained by 13 risk factors for the total population in 2007, noting the methodological differences between the two studies (page 24).⁸⁸ Considering individual risk factors and diseases, the impact of tobacco smoking on health outcomes for Indigenous Queenslanders was markedly greater than for the non-Indigenous population, reflecting the much higher smoking rate for Indigenous people. Tobacco caused 31.9% of the cancer burden and 33.7% of the cardiovascular burden for Indigenous Queenslanders, about 3 times the impact on cardiovascular disease and 30% greater impact on cancer than for the non-Indigenous population. Three-quarters of the burden of diabetes (72.7%) was due to high body mass and physical inactivity, and contributed to the much higher diabetes burden for Indigenous Queenslanders—the burden rate was 4.7 times the non-Indigenous diabetes burden.

Figure 13: Burden of disease and injury by specific cause and remoteness, Indigenous Queenslanders, 2007

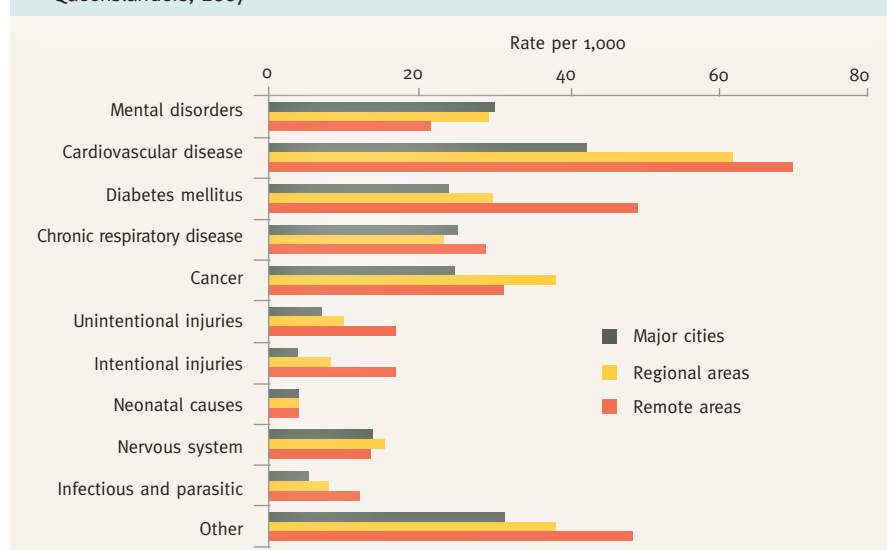


Table 7: Burden of disease and injury due to major risk factors, by sex, percentage, Indigenous Queenslanders, 2007

Risk factor	Broad cause group						All causes
	Cancer	CVD	Mental disorders	Neurological	Injury	Diabetes	
High body mass	3.4	34.7				67.8	12.1
Tobacco	31.9	33.7		-0.4	0.9		11.6
Physical inactivity	4.7	29.7				31.8	7.9
High blood cholesterol		30.9					4.6
Alcohol	8.1	-6.1	8.1		23.0		4.0
High blood pressure		25.9					3.8
Low fruit and vegetable intake	4.8	17.9					3.1
Intimate partner violence	2.3	2.5	7.6	0.0	6.8		3.0
Illicit drugs		0.0	10.1		3.1		2.8
Child sexual abuse	0.4	0.0	10.1		2.3		2.1
Unsafe sex	4.6						1.1
Joint	47.9	68.7	32.8	-0.4	32.4	72.7	36.1

This section reports on the deaths and hospitalisations in Queensland due to all causes (Figure 14). The death data is based on the underlying cause of death and includes the deaths of all Queensland residents in Australia as released by ABS.⁶³⁻⁶⁶ Hospitalisations are reported by principal diagnosis and are admissions to public and private hospitals, excluding psychiatric hospitals.¹¹³

The three largest broad causes of death in Queensland are circulatory disease, cancer and respiratory conditions, together accounting for 70% of all deaths in 2010. Digestive diseases were the leading broad cause of hospitalisation, followed by injury and pregnancy, together accounting for 22% of all hospitalisations in 2010–11.

A There were 27,289 deaths of Queenslanders in 2010, and 1.77 million hospitalisations in 2010–11. The male all-cause death rate was 45% higher than the female rate. While the male all-cause hospitalisation rate was 6.6% lower than the female rate, it was nearly 6% higher when hospitalisations due to pregnancy are excluded. The all-cause hospitalisation rate (overnight admissions) in Queensland in 2010–11 was similar to the national rate.¹⁴¹ The Australian discharge rate is about double that of Canada's, and another 14 OECD countries had lower rates than Australia.¹⁴²

B The male death rate was higher than the female rate at all ages—in the age group 25–34 it was up to 3 times the female rate. The median age of death for males in 2010 was 78.4 years and 84.2 years for females. The impact of pregnancy on hospitalisation rates for females is evident in the child bearing years, but this is outstripped by the male rate particularly from age 75 years (about 30% higher).

C The all-cause death rate decreased by 1.4% per year between 2000 and 2010. However, the all-cause hospitalisation rate increased by 1.3% per year between 2000–01 and 2010–11. The impact of rate increase is seen in substantially higher numbers of hospitalisations each year as a result of population growth and ageing and independent of these factors an increased utilisation of hospital services—between 2000–01 and 2010–11 there was a 62% increase in the number of hospitalisations or 4% per year, resulting in an increase of about 60,000 per year (Figure 1F, page 3). The change in hospitalisation rate was similar for males and females. The number of hospitalisations (admitted patient hospitalisations) in public and private hospitals in Queensland is projected to increase dramatically over the next 20 years from 1.77 million in 2010–11 to about 3.5 million in 2026–27.

D The all-cause hospitalisation rate was 10% higher in socioeconomically disadvantaged areas than in advantaged areas in the two-year period 2009–10 to 2010–11.

E The all-cause hospitalisation rate was higher in remote and very remote areas of Queensland than in major cities—17% higher in the two-year period 2009–10 to 2010–11.

F The all-cause hospitalisation rate for Indigenous Queenslanders was 2.1 times the non-Indigenous rate in

the two years 2009–10 to 2010–11. This was evident across all age groups, rising from about 10% higher in the age group 5–14 years to 3 times higher in the age range 45 to 64 years. However, in outer regional and remote areas the rate difference was much higher—3 to 4 times the non-Indigenous rate.

G The all-cause death rate in the two years 2006–2007 was 25% higher in the most disadvantaged areas than the most advantaged areas. On average about 2,200 premature deaths were due to disadvantage each year.

H All-cause death rates increased with increasing levels of remoteness. In remote and very remote areas, rates were 40% higher than in major cities in 2006–2007.

I There were 948 deaths of Indigenous Queenslanders registered in 2010, although it is likely that about 30% of these were associated with a lag in registration, the death having occurred in previous years.⁶⁵ More than half of the Indigenous deaths (56%) were males. The all-cause death rate for Indigenous Queenslanders was 2.7 times the non-Indigenous rate.⁶⁴ Life expectancy for Indigenous Queenslanders is lower than for others, with a gap of 10.4 years for males and 8.9 years for females (Table 1, page 4).

J Queensland's all-cause death rate in 2009–2010 was 2% higher than the Australian rate, 9% higher than for the jurisdiction with the lowest rate, the Australian Capital Territory, and third highest among the states and territories.

K On a global scale in 2004–2006 Queensland rated very well. When ranked against OECD countries, the all-cause death rate in Queensland was the fourth lowest after Japan, Australia and Switzerland.

L In 2007, more than half a million years of healthy life were lost due to the burden of disease and injury in Queensland. More than half of this burden was experienced by males (53%), and a greater proportion was due to disability or non-fatal outcomes (55%) than fatal outcomes. Almost a third of burden was due to the joint effect of 13 selected risk factors (31%).

Figure 14: All causes, selected indicators, Queensland



a) Rates are per 100,000 and directly age standardised to the total Australian ERP 2001. OECD rates are standardised to the OECD standard population 1980.
b) Death data are for 2010 except for OECD comparisons (2004-2006), interstate comparisons (2009-2010) and socioeconomic, remoteness and Indigenous status (2006-2007).
c) Hospitalisation data are for the financial year 2010-11 except for hospitalisations by socioeconomic status, remoteness and Indigenous status (2009-10 to 2010-11).
d) Burden of disease data are for 2007 with risk factor impact being the joint effect of contributing risk factors.

Avoidable deaths and potentially preventable hospitalisations

The majority of premature deaths in Queensland were avoidable. A premature death is defined as occurring in a person less than 75 years of age and in 2010, 39% of all deaths in Queensland were premature. Avoidable deaths are those premature deaths that were amenable to healthcare or were preventable.¹⁴³ Deaths in these two categories represented 26% and 43% respectively of all premature deaths in Queensland in 2010. The death data is based on the underlying cause of death and includes the deaths of all Queensland residents in Australia as released by ABS.⁶³⁻⁶⁶ Hospitalisations are reported by principal diagnosis and include admissions to public and private hospitals, excluding psychiatric hospitals.¹¹³

Potentially preventable hospitalisations (PPHs) are conditions where hospitalisation is thought to be avoidable if timely and adequate non-hospital care had been provided. There are, however, many more hospitalisations that could have been prevented if the disease or condition had been prevented in the first place.

A About two-thirds (68%) of premature deaths were considered avoidable in Queensland in 2010. Of the 10,544 premature deaths, 7,187 were avoidable, and of these 2,691 were amenable to healthcare and 4,497 could have been prevented from occurring in the first place. A greater proportion of avoidable deaths were male, 63%, and a greater proportion of the male avoidable deaths were preventable—68% compared to 54% of female avoidable deaths.

B The rate for preventable deaths is higher than for the healthcare amenable deaths in all age groups except 0–4 years. The pattern for both is similar except preventable death rates start to increase earlier, from 15–19 years, due to the very rapid rise in male preventable deaths. One in 5 of all male preventable deaths occurred in the age group 15–34 years, compared to 1 in 8 for female preventable deaths.

C The avoidable death rate decreased by 2.6% per year between 2000 and 2010, with greater decrease in healthcare amenable death rates (3.2% per year) than preventable death rates (2.1% per year).

D The avoidable death rate increased with increasing levels of socioeconomic disadvantage, the rate in the most disadvantaged areas was 74% higher than the most advantaged areas in 2006–2007. Of the 2,200 premature deaths associated with the socioeconomic gradient, about 77% were avoidable, demonstrating the potential to improve outcomes for Queenslanders through improved prevention and healthcare.

E Very remote areas of Queensland had the highest rate of avoidable deaths. The rate in very remote areas was more than double the rate in major cities in 2006–2007 and in remote areas it was about 70% higher.

F The avoidable death rate for Indigenous Queenslanders was more than 3 times the non-Indigenous rate in 2006–2007. About 70% of premature Indigenous deaths were avoidable.

G In Queensland there were on average 141,631 hospitalisations per year that were potentially preventable over the period 2009–10 to 2010–11 which equates to 8% of all

Queensland hospitalisations and was similar to the national rate (8.1%) in 2009–10.¹⁴⁴ The male PPH rate was 6% higher than the female rate. Chronic conditions were responsible for 52% of all PPHs, acute conditions 46% and vaccine preventable conditions 3%. Diabetes complications accounted for 29% of all PPHs in Queensland in the three years prior to 2009–10 and were the largest cause of chronic PPHs and largest specific cause overall. Due to recent changes in coding for diabetes and its complications, the last year of data is not comparable with previous years. The proportion of PPHs due to diabetes complications peaked in the age range 45–84 years especially for males aged 50 to 69 years where about 50% of PPHs were due to diabetes complications, compared with about 35% for similar aged females.

H There is a small peak in PPHs in early childhood, a secondary small peak in young women, and a dramatic increase in the older age groups. The female PPH rate is higher than the male rate in the age range from 10–14 years through to 45–49 years. About 1 in 8 (11%) PPHs occurred in the age group 0–9 years, and of these 27% were due to dental conditions, mainly dental decay.

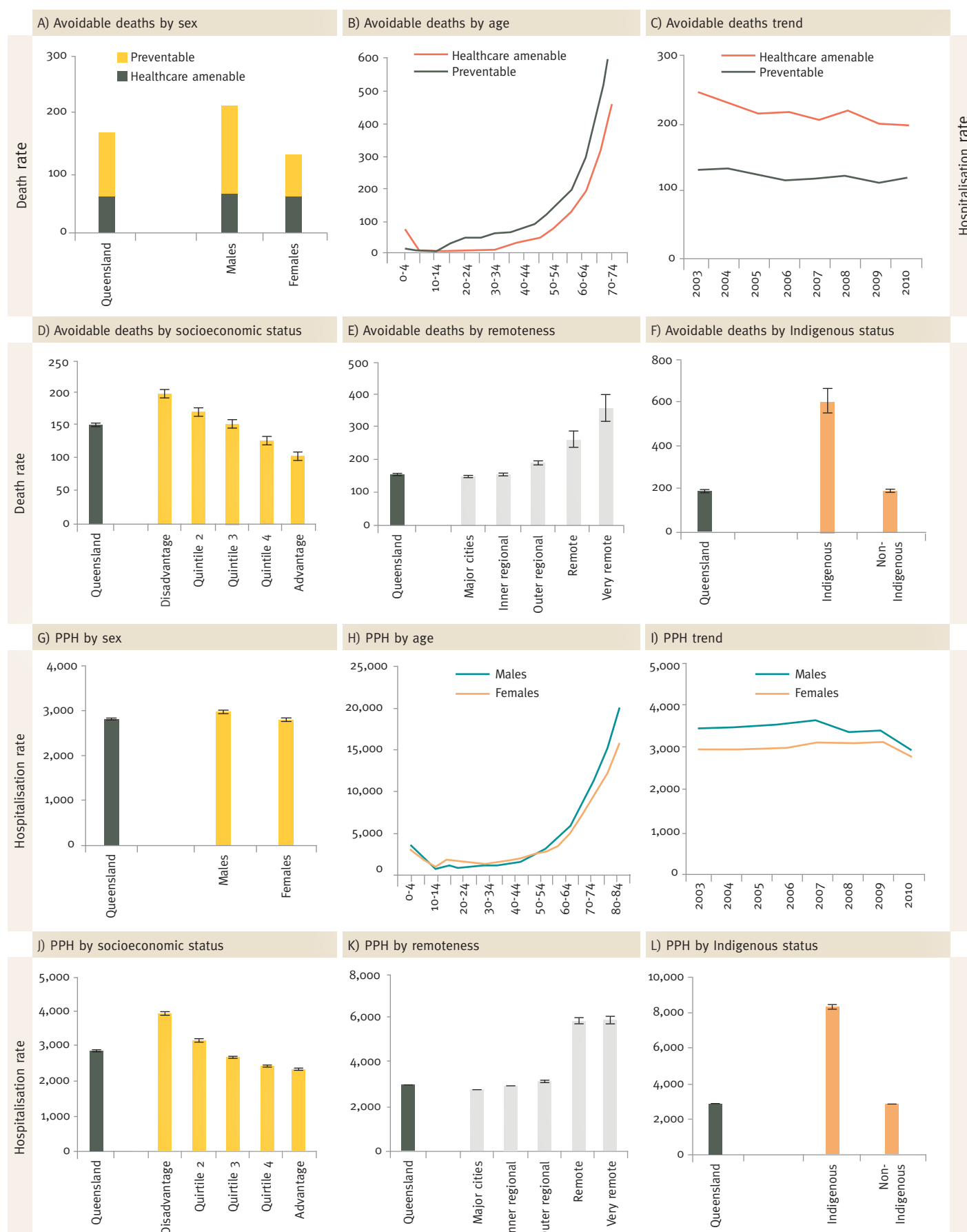
I PPH rates increased by 1.2% per year between 2000–01 and 2007–08 (similar for males and females). There were significant changes to the coding rules for diabetes complications in July 2008, limiting the comparability of data since then with earlier years.⁶²

J The PPH rate increased with increasing socioeconomic disadvantage. The rate in the most disadvantaged areas in 2009–10 to 2010–11 was 67% higher than the most advantaged areas. In 2007–08 this rate difference represented more than 32,000 excess hospitalisations in Queensland.⁶⁸

K The PPH rate was lowest in major cities in the two years 2009–10 to 2010–11. The rate in remote and very remote areas was more than twice that of major cities, and in 2007–08 this rate difference represented more than 12,000 excess hospitalisations.⁶⁸

L The PPH rate for Indigenous Queenslanders was 2.9 times the non-Indigenous rate in the two-year period, 2009–10 to 2010–11. In 2007–08 this rate difference represented nearly 5,000 excess hospitalisations.⁶⁸

Figure 15: Avoidable deaths and potentially preventable hospitalisations, selected indicators, Queensland



- a) Rates are per 100,000 and directly age standardised to the total Australian ERP 2001. OECD rates are standardised to the OECD standard population 1980.
- b) Death data are for 2010 except for state comparisons (2009-2010), OECD comparisons (2004-2006) and socioeconomic, remoteness and Indigenous status (2006-2007).
- c) Hospitalisation data are for the financial year 2010-11 except for hospitalisations by socioeconomic status, remoteness and Indigenous status (2009-10 to 2010-11).
- d) Trends in PPH need to be interpreted with caution due to changes in diabetes with complication coding over time.

All cancers and selected cancers

Cancer was the largest cause of premature death in Queensland (39% in 2010), the second largest cause of all deaths (30% in 2010), and the largest cause of total burden of disease and injury (19% in 2007).^{112,64} Common cancers are lung, breast, prostate, cervical, colorectal and melanoma (Figure 16, Figure 17). National screening programs have been developed for three of these cancers (pages 61 and 111). Lifestyle behaviours such as smoking (page 90), overweight and obesity (page 67), and physical inactivity (page 83) are critical risk factors for some cancers, jointly accounting for 35% of the total disease burden due to cancer in 2007.⁸⁸ About 25% of the projected number of cancer cases in Australia in 2025 could potentially be prevented through improvement in diet and physical activity.⁵⁵ The number of new cases diagnosed, termed the incidence of disease, is based on Queensland Cancer Registry data.^{47,54,145} Death data is from ABS and includes analysis undertaken and reported previously by Queensland Health.^{63,64,66}

The lifetime risk of a cancer diagnosis in Queensland males in 2009 was 1 in 2 and for females 1 in 3.⁴⁷ The lifetime risk of cancer death for males in 2008 was 1 in 5, and for females 1 in 9. Statistically, a lifetime was considered to be up to the age of 79 years. There was a 2.2% increase in the number of new cancer cases in Queensland each year between 1982 and 2008 (Figure 1B, page 2).⁵⁴ However, most of this increase was due to population growth and ageing. When adjusted for these two factors, the cancer incidence rate has remained stable over the past decade.⁵⁴ In contrast, the death rate decreased by 9% between 2000 and 2010.

A There were 8,260 deaths from cancer (malignant neoplasms) in Queensland in 2010, and 59% were male. The death rate in the most disadvantaged areas was 15% higher than in the most advantaged areas in 2006–2007.

B All-cancer death rates did not differ across areas of Queensland categorised by remoteness in 2006–2007.

C The death rate for all cancers in 2006–2007 was 26% higher for Indigenous Queenslanders than for others and remoteness made no difference to this relationship. As the incidence rate for Indigenous Queenslanders is lower, and the death rate is higher, it is evident that benefits of early diagnosis and effective treatment are not being achieved for Indigenous Queenslanders.

D The all-cancer death rate for Queensland was third highest of the states and territories in 2009–2010 and was 3% higher than the national rate.

E When compared to other OECD countries, Australia's all-cancer death rate in 2004–2006 was ranked sixth lowest and Queensland's rate was 57% higher than the best performing country, Mexico.

F There were 23,483 new cases of cancer diagnosed in 2009 and of these 64% were due to lung, colorectal, prostate, breast and melanoma cancers. These selected cancers accounted for 49% of all cancer deaths in 2010.

G Lung cancer accounted for 9% of all new cancers diagnosed and 20% of all cancer deaths, with 2,094 new cases of lung cancer in 2009 and 1,635 deaths in 2010. Male incidence rates were 56% higher than female rates and death rates were double. Of those aged 0–89 years diagnosed with lung cancer in the period 2005–2009, 12.1% of males and 14.3% of females could expect to live for at least five years, in the absence of other causes of death (relative survival).⁴⁷ The leading risk factor for lung cancer is tobacco smoking—81% of the burden in Queensland could be explained

by this single risk in 2007 (page 90).⁸⁸ Lung cancer death rates are higher in areas of socioeconomic disadvantage. If everyone had the same rates as those in the most advantaged areas, about 30% of premature lung cancer deaths could have been avoided in 2006–2007.⁶⁶

H Lung cancer primarily affects those in the older age groups with death and incidence rates peaking at age 80–84 years. However, the median age of diagnosis in 2008 was 70 years and 72% of deaths occurred at 65 years and older in 2009–2010.

I Lung cancer rates in males (incidence and death) have been falling steadily since the early 1980s, but the rate of new cases for females has increased and was 50% higher in 2008 than 20 years earlier.⁴⁷ The female death rate increased up to 2002, but has remained steady since. The male death rate decreased by 20% between 2000 and 2010. The rate of new cases diagnosed increased by 2.5% per year for females and decreased by 1.5% per year for males, between 1982 and 2008.

J There were 2,818 new cases of colorectal cancer in 2009 and 792 deaths in Queensland in 2010. The incidence rate among males was 35% higher than the female rate and the death rate was 46% higher. Of those aged 0–89 years diagnosed with colorectal cancer in the period 2005–2009, 65.2% of males and 68.2% of females could expect to live for at least five years, in the absence of other causes of death (relative survival).⁴⁷

K Colorectal cancer primarily affects older age groups with incidence and deaths increasing substantially from ages 45–49 years onwards. The median age of diagnosis in 2008 was 69 years and 73% of deaths occurred in people aged 65 years and older in 2009–2010. A national screening program currently targets people aged 50, 55 and 65 years and is further discussed on page 111.

L Colorectal cancer death rates declined by 36% between 2000 and 2010, or about 3% per year. The number of new cases has more than doubled since 1982–1986, although rates have not changed since 1995.^{47,145}

Figure 16: All cancers and selected individual cancer indicators, Queensland



- a) Rates are per 100,000 and directly age standardised to the total Australian ERP 2001. OECD rates are standardised to the OECD standard population 1980.
- b) Death data are for 2010 except for state comparisons (2009-2010), OECD comparisons (2004-2006) and socioeconomic, remoteness and Indigenous status (2006-2007).
- c) Hospitalisation data are for the financial year 2010-11 except for hospitalisations by socioeconomic status, remoteness and Indigenous status (2009-10 to 2010-11).
- d) Trends in PPH need to be interpreted with caution due to changes in diabetes with complication coding over time.

Cancer—continued

A There were 3,978 new cases of prostate cancer diagnosed in Queensland in 2009 and 686 prostate cancer deaths in 2010. Of those males aged 0–89 years diagnosed with prostate cancer in the period 2005–2009, 90.6% could expect to live for at least five years, in the absence of other causes of death (relative survival).⁴⁷ Population screening for prostate cancer is not recommended as the benefit for asymptomatic testing carries unacceptably high levels of risk associated with treatment (page 111).¹⁴⁶

B The incidence rate of prostate cancer rises dramatically after age 45–49 with the highest incidence and death rates occurring in those aged 85 years and older. However, 80% of new cases were diagnosed in the age group 55–79 (median age of diagnosis was 67 years) while 72% of deaths occurred in those aged 75 years and older.

C Since 1997, prostate cancer incidence rates increased by 4.2% per year.^{54,145} This increase can be partly explained by improved case detection through prostate specific antigen testing. There has been little change in prostate cancer death rates since 2005 although a downward trend was evident before then.

D There were 2,798 new cases of female breast cancer in Queensland in 2009, and 499 deaths in 2010. Male breast cancer represents less than 1% of all breast cancer cases diagnosed (26 in 2009) and also of deaths. The lifetime risk of a breast cancer diagnosis before 80 years of age was 1 in 9, in 2009.⁴⁷ Of those females aged 0–89 years diagnosed with breast cancer in the period 2005–2009, 88.7% could expect to live for at least five years, in the absence of other causes of death (relative survival).⁴⁷ BreastScreen Queensland is part of the national breast cancer screening program for women, targeting the age group 50 to 69 years and is further discussed on page 111.

E Incidence rates of female breast cancer peaked in the age group 65–69 years in 2009, and deaths peaked in those aged 85 years and older. However, 78% of new cases were diagnosed in women aged 40–74 years (median age of diagnosis was 59 years) and 79% of deaths occurred in those aged 55 years and older.

F The incidence rate of female breast cancer has not changed since 1999.⁵⁴ However, the number of new cases diagnosed each year is growing as the population increases and ages—a 35% increase in the past decade. There has been little change in female breast cancer death rates since 2006 although a downward trend was evident before then.

G In 2009, there were 3,060 new cases of melanoma in Queensland and 365 deaths in 2010. The male death rate was 2.1 times the female rate in 2010, while the male incidence rate was 50% higher in 2009. Of those aged 0–89 years diagnosed with melanoma in the period 2005–2009, 92.1% of males and 95.0% of females could expect to live for at least five years, in the absence of other causes of death (relative survival).⁴⁷ Ultraviolet radiation

(UV) exposure is recognised as the principal cause of 95% of melanoma and 99% of non-melanoma skin cancers in Australia.¹⁴⁷ In 2008, it was estimated that about 87,000 non-melanoma skin cancer cases were diagnosed in Queensland.¹⁴⁸ In 2012, 10.2% of adult Queenslanders self reported ever being diagnosed with skin cancer, 2.9% with melanoma, and 6.4% with non-melanoma skin cancer.¹⁴⁹ The prevalence of self reported skin cancer was 30% higher in males than females and increased with age, from 1 in 50 in those aged 16–34 years to 1 in 5 aged 55 years and older. Sun safety is a key health promotion priority in Queensland (page 113).

H Rates of melanoma incidence begin to climb from adolescence and peak in the oldest age groups. Of those diagnosed with melanoma in 2009, 14% were younger than 40 years, 46% were aged 40–64 years and the remaining 40% were older than 65 years (median age of diagnosis was 60 years in 2008). The death rate peaked in the age group 80 years and older in 2010 and although 62% of deaths occurred in older age groups (65 years and older), 9% occurred in people aged less than 40 years and 27% in those aged 40–64 years.

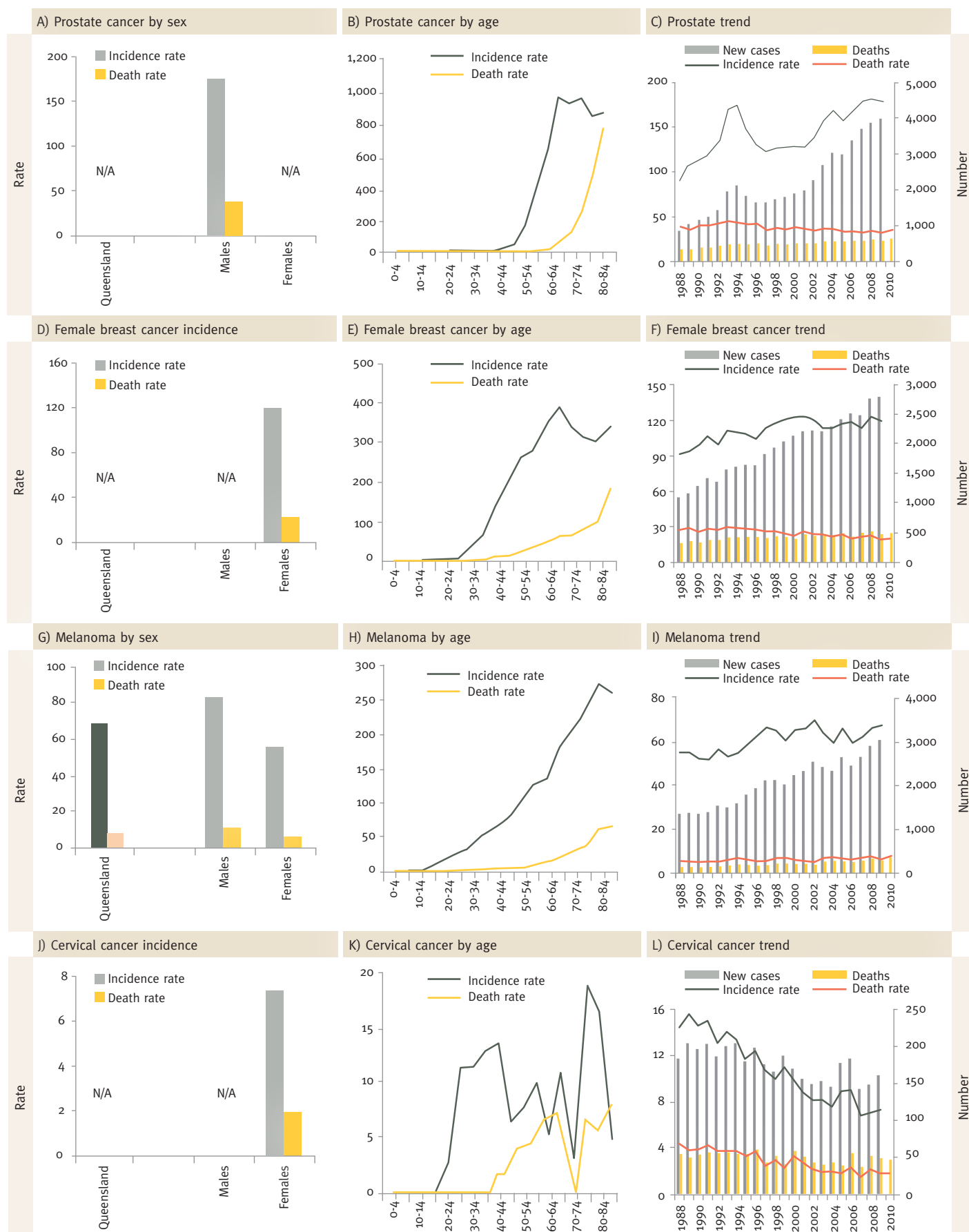
I Melanoma incidence and death rates have remained steady since 1997.⁵⁴ However, consistent with other reports, over recent years a downward trend in melanoma incidence is apparent for young people in Queensland aged 15–24 years and possibly for age groups up to 35 years.¹⁵⁰ This is in contrast with increasing rates among older people (75 years and older). In 2009, melanoma was the leading cause of new cancers diagnosed in young people aged 15 to 34 years, and in the age group 35 to 54 years along with breast cancer.⁴⁷

J In 2009, there were 163 new cases of cervical cancer diagnosed in Queensland, and 47 deaths. Of those females aged 0–89 years diagnosed with cervical cancer in the period 2005–2009, 75.3% could expect to live for at least five years, in the absence of other causes of death (relative survival).⁴⁷ A national cervical screening program recommends two-yearly Pap smears for women aged 20 to 69 years and this is discussed on page 111. A national vaccination program targeting girls aged 12–13 years was introduced in 2007 to prevent human papillomavirus (HPV) infection, a virus linked to cervical cancer (page 119).

K More than half of those diagnosed with cervical cancer in 2009 were aged less than 50 years (60%) and 1 in 7 were in their twenties. Incidence rates peaked in the age group 35–44 years and then again at 75–84 years, with median age of diagnosis of 43 years. Death rates for cervical cancer generally increased with age, although death from cervical cancer does occur in very young women (from 25 years of age in 2010).

L Between 1982 and 2002 the incidence rate for cervical cancer almost halved, but since this time has remained unchanged.⁴⁷ Death rates have been steady in the past decade.

Figure 17: All cancers and selected individual cancer indicators, Queensland (continued)



a) Rates are per 100,000 and directly age standardised to the total Australian ERP 2001. OECD rates are standardised to the OECD standard population 1980.

b) Death data are for 2010 except for OECD comparisons (2004-2006) and socioeconomic, remoteness and Indigenous status (2006-2007).

c) Incidence data are for 2009 unless otherwise noted; the age specific incidence rate is for 2008.

d) N/A: Not applicable

Coronary heart disease

Coronary heart disease (CHD) is the most common form of heart disease, accounting for 50% of all cardiovascular disease deaths and 15.8% of deaths from all causes in 2010.⁶⁴ In 2010, 1 in 4 CHD deaths was premature (26.7%) and CHD was the cause of 11% of all premature deaths. CHD is a major cause of death across many age groups—for people aged between 45 and 74 years in 2010, it was the second largest cause after cancers of the digestive system and for those aged 75 years and older it was the largest cause of death.⁶⁴ The death data is based on the underlying cause of death of all Queensland residents in Australia as released by ABS.^{63–66} Hospitalisations are reported by principal diagnosis and are for public and private hospitals, excluding psychiatric hospitals.¹¹³

About 70% of all heart disease deaths, including CHD, are due to the joint effect of modifiable physiological and lifestyle factors.⁸⁸ Australian guidelines for the assessment of cardiovascular risk have been developed to help GPs effectively manage patients. They recognise the combined effect of identified risk factors, their impact over time and the additional risk that can accrue due to multiple risk factors.¹⁵¹

A There were 4,314 deaths of Queenslanders due to CHD in 2010—2,317 males and 1,997 females. The male death rate was about 60% higher than the female rate. There were 31,304 hospitalisations per year between 2009–10 and 2010–11, and two-thirds (65%) were for males, with the male rate double the female rate.

B Death rates start rising from 60–64 years for males and 70–74 years for females, although CHD deaths do occur at much younger ages. In 2010 there were 504 deaths due to CHD in Queenslanders aged between 25 and 54 years, and 80% of these were males.⁶³ Hospitalisation rates rise steeply and steadily from age 35–39 years for males and some 10 to 20 years later for females—about 60% of hospitalisations are in the 55–79 year age group. The male hospitalisation rate remains higher than the female rate throughout, while death rates were similar in older age groups.

C Death and hospitalisation rates due to CHD are decreasing. Between 2000 and 2010, the death rate decreased by 43% or 4.9% per year. Although the male rate is substantially higher than the female rate, the rate of decline was similar for both. Longer term trends for CHD and stroke are shown in Figure 1A, page 2. Hospitalisation rates for CHD decreased by 24% between 2000–01 and 2010–11 or by 3% per year, similar for males and females.

D The death rate due to CHD was 24% higher in disadvantaged areas than in advantaged areas in 2006–2007. For premature CHD deaths, there was a greater socioeconomic differential with the rate in disadvantaged areas nearly double that in advantaged areas, resulting in about 300 excess deaths per year.⁶⁸

E In very remote areas, the CHD death rate was 40% higher than in major cities in 2006–2007. For premature deaths, there was a greater differential, with the rate in very remote areas 2.7 times that in major cities (2.3 times for females and 3.4 times for males), resulting in about 60 excess premature deaths per year in 2006–2007.⁶⁸

F CHD caused about 80 deaths of Indigenous Queenslanders per year in 2006–2007, and about 4,200 deaths of non-Indigenous Queenslanders. For Indigenous Queenslanders the

death rate was nearly double the non-Indigenous rate (about 80% higher) with a similar differential for males and females. Indigenous Queensland death rates were similar to non-Indigenous rates in major cities and inner regional areas but about double those in outer regional and remote areas. There were about 50 premature deaths per year of Indigenous Queenslanders due to CHD in 2006–2007, and about half could have been avoided if Indigenous death rates were as low as non-Indigenous rates.⁶⁸

G The CHD death rate in Queensland was 7% higher than the national rate in 2009–2010.

H Queensland had the second highest death rate for CHD of the states and territories in 2009–2010 after Tasmania.

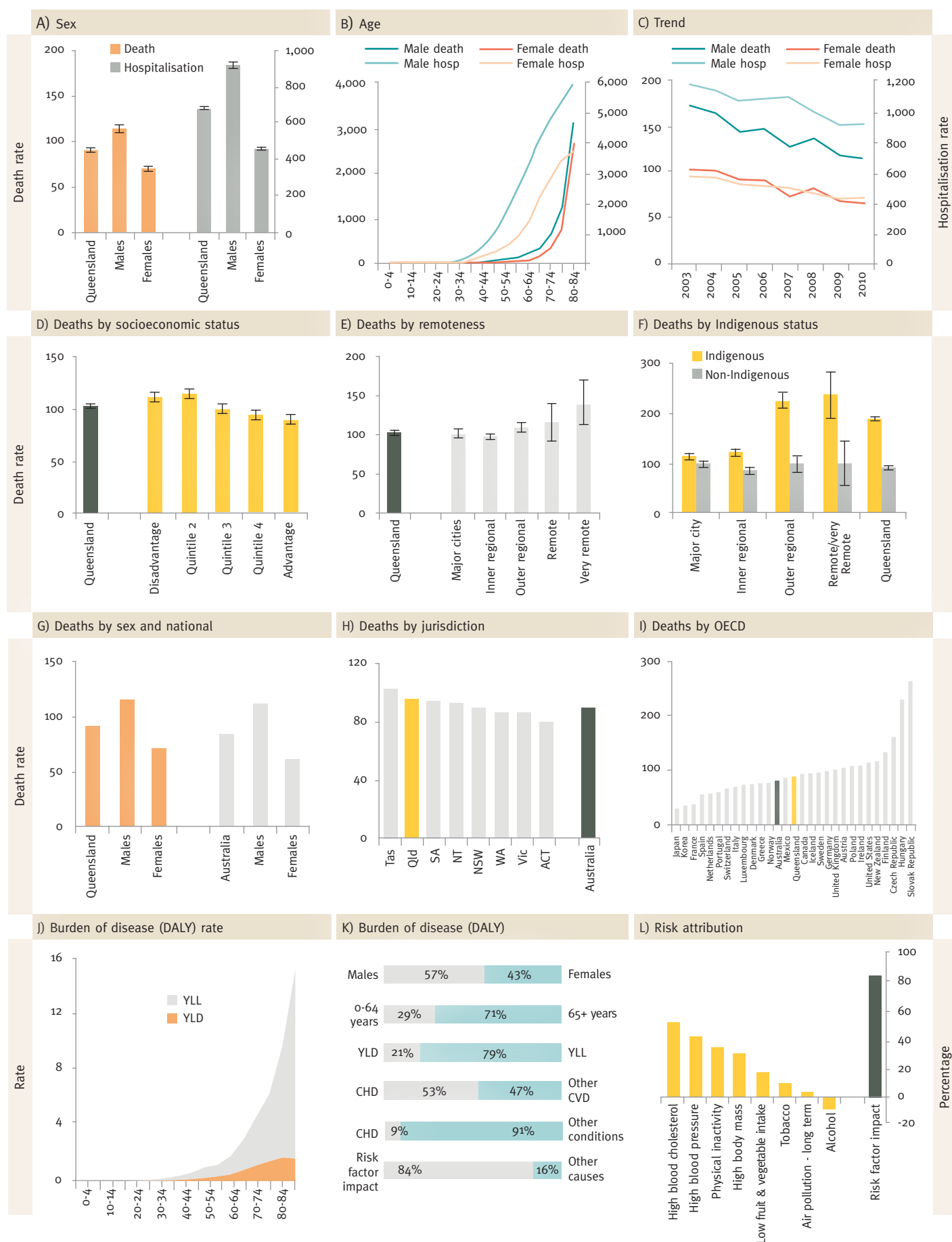
I Australia was middle ranking for CHD death rates among OECD countries, and Queensland was ranked fifteenth, the death rate being about 3 times higher than Japan, the best performing country in the period 2004–2006. Reduction in cardiovascular deaths will make the largest contribution to improvements in life expectancy. More than 2,000 deaths per year would be avoided if the rates of CHD in Queensland were as low as those in Japan.

J Most of the burden of disease (DALYs) due to CHD was associated with fatal outcomes (79%). The fatal burden (YLL) begins to increase in the early middle years (40–44 years) and rises steeply in older age groups. The non-fatal burden (YLD) increased after 55–59 years.

K Of the total burden of disease (fatal and non-fatal outcomes) due to CHD, 57% was associated with being male and 71% with being aged 65 years and older. In 2007, CHD accounted for 53% of the total cardiovascular burden and 9% of the total burden of disease and injury in Queensland, and 84% of the CHD burden could be explained by modifiable risk factors.

L The leading risk factors associated with CHD burden were high blood cholesterol, high blood pressure, physical inactivity, high body mass, low fruit and vegetable intake, and tobacco smoking.⁸⁸ The full impact of poor nutrition on CHD has not been assessed.

Figure 18: Coronary heart disease, selected indicators, Queensland



- a) Rates are per 100,000 and directly age standardised to the total Australian ERP 2001. OECD rates are standardised to the OECD standard population 1980.
- b) Death data are for 2010 except for OECD comparisons (2004-2006), interstate comparisons (2009-2010) and socioeconomic, remoteness and Indigenous status (2006-2007).
- c) Hospitalisation data are for the financial year 2010-11 except for hospitalisations by socioeconomic status, remoteness and Indigenous status (2009-10 to 2010-11).
- d) Burden of disease data are for 2007 with risk factor impact being the joint effect of contributing risk factors.

Stroke (also called cerebrovascular disease) is the second most common form of heart disease. It accounted for 25% of cardiovascular disease deaths and 8% of all deaths in Queensland in 2010. About 1 in 6 stroke deaths is premature (17.7%), that is, death in those aged 75 years or less.⁶⁶ The stroke death rate has declined over the last two decades due to research and improvements in prevention and clinical management. High blood pressure is the major risk factor for stroke (page 109).

The death data is based on the underlying cause of death and includes the deaths of all Queensland residents in Australia as released by ABS.⁶³⁻⁶⁶ Hospitalisations are reported by principal diagnosis and include admissions to public and private hospitals, excluding psychiatric hospitals.¹¹³

A There were 2,194 deaths of Queenslanders due to stroke in 2010—874 males and 1,320 females. Despite the larger proportion of deaths being female, the rate of death for both sexes was similar. There were 10,895 hospitalisations per year between 2009–10 and 2010–2011, with a similar proportion for both sexes. However, the male hospitalisation rate was 29% higher than the female rate.

B Death rates start rising from age 70–74 years, but death from stroke can occur in younger people. In 2010, 7% of deaths (161 deaths) occurred in people younger than 55 years, with a small number of these in teenagers and young people.⁶³ Hospitalisation rates rise steeply and steadily from age 60–69 years for males and females. The male hospitalisation rate is slightly higher than the female rate throughout, while male and female death rates are similar in older age groups.

C Death and hospitalisation rates due to stroke are decreasing. Between 2000 and 2010, the death rate decreased by 32% or 3.4% per year (similar decline for males and females). Longer term trends for stroke and CHD are shown in Figure 1A, page 2. Hospitalisation rates for stroke decreased by 10%, or 1.2% per year, between 2000–01 and 2010–11, 1.5% per year for males and 0.9% per year for females.

D The death rate for stroke in the whole population did not differ by socioeconomic status in 2006–2007, but for premature deaths, there was a socioeconomic difference—the rate in disadvantaged areas was 70% higher than in advantaged areas and was similar for males and females.

E The death rate due to stroke in remote and very remote areas of Queensland was similar to that in major cities in 2006–2007. However, for premature stroke deaths, the rate in remote and very remote areas was double that in major cities (1.6 times for females and 2.4 times for males).

F There were about 30 deaths of Indigenous Queenslanders due to stroke per year in 2006–2007, and about 2,200 for non-Indigenous Queenslanders. The stroke death rate for Indigenous Queenslanders was 40% higher than the

non-Indigenous rate but this difference was due entirely to the male Indigenous Queensland rate being double the non-Indigenous rate, while female rates were similar.

G The death rate for stroke in Queensland was 5% higher than the national rate in 2009–2010.

H Queensland had the third highest death rate for stroke among the states and territories in 2009–2010, after Tasmania and the Australian Capital Territory.

I Australia had the fifth lowest death rate for stroke among OECD countries, and Queensland was ranked in eighth position, with the Queensland rate about 40% higher than the best performing country (Switzerland) in 2004–2006.

J The greater proportion of burden of disease due to stroke was associated with fatal outcomes (71%). The fatal burden (YLL) begins to increase in the early middle years (40–44 years) and rises steeply from 70–74 years through to older age groups. The non-fatal burden (YLD) increased after 55–59 years.

K More than half the total burden of disease (fatal and non-fatal outcomes) due to stroke was for females (55%), and older people, with 68% in the 65 years and older age group. Stroke accounted for 26% of the total burden due to cardiovascular disease and 4% of the total burden of disease and injury in Queensland in 2007. Nearly 70% of the burden due to stroke can be explained by modifiable risk factors (69% in 2007).

L The leading risk factors associated with stroke burden were high blood pressure, high body mass, physical inactivity, high blood cholesterol, smoking, and low fruit and vegetable intake.⁸⁸ The full impact of poor nutrition on stroke has not been assessed.

Figure 19: Stroke, selected indicators, Queensland



- a) Rates are per 100,000 and directly age standardised to the total Australian ERP 2001. OECD rates are standardised to the OECD standard population 1980.
- b) Death data are for 2010 except for OECD comparisons (2004-2006), interstate comparisons (2009-2010) and socioeconomic, remoteness and Indigenous status (2006-2007).
- c) Hospitalisation data are for the financial year 2010-11 except for hospitalisations by socioeconomic status, remoteness and Indigenous status (2009-10 to 2010-11).
- d) Burden of disease data are for 2007 with risk factor impact being the joint effect of contributing risk factors.

Diabetes is a complex and chronic disease. Diabetes mellitus (diabetes) is used to describe a group of different disorders with common elements, including high blood glucose (sugar) levels and glucose intolerance, that are due to insulin deficiency, impaired effectiveness of insulin or both. About 190 new cases of type 1 diabetes are diagnosed each year in Queensland children 0–14 years, and about 260 in those aged 15 years and older.¹⁵² On average, about 3,300 new cases of insulin dependent type 2 diabetes were diagnosed each year over this period. The number of new cases of non-insulin dependent diabetes diagnosed is unknown but estimated to be about 20,000 each year or about 60 new cases per day.⁶⁶

Type 2 diabetes is highly preventable. Major risk factors are high body mass (page 67), physical inactivity including prolonged periods of sitting (page 83) and genetic predisposition.^{153,154} This section refers to type 1 and type 2 diabetes combined. The death data is based on the underlying cause of death and includes the deaths of all Queensland residents in Australia as released by ABS.⁶³⁻⁶⁶ Hospitalisations are reported by principal cause and are for public and private hospitals, excluding psychiatric hospitals.¹¹³

A In Queensland in 2010, there were 752 diabetes deaths and of these, 35% were premature. The proportion of diabetes deaths that were premature was higher for males than females, 40% compared with 29%. Diabetes represented 2.8% of all deaths in Queensland in 2010 and the male death rate was 28% higher than the female rate. In the two years 2009–10 to 2010–11, there were 12,617 hospitalisations per year in Queensland where diabetes was the principal diagnosis. For every one of these there were another four or five where diabetes was associated with the diagnosis but was not the principal cause, a total of about 60,000 hospitalisations per year. The male hospitalisation rate for diabetes as the principal cause was about 30% higher than the female rate.

B Death rates for diabetes rise steadily from age 60–64 years, the increase occurring at slightly younger ages for males than females. Hospitalisation rates are relatively low from childhood onwards with a marked increase at 50–54 years and highest rates in those aged 80–84 years, although half the hospitalisations were in the age group 50–79 years in 2010–11.

C The diabetes death rate has not changed in recent years. However, between 2000 and 2007 the rate of premature deaths due to diabetes declined by 4.9% per year. In contrast, the hospitalisation rate for diabetes increased by 10% per year between 2000–01 and 2007–08 with similar increases for males and females. A substantial change in coding practice for diabetes in July 2008 limits comparability over the full period.

D The diabetes death rate in 2006–2007 for people living in disadvantaged areas of Queensland was double that for advantaged areas. If the rates across Queensland were as low as those in advantaged areas there would have been 88 fewer premature diabetes deaths per year.⁶⁶

E The diabetes death rate in remote and very remote areas of Queensland was about 4 times the rate in major cities in 2006–2007. The rate in regional areas was similar to cities.

F In 2007, the diabetes death rate for Indigenous Queenslanders was 10 times the non-Indigenous rate—with this excess evident in cities as well as regional and remote areas, although the differential was greatest in remote and very

remote parts of Queensland. The prevalence of diabetes for adult Indigenous Queenslanders was at least double that of non-Indigenous Queenslanders, based on estimations in 2007, and about 30% higher for Indigenous Queenslanders in remote areas than those in major cities.^{24,155}

G Based on self report in 2012, 8.6% of adult Queenslanders have diabetes or high blood sugar.⁴ In 2000, by blood measurement, 6.8% were diabetic, with one undiagnosed case for every diagnosed case.¹⁵⁶ It is likely that there will be relatively fewer undiagnosed cases in 2012, but until data from the 2011 Australian Health Survey is released, the true prevalence of diabetes is unknown, and recognising that the most recent clinical measurement was more than 10 years ago.¹⁵⁷ Based on self report data over the past 12 years there has been a 35% increase in prevalence of adult diabetes.

H The death rate for diabetes in Queensland was similar to the national rate in 2009–2010. For females, the Queensland rate was third lowest among the states and territories, while for males it was fourth lowest.

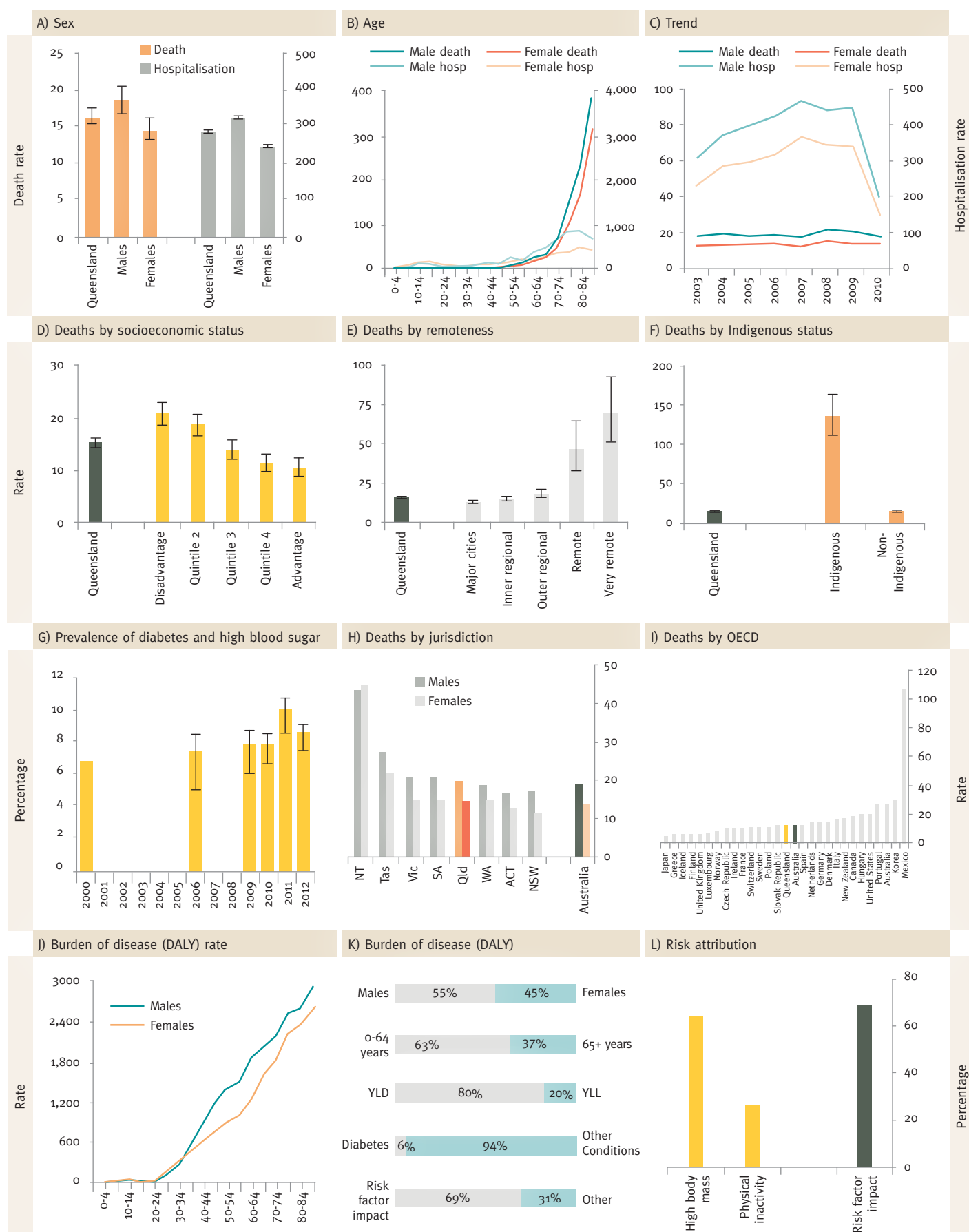
I Within the OECD, Australia was a middle ranking country for diabetes death rates in 2004–2006 and the rate in Queensland was more than double that of the best performing country, Japan.

J The burden rate (DALYs) for diabetes starts to increase rapidly among people in their twenties and steadily increases thereafter.¹³⁵ Diabetes was the eleventh largest specific cause of fatal burden in Queensland in 2007 and the second largest cause of disability burden.⁶⁶ The burden rate for diabetes is projected to increase by 17% between 2006 and 2016, the largest proportional increase of all diseases.¹³⁷

K A greater proportion of the total diabetes burden (DALYs) was for males (55%). For people younger than 65 years, 80% of burden was associated with disability. Risk factors accounted for 69% of the total burden.⁸⁸

L Type 2 diabetes is highly preventable and 69% of the total diabetes burden was due to the joint effect of high body mass and physical inactivity where high body mass has the dominant impact.⁸⁸

Figure 20: Diabetes, selected indicators, Queensland



- a) Rates are per 100,000 and directly age standardised to the total Australian ERP 2001. OECD rates are standardised to the OECD standard population 1980.
- b) Death data are for 2010 except for OECD comparisons (2004-2006), interstate comparisons (2009-2010) and socioeconomic, remoteness and Indigenous status (2006-2007).
- c) Hospitalisation data are for the financial year 2010-11 except for hospitalisations by socioeconomic status, remoteness and Indigenous status (2009-10 to 2010-11).
- d) Burden of disease data are for 2007 with risk factor impact being the joint effect of contributing risk factors.

Mental health and wellbeing

In this section two new mental health measures are reported in order to more broadly capture this complex concept—the Warwick Edinburgh Mental Well-Being Scale (WEMWBS) of positive mental health and the EQ-5D health related quality of life measure (page 103).¹⁵⁸ As in previous Chief Health Officer reports the Kessler 10 measure of psychological distress is included along with self reported quality of life, health and satisfaction with health. Leading mental disorders are also reported, particularly their impact on the hospital system.¹³⁴ Dementia has been included as it is categorised as a mental disorder under the International Classification of Diseases (ICD).¹⁵⁹ Hospitalisations are reported by principal diagnosis and are for public and private hospitals, excluding psychiatric hospitals.¹¹³

A In 2011, 15% of Queensland adults scored above average levels of positive mental health, 68% were in the average range and 17% below average.¹⁵⁸ Relatively more people in disadvantaged areas reported below average levels of positive mental health than those in advantaged areas—22% compared with 11%.

B About 1 in 7 adult Queenslanders reported high or very high risk of psychological distress in 2011 (14%), with similar risk levels for males and females, as well as across areas of socioeconomic status and remoteness.¹⁵⁸ Levels of risk were highest among younger people and decreased with age—from 16% in those aged 18–24 to 10% in people aged 75 years and older. Although trend data is limited, there is no evidence of change in the prevalence of high or very high risk of psychological distress since 2005 in Queensland or nationally.¹⁶⁰

C The majority of adult Queenslanders reported good or very good quality of life (91% in 2012), similar for males and females.⁴ Younger people reported highest levels of good or very good quality of life (96% of those aged 18–24 years), and older people reported lowest levels (83% of those aged 75 years and older). There is no evidence of change in the proportion of the population reporting good quality of life since 2002.

D In 2011, based on the EQ-5D, 16% of Queensland adults reported some problem with mobility or being confined to bed, 3% experienced problems or inability with self-care such as washing or dressing, 15% experienced some problem or inability performing their usual activities, 40% reported they were currently experiencing moderate or extreme pain or discomfort, 16% reported moderate or extreme anxiety or depression.¹⁵⁸ Apart from the prevalence of anxiety or depression, the proportion of the population reporting these problems increased with age.

E In 2012, 83% of Queensland adults reported their health to be excellent, very good or good.⁴ More younger than older people reported better health and those in socioeconomically advantaged areas were 11% more likely to report better health than those in disadvantaged areas. There was no difference based on remoteness, nor evidence of change in levels since 2002.

F In 2007, 47% of adult Queenslanders aged 16–85 years reported experience of a mental disorder in their lifetime, and 19% in the previous 12 months.¹⁶¹ Of these, the prevalence was about 20% higher in females than males, and decreased with age from about 1 in 4 in those aged 16–34 years to 1 in 10 or less in those aged 55 years and older.

G Mental disorders were the third largest cause of burden of disease (DALYs) in Queensland in 2007 and the largest cause of non-fatal or disability burden (YLD).⁶⁶ Anxiety and depression (44%) was the leading specific cause of the mental disorders and dementia burden, followed by dementia and substance use disorders. Among people aged 15–24 years, mental disorders accounted for about half the total burden of disease in 2007, and among those aged 25–44 years it was one-third the burden. The burden rate for mental disorders in Indigenous Queenslanders was 50% higher than the non-Indigenous rate in 2007.²⁴

H There were 68,861 hospitalisations for mental and behavioural disorders in Queensland in 2010–11, and the female rate was 22% higher than the male rate.

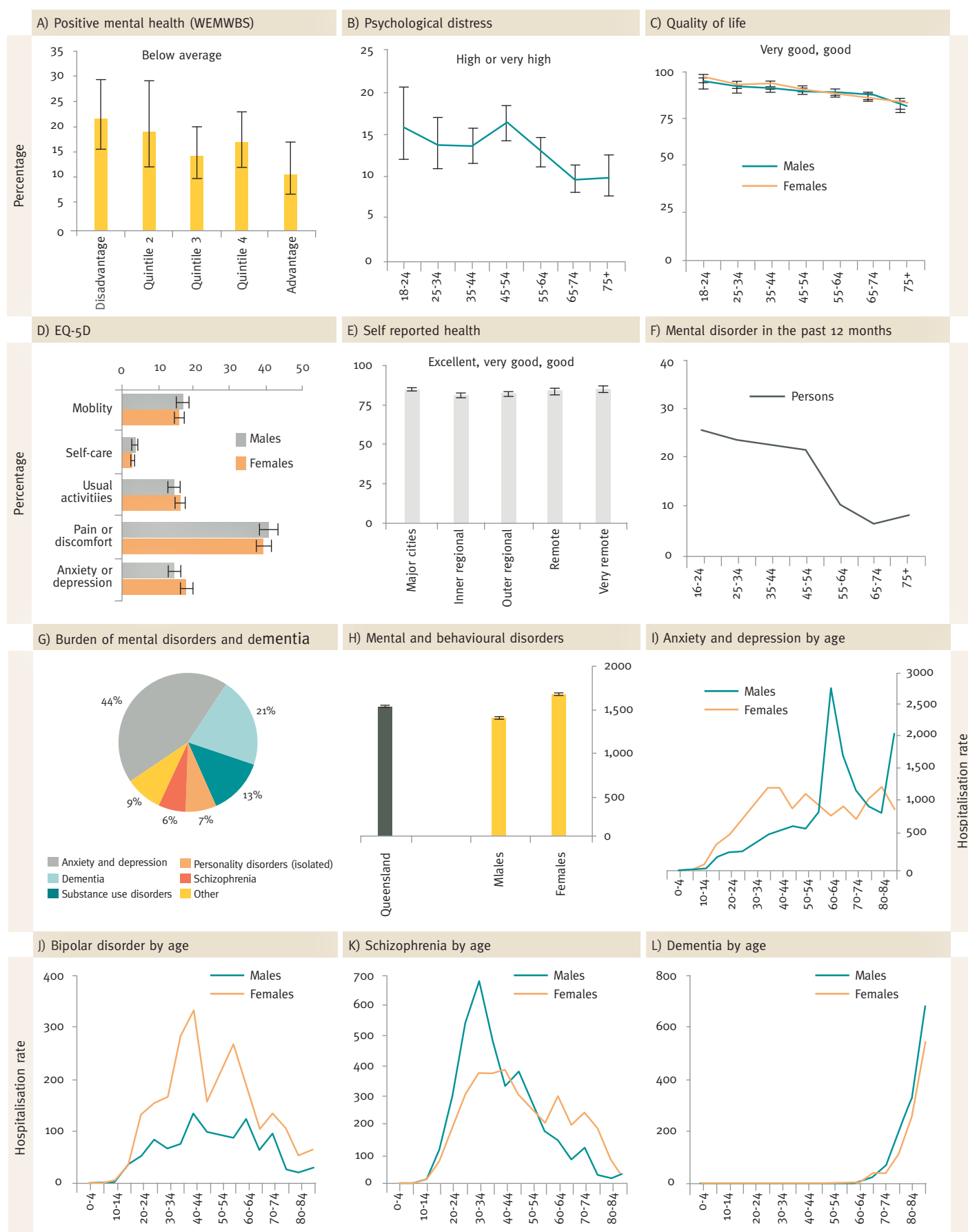
I Of the total 30,863 hospitalisations for anxiety and depression in Queensland in 2010–11, 55% were for females, and the average length of stay was 6.3 days. While the age-specific profile for males and females differs, for both, 80% of hospitalisations occur in people aged 25–69 years. The Indigenous Queensland rate of burden of disease due to anxiety and depression was 70% higher than the non-Indigenous rate in 2007.²⁴

J There were 4,610 hospitalisations for bipolar disorder in Queensland in 2010–11 and the female rate was 2.3 times the male rate. The average length of stay was 9.9 days. Rates increase in the teenage years rising rapidly for females and reaching a peak at 40–44 years before settling back to a plateau over middle and older ages. The pattern for males is similar but is generally lower than the female rate across all age groups.

K There were 10,056 hospitalisations for schizophrenia in Queensland in 2010–11 with the male rate 20% higher than the female rate. The average length of stay was 13.1 days. The rate rises sharply from age 15–19 years, and peaks in the twenties to thirties, before declining to low levels in older age groups. The pattern was similar for males and females.

L Dementia was the principal diagnosis for 1,012 hospitalisations in Queensland in 2010–11, where the male rate was 35% higher than the female rate. The average length of stay was 13.1 days. There were an additional 13,745 hospitalisations where dementia was associated with the diagnosis. The rate rises steeply from age 65–69 years.

Figure 21: Mental health, selected indicators, Queensland



- a) Rates are per 100,000 and directly age standardised to the total Australian ERP 2001. OECD rates are standardised to the OECD standard population 1980.
- b) Death data are for 2010 except for OECD comparisons (2004-2006), interstate comparisons (2009-2010) and socioeconomic, remoteness and Indigenous status (2006-2007).
- c) Hospitalisation data are for the financial year 2010-11 except for hospitalisations by socioeconomic status, remoteness and Indigenous status (2009-10 to 2010-11).
- d) Burden of disease data are for 2007 with risk factor impact being the joint effect of contributing risk factors.

Self-inflicted injury and suicide

Suicide can be defined as the intentional taking of one's own life¹⁶² or deliberately causing one's own death.¹⁶³ To be classified as a suicide, a death must be recognised as being due to other than natural causes. The death data is based on the underlying cause of death and includes the deaths of all Queensland residents in Australia as released by ABS.⁶³⁻⁶⁶ Hospitalisations are reported by principal diagnosis and include admissions to public and private hospitals, excluding psychiatric hospitals.¹¹³

Deaths due to external causes such as suicide are required to be examined by the coroner, who investigates both the mechanism by which a person died, and the intention of the injury (whether accidental, intentional self-harm or assault). For a death to be determined a suicide, it must be established by coronial inquiry that the death resulted from a deliberate act of the deceased with the intention of ending his or her own life (intentional self-harm).⁶⁴ A major revision in the coronial coding process for suicide and other deaths due to external causes occurred in 2010 and has since been retrospectively applied to deaths from 2006 onwards, limiting comparability of suicide reporting prior to the revisions.

This caveat does not apply to hospitalisations for self-inflicted injury. For a hospitalisation to be recorded as an attempted suicide or due to other self-inflicted injury, intent must be documented in the hospital record by a clinician, otherwise such a diagnosis is not reported.¹⁶⁴

A There were 7,367 hospitalisations for self-inflicted injuries in Queensland in 2010–11 and 62% were for females. The female rate was 62% higher than the male rate.

B The peak hospitalisation rate for self-inflicted injury for females is in the age group 15–19 years, with rates higher than for males at all ages up to 65 years. For both males and females 80% of hospitalisations occur in the age range 15 to 49 years.

C Rates of hospitalisation for self-inflicted injury in Queensland have not changed since 2000–01.

D There were 572 suicide deaths in Queensland in 2010, 429 males and 143 females. The male suicide rate was 3 times the female rate. The most common method of suicide for males (59% of all suicides) and females (50%) was strangulation, hanging or suffocation. Poisoning by drugs was used in 11% of suicides and poisoning by gases, alcohol and motor vehicle exhaust by 11%. Methods using firearms accounted for 9% of suicides. The remainder included deaths from sharp objects, drowning, jumping from a high place, and other methods.⁶⁴

E The male suicide rate rises sharply in the teenage years and remains higher than the female rate in all age groups. Over half (54%) the suicides in Queensland in 2010 occurred in the age range 15 to 44 years and this was similar for males and females.

F There has been no change in suicide rates in Queensland since 2006 for males or females. Data from 2006 onward are subject to an ABS coding revision which allows annual data since then to be compared.⁶⁴ Trend data prior to 2006 should be interpreted with caution.

G The suicide rate in disadvantaged areas of Queensland was 3.6 times the rate in advantaged areas in 2006–2007, based on the data released in 2009 prior to the 2010 ABS coding revision.⁶⁶

H The suicide rate in remote and very remote areas of Queensland was about 3 times the rate in major cities in 2006–2007 (based on data prior to 2010 ABS coding revision).⁶⁶ For males, suicide rates were higher outside major cities, and increased with increasing remoteness—up to 3.5 times the city rates in very remote areas. Higher rates of suicide have been well documented in Australian rural communities compared to urban areas, especially among young males.¹⁶⁵⁻¹⁶⁷

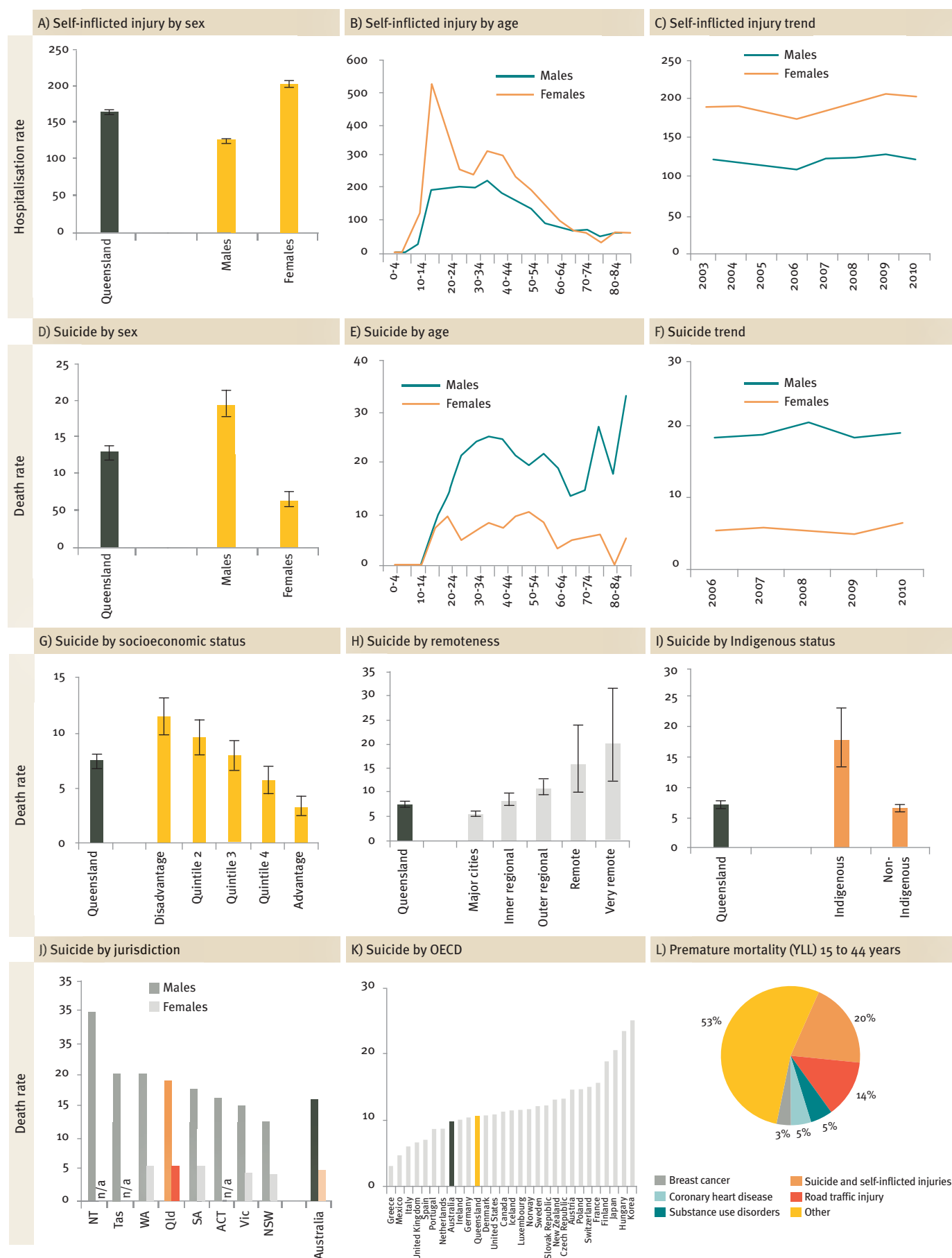
I Using the 2006–2007 data prior to the ABS coding revision, the suicide rate among Indigenous Queenslanders was 2.7 times the non-Indigenous rate.⁶⁶

J The suicide rate in Queensland in 2010 was 17% higher than the national rate. The male and female Queensland suicide rates were both fourth highest of the states and territories in 2010.

K Australia had the eighth lowest suicide rate out of 28 OECD countries in 2004–2006, and the Queensland rate was equivalent to the tenth ranked OECD country. However, international comparisons must be interpreted with caution as significant societal stigma attached to suicide in some cultures may influence reporting rates.¹⁶⁸

L Among all causes of premature death of persons 15 to 44 years, suicide was the leading specific cause, accounting for 20% of all years lost due to premature death.¹³⁵ Road traffic deaths were the next largest specific cause (13%), followed by substance use disorders, coronary heart disease and breast cancer.

Figure 22: Suicide and self-inflicted injury, selected indicators, Queensland



- a) Rates are per 100,000 and directly age standardised to the total Australian ERP 2001. OECD rates are standardised to the OECD standard population 1980.
- b) Death data are for 2010 except for OECD comparisons (2004-2006), interstate comparisons (2009-2010) and socioeconomic, remoteness and Indigenous status (2006-2007).
- c) Hospitalisation data are for the financial year 2010-11 except for hospitalisations by socioeconomic status, remoteness and Indigenous status (2009-10 to 2010-11).
- d) Burden of disease data are for 2007 with risk factor impact being the joint effect of contributing risk factors.
- e) n/a: Data unavailable for publication

Selected injuries

Unintentional injuries accounted for 4.8% of the total burden of injury and disease in Queensland in 2007.⁶⁶ Road traffic injury, falls, drowning and poisoning are leading causes of unintentional injury hospitalisations and death in Queensland and are therefore reported in this section.⁶⁴ The intentional injury burden of self-inflicted injury and suicide is described on page 42. The death data is based on the underlying cause of death and includes the deaths of all Queensland residents in Australia as released by ABS.⁶³⁻⁶⁶ Hospitalisations are reported by principal diagnosis and include admissions to public and private hospitals, excluding psychiatric hospitals.¹¹³

A There were 1,882 deaths of Queenslanders due to all injuries in 2010—1,246 males and 636 females. Male rates of death were more than double the female rates (2.3 times). There were 115,238 hospitalisations for injury in 2010–11, and 65% were for males. The male hospitalisation rate was 40% higher than the female rate. Rates of hospitalisation for injury in Queensland were about 13% higher than national rates in 2008–09, and this was consistent for many types of injury, including intentional and unintentional causes.¹⁶⁹ Prevention of such injuries including transport, assault, falls, poisoning and drowning and near drowning represent an important opportunity to improve outcomes in Queensland and reduce the hospital burden.

B Unintentional injury was responsible for 5% of Queensland's burden of disease (DALY) in 2007—two-thirds of this burden was due to premature death and one-third to non-fatal or disability burden.⁶⁶ The injury burden (DALYs) varied by age group, from 7% in 0–14 years, to 15% in 15–24 years and 11% in 25–44 years. Road traffic injury and falls were the leading causes of injury burden, responsible for 32% and 20% respectively in 2007.

C About 3 times as many males as females drown each year in Queensland. Over the 10-year period 2001 to 2010, 369 males and 128 females drowned, an average of 37 males and 13 females per year. The number of drowning deaths each year has varied, peaking for males in 2001 (51 deaths), and for females in 2006 (16 deaths). About 1 in 10 of the 302 drowning deaths in Australia in 2008–09 occurred in children aged 0–4 years.¹⁷⁰ The number of deaths each year is too small to meaningfully report as a rate. Mandatory reporting of immersion incidents was introduced in Queensland in 2010 and is discussed in Chapter 4.

D Male death and hospitalisation rates for road transport injury were higher than female rates. The male death rate was at least double the female rate for most age groups, and about 4 times the female rate in some age groups (40–49 years). The male hospitalisation rate was higher than the female rate, and was about double in the age group 15 to 64 years. Almost one-fifth (19%) of the burden caused by harmful alcohol consumption in males aged 25–44 years was due to road traffic injury.⁸⁸ In Queensland over the 11 years 1999 to 2009 there were about three low speed vehicle runover incidents per week of children aged 0–15 years, where 56% involved admission to hospital—21 children aged 0–4 years died as a result of these incidents.¹⁷¹

E Hospitalisations due to falls are common in older people, but particularly among females where the rate was at least 5%

higher each year from 2001 to 2010, similar to national data.¹⁷² While the hospitalisation rate for falls in people aged 65 years and older increased by 26% over the period from 2001–02 to 2010–11 (2.6% per year), the number of hospitalisations increased by 72%. In 2010, there were 417 deaths due to falls in Queensland, where 86% occurred in the age group 65 years and older. Falls caused about 30% of all injury related deaths.

F Hospitalisation for accidental poisoning occurs more often in the youngest and oldest age groups. In 2010–11, children aged 0–4 years were hospitalised at a rate similar to those aged 80 years and older. Male and female rates were generally similar, except at ages 25–44 years and 80 years and older when male rates were higher. Poisoning due to pharmaceuticals was the most common cause (78%).¹⁷³

G The road traffic injury death rate increased with socioeconomic disadvantage—the rate in the most disadvantaged areas of Queensland in 2006–2007 was 2.9 times the rate in the most advantaged areas.⁶⁶

H The death rate for road traffic injury in remote and very remote areas was 3 to 4 times the major city rate in 2006–2007.⁶⁶

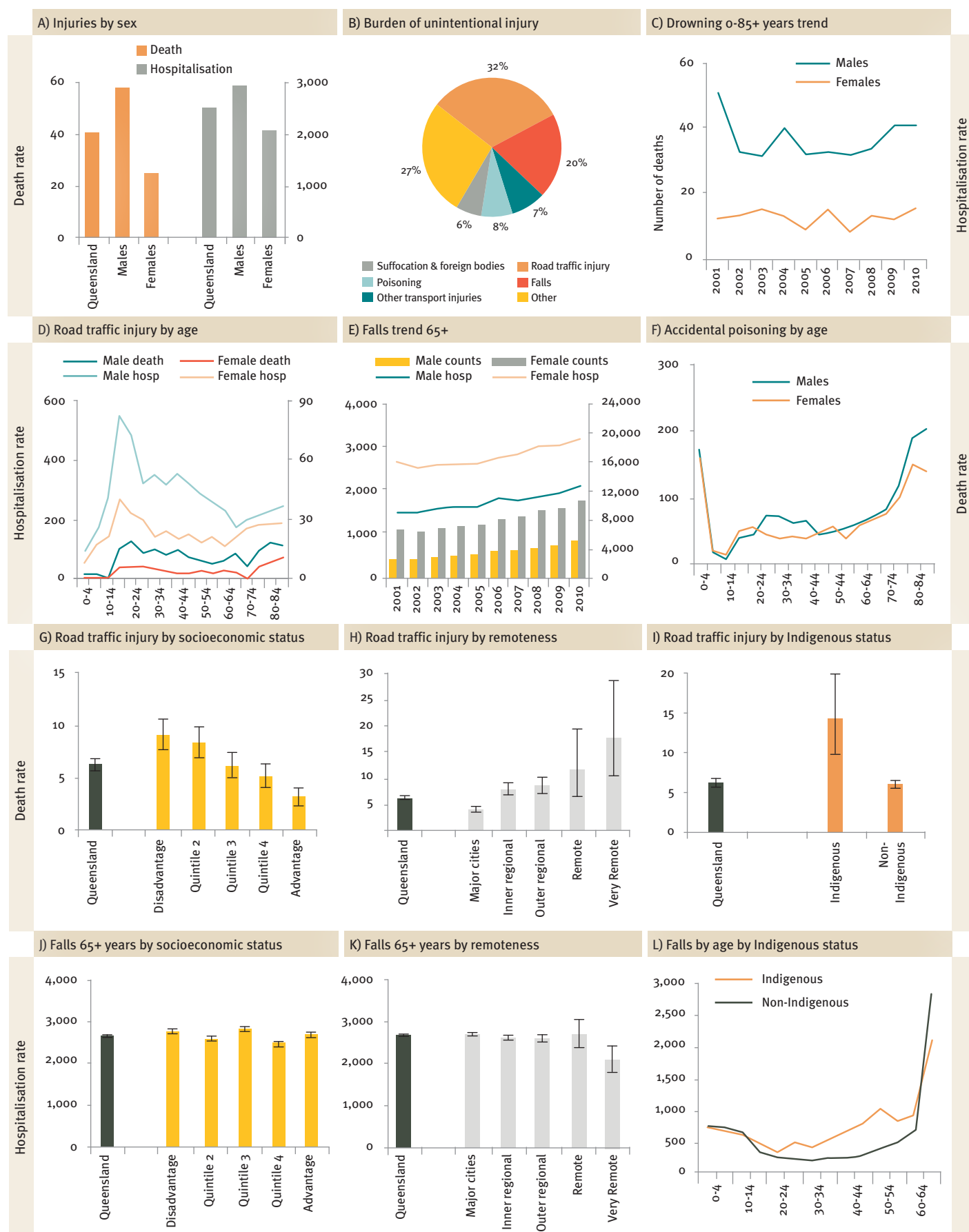
I The death rate for road traffic injury among Indigenous Queenslanders was 2.4 times the rate in the non-Indigenous population in 2006–2007, with the female rate difference higher (3.6 times) than the male rate difference (2 times).⁶⁶

J Hospitalisation rates for falls in persons aged 65 years and older did not differ by socioeconomic status in 2010–11.

K The hospitalisation rate for falls in older people (65 years and older) was about 25% higher for those living in major cities and regional areas than those in very remote areas. Lower rates of hospitalised falls in very remote areas have also been noted nationally, with low proximity to health services in these areas a probable influence.¹⁷²

L Hospitalisation rates for falls peaked in those aged 65 years and older—for females, 58% of hospitalisations for falls occurred in this age group, while for males it was 32%, 50% overall. In contrast, 10% of falls in Indigenous Queenslanders occurred in this age group. The non-Indigenous hospitalisation rate was about 35% higher than the Indigenous rate. However, in the age range 15 to 64 years, Indigenous Queensland rates were about 2.5 times the non-Indigenous rates.

Figure 23: Injury, selected indicators, Queensland



- a) Rates are per 100,000 and directly age standardised to the total Australian ERP 2001. OECD rates are standardised to the OECD standard population 1980.
- b) Death data are for 2010 except for OECD comparisons (2004-2006), interstate comparisons (2009-2010) and socioeconomic, remoteness and Indigenous status (2006-2007).
- c) Hospitalisation data are for the financial year 2010-11 except for hospitalisations by socioeconomic status, remoteness and Indigenous status (2009-10 to 2010-11).
- d) Burden of disease data are for 2007 with risk factor impact being the joint effect of contributing risk factors.

Asthma and COPD

Respiratory diseases were the third largest cause of death in Queensland in 2010 (8.1% of deaths due to all causes). Two chronic respiratory diseases contribute the greatest disease burden, chronic obstructive pulmonary disease (COPD) and asthma. Many COPD deaths are both premature and preventable with tobacco smoking the major risk factor. In Australia and in Queensland, over the past century, trends in the rate of death for males from COPD have closely followed tobacco consumption trends.¹⁷⁴ Tobacco smoking accounted for 70% of the total burden due to COPD in males and 60% of the female burden.⁸⁸ Asthma is not a major cause of death but is a frequent reason for hospitalisation and a significant cause of disability, particularly in children.¹⁷⁵

In 2007–08, 11.8% of all Queenslanders reported asthma as a long term condition, with 1 in 5 reporting a current asthma plan for the personal and clinical management of the disease.²¹ Defining COPD for clinical measurement is difficult and varies between studies. However, in 2007–08, based on self reported emphysema or bronchitis to estimate the prevalence of COPD, it was estimated at 5.3% among Australians aged 55 years and older.¹⁷⁶

The prevalence of current asthma among Australian children aged 0–17 years declined significantly from 14.0% in 2001 to 11.3% in 2004–05 and to 10.0% in 2007–08.¹⁷⁶ The prevalence of current asthma was higher among boys than girls aged 0–17 years in 2007–08, and the highest prevalence was among boys aged 5–11 years at 14.8% compared with 8.7% in girls of the same age. The death data is based on the underlying cause of death and includes the deaths of all Queensland residents in Australia as released by ABS.^{63–66} Hospitalisations are reported by principal diagnosis and include admissions to public and private hospitals, excluding psychiatric hospitals.¹¹³

A In 2010–11 there were 7,113 hospitalisations for asthma. The female rate was 20% higher than the male rate and 54% of the hospitalisations were for females. There were 68 deaths where asthma was the underlying cause in 2010 and 68% of these were for females—the female rate of death was 64% higher than the male rate.

B Hospitalisations for asthma occur mostly in the very young with about 44% in 2010–11 in children aged 0–9 years. Young children accounted for 64% of male hospitalisations for asthma and 36% of females. While death from asthma largely occurs in older people—43% of asthma deaths were of people aged 70 years and older in 2010—16% of deaths occurred in people less than 30 years of age.

C The asthma hospitalisation rate did not change between 2000–01 and 2010–11. Between 2000 and 2010 the asthma death rate decreased by 28%.

D COPD is a more common cause of death and hospitalisation than asthma. In 2010–11 there were 12,572 hospitalisations where COPD was the principal diagnosis and in 2010 there were 1,071 deaths where COPD was the underlying cause. The male hospitalisation rate was 38% higher than the female rate and the male death rate was 69% higher than the female rate in 2010.

E Death and hospitalisation rates for COPD increase with age. Hospitalisation rates rise steadily from the 45–49 age group while death rates start to rise from about 55–59 years. Male hospitalisation and death rates rise more sharply than female rates and continue to be higher in all older age groups. Over 70% of hospitalisations and 90% of deaths due to COPD occur in people aged 65 years and older.

F Greater gains in COPD over the past decade have been achieved for males than females. Between 2000–01 and 2010–11 the male COPD hospitalisation rate decreased by 14.1% while the female rate increased by 17.5%, with no net change at the person level. The male COPD death rate decreased by 8% between 2000 and 2010 and the female rate did not change.

G The death rate for asthma and COPD in areas of socioeconomic disadvantage in 2006–2007 was 1.8 times the rate in advantaged areas, with the male difference greater than the female difference (1.9 times compared with 1.5 times).⁶⁶

H The asthma and COPD death rate for Queenslanders living in remote and very remote areas was double the major city rate in 2006–2007, and the difference was higher for males (2.4 times) than females (1.3 times).⁶⁶

I The death rate for asthma and COPD for Indigenous Queenslanders was 2.6 times the non-Indigenous rate in 2006–2007.⁶⁶

J The death rate for asthma and COPD was 9% higher than the national rate in 2009–2010. The Queensland rate for both males and females was third highest of the states and territories.

K When compared to other OECD countries, Australia's asthma and COPD death rate in 2004–2006 ranked fifteenth lowest and Queensland's rate was 2.5 times higher than the lowest country, Finland.

L Females experienced 56% of the total asthma burden (DALYs) and 94% of the burden was due to years lived with disability (YLD) rather than premature death (YLL). Almost all the asthma burden occurs in people younger than 65 years. In contrast, COPD affected males to a greater degree than females (58% of the total COPD burden). About half of the COPD burden was associated with disability.

Figure 24: Asthma and COPD, selected indicators, Queensland



- a) Rates are per 100,000 and directly age standardised to the total Australian ERP 2001. OECD rates are standardised to the OECD standard population 1980.
- b) Death data are for 2010 except for OECD comparisons (2004-2006), interstate comparisons (2009-2010) and socioeconomic, remoteness and Indigenous status (2006-2007).
- c) Hospitalisation data are for the financial year 2010-11 except for hospitalisations by socioeconomic status, remoteness and Indigenous status (2009-10 to 2010-11).
- d) Burden of disease data are for 2007 with risk factor impact being the joint effect of contributing risk factors.

Communicable diseases

In 2007, infectious and parasitic diseases accounted for 1.6% of the total burden of disease and injury in Queensland—1.8% of the total burden for males and 1.4% for females. This low level of burden is due to past and current investments in immunisation and communicable disease surveillance and control. Continued investment is essential if this low burden is to be maintained. The burden of disease rate due to infectious and parasitic diseases for Indigenous Queenslanders was 4 times the non-Indigenous rate in 2007.²⁴

Queensland Health records and analyses data on all notifiable conditions in Queensland, and releases regular reports.¹⁷⁷ In this section, selected key conditions are reported in groups: vaccine preventable diseases (influenza, pertussis and invasive pneumococcal disease), sexually transmissible diseases (HIV, syphilis and chlamydia), zoonoses, that is, diseases acquired from animals (leptospirosis, Hendra virus), vector borne (dengue), foodborne and waterborne infections (Salmonella and Campylobacter), along with tuberculosis (TB).

A In 2011, relatively high influenza notification and hospitalisation counts were recorded during January to April, which is outside the usual influenza season. The winter profile was typical, beginning in late May with a peak in July (notifications) and August (hospitalisations).

B Pertussis (whooping cough) notifications have been at high levels in Queensland as well as nationwide, since 2008. This increase has probably been influenced by greater awareness of the disease amongst the public and GPs, and greater use of newer laboratory tests so that more cases are being detected. Pertussis vaccine, which is available for adults as well as children, is the best way to prevent infection.

C In 2011, pneumococcal notification counts were higher than for each of the previous four years. Notification rates dropped after the introduction of pneumococcal vaccine for all babies in 2005—the increase since 2009 is due to an increase in cases caused by types of pneumococcal bacteria not covered by the childhood vaccine. In July 2011, a newer vaccine which covers more types was introduced.

D Although there were fewer notifications of new HIV diagnoses in Queensland in 2011 (195 compared to 205 in 2010), the general trend in the notification rate has been increasing since the late 1990s. There has been a similar trend nationally, although the rate has stabilised in the past few years. The majority of HIV notifications in Queensland (68% in 2011) continue to be in men who have sex with men, consistent with national data.

E In 2011, the majority of notifications of infectious syphilis in Queensland were in young Indigenous Queenslanders and men who have sex with men. Syphilis notifications in men who have sex with men have been increasing throughout Australia since the early 2000s. A large outbreak of syphilis in young Aboriginal people in north-west Queensland accounted for the high rate of syphilis in Queensland in 2011.

F There were 18,340 notifications of chlamydia in Queensland in 2011. Notifications have increased by 44% since 2007, consistent with national trends. Notification rates are highest in people aged 15–29 years.

G Leptospirosis is a bacterial zoonotic disease acquired by exposure of broken skin to soil, water, flooded waterways or vegetation that is contaminated by the urine of infected animals. In Queensland, usually notifications are mainly in the north where rainfall is high during the summer months. Increased notifications were recorded in 2011, primarily due to extensive flooding events in central and southern Queensland.

H The number of overseas acquired cases of dengue identified in Queensland has increased in recent years. In the last few decades, local transmission has occurred only in north Queensland, and the largest outbreak was recorded in 2009.

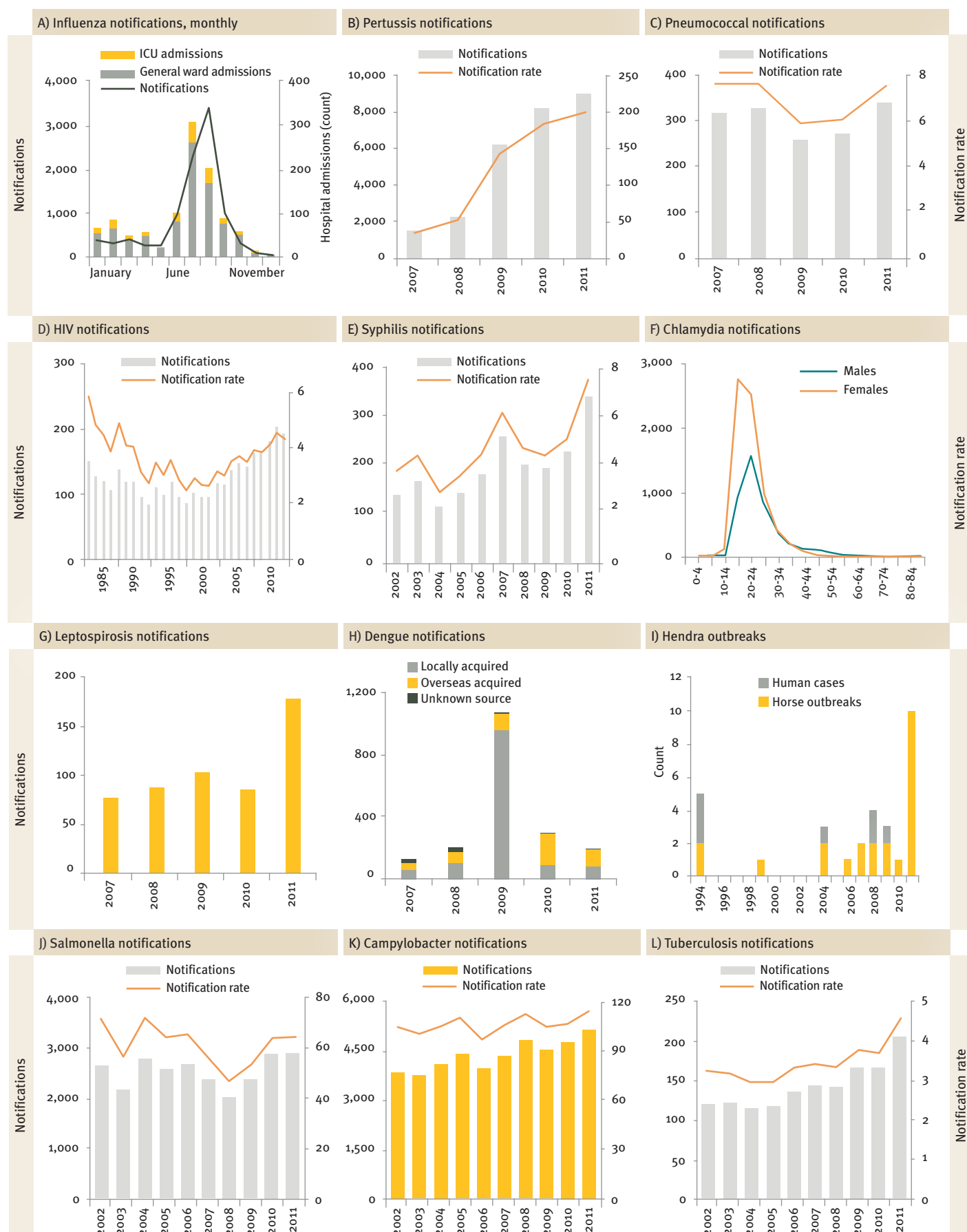
I From when the Hendra virus was first identified in 1994 to June 2012, there have been 27 outbreaks in horses involving 60 horses, and seven confirmed cases of human infection in Queensland. In 2011 there was an unprecedented number of 10 outbreaks in horses in Queensland and although 89 human contacts were exposed, no cases of human infection resulted. However, in the first six months of 2012, there were four outbreaks, involving four horses. No human cases of Hendra virus infection have been recorded since 2009, and this is likely to be due to veterinary staff and horse owners being more aware of the need for preventive measures, including use of appropriate personal protective equipment when dealing with horses, particularly sick ones.

J Salmonella is a predominantly foodborne gastroenteritis illness. Notification rates in Queensland fluctuated during the period 2002–2011, with around 2,500 cases notified each year on average. Common causes include raw and undercooked eggs, poultry and red meats.

K Campylobacter is a foodborne or waterborne gastroenteritis illness. Notification rates in Queensland fluctuated during the period 2002–2011, with around 4,400 cases notified each year on average. Eating undercooked chicken and poor hygiene when handling raw chicken are major causes.

L Notifications of TB have increased over the past 10 years, due to changes in the region of origin of migrants to Australia. The majority of notifications in Australia are in people born in high prevalence countries.

Figure 25: Communicable diseases, selected indicators, Queensland



a) Notification rates are per 100,000, and are crude rates. Notification data are from 2011 unless stated.

Dental disease

Dental diseases include any disease of the mouth, teeth and gums. The two main conditions are dental caries (decay) and periodontal disease (gum disease). Oral health is also discussed on page 116.

A In 2007, the majority (61%) of Queensland children aged 5–12 years had decay experience in either their deciduous (dmft) or permanent teeth (DMFT).¹⁷⁸ Decay experience includes treated or untreated decay and filled or missing teeth. The proportion of Queensland children with decay experience was third highest of the states and territories and about 10% higher than national.

B Of Australian children attending a school dental service in 2007, decay experience in permanent teeth increased with age from 0.08 teeth affected in 6 year olds to 2.1 teeth in 15 year olds.¹⁷⁸ Untreated decay caused most of the decay experience in children aged 5–8 years while filled teeth was the more common issue among 15 year olds.

C There were 12,083 potentially preventable hospitalisations (PPHs) due to dental conditions in Queensland in 2010–11 where 37% occurred in infants and young children (0–9 years). Male and female rates were similar. The major cause of these hospitalisations was dental decay—82% in children 0–9 years, and 36% in the rest of the population. PPH rates for dental conditions were about 80% higher in remote and very remote areas compared to cities and highest rates were consistently in the second most socioeconomically disadvantaged area in each of the past three years—about 30–40% higher than in most advantaged areas. The rate for PPHs for dental conditions in Queensland was similar to

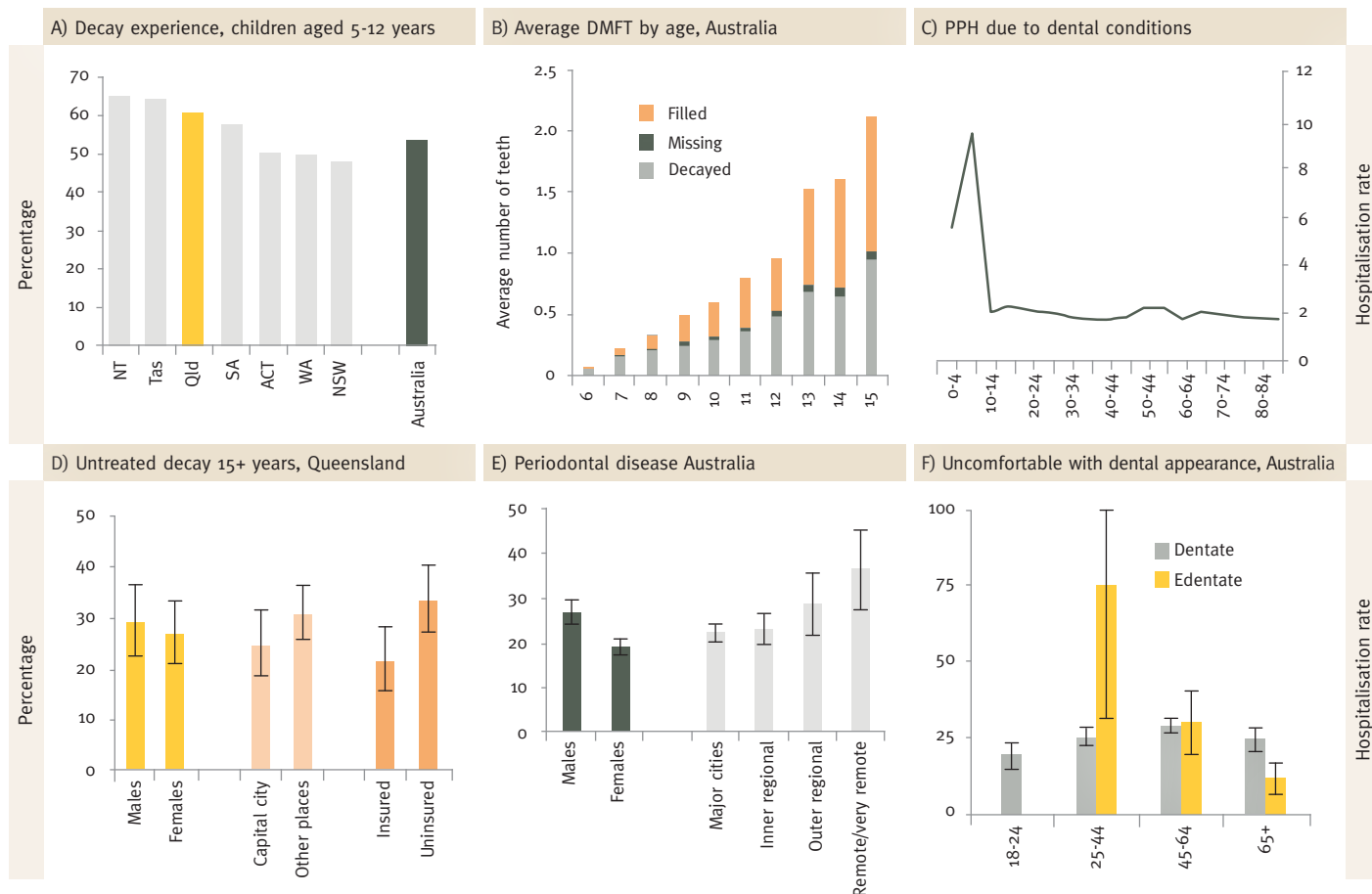
the national rate and fourth highest after Western Australia, South Australia and Victoria.¹³

D One in 4 Queenslanders aged 15 years and older in 2004–2006 had untreated decay (27.6%).¹⁷⁹ Untreated decay was higher in males than females, in remote and very remote areas than in cities, and among uninsured people than insured. It was highest for adults aged 25–44 years and lowest for those aged 65 years and older.

E Periodontal disease (where the gum has lost its attachment to the tooth by 4 mm or more) was evident in 24.1% of Queenslanders aged 15 years and older, and varied from 11.6% for those aged 15–34 years to 46.7% at age 55 years and older.¹³ For Australia, a higher proportion of males had periodontal disease—about 50% higher than females (28.7% compared with 19.2%), and among people in remote and very remote areas—2.3 times higher than those in major cities (32.6% compared with 14.2%).

F In 2010, one-quarter of Australians aged 15 years and older reported being uncomfortable about their dental appearance.¹³ Those without natural teeth (edentate) were more likely than those with their own teeth (dentate) to report being uncomfortable, particularly those aged 25 to 44 years—75% of the edentate and 25% of dentate. In 2004–06, in Queensland and nationally, 15% reported avoiding certain foods because of a dental problem.¹⁷⁹

Figure 26: Dental disease, selected indicators, Queensland



A and B data derived from national Child Dental Surveys

D, E, F data derived from National Survey of Adult Oral Health

CHAPTER 4 What are we doing to build good health?



Much is being done to advance the good health of Queenslanders.

In this chapter:

- Partnerships
- Laws and regulations
- Tax and price interventions
- Improving the built environment
- Public awareness campaigns
- Community based interventions
- School based interventions
- Workplace interventions
- Screening
- Group based programs
- Brief interventions

The power of prevention is clear, as is the effectiveness of an integrated approach to ensuring that the health system is sustainable for the long term, and contributing to better health for all Queenslanders.^{41,42}

Governments, the private sector, non-government organisations and community groups are providing comprehensive population based approaches that reduce the risk of disease rather than focus on the consequences. Strategies cover promotion of healthy behaviours, interventions in communicable disease prevention and control, and addressing environmental health.

Many of these strategies are initiated through the National Partnership Agreement on Preventive Health, a multidisciplinary and multi-sectoral national initiative to address the rising prevalence of lifestyle related chronic diseases in three broad components: Healthy Children, Healthy Workplaces and Healthy Communities.¹⁸⁰

This chapter describes some of the interventions directly implemented or funded by Queensland Health or delivered in partnership with other organisations. They are presented in categories based on those proposed by the World Health Organization (WHO) to advance population health.⁴² As demonstrated in the steady decline in smoking rates, achieving change at a population level depends on implementation of a broad range of strategies sustained over time and at a depth to affect local and target populations. Smoking reduction was achieved over many years of population health investments, and it would be expected that achieving change in the 'juggernaut' of rising obesity will similarly require sustained, steady investments over many years.¹⁸¹

Partnerships

Health is determined by a complex interplay of factors, as described in Chapter 2. These factors are directly and indirectly influenced by the policies and practices of a wide range of entities, including state and federal governments, local councils, private and public companies, businesses, communities, and non-government organisations. It is vital that governments forge partnerships with such entities to maximise the reach of interventions to prevent avoidable injuries, diseases and deaths, and protect public health. The combination of knowledge, expertise and resources within partnerships is critical to effective public health interventions.

Queensland Health has established strong partnerships with a broad range of stakeholders across and beyond the state. Much of the success in health protection and prevention of injury and disease in Queensland is attributable to this partnership approach. Examples of collaborative partnerships for public health interventions are described throughout this chapter, with two specific examples of recent public health interventions in injury prevention.

SPOTLIGHT

Child resistant dishwashing detergent dispensing

Every year in Queensland, more than 1,000 children (an average of 20 children a week) under the age of five are rushed to emergency departments for treatment after swallowing a poisonous non-medicinal substance. Dishwashing detergents accounted for 4% of all non-medicinal poisonings in Queensland.

In 2004, a Queensland child swallowed caustic dishwasher powder which burned his oesophagus and upper airway. The product had a child resistant cap, but the mechanism had not fully engaged and there was inadequate information on how it would be fully engaged. Despite extensive medical treatment, the child suffered lifelong scarring of the oesophagus.

This tragic incident prompted the establishment of a working party with representatives from Kidsafe Queensland, the Queensland Injury Surveillance Unit, the Queensland Poisons Information Centre, Queensland Health and the Office of Fair Trading. This collaboration brought together child health advocates, researchers, practitioners, health industry representatives, private companies and regulators on the broader issue of the effectiveness of child resistant packaging and the pH of the product. The working party successfully lobbied for regulatory changes in the way dishwashing detergent is packaged and labelled so that products with a pH greater than 11.5 would be required to have an effective child resistant cap. Products with a pH greater than 12.5 were restricted from domestic sale. As a result, manufacturers of the product improved the child resistant device and lowered the level of pH in the detergent to minimise damage in case of an accidental ingestion. This partnership, based on strong data and collaboration between key stakeholders, is a good example of effective public health practice which is expected to make a difference in child injury.



SPOTLIGHT

Notification of pool related immersions

Drowning is one of the leading causes of death of Queensland children under 5 years of age. In 2010, as a result of the collaborative campaign supported by Queensland Health, legislative amendments were introduced to the *Building Act 1975*. The amendment requires Queensland Health to be notified in the first instance of any pool immersion incident, presented to a health professional, that involves a child aged up to 5 years. This includes presentations at public emergency departments, call-outs by Queensland Ambulance Service and presentations at private health facilities. Queensland Health then notifies the local government authority where the incident took place, the Pool Safety Council of the Department of Housing and Public Works, which administers the *Building Act 1975* and the Commission for Children and Young People and Child Guardian. The Pool Safety Council collects this information, providing a centralised source of data. In addition, the local government authority will carry out a timely inspection of the pool to ensure all fencing and gates meet the required standard and record any defect or breach of the pool fencing regulations. The mandatory reporting of immersion related data in Queensland presents the first known opportunity in Australia to accurately assess the number, date, location and age of the child involved in a pool related immersion incident in a systematic fashion. Data on such incidents will help to target actions for prevention, law enforcement and research.

From December 2010, when the legislation was enacted, to the end of March 2012, there were 136 immersion notifications recorded, however, many of these incidents appear to have happened in bodies of water other than domestic pools. Nineteen local council areas reported immersions mainly in the south-east corner and along the coast. The distribution of notifications roughly correlates with that of domestic pools in the region.



Laws and regulations

■ Laws and regulations are notable features of civilised society and have historically been used for the prevention of disease, and protection and promotion of health and wellbeing in many societies. Much of the health gains and the generally good health Queenslanders enjoy today are due to legislative and regulatory measures, such as those for tobacco, alcohol, water fluoridation and food safety.

SPOTLIGHT

Tobacco control

The prevalence of smoking is steadily decreasing in response to Queensland's multi-strategy tobacco control plan, declining by about one percentage point per year from 22.1% in 2001 to 14.3% in 2012 (page 92). There is strong evidence that advertising, display and promotion of tobacco products influence the uptake and maintenance of smoking.¹⁸² Retail displays in particular predispose adolescents towards smoking and make them more likely to experiment with tobacco products.^{182,183}

The Queensland Government's tobacco laws include comprehensive smoking bans for indoor and outdoor public places, and since 2010 it has been illegal to smoke in private vehicles carrying children under 16 years. In 2011 the display of tobacco products in retail stores was banned.¹⁸⁴

These laws are intended to reduce the public's exposure to environmental tobacco smoke, contribute to a culture that supports smokers attempting to quit, and discourage young people from taking up the habit.



SPOTLIGHT

Alcohol legislation

Queensland's Liquor Act 1992 regulates the sale and supply of alcohol to the public including liquor licensed venues and the sale and supply of alcohol to minors. These laws are designed to minimise alcohol related harms including injury, crime and violence that threaten public health and safety. A new alcohol law in the *Transport Operations (Road Use Management) Act 1995* passed in Queensland in March 2010 requires relapsing drink-drivers to install an alcohol ignition interlock in their own vehicle and blow a negative reading before they can start up. It was estimated that these devices will become mandatory for about 12,000 people convicted of drink-driving in Queensland each year.¹⁸⁵



SPOTLIGHT

Water fluoridation

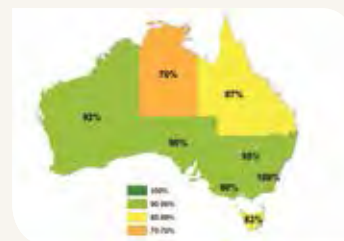
There is well-established scientific evidence that water fluoridation can contribute to improved oral health.¹⁸⁶⁻¹⁸⁹ In accordance with recommendations of peak national and international bodies, in March 2008 the Queensland Government introduced legislation to fluoridate most of the state's drinking water supplies. *Queensland's Water Fluoridation Act 2008* requires mandatory fluoridation of all public potable water supplies that provide drinking water to at least 1,000 people. Before the introduction of this legislation less than 5% of the state's population was in receipt of fluoridated water. By 30 June 2012 this figure had risen to 87%, bringing Queensland into line with other Australian states and territories.

The implementation of water fluoridation involved a phased approach, where larger drinking water providers were required to begin water fluoridation earlier. This included 32 drinking water supplies that comprise the South East Queensland Water Grid, providing water for more than 3 million people and was completed by the end of 2009. A total of 134 water supplies are required to have water fluoridation, with 69 supplies having completed the implementation as of June 2012. Included in this implementation are the seven Indigenous councils with a population of more than 1,000.

To assist with the implementation of water fluoridation, the Queensland Fluoridation Capital Assistance Program was created, which provides up to 100% reimbursement for eligible capital expenses. This program reduces the financial burden associated with installation of water fluoridation infrastructure for smaller councils.

Along with these regulatory measures and financial supports, Queensland Health undertakes risk based auditing of fluoride dosing plants and works to enhance the capacity of public water supply operators to implement the provisions of the Act. This involves supporting training and providing advice on fluoride dosing, monitoring, plant equipment, maintenance and reporting. In 2011, Queensland Health developed a community engagement strategy consisting of a suite of materials to assist smaller councils across the state in rolling out fluoridation within their communities.

Valuable data on the benefits of water fluoridation will be captured in Queensland Health's Child Oral Health Survey in 2013 which will include the first statewide cohort of Queensland children to have been exposed to water fluoridation for their whole life. Overall improvement in oral health as a result of fluoridation is estimated to save the Queensland community up to \$1.1 billion over 30 years.¹⁹⁰



Food safety regulation

Queenslanders trust that the food they purchase is safe for human consumption. *The Food Act 2006* is the state's principal food safety legislation and applies to food businesses in the manufacturing, service and retail sectors. The main objectives of the Act are to ensure the safety of food for sale, to prevent misleading conduct in relation to the sale of food, and to apply the Australia New Zealand Food Standards Code.

Enforcement of the Act is a joint responsibility of Queensland Health and local governments. Queensland Health provides advice to departments and agencies at all levels of government and is responsible for enforcement of labeling and compositional requirements, surveillance, investigation of food complaints and foodborne illness outbreaks. Local governments license food businesses and monitor their compliance with food safety requirements by performing routine inspections and responding to complaints. In 2010–11, a total of 25,409 food businesses throughout Queensland were licensed under the Act.

Food safety and hygiene issues are closely associated with the knowledge and behaviour of those involved in food handling. Queensland Health provides guidance and advice to local governments and food businesses to facilitate compliance with the Act.



Tax and price interventions

■ Tax and price interventions can discourage people from taking up or maintaining unhealthy behaviours because they reduce the affordability of unhealthy products like cigarettes, alcohol and junk food. The Australian Government is responsible for taxation measures nationally.

Tobacco taxes

Higher tobacco taxes lead to higher tobacco product prices. This in turn reduces tobacco use.¹⁹¹

Tobacco tax increases have been identified as the most effective single intervention to reduce the demand for tobacco.^{192–194} Data from comparable high-income countries show that an estimated 10% rise in cigarette price reduces overall cigarette consumption by about 3–5%.^{195,196}

In 2010, the Australian Government increased the tobacco tax by 25% as part of its national tobacco control efforts and this added about \$2.20 to an average packet of 30 cigarettes.¹⁹¹ There was a direct link between the price increase and smoking cessation with 70% increase in the rate of quitting activity immediately after the price increase.



Improving the built environment

■ There is strong evidence that the built environment—the physical structures and infrastructure of communities— contributes to the health of the population. The physical infrastructure, walkability, land use and urban sprawl are linked with the prevalence of obesity^{197–199}, traffic safety and community security.^{42,200–202} In many cases, a change to the built environment will also impact on many diseases, such as cardiovascular diseases, type 2 diabetes, some cancers and asthma.^{202,203} In highly walkable neighbourhoods, moderate-to-vigorous physical activity is more prevalent than in low-walkable neighbourhoods.²⁰⁴ Similarly, neighbourhood walkability is related to lower risk of being overweight or obese.

In Queensland, local councils are very involved in the planning and development of community environments, primarily by regulating these activities. Queensland Health has been working with local councils, state government agencies, non-government agencies, universities and community organisations, to create supportive environments and bring about improvements to where people work, learn, live and play. It provides advice on environmental, social, demographic and economic conditions that drive the health and wellbeing of communities such as housing, transportation, employment, income, noise, air quality, access to goods and services, access to parks and social networks within the built environments that have links to health outcomes. Queensland Health seeks to establish these conditions through development assessment processes coordinated by both state and local government. Examples include State Significant Projects under the *State Development Public Works Organisation Act 1971* and development assessments against a local government planning scheme under the *Sustainable Planning Act 2009*.

State planning policy to promote healthy outcomes

Queensland Health is working with the Department of State Development, Infrastructure and Planning on legislation that will ensure a better built environment for communities. Planned for implementation in 2013, it will require all development applications to be assessed for their ability to meet outcomes such as more parks, public spaces, greenspace and shade, improved pedestrian pathways, bicycle pathways and public transport networks, as well as greater access to affordable fresh food. Queensland will be the first state in Australia to introduce such legislation.



Thursday Island on the move



Queensland Health is supporting the Torres Shire Council in a 2010 initiative to encourage Thursday Islanders to get active for good health by walking. Three walking routes across the island, totalling 11 kilometres, have been equipped with public benches and water fountains as well as signage to indicate start and finish points. The signs display messages about the benefits of walking and the '10,000 Steps' program which also appear on the walking route maps. Each route is measured in steps so there is no need to use a pedometer. The initiative is part of the Waibene Matha Move project which translates to 'Thursday Island Just Move' and aims to get community members to maintain or increase their physical activity levels.



Health Impact Assessment—Mackay

When the Mackay Regional Council released its Draft Residential Densities Strategy in 2010, outlining its vision for more compact urban areas within the region, Queensland Health identified the potential of the strategy to influence public health. To achieve this and engage council leaders in healthy urban planning, Queensland Health worked in a multi-sectoral collaboration with the council, the Department of Communities, Child Safety and Disability Services and the University of New South Wales to conduct a Health Impact Assessment (HIA) that sought to answer three questions:

- What was already known about the association between housing density and health?
- What were the potential positive and negative consequences of implementing the strategy?
- What actions if included in the strategy would maximise health gains of the populations?

The council will apply the draft strategy to the new Mackay Region Planning Scheme to be released for public consultation late in 2012. It is also being used in discussions with developers on increased densities for larger developments. Some of the potential benefits for the community may include:

- improvement in physical activity and general health
- increased viability of public transport and development of walkable neighbourhoods
- housing affordability and increased variety in housing product.

Mackay Regional Council planners and policy makers are increasingly recognising the value of the HIA and are adopting its processes in their planning considerations now and in the future.



Public awareness campaigns

Public health awareness campaigns are conducted to encourage people to adopt a healthy lifestyle by increasing awareness of the risk of chronic diseases and promoting healthy behaviours. Such campaigns can reach large populations at relatively low cost and within a short period of time. They are most effective when used in conjunction with legal actions, taxation and living conditions.²⁰⁵ For example, the Go For 2&5 social marketing campaign was undertaken in Queensland between 2005 and 2009 with a goal to increase fruit and vegetable consumption in adults. Over the campaign period and up to six months following campaign completion, fruit consumption steadily increased. For vegetable consumption, gains were evident during the latter half of the campaign. Significant decreases in consumption of fruit and vegetables occurred in the 12 months following the completion of the campaign.

HIV/AIDS awareness campaign

On 9 September 2012, Queensland Health launched a new HIV prevention campaign 'Let's end HIV'. The campaign is based on Queensland Government's commitment to make HIV/AIDS a health priority following confirmation that HIV diagnosis rates had almost doubled in the last decade (Chapter 3, page 48).

The campaign comprises television, press and online advertising all signposting people to the campaign website.²⁰⁶ The website contains a range of information about protection from HIV, getting tested for HIV and living with HIV.



Healthier Queensland

In 2010, the Queensland Government launched its largest ever mass media campaign—Healthier Queensland—which continued in 2012.²⁰⁷ The campaign promoted healthy living advice and provided information about how to access relevant services, including 13 HEALTH, 13 QUIT and BreastScreen Queensland. In 2011–12 messages encouraging sun safe behaviours were included as well as the My Smoking youth campaign. It delivered a range of advisory and education services that were also provided on its comprehensive, user friendly website, including simple messages about health conditions and treatments, health services, and information about mental health, sun safety, infectious diseases, men's health, healthy eating and fitness.



Throughout 2011–12, the campaign continued to achieve high levels of awareness, with up to 82% recall among Queensland adults and 91% support of the campaign messages in the last quarter of that year. The website had more than 120,000 unique visitors between July 2011 and May 2012.



Targeted anti-smoking campaigns

13 QUIT

The Healthier Queensland 13 QUIT campaign was designed to increase awareness of the 13 QUIT service and encourage smokers to consider their smoking behaviour. The campaign was targeted primarily at smokers with young families and focused on the positive impact of quitting for them and their family.

The key messages of the campaign were to call 13 QUIT for a personalised plan to quit and that stopping smoking will improve wellbeing and increase energy levels. The campaign comprised television, radio, press, out-of-home and online advertising and has run in two bursts—from July to September 2011 and from January to May 2012. Tracking research showed that two-thirds (66%) of respondents recognised the campaign, and 42% reduced the number of cigarettes smoked as a result.



My Smoking

The My Smoking campaign targets 18–29 year olds and is currently the only quit smoking campaign nationally aimed at young people. It motivates young smokers to consider their smoking habits and encourages and supports them to quit. The campaign initially ran from February to May 2011 and then again in February to May 2012 as part of the Healthier Queensland campaign. The campaign comprised television, outdoor, press and online advertising. Tracking research showed that 81% of respondents recognised the campaign, and in response to seeing it, 50% had reduced the number of cigarettes they smoked and 13% had successfully quit.



Swap It, Don't Stop It

The Swap It, Don't Stop It initiative was launched in March 2011 as part of the national Measure Up campaign. Its aim is to raise public awareness of the link between an increased waistline and preventable chronic diseases such as type 2 diabetes, cardiovascular disease and some cancers, and to show people how they can reduce their risk. The program encourages people to consider small nutrition and physical activity swaps they can do every day.

Queensland is delivering several activities to reach various populations at risk of chronic disease:

- In partnership with Diabetes Australia, Heart Foundation, Cancer Council Queensland, Nutrition Australia and several other non-government health agencies, Queensland Health is delivering specialised promotions to increase the reach and impact of the national campaign and help Queenslanders realise that simple everyday lifestyle changes can lead to better health.
- Ethnic Communities Council Queensland is delivering culturally appropriate Swap It, Don't Stop It programs.
- The Queensland Aboriginal and Torres Strait Islander Health Council is promoting the Swap It, Don't Stop It messages through their Health Check initiative and Good Quick Tukka program through the Community Controlled sector.

Queensland Health is coordinating local co-branded community based nutrition and physical activity programs across the state including the TAFE Cook for Life initiative, Cancer Council Queensland Relay for Life, and the 10,000 Steps and Heart Foundation walking programs. More than 90 programs were delivered between January and June 2012.



Community based interventions

Integrated community based health interventions are an effective way to reach the general population as well as high risk populations in various settings within the community.⁴² Queensland Health is involved in a range of community based interventions covering early life to healthy ageing.

Early life interventions

SPOTLIGHT

Healthy Early Years Training Strategy

The Healthy Early Years Training Strategy aims to enhance health and hygiene practices in early childhood education and care. It is a collaborative initiative between Queensland Health, which also provided the funding, the Department of Education and Training, and Workplace Health and Safety Queensland. The strategy has developed training resources and an innovative service delivery methodology that is flexible and responsive to the needs of the sector, combining both accredited training and professional development for staff in education and care services. The timing of the strategy supports the introduction of the National Quality Standards which includes a requirement for at least 50% of staff to have, or be actively working towards, a diploma level qualification by 2014.²⁰⁸

The training material contains six modules that include current evidence based health information and assessment tasks. Topics include communicable disease prevention and control, immunisation, sun safety, physical activity, nutrition, ear health, social and emotional wellbeing, and injury prevention and safety promotion. The materials were adopted by all Queensland TAFE institutes and 14 private training organisations in 2012.



SPOTLIGHT

Have Fun–Be Healthy

Have Fun–Be Healthy for Supported Playgroups is a joint effort of the Australian Government and the Queensland Government, launched in 2011. Supported Playgroups are for families experiencing difficulties that may lead to compromised parenting skills and poorer child development outcomes. The eight-week program aims to increase the knowledge and confidence of parents and carers to encourage healthy eating and physical activity for their children. It also enhances the skills of staff, enabling them to deliver interactive play and healthy eating activities.



Healthy morning teas and physical play for the families are an effective way for the parents to engage with their children and develop the skills and confidence to support similar behaviour at home. The play and cooking equipment supplied under the project remains with the playgroup to help maintain the project's messages and activities. Playgroup Queensland piloted the project in 2010–11 with 121 children and 98 parents from eight playgroups in south-east Queensland. This stimulated community interest and increased attendance in the pilot playgroups. The program is being rolled out statewide from 2012 through to 2015.



SPOTLIGHT

Good Start Program for Pacific Islander and Maori children



The Good Start Program is a Queensland Health initiative to improve the health and wellbeing of Pacific Islander and Maori children and families. The program works with communities to help families build their skills, knowledge and confidence about healthy eating and physical activities.

The program started in July 2011 and is funded for four years. It currently covers the Brisbane metropolitan area although expansion throughout south-east Queensland is considered. Since January 2012, more than 300 Pacific Islander children have participated in the program and the Good Start team have worked with an additional 80 families including Cook Islander, Tongan, Maori, Fijian, Papua New Guinean, Fiji Indian and Samoan backgrounds.



Healthy communities

A healthy community is a place where the physical, social and economic environments facilitate individual and community wellbeing. In partnership, Queensland Health seeks to create such an environment primarily through policies, plans, programs and laws that make healthy choices the easiest choices. The goal is to have local communities that promote healthy behaviours such as physical activity and healthy eating, not smoking, safe drinking and sun protection. This work is supported by the National Partnership Agreement on Preventive Health Healthy Communities Initiative which is helping 18 Queensland local governments to deliver effective community based programs and develop policies that support healthy lifestyle behaviours.

Active, Healthy Communities

Active, Healthy Communities commenced in 2006 as a collaboration of Queensland Health, the Heart Foundation and the Local Government Association of Queensland. A resource package to support healthy lifestyle choices has been developed to assist local governments create and maintain local environments that encourage and support physical activity and healthy eating.²⁰⁹ It provides strategic planning guidance and tools, and is available through the internet. There is also a supporting campaign that involves promotion, training and advice to local councils, which has been implemented locally.

Moreton Bay Healthy Communities Partnership

Moreton Bay Healthy Communities Partnership was established in 2005 as a collaboration between Queensland Health, the Heart Foundation, Moreton Bay Regional Council, Department of Communities, Child Safety and Disability Services, Department of Transport and Main Roads, Department of National Parks, Recreation, Sport and Racing Queensland, Police Citizens Youth Clubs and local non-government organisations. The aim of the initiative was to plan, deliver and evaluate strategies to promote physical activity for residents in the Moreton Bay region. Recent achievements include:

- Four walkability workshops were delivered in 2011–12, to increase the adoption of local physical activity programs. The 45 community organisations that attended the workshops reported up to 25% increase in the number of local walking programs delivered at community level.
- Two cultural awareness workshops were delivered to build the capacity of physical activity program providers to be inclusive of culturally and linguistically diverse populations.
- Five professional development workshops were delivered to more than 100 local council planners to ensure Active Healthy Communities principles were incorporated into nine key local government plans.
- More than 80 directional signs for 10,000 Steps and Swap It Don't Stop It were installed in six local neighbourhoods to improve walkability and encourage active healthy communities, and four more will be installed by June 2013.
- A local walking guide to support the Swap It Don't Stop It campaign was developed and promoted.
- In partnership with local libraries and community health centres, 12 pedometer loan schemes are being managed to encourage increased participation in walking programs.
- The partnership was awarded funding in excess of \$1 million between 2009 and 2012 to implement and evaluate health promotion initiatives under the National Resilience Strategy, Healthy Communities Initiative, and Active Inclusion Program grants.

Actively Connect Townsville – a tale of two local initiatives

Queensland Health in collaboration with Townsville City Council and local community partners implemented Actively Connect Townsville in 2009. The initiative aims to create supporting environments for the promotion of physical activity and social connectedness in the Townsville West region, a low socioeconomic area with a high number of Indigenous people. It was the result of public consultation that indicated exercise stations in local parks would encourage residents to increase physical activity. Ten station exercise circuits have now been installed.

Tai Chi in the Park was implemented in 2010 to encourage increased physical activity, strength and balance in people aged over 50 years. By the end of 2011, 37 residents had attended the 12-week course.

Flinders Shire Healthy Community Project

The Flinders Shire Healthy Community Project commenced in 2009. Its aim is to promote and improve healthy behaviours for the whole community, such as physical activity, healthy eating, positive mental health and healthy active ageing. By the end of 2011, five exercise circuits had been installed in a local park and these were used by four subsidised fitness classes. The project has also trained volunteers, installed six 10,000 Steps signs and provided funding support for three local residents to complete Certificate III in Fitness.



Be Healthy Maranoa

Be Healthy Maranoa is a project of the Maranoa Regional Council which commenced in early 2011. The project is funded under the Australian Government's Healthy Communities Initiative and is a partnership between federal, state and local government agencies including Queensland Health, Department of Health and Ageing, Maranoa Regional Council, TAFE, Aboriginal and Islander Health Council and non-government partners. Its aim is to establish and implement a community action plan for reducing chronic disease in the Maranoa region.

Be Healthy Maranoa seeks to create environments that support healthy living for high risk groups such as those not in paid employment. The project has contributed to environmental policies to increase opportunities for physical activity and healthy eating, provide marketing and information to the communities, and strengthen and promote existing prevention activities throughout the region.



SunSmart Grants

Protecting children from over-exposure to the sun's ultraviolet radiation is important as damage from the sun early in life is a major contributor to their future skin cancer risk. Cost can be a major barrier to installing sun protective measures such as shade and providing sun safe clothing, hats and sunscreen.²¹⁰

In 2010, Queensland Health and Cancer Council Queensland developed a funding initiative, the SunSmart Grant Scheme. Its aim was to help early childhood centres, primary schools and community organisations whose focus is children aged 0–12 years to improve their sun protection measures and promote SunSmart behaviour. Since the collaboration began in 2010, a total of 347 organisations have received grants for 50% of the full cost of the project up to a maximum of \$2,500 for a single project. These funds are to assist organisations with resources including shade structures (fixed and portable), sunscreen, hats, sun protective uniform design and tree planting for shade. In 2011, 99% of the SunSmart grant recipients indicated that many of the behaviours of members and children within their organisations had changed as a result of receiving the funding and 94% had an increased awareness of sun protection strategies.



Healthy food choices

Cook for Life

Cook for Life is a joint initiative of Queensland Health and a number of TAFEs across Queensland. Cooking classes are held to encourage people to prepare healthy foods and adopt sustainable food and nutrition habits which can, in the long term, improve diet quality and overall health outcomes. During 2011, there were 25 programs in 12 locations across Queensland with 263 participants. In 2012, 30 programs will be implemented in 20 different locations. All those attending the cooking programs will be invited to participate in the evaluation to be conducted in late 2012.



Need for Feed

Queensland Health is funding Diabetes Australia Queensland to coordinate the Need for Feed high school cooking program for students in years 8 to 10 in Queensland schools. It focuses on improving food preparation and cooking skills, basic nutrition knowledge, and attitudes and behaviours associated with healthy eating. The program is operated outside of school hours, using school cooking facilities, and facilitators are usually home economics teachers. In 2011, there were 12 programs in 11 locations in south-east Queensland and more than 120 participants. Diabetes Australia Queensland will deliver 16 programs across the state in 2011–12 and has scheduled 42 programs each for 2012–13 and 2013–14, and 20 programs in 2014–15.



Ministry of Food

Jamie's Ministry of Food Australia, a community based healthy cooking program partially funded by the Queensland Government, teaches people to cook simple, healthy and affordable meals. Participants are able to develop healthy eating practices by learning skills in cooking, food budgeting, meal planning, food preparation and sourcing fresh seasonal produce. The program is delivered by The Good Foundation in partnership with Queensland Health and retailer The Good Guys and its focus is on low income population groups. A Jamie's Ministry of Food Centre is located in Ipswich and a Jamie's Ministry of Food Mobile Kitchen visits four centres each year across the state. Queensland Health provided \$2.5 million over four years from 2010–11. At least 2,400 people will undertake the 10-week cooking program at the Ipswich centre over the life of the program and another 9,000 people will be reached through community cooking demonstration events.



Retail store nutrition program for remote Indigenous communities

Since 2010, Queensland Health has partnered with two remote food store groups—the Retail Stores Branch of the Department of Communities, Child Safety and Disability Services and the Islander Board of Industries and Service (IBIS) to help remote Indigenous Queenslanders to eat more healthy food. Retail Stores operates six stores in Doomadgee, Palm Island, Wooraabinda, Lockhart River, Pormpuraaw and Kowanyama. IBIS operates 16 stores across the Torres Strait and Northern Peninsula Area. Funding from Queensland Health enables each food store operator to employ a qualified nutritionist and deliver high quality services to the community including:

- increasing the range of healthy foods in the stores and promoting these to customers
- cooking demonstrations, posters, and recipe cards to promote healthy food
- nutrition education sessions for community health centres and schools
- nutrition training for store managers and staff
- partnerships with community organisations, schools, sport and recreation officers, sports teams and local health teams to promote healthy food and drink choices.



Retail store nutrition program for remote Indigenous communities (continued)

In 2011, the stores stocked more healthy foods for sale compared to the pre-intervention stocking practice. However, there was only limited impact on sales of healthy choices. This may have been due to the short timeframe during which promotional activities were conducted, or to the higher cost of healthy food and drink choices compared to unhealthy foods.



School based interventions

Interventions in schools can be an efficient way of advancing good health for large numbers of children. School based health programs can be one of the most cost effective investments a nation can make to improve education and health simultaneously.²¹¹ Queensland Health, in collaboration with partners, supports and implements many school based programs for health promotion and protection.

Human papillomavirus immunisation

Human papillomavirus (HPV) is the name of a group of viruses that cause skin warts and genital warts. Some types of HPV can cause cancers including cancer of the cervix.²¹² Immunisation against HPV is recommended for girls aged 12–13 years as part of the National Immunisation Program Schedule, to help prevent cervical cancer.²¹³ Under the Queensland Government's School Based Vaccination Program²¹⁴, all year 8 female students in Queensland are offered free HPV vaccination through their school. The vaccine is given in three doses over a six-month period. In 2011, 59,770 doses of HPV vaccine were given to girls as part of this program in more than 500 schools across Queensland. Parents are encouraged to discuss HPV vaccination with their daughters. In July 2012 the Australian Government, for the first time in the world, announced the provision of free HPV vaccines for boys. This is an expansion to the current program for girls (generally given in the first year of secondary school) and will also include a two-year catch up.



Falon's Quest

Learning about sun safety and how to enjoy the Queensland climate in a safe and healthy way is an essential part of all children's education. Falon's Quest is a school based online resource developed by Queensland Health in partnership with the Department of Education, Training and Employment, and Cancer Council Queensland.²¹⁵ Launched in 2009, Falon's Quest is a fun and engaging way to teach primary school students, from year 3 to year 7, about sun safety. The story is about Falon, an interspace hero who travels to other planets to learn how



his people can be protected from the sun's harmful ultraviolet radiation. Through Falon's adventures students learn about wearing hats, sunglasses and sunscreen, seeking shade and avoiding the sun when the UV Index is 3 or above. From a small trial in seven schools across Queensland, the resource was well received by students and teachers, with approximately three-quarters of students surveyed identifying that the resource had changed the way they thought about sun safety.



Sexual health for young people

The Queensland Government's HIV/AIDS, Hepatitis C and Sexually Transmissible Infection Strategy 2005–2011 made sex education for young people a priority. Sex education has traditionally been considered a controversial topic that was often avoided by schools because of the perceived risk of adverse publicity and lack of parental support. To help address this, Queensland Health funded Family Planning Queensland in 2011 to survey parents in two areas of regional Queensland (Cairns and the Sunshine Coast) on attitudes to their children participating in sex education, and to conduct a pilot project to help teachers who provide sex education.



Parents overwhelmingly supported their children's participation in age-appropriate sex education in schools. Teachers reported that their main priority was to have better access to approved teaching resources. Queensland Health is now working collaboratively with the Department of Education, Training and Employment to respond to these findings, through an expansion of the range of online sex education resources available to teachers, and increased access to online support and networking.



Workplace interventions

The workplace directly influences the physical, mental, economic and social wellbeing of workers and, in turn, the health of their families, communities and society. The workplace is a priority setting for health promotion for the following reasons:

- At least a third of the day is spent at work.
- Workplace culture and the working environment influence lifestyle habits.
- Work demands are leading to increased work hours and workloads.

About two million Queenslanders are of working age. Promoting healthy environments and lifestyle choices at work helps not only the individual workers but also supports and promotes corporate social responsibility. The Queensland Government has implemented a suite of workplace based health promotion initiatives throughout the state in recent years.

Workplaces for Wellness

Queensland's Workplaces for Wellness Initiative commenced in 2011 with the aim to engage and help workers to make positive and sustainable behaviour changes to reduce lifestyle related health risk factors and improve their health as well as contribute to improved workforce capacity. Funded under the Healthy Workers initiative of the National Partnership Agreement on Preventive Health, the Queensland initiative implements and evaluates workplace wellness programs in identified high risk and hard to reach workplaces.

The focus is on programs that promote physical activity and healthy eating, and encourage smoking cessation and reduction in harmful alcohol consumption. Specific examples are 10,000 Steps Workplace Program and Workplace Quit Smoking Program for which Queensland Health is developing and promoting a suite of resources. Workplaces will be able to access additional online 10,000 Steps resources and a funding incentive to support the implementation of the 10,000 Steps Workplace Challenge.

The Workplace Quit Smoking Program delivers six telephone counselling sessions over 16 weeks with the Quitline service and offers nicotine replacement therapy to assist workers' quit attempts. This intervention is provided at no cost to the workers. As of 30 June 2012, 35 Queensland workplaces had participated in the program with 1,162 workers and 65 family members supported. Of the participants, 29% were from the transport and storage industry, 13% from mining, 10% from construction, and the remainder from another six industries. The program has been completed by 308 people, and the quit rate at three months for the first 101 participants was 55%.

Information, tools and resources, including a Workplaces for Wellness website under development as of 30 June 2012, will also help to increase worker awareness about healthy living. The website will contain health and wellbeing messages and a health risk assessment tool that will provide feedback to individual workers on their current risky behaviours and advice on how to change their behaviours to a healthy lifestyle. The website will also help workplaces move through the stages required to create effective workplace wellness programs.

Under the initiative, incentives and support are offered to employers to deliver these programs. There is a recognition scheme to formally acknowledge their efforts to reduce lifestyle risk factors for chronic disease.

SPOTLIGHT



A Better Choice

Queensland Health's Healthy Food and Drink Supply Policy, known as 'A Better Choice', was first introduced in 2007. The aim of the policy was to ensure that nutritious food and drinks are actively promoted and readily available in all food outlets such as canteens, cafes, catering facilities and vending machines operated within Queensland Health facilities. In May 2009, 78% of the 134 facilities assessed had implemented more than half of the strategy's requirements for the supply and promotion of healthy food and drink, including 25% that reported full implementation.

SPOTLIGHT



Screening

Screening tests are used to detect early signs of a disease before any symptoms develop. Screening is generally undertaken on the basis of evidence that early diagnosis and treatment increase the chances of successfully managing disease. Population screening is the offer of a specific test to all individuals in a target group, usually defined by age, as part of an organised program to reduce the impact of the disease on both the individual and the health system.²¹⁶ The Australian Government has developed a population screening framework that includes defined criteria to determine if the population should be screened for a particular disease.²¹⁷ National screening programs that meet these criteria are for breast cancer, cervical cancer and bowel cancer.

Mobile Women's Health Service

Cervical screening by Pap smear every two years is an effective way to prevent cervical cancer in women aged 20–69 years.²¹⁸ While most Pap smears are undertaken by general practitioners, many women in rural and remote areas of Queensland may have difficulty in accessing this screening service.



The Queensland Mobile Women's Health Service, now in its twenty-first year, has travelled four million kilometres since 1991 to provide a much needed outreach health service for Queensland women who are geographically isolated, including Indigenous women. The service operates from 15 locations across Queensland and specially trained nurses and health workers provide Pap smears, support and information on women's health issues, including sexual health, menopause and family planning. Based on services delivered in previous years, it is expected that about 9,000 appointments will be made in 2012, and about 6,500 Pap smears undertaken.



Successful partnership provides breast cancer screening services in department store

In 2011, BreastScreen Queensland embarked on a very different venture when it entered into a formal partnership with retailer David Jones to provide a city service at its QueensPlaza store. This collaborative service provides a unique opportunity in a central retail location for women to have a breast screen. The aim is to provide a convenient, flexible service for women working in Brisbane City to access. Busy working women are the focus of this approach as they often cite being time poor as a reason for not having a regular breast screen, especially if it means they have to take time off work. The arrangement also addresses other barriers and expectations of this group, such as drop-in appointments, parking and public transport options.

The first three months of operation in 2011 demonstrated a positive result. An additional 234 women attended the QueensPlaza clinic compared to the number of women who attended BreastScreen Queensland's previous city service. Nearly half the women who attended had never had a breast screen and there was a 36% increase in the number of women who walked in to make an appointment compared to other BreastScreen Queensland services in Brisbane in the same period.



Innovative technology for BreastScreen Queensland

BreastScreen Queensland has implemented a statewide fully integrated Picture Archiving Communication System (PACS) and clinical information system that will be implemented in its 11 services by the end of 2012. This system will enable a Statewide Coordinated Reading Model that will ensure that Queensland women receive high quality breast screen services irrespective of where they live or which BreastScreen Queensland Service they attend. This new digital technology will provide the capability to store, distribute, view and interpret digital images electronically both centrally and at each of the BreastScreen Queensland Services. Timeliness in providing the results of screening to women and the provision of follow-up assessment services for those women recalled will be greatly improved. The central reading hub at Herston will also support registrar and reader training, professional development and research activities.



Ear health

Poor ear health is a widespread condition for Indigenous Queensland children in remote locations. These children have the world's highest recorded rates of otitis media (chronic middle ear disease), up to 70% in some remote communities.²¹⁹

Queensland Health's Deadly Ears Program aims to reduce the prevalence of middle ear disease in Indigenous Queensland children, particularly those aged 0–4 years, by offering multi-disciplinary services to the communities ranging from education and awareness to clinics and surgery. This involves working closely with community elders, families, councils, local health centres, schools and community organisations to raise community awareness of ear health, doing hearing assessments as part of routine child health checks, and conducting training for teachers, early educators and health professionals. The program operates ear, nose and throat clinics and surgical outreach services which bring ear doctors and nurses to those remote communities.



Since the program began in 2007, more than 4,700 children have received ear screening and treatment through the Deadly Ears outreach clinics and more than 1,000 surgeries have been performed. In 2012, an estimated 1,600 children will have their ears screened for middle ear disease, there will be 360 surgical procedures and another 800 will receive general ear checks and hearing examinations.



Group based programs

Group based programs are usually undertaken to target a specific group of people with the same interest or high risk groups for a particular health intervention. Such interventions are typically focused on prevention and lifestyle modification programs which are organised at the community level. Queensland Health has been supporting a number of group based lifestyle modification programs, mainly focused on chronic disease prevention.

SPOTLIGHT

Lighten Up to a Healthy Lifestyle



Lighten Up to a Healthy Lifestyle is a group based, healthy lifestyle program for adults developed and facilitated by Queensland Health.²²⁰ It is a program that runs for two or more months focusing on lifestyle modification including long term stress and weight management. Participants learn how to eat healthier, increase physical activity, set goals, relax and reduce their stress levels.

More than 1,100 adults took part across Queensland in 2010–11. At the end of the program in 2004, the most recent evaluation of the program, a significant increase was observed in healthy eating, physical activity, self-assessed health and self-esteem. A modest weight loss amongst participants was also achieved and weight gain prevented. The program reached high risk population groups such as Indigenous Queenslanders and people from low socioeconomic backgrounds. Key outcomes in the intervention groups included:

- Mean daily vegetable intake significantly increased by 0.6 serves (a 23% increase).
- Mean daily fruit intake significantly increased by 0.4 serves (a 24% increase).
- Mean weekly walking times nearly doubled from 69 minutes at registration to 137 at the end of program.
- Mean self-assessed health rating significantly increased by 17%.²²⁰



SPOTLIGHT

Living Strong

Living Strong intervention commenced in 1997 as a group based healthy lifestyle program for Indigenous Queenslanders. The intervention provides individuals with skills to identify and choose ways to make long term lifestyle changes, such as choosing healthier food and drinks and being more physically active. Some Living Strong participants who have attended the program have made changes to their own lifestyles as well as advocated for changes in their community. Examples include asking their retail store managers to offer more low fat food choices or working with the councils to get a safer walking track in their communities. Living Strong includes health screenings and up to 12 workshops which can be delivered in a variety of ways to suit community and local group needs.

In 2005, the most recent evaluation, 57% of participants lost some weight and about half the participants who were not previously eating sufficient fruit and vegetables every day, had started eating recommended serves of fruit and vegetables on a daily basis.²²¹ Small gains were also observed in both planned and incidental physical activity among participants.

During the 2010–11 period, a total of 29 programs were delivered statewide and 115 participants completed a program. Although the comparative effectiveness of other strategies to promote healthy weight, nutrition and physical activity in Indigenous communities was not investigated, it is expected that a group based program such as Living Strong would continue to have a role in preventing chronic disease in Indigenous Queenslanders.



SPOTLIGHT

Living Well Multicultural

The Ethnic Community Council of Queensland has received Queensland Health funding since January 2010 to employ multicultural health workers who deliver their flagship Living Well Multicultural health promotion program to Arabic speaking, Bosnian, Indian, Samoan, Spanish speaking, Sudanese and Vietnamese communities across south-east Queensland.

The program includes an accredited lifestyle modification program delivered over 14 weeks aimed at the prevention of type 2 diabetes, as well as a related health education program focused on increasing health literacy with information sessions on physical activity, good nutrition, food safety, shopping and food labels, understanding the Australian healthcare system, and disease-specific sessions on type 2 diabetes, asthma, COPD, cardiovascular disease and renal disease.

During the twelve months to July 2012, approximately 390 sessions have been delivered to in excess of 3,000 people, including over 1,000 Sudanese, 650 Samoan and 470 Vietnamese participants.



Brief interventions

Brief interventions are short one-on-one counselling sessions between a health professional and client. Their aim is to reduce risk factors for many preventable health conditions and have proven efficacy in promoting healthy behaviour and increasing individual capacity to start or maintain healthy behaviours. Over the past decade, Queensland Health has supported a number of prevention focused brief interventions targeting high risk individuals.

SPOTLIGHT

Health Check Program

Queensland Health in partnership with Cancer Council Queensland implemented the Health Check Program in 2010 as a brief intervention for men and women. The program is delivered in community and workplace environments to help Queenslanders assess and identify ways to reduce the risk. It also links participants to local health services and programs, including BreastScreen Queensland and the Queensland Cervical Screening and Bowel Cancer Screening programs. Health Check strives to boost interest in healthy living by raising awareness of the preventability of many diseases and health conditions, placing responsibility for change with individuals and helping them to set realistic goals to improve their health.

A trained health staff member, together with the participant, completes a detailed questionnaire that examines the person's health behaviours and their history, including alcohol intake, cancer screening, smoking and nutrition. Usually administered one-on-one, large and small groups have proved to be useful for those who have limited time. About a month after participating in the health check, the person is contacted to assess what health changes they have made and to further encourage them to make lifestyle changes. The initiative will be evaluated in 2013.



SPOTLIGHT

SmokeCheck

SmokeCheck is a training program for health professionals who work with Indigenous Queenslanders who smoke, developed by Queensland Health in 2003 in collaboration with Indigenous communities in northern Queensland.²²² The program aims to enhance the skills and capacity of health professionals to use culturally appropriate brief interventions to encourage and support clients who smoke to make healthy behaviour change.

Since 2003 more than 2,100 health professionals from government and non-government agencies across Queensland have been trained in the SmokeCheck program.

The 2006 evaluation of the program showed that clients receiving SmokeCheck advice had a significant reduction in daily cigarette smoking compared with those who did not. Other positive trends for clients included:

- increased number of quit smoking attempts
- reduced nicotine dependence
- increased motivation to change
- improved readiness to change
- increased awareness of the adverse health effects of smoking.

Overall, the evaluation showed that SmokeCheck was effective. The program was considered culturally appropriate, built health workers' skills in delivering brief intervention, and supported positive and healthy behaviour change.²²²



CHAPTER 5 Monitoring progress to good health



Known risk factors have a major impact on health outcomes.

In this chapter:

- Healthy weight
- Good nutrition
- Being active
- Smokefree
- Low risk drinking
- Illicit drug use
- Promoting mental health and wellbeing
- High blood pressure and cholesterol
- Cancer screening
- Being sun safe
- Improving oral health
- Immunisation

The contribution of modifiable risk factors to a high proportion of early deaths and disability highlights the potential preventability of the health burden in this state.⁸⁸ If Queenslanders were to eat well, be active, prevent weight gain, not smoke, take care that alcohol consumption does not exceed guidelines, be sun safe, invest in good oral health care, keep up with recommended immunisation and screening schedules and look after their mental health, the population would be healthier. The result would be less chronic disease, less pressure on health services and systems and the state would be wealthier through improved productivity. Recognising this, the June 2012 Statement of Government Health Priorities identifies the need to 'reduce rates of chronic disease in the community by investing in health awareness and prevention campaigns'.⁴³

Making change and advancing good health through reduction in disease risk factors cannot be achieved unless such change addresses unhealthy environments and cultures as well as individual behaviours. The WHO recognises that 'individual responsibility can have its full effect only when individuals have equitable access to healthy life and are supported to make healthy choices'.⁴² Therefore, in this report, the potential for change does not focus entirely on the individual. For example, reducing obesity and improving the food choices of Queensland's children are more likely to be

achieved if exposure to junk food advertising is reduced. Sometimes it is the environment that makes it hard to be healthy. Many workers lead very sedentary lives during the week because they sit at a computer, or travel only by car to work—this is a challenge increasingly recognised by society including government. At the same time, gains are being made as a result of environmental change—Queensland is becoming smokefree due to the impact of legislation to ban smoking in public places and smoking rates are progressively declining. However, it is true that individual behavioural change is also necessary—about a quarter of adult Queenslanders think they are of a healthy weight when they are not, and similarly many parents of overweight children are not aware that their child is outside the healthy weight range. Making an accurate assessment of one's health risks and taking action to mitigate them is important and this is where Queenslanders do need to individually invest in becoming healthier.

This chapter focuses on a number of the main risk and protective factors for health, chronic conditions in particular. Information is provided for the whole Queensland population as well as subpopulations where information is available, such as those in socioeconomically advantaged and disadvantaged areas, regional and remote populations, Indigenous Queenslanders, and those from culturally and linguistically diverse backgrounds. The current prevalence for each

87% of Australians broadly support the idea that preventing disease is more important than curing illness.¹⁸

risk and protective factor is described as are trends to enable systematic assessment of progress. Sources are cited, analytical methods reported (page 8), terms defined (page 131) and, while the most recent Queensland data is used in this chapter, historical data is reported in Table 1, page 4.

The prevalence of many of the risk factors for regional Queensland discussed in this chapter were reported in 2009–10 and will be reported for the 2011–12 period.²²³

The assessment of economic impact of key risk factors is drawn from sources where different approaches are used and therefore comparability is limited. For most, the economic analysis relates to Australia, not Queensland. In the absence of state-specific data, an estimate for Queensland is made based on the relative proportion of national population at the time of the estimate. For example, in 2011, 20% of the Australian population lived in Queensland and this would be the factor used to assess expenditure in Queensland in 2011. This estimation assumes national rates of treatment and, more importantly, costs associated with service delivery. It also assumes expenditure from all sources, including Australian and Queensland government funding as well as other sources, and therefore these estimations should not be interpreted as indicative of Queensland Government commitments in this area. In some reports the scope of assessment is health system expenditure while others include productivity costs and gains, production losses and gains, effects on households and crime.⁹ Several series of reports value the loss of wellbeing or what is described in some reports as intangible costs. To do this the Value of a Statistical Life is used, which was estimated to be within the range of \$5 million to \$7.1 million in Australian dollars (average of \$6 million) in 2006.²²⁴

Estimations of economic impact of selected risk factors, recognising these limitations, are as follows:

- Obesity was estimated to cost \$391 million in health system costs in Queensland in 2008.⁴⁹ This includes hospital and non-hospital expenditure. The total financial cost was \$1,654 million (includes health system costs) and cost of lost wellbeing was \$9,961 million, resulting in a total cost due to obesity of \$11,614 million.
- Inadequate fruit and vegetable consumption was estimated to cost \$206 million nationally to the health sector in 2008 (about \$41 million in Queensland).²²⁵
- Physical inactivity was estimated to cost \$144 million in health system expenditure in Queensland in 2008.²²⁶ Productivity losses were estimated to be \$1,860 million and the cost of reduced life expectancy \$770 million, taking the total cost of physical inactivity to \$2,760 million.
- Tobacco smoking was estimated to cost \$62 million (net) in healthcare which includes hospitals, medical costs, related nursing home costs, ambulances and pharmaceuticals in Queensland in 2004–05.⁹ Net labour costs including reduced employment and loss of productivity and the net effect on households due to premature death and illness associated with tobacco smoking, was estimated to be \$2,280 million. These are the tangible costs of tobacco smoking—tangible costs outside the health system were 38 times those within. The intangible costs of tobacco smoking were associated with loss of life and contributed a further \$3,790 million, taking the total cost of tobacco for the Queensland society to about \$6,140 million in 2004–05.
- Alcohol was estimated to cost about \$380 million in healthcare (including hospital, medical, related aged care, pharmaceutical and ambulances) in Queensland in 2004–05. Total cost to the Queensland society which also includes labour and productivity losses and loss of life due to alcohol related harms was about \$3,000 million in 2004–05.⁹
- The total cost of illicit drug use to the Queensland society was \$1.6 billion, with \$0.039 billion in healthcare costs in 2004–05. Nationally illicit drug use was estimated to cost the Australian society \$8.19 billion in 2004–05.⁹ The majority, \$6.915 billion or 84% of total was associated with tangible costs related to healthcare, labour and productivity losses and crime, and 16% or \$1.275 billion for intangible costs such as pain and suffering and loss of life. Healthcare costs include medical, hospital, nursing homes and pharmaceuticals with a net cost nationally of \$0.2 billion in 2004–05.⁹

There are significant economic gains in reducing key risk factors—it was estimated that over the lifetime of the 2008 Australian population, if feasible reductions of six major risk factors could be achieved there would be a saving of \$2.334 billion, with 64% of the savings occurring in the health sector.⁴⁶ Deaths would be reduced and productivity losses reduced as well as increased days of leisure time.

The Australian Government through the Australian National Preventive Health Agency envisages a healthy Australian society where the promotion of health is embraced by every sector, valued by every individual and includes everybody.¹⁸ Under the auspices of COAG, the Queensland Government has entered into a National Partnership Agreement on Preventive Health, which includes performance measures where the goal is to realise greater success in preventing chronic disease and improving the health and wellbeing of the population. This chapter includes progress towards these performance measures.

In 2010, the Queensland Chief Health Officer articulated the need to improve the environment as well as improve behaviours where we live, work and play.⁶⁶ A small number of the many positive changes taking place in Queensland are featured in Chapter 4. In the sub-section titled 'Potential for change', this chapter identifies opportunities for further gain and acknowledges that while it is beneficial to start early in life, effective change must continue into the later years.

The benefit of maintaining a healthy weight across the lifespan is clear, including during pregnancy and at birth. People of all ages, from infants through to older people, who are in the healthy weight range have generally better health and psychosocial outcomes than people who are underweight or overweight.^{227,228} In Queensland, adults in the healthy weight range are more likely than obese adults to rate their health as excellent, very good or good; rate their quality of life as good or very good; and to be very satisfied or satisfied with their health.³ Furthermore, those in the healthy weight range are less likely to have problems with mobility, self-care or undertaking usual activities, and are also less likely to report pain or discomfort.¹⁵⁸

The health problems as a consequence of being overweight and obese are many and varied, including cardiovascular disease, hypertension, type 2 diabetes, some cancers, sleep apnoea and musculoskeletal problems. Many of these are preventable through a healthy and active lifestyle.^{88,229} In 2007, high body mass was the largest risk factor, causing 8.5% of the disease burden in Queensland (Figure 10, page 23).⁸⁸ Obesity reduces life expectancy—median survival for obese people was reduced by two to four years and for the severely obese it was reduced by eight to 10 years.²³⁰ The epidemic of obesity also has substantial impact on the design of medical and associated equipment. At present, an upper limit of 250 kg of body weight is set for design purposes although in future this may need to be increased as the epidemic worsens.

Overweight and obesity are defined as a condition of excess weight that normally results from a sustained energy imbalance. Energy imbalance occurs when dietary energy intake is more than energy expenditure over a period of time, that is, consuming more energy than is burned off. A combination of body mass index (BMI) and waist circumference measurement is recommended for the clinical and population assessment of overweight and obesity.^{231–233} BMI is calculated from height and weight. Many population studies have demonstrated the relationship between BMI and health outcomes.²³⁴

Rising levels of obesity in children and adults are of concern to governments worldwide. Nationally the goal is to arrest and reverse the upward trend in child and adult overweight and obesity.¹⁸⁰ Achieving change will require detailed understanding of the factors that are causing this burden,

much of which is known. For several decades, internationally and within the WHO, the term ‘obesogenic environment’ has been used to describe the complex interplay of environmental and social factors that are leading to over consumption of energy-dense nutrient-poor foods combined with sedentary lifestyles.²³⁵ Although there is a general tendency for body weight to increase up to the age of about 60 years, the obesogenic environment is contributing to more rapid weight gains from the teenage years onwards, resulting in higher rates of overweight in young to middle-aged adults, which often progresses to obesity.^{236,237} Long term adherence to an active lifestyle and a healthy eating pattern can prevent age-associated weight gain.²³⁸

The most recent economic analysis of the impact of obesity is summarised on page 66 and in more detail in the previous report of Queensland's Chief Health Officer in 2010.⁶⁶

Current prevalence and differentials—adults

In 2012 less than half of adult Queenslanders were in the healthy weight range (40%) based on self report.⁴ A very small percentage were underweight (less than 3%), over a third were overweight (35%) and nearly a quarter were obese (23%) (Table 8). While 77% of teenage girls aged 16–17 years were in the healthy weight range, among those aged 25–44 years about 50% were in this range, with prevalence at lowest levels among middle-aged women (about 35%). A similar pattern was evident for males with even fewer middle-aged males reporting healthy weight (less than 25%).

While 57.7% of adult Queenslanders were overweight or obese in 2012, the health issues are largely associated with obesity. Rates of obesity were similar in males and females overall and increased with age for both, peaking at about 30% in the age group 45 to 74 years (Figure 27). There was a notable increase between the teen years and twenties and thirties with a doubling of the rate from about 10% to at least 20% and this was similar for males and females (Table 8). In contrast, rates of overweight are higher in males than females (more than 40% compared with about 30%) and increase with age, reaching peak levels by 35 years and remaining high into older age. Very rapid weight gain between the teen years and early adulthood for males resulted in 44% of those aged 25–34 years being overweight in 2012.

Obesity is a risk factor for diabetes.⁸⁸ In 2011 in Queensland, being obese was associated with about 4 times the likelihood of having diabetes or high blood sugar compared to healthy weight, and being overweight with about twice the likelihood.⁶⁹ Obesity can complicate the management of diabetes by increasing insulin resistance, which results in increased levels of blood glucose. However, loss of just 5% of body weight has been shown to improve insulin response and glycaemic control.²³⁹

Obesity rates vary across areas of Queensland based on socioeconomic status and remoteness. In 2012, rates of obesity were about 70% higher in disadvantaged areas than advantaged areas, 40–50% higher in remote and very remote areas than major cities, and 30–35% higher in inner and outer regional areas (Table 8).⁴ In contrast, rates of overweight were similar across Queensland.

Rates of obesity among Indigenous Queenslanders are higher than among the non-Indigenous population. In 2004–05, 64% of Indigenous Queenslanders aged 15 years and older reported being overweight or obese, compared with 51% of non-Indigenous people.²⁴⁰ Although the disparity was evident across all age groups, when overweight and obesity are considered separately, the difference lies largely in the relative proportion who are obese. Obesity rates in Indigenous Australians were nearly double the non-Indigenous rates, for example among those aged 18–24 years, obesity rates were 12% and 6% respectively, among those aged 55 years and older they were 30% and 18% respectively.

Health data for Queensland's overseas born population are limited, and are often reliant on country of birth identification—a descriptor which inadequately reflects the cultural and linguistic characteristics of the population. Recognising this limitation, in 2007–08, Queenslanders born outside Australia (with the exception of those born in the United Kingdom) reported lower levels of overweight and obesity than those born in Australia.²¹ However, it is likely that some overseas born Queenslanders will have substantially higher rates of overweight and obesity, such as Pacific Islanders, based on OECD data on country of origin.

Rates of overweight and obesity in Queensland adults were similar to national rates in 2007–08, with 57.1% of adult Queenslanders overweight or obese by self report compared with 57.0% of adult Australians.^{21,241} Similarly, by physical

The rate of overweight and obesity in Queensland in 2007–08 was similar to the national rate.²¹

measurement in 2007–08, 60.8% of Queenslanders were overweight or obese, compared to 61.2% nationally. Among males, the rate of overweight and obesity in Queensland was second highest of the states and territories, excluding the Northern Territory, and the rate for Queensland females was third highest.

International comparisons are limited.¹⁶⁸ Of 11 OECD countries with comparable data in 2007–2008, the rate of measured overweight and obesity in Australia was second highest after the United States.²⁴² However, based on the WHO collated data of about 200 countries in 2008, for age adjusted adult obesity, Australia was ranked in the top 25%

of countries, where levels varied from over 50% in some of the Pacific Island nations (Nauru, Tonga, Samoa) to less than 2% in places such as Bangladesh, Ethiopia and Nepal.²⁴³ Australia was similarly ranked for overweight and obesity combined.

Current prevalence and differentials—infants and children

■ Among Queensland infants born in 2010, 13% weighed 4,000 grams or more at birth and could be defined as a high birth weight or 'big baby', 81% were in the healthy weight

range (2,500 to 3,999 grams) and 7% were low birth weight (less than 2,500 grams).^{23,244}

Healthy weight mothers are more likely to give birth to healthy weight babies. Mothers and babies are both at greater risk if they are outside the healthy weight range. Queensland women who were obese at conception were 1.3 times more likely to have a postpartum haemorrhage, 2.6 times more likely to have gestational diabetes and 2.9 times more likely to experience gestational hypertension than healthy weight women in 2008.²⁴⁵ Among Queensland women who were similar in all other pre-labour obstetric characteristics in 2008, obese women were almost twice as likely to have a caesarean section as

Table 8: Self reported BMI, adults, percentage (95% CI), Queensland, 2012⁴

		Underweight BMI <18.5	Healthy weight BMI 18.5 -<25	Overweight BMI 25 -<30	Obese BMI 30+	Overweight/obese BMI 25+
Adults (18+ years)	Persons	2.5 (2.1-3.0)	39.8 (38.6-41.0)	35.0 (33.8-36.2)	22.7 (21.8-23.7)	57.7 (56.4-58.9)
	Males	1.5 (1.1-2.0)	33.7 (32.0-35.5)	41.9 (40.2-43.7)	22.9 (21.5-24.3)	64.8 (63.0-66.6)
	Females	3.6 (2.9-4.4)	45.9 (44.2-47.7)	28.0 (26.5-29.5)	22.5 (21.2-23.9)	50.5 (48.8-52.2)
Persons	16-17 years	n/a	70.4 (62.8-77.1)	18.5 (13.3-25.2)	*7.3 (4.1-12.7)	25.8 (19.7-33.1)
	18-24 years	5.6 (3.5-8.8)	62.3 (57.1-67.2)	22.2 (18.3-26.6)	10.0 (7.3-13.4)	32.2 (27.6-37.1)
	25-34 years	1.9 (1.2-3.0)	43.9 (40.3-47.6)	35.4 (31.9-39.0)	18.8 (16.1-21.7)	54.1 (50.5-57.8)
	35-44 years	2.2 (1.6-3.0)	39.2 (36.7-41.7)	36.1 (33.7-38.6)	22.5 (20.5-24.7)	58.6 (56.1-61.1)
	45-54 years	1.8 (1.3-2.6)	32.7 (30.5-35.0)	37.2 (34.9-39.6)	28.3 (26.2-30.5)	65.5 (63.2-67.7)
	55-64 years	2.2 (1.6-3.0)	30.0 (28.0-32.0)	37.6 (35.5-39.7)	30.3 (28.3-32.3)	67.8 (65.8-69.9)
	65-74 years	2.1 (1.5-2.8)	29.8 (27.7-31.9)	40.4 (38.2-42.6)	27.8 (25.8-29.9)	68.2 (66.0-70.2)
	75+ years	2.6 (1.9-3.6)	44.4 (41.5-47.4)	34.7 (31.9-37.5)	18.3 (16.0-20.8)	53.0 (50.0-55.9)
Males	16-17 years	n/a	65.1 (55.7-73.4)	24.4 (17.0-33.7)	*8.6 (4.9-14.7)	33.0 (24.8-42.4)
	18-24 years	*4.4 (2.2-8.5)	59.1 (52.3-65.6)	27.3 (21.7-33.7)	9.2 (6.3-13.1)	36.5 (30.3-43.2)
	25-34 years	n/a	36.1 (30.9-41.6)	44.2 (38.8-49.8)	19.1 (15.1-23.9)	63.4 (57.8-68.6)
	35-44 years	*0.5 (0.2-1.2)	32.5 (29.1-36.1)	42.4 (38.8-46.1)	24.6 (21.5-27.8)	67.0 (63.4-70.4)
	45-54 years	*1.0 (0.5-1.8)	24.4 (21.6-27.4)	45.0 (41.6-48.4)	29.7 (26.6-33.0)	74.7 (71.6-77.5)
	55-64 years	*1.9 (1.1-3.1)	24.5 (21.9-27.2)	43.8 (40.7-46.8)	29.9 (27.1-32.8)	73.7 (70.8-76.3)
	65-74 years	*1.6 (0.9-2.7)	24.8 (22.2-27.5)	47.5 (44.3-50.6)	26.2 (23.5-29.0)	73.6 (70.8-76.3)
	75+ years	*1.6 (0.9-2.8)	44.5 (40.5-48.6)	39.7 (35.7-43.8)	14.2 (11.5-17.3)	53.9 (49.8-57.9)
Females	16-17 years	n/a	77.4 (63.5-87.0)	*10.8 (5.1-21.3)	n/a	*16.5 (8.8-29.0)
	18-24 years	*6.8 (3.6-12.5)	65.5 (57.5-72.6)	16.9 (11.9-23.5)	10.8 (6.7-17.0)	27.7 (21.2-35.3)
	25-34 years	3.3 (2.1-5.4)	52.0 (47.2-56.7)	26.3 (22.4-30.6)	18.4 (15.2-22.2)	44.7 (40.1-49.4)
	35-44 years	3.9 (2.8-5.5)	46.1 (42.6-49.6)	29.6 (26.4-33.0)	20.4 (17.7-23.4)	50.0 (46.5-53.6)
	45-54 years	2.7 (1.8-4.1)	41.2 (37.9-44.6)	29.2 (26.2-32.4)	26.8 (24.0-29.8)	56.0 (52.6-59.4)
	55-64 years	2.5 (1.6-3.8)	35.7 (32.8-38.8)	31.2 (28.4-34.1)	30.6 (27.8-33.6)	61.8 (58.7-64.8)
	65-74 years	2.6 (1.8-3.7)	35.0 (32.0-38.2)	32.9 (29.9-36.0)	29.5 (26.7-32.5)	62.4 (59.2-65.5)
	75+ years	3.4 (2.4-5.0)	44.3 (40.2-48.5)	30.7 (26.9-34.8)	21.6 (18.2-25.4)	52.2 (48.0-56.4)
Socioeconomic status (18+ years)	Disadvantaged	2.2 (1.7-2.8)	32.3 (30.2-34.5)	37.3 (35.1-39.5)	28.2 (26.3-30.3)	65.5 (63.3-67.6)
	Quintile 2	2.0 (1.3-3.0)	34.6 (32.1-37.2)	36.3 (33.9-38.8)	27.1 (24.9-29.4)	63.4 (60.8-65.9)
	Quintile 3	2.2 (1.5-3.1)	39.8 (37.2-42.4)	34.6 (32.2-37.2)	23.5 (21.4-25.6)	58.1 (55.4-60.7)
	Quintile 4	3.2 (2.2-4.6)	42.4 (39.3-45.5)	34.5 (31.8-37.4)	19.9 (17.7-22.4)	54.4 (51.3-57.5)
	Advantaged	2.9 (2.0-4.3)	48.1 (45.1-51.2)	32.7 (30.0-35.5)	16.3 (14.4-18.4)	49.0 (46.0-52.0)
Remoteness (18+ years)	Major cities	2.8 (2.2-3.6)	42.9 (41.1-44.8)	34.3 (32.6-35.9)	20.0 (18.7-21.3)	54.2 (52.4-56.0)
	Inner regional	1.9 (1.5-2.5)	36.1 (33.9-38.5)	36.1 (33.9-38.3)	25.9 (23.9-28.0)	61.9 (59.6-64.2)
	Outer regional	2.1 (1.5-2.9)	34.9 (32.4-37.5)	36.2 (33.8-38.7)	26.8 (24.6-29.0)	63.0 (60.4-65.5)
	Remote	2.2 (1.5-3.2)	34.3 (31.2-37.5)	35.4 (32.4-38.5)	28.1 (25.4-30.9)	63.5 (60.3-66.6)
	Very remote	2.2 (1.5-3.4)	32.1 (28.9-35.4)	35.3 (32.3-38.4)	30.4 (27.4-33.5)	65.7 (62.3-68.9)

* Estimate has a relative standard error of 25% to 50% and should be used with caution.

n/a Not available for publication

There were about 200,000 overweight or obese children in Queensland in 2011, about 1 in 4 of those aged 5–17 years.³

non-obese women.²⁴⁶ This rate was similar for deliveries in public and private hospitals.

Women who were obese at the time of conception were more likely to give birth to a high birth weight infant—in 2010 about 1 in 5 obese Queensland mothers did so, whereas for healthy weight mothers only 1 in 10 babies were in the high weight category. This represents double the risk of giving birth to a high birth weight infant among obese mothers compared with healthy weight mothers. In 2009 this increased risk resulted in about 1,200 more such infants in Queensland than would have been expected based on healthy weight mothers.

For a woman to be underweight at conception doubled the risk of giving birth to a low birth weight baby—in 2010, 12% of babies born to mothers who were underweight at conception weighed less than 2,500 grams compared to 6% among healthy weight mothers.

The majority of Queensland's children are of healthy weight. By proxy report in 2011, 66% of Queensland children aged 5–17

years were a healthy weight, 7% were underweight, 18% were overweight, and the remaining 9% were obese (Table 9).¹¹ This was in very close agreement with a national physical measurement survey in 2007–08 where 73% of Queensland children aged 5–17 years were of healthy weight or underweight, 18% were overweight, and the remaining 9% obese.²¹

The prevalence of proxy reported healthy weight, overweight and obesity was generally similar in Queensland children across age groups in 2011, although the proportion of overweight males aged 16–17 years was double the female proportion (Table 9). However, there were some socioeconomic differences. The prevalence of combined overweight and obesity among Queensland children living in disadvantaged areas was 40% higher than for those in advantaged areas, while rates of obesity alone were about double. The rates of healthy weight, and overweight and obesity were similar in major cities and regional and remote areas in Queensland, noting the limitation of small sample sizes in some regions.³

Figure 27: Self reported BMI by age and sex, Queensland, 2012⁴

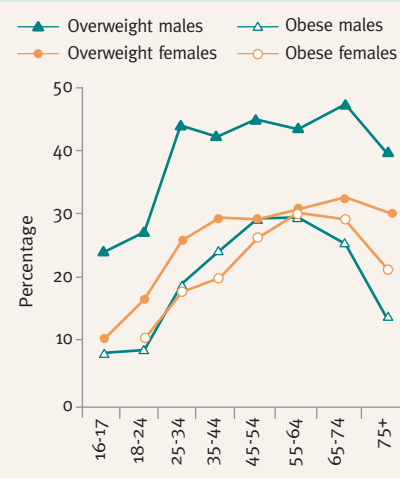


Table 9: Proxy reported BMI, children, percentage (95% CI) Queensland, 2011¹¹

		Underweight	Healthy weight	Overweight	Obese	Overweight/obese
Persons	5-17 years	7.0 (5.9-8.3)	66.4 (64.2-68.5)	18.1 (16.5-19.9)	8.5 (7.3-9.8)	26.6 (24.7-28.6)
Males	5-17 years	8.0 (6.4-10.0)	63.5 (60.5-66.5)	19.4 (17.1-22.0)	9.1 (7.5-11.0)	28.5 (25.8-31.4)
Females	5-17 years	5.9 (4.6-7.7)	69.4 (66.3-72.4)	16.8 (14.5-19.3)	7.9 (6.2-9.9)	24.6 (21.9-27.6)
Person	5-7 years	10.5 (7.8-13.9)	62.0 (57.3-66.6)	14.4 (11.3-18.1)	13.1 (10.2-16.7)	27.5 (23.4-32.0)
	8-11 years	6.3 (4.6-8.7)	59.6 (55.6-63.6)	23.5 (20.3-27.1)	10.5 (8.1-13.4)	34.0 (30.3-38.0)
	12-15 years	5.6 (3.9-7.9)	71.4 (67.7-74.9)	17.1 (14.4-20.3)	5.9 (4.3-8.0)	23.0 (19.9-26.5)
	16-17 years	6.3 (3.9-9.8)	75.1 (69.9-79.7)	14.9 (11.3-19.4)	*3.7 (2.1-6.5)	18.6 (14.6-23.4)
Males	5-7 years	10.7 (7.3-15.3)	61.7 (55.3-67.7)	14.6 (10.6-19.8)	13.1 (9.5-17.7)	27.6 (22.3-33.7)
	8-11 years	7.2 (4.7-11.1)	59.3 (53.6-64.8)	22.8 (18.5-27.9)	10.6 (7.4-14.9)	33.4 (28.3-39.0)
	12-15 years	6.9 (4.3-10.6)	66.6 (61.2-71.6)	19.0 (15.3-23.5)	7.5 (5.1-11.0)	26.6 (22.1-31.6)
	16-17 years	*8 (4.2-14.6)	67.9 (59.8-75.0)	20.1 (14.2-27.5)	*4.1 (2.1-7.8)	24.2 (18.0-31.7)
Females	5-7 years	10.2 (6.4-15.9)	62.4 (55.2-69.1)	14.2 (9.9-19.8)	13.2 (8.9-19.1)	27.4 (21.4-34.2)
	8-11 years	5.4 (3.3-8.6)	60.0 (54.2-65.5)	24.3 (19.7-29.6)	10.3 (7.2-14.7)	34.6 (29.3-40.4)
	12-15 years	*4.3 (2.4-7.3)	76.4 (71.1-81.0)	15.2 (11.3-20.0)	*4.2 (2.6-6.8)	19.4 (15.1-24.4)
	16-17 years	*4.5 (2.5-8.0)	82.8 (76.5-87.6)	9.4 (6.1-14.4)	n/a	12.8 (8.5-18.7)
Socioeconomic status	Disadvantage	8.0 (5.5-11.5)	61.5 (56.3-66.3)	17.6 (14.1-21.8)	12.9 (9.9-16.7)	30.6 (26.1-35.4)
	Quintile 2	6.3 (4.1-9.7)	64.7 (59.5-69.5)	19.0 (15.2-23.5)	10.0 (7.2-13.7)	29.0 (24.4-34.0)
	Quintile 3	6.0 (4.0-9.0)	68.8 (64.0-73.2)	18.3 (14.8-22.3)	6.9 (4.8-9.9)	25.2 (21.1-29.7)
	Quintile 4	6.3 (4.3-9.2)	67.3 (62.6-71.6)	19.7 (16.1-23.9)	6.7 (4.7-9.3)	26.4 (22.4-30.8)
	Advantage	8.4 (6.0-11.6)	69.6 (64.8-73.9)	15.9 (12.7-19.7)	6.1 (4.0-9.2)	22.0 (18.2-26.4)
Remoteness	Major cities	6.2 (4.8-7.8)	67.3 (64.4-70.1)	18.1 (15.9-20.5)	8.4 (6.8-10.4)	26.5 (23.9-29.3)
	Inner/outer regional	8.3 (6.4-10.6)	64.6 (61.1-67.9)	19.0 (16.4-22.0)	8.1 (6.4-10.2)	27.1 (24.1-30.4)
	Remote/very remote	n/a	71.6 (62.2-79.4)	*11.6 (6.8-19.0)	*12.1 (7.2-19.4)	23.6 (16.6-32.5)

* Estimate has a relative standard error of 25% to 50% and should be used with caution.

n/a Not available for publication

Trends—adults

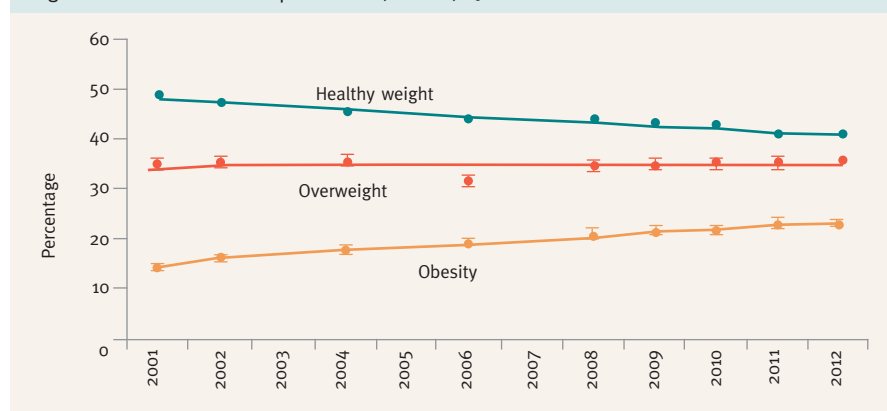
Rates of healthy weight are decreasing in Queensland adults while rates of overweight and obesity are increasing. Between 2001 and 2012, healthy weight decreased by 15.6%, or 1.4% per year (7.3 percentage points decrease), while overweight and obesity increased by 17.9%, or 1.4% per year (8.7 percentage points or 0.7 percentage points per year). Over this period there was no change in the prevalence of overweight, but for obesity there was an increase of 54.9%, or 3.7% per year (8.3 percentage points or 0.7 percentage points per year) (Figure 28). However, considering the longer term, the current trends were evident more than 20 years ago, with the rate of obesity more than doubling since 1993—from 10% in 1993 to 23% in 2012 (Figure 1D, page 3). There has been little change in the proportion of overweight adults over the period.

The upward trend in rates of obesity combined with population growth is resulting in about 55,000 additional overweight or obese adults in Queenslanders each year, on average, since 2001. This includes, 30,000 obese adults per year and 25,000 overweight adults per year. As a result, it is estimated there were about two million Queensland overweight or obese adults in 2012.

Based on the current trend, it is projected that by 2017, in five years, almost two-thirds of Queensland adults (63%) will be overweight or obese—27% obese and 34% overweight. If the current rate of increase were to halve, the prevalence in 2017 is projected to be about 60%.

Socioeconomic differences remained steady between 2001 and 2012, with the rate of obesity in Queensland's most disadvantaged adult populations about double, or about 10 percentage points higher than the rate in the most advantaged areas over the decade.

Figure 28: Trends in self reported BMI, adults, Queensland



The rate of adult obesity doubled in Queensland between 1996 and 2012, with about 30,000 more obese people every year on average.

There has been a 13.5% increase in the proportion of high birth weight infants in Queensland over the past 20 years—they are at greater risk of delivery complications and childhood and adult adiposity.

The goal of the National Partnership Agreement on Preventive Health is to limit the increase in prevalence of unhealthy weight (includes underweight, overweight and obese) in June 2016 to no more than 5% from the 2009 baseline of 58.5% and to return to baseline by December 2017. Between 2001 and 2012, the proportion of adults of unhealthy weight has increased (by 0.6 percentage points per year), with the 2012 estimate 2.7% above the baseline. The current upward trend will need to be reversed to achieve the 2017 goal.

Trends—infants and children

Overweight and obesity prevalence in Australian children has doubled over the past 30 years.²⁴⁷ This upward trend is a significant public health issue and for this reason has been included as a performance indicator in the National Partnership Agreement on Preventive Health. There is some evidence accumulating that in the past decade prevalence is approaching a plateau.²⁴⁸ Based on the limited comparable data in Queensland, between 2009 and 2011 there was no change in overweight and obesity in Queensland children.^{11,249}

The National Partnership Agreement on Preventive Health performance indicator is the proportion of children in the unhealthy weight range and includes those who are underweight as well as the overweight and obese. In the baseline year of 2009, 31.6% of Queensland children aged 5–17 years were reported to be an unhealthy weight and in 2011, 33.6% were. The June 2016 goal is to limit the increase in unhealthy weight to less than 5% above baseline and by December 2017 to return to baseline. The 2011 estimate was 6% above baseline. However, the difference between the 2011 estimate and the baseline measure was not statistically significant.

Over the past 20 years, there has been a steady downward trend in the proportion of healthy weight infants born in Queensland, offset by significant upward trends in the low birth weight and high birth weight categories (considering only singleton births of greater than 37 weeks gestation). The proportion in the healthy weight range decreased by 2.4% between 1989 and 2008, while there was an increase of 7.8% in the proportion of low birth weight infants (less than 2,500 grams) and 13.5% increase in the high birth weight proportion (4,000 grams and over).

Potential for change

With 57.7% of adult Queenslanders overweight or obese in 2012, and 26.6% of children aged 5–17 years overweight or obese in 2011, it is estimated that there were about 1.2 million overweight and 0.8 million obese adults and about 0.2 million overweight or obese children in Queensland—a total of about 2.2 million people.

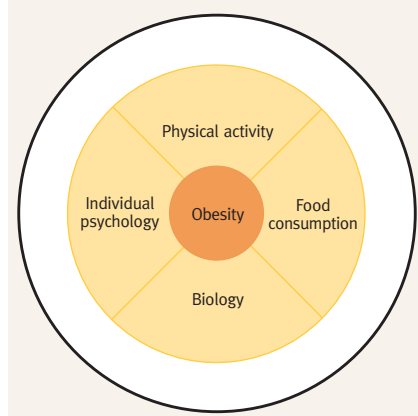
Despite the widespread concern among governments about rising rates of obesity, and the efforts to control the rise, the problem remains. A complex interplay of factors such as individual eating and activity behaviours, and genetic predisposition, together with societal and environmental influences are creating this modern phenomenon (Figure 29).²⁵⁰ It is commonly understood that obesity is a result of overeating and poor dietary habits, probably combined with lack of exercise, and fundamentally this is correct. Energy imbalance does result in weight gain.²⁵¹ However, the choices an individual makes about food intake are governed by many factors including the availability of healthy food, knowledge about good eating, motivation to improve health, food advertising, family and society

norms, attitudes and beliefs as well as psychological outlooks.²⁵² Lack of physical activity contributes to an energy imbalance. Environments that encourage and support physical activity, along with personal choices, attitudes and inclination, all influence the behaviour of the individual. For children, birth weight and family characteristics including parenting styles are also contributing factors.²⁵³

Arresting and reversing the current upward trend in obesity among Queenslanders will require concerted action across all levels of government as well as the cooperation of the private sector and changing knowledge and attitudes in the community. Interventions and strategies to prevent obesity do, however, have the potential to generate additional long term health benefits.²⁵⁴ It is likely that the most promising gains in obesity prevention and the many chronic diseases that stem from it, will involve multiple interventions implemented simultaneously, and include both population-wide and targeted approaches. It will also be necessary to develop effective treatments for obesity because preventing new cases from occurring alone will have limited impact on the already large number of cases in the population.²⁵⁵



Figure 29: The major causes of obesity²⁵⁰



Getting a healthy start

Obesity is notoriously difficult to treat, so prevention is critical. The evidence shows that the fetal period, neonatal environment, and the early years are critical to the eventual health of the adult and that obesity itself has some of its origins at the beginning of life. Attention to the health of mothers and babies is therefore fundamental to addressing the growing problem of obesity.

Good health begins before birth. A large number of studies have demonstrated relationships between fetal experiences and risk of adult chronic disease, including cardiovascular disease, cancer, diabetes, osteoporosis, respiratory conditions and neuropsychiatric outcomes.²⁵⁶ Information on the fetal origins of obesity is slowly emerging. Variation in weight at birth is often used as a surrogate to reflect the underlying mechanisms influencing intrauterine growth and the fetal environment.

It has long been established that low birth weight carries long term health risks.^{98,257} However, high birth weight also has health risks including eventual adiposity and its comorbidities such as type 2 diabetes. This demonstrates a U-shaped relationship, showing trouble at both extremes of the birth weight spectrum.^{256,258}

Over the past 20 years, there has been a steady downward trend in the proportion of healthy weight infants born in Queensland, along with significant upward trends in the low birth weight and high birth weight categories. Mean birth weight has been increasing in many countries in recent decades and also in Queensland.²³ In Canada, an increase in the proportion of infants who are large for gestational age over a 20-year period since 1978 was attributed to

increases in pre-pregnancy maternal BMI and gestational weight gain.²⁵⁹

Maternal nutrition and care are essential. Protection of health in the long term can be achieved by improving the maternal environment, including the nutritional status of mothers prior to conception, throughout pregnancy and during lactation. Adverse effects of maternal overweight and obesity include increased risk of gestational diabetes, hypertension, caesarean delivery, postpartum haemorrhage, induction of labour, shoulder dystocia and likelihood of delivering an infant who is large for gestational age. Most of these impacts and risks have been demonstrated among obese mothers in Queensland in recent years.²⁴⁵ Action to address the increase in maternal obesity, prior to conception and during pregnancy, is needed.²⁶⁰

Good nutrition in the child's first five years supports healthy growth and development and often the benefits last throughout

life.²⁶¹ Direct effects are lower risk of excessive weight gain in childhood, improved dental health and prevention of diet related disease in later life. Childhood obesity also prolongs exposure to the health risks of obesity.^{262,263}

Evidence suggests that rapid weight gain in the first five years of life predisposes the child to adult obesity and the first week of life is a particularly important period for infant nutrition.²⁶⁴ Very rapid weight gain for infants fed infant formula in their first week has been shown to be associated with higher rates of adult overweight. As the protective benefits of breastfeeding are well documented it is important that breastfeeding is established at birth.²⁶⁵ While the evidence for a biological relationship with obesity is not yet established, the draft NHMRC guidelines recognise breastfeeding as an important factor in the maintenance of healthy growth during infancy and prevention of later obesity.¹⁰

Obesity is notoriously difficult to treat, so prevention is critical.



Marketing obesity—junk food advertising and children

Exposure of children to junk food advertising contributes to the problem of childhood obesity. Queensland children are watching about 12 hours of television and other screen based technology for entertainment each week.¹¹ And the amount of time spent on small screen viewing is likely to be growing as a result of increased access to handheld electronic media devices.²⁶⁶ Such a level of exposure to electronic media can affect health not only because it leaves less time for active recreational and sporting activity, but it also exposes children to food advertising which, the evidence shows, is largely related to foods of poor nutritional value and high energy content, known as 'junk food'.²⁶⁷

Childhood obesity has been labelled one of the most serious public health issues of the 21st century as it puts the child at higher risk of adult obesity and subsequent chronic disease.²⁶⁷ The WHO identified the obesogenic environment as a critical factor in the development of this problem. The Australian Government has examined the evidence that advertising of junk food during children's television time and during programs that target family viewing is contributing to the problem.²⁶⁷ There are two sides of the ongoing debate over whether governments should impose limitations on advertising of junk food to children. Arguments for tighter restrictions include the particular vulnerability of children to advertising, and its effect on their food related behaviour which can lead to obesity.²⁶⁷ There is mounting evidence that junk food advertising does negatively affect children's diet and diet related outcomes.^{268,269}

Television advertising influences children's food and beverage consumption, preferences, and purchase requests, and this affects the overall balance of their diet.^{268,269} While there is an association between television advertising and adiposity, it is difficult to determine if this is a causal relationship.²⁶⁹ Arguments against are that the link between junk food advertising and children's weight is unconvincing and that self regulation is sufficient to ensure that food advertising does not contribute to childhood obesity.

The National Preventive Health Taskforce in 2009 recommended some initiatives to halt and reverse the rise in overweight and obesity in Australia.²⁷⁰ One was to



reduce children's exposure to marketing, advertising, promotion, and sponsorship of energy-dense nutrient-poor foods, and to 'phase out the marketing of energy-dense nutrient-poor food and beverage products on free-to-air and pay television before 9 pm within four years'. In their 2010 response to the report, the Australian Government stated that 'change is currently being achieved through a combination of government regulation, industry self regulation and new television initiatives'.²⁷¹ However, according to a 2011 monitoring report by the Australian Communications and Media Authority it was not clear whether there was any measurable change in the exposure of children to food and beverage advertising.²⁷² Furthermore, recent Australian research has found that children's exposure to junk food advertising was unchanged following the introduction of self regulation and this supports similar findings from earlier research.²⁷³

The increase in childhood obesity over the past 30 years has now become a significant public health concern in most industrialised societies. Concerted action

by governments, communities and families along with restricting media promotion of junk food to children are important steps towards arresting this obesity promoting environment. However, clear statements of the objectives to be achieved from any change in policy are required, and a definition of measured success as well as engaging the relevant stakeholders to monitor progress.²⁷⁴

Knowledge, perception and awareness of obesity

Body image and actual body weight are not always well connected. Body image involves a person's perception, imagination and emotions—it does not necessarily reflect actual body weight or how others might see the person. Poor body image is often linked to dieting or eating disorders such as anorexia nervosa, bulimia and binge eating as well as to other mental health issues such as depression and anxiety.²⁷⁵ Young people are especially concerned with body image. In a 2007 survey of 5,466 selected young Queenslanders aged 11–24 years, body image was the top issue of

concern with about one-third identifying it as a significant issue, ahead of coping with stress and family conflict.²⁷⁶

However, having an accurate and realistic perception of body weight is an important factor in maintaining a healthy weight and avoiding weight gain or excessive loss of weight. Studies that measure a person's weight and height and then compare those to self reported measurements have shown that people tend to underestimate their weight or overestimate their height or both and as a result their weight status is misclassified.

Most Queensland adults (72% in 2011) accurately self assessed their weight category but 27% made an incorrect assessment. Underweight adults tended to overestimate their weight status and overweight adults to underestimate their weight, whereas those in the healthy weight range were more likely to make a correct assessment (Figure 30).²⁷⁷

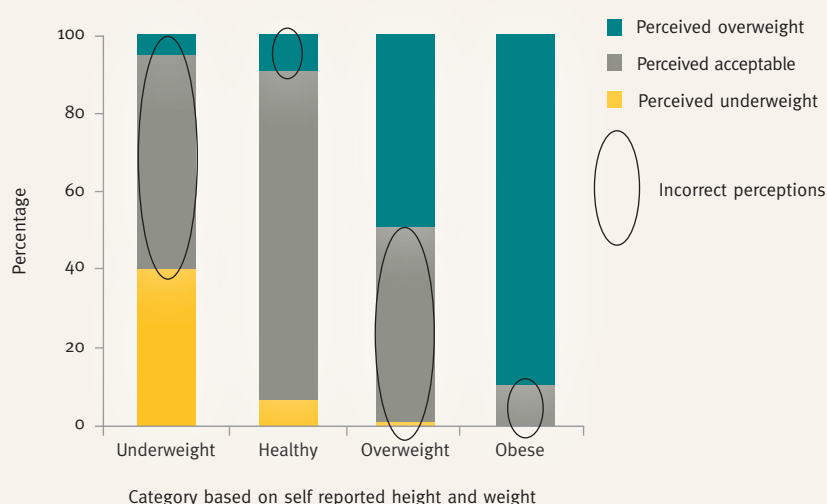
Of those in the healthy weight range, 85% of Queensland adults correctly assessed themselves to be so based on self reported height and weight, about 6% thought they were underweight and 9% incorrectly thought they were overweight (Figure 30).²⁷⁷ Those outside the healthy weight range had distorted perceptions of weight. Only 40% of underweight people made a correct assessment, while 55% thought their weight was acceptable and 6% incorrectly thought they were overweight. Of those who were overweight or obese, 67% were correct in their assessment, but the remaining 33% thought they were of an acceptable weight.

Males were more likely to incorrectly assess their weight than females. In 2011, irrespective of age, socioeconomic status and remoteness, adult Queensland males were twice as likely as adult females to consider themselves to be in an acceptable weight range when in fact they were obese.⁶⁹ A substantial increase is evident in the prevalence of overweight among males in their early adult years (Figure 27) and it is possible that young males are not fully aware of the significant weight gain that is occurring during these years.

The majority of Queensland parents correctly assess their children's weight but there are some who considerably underestimate it. In a 2006 Queensland survey, children's BMI was measured and their parents were asked whether they considered their child to be 'too thin',

1 in 4 adult Queenslanders inaccurately perceived their weight status in 2012.⁴

Figure 30: Accuracy of perceived weight and self reported height and weight for BMI assessment, adults, Queensland, 2011²⁷⁷



'about right' or 'too fat'.²⁷⁸ Over 90% of parents of children in the healthy weight range in year 1 and year 5 correctly assessed their children to be about right, about 8% incorrectly considered them too thin and less than 1% considered them too fat. However, fewer parents of children who were measured as overweight or obese correctly estimated their child's size—less than 10% of year 1 parents and 30% of year 5 parents. Year 10 students themselves (parent responses were not required) were more likely to correctly assess their own size, particularly girls—two-thirds of year 10 girls who were measured overweight or obese considered themselves too fat, compared with 40% of boys. These results are consistent with other reports which suggest that parents of healthy weight children were more likely to correctly assess their child's weight status than parents of overweight children.²⁷⁹

Most Queensland adults and parents correctly consider their weight or their child's weight to be acceptable. However, there is a tendency for overweight and obese adults and parents of overweight and obese children to underestimate weight and not perceive the problem correctly, so they may be less likely to take action to prevent further weight gain.

Weight loss is difficult to achieve and to sustain, so prevention of weight gain is vital, particularly given the growing trend towards obesity in adults as they age and the rise in childhood obesity. Messages about preventing weight gain should be aimed at population groups that have greater misconceptions such as males and those already outside the healthy weight range.



Good nutrition

Food provides nutrients for the body to fuel activity and protect against disease.²⁸⁰ According to the NHMRC, 'diet is arguably the single most important behavioural risk factor that can be improved to have a significant impact on health'.¹⁰ Good nutrition is necessary to maintain healthy weight, mental and physical health, resistance to infection, quality of life, and for protection against chronic disease, premature death and disability.²⁸¹ It is recommended that Australians consume a wide variety of nutritious foods in amounts to meet energy needs, and limit the intake of food and drinks containing high levels of saturated and trans fats, added salt, added sugars and alcohol.^{10,282} However, the role of food goes beyond providing nutrients, preventing disease and promoting health: food also has a social and cultural value. Food is frequently used in symbolic ways, playing an integral role in social bonding, relationships, and religious and social celebrations, and is a significant component of the cultural diversity in Australia.²⁸³

The evidence suggests that Australians need to eat more vegetables, fruit, wholegrain cereal, low fat dairy (milk, yoghurt and cheese), fish, seafood, poultry, eggs, legumes or beans (including soy), nuts and seeds and, for young females only, red meat. They also need to reduce consumption of food and drinks that are high in saturated fat, added sugar, salt and alcohol, for example, most takeaway food from quick service outlets, cakes and biscuits, chocolate and confectionery, sweetened drinks, refined cereals, starchy vegetables such as potatoes, as well as high and medium fat dairy food and, for adult males only, red meat.

While excess food intake, particularly of energy-dense and nutrient-poor foods is a cause of obesity (page 67), under-nutrition can be a problem particularly in older people.²⁸⁴ Four risk factors with substantial dietary determinants (high body mass, high blood pressure, high cholesterol, and low fruit and vegetable intake) as well as physical inactivity were jointly responsible for about 16% of the total burden of disease and injury in Queensland in 2007.⁸⁸ The most recent economic analysis of the impact of poor nutrition is summarised on page 66 and in more detail in the previous report of Queensland's Chief Health Officer in 2010.⁶⁶

In this section, the following nutrition indicators are discussed: fruit and vegetables, takeaway food, soft drink, milk, breastfeeding and food insecurity. The current 2003 Australian Guidelines for healthy eating are used in this report, consistent with state and

national performance reporting, although the draft Australian Dietary Guidelines are shown on this page.

Fruit and vegetables have low energy density and are rich in nutrients. They provide dietary fibre and high levels of vitamins and minerals.¹⁰ Each additional daily serve of fruit or vegetables is associated with reduced risk of coronary heart disease and stroke.²⁸¹ Consumption of fruit and vegetables is associated with a lower risk of weight gain and some cancers. The current recommended serves of fruit and vegetables vary by life stage. In 2007, low fruit and vegetable intake was responsible for about 2% of the total burden of disease in Queensland, and 4% of the deaths.⁸⁸

Fruit should mostly be eaten fresh and raw. Fruit juice has low fibre content and should only be used occasionally as a substitute for fresh fruit as it is energy dense and, if consumed in excess, it can displace other nutritious foods from the diet and may lead to problems such as obesity. Dried fruit has high energy density and stickiness, which may have implications for dental decay.

Takeaway food is usually energy dense, low in nutrients, and high in salt, sugar and saturated fat, so consumption should be limited.¹⁰ In this report, 'takeaway food' refers to meals or snacks such as burgers, pizza, chips and other fried foods sold in places like fast food chain outlets or independent takeaway food stores.

Soft drinks sweetened with sugar are energy dense, usually nutrient poor and are associated with weight gain and dental decay so consumption should be limited.^{10,285} While sugar is substituted in diet soft drinks, the additives in both diet and non-diet drinks can cause tooth decay. Average consumption of aerated and carbonated waters more than

doubled in Australia from the late 1960s to the late 1990s.²⁸⁶ While consumption of non-diet soft drink decreased between 2002 and 2006, Australians still consumed on average 66 litres per person in 2006, or 1.3 litres per week.²⁸⁷ The proposed NHMRC Australian dietary guidelines recommend drinking plenty of water, and that fruit juice should be drunk only in moderation.¹⁰

Milk, cheese and yoghurt are good sources of many nutrients, including calcium, protein, iodine, vitamin A, vitamin D, riboflavin, vitamin B12 and zinc. However, full cream varieties are also high in fat, most of which is saturated.^{10,288} Higher intake of saturated fat is associated with higher total and low-density lipoprotein (LDL) cholesterol. As these are risk factors for cardiovascular disease, reduced fat varieties are recommended for most Australians, except for infants up to 2 years of age for whom whole milk is recommended.^{10,281,289} In this report, usual consumption of full cream milk is included as a proxy for dietary saturated fat and total fat, as it has been found that those who usually consume full cream milk receive a higher proportion of their total dietary energy from fat and saturated fat than those who usually consume skim or reduced fat milk.²⁹⁰

Breastfeeding is recommended as breast milk is a complete food for infants, providing appropriate amounts of all the nutrients needed to support healthy growth and development.¹⁰ Breastfeeding has short term and long term health and other benefits for infants and mothers. Being breastfed is associated with reduced risks of obesity and lower blood pressure in later stages of the child's life. Mothers who breastfeed have reduced risk of some cancers (breast and ovarian), type 2 diabetes and postpartum depression.^{10,291}

Draft Australian Dietary Guidelines: NHMRC 2011¹⁰

	Fruit serves (150g)	Vegetable serves (75g)
Children 2-3 years	1	2 1/2
Children 4-8 years	1 1/2	4 1/2
Children 9-11 years	2	5
Boys 12-18 years	2	5 1/2
Girls 12-18 years	2	5
All adults	2	5
Pregnant women	2	5
Lactating women	2	5 1/2

50–60% of adults and children eat enough fruit, but only 10% of adults and 29% of children eat enough vegetables.⁷

There are also economic benefits to families and society.¹⁰ It is recommended that infants are exclusively breastfed until around 6 months of age, and that breastfeeding is continued with appropriate complementary foods until 12 months of age or beyond.²⁹² National targets are for an initiation rate of at least 90% and for 80% of infants to be breastfed at 6 months.²⁸⁹

Food insecurity occurs when there is uncertain or limited availability of safe and nutritionally adequate foods, and this may lead to hunger, malnutrition or both.²⁹³ However, people who are food insecure are also more likely to be obese, possibly through the consumption of energy-dense nutrient-poor food and drinks.²⁹⁴ People could be considered food insecure if they had run out of food at some time in the previous twelve months and could not afford to buy more.⁷ This definition is used in this report and, as it excludes non-financial reasons such as physical barriers, it could lead to under-reporting.²⁹⁴

Current prevalence and differentials—adults

The prevalence of nutrition indicators in Queensland adults is summarised below (Table 10, Table 11):

- average intake of fruit was 1.8 serves per day in 2012

- 54% consumed the recommended 2 serves of fruit per day in 2012
- average intake of vegetables was 2.4 serves per day in 2012
- 10% consumed the recommended 5 serves of vegetables per day in 2012
- 7% consumed 2 serves of fruit and 5 serves of vegetables per day in 2012
- 34% consumed takeaway food at least weekly in 2011
- 45% usually consumed full cream milk in 2011
- 14% consumed non-diet soft drink at least daily in 2011
- 7% reported food insecurity in 2011.^{4,7}

Generally, the nutritional behaviour of females was better than males. They were more likely to consume the recommended fruit serves each day (17% higher) and vegetable serves (almost twice as high) and were twice as likely to meet the recommendations for both (Table 10).⁴ They were less likely to eat takeaway food weekly (30% lower), drink non-diet soft drink daily (45% lower) or usually drink full cream milk (27% lower) (Table 11). There was no difference in reported food insecurity.

Younger people had poorer nutritional behaviours than older. Those aged 18–24 years were less than half as likely to consume the recommended serves of vegetables daily as those 55 years and older (Table 10).⁴

Younger people were more likely to eat takeaway food at least weekly, drink non-diet soft drink daily or usually drink full cream milk (Table 11).⁷

For some nutritional indicators, populations in disadvantaged areas had poorer behaviours than those in advantaged areas, but not all. Recommended fruit consumption was 11% lower in disadvantaged areas than advantaged areas, but there was no difference in recommended vegetable consumption (Table 10).⁴ Prevalence of usual consumption of full cream milk was 60% higher in disadvantaged areas than advantaged areas (Table 11).⁷ There was no difference in non-diet soft drink or takeaway food consumption or reported food insecurity.

There was little difference in nutrition behaviours in remote and regional populations compared with major cities except for two indicators—weekly takeaway food and full cream milk consumption. People in major cities were about 30% more likely than those in regional areas to consume takeaway food at least weekly (Table 11).⁷ People in remote and very remote areas were 60% more likely to usually consume full cream milk than those in major cities.

Nutrition data for Indigenous Queenslanders is limited. However, 14% of Indigenous Queenslanders reported no daily fruit intake, and 5% no daily vegetable intake, compared

Table 10: Fruit and vegetable consumption, adults, percentage (95% CI), Queensland, 2012⁴

	Adequate fruit intake			Adequate vegetable intake		
	Males	Females	Persons	Males	Females	Persons
Adults 18+ years	49.5 (47.8–51.3)	57.7 (56.0–59.4)	53.7 (52.5–54.9)	6.8 (5.9–7.7)	12.5 (11.6–13.5)	9.7 (9.0–10.4)
16–17 years	26.1 (18.5–35.5)	20.6 (12.5–32.1)	23.6 (17.7–30.7)	18.3 (11.9–26.9)	*16.9 (9.7–27.7)	17.6 (12.6–24.1)
18–24 years	54.4 (47.4–61.2)	52.8 (44.9–60.5)	53.6 (48.3–58.8)	*6.2 (3.7–10.1)	*5.0 (2.7–9.0)	5.6 (3.8–8.1)
25–34 years	48.0 (42.4–53.5)	52.2 (47.5–56.9)	50.1 (46.5–53.7)	8.0 (5.3–11.9)	9.8 (7.4–12.9)	8.9 (7.0–11.3)
35–44 years	44.1 (40.4–47.8)	51.6 (48.1–55.0)	47.9 (45.4–50.4)	5.2 (3.9–7.0)	12.3 (10.2–14.7)	8.8 (7.5–10.3)
45–54 years	47.9 (44.5–51.3)	56.1 (52.8–59.4)	52.0 (49.7–54.4)	5.7 (4.4–7.3)	13.1 (11.0–15.4)	9.4 (8.2–10.8)
55–64 years	51.4 (48.3–54.5)	66.4 (63.5–69.2)	58.9 (56.8–61.1)	7.6 (6.0–9.6)	18.9 (16.6–21.5)	13.3 (11.9–14.9)
65–74 years	53.4 (50.3–56.5)	66.1 (63.0–69.0)	59.7 (57.5–61.9)	7.9 (6.3–9.7)	17.3 (15.1–19.8)	12.6 (11.2–14.1)
75+ years	55.4 (51.3–59.4)	69.4 (65.6–73.0)	63.5 (60.6–66.2)	8.3 (6.3–10.8)	11.6 (9.3–14.4)	10.2 (8.6–12.1)
Socioeconomic status (persons 18+ years)						
Disadvantaged			51.2 (48.9–53.4)			10.0 (8.9–11.3)
Quintile 2			51.1 (48.6–53.7)			9.4 (8.2–10.8)
Quintile 3			52.6 (50.0–55.2)			9.9 (8.6–11.4)
Quintile 4			55.4 (52.3–58.3)			9.7 (8.2–11.4)
Advantaged			57.6 (54.6–60.5)			9.5 (7.8–11.4)
Remoteness (persons 18+ years)						
Major cities			55.0 (53.2–56.8)			8.9 (8.0–9.9)
Inner regional			52.2 (49.9–54.5)			10.8 (9.6–12.2)
Outer regional			51.5 (49.0–54.1)			10.3 (9.0–11.9)
Remote			51.4 (48.2–54.5)			11.8 (9.8–14.2)
Very remote			50.8 (47.5–54.1)			11.4 (9.4–13.8)

* Estimate has a relative standard error of 25% to 50% and should be used with caution.

with 7% and 1% respectively for non-Indigenous Queenslanders in 2004–05.²⁹⁵ Most (82%) Indigenous Queenslanders aged 12 years and older usually consumed full cream milk, compared with 50% of all Queenslanders of similar age.²⁹⁵

Current prevalence and differentials—children and infants

The prevalence of nutrition indicators in Queensland children aged 5–17 years in 2011 was as follows (Table 12)¹¹:

- average intake of fruit was 1.9 serves per day
- 60% consumed the recommended serves of fruit per day
- average intake of vegetables was 2.1 serves per day
- 29% consumed the recommended serves of vegetables per day
- 48% consumed takeaway food at least weekly
- 66% usually consumed full cream milk
- 7% consumed non-diet soft drink at least daily, 2% consumed diet soft drink and 9% consumed non-diet flavoured drinks
- 89% ate breakfast every day
- 14% ate dinner in front of the television every day
- 96% of children aged 0–2 years had ever been breastfed (2010)²⁹⁶
- 60% of infants were introduced to solids at about 4–6 months in 2008.⁵

Generally, the nutritional behaviours of boys and girls did not differ. However, boys were more likely than girls to consume non-diet soft drink at least daily (60% higher), and were more likely to consume non-diet flavoured drinks at least daily (60% higher). Boys were more likely to usually consume full cream milk than girls (18% higher).

Younger children often had better nutritional behaviours than older age groups. Over 90% of children aged 5–11 years consumed adequate serves of fruit each day compared with about 20% of those aged 12–17 years (Table 12). While about 1 in 2 younger children (5–7 years) consumed adequate serves of vegetables each day, fewer than 20% of those aged 12–17 years did so. The prevalence of at least daily consumption of non-diet soft drink generally increased with age while the prevalence of usual consumption of full cream milk decreased with age. Younger children were more likely to eat breakfast every day than older age groups.

Table 11: Selected nutrition indicators, adults, percentage (95% CI), Queensland, 2011⁷

	Usually drink full cream milk	Non-diet soft drink at least daily	Takeaway food at least weekly	Food insecurity
18+ years				
Persons	44.8 (42.1–47.5)	13.7 (11.7–16.0)	33.7 (31.0–36.4)	7.1 (5.7–8.7)
Males	52.1 (48.1–56.0)	17.7 (14.6–21.4)	40.0 (36.0–44.1)	5.3 (3.7–7.5)
Females	37.8 (34.3–41.4)	9.8 (7.6–12.6)	27.6 (24.2–31.2)	8.8 (6.7–11.4)
Persons				
18–34 years	49.9 (43.3–56.4)	24.8 (19.4–31.0)	52.4 (45.9–58.8)	10.5 (7.0–15.4)
35–54 years	48.3 (44.3–52.4)	11.7 (9.4–14.4)	37.6 (33.8–41.6)	7.4 (5.7–9.5)
55+ years	36.0 (32.7–39.5)	6.0 (4.5–7.9)	12.0 (9.9–14.5)	3.6 (2.6–5.1)
Males				
18–34 years	61.7 (52.0–70.5)	34.1 (25.6–43.7)	63.8 (54.6–72.1)	*8.4 (4.5–15.3)
35–54 years	53.7 (47.7–59.7)	13.7 (10.3–17.9)	43.2 (37.4–49.1)	5.5 (3.5–8.6)
55+ years	41.7 (36.6–47.0)	7.5 (5.2–10.8)	14.3 (11.1–18.4)	*2.3 (1.3–4.0)
Females				
18–34 years	38.9 (30.7–47.8)	15.8 (10.2–23.8)	41.5 (33.1–50.4)	*12.4 (7.3–20.3)
35–54 years	43.0 (37.8–48.5)	9.7 (7.0–13.4)	32.1 (27.2–37.4)	9.2 (6.7–12.6)
55+ years	30.5 (26.4–35.0)	4.5 (2.9–6.9)	9.8 (7.3–13.0)	4.9 (3.2–7.5)
Socioeconomic status				
Disadvantaged	54.8 (49.2–60.2)	13.9 (10.2–18.7)	33.5 (28.3–39.1)	9.9 (6.9–14.1)
Quintile 2	47.1 (41.3–53.0)	14.6 (10.5–20.1)	27.5 (22.3–33.4)	5.8 (3.5–9.3)
Quintile 3	42.9 (36.9–49.1)	16.3 (11.9–22.1)	32.3 (26.6–38.5)	4.3 (2.8–6.7)
Quintile 4	44.0 (37.8–50.5)	14.7 (10.1–20.9)	35.8 (29.6–42.6)	*8.5 (5.1–14.0)
Advantaged	34.4 (28.6–40.6)	8.9 (5.9–13.2)	38.9 (32.7–45.4)	*6.6 (4.0–10.8)
Remoteness				
Major cities	40.3 (36.7–44.0)	14.0 (11.3–17.2)	37.4 (33.8–41.2)	7.1 (5.3–9.5)
Inner/Outer regional	48.8 (44.6–53.1)	12.9 (10.2–16.2)	29.1 (25.3–33.2)	6.8 (4.9–9.4)
Remote/Very remote	64.3 (53.0–74.2)	*16.4 (9.0–27.9)	25.8 (17.2–36.9)	n/a

* Estimate has a relative standard error of 25% to 50% and should be used with caution. n/a Not available for publication



Recommended breastfeeding and introduction to solid foods for infants ²⁸⁹

GUIDELINES	12 months	
	6 months	Breastfeeding
	Birth	Solid foods
	Breastfeeding	Introduction of solids

availability.³⁰¹ International comparison of supermarket sales data from 2008 indicates the proportion of full cream milk consumption in Australia was higher (55%) than in other developed countries (United States 31%, United Kingdom 23%).³⁰²

Trends—children and infants

There is limited data, often based on two years, to report on the trends in children's nutrition. For two indicators—eating breakfast every day and eating dinner in front of the television—there is no comparative data.

The proportion of Queensland children aged 5–15 years consuming adequate fruit decreased from 75% in 2009 to 67% in 2011 (Table 1, page 4).^{11,249} Mean fruit intake was similar in 2009 and 2011 at about 2 serves per day. The prevalence of adequate vegetable consumption in Queensland children decreased, from 38% in 2009 to 31% in 2011. Average daily vegetable intake in Queensland children was stable at 2.1 serves. More Australian children consumed fruit in the previous day in 2007 (69%) than in 1995 (63%), and larger amounts were also consumed.³⁰³ The proportion of Australian children consuming vegetables in the previous day was similar in 1995 and 2007 at around 70%, and mean serves per day were unchanged.

Between 2009 and 2011, the prevalence of at least weekly takeaway consumption in 5–15 year old Queensland children did not differ.^{11,249} Nationally, the proportion of children consuming full cream milk dropped from 63% in 1995 to 51% in 2007, and the proportion consuming reduced fat milk increased from 17% to 25% over the same period.³⁰⁴

The proportion of babies exclusively breastfed at discharge in Queensland was similar in 2010 (79%) to the three previous years (about 78%).²³ In 2010, Queensland met the national target for 90% initiation, when breastfeeding was initiated with 91% of infants (Figure 32). Queensland did not meet the national target for 80% of infants being breastfed at 6 months, with only 62% being breastfed at this age.

There was little difference in nutritional behaviour by socioeconomic status. However, children in the most disadvantaged areas were more likely to usually consume full cream milk (34% higher) than those in advantaged areas, while children in advantaged areas were more likely to eat breakfast every day than all other areas (about 8–10% higher).

There was no difference in children's nutrition behaviours by remoteness, except children in inner and outer regional areas were more likely to usually consume full cream milk than those in major cities (about 15% higher).

The proportion of babies exclusively breastfed at discharge in Queensland in 2010 was 79%, with an additional 12% receiving some breast milk and 9% receiving infant formula only.²³ In 2010, while 91% of new mothers in Queensland initiated breastfeeding, only 2% breastfed exclusively until the infant was at least 6 months of age (Figure 32).²⁹⁶ However, 96% of Queensland children aged 0–2 years had ever been breastfed, similar to national rates in 2010.

Solid food was introduced at around 4 to 6 months of age for 60% of Queensland infants in 2008. However, for 31% it was introduced at 4 months or earlier and for 8% after 6 months of age.⁵ The recommendation is that solid food is introduced at around 6 months of age.²⁸⁹

Trends—adults

Rates of adequate fruit consumption are generally increasing in Queensland adults (Figure 31). The rate increased by 10.9% or 0.9% per year between 2001 and 2012. However, excluding 2011 when there was a drop in consumption, possibly due to higher prices associated with the 2010–11 floods and cyclone, the annual increase was higher at 1.2% per year. Mean serves increased from 1.6 per day in 2005 to 1.9 in 2010 and down to 1.6 in 2011 and 1.8 in 2012. The goal of the National Partnership Agreement on Preventive

Health is to increase the mean daily serves of fruit from 1.8 serves at the 2009 baseline to at least 2.0 serves by June 2016, and at least 2.4 serves by December 2017.¹⁸⁰ In 2012, the mean daily serves of fruit for adults in Queensland was 0.3 serve below the baseline.

The overall trend in the proportion of adult Queenslanders consuming adequate daily vegetable serves is uncertain, with periods of decline followed by increase between 2007 and 2010 and uncertain pattern in the past two years (Figure 31). The National Partnership Agreement on Preventive Health goal is to increase the mean daily serves of vegetables from the 2009 baseline of 2.5 serves to at least 3.0 serves by June 2016, and at least 4.0 serves by December 2017.¹⁸⁰ In 2012, the mean daily serves of vegetables for adults in Queensland was 2.4, which is 0.1 serve below the baseline.

Between 2009 and 2011, there was no change in the prevalence of at least weekly takeaway food consumption in adult Queenslanders (Table 1, page 4).^{7,155} The prevalence of food insecurity among Queensland adults was largely unchanged between 2007 and 2011, at around 6–8%.^{7,297–299} In 1995, 5% of Australian adults ran out of food and had no money to buy more.³⁰⁰ Historical statewide data on at least daily non-diet soft drink consumption are not available to compare with 2011 estimates.

Between 2005 and 2011, the prevalence of usual consumption of full cream milk in Queensland adults remained relatively constant (Table 1, page 4). However, in 2011, about 40% of the average per person consumption of fresh milk in Australia was low or reduced fat compared with about 20% in 1990, probably due to its increased

62% of infants received some breast milk at 6 months—the national target is 80%.⁵

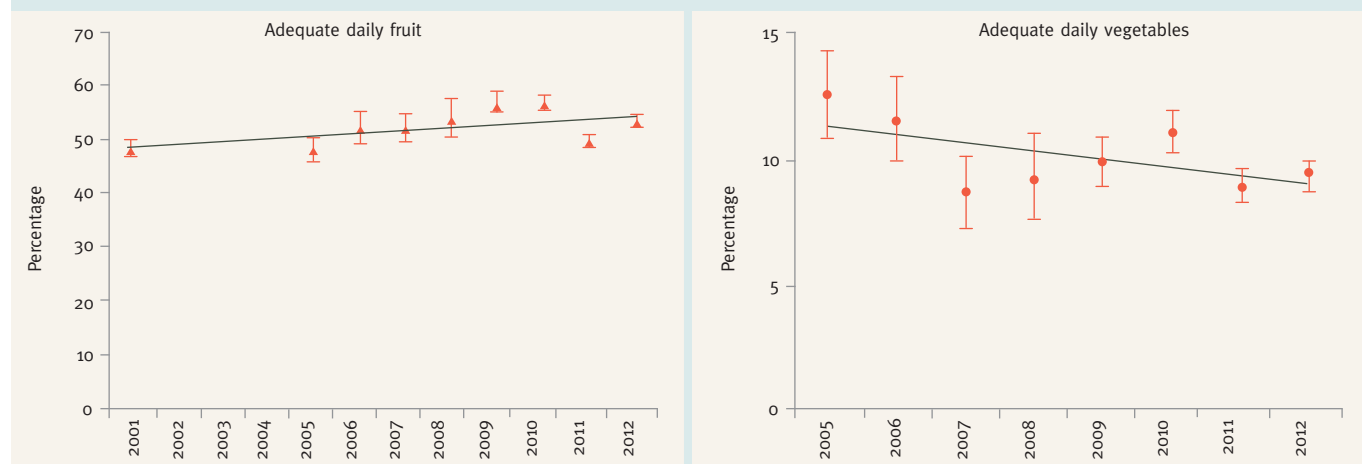
Table 12: Selected nutrition indicators, children, percentage (95% CI), Queensland, 2011¹¹

		Adequate fruit intake	Adequate vegetable intake	Takeaway food at least weekly	Usually drink full cream milk	Breakfast every day	Dinner eaten in front of TV every day
5-17 years	Persons	59.6 (57.4-61.7)	29.2 (27.2-31.3)	47.6 (45.3-49.8)	66.0 (63.9-68.1)	88.5 (87.0-89.9)	13.5 (12.1-15.1)
	Males	58.5 (55.5-61.5)	27.9 (25.3-30.7)	49.7 (46.7-52.8)	71.3 (68.5-73.9)	89.5 (87.4-91.3)	15.0 (12.9-17.3)
	Females	60.6 (57.5-63.7)	30.6 (27.7-33.6)	45.3 (42.1-48.5)	60.5 (57.3-63.6)	87.5 (85.1-89.5)	12.0 (10.1-14.2)
Persons	5-7 years	96.6 (94.6-97.9)	54.2 (49.4-58.8)	44.3 (39.7-49.0)	71.0 (66.4-75.1)	97.2 (94.9-98.5)	11.9 (9.2-15.3)
	8-11 years	94.4 (92.2-96.0)	30.4 (26.8-34.1)	43.6 (39.7-47.6)	67.4 (63.6-71.0)	93.5 (91.1-95.3)	11.1 (8.9-13.7)
	12-15 years	20.4 (17.3-23.9)	16.3 (13.5-19.4)	47.8 (43.9-51.8)	66.1 (62.3-69.8)	83.0 (79.8-85.8)	17.0 (14.1-20.2)
	16-17 years	18.9 (14.8-23.7)	18.0 (14.1-22.7)	59.0 (53.4-64.4)	56.5 (50.8-62.0)	78.0 (72.8-82.4)	13.8 (10.6-17.9)
Males	5-7 years	96.0 (92.9-97.8)	50.1 (43.8-56.4)	49.8 (43.5-56.2)	77.7 (72.2-82.3)	97.3 (93.9-98.8)	14.3 (10.4-19.4)
	8-11 years	93.4 (89.7-95.8)	29.1 (24.3-34.5)	43.0 (37.6-48.6)	70.4 (65.1-75.2)	94.4 (91.2-96.5)	11.9 (8.7-15.9)
	12-15 years	17.9 (14.1-22.5)	15.8 (12.3-20.1)	48.8 (43.3-54.3)	69.1 (64.0-73.8)	84.9 (80.5-88.4)	18.3 (14.3-23.0)
	16-17 years	20.2 (14.6-27.2)	18.8 (13.6-25.4)	64.0 (56.3-71.1)	68.7 (61.3-75.2)	78.7 (71.0-84.8)	15.4 (10.6-22.0)
Females	5-7 years	97.2 (93.9-98.7)	58.4 (51.4-65.0)	38.4 (31.9-45.4)	64.0 (56.9-70.5)	97.1 (93.0-98.8)	9.4 (6.1-14.3)
	8-11 years	95.4 (92.5-97.3)	31.7 (26.6-37.2)	44.2 (38.7-49.9)	64.3 (58.6-69.5)	92.5 (88.5-95.2)	10.2 (7.4-13.9)
	12-15 years	23.0 (18.3-28.5)	16.7 (12.8-21.6)	46.9 (41.1-52.7)	63.0 (57.3-68.4)	81.0 (76.1-85.1)	15.6 (11.8-20.3)
	16-17 years	17.5 (12.1-24.6)	17.1 (11.7-24.4)	53.7 (45.7-61.6)	43.3 (35.6-51.4)	77.3 (69.8-83.3)	12.2 (8.3-17.5)
Socioeconomic status	Disadvantaged	61.3 (56.2-66.1)	32.2 (27.7-37.2)	41.0 (36.1-46.2)	75.5 (71.0-79.6)	87.1 (83.2-90.2)	14.1 (11.0-17.9)
	Quintile 2	55.0 (49.9-60.0)	28.5 (24.2-33.2)	49.9 (44.8-54.9)	68.1 (63.2-72.6)	85.0 (80.7-88.5)	16.9 (13.3-21.2)
	Quintile 3	57.6 (52.7-62.4)	31.0 (26.6-35.7)	46.0 (41.2-50.9)	65.9 (61.2-70.4)	89.8 (86.2-92.5)	12.2 (9.4-15.6)
	Quintile 4	61.6 (57.0-66.0)	26.3 (22.3-30.7)	52.1 (47.4-56.8)	64.1 (59.4-68.6)	87.2 (83.7-90.0)	15.2 (12.2-18.7)
	Advantaged	62.4 (57.5-67.0)	28.3 (24.0-33.1)	48.4 (43.4-53.3)	56.3 (51.2-61.2)	93.9 (91.2-95.8)	9.0 (6.5-12.4)
Remoteness	Major cities	60.7 (57.8-63.6)	26.4 (23.9-29.1)	49.0 (46.0-52.0)	61.9 (58.9-64.8)	89.3 (87.3-91.1)	13.0 (11.1-15.1)
	Inner regional	57.3 (52.7-61.8)	33.6 (29.3-38.1)	47.1 (42.5-51.7)	69.4 (65.0-73.4)	87.1 (83.6-90.0)	13.0 (10.3-16.2)
	Outer regional	58.7 (53.3-63.8)	29.1 (24.6-34.1)	47.5 (42.2-52.8)	72.7 (67.6-77.2)	86.5 (82.3-89.9)	15.2 (11.7-19.6)
	Remote	60.9 (47.1-73.2)	48.8 (35.6-62.2)	37.7 (25.6-51.7)	65.3 (51.7-76.8)	92.1 (77.8-97.5)	n/a
	Very remote	61.0 (45.9-74.2)	24.8 (15.2-37.9)	33.8 (22.0-47.9)	75.2 (61.9-85.0)	94.2 (84.9-97.9)	*22.2 (11.4-38.7)

* Estimate has a relative standard error of 25% to 50% and should be used with caution.

n/a Not available for publication

Figure 31: Trends in fruit and vegetable consumption, adults, Queensland



Potential for change

While food choices on any day may benefit or harm our health in only a small way, over years the consequences of these choices become significant.²⁸⁰ Food choice decisions are complex, frequent, situational and dynamic.³⁰⁵ Factors affecting food choices have varying influences across individuals and groups, and include:

- biological determinants, for example, hunger, taste and appetite
- economic determinants including availability, cost and income
- physical determinants, for example, access, time, education and skills such as cooking
- social determinants including peers, family, culture and meal patterns
- psychological determinants, such as stress, mood and guilt
- food knowledge, attitudes and beliefs.³⁰⁶

Increasing the knowledge of recommended fruit and vegetable intake, using food labels for better food choices, ensuring access to healthy food and improving nutrition through promotion of the draft Australian Dietary Guidelines each provide potential to advance the good health of Queenslanders. Improving the nutritional quality of the food supply in Queensland is an achievable goal to benefit the whole population, as discussed in Chapter 6, page 128.

Knowledge—recommended serves of fruit and vegetables, and use of food labels

Knowledge of recommended fruit and vegetable intake is a strong predictor of actual intake, and is associated with higher consumption in adults and children.^{307,308}

In Queensland in 2011, the likelihood of knowing the recommended fruit serves increased with increasing fruit consumption.⁶⁹ Similarly, people consuming the recommended vegetable serves were more likely to know the vegetable recommendations (at least 10 times the odds of doing so).

Most Queenslanders know the fruit guideline, with 90% of adults correctly identifying or overestimating the number of recommended daily serves in 2011 and females (94%) were more likely than males (86%) to do so.⁷ However, this knowledge is related to age, with younger adults (97%) more likely to know the recommendation than middle-aged (89%) or older adults (85%). The relationship between knowledge and age held after adjustment for other sociodemographic and lifestyle factors.⁶⁹ And those who knew the recommended fruit serves were more likely to also know the recommended vegetable serves.

In contrast to fruit knowledge, far fewer Queensland adults (39%) correctly identified or overestimated the number of recommended daily vegetable serves, with females (49%) more likely to do so than males (28%), and younger (44%) and middle-aged (40%) adults more likely than older adults (32%).⁷ This relatively low prevalence of knowledge of the guidelines is consistent with an observed discrepancy between belief and practice. In 2011, 70% of adults believed they were already eating enough vegetables, but only 13.5% of these were consuming the recommended serves each day.²⁷⁷

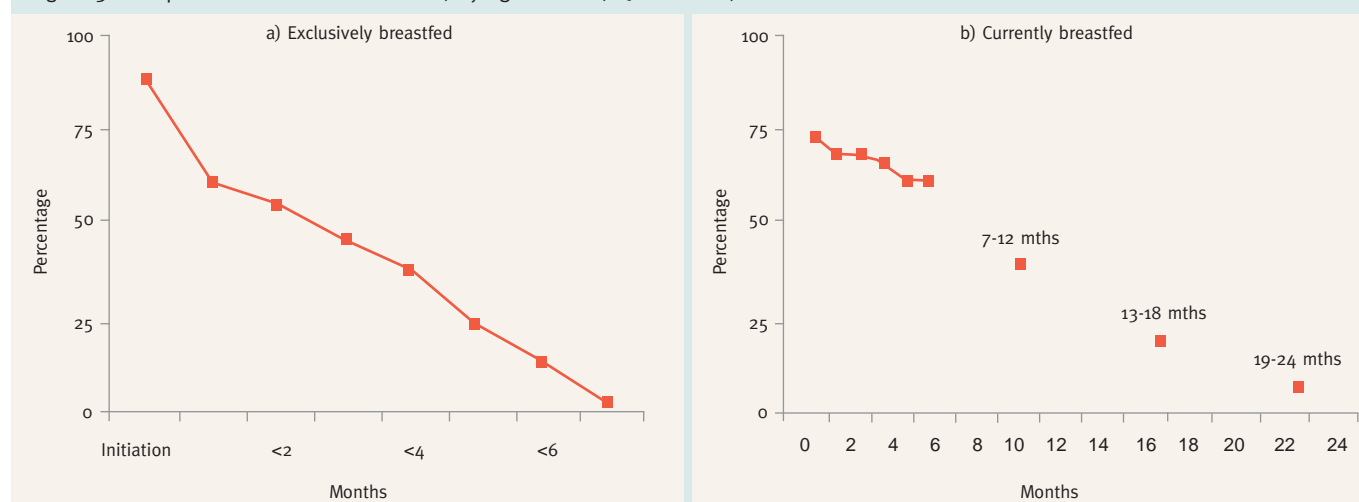
How can this information about knowledge, attitudes and behaviour of the population be used to improve nutrition in Queensland? Although very few adults achieved the recommended 5 serves of vegetables a day

in 2011, about 1 in 8 consumed 4 serves a day—1 serve short of the recommendation. If all adults ate just one additional serve of vegetables each day, the prevalence of adequate vegetable consumption in adults would more than double from the present 10%, and this would be a step towards improved health. In 2001 in Australia, each additional serve of fruit and vegetables was estimated to result in direct healthcare system savings of \$513 million a year.³⁰⁹

Consumers who use food labels have healthier diets—they consume less energy, total fat, saturated fat, cholesterol, sodium and sugars, and more dietary fibre, than those who do not use labels.³¹⁰ In Australia, food labelling is a national issue and most foods must have a nutrition information panel that shows serving size, the amount of energy and specific components (such as protein, fat, carbohydrate and sodium) for each serving and unit quantity (page 128).³¹¹



Figure 32: Proportion of children breastfed, by age of child, Queensland, 2010²⁹⁶



In Queensland in 2011, about a third of adults (36%) reported always or almost always using the nutrition information panel.⁷ Females, older people and those living in major cities were more likely to do so.⁷ Similarly, about a third (31%) reported always or almost always using the list of ingredients, and about 1 in 5 (18%) the serving size information. Usage of all three components generally increased with age, was higher for those with diabetes and decreased for people who usually consumed full cream milk.⁶⁹

Wide-ranging recommendations were made in the recent Review of Food Labelling Law and Policy undertaken by COAG and the Australia and New Zealand Food Regulation Ministerial Council.^{312,313} Several recommendations related to increased use and efficacy of label presentation, and point-of-sale display of nutritional information in chain food service outlets. The mandatory inclusion of an interpretative labelling system on all labelled food products that indicates whether levels of total fat, saturated fat, sugar and salt are low, medium or high is expected to be highly cost-effective. The projected health benefit to Australians is an average of 1.3 kilograms weight loss across the adult population and 45,100 disability-adjusted life years averted.³¹⁴

Access to healthy food in Queensland

Access to healthy food in Queensland is influenced by economic factors including financial cost, income and socioeconomic status, as well as physical factors such as distance and availability, and the time, effort and skill required to obtain and prepare healthy food.

In 2011, more than half of adult Queenslanders thought that fruit and vegetables were too expensive. However, in early 2011 there were substantial increases in some fruit and vegetable prices, particularly bananas, attributed to the Queensland floods and cyclone.³¹⁵ Noting this important limitation, 62% of adults considered fruit too expensive, and 52% that vegetables were too expensive.⁷ People living in remote and very remote areas were generally more likely to have this view, with 76% agreeing that fruit was too expensive (compared with 61% in major cities and regional areas) and 67% agreeing that vegetables were too expensive (compared with around 50% in major cities and regional areas).

The Healthy Food Access Basket (HFAB) survey reports on the availability and cost across Queensland of a standard, basic basket of healthy food items.¹⁶ In 2010, the cost of the basket in very remote areas was 26% higher

In very remote areas of Queensland, the price of healthy food was 35% higher than in cities, but less healthy food was only 14% higher.¹⁶

than in major cities. The cost of food items such as fruit, vegetables and legumes was 35% higher in remote areas than major cities, while the cost of items considered less healthy was 14% higher. From 2000 to 2010, the cost of the basket increased by \$192 (63%), and the fruit, vegetable and legume component by \$69 (61%). The basket cost increases were generally similar to the consumer price index changes over the period.

There are clear discrepancies in the availability of healthy food in Queensland. The 2010 HFAB survey found that there were fewer varieties of fruit and vegetables available in remote areas compared with major cities, and the availability of nutritionally better foods declined with remoteness.¹⁶ In 2011, adult Queenslanders living in regional areas (12%) were almost twice as likely, and people living in remote areas (41%) around 6 times more likely to agree that fruit and vegetables were not readily available where they shop, compared with people living in major cities (7%).⁷ This relationship was irrespective of sociodemographic and lifestyle factors.⁶⁹

Geographical remoteness is not, however, the only factor associated with reduced availability of healthy food in Queensland—socioeconomic status also plays a part. About 1 in 6 adults (16%) living in the most disadvantaged areas of Queensland reported that fruit and vegetables were not readily available where they shop, compared to 6% of people living in the most advantaged areas, a threefold difference.⁷

Ready availability of unhealthy food options is also associated with fruit and vegetable consumption. In Victorian children in 2002–03, fruit consumption was lower where there were more local fast food outlets and vegetable consumption increased as distance to a fast food outlet increased.³¹⁶ The consumption of fast food by low-income males appears to increase as the availability of fast food increases and, not surprisingly, living in an urban area has been associated with greater fast food consumption.^{317,318} With a third of adults and a half of children consuming takeaway food at least weekly in Queensland, and less than 10% of adults and a third of children consuming adequate vegetables, there is potential for change.

Perceived time and effort to prepare vegetables are barriers to consumption for some Queenslanders. In 2011, 1 in 8 (12%) adults agreed that vegetables take too much time to prepare, with younger adults more likely to do so.⁷ Queenslanders who thought vegetable preparation takes too much time usually also thought it takes too much effort.⁶⁹ The convenience of takeaway food and the perceived effort of vegetable preparation contribute to inadequate vegetable consumption. Adults who consume takeaway food at least weekly were more likely to agree that vegetable preparation takes too much effort, while those who consumed adequate vegetables were about one-tenth as likely to agree that vegetable preparation takes too much effort.



One-third of adults and half of children eat takeaway food at least once a week in 2011.¹¹

A range of approaches have been recommended to improve access to healthy food in remote areas of Australia.³¹⁹ Community stores often function as the main source of food and other goods in remote or very remote Indigenous communities of Australia, and can play a pivotal role in improving the community's health.³²⁰ Partnerships between all levels of government, non-government and community organisations will be needed to improve access to, and availability of, healthy food in remote areas of Queensland.

More broadly, over recent years a number of initiatives have been rolled out to improve the availability of healthy food and restrict that of unhealthy food. In 2007, Smart Choices—Healthy Food and Drink Supply Strategy for Queensland Schools became mandatory in Queensland state schools.³²¹ Smart Choices determines which drinks and food may be supplied in schools, and provides guidance regarding appropriate frequency of consumption by categorising foods as green, amber or red.^{322,323} Using a similar system, A Better Choice determines the nutritional quality of most food provided in Queensland Health facilities.³²⁴



Whole of government approaches are needed to improve the quality of our food supply as is evident in Chapter 6 (page 128).³¹⁹ Addressing disparities in the cost and availability of healthy food is an opportunity for improving the nutrition of Queenslanders, along with interventions to address the perception that time and effort to prepare vegetables is a barrier to healthy eating. A small number of the many current initiatives in Queensland are showcased in Chapter 4.

Australian Dietary Guidelines 2011

The draft Australian Dietary Guidelines were released for public feedback in December 2011.¹⁰ Briefly, the guidelines recommend:

- every day eating a wide variety of nutritious foods from five groups and drinking water
- limiting saturated and trans fat, added sugar and salt, and alcohol intake
- being physically active and consuming amounts of nutritious drinks and foods to meet energy needs
- encouraging and supporting breastfeeding
- preparing and storing food safely.



The proposed guidelines are based on a rigorous review of the scientific evidence about the relationships between food, dietary patterns and health outcomes. They are based on foods and food groups, rather than nutrients as in the 2003 guidelines. The evidence base has strengthened for the association between:

- consumption of sugar-sweetened drinks and the risk of excessive weight gain in children and adults
- the health benefits of breastfeeding
- consumption of milk and decreased risk of heart disease and some cancers
- consumption of fruit and decreased risk of heart disease
- consumption of non-starchy vegetables and decreased risk of some cancers
- consumption of wholegrain cereals and decreased risk of heart disease and excessive weight gain.

While the major recommendations are generally similar to the 2003 guidelines, the proposed guidelines incorporate advice for the whole population and no longer recommend limiting total fat intake, but focus specifically on limiting the intake of trans and saturated fat. The evidence for the health effects of fat is now strongest with regard to the type of fat in the diet rather than the amount. However, the guidelines still advise caution in choosing foods high in fat due to the risk of excess energy intake and, for the first time, specifically address limiting intake of sugar-sweetened drinks. They also specify that different types and colours of vegetables should be consumed, and that cereals should be mostly wholegrain. The new guidelines are expected to be released later in 2012.



Being active

The health benefits of physical activity are numerous: markedly reduced mortality from coronary heart disease, reduced risk of developing hypertension, diabetes and colon cancer, enhanced mental health, stronger muscles and bones, and helping to preserve independence and maintain function in older people.³²⁵ Being sedentary is associated with increased metabolic risk and risk of death, irrespective of whether sufficient physical activity is achieved.³²⁶⁻³²⁸

The burden of disease and injury due to physical inactivity was 6% in the total Queensland population in 2007, and 9% for those aged 65 years and older.⁸⁸ The direct annual healthcare costs of physical inactivity in Australia were estimated to be \$1.5 billion in 2006-07, and about 25% of this cost was due to its impact on coronary heart disease.³²⁹ It is estimated that in 2025 about 25% of cancers in Australia (43,000 cases), could be prevented by improvements in diet and physical activity.⁵⁵

The national guidelines used in this report as the basis for the classification of sufficient and insufficient physical activity for health benefit were not designed for management of overweight and obesity.³³⁰ The United States has provided such guidance and, while recommending levels of physical activity similar to the Australian guidelines, there is an additional objective to achieve energy balance and so manage weight.³³¹ Revised Australian guidelines for physical activity are under development.

In this report, the indicator of sedentary behaviour is usually sitting seven or more hours each day, where this includes sitting at a computer, reading, eating, drinking, driving, watching television and lying down to do any of these activities (except driving). It is important to note that while an individual may achieve sufficient physical activity they may also be sedentary. For example, an office worker sitting at a

56% of adults did sufficient physical activity and 30% walked for transport at least five days per week.⁸



computer seven hours each day may achieve sufficient physical activity before or after work, but still be classified as sedentary.

Current prevalence and differentials—adults

In 2012, about 1 in 2 (56%) Queenslanders aged 18-75 years engaged in sufficient physical activity for health benefit, based on self report (Table 13).⁴ Males were more likely to achieve sufficient physical activity than females, 60% compared with 53%. For both sexes, the proportion engaging in sufficient physical activity generally decreased with age, for males from 76% in 18-24 year olds to 51% in those aged 65-75 years, and similarly for females from 69% to 40%.

In 2012, the rate of sufficient physical activity was 18% higher among adults from the most advantaged areas compared to those of the most disadvantaged areas, but did not vary by remoteness (Table 13).⁴

More than one-third of adults (39%) aged 18-65 years were usually sedentary on weekdays, with 1 in 8 (12%) sedentary all week in 2011 (Table 13). There was little

variation in prevalence of sedentariness all week by age, sex, socioeconomic status or remoteness.⁸ When considering sedentary on weekdays only, prevalence was higher in younger age groups (41% for 18-54 years) than in older age groups (29% for 55-65 years), probably reflecting the higher proportion of younger and middle-aged people in employment which often involves extended sedentary time.³³²

People who were sufficiently active were less likely to be sedentary. Queensland adults who engaged in sufficient physical activity were less likely to be sedentary on weekdays (one-third the odds) after adjustment for selected sociodemographic and lifestyle factors including employment status in 2011.⁶⁹ Increasing sedentariness in the workplace is therefore likely to have an impact on overall levels of physical activity in the population.

Frequent use of a motor vehicle to get from place to place such as by car, bus and train, is substantially higher in the 18-54 age group than in the 55-69 age group (86% compared with 72%), with young to middle-aged users averaging over 7.5 hours per week in travel by motor vehicle (Table 14).⁸ Around 1 in 3 (30%) Queensland adults walked for transport at least five days per week, 2 in 3 (66%) did so at least one day per week and 6% cycled at least one day per week.

In 2004-05 using a different measure of physical activity to the one used in Queensland surveys, 74% of Queensland's non-remote Indigenous population aged 15 years and older reported no or low levels of exercise, similar to the 71% of adult Queenslanders.^{240,295} In 2007-08, 77% of people who mostly speak a language other than English at home reported no or low levels of exercise, similar to those who mostly speak English at home (74%).²¹

Australian Physical Activity Guidelines ²⁶⁻³¹

GUIDELINES	Age Group	Duration	Intensity	Frequency	Additional notes
	5-18 years	60 mins+	Moderate to vigorous	Every day	Plus less than 2 hours of recreational use of electronic media
	Adults	30 mins+	Moderate (at least)	Most days (preferably all)	Not applicable
	Older people	30 mins+	Moderate (at least)	Most days (preferably all)	Incorporating strength, fitness, balance and flexibility

43% of children exceed the recommended maximum screen time for entertainment.¹¹

Table 13: Sufficient physical activity and daily sedentary behaviour, adults, percentage (95% CI), Queensland^{4,8}

Sufficient physical activity 2012				Sedentary daily 2011			
	Males	Females	Persons		Males	Females	Persons
18-75 years	59.5 (57.6-61.3)	52.8 (51.0-54.6)	56.1 (54.8-57.4)	18-65 years	13.6 (10.5-17.4)	10.7 (8.3-13.6)	12.1 (10.1-14.5)
18-24 years	76.5 (69.9-82.0)	68.7 (60.9-75.6)	72.5 (67.5-77.1)	18-34 years	*16.4 (9.7-26.3)	*10.3 (6.1-16.7)	13.2 (9.1-18.7)
25-34 years	65.8 (60.2-70.9)	52.9 (48.1-57.7)	59.4 (55.7-62.9)				
35-44 years	55.2 (51.4-59.0)	52.0 (48.5-55.5)	53.6 (51.0-56.2)	35-54 years	13.5 (9.8-18.2)	11.8 (8.4-16.2)	12.6 (10.1-15.7)
45-54 years	57.0 (53.5-60.4)	53.1 (49.7-56.5)	55.0 (52.6-57.5)				
55-64 years	52.2 (49.0-55.4)	48.8 (45.6-51.9)	50.5 (48.2-52.7)	55-65 years	9.3 (6.0-14.1)	8.6 (5.4-13.5)	9.0 (6.6-12.2)
65-75 years	50.7 (47.5-53.8)	40.4 (37.3-43.6)	45.5 (43.3-47.7)				
Socioeconomic status							
Disadvantaged			50.9 (48.4-53.3)				12.1 (7.6-18.7)
Quintile 2			53.9 (51.2-56.6)				13.2 (9.3-18.4)
Quintile 3			56.8 (54.1-59.5)				12.8 (8.4-19.1)
Quintile 4			57.4 (54.2-60.6)				14.9 (10.4-20.7)
Advantaged			60.2 (57.1-63.2)				8.0 (4.9-12.6)
Remoteness							
Major cities			58.2 (56.4-60.1)	Major cities			13.1 (10.3-16.6)
Inner regional			52.5 (49.9-54.9)	Inner/outer regional			9.2 (6.9-12.1)
Outer regional			53.5 (50.7-56.2)	Remote/very remote			*20.3 (10.5-35.5)
Remote			54.5 (51.2-57.7)				
Very remote			53.2 (49.8-56.6)				

* Estimate has a relative standard error of 25% to 50% and should be used with caution.

Table 14: Active transport indicators, adults, percentage (95% CI), Queensland, 2011⁸

		Motor powered vehicle ^a		Walking		Bicycle
		5 or more days of past week	1 day or more of the past week	5 or more days of past week	1 day or more of the past week	1 day or more of the past week
18-69 years	Persons	82.9 (80.7-84.9)	98.6 (97.8-99.1)	29.7 (26.9-32.7)	65.9 (63.0-68.7)	5.9 (4.6-7.6)
	Males	83.2 (79.6-86.2)	98.3 (96.7-99.1)	32.4 (28.2-37.0)	63.7 (59.4-67.8)	7.8 (5.7-10.5)
	Females	82.6 (79.8-85.2)	98.9 (98.1-99.4)	27.1 (23.6-30.9)	68.1 (64.2-71.8)	4.1 (2.7-6.2)
Persons	18-34 years	85.9 (80.8-89.9)	98.7 (96.1-99.6)	35.7 (29.3-42.7)	72.7 (66.4-78.2)	8.1 (5.1-12.7)
	35-54 years	86.4 (83.4-89.0)	98.8 (97.6-99.4)	26.7 (23.2-30.5)	63.5 (59.4-67.4)	5.2 (3.7-7.1)
	55-69 years	72.1 (68.3-75.7)	98.2 (96.9-98.9)	26.8 (23.2-30.8)	60.9 (56.7-64.9)	4.2 (2.8-6.3)
Males	18-34 years	82.0 (72.8-88.6)	98.3 (91.8-99.7)	43.8 (33.7-54.4)	74.6 (65.1-82.2)	*11.0 (6.2-18.7)
	35-54 years	87.6 (82.9-91.1)	98.3 (96.1-99.3)	24.7 (19.8-30.3)	56.8 (50.7-62.7)	7.3 (4.8-10.7)
	55-69 years	76.7 (71.3-81.4)	98.4 (96.6-99.3)	31.4 (25.9-37.5)	61.6 (55.6-67.4)	*4.3 (2.4-7.6)
Females	18-34 years	89.5 (83.8-93.4)	99.1 (96.6-99.8)	28.3 (20.9-37.0)	71.0 (62.2-78.5)	n/a
	35-54 years	85.4 (81.1-88.8)	99.2 (97.8-99.7)	28.7 (24.0-34.0)	70.0 (64.6-74.9)	*3.1 (1.8-5.4)
	55-69 years	67.6 (62.0-72.7)	98.0 (95.8-99.1)	22.2 (17.7-27.5)	60.1 (54.3-65.7)	*4.1 (2.3-7.2)
Socioeconomic status	Disadvantaged	70.7 (64.2-76.5)	96.9 (93.2-98.6)	28.4 (22.6-34.9)	65.3 (58.5-71.5)	*4.8 (2.3-9.8)
	Quintile 2	81.9 (76.9-86.0)	98.6 (96.4-99.4)	26.2 (20.9-32.4)	57.4 (50.9-63.7)	*8.5 (5.0-14.1)
	Quintile 3	86.1 (81.1-89.9)	99.3 (98.2-99.7)	32.4 (25.6-39.9)	68.5 (61.9-74.4)	*6.8 (4.1-11.1)
	Quintile 4	86.3 (81.4-90.0)	99.1 (96.9-99.7)	25.6 (20.3-31.7)	63.6 (57.2-69.5)	7.0 (4.4-10.9)
	Advantaged	88.6 (84.1-92.0)	99.1 (97.7-99.7)	35.2 (28.7-42.3)	73.3 (67.2-78.7)	*2.7 (1.3-5.3)
Remoteness	Major cities	87.0 (84.2-89.3)	99.0 (98.1-99.4)	32.0 (28.1-36.2)	69.3 (65.4-72.9)	5.1 (3.6-7.1)
	Inner/Outer regional	77.7 (73.6-81.4)	98.5 (96.4-99.4)	26.1 (22.1-30.5)	60.3 (55.7-64.7)	7.5 (5.0-10.9)
	Remote/Very remote	75.0 (65.1-82.8)	95.9 (90.6-98.3)	29.0 (19.3-41.2)	67.2 (54.2-78.1)	n/a

* Estimate has a relative standard error of 25% to 50% and should be used with caution.

^a Includes transport by car, bus or train

n/a Not available for publication

44% of children were active for at least 60 minutes every day.¹¹

Of the Australian states and territories, in 2007–08, Queensland adults had the lowest prevalence of moderate or high exercise in the previous week at 25% while the national prevalence was 28%.³³³ This pattern was similar for males and females.

International comparisons of the prevalence of physical activity cannot be made because measures, guidelines and availability of data vary.¹⁶⁸ For sedentariness, an international study showed that median sitting time of four hours per working day was similar in Australia, New Zealand, the United States and China in 2002–03.³³⁴ As for most other

countries, adults with more than 13 years of education spent more time seated than those with less education.

Current prevalence and differentials—children

■ Less than half (44%) of children aged 5–17 years were active for at least one hour every day in the previous week, as recommended by the national physical activity guidelines for children (Table 15).¹¹ Boys were more likely to be active than girls (49% compared with 39%).¹¹ The proportion

active every day decreased substantially with age from 62% in the age group 5–7 years to 26% in the age group 16–17 years. Twice as many boys as girls were active in this older age group (35% compared with 17%). Children in the most disadvantaged areas were more likely to be active every day than those in the most advantaged areas (41% higher) as were children in very remote areas compared to those in cities (47% higher). About three-quarters of children (72%) participated in physical education in school, 76% of those aged 5–15 years, but down to 46% in those aged 16–17 years in 2011.

Compared to national rates in 2009–10, slightly more Queensland students were engaging in sufficient activity (18% compared with 15%).³³⁵ International comparisons of physical activity in children are unavailable.

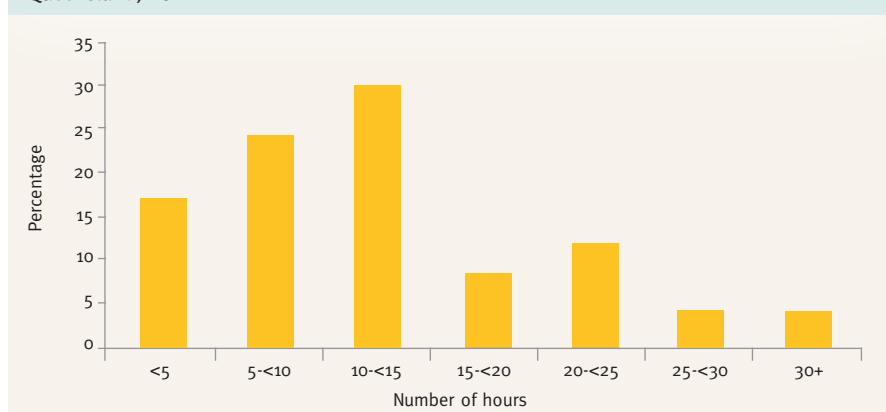
In 2011, from proxy report of parents or carers, 43% of Queensland children aged 5–17 years exceeded the recommended maximum recreational screen time of two hours per day (Table 15). A little more than half of those aged 12–17 years, and around one-third of those aged 5–11 years exceeded the screen time recommendation. There were no differences in the proportion of children exceeding the recommended screen time by sex, socioeconomic status or remoteness. On average, Queensland children spent 12 hours a week engaged in screen based entertainment, although 1 in 5 (21%) spent 20 hours or more doing so (Figure 33).¹¹ Screen based entertainment time increased with age from 10 hours per week in children aged 5–7 years, to 13.5 hours in those aged 16–17 years. There was no difference based on sex, socioeconomic status or remoteness.

In 2009–10, for students in years 8 to 11 (approximately 12 to 17 years of age), the Queensland rates of exceeding the maximum recommended screen time on schooldays (69%) and on weekends (83%) were similar to the national rates (71% and 83% respectively).^{336,337} Estimates from the national survey are not directly comparable to estimates from Queensland's surveys due to methodological differences.^{11,249}

In 2011, almost half of Queensland children (47%) aged 5–17 years travelled only by car to and from school in a usual week (Table 15). Younger children and those in more advantaged areas were more likely to travel by car only. Also in 2011, 29.8% of children used some form of active transport such as walking or cycling, to travel to or from school in a usual week—an average of 16 minutes per trip and 7.1 trips a week.¹¹



Figure 33: Screen based entertainment in hours per week, children (5–17 years), Queensland, 2011¹¹



In recent years, physical activity in adults has increased—by 38% since 2004.

Trends—adults

Rates of sufficient physical activity for adults are increasing in Queensland for both males and females (Figure 34). The proportion of Queensland adults achieving the recommended physical activity increased from 40% to 56% between 2004 and 2012, an increase of 38%. The rate of increase over the period for males was greater than for females—47% and 29% respectively. Based on the current trend, it is projected that by 2017, in five years, the

prevalence of sufficient physical activity in Queensland adults will be about 69%.

The physical activity goal of the National Partnership Agreement on Preventive Health is to increase the proportion of adults aged 18–75 years engaging in 30 minutes or more of moderate physical activity on at least five days of the week. The goal is an increase of 5% from baseline by June 2016 and 15% from baseline by December 2017 where the baseline year was defined as 2009 (55.9%).¹⁸⁰ In 2012, Queensland was 0.4% above the baseline measure.

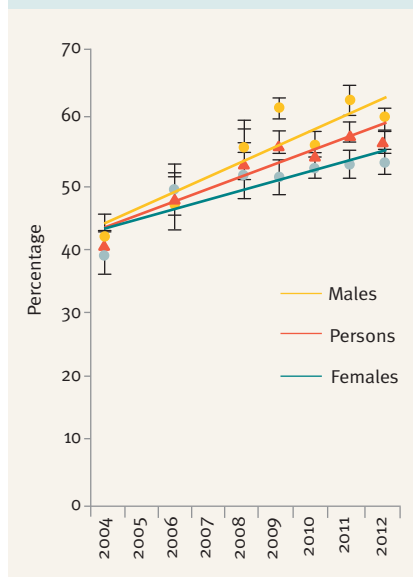
Socioeconomic differences in sufficient physical activity decreased in recent years, with the gap in prevalence between adult Queenslanders in the most advantaged and most disadvantaged areas reducing by over a third, from 17% in 2005 to 11% in 2011 (Figure 1E, page 3). Nonetheless, a significant socioeconomic gap remains.

Table 15: Selected physical activity indicators, children, percentage or mean (95% CI), Queensland, 2011¹¹

	Active every day of the past week ^a	Two or more hours per day of screen based entertainment	Minutes per week of screen based entertainment time	Transport to and from school only by car in a usual week
5-17 years				
Persons	44.0 (41.8-46.2)	43.3 (41.1-45.5)	731 (710-753)	47.4 (45.1-49.6)
Males	49.1 (46.1-52.2)	45.9 (42.9-49.0)	765 (734-796)	46.2 (43.1-49.3)
Females	38.5 (35.4-41.7)	40.4 (37.3-43.7)	696 (666-726)	48.6 (45.3-51.9)
Persons				
5-7 years	62.1 (57.4-66.5)	31.2 (27.0-35.8)	599 (560-638)	67.0 (62.4-71.3)
8-11 years	52.3 (48.3-56.3)	37.6 (33.8-41.6)	672 (637-707)	57.2 (53.2-61.1)
12-15 years	32.1 (28.5-36.0)	53.4 (49.4-57.4)	843 (802-885)	29.7 (26.1-33.5)
16-17 years	26.4 (21.6-31.8)	51.4 (45.8-57.0)	813 (752-875)	33.9 (28.4-39.8)
Males				
5-7 years	62.1 (55.8-67.9)	34.0 (28.2-40.2)	618 (561-674)	63.5 (57.1-69.5)
8-11 years	55.5 (49.9-60.9)	38.7 (33.4-44.3)	690 (640-740)	58.9 (53.3-64.3)
12-15 years	41.3 (36.0-46.8)	56.6 (51.0-62.0)	875 (815-934)	27.2 (22.5-32.5)
16-17 years	34.8 (27.4-42.9)	56.1 (48.2-63.7)	906 (818-994)	34.1 (26.6-42.4)
Females				
5-7 years	62.0 (55.1-68.5)	28.4 (22.4-35.2)	580 (526-634)	70.6 (63.8-76.6)
8-11 years	49.0 (43.3-54.7)	36.4 (31.1-42.1)	653 (604-702)	55.5 (49.8-61.1)
12-15 years	22.4 (18.0-27.5)	50.0 (44.2-55.8)	810 (752-869)	32.3 (27.0-38.0)
16-17 years	17.4 (12.4-23.9)	46.6 (38.7-54.7)	719 (637-801)	33.6 (25.9-42.3)
Socioeconomic status				
Disadvantaged	49.8 (44.7-54.9)	44.2 (39.2-49.4)	742 (693-792)	41.3 (36.2-46.5)
Quintile 2	45.8 (40.7-50.9)	45.6 (40.5-50.7)	772 (717-827)	47.3 (42.1-52.5)
Quintile 3	44.9 (40.1-49.8)	42.1 (37.4-47.0)	709 (662-756)	45.2 (40.3-50.1)
Quintile 4	43.7 (39.0-48.5)	46.7 (41.9-51.5)	755 (709-800)	50.3 (45.5-55.1)
Advantaged	35.3 (30.6-40.3)	37.3 (32.6-42.2)	674 (631-718)	52.4 (47.3-57.4)
Remoteness				
Major cities	41.7 (38.7-44.7)	43.6 (40.7-46.7)	740 (711-769)	49.8 (46.7-52.8)
Inner regional	45.0 (40.5-49.7)	43.5 (39.0-48.2)	717 (672-762)	^b 45.6 (42.1-49.2)
Outer regional	47.0 (41.7-52.3)	45.8 (40.6-51.2)	760 (702-817)	
Remote	43.5 (30.6-57.4)	30.1 (19.7-43.1)	573 (479-668)	^c 36.5 (27.2-46.9)
Very remote	61.3 (47.1-73.8)	29.2 (17.9-43.7)	653 (521-785)	

^a One hour or more of physical activity per day ^b Inner and outer regional ^c Remote and very remote

Figure 34: Trends in self reported physical activity, adults (18–75 years), Queensland



Trends—children

There is insufficient evidence to assess physical activity or screen-time trends in Queensland children. The National Partnership Agreement on Preventive Health physical activity performance indicator is to increase the proportion of children aged 5–17 years participating in at least 30 minutes of moderate physical activity on five or more days of the week by 5% in June 2016 and 15% by December 2017 from the 2009 baseline.¹⁸⁰ The baseline for Queensland children aged 12–17 years was 16%, with no baseline measure for children aged 5–11 years.³³⁶

Potential for change

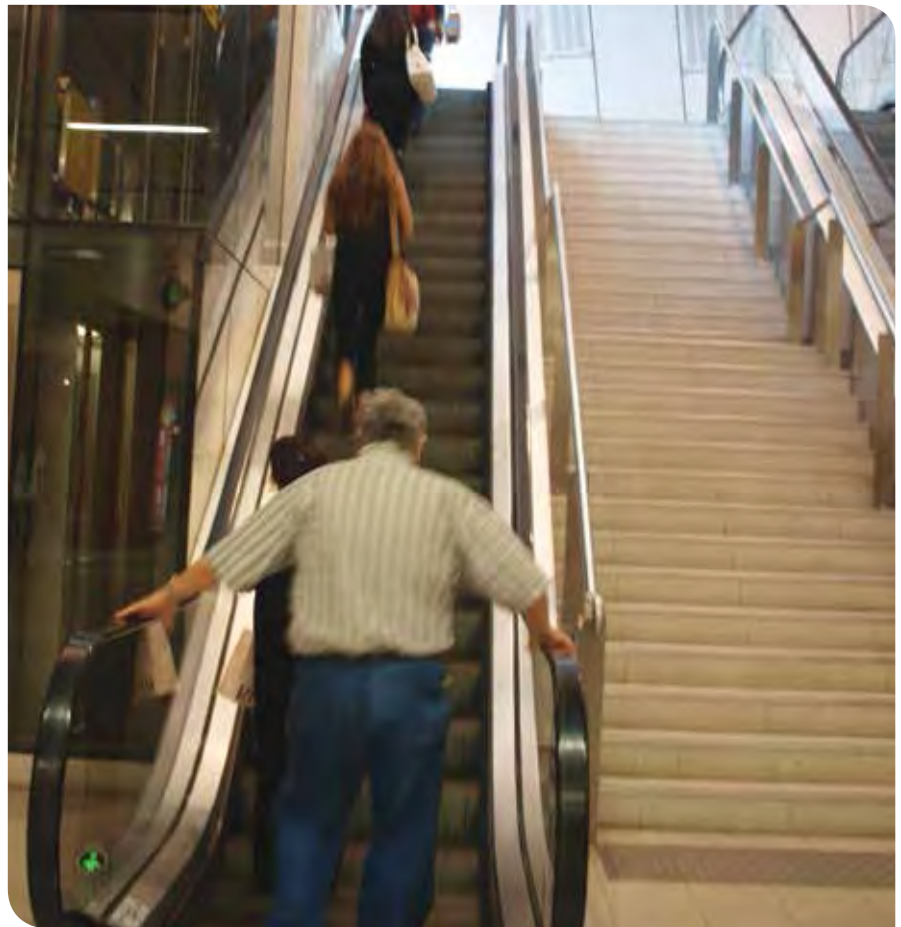
With most Queenslanders often using motor vehicles and infrequently travelling by bicycle or on foot for transport, encouraging active transport for adults and children is an opportunity to increase Queenslanders' physical activity and reduce sitting time. Workplaces, where many spend a large proportion of the day, also provide a strategic opportunity for change and are a focus of the National Partnership Agreement on Preventive Health. The following sections expand on these themes, concluding with several further concepts such as the importance of confidence building, the benefit of everyone doing a little more physical activity, and management of children's screen time.

Active transport

Most days, many Queenslanders need to travel between home and other places. In 2011, there were about 2.4 million passenger vehicles in Queensland, that is about one passenger vehicle for every two people.³³⁸ With each passenger vehicle clocking up more than 13,000 kilometres on average in a year, this equates to around an hour of driving per day per car based on an average speed of 40 kilometres per hour.³³⁹

Active transport generally means a form of transport involving physical activity, such as walking and cycling. Increasing the proportion of trips, travel time and people using active transport is an opportunity to improve the physical activity levels of Queenslanders and reduce their sedentary time. There are also environmental benefits through reduction in car use.

Children and adolescents are more likely to achieve sufficient physical activity when they walk or cycle to school, and this is influenced by a number of factors such as the built environment and parental support.³⁴⁰ In Australia, parents usually make the decision



about their child's mode of transport to school.³⁴¹ Of those children who did not cycle to school, 38% had asked if they could do so. Most parents of children who do not walk or cycle would permit them to do so if they could be confident of the child's safety.

The proportion of Australian children walking and cycling for transport is relatively low and declining.³⁴² While a quarter of Queensland children (25%) included some walking, and 5% some cycling to or from school in a usual week in 2011, almost half travelled exclusively by car.¹¹ On average, active commuting took almost two hours for seven school trips each week, or 20 minutes a day, which is about a third of the recommended minimum 60 minutes of daily physical activity. This level is more likely to be achieved by children who actively travel to school each day. Age is a strong predictor of achieving the recommended level, with younger children more likely to do so. After adjusting for this factor, the odds of Queensland children being active every day were at least 20% higher among those who walked, cycled or used a scooter to or from school in 2011.³⁴³ This indicates that active transport to school is an opportunity to increase children's physical activity and reduce their sedentary time.

Active transport can be an effective form of physical activity for adults. In 2011, Queensland adults who were sufficiently active were more likely to walk or cycle for transport, irrespective of sociodemographic and lifestyle factors.⁶⁹ Sufficiently active adults were more likely (double the odds) to walk for transport at least five days per week and those who cycled for transport at least one day per week were less than half as likely to travel by motor vehicle five or more days per week.

Community approaches have been shown to increase physical activity^{344,345}, as do some land use and urban design practices and policies.³⁴⁶ Urban sprawl, for example, leads to higher rates of vehicle ownership and use, and lower rates of walking and cycling.³⁴⁷ Higher density of road intersections is associated with people walking more.³⁴⁸ There are a number of community-based interventions and interventions to improve the built environment to get people moving in Queensland and a small selection of these are showcased in Chapter 4.

Getting physical activity into work

In some workplaces people are at greater risk of the unhealthy behaviours that lead to chronic disease.^{349,350} Prolonged periods of sitting are common to many occupations such as office workers and transport workers. Sedentariness has an adverse effect on people's health and is associated with sitting at work as well as travelling to work by car or other motor vehicle.

In 2011, 39% of Queensland adults aged 18–65 years were sedentary on weekdays, that is sitting for seven hours or more each day.⁸ Adults in full-time employment were more likely to be sedentary on weekdays (twice the odds) compared with part-time workers, retired people and those with an employment status of home duties or carer.⁶⁹ Cars and other vehicles are the most common ways people move from place to place including getting to work. In 2011, 83% of Queenslanders aged 18–69 years used a motor vehicle such as car, bus or train on five days or more in the previous week to travel from place to place. Only 30% walked as often for travel and even fewer used a bicycle on just one day in the previous week (6%). Using a motor vehicle on at least five occasions a week was more common among people in advantaged areas than disadvantaged areas (89% compared with 71%). There is an opportunity to encourage people to use more active forms of transport in their daily working life.

Encouraging people to actively commute to work will require an integrated active transport network, focusing on those localities and connections that will best motivate people and make it easy for them to walk or cycle more often.³⁵¹ Although this is more likely to occur in higher density urban areas there is a need to improve the links between urban areas as well. It is also important to provide end of trip facilities such as secure bicycle storage, lockers and showers.

For those who spend a lot of time seated at work, regular breaks even as brief as one minute, may be sufficient to reduce the detrimental metabolic effects of being sedentary.³²⁷ Although in Australia it is recommended that office workers walk around every 20 to 30 minutes or so, there is little evidence as yet to demonstrate that this is widespread or that there are effective interventions to encourage such behaviour change.^{352,353} Further research is needed to show how sedentariness in the workplace can be reduced.^{354,355,360}

The Australian Government has recognised that health improvements in the workplace

are an important factor in reducing chronic disease and improving the health of the population. This includes increasing levels of physical activity.¹⁸⁰ The Workplaces for Wellness Initiative commenced in Queensland in 2011, with an aim to encourage a more physically active workforce by improving the facilities to support active transport to work, helping workers find ways to achieve 30 minutes of moderate intensity activity every day and reducing prolonged periods of sitting. For example, desks that can be adjusted will allow people to stand rather than sit for periods at work. The overall goal of the initiative is to reduce chronic disease risk factors in the working population and to modify workplaces to support healthy living. For more information see page 61.

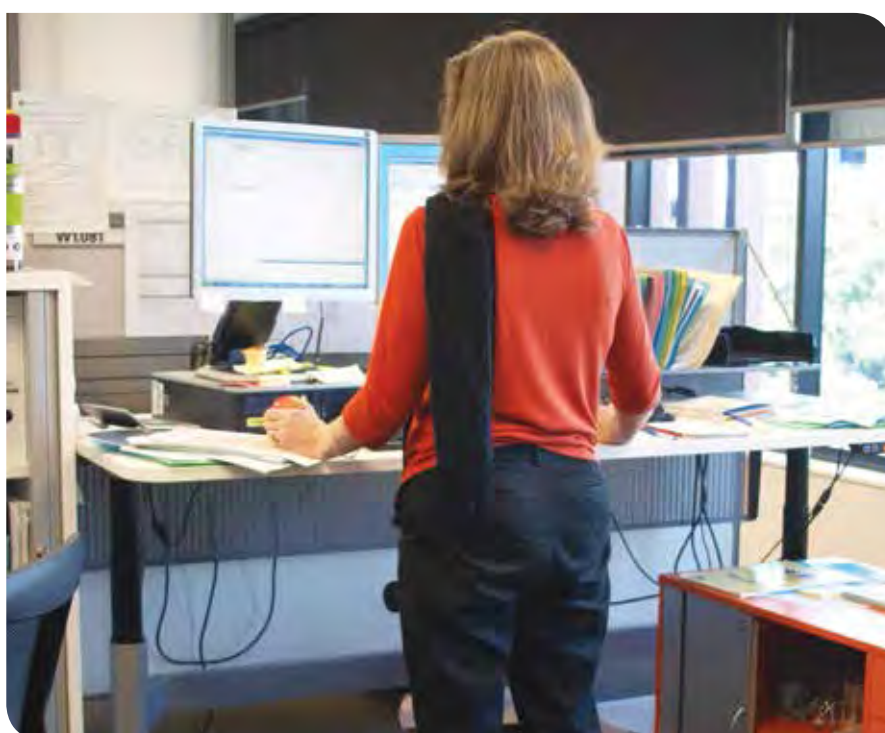
In 2011, nearly a third of employed adult Queenslanders (31%) reported that their workplace had offered a program to address chronic disease risks.²⁷⁷ Of the chronic disease programs, those that targeted physical activity were the most commonly offered (69%) and had the highest participation rates (48%) (Figure 40, page 106). It is likely that the level of participation and the offer of physical activity programs are good evidence that the message of getting workers active and the benefits of doing so are being recognised. A number of programs and initiatives in Queensland are demonstrating the strength of this growing interest and commitment and some are featured in Chapter 4.

Enhancing upward trends in physical activity

More adults in Queensland are achieving sufficient physical activity. These upward trends are evident for males and females, and across the socioeconomic gradient, and cannot be attributed to any one program or intervention. Population gains in physical activity have followed increased policy focus at local, state, national and international levels and interventions at all levels of society. There is, however, more that can be done, and ongoing will is necessary to build on recent gains in physical activity.

An international review by the WHO gave the 2001 Active Australia media and social marketing campaign the highest effectiveness ratings for psychosocial and behavioural changes.³⁵⁶ Mass media community campaigns, and programs which encourage the use of pedometers are expected to be cost-saving interventions to increase physical activity in Australia.³⁵⁷ Other Australian interventions which rated well in the WHO review were the cycle trail promotion and Rockhampton's 10,000 Steps program.³⁵⁶ General practitioner physical activity prescription programs as well as internet based and active transport programs are also expected to be cost-effective initiatives.³⁵⁷

Knowledge of what people need to do to be healthier is one of the many factors which influence the uptake of any given



health behaviour, although knowledge alone is usually insufficient to cause behaviour change.^{358,359} In 2011, around one-third (36%) of adult Queenslanders knew all components of the current national physical activity guidelines for adults.⁸ Females (42%) were more likely to do so than males (31%), and younger (41%) and middle-aged (38%) adults more likely than older adults (31%). Sedentary adults were less likely to know the guidelines, with those usually sitting for at least seven hours each day less likely (half the odds) to know all the guideline components, after adjustment for several factors including sociodemographic and lifestyle variables.⁶⁹ There was little relationship between knowledge of physical activity guidelines and achieving sufficient physical activity, indicating other influences are at play.

In 2011, Queensland adults confident in their ability to do more physical activity undertook almost twice as much activity over a week as those without this confidence although it is not known whether confidence caused the higher physical activity, or vice versa.⁶⁹ However, it is clear that confidence plays an important role in physical activity behaviour and this is consistent with what is known about how people learn and how they change behaviours.³⁵⁹

Increasing the activity of people who do not engage in physical activity is expected to provide the largest public health benefit associated with physical activity.³⁴⁴ In 2012, around 1 in 10 adult Queenslanders reported not engaging in any physical activity.⁴ It is a priority to get them active.

About 1 in 12 (9%) adult Queenslanders achieved the recommended 150 minutes of weekly physical activity in 2012 but this was not spread over the recommended five sessions.¹⁴⁹ Half of these, or 4% of adult Queenslanders, were only one session short of meeting the recommendation and another 1% achieved the recommended five sessions, but only about 140 minutes of weekly physical activity. If all Queenslanders engaged in an additional 10-minute session of moderate intensity physical activity such as walking each week, it is expected that the prevalence of sufficient physical activity among Queensland adults in 2012 would increase by 5 percentage points.

A 5 percentage point increase in the prevalence of physical activity in Queensland could be expected to lead to a reduction in annual deaths due to physical inactivity by around 200 over time and a reduction in new annual cases of related disease by around 600 over time.²²⁵



The Smart Moves physical activity program was introduced in Queensland state schools in 2008 to ensure that primary school children received at least half of their daily recommended physical activity on school days.³⁶⁰ Smart Moves, or a similar program or curriculum, would be a good investment to ensure upward trends are enhanced.

Children's active transport to school can contribute substantially to their physical activity every day, and could reduce inequalities due to age, sex and socioeconomic status in physical activity participation.³⁴² Physical environments that support children walking and cycling to school are important to achieve change, as is addressing parents' concerns regarding active transport. Parents who support their child being physically active and are physically active themselves are an important influence.

More than a third (35%) of Australian parents reported difficulty managing their child's use

of television, video or computer games, the internet and mobile phones in 2007.³⁶¹ Given that 43% of Queensland children exceeded the maximum recommended recreational screen time in 2011, interventions that educate parents about the recommended maximum recreational screen time for children and help them manage it are worth considering.¹¹

These interventions are investments in the health of future adult Queenslanders as research indicates that consistently active children are more likely to be active as adults.³⁶²

Overall, there has been improvement in levels of physical activity of Queenslanders. Building on these gains where people work, learn, live and play and when travelling between these places is a priority, and will require ongoing and concerted effort across the community. Several of the many physical activity interventions are featured in Chapter 4.

Queensland is increasingly becoming smokefree with about 10,000 fewer smokers each year. Liquor licensed venues, cafes and many outdoor sporting areas are now smokefree as a result of legislation introduced in Queensland in 2006. Three-quarters of Queenslanders actively avoid places where they are exposed to other people's smoke and the majority of current Queensland smokers are trying to quit or intend to do so.¹² The culture is changing.

There is good reason for smokers to quit and non-smokers to avoid other people's smoke. Smoking is a key health risk factor causing 7.2% of the disease burden in Queensland in 2007.⁸⁸ It increases the risk of lung cancer, cardiovascular disease, chronic lung disease, and several other conditions (Figure 35). About 80% of lung cancer is caused by smoking. The health risk increases the earlier a smoker takes up the habit and the longer they smoke. Quitting smoking leads to a large and rapid fall in the risk of heart disease, stroke and vascular disease.³⁶³

Smoking causes death, with about one-half to two-thirds of long term smokers eventually killed by their addiction.¹⁴ In 2006–2007, there were about 3,400 smoking related deaths each year, which was 1 in 7 of all deaths and 1 in 6 of premature deaths. There were about 36,000 hospitalisations per year due to smoking from 2006–07 to 2008–09, 2.3% of all hospitalisations. The most recent economic analysis of the impact of tobacco smoking is summarised on page 66 and in more detail in the previous report of Queensland's Chief Health Officer in 2010.⁶⁶

It is likely that variation in smoking rates explains a substantial proportion of the differences in life expectancy among populations. For example, the damage caused by smoking was estimated in 2003 to account for 78% of the gap in life

50% of smokers will die from smoking.¹⁴

expectancy for females in the United States, and other high income countries and 40% of the male gap.³⁶⁴ A Taiwan study estimated that 19% of the variation in life expectancy was explained by tobacco smoking.^{364,365} The impact of smoking on the life expectancy of Indigenous and non-Indigenous Australians in the Northern Territory was recently assessed.²² Socioeconomic factors accounted for 42–54% of the life expectancy gap, smoking accounted for 14–24%, obesity 9–17%, alcohol 1–7% and assault and pollution less than 1% of the gap. Jointly these risks accounted for 60–70% of the life expectancy gap in the Northern Territory based on data from 1986 to 2005.

Current prevalence and differentials

In 2012, 14.3% of adult Queenslanders were daily smokers, 2.9% were smokers but not daily, 28% were ex-smokers and 55% had never smoked (Table 16).⁴

Rates of daily smoking were similar in males and females in 2012, and this was evident across all age groups (Table 16). Rates of smoking were highest in adults aged 35 to 54 years—about 1 in 6 smoked daily—compared to those in older age groups, with rates falling to less than 3% among those aged 75 years and older.

Among Queensland teenagers aged 14–19 years about 1 in 14 or 7.3% smoked daily in 2010.¹⁷ Their smoking rate was less than half that of the adult population (17.7%) in that year. The Queensland rate was 6% higher than the national smoking rate for this age group, and second highest jurisdiction, after Victoria. In 2010, the average age that Queenslanders aged 14 years and older smoked their first full cigarette was 15.8 years, 15.3 years for males and 16.4 for females, with no variation in age of initiation by socioeconomic status or remoteness.¹² Nationally, the average age of smoking a first full cigarette has steadily increased from 15.6 years in 1995 to 16 years in 2010, while in Queensland the age of initiation has varied little since 2001 (15.6 years).^{17,366}

There is a socioeconomic and remoteness gradient in daily smoking in Queensland. In 2012, daily smoking rates among adults

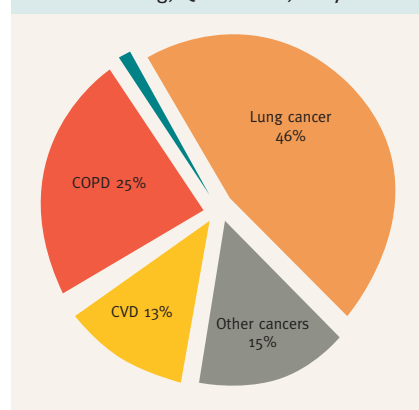
living in the most disadvantaged areas were double those in most advantaged areas. Smoking rates were higher outside major cities—25% higher in outer regional areas and 30–35% higher in remote and very remote areas (Table 16).⁴

Daily smokers are more likely to be heavier drinkers. For adult Queenslanders, the likelihood of being a daily smoker increased by 20% with each additional weekly drink of alcohol independent of differences due to sex, age, socioeconomic status, remoteness and selected lifestyle factors.⁶⁹ Conversely, there was a 25% decrease in the likelihood of being a daily smoker for each additional serve of fruit per day in 2011. Obese people were less likely to be smokers, with each unit increase in BMI associated with a 5% reduction in the likelihood of being a daily smoker.

The smoking rate among Indigenous Queenslanders aged 15 years and older (44%) was about double that of non-Indigenous Queenslanders in the same age group (24.5%) in 2007–08.^{367,368} The gap between smoking rates for Indigenous and non-Indigenous Australians has remained unchanged since 2002.³⁶⁹

There is limited data to reliably report differences in smoking rates among culturally and linguistically diverse populations in Queensland. However, in 2007–08, smoking rates were about 30% lower among Queenslanders born overseas compared with those who were Australian born, and about 40% lower among those who speak a language other than English at home compared with those who speak English at home.²¹ These data do not adequately reflect the variation in smoking rates within culturally and linguistically diverse populations—and considering the smoking rates in the country of origin of recent arrivals, smoking rates of migrants may reflect these behaviours rather than the Queensland rates. For example, the smoking rates for males and females are a little higher than Queensland's in the leading countries of origin (United Kingdom and New Zealand), and for many other countries the rates are much higher.^{115,242,370} Smoking rates for males in country of birth of recent settlers (Figure 3), South Africa, India, China, and Korea, are substantially higher than Queensland male rates at 24%, 36%, 53% and 43% respectively.^{242,243,371–373}

Figure 35: Distribution of burden of disease due to smoking, Queensland, 2007⁸⁸



13% of women smoked throughout their pregnancy—44% of Indigenous women and 11% of non-Indigenous women.²²

Female rates did not differ as markedly from the Queensland rates for females: 8%, 12%, 2% and 5% respectively.

Rates of smoking in Queensland in 2010 were similar to national rates for the adult population and for those aged 14 years and older.¹⁷ Queensland males had the second highest smoking rate among the states and territories after Northern Territory, and for Queensland females, the rate was third highest after Northern Territory and Tasmania (Table 17).

Among 18 OECD countries with comparable data, Australia had the third lowest daily smoking rate after Sweden and the United

States for people 15 years and older in 2007.²⁴² Male rates were third lowest after Sweden and the United States but female rates were fifth lowest with Korea and Japan also being lower than Australia.

Most pregnant women in Queensland did not smoke at all during their pregnancy, 83% in 2010, while 17% smoked at some time during their pregnancy.²³ Indigenous Queenslander women were more likely to smoke at some point during their pregnancy— 53% compared with 15% of non-Indigenous women in 2010. Teenage girls were also more likely to smoke at some time during their pregnancy—53% did so in 2010 compared

with 15% for other women. A small proportion of the women who smoked in the first half of their pregnancy had stopped by 20 weeks— 1 in 5 non-Indigenous women and 1 in 7 Indigenous Queenslander women quit. The quit rate before the second half of pregnancy took the proportion of Queensland women who continued to smoke during the second half of their pregnancy to 13%, although for Indigenous women it was 44%, compared with 11% of non-Indigenous women. Of those women who smoked during the second half of their pregnancy, 21% smoked more than 10 cigarettes a day, and this was similar for Indigenous and non-Indigenous women.

Table 16: Smoking status, adults, percentage (95% CI), Queensland, 2012⁴

		Current daily	Current - not daily	Ex-smoker	Never smoked
18+ years	Persons	14.3 (13.5-15.2)	2.9 (2.5-3.4)	28.3 (27.3-29.3)	54.5 (53.3-55.7)
	Males	15.3 (14.2-16.6)	4.1 (3.4-5.1)	30.8 (29.4-32.3)	49.7 (47.9-51.4)
	Females	13.3 (12.2-14.5)	1.7 (1.3-2.3)	25.8 (24.5-27.2)	59.2 (57.5-60.8)
Persons	18-24 years	15.0 (11.7-19.1)	6.8 (4.5-10.0)	4.8 (3.1-7.4)	73.4 (68.5-77.7)
	25-34 years	16.3 (14.0-19.0)	4.2 (2.8-6.1)	21.7 (19.0-24.7)	57.8 (54.2-61.3)
	35-44 years	17.5 (15.6-19.5)	2.7 (2.0-3.5)	27.7 (25.5-30.0)	52.2 (49.6-54.7)
	45-54 years	17.4 (15.8-19.2)	2.1 (1.6-2.9)	32.2 (30.1-34.5)	48.2 (45.9-50.6)
	55-64 years	12.7 (11.4-14.2)	1.7 (1.2-2.3)	38.3 (36.2-40.4)	47.3 (45.2-49.5)
	65-74 years	8.9 (7.7-10.3)	1.2 (0.9-1.8)	40.9 (38.7-43.1)	49.0 (46.8-51.2)
	75+ years	2.6 (2.0-3.6)	*0.8 (0.4-1.4)	37.8 (35.1-40.5)	58.8 (56.0-61.6)
Males	18-24 years	12.7 (9.1-17.5)	10.3 (6.7-15.4)	*3.4 (1.9-6.3)	73.6 (67.3-79.0)
	25-34 years	19.8 (16.1-24.1)	6.7 (4.3-10.3)	19.0 (15.2-23.4)	54.5 (49.0-59.9)
	35-44 years	18.4 (15.7-21.5)	3.3 (2.2-4.8)	26.9 (23.8-30.2)	51.4 (47.7-55.1)
	45-54 years	17.7 (15.5-20.3)	2.8 (1.9-4.1)	34.5 (31.4-37.8)	44.9 (41.6-48.4)
	55-64 years	13.6 (11.7-15.7)	1.9 (1.2-3.0)	44.7 (41.7-47.8)	39.8 (36.9-42.9)
	65-74 years	10.6 (8.8-12.7)	1.9 (1.2-2.9)	51.0 (47.9-54.2)	36.5 (33.5-39.6)
	75+ years	2.8 (1.9-4.0)	n/a	54.0 (50.0-57.9)	42.7 (38.8-46.7)
Females	18-24 years	17.3 (12.2-24.1)	n/a	*6.2 (3.4-11.0)	73.2 (65.5-79.6)
	25-34 years	12.8 (10.1-16.1)	*1.7 (0.8-3.3)	24.4 (20.7-28.6)	61.1 (56.5-65.5)
	35-44 years	16.6 (14.1-19.4)	2.1 (1.3-3.2)	28.5 (25.4-31.7)	52.9 (49.4-56.3)
	45-54 years	17.1 (14.8-19.7)	1.5 (0.9-2.4)	29.9 (27.0-33.1)	51.5 (48.2-54.8)
	55-64 years	11.9 (10.2-14.0)	1.5 (0.9-2.3)	31.8 (29.0-34.7)	54.8 (51.7-57.8)
	65-74 years	7.2 (5.6-9.0)	*0.6 (0.3-1.3)	30.7 (27.9-33.6)	61.5 (58.4-64.5)
	75+ years	2.5 (1.6-3.9)	*0.9 (0.4-2.0)	25.6 (22.3-29.2)	70.9 (67.2-74.3)
Socioeconomic status	Disadvantaged	18.1 (16.4-19.9)	2.3 (1.5-3.4)	29.9 (28.0-31.8)	49.7 (47.5-51.9)
	Quintile 2	17.2 (15.3-19.3)	1.9 (1.4-2.6)	29.6 (27.5-31.8)	51.2 (48.7-53.8)
	Quintile 3	14.1 (12.3-16.0)	3.1 (2.2-4.4)	30.2 (28.0-32.5)	52.6 (50.0-55.2)
	Quintile 4	13.4 (11.6-15.5)	2.4 (1.6-3.7)	26.5 (24.1-28.9)	57.7 (54.8-60.6)
	Advantaged	9.5 (7.9-11.4)	4.6 (3.3-6.4)	25.8 (23.5-28.2)	60.1 (57.2-62.9)
Remoteness	Major cities	13.2 (12.0-14.4)	3.5 (2.8-4.4)	27.3 (25.9-28.7)	56.0 (54.3-57.7)
	Inner regional	15.2 (13.7-16.9)	2.0 (1.4-2.9)	30.2 (28.2-32.3)	52.6 (50.3-54.8)
	Outer regional	16.4 (14.6-18.3)	1.7 (1.3-2.4)	28.7 (26.7-30.9)	53.2 (50.7-55.7)
	Remote	17.3 (15.2-19.6)	2.3 (1.6-3.3)	30.9 (28.0-34.0)	49.5 (46.4-52.7)
	Very remote	17.8 (15.5-20.4)	3.7 (2.7-5.1)	30.4 (27.6-33.4)	48.0 (44.8-51.3)

* Estimate has a relative standard error of 25% to 50% and should be used with caution.

n/a Not available for publication

Daily smoking decreased by 4% per year between 2001 and 2012 and the greatest decline was in teenage rates.

Table 17: Daily smoking, adults, by state and territory, percentage (95% CI), 2010¹⁷

	Persons	Males	Females
Australian Capital Territory	11.7 (9.7-14.2)	12.8 (9.8-16.5)	10.7 (8.1-14.0)
New South Wales	15.0 (14.1-16.0)	16.6 (15.1-18.2)	13.5 (12.3-14.8)
Queensland	17.7 (16.5-18.9)	19.6 (17.8-21.6)	15.7 (14.3-17.3)
South Australia	15.7 (14.0-17.6)	17.9 (15.1-21.0)	13.7 (11.7-16.0)
Tasmania	16.9 (14.5-19.6)	17.3 (13.8-21.5)	16.5 (13.3-20.2)
Victoria	15.5 (14.4-16.7)	15.7 (14.1-17.5)	15.3 (13.8-16.8)
Western Australia	16.5 (14.8-18.3)	18.8 (16.2-21.6)	14.1 (12.1-16.4)
Northern Territory	23.9 (20.7-27.4)	29.6 (24.5-35.2)	17.8 (14.4-21.8)
Australia	15.9 (15.4-16.5)	17.4 (16.6-18.3)	14.5 (13.8-15.2)

Trends

Smoking rates in Queensland continue to decline. In 2001, 22.1% of adult Queenslanders were smoking daily, compared to 14.3% in 2012—a decrease of 8.8 percentage points or 0.8 percentage points per year based on trend (Figure 36). This represents a 39% decrease over the period based on trend, or 4% per year. If the smoking rate in 2012 were the same as in 2001, it is estimated there would have been about 780,000 adults smoking daily in Queensland in 2012—but due to smoking rate decline there were about 490,000 daily smokers, that is about 290,000 fewer people smoking daily (Figure 1C, page 3). This represents a reduction of about 10,000 people per year since 2001, after taking into account population growth. Based on the current trend, it is projected that by 2017, in five years, the prevalence of daily smoking in Queensland adults will be about 10%.

Daily smoking is a performance indicator of the National Partnership Agreement on Preventive Health.¹⁸⁰ The goal is to reduce Queensland smoking rates by 1.5 percentage points from the 2007 national rate by June 2016 and by 3.5 percentage points by December 2017. According to the national data collection in 2010, the Queensland smoking rate (17.5%) was similar to the 2007 national baseline (17.7%).¹⁷

Among teenagers aged 14 to 19 years, the rate of daily smoking decreased from 9.3% in 2007 to 7.3% in 2010, a 30% decline over the three years. This was consistent with the continuing downward trend over the decade since 2001 for Queensland when the smoking rate among teenagers was

17.8%.³⁷⁴ For teenagers and adults aged up to 29 years the rate of decline in smoking was higher than for other age groups. Because most people start smoking in their teenage years, changes in smoking rates in younger age groups reflect changes in uptake.³⁷⁴

Potential for change

Building on past success in smoking reduction is a challenge. Tobacco is highly addictive and multiple strategies are needed to prevent uptake and to help people quit. Continued efforts at the national, state and local level to reduce smoking rates are necessary as there are new generations of potential smokers coming forward every year.

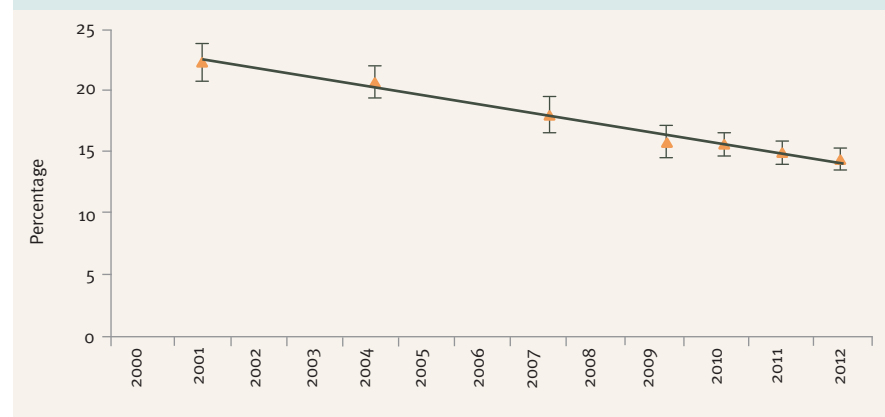
An integral part of the multi-strategy tobacco control plan is legislative control measures at state and national levels. Australia is moving towards plain packaging of cigarettes in an attempt to continue to

reduce smoking by eliminating persuasive messages and images on packs. The *Tobacco Plain Packaging Act 2011* to implement this change was passed in November 2011 and will come into force in December 2012. However, the tobacco companies' unsuccessful appeal against the legislation in the high court and the ongoing ferocity of the battle is an indication of their concern that plain packaging would reduce tobacco consumption in Australia and subsequently impact other parts of the developed world.³⁷⁵

To continue to achieve gains in smoking, the quitting rate needs to increase and the uptake rate needs to decrease. The steady decline in smoking rates is evidence that in Queensland both are occurring. However, the challenges continue—in 2010, 8% of Queenslanders aged 14 years and older considered themselves heavy or chain smokers, but double that number were smoking daily (16.7%).¹²

**N~~NO~~BODY
SM~~NO~~KES
HERE ANY
M~~NO~~RE**

Figure 36: Trend in daily smoking, adults, Queensland



Reducing the number of cigarettes is a positive step in successful quitting.²⁵

Reduce uptake

On average, Queensland smokers have their first full cigarette at age 15.8 years, and often it has been supplied by a friend or acquaintance. Typically, they become daily smokers two years later at 17.9 years and continue to smoke every day with attempts to quit or cut down until they stop smoking daily at the average age of 34.1 years. The duration of daily smoking for females is shorter than for males—on average they are one year older than males when they have their first full cigarette (16.4 years compared with 15.3 years) and they become daily smokers a little later than males (18.3 compared to 17.6 years). They also stop smoking on a daily basis two years earlier than males at 32.9 years compared with 35.0 years.

A small proportion of Queenslanders are very young when they have their first full cigarette. Of those who have ever smoked, about 1 in 50 (1.9%) were under 10 years of age and 1 in 2 (4.9%) were aged 10 to 15 years (Figure 37).¹² Boys had their first cigarette earlier than girls, with 57% of those who had smoked having their first full cigarette at 15 years or younger, compared with 45% of girls.

Quitting and reducing

Most smokers are trying to quit. In 2010 among Queenslanders aged 14 years and older who had smoked at all in the previous 12 months, 1 in 4 reported having already given up smoking, 2 in 4 intended to do so but at some time in the future, while 1 in 4

said they did not plan to quit.¹² Of those who did not intend to quit, their main reasons were that they enjoyed smoking (57%) or found it relaxing (34%). One in five (21%) said they did not intend to stop because they recognised that they were addicted to smoking, and 1 in 6 (16%) said they had in the past tried unsuccessfully to quit. A very few indicated that the reason for not quitting was weight control (6%) or that they did not believe that smoking was as bad for them as people say (4%).

Of those who did not plan to quit, 41% said they would be influenced to do so by the impact of smoking on their health, 20% would be influenced to stop by their doctor, 20% by the effect of smoking on their fitness, 18% by the impact on children in the home and 11% by the impact of smoking on pregnancy.¹²

Quitting or reducing tobacco smoking is a personal challenge for smokers. About half the current smokers in Queensland had tried unsuccessfully to quit or cut down their smoking in the previous 12 months (50.3%).¹² A greater proportion of females than males were unsuccessful, 55.8% compared with 45.8%. The highest rates of unsuccessful quitting or cutting down were in the age group 40 to 69 years.

Smokers are working at reducing their nicotine dependence through quit attempts

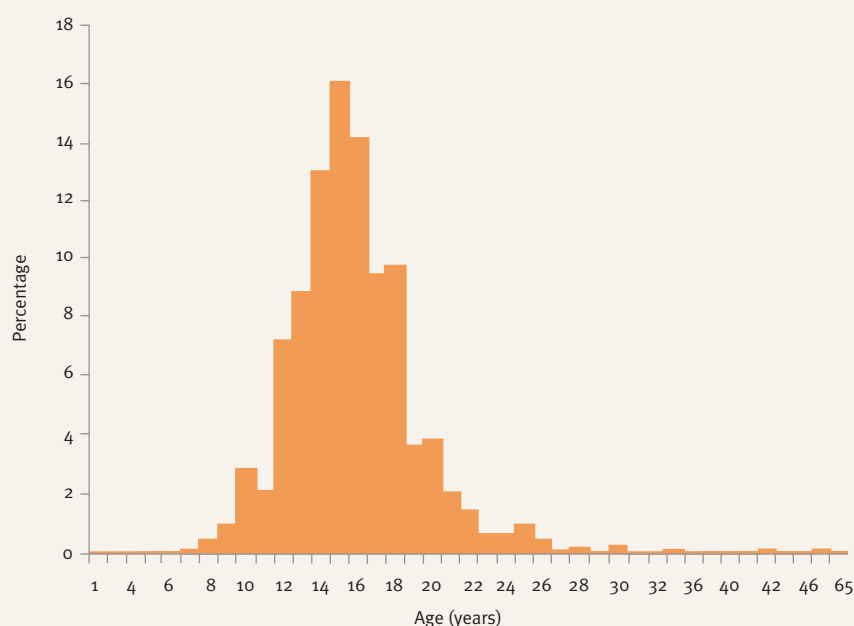
or reducing their consumption. In 2010 in Queensland, a quarter (25.9%) of those who had smoked in the past 12 months reported having successfully stopped smoking for at least a month in the previous 12 months, while a quarter were unsuccessful (25.8%) in doing so.¹² About 1 in 10 (11.2%) changed to a brand with a lower tar or nicotine content and a very small proportion unsuccessfully tried to do so (2.2%). Nearly a third (29.4%) successfully reduced the amount of tobacco smoked in a day and 12.3% were unsuccessful. The majority of those who limited their consumption did so by cutting out up to 10 cigarettes a day (58.9%). Males and females were similar in their experience of quitting and reducing consumption.

Successful quitting is a challenge. A four-country study, which included Australia, found that lower levels of nicotine dependence were associated with greater likelihood of quit duration and quit success.²⁵ Those with a history of quitting for at least six months were more likely to be successful than those who had a history of quick failures, that is, quitting for a week or less. Therefore, interventions that reduce nicotine dependence through reducing the number of cigarettes may boost cessation rates.

Surprisingly, those with the highest expectations of health benefit from quitting smoking relapsed at a greater rate than those with more modest expectations.²⁵ It could be that some smokers overestimate the short term improvements, and when they find these are not achieved, are prone to relapse. If so, it would suggest that promotion of the gains from quitting smoking should be realistic and distinguish between short term and longer term benefits.

Factors associated with success in quitting were not the same as those associated with making a quit attempt and for hard to change behaviours like smoking, it is important that the unique factors for both are understood. People who are positive about smoking, that is, enjoyed it or did not believe it was bad for them, were less likely to attempt to quit.²⁵ Those who had tried to quit before were generally more likely to try in future. Those who indicated they intended to quit were more likely to attempt to do so, as were those who were experiencing a health problem.

Figure 37: Age at first full cigarette (14 years and older), Queensland, 2010¹²



Non-smokers who are exposed to second-hand smoke at home or at work have a 30% increase in their risk of developing lung cancer.¹⁵

Although success in quitting is quite difficult for many, even the small percentage of smokers who quit represents substantial progress at a population level.³⁷³ For example, the rate of smoking reduction was estimated to have averted at least 2,000 deaths due to lung cancer and COPD alone in Queensland over a decade (page 2). Tobacco control interventions that increase the percentage of smokers making a quit attempt and their likelihood of success are effective measures for increasing cessation in the population.

Passive smoking

Non-smokers, including infants and children, who inhale smoke in the environment from second-hand smoke (exhaled smoke) or sidestream smoke from smouldering cigarettes is termed 'passive smoking'. They are exposed to most of the same toxins and chemicals that smokers inhale directly through cigarettes. Sidestream smoke is usually formed at a lower temperature which leads to incomplete combustion. This results in a greater quantity of compounds per cigarette being released by sidestream smoke than exhaled smoke.³⁷³ Passive smoking is strongly linked to heart disease, lung cancer and respiratory conditions for adults.³⁷⁶ Non-smokers who are exposed to second-hand smoke at home or at work have a 30% increase in their risk of developing lung cancer, and the WHO has estimated that about 10% of deaths due to smoking are a result of second-hand smoke.^{15,51} Legislation to protect people from second-hand smoke includes the Queensland Government's tobacco laws which ban smoking in indoor and outdoor public places, and since 2010 it has been illegal to smoke in private vehicles carrying children under 16 years (Chapter 4).

Children's health is particularly affected by exposure to tobacco smoke, especially when it is indoors. Passive smoking increases the risk of ear infections and asthma. Evidence also suggests that parental smoking may lead to an increased risk of allergic respiratory diseases.³⁷⁷ For babies, passive smoking is one of the predominant risk factors for sudden infant death syndrome.³⁷⁸

Although rates are generally decreasing, a small percentage of people are still smoking inside the home. In 2010, 10.9% of Queenslanders aged 14 years and older reported that a member of their household had smoked inside the home in the previous 12 months.¹² Exposure to second-hand smoke in the home has declined nationally

Table 18: Proportion of children (0–14 years) living with a daily smoker by Indigenous status, Australia, 2008³⁶⁹

	Indigenous	Non-Indigenous
Current daily smoker in household		
Smokes at home indoors	21.6	6.6
Does not smoke at home indoors	43.2	25.6
No current daily smoker in household	35.2	67.8
Total*	100.0	100.0
* Excludes not stated smoking status		

since 1995, reflecting a continuing decline in the prevalence of smoking as well as an increase in the percentage of smokers confining their smoking to outside the home environment.³⁷³ Queenslanders are increasingly avoiding places where they might be exposed to other people's smoke. In 2010, 71.7% of males and 76.9% of females aged 14 years and older reported avoiding places where they might be exposed to other people's smoke all or some of the time. People of all ages reported avoiding other people's smoke.¹² The highest proportion was among older people (80% of those aged 60 years and older) and the lowest among those aged 20 to 40 years (70%).

Indigenous Australians are much more likely to live in a household with a smoker. In 2008, 68% of Indigenous Australians aged 15 years and older lived in a household with a current daily smoker and 26% lived in a household where someone usually smoked inside.³⁶⁹ Among non-smokers (that is those who were ex-smokers or who had never smoked), 41% lived in a household with a current daily smoker and 15% lived with a person who smoked in the home. While people in remote areas were more likely to live with a current daily smoker (76% compared with 65% in non-remote areas),

the proportion of people exposed to tobacco smoke inside their home was similar (28% compared with 25% in non-remote areas).

Indigenous children in both remote and non-remote areas are also more likely to live in a household with a smoker. In 2008, 65% of Indigenous Australian children aged 0–14 years lived in a household with a current daily smoker (72% in remote areas and 61% in non-remote areas) (Table 18).³⁶⁹ While there has not been any real change in this proportion, fewer children live in households with indoor smokers. In 2008, 22% of Australian Indigenous children 0–14 years, and 16% of infants aged 0–3 years lived in a household with an indoor smoker, down from 29% and 24% respectively in 2004–05. However, Indigenous Australian children were three times as likely as non-Indigenous children to live in a household with a current daily smoker who smoked inside the house (21.6% compared with 6.6%), a reflection of the higher rates of smoking in the Indigenous population overall.

Although the culture is changing and smoking as a risk behaviour is in decline, it is evident that there is an opportunity for further health gain by reducing exposure to second-hand smoke particularly for Indigenous Queenslanders.

High risk groups

The gains in smoking reduction in Australia and indeed in Queensland, are among some of the best in the world. In fact Australia is on the cutting edge internationally in terms of low smoking rates.^{373,375} Despite these gains, there are groups of people within the Queensland population who are at greater risk of harm from tobacco smoke than others. These include pregnant teenage girls, Indigenous Queenslanders, and people living in areas of socioeconomic disadvantage, remote areas and very remote areas. Some of the state and national interventions to reduce smoking rates are described in Chapter 4.

In 2012, smoking rates in disadvantaged populations in Queensland were about double the rates in advantaged populations (18.1% compared with 9.5%).⁴ This relative rate difference has been evident throughout the past decade.⁶⁸ It demonstrates that while the downward decline in smoking is affecting many parts of the population, the socioeconomic gap remains. In 2007, there were about 1,500 premature deaths due to smoking in Queensland (16% of all premature deaths) and about one-third of these were associated with socioeconomic disadvantage. If all areas in Queensland had the same rate of smoking as advantaged areas, in 2007

About 20% of the life expectancy gap between Indigenous and non-Indigenous Australians is likely to be due to tobacco smoking.²²

there would have been about 500 fewer smoking related premature deaths.

Higher rates of smoking in disadvantaged areas of Queensland resulted in more smoking related hospitalisations than would have occurred if the rates across Queensland were the same as those in advantaged areas. In 2007–08 about one-quarter (26.5%) of smoking related hospitalisations were considered excess as a result of socioeconomic differences. That equates to about 10,000 of the 35,700 hospitalisations per year in the two-year period 2006–07 to 2007–08.⁶⁸

Smoking during pregnancy puts unborn babies at higher health risk. The babies of Indigenous women were more likely to be at risk due to higher smoking rates. In 2010, 53% of Indigenous women in Queensland smoked at some time during their pregnancy with only 1 in 7 quitting before 20 weeks gestation. Teenage girls in

general were more likely to smoke during their pregnancy—53% compared with 15% for other women. However, smoking rates for pregnant Indigenous teenage girls and women were similar in 2010 (55% and 53% respectively). As the majority of women (90% in 2010) had been provided with advice about the dangers of smoking during the second half of pregnancy, making change on this key health issue will require sustained culturally appropriate interventions.

Smoking rates in outer regional and remote areas of Queensland were higher than rates in major cities. Some of these differences will be associated with socioeconomic gradients and also the higher proportion of Indigenous Queenslanders in some areas. The consequence of these rate differences was up to 100 excess deaths due to smoking related conditions and more than 3,000 excess hospitalisations per year.⁶⁶ Analysis in 2010 showed that in recent years there was an increasing trend in the proportion of remoteness-related excess hospitalisations due to smoking—an increase of 3.7% per year over the period between 2001–02 and 2007–08. This implies a widening gap between smoking related hospitalisation rates in major cities and the rest of the state, although it was not matched by change in excess deaths.⁶⁸

Indigenous Queenslanders have substantially higher smoking rates than non-Indigenous Queenslanders. Noting limited data for comparison, Indigenous smoking rates were about double in Queensland with no evidence of a narrowing gap nationally. The COAG National Partnership Agreement on Closing the Gap in Indigenous Health Outcomes has a priority to tackle smoking with expected outcomes a reduction in the smoking rate and a reduction in the burden of tobacco related disease.³⁷⁹ Initiatives to achieve smoking reduction include social marketing campaigns, culturally appropriate quit support services which include nicotine replacement therapy, targeted programs and tobacco control initiatives including legislation and enforcement. Some current Queensland investments through the Making Tracks policy and accountability framework¹⁴⁴ are featured in Chapter 4.

What are the benefits of giving up smoking?

Giving up smoking has immediate as well as long term benefits. The benefits are a reduced risk of smoking related disease and improved overall health and quality of life.

Within the first year of quitting

Carbon monoxide levels in blood reduce. Circulation and lung function improve. Coughing and shortness of breath decrease. Risk of coronary heart disease is half that of a continuing smoker.

After 5 years

Stroke risk reduces to that of a non-smoker 5 to 15 years after quitting. Risk of smoking related cancer decreases.

After 10 years

Risk of lung cancer death reduces to about half that of a continuing smoker and keeps on declining. Risk of cancer of the bladder, kidney and pancreas decreases.

After 15 years

Risk of coronary heart disease is the same as for a non-smoker. Risk of death in ex-smokers declines to the same level as for people who have never smoked.

Other benefits

- Savings of about \$5,000 per year for a pack-a-day smoker
- Improved sense of taste and smell
- Smoking related skin damage ceases
- Fewer sick days
- More energy and improved level of fitness

Low risk drinking

Alcohol is widely used in Australian society. It is a source of pleasure and is associated with celebration and relaxation, but also with a range of problems that affect individuals, families and society. Most people who drink alcohol do so at levels which pose little risk to their health. Drinking at risky levels over a lifetime can result in cardiovascular disease, diabetes and cancers, while risky consumption on a single occasion can lead to road traffic injuries, violence, falls and drowning.

Governments recognise the costs associated with harmful alcohol consumption and the Australian Government, through the NHMRC, has set national guidelines to reduce health risks from drinking alcohol.⁶ For this section, the 2009 guidelines have been used to assess the level of risky drinking in Queensland.

Current prevalence and differentials

The majority (94%) of Queenslanders aged 14 years and older have consumed a full serve of alcohol at some time in their life (Table 20). In 2010, based on questions about the volume and frequency of alcohol consumed in the previous 12 months, 8.3% were classified as daily drinkers, 40.6% were weekly drinkers, 34.3% were drinking less than weekly, 7.5% were ex-drinkers, while 9.3% had never had a full drink of alcohol.¹⁷

The 2009 NHMRC Guideline 1 (box) recommends no more than two standard drinks on each drinking occasion, even if the drinking is daily, to reduce the risk of alcohol related harm over a lifetime. In 2012, 21.1% of adult Queenslanders were drinking at levels that put them at risk over a lifetime (Table 19).⁴

Males and young people had higher rates of lifetime risky drinking.⁴ One-third of Queensland males were drinking on average more than two drinks a day (32.0%) whereas 1 in 10 Queensland females were drinking at this level (10.5%) in 2012. Rates of lifetime risky drinking were higher among younger people—28% of those aged 18–24 years—compared with less than 20% of those aged 55 years and older. Rates were about 30% higher in outer regional and remote areas compared with major cities and inner regional areas, but did not differ by socioeconomic status.

Lifetime risky drinkers were more likely to be smokers. Adult smokers were more likely (double the odds) to also be drinking at levels that put them at harm over a lifetime

compared with non-smokers in 2011.⁶⁹ Similar relationships were evident for single occasion risky drinkers.

Guideline 2 recommends that to reduce the risk of injury, no more than four standard drinks should be consumed on a single occasion. In 2012, 15.3% of adult Queenslanders were consuming more than four drinks on a single occasion at least weekly and 35.5% were drinking at this level less often than weekly but at least once a year (Table 19).⁴

Males and young people have higher rates of single occasion risky drinking. About 1 in 4 males consumed more than four drinks on a single occasion every week (23.6%) compared to 1 in 12 females (7.2%) in 2012 (Table 19).⁴ Single occasion risky drinking was about 30% higher in remote and outer regional areas than cities but there was no difference by socioeconomic status.

About 1 in 6 Queenslanders aged 14 years and older exceeded both Guideline 1 and Guideline 2 in 2010, that is, they were drinking at both lifetime risk and weekly single occasion risk (Table 20).¹² This drinking pattern could be considered very risky, with national prevalence of 15.9% similar to Queensland (15.7%) in 2010.¹² Overwhelmingly, these riskiest drinkers were

males—3 times as likely as females. Young males aged 18–24 years had the highest levels of this highly risky drinking (about 30%) compared with the same aged females (about 14%), and compared to all older age groups (males and females). There was no difference in rates of riskiest drinking across areas of socioeconomic status or remoteness.

According to Guideline 3 the safest option for children and young people up to 18 years of age is not to drink. Among Queensland teenagers aged 13–17 years in 2010, most had had a full serve of alcohol (64%), only 1 in 3 (36%) had not (Table 20).¹² About 1 in 20 were drinking at levels that put them at risk over a lifetime and a similar proportion were exceeding the adult recommendation of no more than four drinks on a single occasion, and were doing so each week.

While the average age of first full serve of alcohol was 16.9 years (16.3 years for males and 17.6 years for females), many Queenslanders were much younger when they had their first serve of alcohol.¹² In 2010, 1 in 10 Queenslanders (9.8%) said they had their first full serve of alcohol before they turned 14. For 40.5%, their first glass of alcohol was supplied by a friend, 22.3% by a parent, and 13.1% purchased the alcohol themselves.

Australian Guidelines to reduce health risks from drinking alcohol: NHMRC 2009⁶

GUIDELINE 1	Reducing the risk of alcohol related harm over a lifetime
	The lifetime risk of harm from drinking alcohol increases with the amount consumed
	Healthy men and women 2 or less standard drinks on any one day
GUIDELINE 2	Reducing the risk of injury on a single occasion of drinking
	On a single occasion of drinking, the risk of alcohol related injury increases with the amount consumed
	Healthy men and women 4 or less standard drinks on any one occasion
GUIDELINE 3	Children and young people under 18 years of age
	Children under 15 years of age are at greatest risk of harm from drinking
	Young people 15-17 years should delay initiation of drinking as long as possible Not drinking is the safest option
GUIDELINE 4	Pregnancy and breastfeeding
	Maternal alcohol consumption can harm the developing fetus or breastfeeding baby
	For women who are pregnant, are planning a pregnancy, or are breastfeeding Not drinking is the safest option

4 out of 5 pregnant women consumed alcohol during pregnancy.¹⁹

Table 19: Alcohol consumption, adults, percentage (95% CI), Queensland, 2012⁴

	Guideline 1 - Lifetime risk			Guideline 2 - Single occasion risk			Guideline 1 and 2
	Abstainers	Low risk	Risky	Low risk	Risky (at least yearly but not weekly)	Risky (weekly)	Risky/Risky (weekly)
18+ years							
Persons	18.8 (17.9-19.7)	60.1 (58.9-61.3)	21.1 (20.1-22.1)	30.4 (29.3-31.4)	35.5 (34.3-36.8)	15.3 (14.4-16.2)	13.4 (12.6-14.3)
Males	14.5 (13.3-15.8)	53.5 (51.7-55.2)	32.0 (30.4-33.7)	21.7 (20.4-23.0)	40.2 (38.5-42.0)	23.6 (22.1-25.1)	21.4 (20.0-22.9)
Females	22.9 (21.7-24.3)	66.6 (65.0-68.1)	10.5 (9.4-11.7)	38.8 (37.3-40.4)	31.0 (29.4-32.7)	7.2 (6.3-8.4)	5.7 (4.9-6.6)
Persons							
18-24 years	13.8 (10.4-18.0)	58.3 (53.0-63.4)	27.9 (23.5-32.8)	13.8 (10.3-18.2)	47.0 (41.8-52.3)	25.5 (21.2-30.3)	21.3 (17.3-25.8)
25-34 years	16.1 (13.6-18.9)	61.4 (57.8-64.9)	22.5 (19.6-25.7)	19.5 (16.8-22.4)	48.0 (44.4-51.6)	16.5 (13.9-19.3)	14.3 (11.9-17.0)
35-44 years	13.7 (12.0-15.6)	63.9 (61.4-66.3)	22.4 (20.4-24.6)	26.3 (24.2-28.6)	43.4 (41.0-45.9)	16.6 (14.8-18.5)	14.8 (13.1-16.7)
45-54 years	15.2 (13.6-17.0)	61.6 (59.2-63.8)	23.3 (21.3-25.3)	32.4 (30.2-34.7)	35.6 (33.4-37.9)	16.8 (15.1-18.7)	15.0 (13.3-16.8)
55-64 years	19.7 (18.0-21.5)	60.5 (58.3-62.5)	19.8 (18.2-21.6)	40.4 (38.3-42.5)	27.3 (25.4-29.3)	12.6 (11.3-14.0)	11.4 (10.1-12.7)
65-74 years	28.5 (26.5-30.5)	56.1 (53.9-58.3)	15.4 (13.9-17.1)	47.9 (45.7-50.1)	15.3 (13.8-17.0)	8.4 (7.3-9.6)	8.0 (6.9-9.2)
75+ years	41.5 (38.7-44.3)	51.0 (48.2-53.9)	7.5 (6.2-9.0)	46.8 (43.9-49.6)	8.5 (7.1-10.2)	3.2 (2.5-4.2)	2.9 (2.2-3.7)
Males							
18-24 years	15.2 (10.4-21.5)	46.6 (39.7-53.7)	38.2 (31.7-45.2)	8.3 (5.1-13.1)	44.6 (37.8-51.6)	32.0 (25.8-38.9)	28.9 (23.0-35.7)
25-34 years	12.4 (9.0-16.9)	53.2 (47.7-58.7)	34.3 (29.4-39.6)	10.8 (7.7-15.0)	52.3 (46.7-57.8)	24.5 (20.2-29.3)	22.4 (18.2-27.2)
35-44 years	9.5 (7.5-12.0)	55.7 (52.0-59.4)	34.8 (31.4-38.4)	18.6 (15.9-21.6)	45.1 (41.4-48.7)	26.9 (23.8-30.3)	24.7 (21.6-28.0)
45-54 years	11.9 (9.8-14.3)	53.8 (50.4-57.1)	34.3 (31.2-37.6)	20.6 (18.0-23.5)	40.5 (37.3-43.9)	27.0 (24.1-30.1)	24.2 (21.4-27.3)
55-64 years	15.8 (13.8-18.1)	54.3 (51.2-57.3)	29.9 (27.2-32.8)	28.2 (25.5-31.0)	35.5 (32.6-38.6)	20.5 (18.2-23.0)	18.5 (16.3-20.9)
65-74 years	19.8 (17.5-22.3)	54.9 (51.8-58.0)	25.3 (22.7-28.1)	41.5 (38.4-44.6)	24.1 (21.4-26.9)	14.7 (12.7-16.9)	14.0 (12.1-16.2)
75+ years	30.9 (27.3-34.6)	55.1 (51.2-59.1)	14.0 (11.6-16.8)	45.3 (41.3-49.3)	17.4 (14.5-20.8)	6.4 (4.9-8.4)	5.7 (4.3-7.5)
Females							
18-24 years	12.4 (8.0-18.6)	69.7 (62.0-76.5)	17.9 (12.6-24.8)	19.2 (13.4-26.6)	49.3 (41.5-57.2)	19.1 (13.6-26.2)	13.8 (9.3-20.1)
25-34 years	19.7 (16.3-23.5)	69.7 (65.3-73.8)	10.6 (8.0-14.0)	28.2 (24.2-32.5)	43.7 (39.1-48.4)	8.4 (6.1-11.6)	6.1 (4.2-8.8)
35-44 years	17.8 (15.2-20.7)	71.9 (68.8-74.9)	10.3 (8.5-12.4)	33.9 (30.8-37.3)	41.8 (38.5-45.3)	6.4 (5.0-8.3)	5.1 (3.9-6.8)
45-54 years	18.4 (16.0-21.1)	69.2 (66.1-72.2)	12.4 (10.4-14.7)	44.1 (40.8-47.4)	30.8 (27.8-33.9)	6.8 (5.3-8.6)	5.9 (4.5-7.6)
55-64 years	23.5 (21.0-26.2)	66.6 (63.7-69.4)	9.9 (8.2-11.8)	52.6 (49.5-55.6)	19.2 (16.9-21.7)	4.7 (3.6-6.1)	4.3 (3.3-5.7)
65-74 years	37.2 (34.2-40.3)	57.3 (54.1-60.3)	5.6 (4.2-7.3)	54.3 (51.2-57.4)	6.5 (5.2-8.2)	2.0 (1.3-3.1)	1.8 (1.1-2.9)
75+ years	49.4 (45.5-53.4)	47.9 (44.0-51.9)	*2.6 (1.5-4.5)	47.9 (43.9-51.9)	*1.8 (1.1-3.2)	*0.9 (0.4-1.8)	*0.7 (0.3-1.6)
Socioeconomic status							
Disadvantaged	24.3 (22.5-26.2)	53.7 (51.5-55.9)	21.9 (20.1-23.9)	28.6 (26.8-30.4)	31.4 (29.3-33.6)	15.7 (14.1-17.6)	14.1 (12.5-15.9)
Quintile 2	20.5 (18.6-22.6)	59.1 (56.6-61.5)	20.4 (18.5-22.5)	30.5 (28.3-32.7)	33.5 (31.1-36.1)	15.5 (13.7-17.4)	13.7 (12.0-15.6)
Quintile 3	16.5 (14.8-18.4)	60.1 (57.5-62.5)	23.4 (21.3-25.7)	29.1 (27.0-31.3)	37.3 (34.8-40.0)	17.0 (15.1-19.2)	15.4 (13.6-17.5)
Quintile 4	17.2 (15.1-19.5)	62.7 (59.7-65.5)	20.1 (17.8-22.8)	32.0 (29.4-34.8)	36.0 (33.1-39.0)	14.7 (12.6-17.2)	12.4 (10.4-14.7)
Advantaged	16.3 (14.2-18.6)	64.1 (61.1-66.9)	19.6 (17.3-22.2)	31.5 (29.0-34.1)	38.6 (35.7-41.7)	13.6 (11.5-16.0)	11.8 (9.9-14.0)
Remoteness							
Major cities	18.6 (17.3-20.0)	61.8 (60.0-63.5)	19.6 (18.2-21.1)	31.1 (29.6-32.7)	36.0 (34.3-37.8)	14.3 (13.0-15.7)	12.3 (11.1-13.6)
Inner regional	18.6 (17.0-20.2)	60.7 (58.5-62.9)	20.7 (18.9-22.7)	32.5 (30.5-34.5)	34.7 (32.4-37.1)	14.3 (12.6-16.0)	13.0 (11.5-14.8)
Outer regional	19.4 (17.6-21.3)	55.3 (52.7-57.8)	25.4 (23.1-27.8)	27.3 (25.2-29.5)	33.8 (31.4-36.3)	19.5 (17.4-21.9)	17.4 (15.3-19.7)
Remote	19.1 (16.8-21.8)	54.8 (51.6-58.0)	26.1 (23.3-29.0)	22.3 (20.2-24.6)	41.1 (37.9-44.4)	17.4 (15.3-19.8)	15.1 (13.2-17.3)
Very remote	22.0 (19.5-24.7)	51.5 (48.3-54.8)	26.5 (23.7-29.5)	23.0 (20.5-25.7)	37.3 (34.1-40.6)	17.8 (15.5-20.3)	16.9 (14.6-19.3)

* Estimate has a relative standard error of 25% to 50% and should be used with caution.

Guideline 4 recommends not drinking alcohol during pregnancy or while breastfeeding. An Australian women's longitudinal study found that only 20% of women fully abstained from alcohol during their pregnancy.¹⁹ The majority (60%) consumed between one and two drinks a day on average and the remaining 20% were consuming more. The proportion who abstained increased with each trimester of the pregnancy.

Rates of risky drinking were higher in Queensland than most other states in

2010. The rate of lifetime risky drinking in Queensland was 15% higher than the national rate and second highest of the states and territories after the Northern Territory.¹⁷ Rates for single occasion risky drinking were 13% higher in Queensland than the national rate and second highest after the Northern Territory. This was similar for males and females for both lifetime and single occasion risk.

It is estimated that the prevalence of harmful alcohol use among Indigenous Australians

is about twice that in the non-Indigenous population.³⁶⁰ Around 1 in 6 Indigenous people aged 15 years and older (17%) drank alcohol at chronic risky or high risk levels in 2008, similar to the rate reported in 2002 (15%).³⁶⁹ This estimate is supported by data on the prevalence of health problems known to be caused by alcohol. However, the proportion of Indigenous Australians who abstain from alcohol is higher than the non-Indigenous population.³⁶⁸

No gains have been made in risky drinking for long term harm in the past decade in Queensland.

Table 20: Alcohol consumption, teenagers and adults, percentage (95% CI), Queensland, 2010¹²

	14+ years	13-17 years	18-24 years
Ever tried alcohol	94.1 (93.3-94.8)	64.4 (57.6-71.1)	98.2 (96.2-99.2)
Abstainer	16.8 (15.7-18.0)	55.3 (49.3-61.2)	9.1 (6.6-12.5)
Lifetime risk	23.2 (22.0-24.6)	5.3 (3.2-8.7)	36.2 (31.2-41.5)
Single occasion risk - weekly	18.1 (16.9-19.4)	5.5 (3.4-9.0)	32.9 (28.1-38.1)
Lifetime risk and single occasion risk weekly	15.7 (14.6-16.9)	4.2 (2.4-7.4)	29.6 (24.9-34.8)

* Estimate has a relative standard error of 25% to 50% and should be used with caution.

Information on alcohol consumption in culturally and linguistically diverse populations is limited. Recognising this limitation, in 2007–08 risky or high risk consumption was generally lower for those who do not speak English at home compared to those who do and for those born outside Australia compared to the Australian born.²¹ However, some regional differences were noted: for those born in other Oceania (including New Zealand), rates of risky drinking were higher, while for those born in other areas of the world the rates were similar to or lower than the Australian born population.

Trends

There has been little change in drinking patterns in Queensland for more than a decade. In 2012 in Queensland, about 11% of the population were drinking at levels that posed long term risk to their health and this has remained unchanged since 2004 (Figure 38), for males and females alike. The assessment of trend is based on the 2001 NHMRC guidelines, noting the change in definition of risky drinking levels in the 2009 guidelines. The average age of first full serve of alcohol remained steady in Queensland and nationally between 1995 and 2010 at around 17 years.¹⁷

However, between 2007 and 2010 there was a national decrease in the proportion of daily drinkers. There was also a decrease in Western Australia and the Northern Territory, but a non-significant decline in all other jurisdictions except for Queensland which remained unchanged.¹⁷

Potential for change

Reducing the prevalence of harmful alcohol consumption for the benefit of all Queenslanders requires the implementation of multiple strategies at the individual,

community, state and national level over time. It is important to directly support the behaviour change of high risk groups, but equally important to encourage low risk drinking in the broader adult population given the influence of these behaviours and the drinking culture on children and adolescents. Ultimately, opportunities for change lie in strategies that encourage delay and reduction in consumption and in changing social norms around risky drinking. Consuming alcohol in ways that cause harm to self and others should no longer be a socially acceptable way to drink.

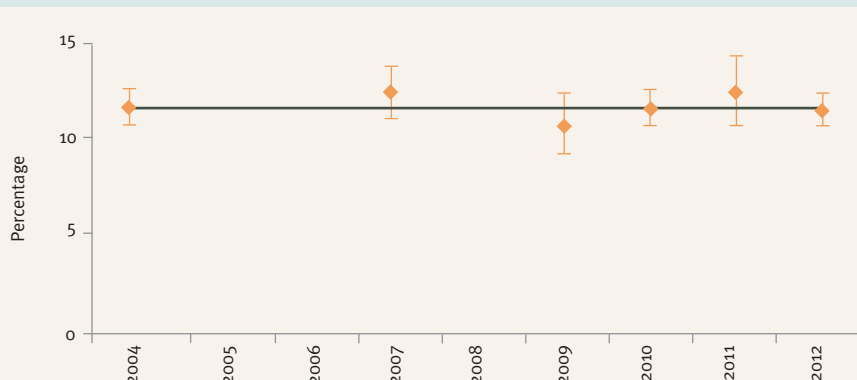
This section describes the social, health and economic costs of alcohol which clearly motivate the government and the community to reduce risky consumption. It also includes a description of the drinking patterns and habits of Queenslanders as a way to better understand the attitudes, beliefs and drinking behaviours that need to be changed and identify opportunities to do so. Finally, the evidence for a range of strategies aimed at reducing harmful alcohol consumption is summarised.

Health, social and economic costs

The health impact of harmful alcohol consumption is widely recognised. At the most extreme, risky drinking results in death either through its direct impact, or through injury as a result of reduced mental and cognitive function. Alcohol is known to be directly associated with alcoholic liver cirrhosis which kills about 160 Queenslanders each year.⁶⁴ It is associated with haemorrhagic stroke, colon cancer, breast cancer in females, as well as suicide and road traffic deaths. About 30,000 hospitalisations each year are associated with harmful alcohol consumption, and about 2.5% of emergency department presentations in Queensland, principally for mental and behavioural disorders related to intoxication.³⁸¹ The number of these presentations increases by evening and rises to peak levels on Friday and Saturday nights. Overall, excessive alcohol consumption accounted for 19% of the total injury burden in Queensland in 2007.⁸⁸

Alcohol use during pregnancy has been linked with a number of adverse outcomes including miscarriage, premature birth, stillbirth and low birth weight.³⁸² Alcohol exposure *in utero* can also cause a range of abnormalities in the unborn child which are broadly described as fetal alcohol spectrum disorders. Fetal alcohol syndrome is at the severe end of these disorders, which also include alcohol related birth defects and neurodevelopmental disorders. The prevalence of the spectrum of disorders is unknown in Australia, although there is preliminary evidence that the rate of fetal alcohol syndrome in Indigenous Australians is at least 100 times higher than non-Indigenous rates.³⁸³ As awareness of the spectrum of disorders is increasing, the social impact on carers, families and the community is becoming more evident.

Figure 38: Risky alcohol consumption (2001 NHMRC guidelines long term risk), adults, percentage (95% CI), Queensland



Harmful alcohol consumption is a contributing factor in a wide range of social problems, including violence, social disorder, family breakdown, child neglect, loss or diversion of income for the purchase of alcohol and other intoxicating substances, as well as higher levels of imprisonment.^{380,384} The social and productivity impacts of alcohol are between 7 and 8 times higher than those of the health system based on economic assessments.⁹

The total economic impact of harmful alcohol consumption in Australia was estimated to be \$15.318 billion in 2004–05 (page 66). The impact on the health system nationally was estimated at \$1.976 billion (13% of total), and in Queensland (\$0.38 billion) assuming a population proportional share of national.^{9,66} The greatest proportion of total costs is associated with reduced employment, lost productivity, and the net effect on households due to premature death and illness. This also includes law enforcement costs associated with alcohol related crime, such as police, criminal courts and prisons. The combination of these tangible impacts cost Australian society \$10.829 billion (57% of total). However, the full impact of alcohol is seen not just in tangible costs, but also in the pain and suffering associated with loss of life particularly as a result of road traffic injuries. Such impacts were assessed to be about \$4.489 billion (30% of total) nationally.

Attitudes, beliefs and behaviours

Typically, young people have their first full serve of alcohol by 16.9 years. The majority of Queensland teenagers and young people had consumed a full serve of alcohol in the previous 12 months (65% of those aged 13–17 years and 98% aged 18–24 years in 2010) (Table 20).^{12,277} Although the majority were either abstainers or drinking at low risk levels, about 1 in 20 teenagers and 1 in 3 young people were consuming more than two drinks a day on average, putting them at risk of harm over their lifetime. One in 20 teenagers and 1 in 3 young people were drinking more than four drinks on a single occasion every week, putting them at high risk of injury. Young people

The social and productivity impacts of alcohol are between 7 and 8 times higher than on the health system based on economic assessments.⁹

aged 18–24 years had higher rates of risky drinking than any other age group and young males more so than young females. Rates of risky drinking diminished with age. Levels of abstinence increased with age.

Most Queenslanders describe themselves as social or light drinkers—71% in 2010.¹² They usually drink in their own home (83%), at a friend's house (42%), at a party (39%), while eating out (38%), or at a club or pub (40%). They buy alcohol themselves (89%). Most consider they have good control of their drinking, with 79% never failing to do what was normally expected of them as a result of alcohol consumption. Similarly, the majority reported no guilt or remorse due to their drinking (74%) and that their drinking had not caused concern to relatives, friends or healthcare workers (89%). Furthermore, most Queenslanders did not consider their current drinking pattern to be harmful with 31% considering it to be somewhat or very beneficial and an additional 50% considering it to be neither beneficial nor harmful.

About half had not changed their drinking behaviour in the previous 12 months (49%), while about one-third had reduced the amount they drank at any one time (32%) or had reduced the number of occasions of drinking (29%).¹² Of those who had tried to cut down, the most common reasons for doing so were health, lifestyle or social. Relatively few had cut down because of drink-driving regulations, for financial or price pressures, or because of parent or peer pressure, with less than 15% nominating each of these reasons.

Queenslanders have limited understanding and knowledge of the NHMRC guidelines. In 2010, while most (88%) had heard of a 'standard' drink and 90% thought that the number of standard drinks was shown on cans and bottles, 45% did not know how many daily standard drinks could be

consumed in a six-hour period without adversely affecting their health.¹² About one-third or less correctly identified the recommended maximum daily number of drinks for males to avoid lifetime risk and single occasion risk (37% and 20% respectively). About 48% correctly identified the number of drinks females could consume to avoid lifetime risk and 31% correctly identified the number of drinks on a single occasion.

With regard to strategies to reduce harmful alcohol consumption and alcohol-related harm, there is currently varying public support. About 4 of 5 Queenslanders support more severe legal penalties for drink-driving (84%) and 82% support stricter enforcement of the law against serving customers who are already drunk while 76% support strict monitoring of late night licensed premises.¹² Over 50% support policies such as serving only low alcohol drinks at sporting events, increasing the number of alcohol-free zones, restricting late night trading of alcohol, limiting advertising of alcohol until later in the evening, increasing the size of standard drink labels on alcohol containers, and requiring information on national guidelines to be displayed on containers. There was less support for reducing trading hours for pubs and clubs (46%), banning alcohol sponsorship of sporting events (43%), increasing the tax on alcohol (37%), or reducing the number of outlets that sell alcohol (30%). Increasing the price of alcohol had the lowest level of support, with 24% or 1 in 4 people supporting such policies.

5% of Queenslanders consider themselves heavy drinkers, but based on their consumption, 3 times that proportion were drinking at the highest risk levels.¹²

One drink isn't always one standard drink



Given the widespread use and acceptance of alcohol, where are the opportunities for change? An important issue is knowledge of risk. Knowledge of what the guidelines recommend to avoid harm from alcohol is poor, with many people having no knowledge of the guidelines and others with incorrect knowledge. Related to knowledge of risk are perceptions about drinking patterns. In 2010, 1 in 20 Queenslanders aged 14 years and older considered themselves binge or heavy drinkers (5.2%, Table 20). However, about 3 times that number were drinking at the highest risk levels (15.7%) based on their reported consumption—these were the people who were exceeding the NHMRC recommendation of no more than four drinks on a single occasion, and also having on average more than two drinks every day.¹² There is strong support for some policies such as more severe legal penalties for drink-driving, stricter enforcement of laws to restrict sales to those already drunk, and strict monitoring of late night premises. While support was not as strong for other policies such as serving low alcohol drinks at sporting events and increasing the alcohol-free zones, there is enough community support to warrant action.

It is evident that changing the drinking patterns of Queenslanders and particularly those of young people, especially young males, and communicating the necessary awareness and knowledge of the level of risk will be challenging.

Evidence for effective approaches

Preventing the harmful use of alcohol and alcohol related harm is a shared responsibility of all levels of government. The WHO and the National Preventative Health Taskforce have identified a range of the most effective and evidence based strategies, some of which are discussed below.³⁸⁵⁻³⁸⁷

Pricing and taxation

There is an inverse relationship between the price of alcoholic beverages and the amount of alcohol consumed, that is, as prices increase consumption decreases, for the whole population and for risky drinkers.³⁸⁸ Therefore, adjusting the price through an alcohol tax is a potentially cost effective way to achieve prevention benefits and subsequently reduce the burden of disease and injury due to alcohol consumption.³⁸⁹⁻³⁹¹ The best form of alcohol tax is unclear, with various models proposed including a volumetric tax so that alcohol can be equally taxed across all beverage types, a tax only on ready to drink beverages, the introduction of minimum alcohol pricing and a tiered tax system.^{386,389-391}

Physical availability

Addressing public accessibility and availability of alcohol products requires policy and regulatory strategies. In Queensland, a number of regulatory controls on the sale and supply of alcohol (including licensing and sales to minors) are part of the *Liquor Act 1992*. Research shows that increased trading hours result in increased alcohol consumption and related harms such as more drink-driving accidents and alcohol related violence and injury. There is also strong evidence that links the density of alcohol outlets (retail and licensed venues) with alcohol consumption and alcohol related harm.^{386,387,392} Given these relationships, setting appropriate regulatory limits on trading hours and alcohol outlet density is considered an essential and effective way to reduce risky drinking.

Alcohol marketing

Marketing of alcohol products includes product design, paid advertising through a range of media, point-of-sale, in-venue and other promotions, product placement and

sponsorship of sporting and cultural events. Millions of dollars are spent each year by the alcohol industry in advertising outlets and selling products to consumers. A number of studies have found that alcohol advertising influences young people's alcohol related knowledge, beliefs and intentions, as well as perceptions and social norms.^{386,387,392}

The National Preventative Health Taskforce recommends a phasing out of alcohol marketing in times and places which have high exposure to children and young people, as well as the ongoing monitoring and evaluation of the effectiveness of existing voluntary and self regulatory approaches. The Australian National Preventive Health Agency is managing an innovative sponsorship partnership between the Australian Government and 12 national sporting organisations as an alternative to alcohol sponsorship in sport, to address binge drinking and the influence of alcohol promotion on young Australians. The campaign message 'Be the Influence: Tackling Binge Drinking' will feature on sporting uniforms and at venues and events across Australia.

At the individual and society level, there are significant economic and social benefits associated with decreasing levels of alcohol consumption.^{386,389,390} However, alcohol policy must be modelled and evaluated in social context recognising that alcoholic beverages are used across diverse cultural and social environments³⁸⁸ and that priorities of industry, government and consumers may differ.^{386,391} Therefore, alcohol taxation is likely to be only one of a number of policy approaches to reduce alcohol related harm, including controlling the marketing, supply, distribution and licensing of alcohol, along with a potential ban on price discounts and promotions.^{386,391,393}

Illicit drug use

■ Illicit drug use includes the use of illegal drugs such as cannabis, the non-medical use of pharmaceutical drugs such as pain-killers and tranquillisers, and the misuse of other substances, such as inhalants including petrol, glue and paint.

Not all drugs are illegal—tobacco and alcohol are described as licit drugs. Tranquillisers and pain-killers are not illegal, however, it is their illicit use that is included in the risk factor of illicit drug use. Data in this section is derived from the National Drug Strategy Household Survey, which included questions on prevalence, attitudes and behaviours related to 15 illicit drugs (page 8).¹⁷

Illegal drugs are defined as those that are prohibited from manufacture, sale or possession—these include cannabis, cocaine, heroin and amphetamine type stimulants (ecstasy, meth/amphetamines).³⁸⁴ Pharmaceutical drugs are defined as those that are available from pharmacies (over-the-counter or by prescription), which may be subject to misuse—such as opioid based pain relief medications, opioid substitution therapies, benzodiazepines, over-the-counter codeine and steroids.

Considering both illicit and licit drug use, alcohol was the most commonly used drug in 2010 when about 3 million Queenslanders aged 14 years and older reported having consumed a full serve of alcohol in the previous 12 months. Tobacco was next with about 700,000 people reporting smoking a full cigarette. The use of any illicit drug was reported by 550,000 people, where the majority reported using cannabis (400,000).

Illicit drug use was responsible for 1.8% of the total burden of disease and injury in 2007 in Queensland, in contrast to 7.2% for tobacco smoking and 2.7% (net) for alcohol.⁸⁸

Current prevalence and differentials

■ In 2010, 15.1% of Queenslanders aged 14 years and older reported illicit drug use in the previous 12 months, although about 3 times that number reported illicit drug use over their lifetime.¹⁷ One in 12 (8%) nationally had used an illicit drug in the previous month and 1 in 20 (5.5%) in the previous week.

Cannabis was the most commonly used illicit drug in the previous 12 months (11% of persons 14 years and older), followed by the use of pain killers (3.1%), ecstasy (2.7%), meth/amphetamines (1.9%), tranquillisers (1.4%), hallucinogens (1.4%) and cocaine (1.3%).¹⁷ Less than 1% used other illicit drugs.

Illicit drug use was higher among males than females—reported use in a lifetime by males was 18% higher than females nationally in 2010, use in the previous 12 months was 39% higher, use in the previous month was 55% higher and use in the previous week was 69% higher.¹⁷

Younger people were more likely to have reported recent illicit drug use than those in older age groups. The highest use in the previous 12 months was among 18–19 year olds and 20–29 year olds (25% and 28% respectively), while highest use in the previous month and in the previous week was among 18–19 year olds (16% and 10% respectively).¹⁷

Among the states and territories, recent use (defined as use in the previous 12 months) in Queensland was third highest in 2010 after Northern Territory and Western Australia, and similar to national reported use (15.1% among those aged 12 years and older in Queensland compared with 14.7% nationally).¹⁷ Queensland male use was fourth highest and this was similar for Queensland females.

The average age of first use of any illicit drug (age of initiation) was around 19 years, several years older than the first full cigarette smoked (16 years) or when the first full serve of alcohol was consumed (17 years), among persons 14 years and older in 2010.¹⁷ First illicit use of pharmaceutical drugs was at age 23.7 years nationally while cannabis was 18.5 years, ecstasy was 22.2 years and cocaine was 23.3 years.

The majority of those who used cannabis in the previous 12 months did not use any other illicit drug (61% nationally in 2010 among illicit drug users aged 14 years and older). Similarly, 62% of those who used pharmaceutical drugs for non-medical purposes did not use any other illicit drug.¹⁷ For those who reported using ecstasy, cocaine, heroin, hallucinogens and meth/amphetamines, almost all were using more than one drug (at least 90% were concurrent drug users), while for inhalant users relatively fewer (75%) were using other drugs concurrently.

Trends

■ There has been a general decline in recent illicit drug use in Queensland and nationally since 1998. However, between the two most recent data collections of 2007 and 2010, there was an increase in recent use in Queensland, consistent with national reporting.

In 1998, 21.5% of Queenslanders aged 14 years and older reported recent illicit drug use, while in 2010, 15.1% did so.¹⁷ Queensland has moved from being the second lowest jurisdiction for reported recent use in 1998 to third highest in 2010.

Nationally, the age of first use of illicit drugs has changed very little since 1995—18.9 years in 1995 and 19 years in 2010. However, excluding the non-medical use of pharmaceuticals, there has been a small decline in the age of first use of all other illicit drugs since 1995 (from 19 years to 18.6 years in 2010). This is because the non-medical use of pharmaceuticals has generally increased over the past decade, and first use of such drugs tends to be at slightly older ages.

The pattern of drug use in Australia has changed. Over the past decade, the recent use of cannabis has declined. Use of cocaine, hallucinogens and inhalants increased between 2007 and 2010. In the longer term, use of cocaine has doubled since 1995 nationally, and there has been increased use in Queensland.

Potential for change

The use of alcohol, tobacco and other drugs is common in Australia. Nearly all young people are exposed to these drugs in some way, whether through peers, the media, or family members. However, only a small proportion of people develop a serious problem with drugs.

The use of illicit drugs in society, their direct impact on individuals and families as well as crime related consequences are of concern to governments and the community. The National Drug Strategy 2010–2015 provides a national framework for action to minimise the harms to individuals, families and communities from alcohol, tobacco and other drugs.³⁸⁴ At the heart of the framework are the three pillars of demand reduction, supply reduction and harm reduction, which are applied together to minimise harm. Prevention is an integral theme across the pillars.

The economic impact of illicit drug use on society

Illicit drug use was estimated to cost the Australian society \$8.19 billion in 2004–05, about half the cost of alcohol (\$15.3 billion) and about one-third the cost of tobacco (\$31.5 billion).⁹ The majority, \$6.915 billion or 84% of total, was associated with tangible costs related to healthcare, labour and productivity losses and crime, and 16% or \$1.275 billion in intangible costs such as pain and suffering and loss of life (page 66). Healthcare costs include medical, hospital, nursing homes and pharmaceuticals with a net cost nationally of \$0.2 billion in 2004–05.⁹ An estimate of economic impact

for Queensland has not been undertaken and using the population proportion approximation method to assess the potential impact, it is estimated that illicit drug use cost the Queensland society \$1.6 billion in 2004–05, and of this an estimated \$39 million was spent on healthcare.

Healthcare costs associated with illicit drug use are a relatively small proportion of all tangible costs. In 2004–05, costs outside the health system were 33 times higher than costs inside the system. This was similar for tobacco (about 38 times higher outside the system) while for alcohol, costs outside the system were about 5 times higher.

The social impact of illicit drug use is evident in crime and productivity losses. Of the \$6.915 billion in tangible costs due to illicit drug use in Australia, 56% was associated with crime, 30% with reduced labour and productivity, while only 3% was spent on healthcare.⁹ In contrast, for alcohol the major tangible impacts relate first to labour and productivity losses, followed by road accidents, and then healthcare. For tobacco, the majority of the tangible costs are associated with loss of production and labour as a result of premature death due to smoking tobacco.

Attitudes, behaviours and perceptions

Use of illicit drugs over a lifetime is not uncommon in Australia, with about 40% of those aged 14 years and older reporting use at some time in their life.¹⁷ However, less than a third of these, about 15% of the population aged 14 years and older, had used illicit drugs in the previous 12 months.

Access to drugs and the subsequent use of drugs varies by type of drug offered and age group. Young people were more likely to use some drugs than others, when offered the opportunity to do so. About half of those aged 12–17 years accepted cannabis when offered it, compared with 73% accepting an offer of alcohol, while only 13% accepted an offer of tobacco. About 1 in 5 people reported access to cannabis, with higher rates among those aged 20–29 years, and 1 in 3 reported an opportunity to use it.¹⁷ Generally, higher uptake of offer was evident across many illicit drugs for those aged less than 40 years, compared with those in older age groups.

Public perceptions about drug use do not always reflect the actual prevalence. In 2010, the drug that was perceived to cause the greatest concern to Australians was excessive alcohol consumption (42%), followed by tobacco smoking (15%) and heroin use (11%).¹⁷ Concern about heroin and hallucinogens has increased in recent years, while concern about alcohol, tobacco and cannabis has decreased slightly. There has been a slight increase in approval of cannabis for regular use by adults, and also the regular use of hallucinogens.

Ongoing information and education is required to ensure the community is aware of the risks associated with illicit drug use and that strategies are supported to strengthen the prevention and harm minimisation agenda of the National Drug Strategy 2010–2015.³⁸⁴

Promoting mental health and wellbeing

The definition of mental health often used within Queensland Health is ‘a state of wellbeing in which the individual realises his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community’.⁷⁷ Core components of positive mental health include feelings of happiness and satisfaction with life (emotional wellbeing), positive individual functioning in terms of self-realisation (psychological wellbeing), and positive societal functioning in terms of being of social value (social wellbeing).³⁹⁴ Domains such as these are included in the Chief Health Officer report for the first time along with measures of social health of the community. It is recognised that while these measures provide insight they do not fully capture this complex concept.

Mental health has traditionally been reported as a negative concept largely because many of the data sources in the past have relied on measures of illness. However, this limitation is not just associated with data sources—in 2008 about 80% of adult Queenslanders perceived a negative or illness association with the term ‘mental health’.³⁹⁵ This negativity may well reflect the sense of stigma associated with mental illness in the community.³⁹⁶ In fact mental health and mental illness are related but distinct dimensions.³⁹⁷ The absence of mental illness is not a criterion for measuring mental health or wellbeing. For example, in a study of Dutch adults which assessed mental illness and mental health in the same population, older adults had fewer mental illness problems but were not in a more positive mental health state than younger adults.³⁹⁷

Mental wellbeing is associated with benefits to health, family, work and economic status.³⁹⁴ For example, positive emotions and attitudes are associated with lower morbidity, decreased symptoms of ill health and pain, and increased longevity among older people.³⁹⁸ Those with higher levels of wellbeing are healthier, more successful at work, have more fulfilling relationships and are more likely to contribute to their communities.³⁹⁹ Nations with high levels of wellbeing have greater civic engagement and stability, more equality and better records of civil liberty than others.⁴⁰⁰ The promotion of mental health as a factor for enhancing overall wellbeing and strengthening resilience in the Queensland population is an integral component of health promotion investments.⁴⁰¹

Three new measures to more fully capture an understanding of mental health and wellbeing in the population have been introduced (page 40). The Warwick Edinburgh Mental Well-Being Scale (WEMWBS) includes life satisfaction and happiness, as well as meaning in life and psychological needs.⁴⁰² The EQ-5D is an important outcome measure of health status.⁴⁰³ It generates a profile describing health related quality of life according to five dimensions and a utility score for assessing the level of impairment with respect to mobility, self-care, usual activities, pain or discomfort, anxiety and depression. A third measure is sense of control, which research shows is associated with numerous positive outcomes, including good health.⁴⁰⁴ In addition, global measures of self reported quality of life, health and satisfaction with health along with the Kessler 10 measure of risk of psychological distress are also included in this and previous reports.

Social capital is a way of describing the social characteristics of a community and is a valuable factor in creating health in a community.¹¹⁰ Although there are numerous definitions and measures of this concept, in this report, consistent with previous Queensland Health publications^{78,158,405,406}, the Social Capital Index© is used with the following three domains from the short form version:

- generalised reciprocity and cohesion
- community identity
- generalised trust.



Current prevalence and differentials

The majority of adult Queenslanders rated their health as good or very good (83% in 2012), their quality of life as excellent or good (91%), and were satisfied with their health (80%) (Figure 21, page 41).⁴

There is little variation in such ratings by sex and remoteness, although younger people rate their health and quality of life more highly than older people, as do people living in socioeconomically advantaged areas than those in disadvantaged areas.⁴ People with a long term chronic condition, or chronic disease risk factor, tend to report poorer health than those without. For example, in 2007–08, Queensland adults with cancer or cardiovascular disease, diabetes, arthritis or asthma were between 6 and 12 times more likely to report poor health.⁶⁶ In Queensland in 2010, smokers were almost twice as likely as non-smokers to report poor health and those who were overweight or obese were 50% more likely to do so than healthy weight individuals.⁶⁶

In 2011, 83% of adult Queenslanders reported average or above average levels of positive mental health according to the WEMWBS measure of positive mental health (page 40).¹⁵⁸ There was little variation between the sexes or by socioeconomic status or remoteness. However, accounting for these sociodemographic and selected lifestyle factors, rates of above average positive mental health increased with age.⁶⁹

Most adult Queenslanders are able to perform their usual activities without difficulty (85% in 2011), move about (84%), and almost all are able to wash and dress themselves without help (97%).¹⁵⁸ However, pain and discomfort are common among adults with 40% reporting moderate to extreme levels and 1 in 6 reporting moderate to extreme levels of anxiety or depression (16%). When these five factors are converted to a single index score of between 0 and 1, where a score of 1 represents perfect self rated health, lower scores were associated with being older or being severely obese (about 6 times more likely than those in the healthy weight range).⁶⁹

Low or moderate risk of psychological distress was reported by 86% of adult Queenslanders in 2011 while 14% reported high or very high risk.¹⁵⁸ Rates of high or very high risk decreased with age and were about twice as high among those who were insufficiently active, compared to those who were active, and twice as

high among smokers as non-smokers even after accounting for differences due to sociodemographic and selected lifestyle factors.⁶⁹ Being overweight increased the risk of psychological distress by 30%, being obese by 60% and being severely obese doubled the risk, compared with healthy weight adults.

A sense of control of one's life has been measured from time to time in Queensland. In 2011, 92% of adult Queenslanders reported that they had control over the decisions that affected their life.¹⁵⁸ Younger people and females were 4% more likely to report a sense of control than males and older people. Similarly, people who reported healthier behaviours such as not smoking, being of a healthy weight, being physically active and having better fruit and vegetable consumption, were 5–50% more likely to report a sense of control than those who reported equivalent risky behaviours (that is, smoking, overweight and obese, inactive, poorer nutrition).²⁷⁷ In 2005, among Queensland women, the single most important associate of perceived higher health and wellbeing for those aged 18–59 years was a feeling of being in control, followed by their sense of personal susceptibility to health problems.⁴⁰⁷

A general sense of give and take and mutual dependence is a significant feature of community life. Supportive relationships and environments together with reciprocity or mutual action and related characteristics are termed 'generalised reciprocity and cohesion'. In 2011, over 80% of people reported that people in their neighbourhood were willing to help each other.²⁷⁷ People living in regional and remote areas of Queensland reported higher levels of generalised reciprocity and cohesion than those living in major cities and levels increased with remoteness.¹⁵⁸ Similarly, levels were higher among older adults (aged 35 years and older) than younger adults (18–34 years), for both males and females.

Identifying positively with the community is also a powerful aspect of strong communities. It is termed 'community identity' and includes satisfaction with the residential environment and perception of shared values as well as implying safety and security within the community. In 2011, over 90% of adult Queenslanders liked living in their neighbourhood and most did not want to move.²⁷⁷ People living in advantaged areas expressed a stronger sense of community identity than those in disadvantaged areas, as did females and older people compared to males and younger people.¹⁵⁸

Having trust in people in the community facilitates safety and promotes engagement. The term 'generalised trust' includes perceptions of trustworthiness of other people in the community, and a common appreciation of values, norms and roles. In 2011, around 80% of people reported general trust in their community and the people living in it.²⁷⁷ Levels of generalised trust increased with remoteness and with age.¹⁵⁸

International comparisons depend on comparable data collections. In a survey of 150 countries conducted over the period 2005 to 2011, which measured life satisfaction, happiness and wellbeing, Australia was ranked in the top 10% of countries across a number of domains.⁴⁰⁸ About 80% of the inter-country differences were due to differences in material resources, and social and institutional supports for a good life. Comparing the top four countries to the bottom four, average incomes were 40 times higher, healthy life expectancy was 28 years greater, people were more likely to have someone to call on in times of trouble (95% versus 48%) and less likely to perceive widespread corruption in business and government (35% versus 85%).

Trends

Trends in positive mental health are not easily measured partly because data collections are limited. In addition, change in subjective concepts such as these is hard to track and even when there has been change in support services and interventions, a measurable effect is not always evident.¹⁶⁰ For example, in Queensland, no change was evident in levels of psychological distress, self rated health, quality of life and satisfaction with health over the past decade (Table 1, page 4). For social capital there are insufficient data collections to demonstrate change. The evidence suggests that people adjust goals and expectations to maintain over time a relatively stable and positive rating of life satisfaction and happiness.⁴⁰⁹ This is not to say that life events do not affect subjective wellbeing, but that the relationship between the objective and the subjective realms reflects a complex interplay between genes and environment. The impact of the natural disasters in Queensland in the summer of 2010–11 on the mental health and community wellbeing of the population is an example of how communities coped with crisis and this is discussed on page 107.



Potential for change

■ Social and emotional wellness is essential for overall health and wellbeing. It means being able to cope with the normal stresses of life, work productively, achieve personal goals, and contribute to the community. Promotion of behaviours that support good mental health and resilience from an early age such as caring for oneself, connecting with the community and engaging with others are primary prevention, mental health messages in Queensland.⁴⁰¹

Healthy children

The early years in a child's life have consequences for the rest of their life. The quality of a child's earliest environments, even in the period prior to birth, and the availability of appropriate experiences at the right stages of development are crucial in shaping the child's development and their ability to navigate the events of life. The importance of getting a healthy start is discussed in Chapter 6, page 122.

The three foundations necessary for healthy development are: stable and responsive

relationships, safe and supportive environments, and appropriate nutrition.⁴¹⁰ These foundations, in turn, trigger adaptations or disruptions in the body that influence lifelong outcomes in health, learning and behaviour. Emotional wellbeing is a critical part of the social and functional competence that is developed in the first years of life and affects a child's later success in education and in human relationships.

Decades of research have demonstrated the role of attachment in shaping outcomes for children. Early bonding is crucial. For a baby, a major benefit of breastfeeding is that it enhances attachment with the mother. The interdependence between the breastfeeding mother and the infant, along with the regular close interaction and skin-to-skin contact during breastfeeds, encourage mutual responsiveness and attachment.⁴¹¹ Babies held skin-to-skin stay warmer, cry less, and have better-coordinated sucking and swallowing patterns. Mothers who hold their babies skin-to-skin enjoy increased milk production, improved mother-baby bonding, and more confidence in their mothering abilities.⁴¹²

While the need for the mother-baby attachment is widely acknowledged, increasingly, the evidence is building that infants benefit from attachment to multiple caregivers.⁴¹³ Studies have shown that infants have the ability to form multiple attachments and are at lower risk of negative outcomes, as the withdrawal of any one attachment can be buffered by the presence of another.⁴¹⁴ Such caregivers may include fathers, grandparents and other family, professional educators and caregivers.⁴¹⁵

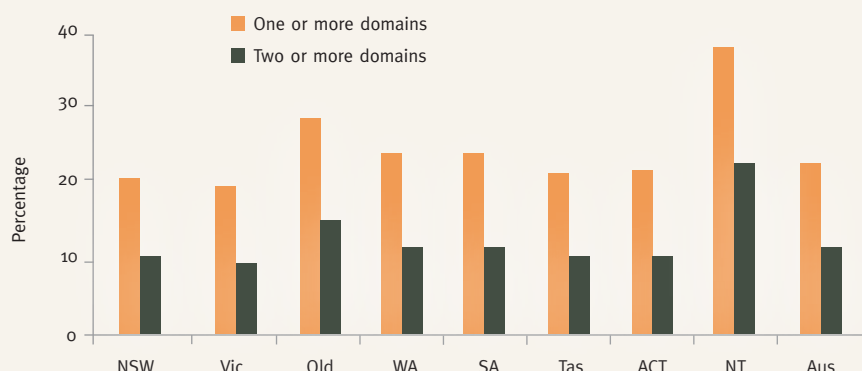
Children's development is significantly influenced by the character of the communities in which they live, learn and play. A key transition point for young children is starting school. By understanding children's development at school entry, parents, teachers and communities can begin to examine ecological or environmental factors that may influence development outcomes.

The Australian Early Development Index provides a measure of children's development at the time they start school. The first nationwide measure was taken in 2009, providing comparable data for children by local community and state.⁴¹⁶ It measures five areas, or domains, that are closely linked to the predictors of good adult health, education and social outcomes:

- physical health and wellbeing
- social competence
- emotional maturity
- language and cognitive skills (school-based)
- communication skills and general knowledge.

In 2009, 30% of children in their first year of school in Queensland were developmentally vulnerable on at least one of the five domains and 16% were vulnerable on at least two domains.⁴¹⁷ Levels of vulnerability were about 25% higher in Queensland than nationally across all domains, with the greatest difference being for language and cognitive skills. All of these domains relate to the development of positive mental health. For example, those children whose emotional maturity is vulnerable are less likely to share or help others and more likely to be anxious or unhappy, to display aggressive behaviour, and to be restless and inattentive.⁴¹⁸ Those with communication vulnerability may have difficulty understanding others, being understood, and being able to participate in games that involve language. They are also likely to have lower general knowledge.

Figure 39: Early childhood development, percentage vulnerable, by state, 2009⁴¹⁷



These results for Queensland show that greater investment is needed to support parents and children in the early years, as a positive long term investment in helping children grow into happy resilient adults. There are likely to be improvements as more children have access to approved kindergarten programs with qualified teachers. Research is showing that the development and overall wellbeing of children require policies that support parents in their role of caregivers, and that parental leave is a fundamental mechanism for doing so, along with family friendly workplaces.⁴¹⁹ Furthermore, in order to develop their potential, young children need secure attachments that are attentive, sensitive and responsive, such as the support that multiple caregivers can provide.⁴¹⁵

Healthy workplaces

Industry is now recognising that stressful work environments, long working hours and low morale can have a negative impact on the social, emotional and physical health of employees.⁴²⁰ In Queensland the Workplaces for Wellness Initiative commenced in 2011

to primarily address the growing burden of chronic disease through reduction of associated risk factors, while also promoting mental wellbeing, within a framework for enhancing productivity (page 61).⁴²¹

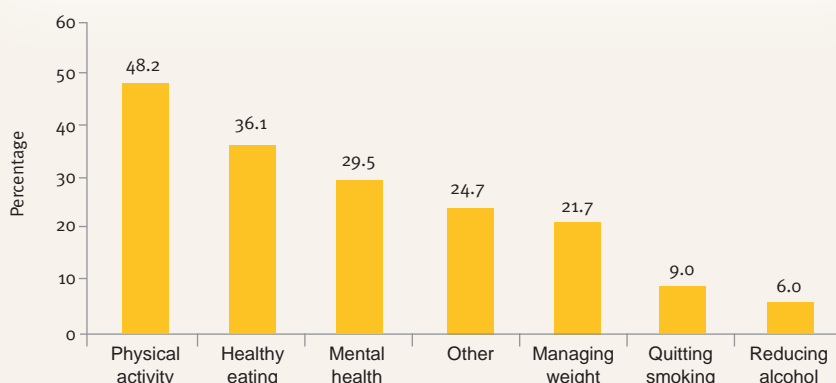
Employers need to make an explicit commitment to enabling social and emotional wellness within the workplace and engaging employees in the effort. Key issues that affect the wellbeing of workers include role clarification, jobs that use the skills and knowledge of workers, human resource policies that are fair, effective and transparent, family friendly work environments and policies, and support for work-life balance. The physical environment has an impact on people's mental and emotional wellbeing and could be designed to increase opportunities for interaction that would benefit the individual as well as the productivity of the workforce.

Employees themselves can improve their health and wellbeing.⁴²¹ They can seek help through the resources offered in the workplace or talk over issues and options with a respected colleague or support service. Work-life balance continues to be a challenge

for many, as it requires more effort to deal with the increasing pressures in many areas of life. Sometimes mental and emotional problems can be relieved by improving nutrition and physical activity and reducing stress. Physical activity has been shown to have a positive effect on both physical and mental wellbeing so opportunities for regular activity need to be included in daily routines despite time pressures.

Workplaces are increasingly developing programs to help their workers address chronic disease risk factors and mental health. Of those employed adults in Queensland who reported a chronic disease related program in their workplace in 2011, 62% reported mental health related programs were available—the second most offered program after physical activity—and of these, about one-third had participated in such programs (30%).²⁷⁷ The importance of mental health issues to the workforce and the wish to seek support is evident in the level of participation in mental health programs (Figure 40).

Figure 40: Participation in workplace wellness initiatives, percentage of employed adults whose workplace offered such programs, Queensland, 2011²⁷⁷



62% of adult Queenslanders were affected by the natural disasters in the summer of 2010–11 in some way.²

Queensland communities coping with disaster

Over the summer of 2010–11, a series of floods hit Queensland, and in January 2011 major flood events occurred in many parts of the state. Later in that month a tropical cyclone devastated the north Queensland coastline.

The floods forced the evacuation of thousands of people from towns and cities with at least 70 towns and many people affected in some way.⁴²² Three-quarters of the state was declared a disaster zone. Communities along the Fitzroy and Burnett rivers were particularly hard hit, while the Condamine, Balonne and Mary rivers recorded substantial flooding. An unexpected flash flood raced through Toowoomba's central business district. Water from the same storm shattered communities in the Lockyer Valley. A few days later thousands of houses in Ipswich and Brisbane were inundated as the Bremer and Brisbane rivers rose.

Severe tropical cyclone Yasi developed from a tropical low north-west of Fiji on 29 January 2011 and started tracking towards the Queensland coastline. It was upgraded to a category 5 cyclone, hitting the coast near Mission Beach early on 3 February, then tracking westwards across northern Queensland where it finally weakened to a tropical low near Mount Isa 20 hours later. It was one of the most powerful cyclones to have affected Queensland since records commenced and caused immense damage to homes and businesses in the coastal towns as well as across the inland regions.

The impact of the floods and the cyclone has been documented widely and measured in many ways, among them, the number of people, households or businesses affected, the number of roads and bridges damaged or destroyed, the effect on GDP, and the number and value of insurance claims. There is no doubt that the tangible costs of the flood and cyclone events were very high.⁴²² The impact on people's wellbeing and mental health is, however, far harder to document. Volunteers were quick to offer assistance and sympathy was expressed from afar, but how did people cope and in the months following the critical period of disaster, how were they feeling and how were they managing?

Statewide representative data on the impact of the floods and cyclone in Queensland was obtained from a survey conducted over a three-month period between early March and early June 2011 in which adults across Queensland were randomly interviewed.²

This showed that 62% of the population were affected in some way, the immediate locality or suburb of more than one-third of Queensland adults was flooded or damaged (37%), one in 10 reported damage or flooding to their home (9.2%), and of these nearly a quarter were forced to move out (23%). Many businesses were directly affected—of those with income producing properties, one in eight (12%) reported damage to the property, and many more reported that their income was reduced as a result of the flood or cyclone (17% of the whole adult population). A total of 15.2% of adults had their own home or income producing property damaged by the disasters.

There was a tremendous community response to the call for assistance in the aftermath of the floods: more than 55,000 volunteers registered to help clean up Brisbane's streets and homes, and thousands more were unregistered volunteers.⁴²² This overwhelming community involvement was a feature of the disaster response, close to 40% of Queensland adults reported having participated in the clean-up in some way—the 'mud army'.² Although the volunteer response involved a wide range of people, males were 30% more likely to have participated than females, and people under the age of 55 were nearly twice as likely to have participated as older people. People living in the most advantaged areas and those living in the most disadvantaged areas of Queensland were more likely to have participated in the clean-up than people from other areas,

a reflection of the higher likelihood of being personally affected by flooding and possibly the capacity to respond. People living in regional areas were also more likely to have participated in clean-up than those in the cities. This was again a reflection of the likelihood of being directly affected as well as the prolonged effect of flooding on regional Queensland compared with Brisbane city where there was a smaller proportion of people directly affected and the flood event was shorter.²

The impact of the flood and cyclone events on the mental health and wellbeing of the population was immense. An assessment of impact using a post-traumatic stress screening instrument⁴²³, showed that 1 in 7 adults felt terrified, helpless or hopeless whether or not their house or business was directly affected by the disasters.^{2,424} One in 25 adults thought they might be badly injured or even die.^{2,425} Such stress was more common in those personally affected—of the 15.2% whose own home or income producing property was damaged, 1 in 3 felt terrified, helpless or hopeless and 1 in 10 thought they might be badly injured or even die. Of those adult Queenslanders who reported being distressed or worried about how they would manage, about three months after the event 16% were still constantly distressed by the events and 36% were still worried most of the time about how they would manage. The pattern of distress and worry was evident across the age range, among males and females equally and was similar across areas of socioeconomic status and remoteness.

40% of adult Queenslanders participated in the clean-up—the 'mud army'.²



Many people throughout Queensland were distressed by the disasters in the summer of 2010–11. As would be expected those people who reported worrying about how they would manage were at greater risk of psychological distress—of those who were worried most or all the time, 49% reported high or very high levels of risk of psychological distress, compared with 12% of the Queensland population who did not report this level of worry.²⁷⁷ Those who participated in the clean-up generally had a better mental health profile than those who did not, whether or not they were flooded, as well as having higher levels of self reported good health, and lower levels of psychological distress. They were also more likely to have higher levels of generalised reciprocity but similar levels

of community identity and generalised trust. The opportunity to help others and the ability and inclination to do so were evidence of generally happier and less distressed people.

Many communities were vulnerable in the face of the floods and cyclone and people suffered terrible losses, in some cases death. However, when asked, people continued to express confidence in the helpfulness of neighbours and the friendships of those nearby, despite the extent of their distress and anxiety about their future.²⁷⁷ People continued to feel attached to their community, liked living there and did not want to move, regardless of the extent of distress and anxiety they experienced. Those whose own home or income earning

property had been flooded reported higher levels of generalised reciprocity and cohesion than those not personally affected, probably a reflection of the recent experience of volunteer help and support among those in their neighbourhood.² The strength of community feeling, attachment to place and neighbourhood as well as the friendship and support of neighbours can be considered important protective factors for the Queensland community during the actual disasters and in the healing process. The impact on personal wellbeing and mental health, however, must remain a focus of investments to aid recovery, particularly as affected communities move through the challenging phases of recovery.⁴²⁶



High blood pressure and cholesterol

■ High blood pressure and high blood cholesterol are modifiable risk factors for cardiovascular disease (CVD).¹⁵¹ In Queensland in 2007, 6% of the burden of disease was due to high blood pressure, and 5% to high blood cholesterol.⁸⁸ A third (37%) of the CVD burden was due to high blood pressure and a third (33%) to cholesterol, where the joint effect of these risks was less than their sum. Of all general practice patient encounters in Australia in 2009–10, 9% included management of high blood pressure and 4% management of lipid disorders such as high cholesterol.⁴²⁷ Over \$50 million was spent in Australia in 2009 on prescribed antihypertensive medications, and over \$1 billion on prescribed lipid-modifying medicines.⁴²⁸

High blood pressure, also termed hypertension, is a major risk factor for coronary heart disease, stroke, and cardiac and renal failure.⁴²⁹ Hypertension is usually due to a combination of lifestyle factors, such as diet (especially high salt), insufficient physical activity, obesity, excessive alcohol¹⁷⁵, and genetics.⁴³⁰ It is often without symptoms, but is easily detected and treatable.⁴³¹ High cholesterol can lead to angina, heart attack and stroke.¹⁷⁵ While the body produces some cholesterol, additional is introduced through consumption of saturated fats.²⁸² Low-density lipoprotein (LDL), or 'bad' cholesterol, is a strong risk factor for coronary heart disease²⁸², while high-density lipoprotein (HDL) or 'good' cholesterol, is protective.¹⁷⁵ Although risk of heart disease increases with blood pressure or total blood cholesterol even at low levels, the risk increases substantially at higher levels.⁴³² The recommended frequency of blood pressure and cholesterol checks is every two years for those at low CVD risk, but more frequent for others.^{430,433}

Data in this section are by self report rather than clinical measurement. The Australian Health Survey 2011–13 will provide prevalence estimates of high blood pressure and cholesterol from direct physical measurement of people, a more accurate method.⁴³⁴ Prior to this survey the most recent clinical measurement for the population was more than 10 years ago.¹⁵⁷

Current prevalence and differentials

■ In 2012, 3 in 10 (29%) adult Queenslanders reported that a doctor or nurse had ever diagnosed them with high blood pressure, with higher prevalence for

females (30%) than males (28%) (Table 21).⁴ High blood pressure increased with age, from 7% in those aged 18–24 years to 60% in those aged 75 years and older. Adults living in the most disadvantaged areas of Queensland were about 40% more likely than those in the most advantaged areas to have been diagnosed with hypertension. Adults living in major cities were about 10% less likely to report high blood pressure than all others.

The prevalence of ever receiving a diagnosis of high blood cholesterol was 29% among Queensland adults in 2012 (Table 21), similar for males and females, and increased with age, but at younger ages for males.⁴ People living in the most disadvantaged areas were 23% more likely than those in the most advantaged areas to report high blood cholesterol. There was no variation by remoteness.

In 2012, 92% reported having their blood pressure measured in the previous two years, and 66% their cholesterol.¹⁴⁹ Two-thirds (66%) of those ever diagnosed were taking medication for high blood pressure, and 53% for cholesterol. A different methodology used in a national survey in 2007–08 showed that Queensland rates did not differ from Australian rates.^{21,241} Similarly, the prevalence of high cholesterol in non-Indigenous and Indigenous Queenslanders did not differ in 2004–05, although the latter were more likely to have high blood pressure.²⁹⁵

Trends

■ Since 2009, there has been no change in the reported prevalence of ever being diagnosed with high blood pressure or high cholesterol, or taking medication for these conditions, among

adult Queenslanders.^{4,155,435} The prevalence of having blood pressure measured in the previous two years increased from 85% in 2006 to 92% in 2012, and cholesterol from 52% to 66%. Substantial declines in CVD mortality have occurred over recent decades in Australia⁴³⁶ and Queensland (Figure 1A, page 2). Nationally, reductions in diastolic blood pressure accounted for 36% of the decline for males and 56% for females.⁴³⁶ Cholesterol reductions were responsible for 22% of the male decline, and 20% of the female decline.

Potential for change

■ The causes of high blood pressure and cholesterol are biomedical factors, lifestyle choices, as well as genetic predisposition. Lifestyle factors include diet, physical activity, smoking and alcohol consumption. Population health interventions, such as reformulation of manufactured food to decrease salt content and, in turn, blood pressure, make individuals' healthy choices easier and can be highly cost-effective.^{437,438} Appropriate assessment of risk of CVD, including knowledge of blood pressure and cholesterol levels, enables patients and primary care health professionals to make well-informed and reasonable decisions regarding CVD risk management.¹⁵¹ Drug therapy may be indicated, but in all cases, lifestyle advice should be provided. There are substantial differences in death rates for coronary heart disease and stroke by socioeconomic status and remoteness, with the disparities more pronounced in premature deaths (pages 34, 36). If a decrease in the incidence and prevalence of high blood pressure and cholesterol can be achieved, CVD risk will be reduced.



At least 40% of Queenslanders aged 55 years and older reported high blood pressure or cholesterol or both in 2012.⁴

Salt reduction in food

High sodium intake raises blood pressure.¹⁰ Salt contains sodium, and for Australians 14 years and over, 460–920 milligrams (mg) of sodium per day is adequate, with an upper limit of 2,300 mg per day (about one-quarter to one teaspoon of salt).⁴³⁹ Recommended intakes are considerably lower for younger children. Sodium consumption in Australia is high, with an average around 2,500 mg per day for those aged 2 years and older—200 mg above the adult maximum.⁴⁴⁰ Average sodium intake for children, especially boys, exceeded upper recommended limits by more than a third in 2007.⁴⁴¹

Reducing the consumption of sodium from processed foods by 25% could avert more than 10% of the burden of disease from stroke and heart attacks in Australia.⁴⁴² About two-thirds of sodium intake from salt comes from breads, meat, poultry and game products, and cereal products.⁴⁴³ The draft Dietary Guidelines for Australians recommend limiting consumption of food and drinks that contain added salt.¹⁰ The Food and Health Dialogue is a joint industry–government–public health initiative to make healthier food choices easier and more accessible, and to address poor dietary habits (Chapter 6, page 128).⁴⁴⁴ To date, the

dialogue has achieved commitment from industry to reformulate foods to reduce sodium in bread products, ready-to-eat breakfast cereals, simmer sauces, processed meats, soups and savoury pies.⁴⁴⁵ However, there is an increasing number of reduced salt and no-added-salt processed foods available in supermarkets. While voluntary limitation of the salt content of processed food by industry is a substantial step in the right direction, mandatory limits are expected to produce far greater health benefit and be more cost-effective.^{437,438}

Knowing your numbers

Knowledge of blood pressure and cholesterol levels can motivate people to improve their lifestyle behaviours. Assessment of these levels is included in the Australian guidelines for the management of absolute CVD risk, which determines the probability of a cardiovascular event occurring over a five-year period, by considering the combination and intensity of risk factors rather than the presence of any single risk factor.¹⁵¹

Know Your Numbers is a program of the National Stroke Foundation that aims to increase individual awareness and detection of CVD and diabetes risk through

opportunistic health checks in pharmacies and other community settings.⁴⁴⁶ Delivered in Queensland since 2008 in more than 500 pharmacies, it is conservatively estimated that 50,000 pharmacy testings took place in 2011. Participants are referred to their general practitioner if warranted and if half those were treated, it is estimated that 95 strokes would be averted per 100,000 checks at a total savings of \$6.5 million, not taking into account other benefits such as prevention of coronary heart disease.⁴⁴⁷⁻⁴⁵⁰

Prevention and control through lifestyle

The healthy lifestyle behaviours promoted throughout this report can help to prevent or control high blood pressure and high LDL cholesterol in many people.^{451,452} Much could be achieved if all Australians were smokefree (page 90) and adhered to the Dietary Guidelines for Australians¹⁰ to improve nutrition and achieve and maintain a healthy weight (pages 67 and 75), the Australian physical activity guidelines^{26,29-31} (page 83), and the 2009 Australian Guidelines to Reduce Health Risks from Drinking Alcohol⁶ (page 96). In addition, specific advice on diet, physical activity and alcohol consumption may be provided as part of the clinical management of high blood pressure and cholesterol.

Table 21: Self reported high blood pressure, high cholesterol and diabetes, adults, percentage (95% CI), Queensland, 2012⁴

	High blood pressure			High blood cholesterol			High blood sugar or diabetes		
	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons
Adults	27.5 (26.1-28.9)	30.5 (29.1-31.9)	29.0 (28.0-30.0)	30.1 (28.5-31.6)	27.9 (26.5-29.3)	29.0 (27.9-30.0)	9.7 (8.8-10.5)	7.6 (6.9-8.3)	8.6 (8.1-9.2)
18-24 years	*6.2 (3.1-12.0)	*7.3 (4.1-12.7)	6.8 (4.3-10.4)	n/a	*12.7 (7.0-22.0)	*7.5 (4.4-12.6)	n/a	n/a	*1.0 (0.4-2.3)
25-34 years	13.2 (10.0-17.2)	18.5 (15.3-22.2)	15.8 (13.5-18.5)	13.1 (9.1-18.5)	12.2 (8.8-16.7)	12.7 (9.9-16.1)	*3.1 (1.6-5.9)	4.0 (2.5-6.1)	3.5 (2.4-5.1)
35-44 years	18.6 (16.0-21.5)	19.0 (16.5-21.9)	18.8 (17.0-20.8)	24.5 (21.1-28.2)	17.6 (14.8-20.8)	21.2 (18.9-23.6)	5.1 (3.7-7.1)	5.6 (4.1-7.4)	5.3 (4.3-6.6)
45-54 years	27.1 (24.2-30.1)	27.2 (24.4-30.2)	27.1 (25.1-29.3)	33.1 (29.9-36.4)	24.3 (21.5-27.4)	28.7 (26.6-31.0)	10.8 (8.9-13.1)	5.7 (4.4-7.4)	8.2 (7.0-9.6)
55-64 years	45.5 (42.4-48.5)	43.7 (40.7-46.8)	44.6 (42.4-46.8)	42.0 (38.9-45.1)	38.7 (35.7-41.8)	40.3 (38.2-42.5)	17.0 (14.8-19.5)	11.5 (9.7-13.5)	14.2 (12.8-15.8)
65-74 years	51.8 (48.6-54.9)	58.3 (55.1-61.3)	55.0 (52.8-57.2)	44.0 (40.9-47.2)	45.7 (42.6-48.9)	44.9 (42.6-47.1)	22.4 (19.9-25.3)	15.3 (13.2-17.6)	18.9 (17.2-20.7)
75+ years	52.9 (48.9-56.9)	65.9 (62.0-69.5)	60.3 (57.5-63.1)	39.9 (35.9-44.0)	43.0 (39.0-47.0)	41.7 (38.8-44.6)	18.4 (15.6-21.6)	17.7 (14.8-21.0)	18.0 (15.9-20.3)
Socioeconomic status									
Disadvantaged			34.5 (32.6-36.5)			32.0 (30.0-34.1)			11.3 (10.1-12.6)
Quintile 2			31.0 (28.9-33.2)			29.5 (27.3-31.8)			10.7 (9.3-12.3)
Quintile 3			30.0 (27.8-32.2)			29.6 (27.3-31.9)			8.1 (7.0-9.4)
Quintile 4			26.5 (24.2-29.0)			28.0 (25.5-30.7)			7.5 (6.3-8.8)
Advantaged			24.0 (21.9-26.3)			26.1 (23.8-28.6)			6.0 (5.0-7.1)
Remoteness									
Major cities			27.4 (26.0-28.8)			28.6 (27.1-30.2)			7.9 (7.2-8.7)
Inner regional			30.8 (28.9-32.8)			30.1 (28.1-32.2)			9.3 (8.3-10.5)
Outer regional			32.0 (29.8-34.3)			28.8 (26.6-31.1)			9.9 (8.6-11.3)
Remote			30.4 (27.7-33.2)			30.9 (27.6-34.3)			8.4 (7.1-9.9)
Very remote			32.4 (29.6-35.4)			25.6 (22.8-28.6)			10.1 (8.5-12.0)

* Estimate has a relative standard error of 25% to 50% and should be used with caution.

n/a Not available for publication

Cancer screening

Three programs meet the national criteria for a population based screening program: BreastScreen Australia, the National Cervical Screening Program, and the National Bowel Cancer Screening Program.²¹⁷ A disease that does not meet this criteria is prostate cancer because of evidence that the benefit for asymptomatic testing carries unacceptably high levels of risk associated with treatment.^{146,453}

Bowel cancer screening

Bowel cancer screening is effective in the early detection and prevention of cancer (removal of precancerous polyps and adenomas). Following a successful pilot, the National Bowel Cancer Screening Program was introduced in Queensland in August 2006. The program uses the Faecal Occult Blood Test (FOBT) for screening. Those with a positive FOBT result are referred to their GP and in most cases referred for an assessment colonoscopy. Phase one of the program (August 2006–June 2008) invited people turning 55 or 65 years of age to participate. In the second phase (July 2008–June 2011) people turning 50 years of age were also included and the program is now ongoing and will be expanded in 2013 to include people aged 60 years and in 2015 aged 70 years.

The participation rate in Queensland was 37.4% between July 2008 and June 2011. Participation was higher among females (39.9%) than males (34.8%), and among those aged 65 years (46.5%) than those aged 55 years (37.3%) or 50 years (32.4%) (Figure 41). Between August 2006 and December 2010, 14,005 Queenslanders returned a positive FOBT result (7.7% of participants). Queensland Health provided assessment colonoscopies to 4,817 of those participants who chose public sector services following a positive FOBT result.⁴⁵⁴ Of these, bowel

Recommended breast, cervical and bowel screening

BreastScreen	Pap smear	Bowel screen (FOBT*)
50-69 years	20-69 years	50 years and older
2 yearly	2 yearly	2 yearly

*FOBT screening is currently offered by the National Bowel Cancer Screening Program to those aged 50, 55 and 65 years

cancer was detected in 209 participants (4.3%), adenomas in 2,311 participants (48.0%), and 3,072 participants (63.8%) had a polypectomy to remove polyps.

The Queensland participation rate (37.4%) was higher than New South Wales (36.4%), but lower than Victoria (38.9%).⁴⁵⁵ The smaller jurisdictions tended to have relatively higher participation rates (from 40.8% to 42.7%), except for Northern Territory (27.7%). Colorectal cancer is reported in Chapter 3, page 30.

Breast cancer screening

The target age group for the BreastScreen Queensland Program is women aged 50–69 years, with the recommendation that women be screened every two years. Women aged 40–49 years and 70 years and older can also attend. Some screening may also occur in the private sector and is not included in this report.⁴⁵⁶ The BreastScreen Queensland Program has a marked impact on improving breast cancer survival through the early detection of cancer which is when treatment is most effective. In 2010, the small diameter invasive cancer detection

rate was 32.3 per 10,000 women screened, exceeding the national benchmark of 25 per 10,000.⁴⁵⁷

The participation rate for the BreastScreen Queensland Program was 57.3% in the two-year period 2009–2010 and rates were higher for women living in regional and remote areas of Queensland than those in major cities or very remote areas (Table 22).⁴⁵⁷ Women living in areas of lower socioeconomic disadvantage were less likely to participate in the BreastScreen Queensland Program than those living in areas of greater disadvantage. Over the past 10 years despite significant growth in the target population, participation rates have remained stable.^{52,458} In the two-year period 2009–2010, participation in the BreastScreen Queensland Program was higher (57.3%) than the national rate (54.8%) and the two larger states (New South Wales 52.8%, Victoria 53.9%).⁵² Breast cancer is reported in Chapter 3, page 32.

Figure 41: Participation in the National Bowel Cancer Screening Program by age and sex, Queensland, July 2008–June 2011⁴⁵⁴

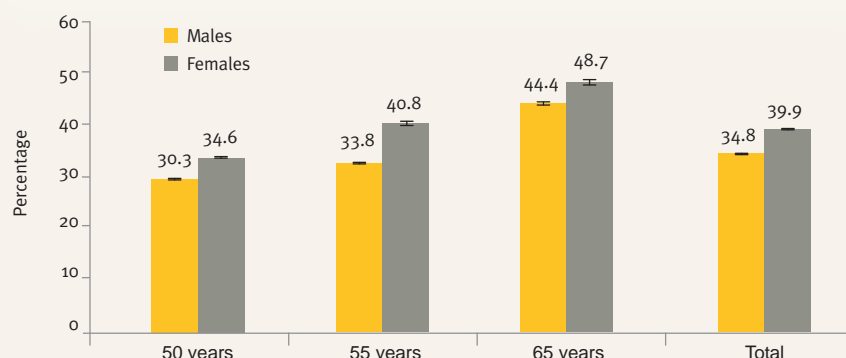


Table 22: Participation in BreastScreen Queensland program and cervical screening, women, Queensland, 2009–2010^{457,459}

Target age group	BreastScreen 50–69 years	Cervical screening 20–69 years
Total	57.3 (57.2–57.4)	55.3 (55.2–55.4)
Remoteness		
Major cities	55.6 (55.4–55.8)	56.6 (56.5–56.7)
Inner regional	58.5 (58.2–58.8)	53.1 (53.0–53.3)
Outer regional	61.6 (61.3–61.9)	54.8 (54.6–55.0)
Remote	60.2 (58.9–61.5)	49.9 (49.1–50.7)
Very remote	55.2 (53.7–56.7)	52.3 (51.4–53.2)
Socioeconomic disadvantage		
Least disadvantaged	52.2 (51.8–52.6)	60.2 (60.0–60.4)
Quintile 4	57.5 (57.2–57.8)	56.2 (56.0–56.4)
Quintile 3	59.1 (58.8–59.4)	55.8 (55.7–56.0)
Quintile 2	58.7 (58.4–59.0)	51.5 (51.3–51.7)
Most disadvantaged	59.1 (58.7–59.5)	51.2 (51.0–51.5)

Cervical screening

The Queensland Cervical Screening Program recommends cervical screening every two years for women aged 20–69 years. Cervical cancer is reported in Chapter 3, page 32.

The participation rate in the Queensland Cervical Screening Program was 55.3% over the two-year period 2009–2010 for the target age group. Women living in major cities had a higher participation rate than those in regional or remote areas, as did women living in areas of lower socioeconomic disadvantage compared with those in the most disadvantaged areas (Table 22).⁴⁵⁹

Over the period 2000 to 2010, participation rates in the program have remained steady with Queensland lower (55.3%) than the national average (57.4%), but comparable with New South Wales (55.6%).^{52,458}

Potential for change

In Queensland, participation in the statewide screening programs for breast cancer and cervical cancer is relatively strong and with expansion of the bowel cancer screening program to a wider population, a greater number of the at-risk population will be screened. Several screening initiatives are highlighted in Chapter 4, page 61.

There are many barriers to participation in population screening, including fear of a cancer diagnosis, cultural issues, embarrassment, and lack of awareness of risks.⁴⁵⁶ In addition, there are many challenges for the sustainability and ongoing effectiveness of the programs. These include funding, capacity, workforce, new technologies and an increasing and ageing population, as well as the competitive and changing health

environment. There is potential for much improvement by addressing these issues and challenges including:

- Maintaining public interest, support and participation in cancer screening programs depends on relevant information being available to all target groups. Due to the size and diversity of Queensland, the different groups and behaviours and the fact that breast, cervical and bowel screening is undertaken once every two years, messages need to be sustained and available from multiple channels to enable all at-risk groups to access potentially lifesaving cancer screening programs.
- Tailored approaches are needed to increase participation, particularly in hard to reach groups such as Indigenous Queensland women and those whose participation rates are low or declining such as BreastScreen Queensland's high socioeconomic status target age group. Initiatives that support women to have a breastscreen during work time and offer after-hours appointments would encourage participation.
- The National Bowel Cancer Screening Program needs to be expanded to all people aged 50–74 years to realise its full potential in prevention and early detection of colorectal cancer. The Australian Government announced a further expansion of the program as part of the 2012–13 Commonwealth budget. From 2013, screening will be offered to people turning 60 years of age and from 2015, to people turning 70 years of age. Screening every two years for all people aged 50–74 years will be phased in from 2017–18.
- Collaboration of the National Human Papillomavirus Vaccination Program and the National Cervical Screening Program would maximise the benefits of both programs. There are anticipated changes to the National Cervical Screening Program in the near future following a review of the age-group range, screening interval and new technologies which is referred to as a renewal project.



Being sun safe



Exposure to ultraviolet (UV) radiation from the sun is potentially carcinogenic, causing both cutaneous malignant melanoma and non-melanoma skin cancer⁴⁶⁰, and can result in eye damage and premature ageing.⁴⁶¹ Queensland has the highest rate of melanoma in Australia⁴⁶², and Australia and New Zealand have the highest in the world.⁵³ Sun exposure is also, however, an excellent source of vitamin D, a substance essential to human health. It is important to minimise risk of skin cancer while maintaining adequate sun exposure for vitamin D synthesis, and developing public health messages for both will be a challenge.

A person's risk of melanoma increases with frequency of sunburn at all life periods⁴⁶³, a family or personal history of skin cancer, skin that burns easily or has many moles and solarium use.⁴⁶⁴ Sun exposure is estimated to be responsible for 99% of non-melanoma skin cancer in Australia⁴⁶⁵ and around 96% of melanoma in Queensland.⁴⁶⁶ Queensland experiences moderate to very high levels of UV radiation at noon in winter, but extreme levels in summer.^{467,468} Solar UV radiation causes damage in all seasons as well as on cloudy days, and its damaging effects are cumulative.⁴⁶⁹ Protection from the sun is generally required in Queensland year-round, although not in the early mornings and late afternoons of winter.⁴⁷⁰

The recommended five best practice sun protection behaviours are to: seek shade; wear sun protective clothing that covers as much of the body as possible; put on a broad-brimmed hat that shades face, neck and ears; wear wrap-around sunglasses; and apply SPF30+ broad spectrum water resistant sunscreen every two hours.⁴⁷¹

Given the long period of time between damaging sun exposure and diagnosis of skin cancer, it is important to monitor the population's sunburn incidence and sun protection behaviour.⁴⁷² For monitoring sunburn incidence, sunburn in the past year

was used, following a review of the evidence for measuring sun related behaviour where sunburn was defined as any reddening of the skin lasting at least 12 hours after sun exposure.^{473,474}

Current prevalence and differentials

In 2012, 1 in 2 (52%) adult Queenslanders reported being sunburnt in the previous year (Table 23).⁴ Highest rates occurred in those aged 16–24 years with over 70% reporting sunburn, decreasing to 11% in the age group 75 years and older. Males (57%) were more likely than females (46%) to report sunburn in the previous year, and there was no difference by socioeconomic status or remoteness. Light or fair-skinned people were more likely to report sunburn in 2011.²⁰ In 2006, 51% of Australians reported sunburn in the previous year.⁴⁷⁵

About 1 in 10 (9%) adult Queenslanders reported being sunburnt on the previous weekend in 2012.⁴ Younger people aged 16–34 years were more likely to report being sunburnt (14–18%) than those aged 75 years and older (1%) as were males (12%) than females (7%). There was no variation in prevalence of sunburn on the previous weekend by socioeconomic status or remoteness.

In 2011, among Queensland adults, sun protection reduced the likelihood of being sunburnt by 20%.²⁰ Younger people,

however, were less likely than older people, and medium or dark skinned people less likely than light or fair skinned people, to protect themselves from the sun (year-round, in at least three ways).

In 2012, 1 in 2 (53%) adult Queenslanders reported at least three best practice sun protection behaviours in summer (Table 23).⁴ People aged 25–64 years were more likely than older and younger age groups to do so. People living in outer regional and remote areas were more likely than those in major cities to practise at least three of the behaviours. There was no difference by sex or socioeconomic status. Far fewer adults (6%) practised all five sun safety behaviours in summer. People living in more remote areas were more likely than those in major cities to do so, but prevalence did not vary by sex or socioeconomic status.

All age groups generally (at least 80%) reported seeking shade in summer (Figure 42).⁴ Use of broad-brimmed hats, however, was low (15–20%) in the age group 16–24 years, rising to 63% in those aged 65–74 years. Sunscreen use and the wearing of wrap-around sunglasses were more prevalent in the age group 25–44 years, than in younger and older age groups. There was no variation by age in the wearing of long-sleeved, collared shirts in summer.

In winter, a quarter (26%) of adults in Queensland practised three or more best practice sun safety behaviours in 2012 (Table 23).⁴ People living in remote and regional areas were more likely than those in major cities to do so as were those in disadvantaged areas compared to advantaged areas. Similar to summer, far fewer adults (less than 3%) displayed all five behaviours, there was no variation by sex or socioeconomic status, and people living in remote areas were more likely than those in major cities to do so.

Trends

There is insufficient data available to assess trends in the prevalence of sunburn and sun protective behaviours in Queensland.



PROTECT YOURSELF IN FIVE WAYS FROM SKIN CANCER

Table 23: Sunburn and sun protection behaviours, adults, percentage (95% CI), Queensland, 2012^a

	Sunburnt in previous year	Sunburnt in past weekend	3 or more best practice sun protection behaviours ^a	
			Summer	Winter
Persons (18+)	51.6 (50.4-52.8)	9.2 (8.5-10.0)	52.6 (51.4-53.8)	26.4 (25.4-27.4)
Males	57.2 (55.4-58.9)	11.9 (10.8-13.1)	53.4 (51.6-55.1)	28.9 (27.4-30.4)
Females	46.1 (44.5-47.8)	6.6 (5.7-7.6)	51.9 (50.2-53.6)	24.0 (22.7-25.4)
Persons				
16-17 years	75.6 (68.5-81.5)	17.9 (13.0-24.0)	43.7 (36.6-51.1)	20.0 (14.3-27.2)
18-24 years	72.7 (67.5-77.3)	16.0 (12.8-19.9)	36.5 (31.7-41.6)	14.4 (11.3-18.2)
25-34 years	67.9 (64.3-71.3)	13.8 (11.6-16.4)	55.4 (51.8-59.0)	31.4 (28.2-34.8)
35-44 years	64.8 (62.4-67.1)	10.9 (9.4-12.6)	59.3 (56.7-61.7)	29.8 (27.6-32.1)
45-54 years	52.7 (50.3-55.1)	8.1 (6.9-9.6)	57.0 (54.7-59.4)	30.3 (28.2-32.5)
55-64 years	36.5 (34.5-38.6)	5.2 (4.3-6.3)	54.1 (51.9-56.2)	25.9 (24.1-27.9)
65-74 years	20.5 (18.8-22.3)	2.5 (1.8-3.3)	48.6 (46.4-50.8)	23.6 (21.7-25.5)
75+ years	10.7 (9.2-12.4)	1.3 (0.8-2.0)	46.9 (44.0-49.7)	19.9 (17.8-22.3)
Males				
16-17 years	79.7 (71.9-85.7)	22.4 (15.9-30.7)	37.9 (29.4-47.1)	19.6 (12.8-28.7)
18-24 years	73.3 (66.1-79.4)	18.0 (13.6-23.4)	38.3 (31.8-45.2)	15.9 (11.7-21.1)
25-34 years	72.5 (66.6-77.6)	16.9 (13.4-21.0)	58.5 (52.9-63.8)	35.4 (30.5-40.7)
35-44 years	70.5 (67.0-73.7)	13.7 (11.4-16.4)	61.6 (57.9-65.2)	33.6 (30.3-37.1)
45-54 years	60.0 (56.6-63.2)	12.0 (9.9-14.6)	59.9 (56.5-63.1)	34.6 (31.5-37.9)
55-64 years	43.1 (40.1-46.1)	8.2 (6.6-10.1)	53.5 (50.4-56.5)	28.0 (25.3-30.8)
65-74 years	25.1 (22.6-27.9)	3.1 (2.2-4.5)	42.0 (39.0-45.2)	20.9 (18.5-23.6)
75+ years	16.9 (14.3-19.9)	*2.0 (1.1-3.5)	41.8 (37.8-45.8)	18.6 (15.6-21.9)
Females				
16-17 years	70.6 (58.0-80.7)	*12.4 (6.5-22.6)	50.8 (39.1-62.5)	*20.5 (11.9-32.8)
18-24 years	72.1 (64.3-78.7)	14.1 (9.7-20.0)	34.7 (27.9-42.3)	13.0 (8.8-18.9)
25-34 years	63.3 (58.6-67.8)	10.7 (8.1-14.0)	52.3 (47.6-57.0)	27.3 (23.4-31.7)
35-44 years	59.2 (55.8-62.6)	8.2 (6.4-10.3)	57.0 (53.5-60.4)	26.0 (23.2-29.1)
45-54 years	45.6 (42.3-48.8)	4.3 (3.2-5.8)	54.2 (50.9-57.5)	26.1 (23.4-29.0)
55-64 years	30.0 (27.3-32.9)	2.3 (1.5-3.3)	54.7 (51.6-57.7)	23.9 (21.4-26.6)
65-74 years	15.8 (13.6-18.3)	*1.8 (1.1-3.0)	55.2 (52.1-58.3)	26.3 (23.6-29.2)
75+ years	6.1 (4.4-8.2)	n/a	50.7 (46.8-54.7)	21.0 (18.0-24.3)
Socioeconomic status (18+ years)				
Disadvantaged	49.3 (47.0-51.5)	9.5 (8.0-11.1)	53.7 (51.5-55.9)	28.0 (26.1-29.9)
Quintile 2	51.8 (49.3-54.4)	9.8 (8.3-11.6)	54.5 (51.9-57.0)	28.5 (26.3-30.7)
Quintile 3	53.4 (50.8-55.9)	9.8 (8.3-11.5)	53.4 (50.8-56.0)	28.8 (26.5-31.3)
Quintile 4	53.2 (50.2-56.1)	8.0 (6.5-9.7)	52.9 (49.9-55.9)	24.3 (21.9-26.9)
Advantaged	50.0 (47.0-53.0)	9.0 (7.3-11.1)	49.0 (46.0-51.9)	22.9 (20.7-25.3)
Remoteness (18+ years)				
Major cities	50.8 (49.1-52.6)	8.5 (7.5-9.6)	50.3 (48.5-52.1)	22.6 (21.2-24.1)
Inner regional	51.7 (49.4-54.0)	10.1 (8.6-11.9)	53.4 (51.1-55.7)	27.9 (25.9-30.0)
Outer regional	53.4 (50.9-55.9)	10.6 (9.0-12.3)	57.2 (54.7-59.6)	34.7 (32.4-37.1)
Remote	53.2 (50.0-56.3)	8.5 (6.8-10.5)	62.5 (59.5-65.5)	37.8 (34.6-41.0)
Very remote	54.0 (50.8-57.2)	9.9 (7.9-12.3)	61.3 (58.1-64.5)	39.1 (36.0-42.3)

^a Best practice behaviours: use of sunglasses, hats, sun-protective clothing, sunscreen and shade.

* Estimate has a relative standard error of 25% to 50% and should be used with caution.

n/a Not available for publication

occurs before adulthood, it is important to protect the skin of infants, children and adolescents.¹⁰³ Where exposure is unavoidable, the five best practice sun protection behaviours apply (page 113). In early childhood education and care services, sun safety needs to be considered as a necessary component, particularly because such services are often provided during peak UV periods. Around 40% of Australian children under 4 years attended formal care in 2011⁴⁷⁷ so a sun safe environment in these services can play a major role in minimising children's exposure to UV and can also influence the child's long term sun protective behaviours.

Schools are another prime setting for addressing sun safety. A comprehensive, coordinated approach is required to incorporate a supportive physical and social environment, including policy and curriculum, underpinned by shared responsibility and contributions from school management and staff, students and parents and the broader community. It is recommended that schools develop and implement policies which limit outdoor activities in peak UV times and promote the use of sun safe behaviours—and these need to be monitored. While knowledge of sun protective behaviours is generally high, translating knowledge into behaviour change of secondary school students is complex and requires innovative solutions to educate and empower students to make sun safe choices.

The Cancer Council has implemented the SunSmart Program in Queensland in early childhood services since 2000 and in schools since 2009. This program aims to encourage and assist in the development of better sun protection policies and practices and acknowledge and recognise these efforts. The SunSmart Grant Scheme, run in partnership with Queensland Health, supports this initiative in early childhood education and care services, and in primary schools (Chapter 4).

Outdoor workers in Queensland are exposed to a UV index of three or more (requiring sun protection) all year round and are at high risk of harm from sun exposure. Sun protection is a responsibility of both employer and employee. Workplace norms, the perceived costs and benefits of sun protection and lack of knowledge regarding skin cancer all influence outdoor workers' sun protection behaviour.⁴⁷⁸ There are, however, several effective interventions: clear and consistent education with highly visible prompts; policies that state requirements or expectations for outdoor task scheduling,

between the risks and benefits of UV exposure in the community are opportunities to improve the sun safety of Queenslanders.

At work, school and play

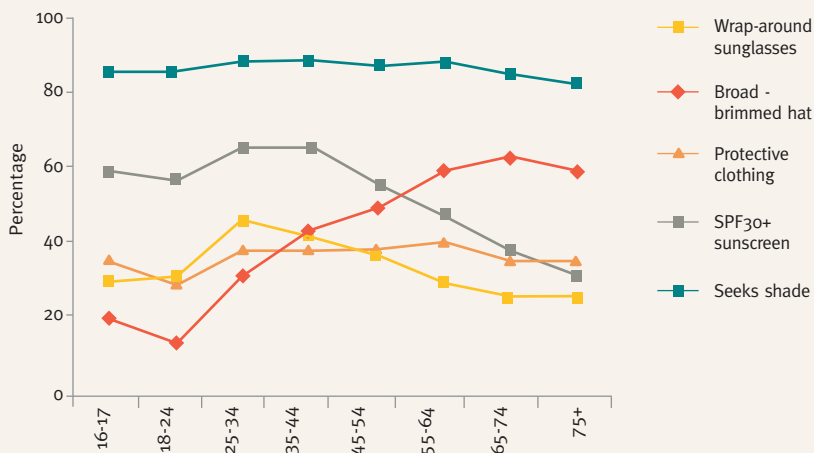
Sunlight exposure at high levels in childhood is a strong determinant of risk of melanoma.⁴⁶¹ As most sun exposure

Potential for change

Exposure to UV radiation has a long term cumulative effect that increases the risk of developing skin cancer whether or not this was incidental or intentional exposure.⁴⁷⁶ Ongoing mass media campaigns and sun protection policy and practice improvements that achieve a balance

Sun protection reduced the likelihood of Queensland adults being sunburnt by 20% in 2011.²⁰

Figure 42: Best practice sun protection behaviours in summer by age, adults, Queensland, 2012⁴



a balance between sun protection and vitamin D.⁴⁷⁰ Developing and communicating appropriate public health messages to achieve this balance is a challenge.

Public awareness campaigns are effective

Public awareness campaigns are a core component of multi-strategy approaches to prevent skin cancer. The Healthier Queensland Sun Safety mass media campaign is aimed at raising awareness of the five best practice sun safety behaviours. The campaign ran between December 2011 and March 2012 and was recognised by 72% of those surveyed. For those who saw at least one element of the campaign 99% recognised the message, 91% supported the message and 75% said they were more likely to consider practising sun safety activities as a result. The Australian experience to date indicates mass media skin cancer awareness campaigns are effective but need to be ongoing and part of a multi-strategy approach.⁴⁸⁸ Continuing support and funding are required for Australia's valuable and effective mass media skin cancer prevention programs.

sun protective behaviour and equipment provision; and a supportive environment such as effective and accessible shade structures, and uniforms that are safe, comfortable and meet guidelines for sun protection.⁴⁷⁹

While physical activity is important for health, unsafe sun exposure needs to be considered when exercising outdoors. The cumulative increase in risk with each extra hour of physical activity for Queensland adults in 2009 was relatively modest and only became meaningful well above the current recommendation of 2.5 hours per week.⁴⁸⁰

Achieving a balance between UV risks and benefits

Sun exposure is not the only source of UV in Queensland. UV radiation obtained from solariums, sun beds and sun lamps can be triple the strength of the Queensland midday summer sun.^{467,481} The International Agency for Research on Cancer has recommended minors be prohibited, and young adults discouraged from using indoor tanning facilities,⁴⁸² and in 2009 changed the classification of the use of UV-emitting tanning devices to 'carcinogenic to humans'.⁴⁸³ Most Australian jurisdictions, including Queensland, have now passed legislation regulating solarium use, with New South Wales announcing a complete ban from 2015.⁴⁸⁴ In Queensland it is illegal for a solarium business to allow a minor, or any person with skin that always burns and never tans, to access a solarium for cosmetic purposes. It is also a legislated requirement that appropriate warning notices be displayed to inform clients about the risks associated with the use of a solarium, and about the need for clients to provide their written consent to the exposure. Regulatory

efforts and education regarding the danger of solariums, should be continued to protect the public from the harm they cause.

Although sun exposure is responsible for almost all skin cancers, it is also an excellent source of vitamin D, a substance essential to human health. Small amounts of sun exposure are generally sufficient to produce adequate vitamin D. Confusion around vitamin D and sun exposure may be leading to reduced sun protective behaviour or even intentional exposure in Queensland.⁴⁸⁵⁻⁴⁸⁷ In 2008, the Australian College of Dermatologists, Australian and New Zealand Bone and Mineral Society, Osteoporosis Australia, and Cancer Council developed a joint statement on achieving



Improving oral health

Oral conditions are a far larger cost to the Australian economy than would be suggested from their proportion of disease burden. Nationally in 2003, oral conditions were the cause of 0.9% of the burden of disease and injury yet accounted for 10% of health expenditure in 2004–05 (Figure 5, page 20). In Queensland, health expenditure of \$1,124 million for dental services was the fifth largest contributor to recurrent health expenditure in 2009–10, accounting for 5% or \$1 in \$20 spent. Out-of-pocket expenditure by individuals accounted for half the spending (Table 4, page 19), and 86% of the \$1,124 million was delivered by private providers rather than government. There are limited data sources to inform the oral health burden in Australia and these are discussed on page 8. Dental disease is reported in Chapter 3, page 50.

Dental decay or caries is the most common dental disease in Australia and is one of the most prevalent health conditions among children, with about 38% of those aged 4 years and 59% of those aged 9 years reporting decay.²⁸ The average 8 year old has 2.15 deciduous teeth and 0.38 permanent teeth that are decayed, filled or missing because of decay.¹³

There are behaviours that can slow down the decay process or actively promote remineralisation of the teeth that will provide further protection.⁷⁰ The most significant risk factor for dental decay is frequent exposure to fermentable carbohydrates such as sugars and starches. These carbohydrates break down into sugars in the mouth, allowing the bacteria in the mouth to use them as food that they turn into acids, which can eventually cause tooth decay. Similarly, frequent exposure to dietary acids is a risk. The pattern of consumption of certain foods and drinks may put children and adults at greater risk of tooth decay and erosion. Reducing the frequency of consumption of such foods is an important preventive behaviour. Regular brushing also reduces plaque and the availability of sugars in the mouth.

Exposure to fluoride is beneficial as it reduces decay and enhances remineralisation.⁴⁸⁹ Strategies to increase exposure to fluoride focus on population approaches where fluoride is added to the drinking water (page 53) as well as individual use of fluoride-containing products such as toothpaste, mouthwashes and supplements. Regular dental visits are recommended to monitor dental health, provide preventive advice, undertake preventive treatments and intervene early if restorative treatment is required.

Tooth brushing, exposure to fluoride products, healthy food and drink choices and regular dental visits are all important preventive behaviours for adults and children.

Current prevalence and differentials

Two-thirds of Australians aged 5 years or older had visited a dentist in the previous 12 months in 2010 (64%). For about 1 in 4 the last visit was between one and five years ago and for 1 in 12, more than five years ago or never (Figure 43).¹³ Among adults aged 25–44 years there was a lower likelihood of dental visits within the previous 12 months, and higher likelihood between one and two years. Data for Queensland in 2004–2006 showed similar patterns of attendance.¹⁷⁹ For about 80% of Queensland children and young people in 2010 the most recent visit was for a check-up but for middle aged and older people about half were attending the dentist to address a problem (Table 24). Being insured, not having a government health card and living in the metropolitan area were all associated with recent dental visits, with greater difference in visit behaviour among those aged 55 years and older.

Among dentate (that is those with teeth) Australian adults in 2010, 49% reported a visiting pattern that was considered favourable, that is they visit a dentist at least once a year, and they have a regular dentist.¹³ Females were more likely to report a favourable visiting pattern than males, with little difference across the age groups. Adults



in higher income households were nearly 70% more likely to report a favourable dental visit pattern, and people in major cities were about 50% more likely than those in remote and very remote locations.

Figure 43: Time since last dental visit by age and sex, (aged 5+ years), Australia, 2012¹³



**70% of Australian children brush their teeth twice daily.
49% of Australian adults visit their dentist sufficiently
frequently.^{13,28}**

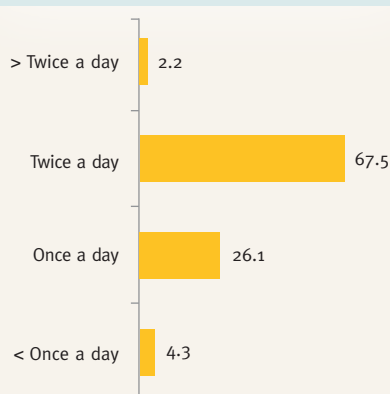
The majority of Australian children brush their teeth at least twice a day (70% in 2002–2004) as recommended (Figure 44).²⁸ One-quarter (26%) brushed only once a day and a small percentage (about 1 in 20 children) did not brush daily. Children from higher income families brushed more often, were more likely to be using children's toothpaste at young ages, were more likely to use a smaller toothbrush suitable for children and less likely to use large amounts of toothpaste, than children from lower income families.

Limiting exposure to sugars in the diet is important for a number of health reasons. The NHMRC guidelines recommend that children and adults drink plenty of water and consume only moderate amounts of sugars and food containing added sugars.¹⁰ Breastfeeding is recommended for infants.^{282,292} While detailed data on food consumption in Australia is improving, it is still limited. In 2011, 8.6% of Queensland children aged 5–17 years had a non-diet flavoured drink every day, with the proportion increasing from 3% in 5–7 year olds (similar for girls and boys) to 25% in 16–17 year old boys.¹¹ Among adult Queenslanders in 2011, 27% reported drinking soft drink or sports drinks daily

Table 24: Reason for last dental visit by age group, percentage, Queensland, 2011¹³

	Reason for last visit	
	Check-up	Problem
Persons	65.2	34.8
5-14	83.2	16.8
15-24	80.3	19.7
25-44	61.1	38.9
45-64	53.4	46.6
65+	56.0	44.0

Figure 44: Daily tooth brushing, children (5–15 years), percentage, Australia, 2002–2004²⁸



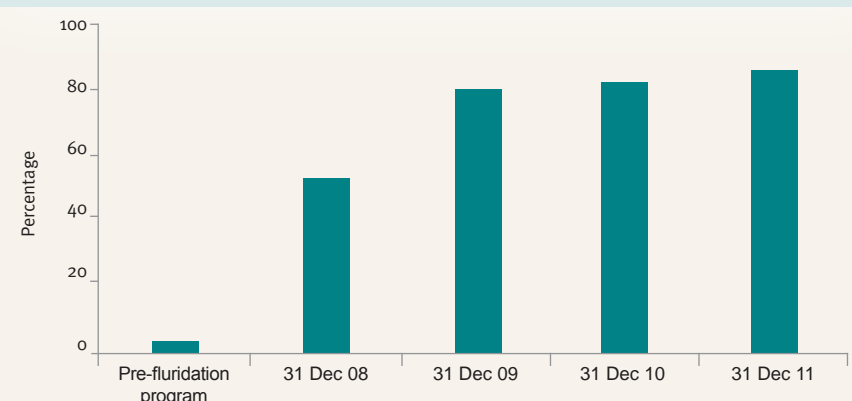
or several times a week, with males nearly twice as likely to do so as females.²⁷⁷ Nearly half of younger people were drinking soft drink or sports drinks every day or several times a week, where about 1 in 8 older people did so—43% of those aged 18–34 years and 12% of the 55 years and older age group (Table 11 and Table 12).

About 10% of Australian children aged 5–15 years had ever used fluoride tablets or drops, and the majority used them for less than three years.²⁸ Children from higher income families were more likely to have used tablets and used them for longer than children from lower income families. The use of fluoride mouth rinse was more common among older children—5% of children aged 5 to 6 years used a fluoride mouth rinse whereas 15% of those aged 15 years did so. Mouth rinses have been shown to be

effective in killing oral bacteria involved in gum and dental decay.^{28,490,491}

Fluoridation of water in Queensland was mandated in the *Water Fluoridation Act 2008*. The goal was for all water schemes serving more than 1,000 people to be fluoridated by 31 December 2012 (page 53). Prior to 2008, less than 5% of the Queensland population had access to fluoridated water. This increased to 86.2% by 31 December 2011 (Figure 45) reaching 87% by 30 April 2012. The responsibility for implementation was split between Queensland Health and the Department of Economic Development and Innovation. While there was widespread public support for this initiative in the period before it commenced, 60–70% of surveyed adults in 2007, there were a number of lobby groups who opposed it and continue to do so.

Figure 45: Proportion of population with access to fluoridated water, Queensland, 2008–2011





Queensland's children and a potentially preventable hospital burden. What is most concerning about the current situation is that the relative burden of dental decay, as seen in preventable hospitalisations is for the most disadvantaged children in Queensland and those in regional and remote areas (page 50). Providing oral health services to such communities and to very young children will help to improve the health of young Queenslanders. One of the principal recommendations of the National Advisory Council on Dental Health is to invest in services and programs for children.⁴⁹²

Lack of access to dental services and ongoing oral health preventive care is affecting the health of Indigenous Queenslanders. In 2007, the burden of disease for oral health conditions was about double that of the non-Indigenous burden, with the relative rate difference as high as 2.7 times in young children (0–4 years) and more than 3 times as high in 15–34 year olds.²⁴ The rate for potentially preventable hospitalisations for dental conditions for Indigenous Queenslanders was 20% higher than the non-Indigenous rate in the two-year period 2009–10 to 2010–11, and in remote areas Indigenous Queensland rates were more than double.

Affordable dental care for all adults and children is necessary. Regular dental visits for children are often provided by public clinics, traditionally in the school setting. A yearly preventive visit can help reduce the risk of poor oral health. As the majority of services are provided by private dental professionals in Australia, many people delay visits to the dentist because of cost—32% of Queenslanders aged 15 years and older in 2004–06 did so.¹⁷⁹ The core recommendation of the National Advisory Council on Dental Health is an integrated national oral health system that provides equitable access for people in Australia to clinically appropriate, timely and affordable oral health care and advice. This recommendation integrates oral health with general health and positions oral health as part of the national reform agenda and the healthcare system. Queensland's relatively poorer oral health outcomes are evident in higher levels of decay experience in children (Figure 26, page 50) and relatively lower spending on dental services, second lowest at 4.5%, as a proportion of total recurrent expenditure among the states and territories in 2009–10⁴⁶ compared with 7.5% in Victoria and 7.1% in New South Wales. This indicates there is potential for improvement in Queensland.

Trends

Over the long term, the decay experience of Queensland children has changed, where decay experience includes the number of teeth either decayed, missing or filled. Between 1989 and 1997, there was a steady downward trend in the mean number of deciduous teeth with decay experience at 5–6 years of age and similarly in the decay experience in the permanent teeth of 12 year olds in Queensland.¹⁷⁸ However, from the late 1990s there has been an increase in deciduous decay experience at 5–6 years of age, from fewer than 2 teeth decayed, missing or filled to about 2.5 in 2007. At 12 years of age the mean number of permanent teeth decayed, missing or filled has remained steady at 1.4 between the late 1990s and 2007. The decay experience of Queensland children is higher than national. The mean number of decayed, missing or filled teeth among Queensland children was 2.47 in 2007, compared with 1.88 nationally (30% higher) and the Queensland rate was

highest among the jurisdictions with the exception of Northern Territory (page 50).¹⁷⁸ Permanent teeth decay experience at 12 years of age was about 40% higher than national, 1.32 decayed, filled or missing teeth, compared with 0.95, and higher than all other states and territories. The commencement of the Queensland Child Oral Health Survey in 2013 and over the following 10 years will provide valuable data to monitor decay experience in Queensland children following the introduction of water fluoridation.

Potential for change

It is important to address dental disease and oral hygiene in children in order to improve the health of the population. There are more than 4,500 hospitalisations each year for dental related preventable hospitalisations in Queensland children aged 0–9 years, with 40% of these occurring in pre-school children and the majority for dental decay (about 3,700 or 82%). This represents a significant health burden among

Many communicable diseases can be prevented through immunisation.⁴⁹³ Immunisation is an effectual and cost effective health intervention as the benefits of personal immunity extend to the community by reducing the risk of disease spread. This benefit is known as herd immunity.⁴⁹⁴ In 2008, a Queensland survey found that 93.6% of primary caregivers and parents supported immunisation.⁴⁹⁵

Current prevalence and differentials

A number of vaccines are funded under the National Immunisation Program for all children, as well as adolescents and adults with a high risk of disease.⁴⁹⁶ Vaccines

currently funded under the program for children can prevent measles, polio, diphtheria, tetanus, pertussis (whooping cough), varicella (chickenpox), hepatitis B, *Haemophilis influenzae* type b (Hib), meningococcal, pneumococcal and rotavirus diseases. Vaccines given to children up to 7 years of age can be recorded in the Australian Childhood Immunisation Register (ACIR).

As reported by the ACIR, 91.6% of Queensland children aged 1 year were fully immunised in 2011, similar to the national coverage of 91.5% (Table 25).⁴⁹⁷ Immunisation coverage was lower for Indigenous Queensland children at all age milestones. At the one-year milestone Queensland Indigenous children had a full immunisation status about 7 percentage points lower than non-Indigenous children and a similar difference was also observed nationally.

Adolescent immunisation in Queensland is delivered mainly through a secondary-school based vaccination program. In 2011, coverage through the school based system was 55% for hepatitis B dose 2, 35% for chickenpox, 62% for human papillomavirus (HPV) dose 3 and 59% for dTpa (adult formulation for diphtheria tetanus pertussis). It is likely that adolescent coverage is underestimated as vaccines may also be

administered by GPs.

In addition to providing funded vaccines to eligible children and adolescents, Queensland Health provides influenza and pneumococcal vaccines for adults at high risk of disease. Influenza vaccine is funded for people aged 65 years and older, Indigenous people aged 15 years and older, pregnant women, and individuals with medical conditions that predispose them to severe influenza disease. Pneumococcal vaccine is funded for people aged 65 years and older, Indigenous people aged 50 years and older and those Indigenous people aged 15–49 years with medical conditions which may predispose them to severe pneumococcal disease. Queensland Health also provides some vaccines for refugees, and rabies vaccine and immunoglobulin for people exposed to rabies or Australian bat lyssavirus. During 2011, free whooping cough vaccine was available for parents, grandparents and other adults living in a household with a child up to 6 months of age. This time limited program was aimed at preventing whooping cough in children too young to be vaccinated.

Of Queenslanders aged 65 years and older, 74.6% received the seasonal flu vaccination in 2009, the same as national coverage (74.6%) and 22.8% of those aged 18–64 years also received this vaccine.⁴⁹⁸ Since May 2009, only 12.7% of pregnant women nationally were vaccinated despite this being a recommendation of the NHMRC.⁴⁹⁹ The most common survey reasons for non-vaccination were the belief that they would rarely get flu, the belief that they would not be at risk or that they had no time to get vaccinated. Only 4.4% of those unvaccinated did not believe in vaccinations.⁴⁹⁸

Trends

In 1998 when the ACIR commenced reporting vaccine coverage, fewer than 70% of Queensland children aged 2 years were fully immunised. Over time this coverage has increased to about 90% with consistent coverage maintained. However, there are some geographic areas or subpopulations where the coverage is not as high. This places individuals at risk of vaccine preventable diseases.

Queensland has only recently seen improvements in the five-year fully immunised vaccine coverage (Figure 46). Between the first quarter and second quarter of 2010, the coverage increased by about 8 percentage points.

Table 25: Fully immunised Queensland and Australian Children, 2011⁴⁹⁷

	Milestone		
	1 year*	2 year*	5 year*
Queensland	91.6	92.8	89.9
Australia	91.5	92.5	89.5

* Immunisation status is assessed at ages 1 year (vaccines due at 6 months), 2 years (vaccines due at 12 months) and 5 years (vaccines due at 4 years) with a three-month lag period allowed for the late notification of immunisation to the register.



While the five-year fully immunised coverage for Queensland children has improved over time, more work will need to be done to consistently attain the target of 90% coverage. Not being vaccinated by 1 year of age poses a significant risk for whooping cough and pneumococcal disease in infants as effective protection from these diseases relies on the timely administration of multiple vaccine doses before 1 year of age.^{496,500} In addition, the booster doses of diphtheria, tetanus, whooping cough and polio vaccine at 4 years of age is necessary to provide continued protection against these diseases.

Potential for change

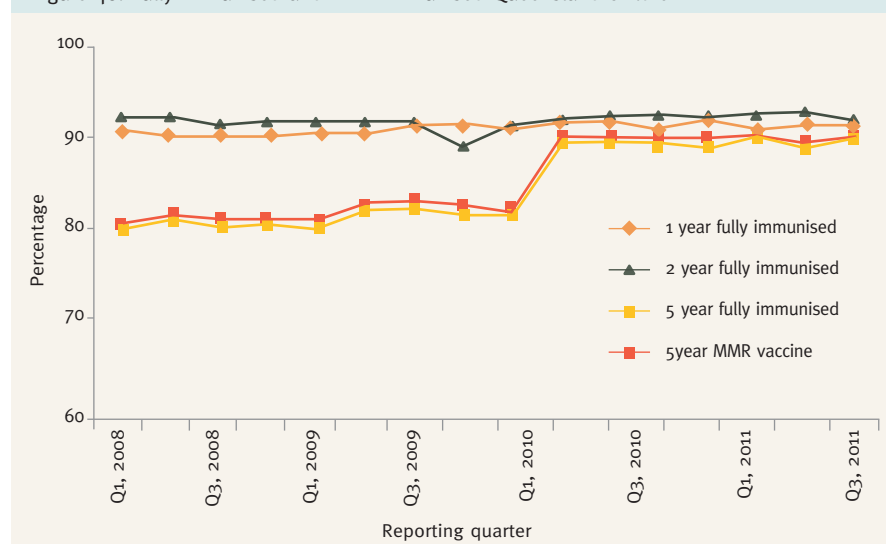
Maintaining community immunity is a complex issue. For example, childhood vaccination coverage may be influenced by attitudes towards immunisation which, along with subsequent vaccine coverage, might be impacted by reports of adverse vaccination events.⁵⁰¹ Such concerns are monitored by Queensland Health.

With respect to community immunity, adult immunisation coverage may impact on child disease if adult immunisations are not kept up to date and diseases spread to children not yet vaccinated. Recent reports of a national epidemic of whooping cough have prompted the Australian Government to run a vaccine awareness campaign and Queensland Health offered, for a limited time, free vaccination to prospective parents, grandparents and adults in households with an infant aged less than 6 months.⁵⁰²⁻⁵⁰⁴

Overall threats to community immunity include a lack of awareness of vaccination status, poor education surrounding immunisation recommendations and complacency.⁵⁰⁵ For example, to prevent the reintroduction of diseases into Queensland, current immunisation status may be very important. Measles outbreaks have been reported in unvaccinated Australians exposed to people entering Australia from countries where measles is still endemic.⁵⁰⁶ Although many diseases are not as common as they were in the past, it is still important for children and adults to be vaccinated to help prevent more serious disease outbreaks.

There are many resources to assist Queenslanders make informed decisions about immunisation. Current national immunisation schedules are available from the Australian Government Department of Health and Ageing website and further information about the Queensland Health Immunisation Program is available on the Queensland Health website or from local GPs.^{507,508}

Figure 46: Fully immunised and MMR immunised Queensland children





Good health is an asset—achieving it for all is a challenge.

In this chapter:

- Getting a healthy start
- Healthy ageing
- Achieving and sustaining gains in Indigenous health
- Improving the nutritional quality of the food supply

For this asset to be extended to all Queenslanders, action will involve every level of government as well as individuals, communities and the private sector. A healthier population will require ongoing investment in disease prevention where gains are widespread and offer social as well as economic benefits to families and the community. Preventing disease from occurring in the first place is paramount, and is strongly supported by the Australian people.¹⁸ In addition to population health interventions, there must be

increasing emphasis on primary healthcare to more effectively meet the diverse and changing needs of the population.

The 2011 National Healthcare Agreement affirmed the agreement of all governments that Australia's health system will strive to eliminate differences in health status of those groups experiencing poor health, and:

- be shaped around the health needs of individual patients, their families and communities
- focus on the prevention of disease and injury and the maintenance of health, not simply the treatment of illness
- support an integrated approach to the promotion of healthy lifestyles, prevention of illness and injury, and diagnosis and treatment of illness across the continuum of care
- provide all Australians with timely access to quality health services based on their needs, not ability to pay, regardless of where they live in the country.⁵⁰⁹

So far in this report, information on the broad influences on health has been provided, the current health status of Queenslanders assessed and gains demonstrated. In Chapter 4 a few of the many initiatives across Queensland are highlighted, focusing on issues that will help Queenslanders to be healthier as well as those that prevent disease. A comprehensive assessment of the current status of the key risk factors for health is in Chapter 5, along

with opportunities to advance the good health of our population. In this final chapter, building on themes of the two most recent Chief Health Officer reports, challenges ahead are identified. In 2008 the focus was on making disease prevention everyone's business¹²⁷ and in 2010 it was on monitoring progress in key trends, tracking health inequalities and identifying causes of the ever-increasing burden on our health system.⁶⁶

In this fourth Chief Health Officer report, the focus is on four of many priorities for improving the health of Queenslanders. Getting a healthy start is fundamental to good health for life—this is the first priority (page 122). Living well in the later years, often termed healthy ageing, is as important as starting well (page 125). A third priority is the need to find ways to 'close the gap' on the health disadvantage of Indigenous Queenslanders—some opportunities to do this are highlighted (page 126). The fourth priority is to take steps to improve the nutritional quality of our food supply. Queensland is uniquely placed to provide a rich variety of food for the enjoyment and good health of all. This section includes current initiatives that will help to achieve better access to healthy food and good nutrition (page 128). By addressing at least these priorities, the health of Queenslanders will be improved at each stage of life and they will be more aware of how they can make healthier choices. The burden of chronic disease can be reduced and promoting health across all the stages of life is necessary—from the early years to the later years.

Getting a healthy start

Health in the earliest years, actually beginning with the future mother's health before she becomes pregnant, lays the groundwork for a lifetime of wellbeing.⁴¹⁰ Early childhood is considered the most important development phase in life and is foundational to the quality of health, wellbeing, learning and behaviour across the lifespan (WHO).⁵¹⁰ In recognition of the importance of getting a healthy start, the Australian Government has set a long term objective that 'Australians are born healthy and remain healthy'.⁴⁰

What is needed to build a strong foundation for lifelong health?

■ The biological foundations of infant health begin with the mother. This includes regular antenatal care provided by a trained maternity health professional, not smoking, avoiding alcohol during pregnancy, and protecting the health of the mother and infant through immunisation. In Queensland, while 7.4% of pregnant women made fewer than the recommended minimum five antenatal visits in 2008, 23.5% of Indigenous women did so (Table 1, page 4). In 2010, about 1 in 6 Queensland women smoked throughout their pregnancy, while for Indigenous women the rate was 1 in 2. Smoking rates need to be reduced (page 90). About 4 in 5 Australian women consumed some alcohol while pregnant in 2010 but the NHMRC recommends that the safest option is no alcohol while pregnant or breastfeeding (page 96).

Immunisation protects children from preventable disease and the national programs provide the necessary coverage to protect infants and children (page 119). The impact of poor oral health begins early. About 3,700 potentially preventable hospitalisations are due to dental decay in Queensland children aged 0–9 years, with about 40% occurring in very young children aged 0–4 years. The rate is about double in remote areas compared to cities and about 40–50% higher in socioeconomically disadvantaged areas than in advantaged areas (page 50).

Infants need a solid social foundation to build good health.⁴¹⁰ They need stable and responsive relationships, including parents, extended families and other caregivers (page 105), as well as safe and supportive homes and built environments. Childhood injuries, including drowning and low speed vehicle runovers, are of particular concern (page 44). Injury in infants and young children is one of the causes of Indigenous



disadvantage with burden rates in 0–4 year olds about 4 times the non-Indigenous rate in 2007.²⁴ Infants need sound and appropriate nutrition, beginning with breastfeeding from birth, appropriate introduction of solids, and good eating habits through the early years and into childhood, noting the origins of obesity can be early in life (page 72). Infants and young children need to be active for physical and social benefits (pages 57 and 83).

Caregiver and community support is valuable. Parenthood brings with it the strong desire to see children grow up happily and in good health.⁵¹¹ However, as the African proverb says 'it takes a village to raise a child'. As society changes, so do the needs of parents and families. Therefore, support to help nurture a child through infancy and childhood should evolve to meet these needs. Parents are often isolated from the support of extended family because of jobs and mobility. In many families, both parents need to juggle the demands of family and work and this can become increasingly complex and even stressful (page 106). Parenting programs and workplace flexibility are opportunities to support families.

Public and private sector policies and programs benefit the state. The broader policies and investment of governments can deliver unique benefits through public health initiatives such as immunisation programs, childcare and early education, child welfare, primary healthcare, early intervention programs and employment policies. For example, the introduction of the kindergarten and prep years for children in Queensland, which has been phased in over the past five years, is expected to enhance

children's social and educational development (page 105). Action to address the issue of advertising of junk food has been considered nationally but not yet resolved (page 73). The implementation of the *Water Fluoridation Act 2008* will generate oral health benefits to Queensland children now and throughout their lives (pages 53 and 116).

Building the foundations for good health for Queensland's children

■ The overarching principle of investments in Queensland's children is to provide support for mothers, infants and families from conception and birth through to the school years, ensuring continuity of care through the transition into child and youth services. This involves accessible family and child health services at the main transition points. Some of the initiatives and programs delivered by the Queensland Government are featured below.

Supporting mothers

- Screening for depression, psychosocial factors (including domestic violence), alcohol, other drugs and tobacco is offered to all mothers.
- Follow-up contact from a health professional is offered to all mothers after the birth of a baby.
- New Clinical Services Capability Framework modules enable services to identify the minimum standards for their facilities, support services and staffing to provide safe maternity and neonatal care.

- The Queensland Maternal and Perinatal Quality Council has been re-established to support classification, reporting, trending and national benchmarking of mortality and morbidity and make recommendations for clinical practice improvements.

Promoting healthy eating during pregnancy and breastfeeding

- The Queensland Health Breastfeeding website (www.health.qld.gov.au/breastfeeding) has information for consumers and health professionals including factsheets, video clips and online education packages, as well as linkages to support services.
- The Queensland Government initiative to promote breastfeeding includes resources for maternal and child health services that support the Baby Friendly Health Initiative. The resources include a DVD on breastfeeding to assist health workers and other staff to support Indigenous women to breastfeed. Communication avenues are being explored along with further research to evaluate this initiative.

Creating a one-stop-shop for services

- The Early Years Centre initiative started in 2006 with \$32 million committed over four years (2006–2010) to establish four centres across the state—at Caboolture and north Gold Coast in 2008, Browns Plains in 2009 and Cairns in late 2010.
- The centres operate as one-stop-shops to provide integrated early childhood education and care as well as family

and parenting support, and child and maternal health services for families expecting a child or with children aged up to 8 years.

- All centres support increased access to kindergarten programs, by delivering a program directly or by initiatives that support participation of vulnerable children.

Focusing on vulnerable families

- Queensland Health is funded to provide a universal and targeted service for families with children aged 0–3 years under the Helping Out Families initiative which aims to enhance the child protection system and the community based services sector to improve support for ‘families who are struggling’. This service is called the Health Home Visiting program.
- The program offers six health contacts (either through home visits, phone or clinic visits) to all parents with children aged 0–3 years. The visits focus on guiding and enhancing the confidence and skills of parents as well as providing health information and education about child development, infant nutrition, sleep and settling, injury prevention, safe infant sleeping and immunisation.
- For families identified as vulnerable and requiring additional support, up to 15 health contacts are offered.
- Since the Health Home Visiting program began, services have been provided for children and families in Logan, Beenleigh, Nerang and the Gold Coast.

The strategic environment

Queensland Health’s response to the national strategic agenda for children includes initiatives described below:

Protecting Children is Everyone’s Business— COAG Framework⁵¹²

- The emphasis of this strategy is on the care and protection of children, young people and their families. Under population health approach, priority is placed on having health and education support available for all families.
- More intensive prevention interventions with a focus on early intervention are provided to families that need additional assistance.
- Tertiary child protection services are a last resort, and the least desirable option for families and governments.
- The Helping Out Families initiative, approved on 30 November 2009, involves a new model of service delivery in the secondary service sector.

Closing the Gap— National Partnership Agreement on Indigenous Early Childhood Development⁵¹³

- This National Partnership Agreement was established to improve the outcomes for Indigenous Australian children in their early years and to contribute to the COAG Closing the Gap targets for Indigenous Australians.
- Queensland Health is implementing a range of programs across the state to provide increased access to culturally competent antenatal care, pre-pregnancy and teenage sexual and reproductive health services for Indigenous people, as well as making it easier for Indigenous families to access and use maternal and child health services. These include:
 - Indigenous health workers who are employed to work in the maternal and infant health, youth and women’s health areas
 - Development and implementation of cessation programs associated with smoking and/or drinking during pregnancy, supporting Indigenous young people to learn more about their sexual and reproductive health, enhancing existing public maternity services, enhancing maternal and child health services across the remote communities of Cape York, and supporting the Deadly Ears program.



Healthy Children—National Partnership Agreement on Preventive Health¹⁸⁰

- The Queensland Healthy Children Implementation Plan includes a comprehensive program to improve the nutrition, physical activity and healthy weight status of Queensland children and young people. A number of initiatives are featured in Chapter 4.
- Strategies are a mix of universal and targeted approaches for specific groups, including disadvantaged and rural and remote populations, for example, the healthy eating and physical activity program for supported playgroups, Have Fun—Be Healthy, and the Good Start Program for Pacific Islander and Maori children.
- The Food for Sport implementation and support package helps Queensland sporting clubs to implement healthy food and drink supply guidelines.
- Current initiatives will be augmented, such as the Smart Choices Healthy Food and Drink Supply Strategy, Healthy Active School Travel program, and outside hours cooking programs for high school students.

Challenges and opportunities ahead

■ Ongoing awareness and commitment from all levels of government and the community is needed to ensure there is public and political understanding of how important the early years are to lifelong health. Clear, evidence based messages about the needs of young children and youth must be available to parents and professionals, particularly in regard to their living environment. This is a central consideration in urban and service planning. The Child Friendly Cities initiative which has commenced in Queensland is just one of the many that focus on the needs of children and youth.⁵¹⁴

Making the care of young children a central consideration means ensuring there are parental leave provisions for parents to care for young children. It is important that adequate funding is allocated to provide family support programs that are flexible and sensitive to cultural and community needs, offer financial, social, emotional and practical support, and are ongoing.

There are equity gaps that are resulting in a poorer start for some children. Greater health risks and poorer outcomes are well known for Indigenous children and continue to challenge

planners and policy makers. The most recent burden of disease and injury analysis provides new data to inform these factors.²⁴ For example, for Indigenous children the burden rate for neonatal conditions was at least double, as was the unintentional injury burden and for acute respiratory infections it was 4 times the rate for non-Indigenous children and accounted for a high proportion of the absolute difference in burden in 0–4 year olds in 2007.²⁴ Socioeconomic gaps begin in childhood and continue throughout life. Lack of affordable oral health care services in disadvantaged areas and remote areas of Queensland is leading to higher hospitalisation rates for dental decay. This is a problem that should be prevented from occurring in the first place, or if treatment is needed it should be affordable and accessible in the primary care setting.

Investment in early childhood is the most powerful investment that a country can make, with returns over the life course many times the size of the original investment according to the WHO.⁵¹¹ The health of children has been a priority in the past and in 2012 this is still so. Investments are designed to ensure that all Queensland children are born healthy and, through safe and supportive places where they live, learn and play, enjoy good health throughout their lives.

Healthy ageing

Good health adds life to years⁵¹⁵

People are living longer. Queenslanders have gained an extra 2.7 years of life on average in the past decade, and over the past 30 years life expectancy has increased by 7 years (8.3 years for males and 5.6 years for females).⁵¹⁶ Life expectancy at age 65 in 2010 was 18.8 years for males and 21.8 years for females, which is similar to national figures.⁶⁴ In 2008–2010, 41% of Queensland males and 57% of females lived to age 85 years. Life expectancy at age 85 in 2010 was 6.1 years for males and 7.1 years for females, again similar to national figures.

In 2011, an estimated 578,000 Queenslanders were aged 65 years and older (13% of the population) and of these, 57% were aged 65–74 years, 31% were 75–84 years and 12% were 85 years and older. The latter age group is one of the fastest growing segments of the population, growing at the rate of 4.4% per year or by about 2,500 people per year since 2000.³⁸ Another age group that has grown very rapidly in the past decade is 60–69 years, by about 16,000 per year. This increase will have a large impact on the future requirement for services to older people. Within the next 10 to 15 years, the number of Queenslanders aged 65 years and older is projected to exceed the number of children aged 0–14 years.

While more people are living longer, their extra years of life need to be lived in good

health. 'Good health adds life to years' was the slogan of World Health Day 2012⁵¹⁵, building on the WHO vision that 'if ageing is to be a positive experience, longer life must be accompanied by continuing opportunities for health, participation and security'.⁵¹⁷

Healthy ageing is largely related to quality of life⁵¹⁸, and this includes physical independence and biological reserve, as well as psychosocial wellbeing and enjoyment of everyday experiences.⁵¹⁹ Because chronic diseases are associated with reduced physical function and poor quality of life, measures aimed at prevention of these conditions are essential. At all stages of life, being physically active, having a healthy diet and not smoking are the best ways to avoid disease and enjoy the benefits of good health. The social environment also plays a part. Social support and participation, education and lifelong learning, peace and protection from violence and abuse all contribute to health and security for older age groups.⁵¹⁷ The factors that will help the whole population, broadly discussed in Chapter 2, will provide the best solutions to keeping people healthy in their older years.⁵²⁰

There are opportunities to improve the health of older Queenslanders, particularly those aged 65–74 years. The major causes of death of 65–74 year olds were cancers of the digestive system including colorectal cancer, coronary heart disease, and cancers of the respiratory system such as lung cancer. These premature deaths could be averted

with greater participation in bowel screening as this can detect abnormalities before cancer develops, monitoring of blood pressure and cholesterol along with weight management to reduce risk of coronary heart disease, and reducing exposure to tobacco smoke as lung cancer is largely a consequence of tobacco smoking. The causes of death change as people age, with coronary heart disease and stroke the dominant causes in those aged 75 years and older.

Falls are very common in older people, with one-quarter of Queenslanders aged 65 years and older having had at least one fall in the previous year and of these one-third required medical attention, 10% were admitted to hospital, and 45% reported multiple falls (see page 44).⁵²¹

The major causes of health disadvantage for older Indigenous Queenslanders were cardiovascular disease, diabetes and chronic respiratory disease. These three conditions combined were responsible for 75% of the excess burden of disease in those aged 65 years and older in 2007, compared to non-Indigenous Queenslanders of the same age.²⁴ There is significant opportunity for prevention of these conditions through lifestyle modifications, focusing on obesity, physical inactivity and smoking.

There are many major and minor conditions which impact on the quality of daily life and wellbeing of people aged 65 years and older. Musculoskeletal conditions are very common, with 47% reporting arthritis and 26% reporting back pain as a long term condition in 2007–08.²¹ More than half (55%) reported a circulatory disease with hypertensive conditions reported by 34%. Diabetes was common (15%), as was asthma (13%). Many older people reported sight problems, with 59% long sighted, 36% short sighted, and 13% having cataracts. About one-third (35%) reported deafness. Addressing these issues within the community and building the social and structural supports to enable people to minimise the impact of these conditions is likely to add quality to years for older Queenslanders.

Positively Ageless, the Queensland Seniors Strategy 2010–20, recognises that finding the best ways to prevent disease, illness and injury and promote good health must be central to planning for healthier later years.⁵²² A multi-factor and multi-strategy whole of government approach in partnership with communities and individuals is necessary to support the healthy ageing of Queenslanders.



Achieving and sustaining gains in Indigenous health

Improving the health outcomes of Indigenous Queenslanders will require the ongoing support of all levels of government, the energy and engagement of Aboriginal and Torres Strait Islander communities to bring about the change that will deliver such outcomes and the expectation of Australian society that change is both possible and necessary. It will require a 'health system that promotes social inclusion and reduces disadvantage, especially for Indigenous Australians'.⁴⁰ In doing so, the system needs to provide access to reliable, culturally effective, secure and sustainable health services that are coordinated and integrated across the healthcare continuum. Furthermore, access to high quality primary healthcare is considered fundamental to achieving change.⁵²³ The Queensland

Government is committed to 'Making Tracks towards reducing the gap in health outcomes for Indigenous Queenslanders by 2033' (Making Tracks).¹¹⁴ Five priorities are key to achieving the 2033 goals: a healthy start to life, addressing risk factors, managing illness better, providing effective health services and improving data and evidence.

This report uses existing epidemiological data and associated evidence to identify some of the opportunities to improve the health of Indigenous Queenslanders and to highlight the challenges ahead. Preceding chapters include the most recent data on the current health status and risk behaviours of Indigenous and non-Indigenous Queenslanders (chapters 3 and 5). The first full analysis of the burden of disease and injury for Indigenous Queenslanders was completed in 2012, and is reported in brief on page 24.²⁴ This will be an important source of information in the coming years. While behavioural and physiological risk factors may explain some of the poorer outcomes, it is recognised that the causes of these risk factors are indeed complex and deeply embedded and while a detailed assessment is not within the scope of this report, they are broadly discussed in Chapter 2.

In this section, four key challenges and opportunities to improve health outcomes for Indigenous Queenslanders are identified:

- high level of some critical chronic disease risk factors
- getting a healthy start—the importance of the primary care setting
- higher hospitalisation burden
- effectiveness of the hospital stay.

Primary prevention services will reduce risk and promote better health for Indigenous Queenslanders. Reducing rates of tobacco smoking will generate a substantial gain in closing the life expectancy gap (currently 8.9 years for females and 10.4 years for males), with recent analysis showing smoking is independently responsible for about 20% of the gap (page 90).^{22,140} Smoking rates among Indigenous Queensland adults are substantially higher than the non-Indigenous population—44% of Queensland's Indigenous people aged 15 years and older were current smokers, compared with 24.5% of the Queensland population in a national study.^{367,368} Smoking rates for Indigenous women during pregnancy are unacceptably high and continue to undermine health outcomes of Indigenous infants—53% of Queensland Indigenous women were smoking at some time during their pregnancy, compared with 15% of non-Indigenous

women in 2010. However, there has been a steady reduction in the proportion of Indigenous women who smoke after 20 weeks, from 53% in 2006 to 44% in 2012, a 15% decline in six years (Table 1, page 4).²³ Exposure to second-hand smoke is higher among Australia's Indigenous children although gains are being made. Indigenous Australian children were 3 times as likely to be living in a household with a daily smoker who smoked inside the home as non-Indigenous children (21% compared with 7%) in 2004–05.²⁴⁰

A significant amount of the burden of disease and premature mortality for Indigenous Queenslanders is due to smoking, but they also have a higher prevalence of many other chronic disease risk factors that lead to higher rates of many diseases and hospitalisation as described throughout Chapter 3. Rates of adult obesity are about double among Indigenous Queensland adults compared to their non-Indigenous counterparts (page 67), risky drinking is about double (page 97), rates of no fruit or vegetable consumption are about double, and full cream milk consumption is about 50% higher (page 77). A small number of the many interventions to address these issues are featured in Chapter 4. Achieving gains for Indigenous Queenslanders requires sustained delivery of prevention services, at a level sufficient to generate change.

Getting a healthy start is a priority of Making Tracks.¹¹⁴ The health of mothers and babies is dependent on comprehensive primary care services. There are some encouraging signs that such care is delivering benefits. The infant mortality rate is decreasing—by 4.0% per year between 2000 and 2009 for Indigenous Queenslanders, compared to 1.8% per year for non-Indigenous Queenslanders.²³ In 2010, 3 out of 4 Indigenous Queensland women (78%) had at least five antenatal visits during their pregnancy, although 95% of non-Indigenous mothers did so. Breastfeeding is being supported, with 86% of newborn Indigenous infants receiving some breast milk in the 24 hours prior to discharge compared to 92% of non-Indigenous infants in 2010.²³ However, challenges remain. There has been no change in the proportion of low birth weight Indigenous infants over the past 20 years and no change in the gap between Indigenous and non-Indigenous birth weight outcomes, 11.6% compared with 6.4% of non-Indigenous infants.²³ Despite 90% of Indigenous women receiving advice about smoking during pregnancy, about half smoked throughout their pregnancy and only about 1 in 7 quit before 20 weeks



gestation.²³ Strengthening the primary care setting to support mothers and infants and their families through the early years will help make inroads into reducing the gap and is discussed on page 122.

While primary prevention and primary healthcare is essential, effort is also required to improve the quality of appropriate admitted and non-admitted services for Indigenous Queenslanders and make it easier for them to access these services. Ensuring the patient journey is an effective and positive experience is necessary to achieve sustained health gains, especially when early treatment may prevent the condition worsening and prevent further hospitalisations and potentially early death.

Indigenous Queenslanders have higher hospitalisation rates for a number of key conditions and rates are often higher in regional and remote areas than in major cities. For example, over the past two years (2009–10 to 2010–11) hospitalisation rates for Indigenous Queenslanders were comparatively higher:

- All causes: 2.1 times the non-Indigenous rates
- Coronary heart disease: 2.3 times the non-Indigenous rates (2.1 times for males, 2.9 times for females), and varied from 1.8 times in major cities to 3.3 times in remote areas
- Stroke: 2.1 times the non-Indigenous rates (1.8 times for males and 2.4 times for females), and varied from no difference in major cities to 2.1 times in regional areas and 3.3 times remote areas
- Diabetes as principal diagnosis: 4.4 times the non-Indigenous rates (3.8 times for males and 5.1 times for females), and varied from 2 times in major cities to 4 times in regional areas and 7.8 times in remote areas
- Diabetes as additional diagnosis: 6.6 times the non-Indigenous rates (6.2 times for males, 7.3 times for females) and varied from 4.7 times in major cities to 9.7 times in inner regional areas, 6.3 times in outer regional areas, 10.8 times in remote areas and 6.7 times in very remote areas
- Dialysis: 9.6 times the non-Indigenous rates (8.6 times for males, 11 times for females)
- Renal failure: 5.4 times the non-Indigenous rates (4.3 times for males and 6.8 times for females)
- Potentially preventable hospitalisations: 2.9 times the non-Indigenous rates, representing about 5,000 excess hospitalisations in 2007–08.



The goal is not necessarily to reduce the rates of hospitalisation, rather to reduce the incidence and prevalence of preventable diseases that necessitate hospitalisation, and to ensure that the hospital stay is effective in treating the underlying health condition. Focusing on the key risks of smoking, nutrition and physical activity is an important step, alongside the more complex programs to address the influential social and economic factors that continue to challenge Indigenous communities.

There is a growing body of evidence that indicates that despite being hospitalised at twice the rate of the non-Indigenous population (page 26), the patient journey for Indigenous Queenslanders is not as effective as it could be. Indigenous Queenslanders receive significantly fewer diagnostic tests and medical or surgical procedures than non-Indigenous Queenslanders.⁵²⁴ Between July 2006 and June 2008, a procedure was reported for 54% of hospitalisations of Indigenous people compared with 80% for non-Indigenous people.⁵²⁵ This is also evident in Medicare expenditure data which shows that the rate of utilisation of some services, such as specialist referrals, imaging, allied health and dental services, was 40% lower for Indigenous Australians than other Australians and similarly PBS spending per head was 40% lower (page 19).¹²⁵

On admission to hospital, Indigenous Queenslanders are also more likely to have presented significantly later in the course of their illness and with a greater number of co-morbidities for other conditions (particularly chronic diseases). This adds to the complexity of the healthcare required. In view

of this additional complexity, it is expected that Indigenous Queenslanders would have significantly longer stays and would use more hospital services (diagnostic tests and procedures). However, in 2010–11, the average length of stay for Indigenous Queenslanders was shorter than for non-Indigenous Queenslanders, 2.67 days compared with 3.25 days, where this excluded hospitalisations for renal failure but included overnight as well as same-day hospitalisations.

In Queensland, discharge against medical advice was 3.4 times higher for Indigenous people compared to the general Queensland population.⁵²⁵ This higher rate shows that culturally effective inpatient service delivery for Indigenous Queenslanders has not yet been achieved. In addition, discharge against medical advice is an adverse health event, which can result in re-presentation for post-discharge complications.

Effort to improve the inpatient experience for Indigenous Queenslanders is a primary focus under Making Tracks. Facilitating access to hospital and specialist services through additional transport, accommodation and hospital liaison services is integral to improving the quality of the inpatient experience, increasing access to tests and procedures where appropriate, and reducing discharge against medical advice.

Improving the nutritional quality of the food supply

The most critical health challenge for Queenslanders is the 'unstoppable juggernaut of obesity'.¹⁸¹ Many nations are confronted with this same challenge as the availability of energy-dense, nutrient-poor foods becomes more prevalent and as lifestyles become increasingly more sedentary. While improving the level of physical activity is good for health and will help manage energy balance and assist with weight control, it is not the primary solution to the obesity problem across the whole population.¹⁸¹ Addressing food issues is the most important way to arrest the obesity epidemic as we are seeing a commercial drive to market unhealthy foods everywhere.

A full assessment of the total impact of poor nutrition including over consumption of energy has not been undertaken anywhere in the world. However, in a preliminary assessment in 2007, it was estimated that diet related risk factors, including physical inactivity, caused 16% of the total burden of disease and injury in Queensland and inadequate fruit and vegetable intake alone caused 2.2%.⁸⁸ Overweight and obesity, as defined by high body mass, was responsible for 8.5% of the burden.

The food we consume is necessary for life—it is the sole source of nutrients and energy needed to build and repair cells and organs, and to fuel muscles and body functions. The amount and type of food we eat has a major influence on our health. Good nutrition contributes to quality of life, helps maintain body weight, protects against infections, and reduces the risk of chronic disease and premature death. Improving the eating patterns of Queenslanders will go a long way towards addressing the obesity epidemic. The NHMRC Dietary Guidelines for Australians provides the most up-to-date evidence based advice on the food and nutrition needs of adults, infants, children and adolescents.¹⁰

Food choices are dependent on the availability, affordability and accessibility of quality, nutritious food items, so it is important to ensure that the highest quality, most nutritious food is available to all Australians. While most Queenslanders enjoy the benefits of easy access to healthy food, there are some who do not, particularly those in remote or socioeconomically disadvantaged areas. Furthermore, for some people, lack of knowledge, price barriers, lack of incentive or awareness, inability to access fresh quality food and the availability and promotion of inexpensive, processed foods that are high in fat, sugar and salt, are challenges to healthy eating and good health.

It is the right of individuals to make lifestyle and food choices. However, as is evident throughout this report, the aggregate consequences of these individual choices of what we eat, how active we are, whether we smoke or drink to excess, result in preventable disabilities and early death. Changing living conditions and the food environment of communities, workplaces, schools and sporting clubs to support people to make better choices and enjoy better health is needed. This will have to be combined with changes to the food supply which is defined as the system by which food is made available to consumers, including production, processing, transport, storage, wholesaling and retailing of food items.⁵²⁶ These factors all play a part and present strategic opportunities to make a difference in Queensland. Politicians, governments, industry and community will need to embrace change if the obesity problem is to be addressed in our lifetime and to improve the quality of food available in Queensland. For example, without change and based on the current trajectory, 75% of adult Queenslanders will be overweight or obese by 2030, and the advances in life expectancy we have enjoyed for decades will be reversed.^{527,528}

The OECD in collaboration with the WHO has examined the cost effectiveness of interventions to tackle unhealthy lifestyles particularly those that relate to poor diet and physical inactivity which are the fundamental causes of obesity.⁵²⁹

- Most prevention interventions assessed by the OECD have favourable cost-effectiveness ratios relative to treating diseases once they emerge. Prevention can improve health and quality of life,

with a cost-effectiveness that is as good as, or better than, that of many accepted forms of healthcare.

- Primary care counselling and healthy lifestyle programs for individuals at risk due to unhealthy behaviours can be very effective but are expensive, with costs exceeding health expenditure savings by a large margin. However, the health benefits are significant and the OECD recommends that health authorities use this approach with careful targeting.
- The most cost-effective interventions are outside the health sector. These include food labelling, fiscal measures and reducing advertising of unhealthy products. Fiscal measures such as taxing unhealthy foods and subsidising the cost of fruit and vegetables could generate larger health gains than most other interventions in the short and the long term. However, such measures are complex to design and enforce; their impact may be unpredictable as the effects vary across individuals and population groups; unexpected substitution effects may occur, potentially increasing inequality.
- School based programs may have modest effects on health outcomes and may take 50 years to be realised. Government regulation of food advertising is estimated to have slightly larger effects within a similar timeframe but at substantially lower cost.
- Strategies combining multiple interventions exploit synergies between interventions, and may be up to twice as effective as the single most effective intervention, at a comparable cost-effectiveness ratio.



to address obesity and enhance health and wellbeing



There are opportunities and options to improve the quality, affordability and availability of the food supply in Queensland, through action at a state and national level. These are broadly described here, although specific examples of programs currently implemented are included in Chapter 4.

Improving healthy food access and availability

Environmental influences, such as higher prices and poorer access to healthy food may add to the burden of obesity and chronic disease experienced by those in more socioeconomically disadvantaged and remote areas, including Indigenous people. Price has been identified as the most important factor in food purchasing decisions. Queensland Health has been conducting the statewide Healthy Food Access Basket (HFAB) survey since 1998, which monitors the price and availability of basic healthy food items throughout Queensland.¹⁶ In 2010, the cost of the basket in very remote areas was 26% higher than in major cities. The cost of healthy food items such as fruit, vegetables and legumes was 35% higher in remote areas than major cities, while the cost of items considered less healthy was only 14% higher.

Subsidising healthy foods is one way of improving access and affordability, but there are currently no food subsidies in place in Queensland, nor are there any formal freight subsidies in recognition that Queensland is a very decentralised state. There are, however, stores and store groups that reduce margins and subsidise freight on some lines such as fresh fruit and vegetables by cost shifting within the store. Where store infrastructure has been improved, and where store nutrition policies apply, the turnover of vegetables and fruit has increased. Queensland Health was the major instigator of a remote stores improvement project aimed at addressing identified leverage points to improve the nutritional quality of foods provided in remote Indigenous community stores.

It is increasingly being recognised that local councils have the opportunity to positively influence the eating behaviour of their residents through creating supportive environments. The Active Healthy Communities resource package (Chapter 4) encourages local councils to improve access to healthy food options through planning for a diverse range of healthy eating venues, improving infrastructure and transport options to connect the community with supermarkets and farmers' markets, and supporting communities to establish community gardens and food cooperatives.

Continuing to support schools, sporting clubs and workplaces to improve healthy choices

The Smart Choices, Healthy Food and Drink Supply Strategy for Queensland schools was introduced and fully implemented by 1 January 2007.³²¹ The first priority of the strategy was designed to limit the sale and supply of nutritionally poor food (designated red) to no more than two occasions per term. The second priority was to encourage and promote green food and drinks (categorised on high nutritional value), and for those with lower nutritional value (amber) to be used sparingly throughout the term. The strategy was designed to include all areas of the school environment including canteens, classrooms, school camps, events and breakfast programs. An evaluation of the program showed high levels of priority one implementation, that is, the limiting of red food and drinks, and substantial implementation of the green and amber food and drinks.³²³ Although there are areas for improvement, the program has contributed to a better nutritional culture within schools. Further support for the implementation

of Smart Choices is being provided in 2011–2015 through the National Partnership Agreement on Preventive Health.

Similarly, A Better Choice was implemented in Queensland Health facilities to improve access to healthy foods and reduce access to nutritionally poor foods and drinks to make healthier choices easier for Queensland Health staff, visitors and the general public. An evaluation conducted in 2009 showed that most facilities (78%) reported implementation of more than half of the requirements of the strategy, and 25% reported full strategy implementation. About 20% of facilities had implemented less than half the requirements, and less than 2% had not implemented any part of the strategy. This is encouraging progress but there are improvements yet to be achieved.

The program Food for Sport: A Guide to Healthy Food and Drink Supply in Queensland Sporting Clubs provides voluntary guidelines to assist Queensland sporting clubs in improving their food and drink supply. A baseline survey in 2011 of 181 Queensland sporting clubs indicated that food and drink supply in sporting clubs is dominated by energy-dense, nutrient-poor items. Development and delivery of an accreditation and support system along with nutrition training and resources are being provided in 2011–2015 through the National Partnership Agreement on Preventive Health.

Improving the nutritional content of certain food products

The Australian Government acknowledges the need to assist Australians in modifying risk behaviours, such as poor dietary habits, that contribute to preventable chronic diseases. It was evident from a national survey of Australian children in 2007 that the consumption of salt and saturated fat was too high and consumption of fruit and vegetables, too low. In response to this, the Food and Health Dialogue was established to take action on food innovation, including a voluntary reformulation program across a range of commonly consumed food items.⁴⁴⁴ The reformulation program aims to reduce the saturated fat, added sugar, salt and energy, and increase the fibre, wholegrain, fruit and vegetable content across nominated food categories (see also page 81).

Nutrition Facts	
Serving Size 1/2 cup (54 grams) (makes about 1 cup prepared)	
Servings per Container about 12 about 2 servings (cups) per bag 6 bags per container	
Amount Per Serving	As Packaged
Calories	190
Calories from Fat	0
% Daily Value*	
Total Fat 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 0mg	0%
Total Carbohydrate 43g	14%
Dietary Fiber 0g	0%
Sugars 0g	
Vitamins	

Reformulation targets will be set at challenging levels to deliver real benefits to Australian consumers, while at the same time recognising technical and safety constraints. The reformulation program will be supported where appropriate by activities aimed at reducing and standardising portion sizes and by improving consumer education and awareness of healthier food choices.

Using food labelling and point of sale strategies to assist people to make informed choices

Currently, food labels are often difficult to read and understand, while health claims on labels can be misleading, and consumers may not be able to translate the information into meaningful knowledge for their specific needs. A national assessment of food labelling, including law and policy considerations, has been undertaken and a number of recommendations put forward.³¹² The objective of these detailed comprehensive recommendations is to improve the presentation, relevance and

validity of the information on food labels to ensure consumers are more easily able to make sound choices for healthy eating.

Policy based population-wide interventions such as traffic-light nutrition labelling are likely to offer excellent value for money as obesity prevention measures. Introducing the display of kilojoule information at the point-of-sale in food outlets has also been recognised in Australia as one approach to help consumers make informed choices when purchasing foods and drinks and has been implemented in New South Wales, Australian Capital Territory and South Australia.

Implementing advertising regulatory measures to support healthy choices

The WHO, among other authoritative health bodies, has found the evidence on food advertising and children's health sufficiently compelling to recommend action on junk food advertising to children. Despite industry-led initiatives to reduce children's exposure to the marketing of energy-dense, nutrient-poor food and beverages in Australia, there is more work needed to reduce the rate of childhood obesity. As a result of a national seminar on food advertising to children held in May 2012, a partnership between the Australian Government and the food industry will develop a monitoring and surveillance framework to measure and reduce children's exposure to the marketing of food and beverages which are high in energy, fat, sugar and salt (page 81).

Using taxes to support healthy choices

Although a number of countries have taxation schemes targeted at unhealthy foods, there is no conclusive data available as to whether these policies lead to an overall change in dietary habits and a reduced risk of obesity. One possible option is to apply a tax to

well-recognised categories of food such as snack foods or soft drinks as has been done in France and Hungary. An alternative option is to apply a tax to food based on nutrient content, for example fat, sugar or salt—trialled in Denmark as a 'fat tax'. Pricing of food is complex and requires broad policy discussions before implementation of any taxation scheme.

Establishing healthy public policy to improve the food supply

At a national level, the Australian Government has recognised the importance of a strategic approach to improving nutrition by the development of a National Nutrition Policy by 2013, to be complemented by the National Food Plan which has a focus on enhancing Australia's food system, including reducing barriers to a nutritious food supply and food security for all Australians. The Queensland Food Policy, introduced in November 2011, highlights the importance of improving the food supply by including a focus on industry partnerships to enhance access to fresh, affordable produce in regional and rural communities, implementing national reformulation targets and ensuring foods align with national dietary recommendations.

Turning the tide of the epidemic of obesity and chronic disease requires fundamental change in the social norms that regulate individual and collective behaviours, requiring wide-ranging prevention strategies that address multiple determinants of health across a range of population groups. Improving the nutritional quality and quantity of the food we eat and increasing physical activity will reduce chronic disease, improve productivity and enhance wellbeing and quality of life. However, just as there is no smoking gun responsible for the obesity epidemic, so there is no silver bullet.³²⁹ Concerted long term multi-strategy responses will be required to achieve success.



Terminology, definitions and abbreviations

ABS (Australian Bureau of Statistics): Australia's official statistical organisation and a statutory authority⁵³⁰

Aboriginal and Torres Strait Islander populations: referred to as 'Indigenous Queenslanders' or 'Indigenous Australians' except where there is reference to either population separately

Adults and age groups: adults are persons aged 18 years and older. Unless otherwise specified, all data in this report refer to the whole population, that is, those aged 0–85+ years.

AIHW (Australian Institute of Health and Welfare): major agency for health and welfare statistics and information⁵³¹

Avoidable death: deaths considered avoidable at the present time given available knowledge^{532,533}

BMI (body mass index): measure correlated closely with body density and skinfold thickness, calculated as BMI = weight (kg)/height (m) squared⁵³⁴

CHD (coronary heart disease): most common form of cardiovascular disease⁵³⁵

Chronic disease: diseases of long duration and generally slow progression.⁵³⁵ In this report, chronic disease refers to all non-communicable disease and excludes injuries, unless otherwise specified.

CI (confidence interval): in general, a range of values expected to contain the true value 95% of the time (95% CI)

COAG (Council of Australian Governments): peak Australian intergovernmental forum comprising the Prime Minister, state premiers, territory chief ministers and the Australian Local Government Association president⁵³⁶

COPD (chronic obstructive pulmonary disease): term to describe chronic lung diseases that limit lung airflow, and includes emphysema and chronic bronchitis⁵³⁷

CVD (cardiovascular disease): term for all medical conditions affecting the heart or blood vessels, including coronary heart disease, stroke, peripheral arterial disease and some types of kidney disease.⁴³³

Decay experience: number of decayed, missing or filled teeth termed dmft in deciduous teeth, and DMFT in permanent teeth

DALY (disability adjusted life year): measure of overall burden of disease and injury, where the DALY for a disease or condition is the sum of the YLL and YLD⁴²⁸

Demographic data: Population data are based on ABS statistical releases and cited in the methods report.⁶²

Disability: temporary or long-term reduction of a person's capacity or function⁵³⁴

GDP (gross domestic product): equivalent to total national expenditure plus exports of goods and services minus imports of goods and services⁵³⁸

Hospitalisations: is the term used for the total number of separations in all hospitals (public and private) that provide acute care services. A separation is an episode of care which can be a total hospital stay (from admission to discharge, transfer or death) or a portion of a hospital stay ending in a change of status (for example from acute care to rehabilitation).⁵³⁹ About 98% of admissions comprise only one episode of care. Unless otherwise indicated all hospitalisation data refers to principal diagnosis only.

ICD (International Classification of Diseases): standard classification of specific conditions and groups of conditions determined by an internationally representative group of experts⁵³⁴ and used for health records

Incidence: number of new health-related events (for example, illness or disease) in a defined population in a defined period of time⁵³⁴

Infant mortality rate: number of deaths of children under 1 year of age in one calendar year per 1,000 live births in the same calendar year⁵³⁴

Illicit drug use: includes the use of illegal drugs, non-medical use of pharmaceutical drugs and misuse of substances (as listed page 8)³⁷

Life expectancy: average number of additional years a person of a given age and sex might expect to live if the age-specific death rates of the given period continued throughout their lifetime⁶⁵

Neonatal death: death of any child born alive who died within 28 days of birth⁵⁴⁰

NHMRC (National Health and Medical Research Council): Australia's leading body promoting development and maintenance of public and individual health standards⁵⁴¹

Notifications: reports of specified health conditions to government by medical practitioners, pathology laboratories and hospitals. In Queensland, this is legislated by the *Public Health Act 2005*.

National Partnership Agreement on Preventive Health: an agreement between the Commonwealth of Australia, and the states and territories to reform Australia's efforts in preventing lifestyle risks for chronic disease¹⁸⁰

Odds: the probability of occurrence of an event divided by the probability of non-occurrence.⁵³⁴ For uncommon events, the odds (or odds ratio) is similar to the relative risk. In general in this report, the term 'odds' is used for events with probability greater than approximately 20% and 'likelihood' or 'risk' when it is lower.

OECD (Organisation for Economic Co-operation and Development): is a group of 34 member countries using information to help governments foster prosperity and fight poverty through economic growth and stability.⁵⁴² Australia became a member in 1971.

Perinatal mortality rate: is the annual number of perinatal deaths per 1,000 births. Perinatal deaths include all fetal and neonatal deaths of at least 400 grams birth weight or at least 20 weeks gestation.⁵⁴³

PPHs (potentially preventable hospitalisations): admissions to hospital that potentially could have been prevented through the provision of appropriate non-hospital health services.

Premature death: in this report, refers to a death that occurs before the age of 75 years

Prevalence: a measure of disease occurrence or disease frequency, often used to refer to the proportion of individuals in a population who have a disease or condition.⁵³⁴

Psychological distress (risk of): is assessed using the Kessler 10 Scale (K10) which is a scale of non-specific psychological distress based on 10 questions about negative emotional states in the four weeks prior to interview.⁵⁴⁴

Public health expenditure: Public health covers those activities that aim to prevent illness and injury and protect or promote the health of the whole population, or of specified population subgroups. It includes expenditure for communicable disease control, organised immunisation, selected health promotion, environmental health, food standards and hygiene, breast and cervical screening programs, prevention of hazardous and harmful drug use and public health research.⁴⁵

Rates: refers to a measure of the frequency of the occurrence of an event or phenomenon in a defined population in a specified period of time.⁵³⁴ To facilitate comparisons between various populations with different age structures (or the same population over time), rates are often adjusted for the age structures by relating them to a standard population. This is termed age-standardisation. In this report, the standard (or reference) population is the 2001 Australian population. Unless otherwise specified, age-standardised rates are generally presented. Notable exceptions are for the prevalence of risk and protective factors, for which population-weighted rates are presented, and notifications of communicable diseases, for which crude (unadjusted) rates are presented.

Relative survival rate: a survival rate adjusted for other independent causes of death⁵³⁴

Significant: a term used in this report to reflect a level of importance as well as statistical difference. In the context of statistical difference, non-significant results are described with terms such as 'similar', 'stable' or 'no difference'. In this report statistical significance is based on non-overlap of 95% confidence intervals.

Survival rate: the proportion of persons in a specified group alive at the beginning of the time interval (for example, a five-year period) who survive to the end of the time interval⁵³⁴

WHO (World Health Organization): directing and coordinating authority for health in the United Nations system⁵⁴⁵

YLD (years of life lost due to disability): measure of burden of disease and injury, capturing the future loss of healthy years of life from new cases of conditions¹²⁸

YLL (years of life lost due to premature mortality): measure of burden of disease and injury, calculated as the number of deaths multiplied by the standard life expectancy at the age at which death occurs¹²⁸

References

1. Australian Institute of Health and Welfare. *Health and expenditure Australia 2010-11*. AIHW: Canberra; 2012.
2. Queensland Health. *Self reported health status 2011: natural disasters and health, Queensland*. Queensland Health: Brisbane; 2011.
3. Queensland Health. *Self reported health status 2011 and child health status 2011: overweight and obesity, Queensland*. Queensland Health: Brisbane; 2011.
4. Queensland Health. *Self reported health status 2012: Health indicators: chronic disease and behavioural risk factors, Queensland*. Queensland Health: Brisbane; 2012.
5. Queensland Health. *Infant nutrition survey*. Queensland Health: Brisbane; 2008.
6. National Health and Medical Research Council. *Australian guidelines to reduce health risks from drinking alcohol*. NHMRC: Canberra; 2009.
7. Queensland Health. *Self reported health status 2011: fruit and vegetable consumption and factors associated with intentions to increase consumption, Queensland*. Queensland Health: Brisbane; 2011.
8. Queensland Health. *Self reported health status 2011: physical activity levels and factors associated with intentions to increase physical activity*. Queensland Health: Brisbane; 2011.
9. Collins DJ, Lapsley HM. *The costs of tobacco, alcohol and illicit drug abuse to Australian society in 2004-05*. Commonwealth of Australia: Canberra; 2008.
10. National Health and Medical Research Council. *Australian dietary guidelines incorporating the Australian guide to healthy eating. Draft for public consultation. December 2011*. NHMRC; 2011.
11. Queensland Health. *Child health status 2011: Queensland report*. Queensland Health: Brisbane; 2011.
12. Queensland Health. *Smoking and alcohol in Queensland 2010: analysis of the national drug strategy household survey (AIHW)*. Queensland Health: Brisbane; 2012.
13. Chrisopoulos S, Beckwith K, Harford JE. *Oral health and dental care in Australia: key facts and figures 2011*. Cat. no. DEN 214. AIHW: Canberra; 2011.
14. Doll R, Peto R, Boreham J, Sutherland I. Mortality in relation to smoking: 50 years' observations on male British doctors. *British Medical Journal* 2004;328:1519.
15. Department of Health and Ageing. *The dangers of passive smoking*. DoHA: Canberra.
16. Queensland Health, Queensland Treasury. *The 2010 healthy food access basket (HFAB) survey*. Brisbane; 2012.
17. Australian Institute of Health and Welfare. *2010 National drug strategy household survey report*. Drug statistics series no. 25. Cat. no. PHE 145. AIHW: Canberra; 2011.
18. The Social Research Centre. *Australian National Preventive Health Agency research to inform key performance indicators for the 2011-2015 ANPHA strategic plan: baseline findings*. Final report. August 2011. 2012.
19. Powers JR, Loxton DJ, Burns LA, Shakeshaft A, Elliott EJ, Dunlop AJ. Assessing pregnant women's compliance with different alcohol guidelines: an 11-year prospective study. *The Medical Journal of Australia* 2010;192:690-693.
20. Queensland Health. *Sun safety in Queensland 2011*. Factsheet. Queensland Health: Brisbane; 2011.
21. Australian Bureau of Statistics. *National health survey: summary of results; state tables 2007-2008 (reissue)*. Queensland. Cat. no. 4362.0. ABS: Canberra; 2011.
22. Yuejen Z, Wright J, Begg S [in press]. Decomposing Indigenous life expectancy gap by risk factors: a life table analysis. *Population Health Metrics* 2012.
23. Queensland Health. *Perinatal data collection*. Unpublished data. Queensland Health: Brisbane; 2012.
24. Queensland Health. *The burden of disease and injury in Queensland's Aboriginal and Torres Strait Islander peoples 2007*. Unpublished data. Queensland Health: Brisbane; 2012.
25. Hyland A, Borland R, Li Q, Yong H-H, McNeill A, Fong GT, et al. Individual-level predictors of cessation behaviours among participants in the International Tobacco Control (ITC) four country study. *Tobacco Control* 2006; 15:iii83-iii94.
26. Department of Health and Ageing. *An active way to better health*. National physical activity guidelines for adults. Publication no. PHY 09. DoHA: Canberra; 2005.
27. Queensland Health: Jardine A, Endo T, Watson M, Bright M, Macleod S-L. *Death and hospitalisation rates by country of birth in Queensland #6: discussion and summary of report series*. Country of birth data analysis report no. 6. Queensland Health: Brisbane; 2011.
28. Armfield JM, Spencer AJ. *Dental health behaviours among children 2002-2004: the use of fluoride toothpaste, fluoride tablets and drops, and fluoride mouthrinse*. Cat. no. DEN 215. AIHW: Canberra; 2012.
29. Department of Health and Ageing. *Active kids are healthy kids. Australia's physical activity recommendations for 5-12 year olds*. Publication no. PHY 06. DoHA: Canberra; 2004.
30. Department of Health and Ageing. *Get out and get active. Australia's physical activity recommendations for 12-18 year olds*. Publication no. PHY 07. DoHA: Canberra; 2004.
31. Brown WJ, Moorhead GE, Marshall AL. *Choose health: be active: a physical activity guide for older Australians*. Commonwealth of Australia and the Repatriation Commission: Canberra; 2005.
32. World Health Organization. *Supplement: constitution of the World Health Organization*. In: Basic documents. 45th ed. Geneva: WHO; 2006.
33. Australian Institute of Health and Welfare. *Health and the environment: a compilation of evidence*. Cat. no. PHE 136. AIHW: Canberra; 2011.
34. Lloyd D, Newell S, Dietrich U. *Health inequity: a review of the literature*. Health Promotion Unit, Population Health & Planning Directorate, Northern Rivers Area Health Service; 2004.
35. Wilkinson R, Marmot M [editors]. *Social determinants of health: the solid facts*. WHO: Geneva; 2003.
36. National Advisory Committee on Health and Disability. *The social, cultural and economic determinants of health in New Zealand: action to improve health*. NACHD: Wellington; 1998.

37. Mikkonen J, Raphael D. *Social determinants of health: the Canadian facts*. York University School of Health Policy and Management: Toronto; 2010.
38. Australian Bureau of Statistics. *Australian demographic statistics*. Cat. no. 3101.0. ABS: Canberra; 2012.
39. Queensland Health. *Queensland Health strategic plan 2012-2016*. Available: http://www.health.qld.gov.au/about_qhealth/strategic.asp. Accessed 2 Oct 2012.
40. Council of Australian Governments. *National healthcare agreement*. COAG: Canberra; 2009.
41. Centers for Disease Control and Prevention. *The power of prevention: reducing the health and economic burden of chronic disease*. US Department of Health and Human Services: Atlanta; 2003.
42. World Health Organization. *Preventing chronic diseases: a vital investment*. WHO: Geneva; 2005.
43. Queensland Government. *Statement of government health priorities*. Available: http://www.health.qld.gov.au/hhsserviceagreement/docs/health_priorities.pdf. Accessed 25 Jul 2012.
44. Goss J. *Projection of Australian health care expenditure by disease, 2003 to 2033*. Cat. no. HWE 43. AIHW: Canberra; 2008.
45. Australian Institute of Health and Welfare. *Health expenditure Australia 2009-10*. Cat. no. HWE 55. AIHW: Canberra; 2011.
46. Cadilhac DA, Magnus A, Sheppard L, Cumming TB, Pearce DC, Carter R. *The societal benefits of reducing six behavioural risk factors; an economic modelling study from Australia*. BMC Public Health 2011;11:483.
47. Queensland Cancer Registry, Cancer Council Queensland. *Cancer in Queensland 1982-2009. Incidence, mortality, survival and prevalence*. Cancer Council Queensland: Brisbane; 2012.
48. Australian Institute of Health and Welfare. *Health system expenditure on disease and injury in Australia, 2004-05*. Cat. no. HSE 87. AIHW: Canberra; 2010.
49. Access Economics. *The growing cost of obesity in 2008: three years on*. Report prepared for Diabetes Australia. Access Economics Pty Limited; 2008.
50. Access Economics. *Economic Impact of COPD and cost effective solutions. Report prepared for the Australian Lung Foundation*. Access Economics Pty Limited; 2008.
51. World Health Organization. *Tobacco*. Fact sheet no. 339. WHO; 2012.
52. Steering Committee for the Review of Government Service Provision. *Report on government services 2012*. Productivity Commission: Canberra; 2012.
53. Ferlay J, Shin HR, Bray F, Forman D, Mathers C, Parkin DM. GLOBOCAN 2008 v1.2, cancer incidence and mortality worldwide: IARC CancerBase no. 10; International Agency for Research on Cancer: Lyon, France; 2010. Available: <http://globocan.iarc.fr>. Accessed 13 Jul 2012.
54. Queensland Government. *Cancer in Queensland 2012*. A statistical overview. Queensland Health: Brisbane; 2012.
55. Baade PD, Meng X, Sinclair C, Youl P. Estimating the future burden of cancers preventable by better diet and physical activity in Australia. *Medical Journal of Australia* 2012;196:337-340.
56. Queensland Treasury and Trade. *Census 2011: Aboriginal and Torres Strait Islander population in Queensland*. Office of Economic and Statistical Research: Brisbane; 2012.
57. Australian Bureau of Statistics. *2011 census counts-Aboriginal and Torres Strait Islander peoples*. Cat. no. 2075.0. ABS: Canberra; 2012.
58. Queensland Treasury and Trade. *Population growth highlights and trends, Queensland 2012*. Queensland Treasury and Trade: Brisbane; 2012.
59. Queensland Treasury and Trade. *Population: rebased estimates, Queensland 2007 to 2011*. Office of Economic and Statistical Research: Brisbane; 2012.
60. Queensland Government. *Queensland Government population projections to 2056: Queensland and statistical divisions*. Queensland Government: Brisbane; 2012.
61. Queensland Treasury and Trade. Office of economic and statistical research. Available: <http://www.oesr.qld.gov.au/>. Accessed 21 Aug 2012.
62. Queensland Health. *Methods for reporting population health status in Queensland. Release 2: 2012*. Queensland Health: Brisbane; 2012.
63. Australian Bureau of Statistics. *Customised report for Queensland Health*. ABS: Canberra; 2012.
64. Australian Bureau of Statistics. *Causes of death, Australia, 2010*. Cat. no. 3303.0. ABS: Canberra; 2012.
65. Australian Bureau of Statistics. *Deaths, Australia, 2010*. Cat. no. 3302.0. ABS: Canberra; 2011.
66. Queensland Health. *The health of Queenslanders 2010. Third report of the Chief Health Officer Queensland*. Queensland Health: Brisbane; 2010.
67. Australian Bureau of Statistics. *Information paper: ensuring the quality of rebased population estimates, June 2011*. Cat. no. 3250.0. ABS: Canberra; 2012.
68. Queensland Health. *Measuring health inequalities in Queensland: current picture and trends since 2001*. Population Epidemiology Unit, Queensland Health: Brisbane; 2010.
69. Queensland Health. *Self reported health status 2011*. Unpublished regression analysis. Queensland Health: Brisbane; 2012.
70. Ha D, Roberts-Thomson K, Armfield J. *The child dental health surveys Australia, 2005 and 2006*. Cat. no. DEN 213. AIHW: Canberra; 2011.
71. World Health Organization. *The Ottawa charter for health promotion. First international conference on health promotion, Ottawa, 21 November 1986*. WHO: Geneva; 1986.
72. Marmot M, on behalf of the Commission of Social Determinants of Health. Achieving health equity: from root causes to fair outcomes. *The Lancet* 2007;370:1153-1163.
73. Marmot M. Social determinants and adolescent health. *International Journal of Public Health* 2009;54:S125-S127.
74. Marmot M, Friel S, Bell R, Houweling TAJ, Taylor S. Closing the gap in a generation: health equity through action on the social determinants of health. *The Lancet* 2008;372:1661-1669.

75. Marmot M, Wilkinson RG [editors]. *Social determinants of health*. 2nd ed. Oxford: Oxford University Press; 2006.
76. Commission on Social Determinants of Health. *Closing the gap in a generation: health equity through action on the social determinants of health*. Final report of the Commission on Social Determinants of Health. WHO: Geneva; 2008.
77. Herrman H, Saxena S, Moodie R [editors]. *Promoting mental health: concepts, emerging evidence, practice. A report of the World Health Organization, Department of Mental Health and Substance Abuse in collaboration with the Victorian Health Promotion Foundation and The University of Melbourne*. WHO: Geneva; 2005.
78. Queensland Health: Harper C, Cardona M, Bright M, Neill A, McClintock C, McCulloch B, Hunter I, Bell M. *Health determinants Queensland 2004*. Queensland Health: Brisbane; 2004.
79. Julian R. Ethnicity, health and multiculturalism. In: *Second opinion: an introduction to health sociology*. Germov J [editor]. 3rd ed. Melbourne: Oxford University Press; 2005.
80. Manderson L, Reid JC. What's culture got to do with it? In: *Just health: inequality in illness care and prevention*. Waddell C, Petersen AR [editors]. Melbourne: Churchill Livingstone; 1994.
81. Aboriginal Health and Medical Research Council of New South Wales. Definition of Aboriginal health. Available: http://www.ahmrc.org.au/index.php?option=com_content&view=article&id=35&Itemid=37. Accessed 18 May 2012.
82. Queensland Health. Multicultural health - cultural profiles. Available: http://www.health.qld.gov.au/multicultural/health_workers/cultdiver_guide.asp. Accessed 18 May 2012.
83. Chuang H-T, Lee Y-C. Analysis of factors found to affect self-perceived weight status in Australia. *Journal of Nursing Research* 2010;18:227-237.
84. Doolen J, Alpert PT, Miller SK. Parental disconnect between perceived and actual weight status of children: a metasynthesis of the current research. *Journal of the American Academy of Nurse Practitioners* 2009;21:160-166.
85. Ipsos-Eureka Social Research Institute and Winangali Pty Ltd. *Developmental research to inform the local Indigenous community campaigns to promote better health*. Prepared for: Department of Health and Ageing: Canberra; 2010.
86. Azzopardi P, Brown AD, Zimmet P, Fahy RE, Dent GA, Kelly MJ, et al. Type 2 diabetes in young Indigenous Australians in rural and remote areas: diagnosis, screening, management and prevention. *Medical Journal of Australia* 2012;197:32-36.
87. Mahler H. The meaning of 'health for all by the year 2000'. *World Health Forum* 1981;2:5-22.
88. Queensland Health: Jardine A, Endo T, Bright M, Macleod SL, Harper C. *Risk factor impact on the burden of disease and injury in Queensland, 2007*. Queensland burden of disease and injury circular series 2, no. 6. Queensland Health: Brisbane; 2010.
89. Queensland Government [in press]. *State of the environment Queensland 2011*. Department of Environment and Resource Management: Brisbane; 2012.
90. Australian Bureau of Statistics. *Socio-economic indexes for areas (SEIFA) - technical paper 2006*. Cat. no. 2039.0.55.001. ABS: Canberra; 2008.
91. Standing Council on Health. *National strategic framework for rural and remote health*. Commonwealth of Australia: Canberra; 2012.
92. Queensland Health. *Self reported health status 2011: preventive health indicators, Queensland*. Queensland Health: Brisbane; 2011.
93. Queensland Health. *The health of Australian South Sea Islander people in Queensland - an analysis of hospital separation data*. Queensland Health: Brisbane; 2011.
94. Queensland Health. *Queensland Health response to Pacific Islander and Maori health needs assessment*. Queensland Health: Brisbane; 2011.
95. Queensland Health. *Social determinants of health. The role of public health services*. West Moreton Public Health Unit, Queensland Health; 2001.
96. Wilkinson R. Putting the picture together: prosperity, redistribution, health and welfare. In: *Social Determinants of Health*. Marmot M, Wilkinson R [editors]. Oxford: Oxford University Press; 1999.
97. Brunner E, Marmot M. Social organisation, stress, and health. In: *Social Determinants of Health*. Marmot M, Wilkinson R [editors]. Oxford: Oxford University Press; 1999.
98. Barker DJP. The fetal and infant origins of adult disease: the womb may be more important than the home. *British Medical Journal* 1990;301:1111.
99. Jaddoe VWV, Troe E-JWM, Hofman A, Mackenbach JP, Moll HA, Steegers EAP, et al. Active and passive maternal smoking during pregnancy and the risks of low birthweight and preterm birth: the Generation R Study. *Paediatric and Perinatal Epidemiology* 2008;22:162-171.
100. Cornelius MD, Day NL. Developmental consequences of prenatal tobacco exposure. *Current Opinion in Neurology* 2009;22:121-125.
101. Prescott SL. Effects of early cigarette smoke exposure on early immune development and respiratory disease. *Paediatric Respiratory Reviews* 2008;9:3-10.
102. Gluckman PD, Hanson MA, Cooper C, Thornburg KL. Effect of in utero and early-life conditions on adult health and disease. *The New England Journal of Medicine* 2008;359:61-73.
103. Whiteman DC, Whiteman CA, Green AC. Childhood sun exposure as a risk factor for melanoma: a systematic review of epidemiologic studies. *Cancer Causes and Control* 2001;12:69-82.
104. Hill D, Dixon H. Promoting sun protection in children: rationale and challenges. *Health Education & Behavior* 1999;26:409-417.
105. Simmons D. Epigenetic influences and disease. *Nature Education* 2008;1:1.
106. Byrne D. *Enabling good health for all: a reflection process for a new EU health strategy*. 2004.
107. Begg S, Vos T, Goss J, Mann N. An alternative approach to projecting health expenditure in Australia. *Australian Health Review* 2008; 32:148-155.
108. Australian Government. *Improving primary health care for all Australians*. Commonwealth of Australia: Canberra; 2011.
109. World Health Organization. *The world health report. Health systems financing: the path to universal coverage*. WHO: Geneva; 2010.

110. NHS Scotland. *Annual report of the Chief Medical Officer. Health in Scotland 2010: assets for health*. The Scottish Government: Edinburgh; 2011.
111. Organisation for Economic Co-operation and Development. *OECD health statistics*. Available: http://www.oecd-ilibrary.org/social-issues-migration-health/data/oecd-health-statistics_health-data-en. Accessed 3 Feb 2012.
112. Queensland Health: Bright M, Begg S, Harper C. *Overview of the burden of disease and injury in Queensland, 2006*. Queensland burden of disease and injury circular series 2, no. 1. Queensland Health: Brisbane; 2009.
113. Queensland Health. *Queensland hospital admitted patient data collection*. Queensland Health: Brisbane.
114. Queensland Health. *Making tracks towards closing the gap in health outcomes for Indigenous Queenslanders by 2033 - policy and accountability framework*. Queensland Health: Brisbane; 2010.
115. Department of Immigration and Citizenship. *Settler arrivals 2010-2011*. Department of Immigration and Citizenship: Canberra; 2011.
116. Queensland Treasury and Trade. *Overseas migration, Queensland 2011*. Queensland Treasury and Trade: Brisbane; 2012.
117. Queensland Health: Endo T, Jardine A, Watson M, Bright M, MacLeod S-L. *Death and hospitalisation rates by country of birth in Queensland #1: introduction, data sources and definitions*. Country of birth data analysis report no.1. Queensland Health: Brisbane; 2011.
118. Queensland Health. *The health of Queensland's Vietnam-born population 2010*. Queensland Health: Brisbane; 2011.
119. Queensland Health. *The health of Queensland's Italy-born population 2010*. Queensland Health: Brisbane; 2011.
120. Queensland Health. *The health of Queensland's India-born population 2010*. Queensland Health: Brisbane; 2011.
121. Department of Immigration and Citizenship. Fact sheet 22—the health requirement. Available: <http://www.immi.gov.au/media/fact-sheets/22health.htm>. Accessed 4 Jul 2012.
122. Department of Immigration and Citizenship. Settlement reporting: providing statistical data on permanent arrivals to Australia. Available: <http://www.immi.gov.au/settlement/>. Accessed 20 Jun 2012.
123. Queensland Government. *State budget 2011-12: budget strategy and outlook*. Budget paper no. 2. Queensland Government: Brisbane; 2012.
124. Queensland Government. *Queensland state budget 2011-12 at a glance*. Queensland Government: Brisbane; 2011.
125. Australian Institute of Health and Welfare. *Expenditure on health for Aboriginal and Torres Strait Islander people 2006-07*. Cat. no. HWE 48. AIHW: Canberra; 2009.
126. Australian Institute of Health and Welfare. *Expenditure on health for Aboriginal and Torres Strait Islander people 2006-07: an analysis by remoteness and disease*. Cat. no. HWE 49. AIHW: Canberra; 2010.
127. Queensland Health. *The health of Queenslanders 2008: prevention of chronic disease. Second report of the Chief Health Officer Queensland*. Queensland Health: Brisbane; 2008.
128. Begg S, Vos T, Barker B, Stevenson C, Stanley L, Lopez AD. *The burden of disease and injury in Australia 2003*. Cat. no. PHE 82. AIHW: Canberra; 2007.
129. Polder JJ, Barendregt JJ, van Oers H. Health care costs in the last year of life - the Dutch experience. *Social Science & Medicine* 2006;63:1720-1731.
130. Seshamani M, Gray A. Ageing and health-care expenditure: the red herring argument revisited. *Health Economics* 2004;13:303-314.
131. Brameld KJ, Holman CDJ, Bass AJ, Coddie JP, Rouse IL. Hospitalisation of the elderly during the last year of life: an application of record linkage in Western Australia 1985-1994. *Journal of Epidemiology and Community Health* 1998;52:740-744.
132. Kardamanidis K, Lim K, Da Cunha C, Taylor LK, Jorm LR. Hospital costs of older people in New South Wales in the last year of life. *Medical Journal of Australia* 2007;187:383-386.
133. Australian Institute of Health and Welfare. *National public health expenditure report 2005-06*. Cat. no. HWE 39. AIHW: Canberra; 2008.
134. Queensland Health: Bright M, Begg S, Harper C. *Leading causes of burden of disease and injury in Queensland, 2006*. Queensland burden of disease and injury circular series 2, no. 2. Queensland Health: Brisbane; 2009.
135. Queensland Health: Bright M, Begg S, Harper C. *Age group differences in burden of disease and injury in Queensland, 2006*. Queensland burden of disease and injury circular series 2, no. 3. Queensland Health: Brisbane; 2008.
136. Queensland Health: Begg S, Bright M, Harper C. *Differentials in the burden of disease and injury in Queensland, 2006*. Queensland burden of disease and injury circular series 2, no. 4. Queensland Health: Brisbane; 2009.
137. Queensland Health: Endo T, Jardine A, Macleod S-L, Bright M, Begg S. *Burden of disease and injury in Queensland projections, 2007 to 2016*. Queensland burden of disease and injury circular series 2, no. 7. Queensland Health: Brisbane; 2010.
138. Queensland Health: Begg S, Bright M, Harper C. *Burden of disease and injury, life expectancy and health adjusted life expectancy in Queensland health service districts, 2006*. Queensland burden of disease and injury circular series 2, no. 5. Queensland Health: Brisbane; 2009.
139. Queensland Health. *Epidemiology - burden of disease*. Available: <http://www.health.qld.gov.au/epidemiology/publications/burden-of-disease.asp>. Accessed 1 Oct 2012.
140. Australian Bureau of Statistics. *Experimental life tables for Aboriginal and Torres Strait Islander Australians, 2005-2007*. Cat. no. 3302.0.55.003. ABS: Canberra; 2009.
141. Australian Institute of Health and Welfare. *Australian hospital statistics 2010-11*. Cat. no. HSE 117. AIHW: Canberra; 2012.
142. Organisation for Economic Co-operation and Development. *OECD health data 2009: statistics and indicators for 30 countries*. OECD; 2009.

143. Australian Institute of Health and Welfare. METeOR: national healthcare agreement: PI 20-potentially avoidable deaths, 2011. Available: <http://meteor.aihw.gov.au/content/index.phtml/itemId/448029>. Accessed 13 Feb 2012.
144. Australian Institute of Health and Welfare. *Australian hospital statistics 2009-10*. Cat. no. HSE 107. AIHW: Canberra; 2011.
145. Queensland Health. *Oncology analysis system (OASys)*. Queensland Cancer Control Analysis Team: Brisbane; 2011. Available: <https://qool.health.qld.gov.au/OASys>. Accessed 6 Jun 2012.
146. Cancer Council Australia. *Position statement: prostate cancer screening. Updated June 2010*. Cancer Council Australia: Sydney; 2010.
147. Veierød MB, Adami HO, Lund E, Armstrong BK, Weiderpass E. Sun and solarium exposure and melanoma risk: effects of age, pigmented characteristics, and nevi. *Cancer Epidemiology Biomarkers and Prevention* 2010;19:111-120.
148. Australian Institute of Health and Welfare, Cancer Australia. *Non-melanoma skin cancer: general practice consultations, hospitalisations and mortality*. Cat. no. CAN 39. AIHW: Canberra; 2008.
149. Queensland Health. *Self-reported health status 2012. Unpublished data/analysis*. Queensland Health: Brisbane; 2012.
150. Baade PD, Green AC, Smithers BM, Aitken JF. Trends in melanoma incidence among children: possible influence of sun-protection programs. *Expert Review of Anticancer Therapy* 2011;11:661-664.
151. National Vascular Disease Prevention Alliance. *Guidelines for the assessment of absolute cardiovascular disease risk*. National Heart Foundation of Australia; 2009.
152. Australian Institute of Health and Welfare. Incidence of insulin-treated diabetes in Australia 2000-2009. Available: <http://www.aihw.gov.au/diabetes/incidence/>. Accessed 15 Feb 2012.
153. Australian Institute of Health and Welfare. Diabetes: *Australian facts 2008*. Cat. no. CVD 40. AIHW: Canberra; 2008.
154. Dunstan DW, Kingwell BA, Larsen R, Health GN, Cerin E, Hamilton MT, et al. Breaking up prolonged sitting reduces postprandial glucose and insulin responses. *Diabetes Care* 2012;35:976-983.
155. Queensland Health: Pollard G, White D, Harper C. *Self-reported health status: Queensland. 2009 survey report*. Queensland Health: Brisbane; 2009.
156. Dunstan D, Cameron A, deCourten M, Coyne T, D'Emben M, Welborn T, et al. *The Australian diabetes obesity and lifestyle study (AusDiab) data report: Queensland*. International Diabetes Institute: Melbourne; 2004.
157. Dunstan D, Zimmet P, Welborn T, Sicree R, Armstrong T, Atkins R. *Diabetes and associated disorders in Australia - 2000: the accelerating epidemic. The Australian diabetes, obesity and lifestyle study (AusDiab)*. International Diabetes Institute: Melbourne; 2001.
158. Queensland Health. *Self-reported health status 2011: quality of life, mental health and wellbeing and associations with preventive health indicators, Queensland*. Queensland Health: Brisbane; 2011.
159. National Centre for Classification in Health. *The international statistical classification of diseases and related health problems, tenth revision, Australian modification (ICD-10-AM)*. NCCH: Sydney; 2010.
160. Jorm AF, Reavley NJ. Changes in psychological distress in Australian adults between 1995 and 2011. *Australian and New Zealand Journal of Psychiatry* 2012;46:352-356.
161. Australian Bureau of Statistics. *National survey of mental health and wellbeing*. Unpublished data for Queensland. ABS: Canberra; 2008.
162. Macquarie dictionary. 5th ed. Available: <http://www.macquariedictionary.com.au>. Accessed 2 Apr 2012.
163. Oxford University Press. *Concise colour medical dictionary*. 5th ed. Oxford: Oxford University Press.
164. National Centre for Classification in Health. *Australian coding standards for ICD-10-AM andACHI*. 7th ed. University of Sydney: Sydney; 2010.
165. Dudley M, Kelk N, Florio T, Howard J, Waters B, Haski C, et al. Suicide among young rural Australians 1964-1993: a comparison with metropolitan trends. *Social Psychiatry and Psychiatric Epidemiology* 1997;32:251-260.
166. Taylor R, Page A, Morrell S, Harrison J, Carter G. Social and psychiatric influences on urban-rural differentials in Australian suicide. *Suicide and Life-Threatening Behavior* 2005;35:277-290.
167. Wilkinson D, Gunnell D. Youth suicide trends in Australian metropolitan and non-metropolitan areas, 1988-1997. *Australian and New Zealand Journal of Psychiatry* 2000;34:822-828.
168. Australian Institute of Health and Welfare. *A working guide to international comparisons of health*. Cat. no. PHE 159. AIHW: Canberra; 2012.
169. Australian Institute of Health and Welfare: McKenna K and Harrison JE. *Hospital separations due to injury and poisoning, Australia 2008-09*. Cat. no. INJCAT 141. AIHW: Canberra; 2012.
170. Royal Life Saving. *The national drowning report 2009*. Special issue: child drowning deaths. 2009.
171. Griffin B, Watt K, Wallis B, Nixon J, Cass D, Gillen T, et al. *Low speed vehicle run over incidents in Queensland children (0-15 years): 11 year review, and development of an intervention and prospective data monitoring system*. Queensland Children's Medical Research Institute, Royal Children's Hospital: Brisbane; 2012.
172. Australian Institute of Health and Welfare: Bradley C. *Hospitalisations due to falls by older people, Australia 2008-09*. Cat. no. INJCAT 138. AIHW: Canberra; 2012.
173. Bradley C, Harrison J. *Hospital separations due to injury and poisoning, Australia 2004-05*. Cat. no. INJCAT 117. AIHW: Adelaide; 2008.
174. Australian Institute of Health and Welfare. COPD (chronic obstructive pulmonary disease). Available: <http://www.aihw.gov.au/copd/>. Accessed 19 Apr 2012.
175. Australian Institute of Health and Welfare. *Australia's health 2010*. Cat. no. AUS 122. AIHW: Canberra; 2010.

176. Australian Centre for Asthma Monitoring. *Asthma in Australia 2011*. Cat. no. ACM 22. AIHW: Canberra; 2011.
177. Queensland Health. Epidemiology, surveillance and research unit. Available: <http://www.health.qld.gov.au/ph/cdb/cdsarunit.asp>. Accessed 18 Sep 2012.
178. Meija GC, Amarasena N, Ha DH, Roberts-Thomson KF, Ellershaw AC. *Child dental health survey Australia 2007: 30-year trends in child oral health*. Cat. no. DEN 217. AIHW: Canberra; 2012.
179. Australian Institute of Health and Welfare Dental Statistics and Research Unit. *The national survey of adult oral health 2004-06: Queensland*. Cat. no. DEN 178. AIHW: Canberra; 2008.
180. Council of Australian Governments. *National partnership agreement on preventive health*. COAG; 2009.
181. Zimmet PZ, James WPT. The unstoppable Australian obesity and diabetes juggernaut. What should politicians do? *Medical Journal of Australia* 2006;185:187-188.
182. Lovato C, Watts A, Stead LF. Impact of tobacco advertising and promotion on increasing adolescent smoking behaviours. *Cochrane Database of Systematic Reviews* 2011;10.
183. Callinan JE, Clarke A, Doherty K, Kelleher C. Legislative smoking bans for reducing secondhand smoke exposure, smoking prevalence and tobacco consumption. *Cochrane Database of Systematic Reviews* 2010;4.
184. Queensland Health. Nobody smokes here anymore. Available: <http://www.health.qld.gov.au/tobaccolaws/default.asp>. Accessed 20 Feb 2012.
185. Department of Transport and Main Roads. *Drink driving in Queensland: a discussion paper*. Department of Transport and Main Roads; 2010.
186. Australian Dental Association Inc. *Community oral health promotion: fluoride use*. ADA policy statement 2.2.1; 2010.
187. Centers for Disease Control and Prevention. Recommendations for using fluoride to prevent and control dental caries in the United States. *Morbidity and Mortality Weekly Report. Recommendations and reports*. 2001;50:RR-14.
188. National Health and Medical Research Council. *A systematic review of the efficacy and safety of fluoridation. Part A: review methodology and results*. NHMRC: Canberra; 2007.
189. US Department of Health and Human Services. *Oral health in America: a report of the Surgeon General*. US Department of Health and Human Services, National Institute of Dental and Craniofacial Research and National Institutes of Health: Rockville, MD; 2000.
190. Queensland Health. *Water fluoridation: information for health professionals*. Queensland Health: Brisbane; 2005.
191. Dunlop SM, Cotter TF, Perez DA. Impact of the 2010 tobacco tax increase in Australia on short-term smoking cessation: a continuous tracking survey. *Medical Journal of Australia* 2011;195:469-472.
192. Gallet CA, List JA. Cigarette demand: a meta-analysis of elasticities. *Health Economics* 2003;12:821-835.
193. Farrelly M, Pechacek TF, Chaloupka FJ. The impact of tobacco control program expenditures on aggregate cigarette sales: 1981-2000. *Journal of Health Economics* 2003;22:843-859.
194. Chaloupka FJ. Macro-social influences: the effects of prices and tobacco-control policies on the demand for tobacco products. *Nicotine & Tobacco Research* 1999;1:S105-S109.
195. Chaloupka FJ, Hu T-W, Warner KE, Jacobs R, Yurekli A. The taxation of tobacco products. In: *Tobacco control in developing countries*. Jha P, Chaloupka FJ [editors]. Oxford: Oxford University Press; 2000:237-272.
196. Chaloupka FJ, Warner KE. The economics of smoking. In: *Handbook of health economics*. Culyer AJ, Newhouse JP [editors]. Amsterdam: Elsevier Science; 2000:1539-1627.
197. Booth KM, Pinkston MM, Poston WS. Obesity and the built environment. *Journal of the American Dietetic Association* 2005;105:S110-S117.
198. Lake A, Townshend T. Obesogenic environments: exploring the built and food environments. *The Journal of the Royal Society for the Promotion of Health* 2006;126:262-267.
199. Sallis JF, Floyd MF, Rodríguez DA, Saelens BE. Recent advances in preventive cardiology and lifestyle medicine: role of built environments in physical activity, obesity, and cardiovascular disease. *Circulation* 2012;125:729-737.
200. Owen N, Leslie E, Salmon J, Fotheringham MJ. Environmental determinants of physical activity and sedentary behavior. *Exercise and Sport Sciences Reviews* 2000;28:153-158.
201. Sugiyama T, Salmon J, Dunstan DW, Bauman AE, Owen N. Neighborhood walkability and TV viewing time among Australian adults. *American Journal of Preventive Medicine* 2007;33:444-449.
202. Prevention Institute. *The built environment and health: 11 profiles of neighborhood transformation*. Prevention Institute: Oakland, USA; 2004.
203. Giles-Corti B, Timperio A, Bull F, Pikora T. Understanding physical activity environmental correlates: increased specificity for ecological models. *Exercise and Sport Sciences Reviews* 2005;33:175-181.
204. Sallis JF, Saelens BE, Frank DL, Conway TL, Slymen DJ, Cain KL, et al. Neighborhood built environment and income: examining multiple health outcomes. *Social Science & Medicine* 2009;68:1285-1293.
205. Gordon R, McDermott L, Stead M, Angus K. The effectiveness of social marketing interventions for health improvement: what's the evidence? *Public Health* 2006;120:1133-1139.
206. Queensland Government. Let's end HIV. Available: <http://www.health.qld.gov.au/hiv/index.htm>. Accessed 30 Aug 2012.
207. Queensland Government. Healthier Queensland. Available: <http://www.healthier.qld.gov.au/>. Accessed 21 Feb 2012.

208. Council of Australian Governments. National quality standard for early childhood education and care and school age care. Available: http://www.deewr.gov.au/Earlychildhood/Policy_agenda/quality/documents/nqstandardchilddedu.pdf. Accessed 6 Jun 2012.
209. Queensland Government, Heart Foundation, Local Government Association of Queensland Inc. What is the active, healthy communities resource package? Available: <http://www.activehealthycommunities.com.au/>. Accessed 19 Apr 2012.
210. Jones SB, Beckmann K, Rayner J. Australian primary schools' sun protection policy and practice: evaluating the impact of the national SunSmart schools program. *Health Promotion Journal of Australia* 2008;19:86-90.
211. World Health Organization. School and youth health. Available: http://www.who.int/school_youth_health/en/. Accessed 20 Apr 2012.
212. National Cancer Institute. HPV and cancer. Available: <http://www.cancer.gov/cancertopics/factsheet/Risk/HPV>. Accessed 9 Jul 2012.
213. Department of Health and Ageing. National immunisation program schedule. Available: <http://www.immunise.health.gov.au/internet/immunise/publishing.nsf/Content/nips2>. Accessed 23 Apr 2012.
214. Queensland Health. Topic: school based vaccination program. Available: http://access.health.qld.gov.au/hid/InfectionsandParasites/ImmunisationandVaccination/schoolBasedVaccinationProgram_ap.asp. Accessed 24 Apr 2012.
215. Queensland Government. Falon's quest game. Available: <http://www.sunsafety.qld.gov.au/atschool/game.aspx>. Accessed 20 Apr 2012.
216. Department of Health and Ageing. Other population health screening issues. Available: <http://www.cancerscreening.gov.au/internet/screening/publishing.nsf/Content/other-pop-health>. Accessed 16 Mar 2012.
217. Australian Health Ministers' Advisory Council. *Population based screening framework*. Commonwealth of Australia: Canberra; 2008.
218. National Health and Medical Research Council. *Screening to prevent cervical cancer: guidelines for the management of asymptomatic women with screen detected abnormalities*. NHMRC: Canberra; 2005.
219. Coates HL. Current management of otitis media in Australia—foreword. *Medical Journal of Australia* 2009;191:S37.
220. Queensland Health. *Evaluation of the lighten up to a healthy lifestyle program*. Queensland Health: Brisbane; 2012.
221. Queensland Health. 2005 evaluation of the healthy weight program: summary report. Available: <http://www.health.qld.gov.au/lightenup/documents/32894.pdf>. Accessed 13 Jun 2012.
222. Queensland Health. SmokeCheck-Indigenous smoking program. Available: <http://www.health.qld.gov.au/atod/prevention/smokecheck.asp>. Accessed 23 Apr 2012.
223. Queensland Health. Epidemiology-health surveys. Available: <http://www.health.qld.gov.au/epidemiology/publications/health-surveys.asp>. Accessed 4 Jun 2012.
224. Access Economics. *The health of nations: the value of a statistical life*. Report prepared for the Office of the Australian Safety and Compensation Council. Access Economics Pty Limited; 2008.
225. VicHealth: Cadilhac DA, Magnus A, Cumming T, Sheppard L, Pearce D, Carter C. *The health and economic benefits of reducing disease risk factors*. VicHealth: Melbourne; 2009.
226. Medibank Private. *The cost of physical inactivity*. Report prepared for Medibank Private by KPMG-Econtech; 2008.
227. World Health Organization. *Obesity: preventing and managing the global epidemic*. WHO technical report series 894. WHO: Geneva; 2000.
228. Australian Institute of Health and Welfare. *Indicators for chronic diseases and their determinants, 2008*. Cat. no. PHE 75. AIHW: Canberra; 2008.
229. Department of Health and Ageing. Measure up. Available: <http://www.health.gov.au/internet/abhi/publishing.nsf/Content/home>. Accessed 14 Dec 2011.
230. Prospective Studies Collaboration. Body-mass index and cause specific mortality in 900 000 adults: collaborative analyses of 57 prospective studies. *The Lancet* 2009;373:1083-1096.
231. Cole TJ, Flegal KM, Nicholls D, Jackson AA. Body mass index cut offs to define thinness in children and adolescents: international survey. *British Medical Journal* 2007;335:194-197.
232. World Health Organization. *Physical status: the use and interpretation of anthropometry*. WHO technical report series 854. WHO: Geneva; 1995.
233. Centers for Disease Control and Prevention. Healthy weight: body mass index. Available: <http://www.cdc.gov/healthyweight/assessing/bmi/index.html>. Accessed 24 Apr 2012.
234. National Health and Medical Research Council. *Clinical practice guidelines for the management of overweight and obesity in adults*. NHMRC: Canberra; 2003.
235. UK Government Office for Science. *Tackling obesity: future choices – obesogenic environments – evidence review*. Government Office for Science; 2007.
236. Villareal DT, Apovian CM, Kushner RF, Klein S. Obesity in older adults: technical review and position statement of the American Society for Nutrition and NAASO, The Obesity Society. *American Journal of Clinical Nutrition* 2005;82:923-934.
237. Ball K, Abbott G, Cleland V, Timperio A, Thornton L, Mishra G, et al. Resilience to obesity among socioeconomically disadvantaged women: the READI study *International Journal of Obesity* 2012;36:855-865.
238. Simkin-Silverman LR, Wing RR, Boraz MA, Kuller LH. Lifestyle intervention can prevent weight gain during menopause: results from a 5-year randomized clinical trial. *Annals of Behavioral Medicine* 2003;26:212-220.
239. Klein S, Sheard NF, Pi-Sunyer X, Daly A, Wylie-Rosett J, Kulkarni K, et al. Weight management through lifestyle modification for the prevention and management of type 2 diabetes: rationale and strategies. *Diabetes Care* 2004;27:2067-2073.

240. Australian Bureau of Statistics. *National Aboriginal and Torres Strait Islander health survey 2004-05*. Cat. no. 4715.0. ABS: Canberra; 2006.
241. Australian Bureau of Statistics. *National health survey: summary of results, 2007-2008* (reissue) Cat. no. 4364.0. ABS: Canberra; 2010.
242. Organisation for Economic Co-operation and Development. OECD StatExtracts. 13 Dec 2011; Available: http://stats.oecd.org/Index.aspx?DataSetCode=HEALTH_LNVG
243. World Health Organization. Global health observatory data repository. Available: <http://apps.who.int/ghodata/?vid=2469#>. Accessed 14 Dec 2011.
244. Medscape Reference. Macrosomia. Available: <http://emedicine.medscape.com/article/262679-overview#a0199>. Accessed 24 Jan 2012.
245. Watson M, MacLeod S-L, Cornes S, Howell S. *Maternal obesity and selected pregnancy risks and outcomes in nulliparous mothers in Queensland, 2008*. StatBite no. 27. Queensland Health: Brisbane; 2010.
246. Watson M, Howell S, MacLeod S-L, Cornes S. *The effect of body mass index on delivery method of low risk pregnancies in public and private patients, Queensland 2008*. StatBite no. 23. Queensland Health: Brisbane; 2009.
247. Norton K, Dollman J, Martin M, Harten N. Descriptive epidemiology of childhood overweight and obesity in Australia: 1901-2003. *International Journal of Pediatric Obesity* 2006;1: 232-238
248. Olds TS, Tomkinson GR, Ferrar KE, Maher CA. Trends in the prevalence of childhood overweight and obesity in Australia between 1985 and 2008. *International Journal of Obesity* 2010;34:57-66.
249. Queensland Health. *Child health status 2009: Queensland report*. Queensland Health: Brisbane; 2010.
250. UK Government Office for Science. *Tackling obesities: future choices- building the obesity system map*. Government Office for Science; 2007.
251. Catford JC, Caterson ID. Snowballing obesity: Australians will get run over if they sit there. *The Medical Journal of Australia* 2003;179:577-579.
252. *Standing Committee on Health and Ageing inquiry into obesity in Australia: submission from the National Centre for Epidemiology and Population Health, Australian National University*. ANU: Canberra; 2008.
253. Crowle J, Turner E. Childhood obesity: *an economic perspective*. Productivity Commission Staff Working Paper: Melbourne; 2010.
254. Lehnert T, Sonntag D, Konnopka A, Riedal-Heller S, König HH. The long-term cost effectiveness of obesity prevention interventions: systematic literature review. *Obesity reviews* 2012;13:537-553.
255. Lee JM, Lee H. Obesity reduction within a generation: the dual roles of prevention and treatment. *Obesity* 2011;19:2107-2110.
256. Oken E, Gillman MW. Fetal origins of obesity. *Obesity Research* 2003;11: 496-506.
257. Barker DJP, Gluckman PD, Godfrey KM, Harding JE, Owens JA, Robinson JS. Fetal nutrition and cardiovascular disease in adult life. *The Lancet* 1993;341:938-941.
258. Tikellis G, Ponsonby A-L, Wells JCK, Pezic A, Cochrane J, Dwyer T. Maternal and infant factors associated with neonatal adiposity: results from the Tasmanian infant health survey (TIHS). *International Journal of Obesity* 2012;36:496-504.
259. Kramer MS, Morin I, Yang H, Platt RW, Usher R, McNamara H, et al. Why are babies getting bigger? Temporal trends in fetal growth and its determinants. *The Journal of Pediatrics* 2002;141:538-542.
260. Kirby T. Early blitz in the battle of the bulge. *The Weekend Australian: Health Weekend Professional*: 9. 12-13 May, 2012.
261. Stettler N. Nature and strength of epidemiological evidence for origins of childhood and adulthood obesity in the first year of life. *International Journal of Obesity* 2007; 31:1035-1043.
262. Ferraro KF, Thorpe Jr RJ, Wilkinson JA. The life course of severe obesity: does childhood overweight matter? *The Journals of Gerontology* 2003;58B:S110-S119.
263. Lee JM, Pilli S, Gebremariam A, Keirns CC, Davis MM, Vijan S, et al. Getting heavier, younger: trajectories of obesity over the life course. *International Journal of Obesity* 2010;34:614-623.
264. Stettler N, Stallings VA, Troxel AB, Zhao J, Schinnar R, Nelson SE, et al. Weight gain in the first week of life and overweight in adulthood. A cohort study of European subjects fed infant formula. *Circulation* 2005;111:1897-1903.
265. Crume TL, Ogden LG, Mayer-Davis EJ, Hamman RF, Norris JM, Bischoff KJ, et al. The impact of neonatal breastfeeding on growth trajectories of youth exposed and unexposed to diabetes in utero: the EPOCH study. *International Journal of Obesity* 2012;36:529-534.
266. Salmon J, Timperio A, Telford A, Carver A, Crawford D. Association of family environment with children's television viewing and low level of physical activity. *Obesity Research* 2005;13: 1939-1951.
267. Jolly R. *Marketing obesity? Junk food, advertising and kids*. Research paper no. 9, 2010-2011. Parliament of Australia: Canberra; 2011.
268. Cairns G, Angus K, Hastings G. *The extent, nature and effects of food promotion to children: a review of the evidence to December 2008*. Prepared for: World Health Organization. WHO: Geneva; 2009.
269. Institute of Medicine of the National Academies. *Food marketing to children and youth: threat or opportunity?* Washington, DC: National Academies Press; 2006.
270. National Preventative Health Taskforce. *Australia: the healthiest country by 2020. National preventative health strategy – overview*. Prepared for: Minister for Health and Ageing. Australian Government: Canberra; 2009.
271. Australian Government. *Taking preventative action - a response to Australia: the healthiest country by 2020 - the report of the National Preventative Health Taskforce*. Australian Government: Canberra; 2010.

272. Australian Communications and Media Authority. *Industry self-regulation of food and beverage advertising to children: ACMA monitoring report*. ACMA: Melbourne; 2011.
273. Hebden LA, King L, Grunseit A, Kelly B, Chapman K. Advertising of fast food to children on Australian television: the impact of industry self-regulation. *Medical Journal of Australia* 2011;195:20-24.
274. Hawkes C, Lobstein T. Regulating the commercial promotion of food to children: a survey of actions worldwide. *International Journal of Pediatric Obesity* 2011;6:83-94.
275. Riva G. The key to unlocking the virtual body: virtual reality in the treatment of obesity and eating disorders. *Journal of Diabetes Science and Technology* 2011;5:283-292.
276. Mission Australia. *National survey of young Australians 2007: key and emerging issues*. Mission Australia: Sydney; 2007.
277. Queensland Health. *Self reported health status 2011. Unpublished data/analysis*. Queensland Health: Brisbane; 2011.
278. Abbott RA, Lee AJ, Stubbs CO, Davies PSW. Accuracy of weight status perception in contemporary Australian children and adolescents. *Journal of Paediatrics and Child Health* 2010;46:343-348.
279. Mamun AA, McDermott BM, O'Callaghan MJ, Najman JM, Williams GM. Predictors of maternal misclassifications of their offspring's weight status: a longitudinal study. *International Journal of Obesity* 2008;32:48-54.
280. Whitney E, Rolfes SR. *Understanding nutrition*. 12th ed. Belmont, USA: Wadsworth, Cengage Learning; 2011.
281. Dietitians Association of Australia. *A modelling system to inform the revision of the Australian guide to healthy eating*. National Health and Medical Research Council: Canberra; 2011.
282. National Health and Medical Research Council. *Dietary guidelines for Australian adults*. NHMRC: Canberra; 2003.
283. Sucher KP, Kittler PG. *Food and culture*. 5th ed. Belmont, California: Wadsworth; 2007.
284. Australian and New Zealand Society for Geriatric Medicine. *Under-nutrition and the older person*. Position statement no. 6. ANZSGM; 2007.
285. World Health Organization. Risks to oral health and intervention: diet and nutrition. Available: http://www.who.int/oral_health/action/risks/en/. Accessed 8 Feb 2012.
286. Australian Bureau of Statistics. *Apparent consumption of foodstuffs, Australia, 1997-98 and 1998-99*. Cat. no. 4306.0. ABS: Canberra; 2000.
287. Levy G, Tapsell L. Shifts in purchasing patterns of non-alcoholic, water-based beverages in Australia, 1997-2006. *Nutrition & Dietetics* 2007;64:268-279.
288. Food Standards Australia New Zealand. NUTTAB 2010 online searchable database: milk, cow, fluid, regular fat (~3.5%). Available: <http://www.foodstandards.gov.au/consumerinformation/nuttab2010/nuttab2010online searchable database/onlineversion.cfm?&action=getFood&foodID=09A10163>. Accessed 6 Feb 2012.
289. National Health and Medical Research Council. *Infant feeding guidelines for health workers: draft for public consultation*. NHMRC; 2011.
290. Rutishauser IHE, Webb K, Abraham B, Allsopp R. *Evaluation of short dietary questions from the 1995 national nutrition survey*. Australian Food and Nutrition Monitoring Unit: Brisbane; 2001.
291. Ip S, Chung M, Raman G, Chew P, Magula N, Devine D, et al. *Breastfeeding and maternal and infant health outcomes in developed countries*. Evidence report/technology assessment no. 153. Agency for Healthcare Research and Quality: Rockville, Maryland; 2007.
292. National Health and Medical Research Council. *Dietary guidelines for children and adolescents in Australia incorporating the infant feeding guidelines for health workers*. NHMRC: Canberra; 2003.
293. Anderson SA [editor]. Core indicators of nutritional state for difficult-to-sample populations. *The Journal of Nutrition* 1990;120:S1559-S1600.
294. Innes-Hughes C, Thrift A, Cosgrove C. *A further analysis of the weight status and dietary characteristics of people reporting food insecurity in NSW: NSW population health survey data 2007 and 2008*. Physical Activity Nutrition Obesity Research Group: Sydney; 2010.
295. Australian Bureau of Statistics. *National Aboriginal and Torres Strait Islander health survey*: Queensland, 2004-05. Cat. no. 4715.3.55.005. ABS: Canberra; 2006.
296. Australian Institute of Health and Welfare. *2010 Australian national infant feeding survey: indicator results*. Cat. no. PHE 156. AIHW: Canberra; 2011.
297. Queensland Health. *Omnibus survey 2008*. Queensland Health: Brisbane; 2008.
298. Queensland Health: Waters B, Pollard G, White D, Harper C. *2009 self reported health status: differentials across populations in Queensland*. Queensland Health: Brisbane; 2010.
299. Queensland Health. *Omnibus survey 2007*. Queensland Health: Brisbane; 2008.
300. Australian Bureau of Statistics. *National nutrition survey: selected highlights, Australia, 1995*. Cat. no. 4802.0. ABS: Canberra; 1997.
301. The Senate Economics References Committee. *The impacts of supermarket price decisions on the dairy industry. Final report*. Senate Printing Unit: Canberra; 2011.
302. Cleanthous X, Thuraingam S. Whole milk vs fat-modified milk in the current Australian market: a comparison of nutritional content and market share. *Food Australia* 2010;62:304-306.
303. Rangan A, Hector D. *Consumption of fruit and vegetables by children in Australia and NSW: results from national surveys in 1995 and 2007. Monitoring update*. Physical Activity Nutrition Obesity Research Group: Sydney; 2010.
304. Rangan AM, Kwan JSL, Louie JCY, Flood VM, Gill TP. Changes in core food intake among Australian children between 1995 and 2007. *European Journal of Clinical Nutrition* 2011;65:1201-1210.
305. Sobal J, Bisogni CA. Constructing food choice decisions. *Annals of Behavioural Medicine* 2009;38:S37-S46.

306. European Food Information Council. *The determinants of food choice*. EUFIC review 04/2005. EUFIC; 2005.
307. Shaikh AR, Yaroch AL, Nebeling L, Yeh M-C, Resnicow K. Psychosocial predictors of fruit and vegetable consumption in adults: a review of the literature. *American Journal of Preventive Medicine* 2008;34:535-543.
308. Brug J, Tak NI, te Velde SJ, Bere E, de Bourdeaudhuij I. Taste preferences, liking and other factors related to fruit and vegetable intakes among schoolchildren: results from observational studies. *British Journal of Nutrition* 2008;99:S7-S14.
309. Miller M. Eat more fruit and vegetable - the case for a five-year campaign to increase more fruit and vegetable consumption in Australia. 2002.
310. Ollberding NJ, Wolf RL, Contento I. Food label use and its relation to dietary intake among US adults. *Journal of the American Dietetic Association* 2010;110:1233-1237.
311. Australia New Zealand Food Standards Code.
312. Blewett N, Goddard N, Pettigrew S, Reynolds C, Yeatman H. *Labelling logic: review of food labelling law and policy (2011)*. Department of Health and Ageing; Canberra; 2011.
313. Department of Health and Ageing. Review of food labelling law and policy. Available: <http://www.foodlabellingreview.gov.au/internet/foodlabelling/publishing.nsf/content/home>. Accessed 21 Mar 2012.
314. Sacks G, Veerman JL, Moodie M, Swinburn B. 'Traffic-light' nutrition labelling and 'junk-food' tax: a modelled comparison of cost-effectiveness for obesity prevention. *International Journal of Obesity* 2011;35:1001-1009.
315. Australian Bureau of Statistics. *Consumer price index, Australia, Mar 2011*. Cat. no. 6401.0. ABS; Canberra; 2011.
316. Timperio A, Ball K, Roberts R, Campbell K, Andrianopoulos N, Crawford D. Children's fruit and vegetable intake: associations with the neighbourhood food environment. *Preventive Medicine* 2008;46:331-335.
317. Boone-Heinonen J, Gordon-Larsen P, Kiefe CI, Shikany JM, Lewis CE, Popkin BM. Fast food restaurants and food stores: longitudinal associations with diet in young to middle-aged adults: the CARDIA study. *Archives of Internal Medicine* 2011;171:1162-1170.
318. Giskes K, van Lenthe F, Avendano-Pabon M, Brug J. A systematic review of environmental factors and obesogenic dietary intakes among adults: are we getting closer to understanding obesogenic environments? *Obesity reviews* 2011;12:e95-e106.
319. Leonard D. *FoodNorth: food for health in north Australia*. WA Office of Aboriginal Health and Department of Health; 2003.
320. House of Representatives Aboriginal and Torres Strait Islander Affairs Committee. *Everybody's business: remote Aboriginal and Torres Strait community stores*. The Parliament of the Commonwealth of Australia: Canberra; 2009.
321. Department of Education, Training and Employment. Smart choices - healthy food and drink supply strategy for Queensland schools. Available: <http://education.qld.gov.au/schools/healthy/food-drink-strategy.html>. Accessed 4 Apr 2012.
322. Department of Education and the Arts, Queensland Health. *Smart choices - healthy food and drink supply strategy for Queensland schools*. Department of Education and the Arts and Queensland Health; Brisbane.
323. Dick M, Lee A, Bright M, Turner K, Edwards R, Dawson J, et al. Evaluation of implementation of a healthy food and drink supply strategy throughout the whole school environment in Queensland state schools, Australia. *European Journal of Clinical Nutrition* 2012; Accepted article: doi: 10.1038/ejcn.2012.108.
324. Queensland Health. *A better choice - healthy food & drink supply strategy for Queensland Health facilities*. Queensland Health; Brisbane; 2007.
325. US Department of Health and Human Services. *Physical activity and health: a report of the Surgeon General*. US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion: Atlanta; 1996.
326. Healy GN, Dunstan DW, Salmon J, Shaw JE, Zimmet PZ, Owen N. Television time and continuous metabolic risk in physically active adults. *Medicine & Science in Sports & Exercise* 2008;40:639-645.
327. Healy GN, Matthews CE, Dunstan DW, Winkler EAH, Owen N. Sedentary time and cardio-metabolic biomarkers in US adults: NHANES 2003-06. *European Heart Journal* 2011;32:590-597.
328. van der Ploeg HP, Chey T, Korda RJ, Banks E, Bauman A. Sitting time and all-cause mortality risk in 222 497 Australian adults. *Archives of Internal Medicine* 2012;172:494-500.
329. Medibank Private. *The cost of physical inactivity: what is the lack of participation in physical activity costing Australia?* Medibank Private; 2007.
330. Department of Health and Ageing. Being active. Available: <http://www.health.gov.au/internet/healthyactive/publishing.nsf/content/physical-activity>. Accessed 11 Apr 2012.
331. US Department of Agriculture, US Department of Health and Human Services. *Dietary guidelines for Americans, 2010*. 7th ed. US Government Printing Office: Washington, DC; 2010.
332. Australian Bureau of Statistics. *Labour force, Australia, Dec 2011*. Cat. no. 6202.0. ABS; Canberra; 2012.
333. Australian Bureau of Statistics. *Physical activity in Australia: a snapshot, 2007-08*. Cat. no. 4835.0.55.001. ABS; Canberra; 2011.
334. Bauman A, Ainsworth BE, Sallis JF, Hagstromer M, Craig CL, Bull FC, et al. The descriptive epidemiology of sitting. A 20-country comparison using the international physical activity questionnaire (IPAQ). *American Journal of Preventive Medicine* 2011;41:228-235.
335. Cancer Council, Heart Foundation. *Prevalence of meeting physical activity recommendations in Australian secondary students*. Cancer Council and Heart Foundation; 2011.

336. Morley B, Scully M, Niven P, Wakefield M. *National secondary students' diet and activity survey, 2009-10 (NaSSDA): Queensland summary report*. Prepared for: Cancer Council of Queensland. Cancer Council Victoria; 2010.
337. Cancer Council, Heart Foundation. *Prevalence of meeting recommendations for small screen recreation in Australian secondary students*. Cancer Council and Heart Foundation; 2011.
338. Australian Bureau of Statistics. *Motor vehicle census, Australia, 31 Jan 2011*. Cat. no. 9309.0. ABS: Canberra; 2011.
339. Australian Bureau of Statistics. *Survey of motor vehicle use, Australia, 12 months ended 31 October 2010*. Cat. no. 9208.0. ABS: Canberra; 2011.
340. Davison KK, Werder JL, Lawson CT. Children's active commuting to school: current knowledge and future directions. *Preventing Chronic Disease* 2008;5:A100.
341. Cycling Promotion Fund. *Active travel to school: 2012 survey findings*. Heart Foundation; 2012.
342. Gerrard J. *Active transport: children and young people*. An overview of recent evidence. VicHealth; 2009.
343. Queensland Health. *Child health status 2011. Unpublished regression analysis*. Queensland Health: Brisbane; 2012.
344. Task Force on Community Preventive Services. Recommendations to increase physical activity in communities. *American Journal of Preventive Medicine* 2002;22:67-72.
345. Kahn EB, Ramsey LT, Brownson RC, Heath GW, Howze EH, Powell KE, et al. The effectiveness of interventions to increase physical activity: a systematic review. *American Journal of Preventive Medicine* 2002;22:73-107.
346. Heath GW, Brownson RC, Kruger J, Miles R, Powell KE, Ramsey LT, et al. The effectiveness of urban design and land use and transport policies and practices to increase physical activity: a systematic review. *Journal of Physical Activity and Health* 2006;3:S55-S76.
347. Ewing R, Pendall R, Chen D. *Measuring sprawl and its impact*. Smart Growth America: Washington, DC.
348. Wilson LAM, Giles-Corti B, Burton NW, Giskes K, Haynes M, Turrell G. The association between objectively measured neighbourhood features and walking in middle-aged adults. *American Journal of Health Promotion* 2011;25:e12-e21.
349. World Health Organization, World Economic Forum. *Preventing noncommunicable diseases in the workplace through diet and physical activity: WHO/World Economic Forum report of a joint event*. WHO/WEF: Geneva; 2008.
350. World Health Organization. *WHO healthy workplace framework and model: background and supporting literature and practices*. WHO: Geneva; 2010.
351. Queensland Government. *Connecting SEQ 2031: an integrated regional transport plan for south east Queensland*. Department of Transport and Main Roads; 2011.
352. Comcare. *Officewise: a guide to health and safety in the office*. Comcare: Canberra; 2008.
353. Chau JY, van der Ploeg HP, van Uffelen JGZ, Wong J, Riphagen I, Healy GN, et al. Are workplace interventions to reduce sitting effective? A systematic review. *Preventive Medicine* 2010;51:352-356.
354. Loney T, Carter JM, Linnane DM. *The active workplace programme: an initiative to increase physical activity in office-based employees*. Paper presented at: SPE Middle East Health, Safety, Security, and Environment Conference and Exhibition: Abu Dhabi, UAE; 2012.
355. Medibank Private. *Stand up Australia. Sedentary behaviour in workers*. Medibank Private; 2009.
356. World Health Organization. *Interventions on diet and physical activity: what works*. Evidence tables. WHO: Geneva; 2009.
357. Cobiaci LJ, Vos T, Barendregt JJ. Cost-effectiveness of interventions to promote physical activity: a modelling study. *Public Library of Science Medicine* 2009;6:e1000110.
358. Clark NM. Foreword. In: *Health behaviour and health education: theory, research and practice*. Glanz K, Rimer BK, Lewis FM [editors]. 3rd ed. San Francisco: Jossey-Bass; 2002.
359. Parcel GS, Baranowski T. Social learning theory and health education. *Health Education* 1981;12:14-18.
360. Monsen S. Smart moves in early childhood. *Educating young children: learning and teaching in the early childhood years* 2008;14:19-20.
361. Australian Communications and Media Authority. *Media and communications in Australian families in 2007. Report of the media and society research project*. ACMA: Canberra; 2007.
362. Salmon J, Timperio A. Prevalence, trends and environmental influences on child and youth physical activity. In: *Pediatric fitness. Secular trends and geographic variability*. Tomkinson GR, Olds TS [editors]. Vol 50. Basel, Switzerland: Karger; 2007.
363. US Department of Health and Human Services. *The health benefits of smoking cessation: a report of the Surgeon General*. DHHS publication no. (CDC) 90-8416. US DHHS: Rockville, Maryland; 1990.
364. Crimmins EM, Preston SH, Cohen B. *Explaining divergent levels of longevity in high-income countries*. Washington: National Academy of Sciences; 2011.
365. Cheng TY, Wen CP, Tsai SP, Chung WSI, Hsu CC. Reducing health disparity in Taiwan: quantifying the role of smoking. *Tobacco Control* 2005;14:i23-i27.
366. Australian Institute of Health and Welfare. *2007 National drug strategy household survey - Queensland results*. AIHW; 2008.
367. Australian Bureau of Statistics. *National health survey: summary of results. State tables. 2007-08*. Cat. no. 4362.0. ABS: Canberra; 2009.
368. Australian Bureau of Statistics. *National Aboriginal and Torres Strait Islander social survey, 2008*. Cat. no. 4714.0. ABS: Canberra; 2009.
369. Australian Bureau of Statistics. *The health and welfare of Australia's Aboriginal and Torres Strait Islander peoples*, Oct 2010. Cat. no. 4704.0. ABS: Canberra; 2010.
370. Ministry of Health. *Tobacco trends 2008: a brief update of tobacco use in New Zealand*. Ministry of Health: Wellington; 2009.

371. Rani M, Bonu S, Jha P, Nguyen SN, Jamjoum L. Tobacco use in India: prevalence and predictors of smoking and chewing in a national cross sectional household survey. *Tobacco Control* 2003;12.
372. Li Q, Hsia J, Yang H. Prevalence of smoking in China in 2010. *New England Journal of Medicine* 2011;364:2469-2470.
373. Scollo MM, Winstanley MH [editors]. *Tobacco in Australia: facts and issues*. 3rd ed. Melbourne: Cancer Council Victoria; 2008.
374. Queensland Health. *Smoking in Queensland 2011. Factsheet*. Queensland Health: Brisbane; 2011.
375. Corderoy A. Fight may cost big tobacco a packet. *The Sydney Morning Herald: News Review*: 8. 24-25 Mar, 2012.
376. Jaakkola MS, Jaakkola JJK. Impact of smoke-free workplace legislation on exposures and health: possibilities for prevention. *The European Respiratory Journal* 2006;28:397-408.
377. Keil T, Kulig M. Editorial: do parents who smoke really cause asthma or allergies in their children? *Pediatric Health* 2009;3:203-204.
378. Machaalani R, Waters KA. Neuronal cell death in the sudden infant death syndrome brainstem and associations with risk factors. *Brain* 2008;131: 218-228.
379. Council of Australian Governments. *National partnership agreement on closing the gap in Indigenous health outcomes*. COAG; 2009.
380. Wilson M, Stearne A, Gray D, Saggars S. The harmful use of alcohol amongst Indigenous Australians. Available: http://www.healthinfonet.ecu.edu.au/alcoholuse_review. Accessed 10 Apr 2012.
381. Queensland Health. *Preliminary analysis of alcohol related emergency department presentations. Unpublished analysis*. Queensland Health: Brisbane; 2011.
382. Intergovernmental Committee on Drugs Working Party on Fetal Alcohol Spectrum Disorders. *Fetal alcohol spectrum disorders in Australia: an update*. 2009.
383. House of Representatives, Australia. Debates. 2012;13 Feb:794-796.
384. Ministerial Council on Drug Strategy. *National drug strategy 2010-2015: a framework for action on alcohol, tobacco and other drugs*. Commonwealth of Australia: Canberra; 2011.
385. World Health Organization. *Global strategy to reduce the harmful use of alcohol*. WHO: Geneva; 2010.
386. National Preventative Health Taskforce. *Preventing alcohol related harm in Australia: a window of opportunity including addendum for October 2008 to June 2009*. NPHT: Canberra; 2009.
387. Babor TF, Casswell S, Giesbrecht N, Graham K, Gruenewald P, Hill L, et al. *Alcohol: no ordinary commodity. Research and public policy*. Oxford: Oxford University Press; 2010.
388. Wagenaar AC, Salois MJ, Komro KA. Effects of beverage alcohol price and tax levels on drinking: a meta-analysis of 1003 estimates from 112 studies. *Addiction* 2009;104:179-190.
389. Byrnes JM, Cobiac LJ, Doran CM, Vos T, Shakeshaft AP. Cost-effectiveness of volumetric alcohol taxation in Australia. *Medical Journal of Australia* 2010;192:439-443.
390. Byrnes J, Petrie DJ, Doran CM, Shakeshaft A. The efficiency of a volumetric alcohol tax in Australia. *Applied Health Economics and Health Policy* 2012;10:37-49.
391. Carragher N, Chalmers J. *What are the options? Pricing and taxation policy reforms to redress excessive alcohol consumption and related harms in Australia*. Attorney General's Department: Sydney; 2011.
392. World Health Organization. *WHO expert committee on problems related to alcohol consumption. Second report*. WHO technical report series 944. WHO: Geneva; 2007.
393. Victorian Alcohol and Drug Association. *Position paper: alcohol taxation*. VAADA: Collingwood; 2010.
394. Kobau R, Snizek J, Zack MM, Lucas RE, Burns A. Well-being assessment: an evaluation of well-being scales for public health and population estimates of well-being among US adults. *Applied Psychology: Health and Wellbeing* 2010;2:272-297.
395. Queensland Health. *Be kind to your mind evaluation report*. Prepared by: A Swinbourne, James Cook University for Queensland Health: Townsville; 2009.
396. Queensland Alliance. *From discrimination to social inclusion: a review of the literature on anti stigma initiatives in mental health*. Brisbane; 2009.
397. Westerhof GJ, Keyes CLM. Mental illness and mental health: the two continua model across the lifespan. *Journal of Adult Development* 2010;17:110-119.
398. Pressman SD, Cohen S. Does positive affect influence health? *Psychological Bulletin* 2005;131:925-971.
399. Tov W, Diener E. The well-being of nations: linking together trust, cooperation, and democracy. In: *Cooperation: the psychology of effective human interaction*. Sullivan BA, Snyder M, Sullivan JL [editors]. Malden, USA: Blackwell Publishing; 2008.
400. Eid M, Larsen RJ. Ed Diener and the science of subjective well-being. In: *The science of subjective well-being*. Larsen RJ, Eid M [editors]. New York: The Guilford Press; 2008.
401. Queensland Health. *Strategic directions for mental health promotion 2009-2012*. Queensland Health: Brisbane; 2009.
402. Tennant R, Hiller L, Fishwick R, Platt S, Joseph S, Weich S, et al. The Warwick-Edinburgh mental well-being scale (WEMWBS): development and UK validation. *Health and Quality of Life Outcomes* 2007;5:63.
403. EuroQol Group. EQ-5D: a standardised measure of health status. Available: <http://www.euroqol.org/home.html>. Accessed 17 Feb 2012.
404. Rodin J. Sense of control: potentials for intervention. *The Annals of the American Academy of Political and Social Science* 1989;503:29-42.
405. Queensland Health. *Is social capital associated with health? Findings from the 2002 Queensland Health survey*. Queensland Health: Brisbane; 2003.
406. Queensland Health. *An investigation of the corridors to self-reported health and wellbeing. Further analysis from the 2002 social capital survey*. Queensland Health: Brisbane; 2005.

407. Queensland Health. *Cervical screening participation project: Prompting action. Key findings and technical report. Baseline survey 2005*. Queensland Health: Brisbane; 2006.
408. Sachs JD. Introduction. In: *World happiness report*. Helliwell J, Layard R, Sachs J [editors]: The Earth Institute Columbia University, Canadian Institute for Advanced Research and Centre for Economic Performance; 2012.
409. Eckersley R. *Well and good. Morality, meaning and happiness*. Melbourne: The Text Publishing Company; 2004.
410. Harvard University. The foundations of lifelong health are built in early childhood. Available: <http://developingchild.harvard.edu>. Accessed 2 Mar 2012.
411. Moore ER, Anderson GC, Bergman N, Dowswell T. Early skin-to-skin contact for mothers and their healthy newborn infants. Available: <http://summaries.cochrane.org/CD003519/early-skin-to-skin-contact-for-mothers-and-their-healthy-newborn-infants>. Accessed 2 Mar 2012.
412. Mezzacappa ES, Katkin ES. Breast-feeding is associated with reduced stress and negative mood in mothers. *Health Psychology* 2002;21:187-193.
413. Hrdy SB. Cooperative breeding and the paradox of facultative fathering. In: *Neurobiology of the parental brain*. Bridges RS [editor]. Burlington, USA: Academic Press; 2008.
414. Sims M. Neurobiology and child development: challenging current interpretation and policy implications. *The Australasian Journal of Early Childhood* 2009;34:36-42.
415. The Royal Children's Hospital. *Caring for young children: what children need*. Policy brief no. 15. RCH: Melbourne; 2009.
416. The Royal Children's Hospital. Australian early development index. Available: <http://www.rch.org.au/aedi>. Accessed 20 Feb 2012.
417. Centre for Community Child Health and Telethon Institute for Child Health Research. *A snapshot of early childhood development in Australia—AEDI national report 2009*. Australian Government: Canberra; 2009.
418. Telethon Institute for Child Health Research, Murdoch Childrens Research Institute, Royal Children's Hospital. *Australian early development index (AEDI) domains fact sheet*. 2009.
419. Royal Children's Hospital. *Policy brief - five years on*. Policy brief no. 22. Royal Childrens Hospital: Melbourne; 2011.
420. Reilly S. Executive health special report. *The Australian: Deal Business Magazine*: 24-27. 5 Feb, 2012.
421. Queensland Health. *Workplaces for wellness initiative*. Queensland Health: Brisbane; 2011.
422. van den Honert RC, McAneney J. The 2011 Brisbane floods: causes, impacts and implications. *Water* 2011;3:1149-1173.
423. O'Donnell ML, Creamer MC, Parslow R, Elliott P, Holmes A, Ellen S, et al. A predictive screening index for posttraumatic stress disorder and depression following traumatic injury. *Journal of Consulting and Clinical Psychology* 2008;76:923-932.
424. Clemens SL, Berry HL, McDermott BM, Harper CM [in preparation]. Personal impact and emotional trauma after the 2011 summer natural disasters in Queensland. 2012.
425. Clemens SL, Berry HL, McDermott BM, Harper CM, [in preparation]. Summer of sorrow: mental health impacts of Queensland's floods and cyclone. 2012.
426. Beaton RD, Murphy SA, Houston JB, Reyes G, Bramwell S, McDaniel M, et al. The role of public health in mental and behavioural health in children and families following disasters. *Journal of Public Health Management Practice* 2009;15:E1-E11.
427. Britt H, Miller GC, Charles J, Henderson J, Bayram C, Pan Y, et al. *General practice activity in Australia 2000-01 to 2009-10: 10 year data tables*. Cat. no. GEP 28. AIHW: Canberra; 2010.
428. Department of Health and Ageing. *Australian statistics on medicines 2009*. DoHA: Canberra; 2011.
429. World Health Organization, International Society of Hypertension Writing Group. 2003 World Health Organization (WHO)/International Society of Hypertension (ISH) statement on management of hypertension. *Journal of Hypertension* 2003;21:1983-1992.
430. National Heart Foundation of Australia (National Blood Pressure and Vascular Disease Advisory Committee). *Guide to management of hypertension 2008*. Updated December 2010. National Heart Foundation of Australia; 2010.
431. High Blood Pressure Research Council of Australia. High blood pressure. Available: <http://www.hbprca.com.au/high-blood-pressure/>. Accessed 29 May 2012.
432. World Health Organization. *The world health report 2002: reducing risks, promoting healthy life*. WHO: Geneva; 2002.
433. National Vascular Disease Prevention Alliance. *Guidelines for the management of absolute cardiovascular disease risk*. National Stroke Foundation; 2012.
434. Department of Health and Ageing. *Biomedical component of the Australian health survey: public health objectives. January 2011*. 2011.
435. Queensland Health. *Self reported health status 2010: Queensland summary report*. Queensland Health: Brisbane; 2010.
436. Taylor R, Dobson A, Mirzaei M. Contribution of changes in risk factors to the decline of coronary heart disease mortality in Australia over three decades. *European Journal of Cardiovascular Prevention and Rehabilitation* 2006;13:760-768.
437. Cobiac LJ, Vos T, Veerman JL. Cost-effectiveness of interventions to reduce dietary salt intake. *Heart* 2010;96:1920-1925.
438. Vos T, Carter R, Barendregt J, Mihalopoulos C, Veerman JL, Magnus A, et al. *Assessing cost-effectiveness in prevention (ACE-prevention): final report*. University of Queensland and Deakin University: Brisbane and Melbourne; 2010.
439. National Health and Medical Research Council, Ministry Of Health. *Nutrient reference values for Australia and New Zealand including recommended dietary intakes*. NHMRC: Canberra; 2006.

440. Food Standards Australia New Zealand. How much salt and sodium are we eating - further information. Available: <http://www.foodstandards.gov.au/scienceandeducation/factsheets/factsheets/howmuchsaltareweeating/howmuchsaltandsodium4551.cfm>. Accessed 1 Jun 2012.
441. Commonwealth Scientific Industrial Research Organisation Preventative Health National Research Flagship, University of South Australia. 2007 *Australian national children's nutrition and physical activity survey: main findings*. Department of Health and Ageing, Australian Food and Grocery Council and Department of Agriculture, Fisheries and Forestry: Canberra; 2008.
442. Centre for Health Economics Research and Evaluation. *Scenario modelling of potential health benefits subsequent to the introduction of the proposed standard for nutrition, health and related claims*. Prepared for: Food Standards Australia New Zealand. University of Technology: Sydney; 2008.
443. Food Standards Australia New Zealand. How much sodium and salt are we eating? Available: <http://www.foodstandards.gov.au/scienceandeducation/factsheets/factsheets/howmuchsaltareweeating/>. Accessed 31 May 2012.
444. Department of Health and Ageing. Food and health dialogue Available: <http://www.foodhealthdialogue.gov.au/internet/foodandhealth/publishing.nsf>. Accessed 5 Jul 2012.
445. Department of Health and Ageing. Food and health dialogue: food category action plans. Available: <http://www.foodhealthdialogue.gov.au/internet/foodandhealth/publishing.nsf/Content/food-category-action-plans>. Accessed 1 Jun 2012.
446. Hicks A, Guthrey P. Focus on the standard: element 3 - screening and risk assessment for cardiovascular disease. National Stroke Foundation know your numbers program. *Excellence* 2012;Jan-Feb:9-11.
447. Cadilhac D, Kilkenny M, Johnson R, Lalor E. *What is the potential economic impact of a national blood pressure awareness program for the prevention of stroke?* Paper presented at: 8th World Congress on Health Economics: Toronto; 2011.
448. Kilkenny MF, Johnson RR, Cadilhac DA. Feasibility of a pilot programme to increase awareness of blood pressure as an important risk factor for stroke in Australia. *International Journal of Stroke* 2010;5:344-350.
449. Law M, Wald N, Morris J. Lowering blood pressure to prevent myocardial infarction and stroke: a new preventive strategy. *Health Technology Assessment* 2003;7(31).
450. Cadilhac DA, Carter R, Thrift AG, Dewey HM. Estimating the long-term costs of ischemic and hemorrhagic stroke for Australia: new evidence derived from the north east Melbourne stroke incidence study (NEMESIS). *Stroke* 2009;40:915-921.
451. Heart Foundation of Australia. Cholesterol. Available: <http://www.heartfoundation.org.au/healthy-eating/fats/Pages/cholesterol.aspx>. Accessed 7 Jun 2012.
452. Heart Foundation of Australia. Cardiovascular conditions. Available: <http://www.heartfoundation.org.au/your-heart/cardiovascular-conditions/Pages/blood-pressure.aspx>. Accessed 7 Jun 2012.
453. Cancer Council Australia, Australian Health Ministers' Advisory Council. *Position statement: prostate cancer screening in Australia: joint key messages*. Cancer Council Australia: Sydney; 2010.
454. Queensland Health. *Queensland bowel cancer screening program: statistical report, August 2006 - December 2010*. Queensland Health: Brisbane; 2011.
455. Australian Institute of Health and Welfare. *National bowel cancer screening program monitoring report: phase 2, July 2008-June 2011*. Cat. no. CAN 61. AIHW: Canberra 2012.
456. Department of Health and Ageing. *BreastScreen Australia evaluation. Evaluation final report*. Screening monograph no.1/2009. DoHA: Canberra; 2009.
457. Queensland Health: Cancer Screening Services Branch. *BreastScreen Queensland program register data*. Queensland Health: Brisbane; 2012.
458. Steering Committee for the Review of Government Service Provision. *Report on government services 2007*. Productivity Commission: Canberra 2007.
459. Queensland Health: Cancer Screening Services Branch. *Queensland cervical screening program pap smear register data*. Queensland Health: Brisbane; 2012.
460. World Health Organization. *IARC monographs on the evaluation of carcinogenic risks to humans: solar and ultraviolet radiation*. Volume 55. WHO: Lyon; 1992.
461. World Health Organization, World Meteorological Organization, United Nations Environment Programme, International Commission on Non-Ionizing Radiation Protection. *Global solar UV index: a practical guide*. WHO: Geneva; 2002.
462. Australian Institute of Health and Welfare, Australasian Association of Cancer Registries. *Cancer in Australia: an overview, 2010*. Cat. no. CAN 56. AIHW: Canberra; 2010.
463. Dennis LK, Vanbeek MJ, Freeman LEB, Smith BJ, Dawson DV, Coughlin JA. Sunburns and risk of cutaneous melanoma: does age matter? A comprehensive meta-analysis. *Annals of epidemiology* 2008;18:614-627.
464. SunSmart Victoria. Risk factors for skin cancer. Available: http://www.sunsmart.com.au/skin_cancer/risk_factors. Accessed 15 May 2012.
465. Armstrong BK. How sun exposure causes skin cancer: an epidemiological perspective. In: *Prevention of skin cancer*. Hill DJ, Elwood JM, English DR [editors]. Dordrecht, The Netherlands: Kluwer Academic Publishers; 2004.
466. Armstrong BK, Kricger A. How much melanoma is caused by sun exposure? *Melanoma Research* 1993;3:395-401.
467. Bureau of Meteorology. Average solar ultraviolet (UV) index: January. Available: http://reg.bom.gov.au/jsp/ncc/climate_averages/uv-index/index.jsp?period=jan. Accessed 11 May 2012.
468. Bureau of Meteorology. Average solar ultraviolet (UV) index: July. Available: http://reg.bom.gov.au/jsp/ncc/climate_averages/uv-index/index.jsp?period=jul. Accessed 11 May 2012.
469. Queensland Government. About sun safety. Available: <http://www.sunsafety.qld.gov.au/forprofessionals/>. Accessed 15 May 2012.

470. The Australian College of Dermatologists, Australian and New Zealand Bone and Mineral Society, Osteoporosis Australia, Cancer Council. *How much sun is enough? Getting the balance right: vitamin D and sun protection*. 2008.
471. Department of Health and Ageing. National skin cancer awareness campaign. Available: <http://www.health.gov.au/internet/skincancer/publishing.nsf/Content/home>. Accessed 11 May 2012.
472. Dobbins SJ, Wakefield MA, Jansen KM, Herd NL, Spittal MJ, Lipscomb JE, et al. Weekend sun protection and sunburn in Australia: trends (1987-2002) and association with SunSmart television advertising. *American Journal of Preventive Medicine* 2008;34:94-101.
473. Lovato C, Shoveller J, Mills C, an Expert Panel. Workshop report: Canadian national workshop on measurement of sun-related behaviours. *Chronic Diseases in Canada* 1999;20:96-100.
474. Queensland Health. Queensland Health skin cancer prevention indicators: audit of *Queensland Health and non-Queensland Health sun safety and skin cancer prevention surveys - unpublished*. Prepared for Queensland Health by Dr H M O'Neill Brisbane; 2009.
475. Raasch BA, Buettner PG. Knowledge and perceptions about sunburn and solar keratoses in Australia. *Australasian Journal of Dermatology* 2008;49:142-147.
476. Nole G, Johnson AW. An analysis of cumulative lifetime solar ultraviolet radiation exposure and the benefits of daily sun protection. *Dermatologic Therapy* 2004;17:57-62.
477. Australian Bureau of Statistics. *Childhood education and care, Australia, June 2011*. Cat. no. 4402.0. ABS: Canberra; 2012.
478. Queensland Government. Skin cancer prevention in Queensland's construction and outdoor workers, 2006. Available: <http://www.sunsafety.qld.gov.au/forprofessionals/>. Accessed 2 May 2012.
479. Queensland Government. Summary of findings of 2009 literature review on skin cancer prevention: evidence based interventions. Available: <http://www.sunsafety.qld.gov.au/forprofessionals/>. Accessed 15 May 2012.
480. Jardine A, Bright M, Knight L, Perina H, Vardon P, Harper C. Does physical activity increase the risk of unsafe sun exposure? *Health Promotion Journal of Australia* 2012;23:52-57.
481. Australian/New Zealand Standard: solarium for cosmetic purposes. AS/NZS 2635:2008.
482. World Health Organization. *Exposure to artificial UV radiation and skin cancer*. IARC working group reports vol 1: WHO; 2006.
483. International Agency for Research on Cancer. Sunbeds and UV radiation. Available: http://www.iarc.fr/en/media-centre/iarcnews/2009/sunbeds_uvradiation.php. Accessed 25 Jun 2012.
484. Cancer Council Australia. National cancer prevention policy: ultraviolet radiation. Available: http://wiki.cancer.org.au/prevention/UV/Effective_interventions#Eradication_of_solariums%20. Accessed 11 May 2012.
485. Vu LH, van der Pols JC, Whiteman DC, Kimlin MG, Neale RE. Knowledge and attitudes about vitamin D and impact on sun protection practices among urban office workers in Brisbane, Australia. *Cancer Epidemiology, Biomarkers and Prevention* 2010;19:1784-1789.
486. Queensland Government. There's nothing healthy about a tan! Available: <http://www.sunsafety.qld.gov.au/forprofessionals/>. Accessed 23 Apr 2012.
487. Ipsos-Eureka Social Research Institute. *Evaluation of national skin cancer awareness campaign - third phase (2009-2010)*. Prepared for: Department of Health and Ageing. Ipsos-Eureka Social Research Institute: Sydney; 2010.
488. Montague M, Borland R, Sinclair C. Slip! Slop! Slap! and SunSmart, 1980-2000: skin cancer control and 20 years of population-based campaigning. *Health Education & Behavior* 2001;28:290-305.
489. Fawell J, Bailey K, Chilton J, Dahi E, Fewtrell L, Magara Y. *Fluoride in drinking-water*. Published on behalf of World Health Organization. IWA Publishing: London; 2006.
490. Gunsolley JC. Clinical efficacy of antimicrobial mouthrinses. *Journal of Dentistry* 2010;38:S6-S10.
491. Marinho VCC, Higgins JPT, Logan S, Sheiham A. Fluoride mouthrinses for preventing dental caries in children and adolescents (review). *Cochrane Database of Systematic Reviews* 2009;3.
492. National Advisory Council on Dental Health. *Report of the National Advisory Council on Dental Health*. NACDH; 2012.
493. Brotherton J, Wang H, Schaffer S, Quinn H, Menzies R, Hull B, et al. Vaccine preventable diseases and vaccination coverage in Australia, 2003 to 2005. *Communicable Diseases Intelligence* 2007;31:S1-S12.
494. Kim TH, Johnstone J, Loeb M. Vaccine herd effect. *Scandinavian Journal of Infectious Diseases* 2011;43:683-689.
495. Office of Economic and Statistical Research. *Immunisation survey 2008 summary report*. Prepared for: Queensland Health. OESR: Brisbane; 2008.
496. Department of Health and Ageing. National immunisation program schedule. Available: <http://www.immunise.health.gov.au>. Accessed 3 Apr 2012.
497. Department of Human Services. Australian childhood immunisation register. Available: <http://www.medicareaustralia.gov.au/provider/patients/acir/index.jsp>. Accessed 22 May 2012.
498. Australian Institute of Health and Welfare. 2009 *Adult vaccination survey: summary results*. Cat. no. PHE 135. AIHW: Canberra; 2011.
499. National Health and Medical Research Council. The Australian immunisation handbook. 9th ed. Available: <http://www.health.gov.au/internet/immunise/publishing.nsf/Content/Handbook-home>. Accessed 30 Mar 2012.
500. Hull B, Dey A, Campbell-Lloyd S, Menzies RI, McIntyre PB. NSW annual immunisation coverage report, 2010. *NSW Public Health Bulletin* 2011;22:179-195.
501. Mahajan D, Campbell-Lloyd S, Cook J, Menzies RI. NSW annual report describing adverse events following immunisation, 2010. *NSW Public Health Bulletin* 2011;22:196-208.

502. Queensland Health. *A Queensland Health fact sheet: free whooping cough vaccine for new parents*. v. 8. Queensland Health; 2011.
503. Roxon N. *Media release: protecting babies from whooping cough*. 25 Nov 2011. Department of Health and Ageing.
504. Lam C, Octavia S, Bahrame Z, Sintchenko V, Gilbert GL, Lan R. Selection and emergence of pertussis toxin promoter ptxP3 allele in the evolution of *Bordetella pertussis*. *Infection, Genetics and Evolution* 2012;12:492-495.
505. Macartney KK, Durrheim DN. NSW immunisation performance: continuing progress but no room for complacency. *NSW Public Health Bulletin* 2011;22: 169-170.
506. Martin N, Foxwell AR. Measles status in Australia, and outbreaks in the first quarter of 2009. *Communicable Diseases Intelligence* 2009;33:225-231.
507. Department of Health and Ageing. Immunise Australia program. Available: <http://www.immunise.health.gov.au/> Accessed 10 Apr 2012.
508. Queensland Health. Immunisation. Available: <http://www.health.qld.gov.au/immunisation/>. Accessed 10 Apr 2012.
509. Council of Australian Governments. *National healthcare agreement* 2011. COAG; 2011.
510. World Health Organization. Maternal, newborn, child and adolescent health. Available: http://www.who.int/maternal_child_adolescent/topics/child/development/en/. Accessed 1 May 2012.
511. World Health Organization. *The world health report 2005. Make every mother and child count*. WHO: Geneva; 2005.
512. Council of Australian Governments. *Protecting children is everyone's business. National framework for protecting Australia's children 2009-2020*. COAG: Canberra; 2009.
513. Council of Australian Governments. *Closing the gap: National partnership agreement on Indigenous early childhood development*. COAG: Canberra; 2009.
514. Griffith University. Creating child friendly cities and communities. Available: <http://www.griffith.edu.au/environment-planning-architecture/urban-research-program/research/creating-child-friendly-cities-communities>. Accessed 22 Jun 2012.
515. World Health Organization. Director-General's message on World Health Day. Available: http://www.who.int/dg/speeches/2012/ageing_roundtable_20120404/en/index.html. Accessed 26 Jun 2012.
516. Queensland Treasury. Life expectancy at birth (years) by sex, Queensland and Australia, 1881 to 2010. Available: <http://www.oesr.qld.gov.au/products/tables/life-expectancy-birth-years-sex-qld/index.php>.
517. World Health Organization. *Active ageing: a policy framework*. WHO: Geneva; 2002.
518. Myint PK. *Healthy ageing: determinants and outcomes of physical and mental functional health* VDM Publishing House; 2010.
519. Myint PK, Welch AA. Healthier ageing. *British Medical Journal* 2012;344:e1214.
520. McClure RJ, Hughes K, Ren C, McKenzie K, Dietrich U, Vardon P, et al. The population approach to falls injury prevention in older people: findings of a two community trial. *BMC Public Health* 2010;10:79.
521. Lennon A, Haworth N, Titchener K, Siskind V, McKenzie K, FitzGerald G, et al. *Injury prevention in Queensland: report to Queensland Injury Prevention Council*. Centre for Accident Research & Road Safety: Brisbane; 2009.
522. Queensland Government. *Positively ageless: Queensland seniors strategy 2010-20*. Queensland Government.
523. Australian Medical Association. *AMA Aboriginal and Torres Strait Islander health audit report 2012: progress to date and challenges that remain*. AMA: Canberra; 2012.
524. Australian Health Ministers' Advisory Council. *Aboriginal and Torres Strait Islander health performance framework report 2010*. AHMAC: Canberra; 2011.
525. Australian Institute of Health and Welfare. *Aboriginal and Torres Strait Islander health performance framework 2010 report: Queensland*. Cat. no. IHW 66. AIHW: Canberra; 2011.
526. Queensland Public Health Forum. *Eat well Queensland: 2002-2012 Smart eating for a healthier state*. Queensland Public Health Forum: Brisbane; 2002.
527. Olshansky SJ, Passaro DJ, Hershow RC, Layden J, Carnes BA, Brody J, et al. A potential decline in life expectancy in the United States in the 21st century. *The New England Journal of Medicine* 2005;352:1138-1145.
528. Gostin LO. Law as a tool to facilitate healthier lifestyles and prevent obesity. *Journal of the American Medical Association* 2007;297:87-90.
529. Organisation for Economic Co-operation and Development. *Obesity and the economics of prevention. Fit not fat*. OECD: Geneva; 2010.
530. Australian Bureau of Statistics. ABS legislative framework. Available: <http://www.abs.gov.au>. Accessed 18 Jul 2012.
531. Australian Institute of Health and Welfare. About AIHW. Available: <http://www.aihw.gov.au/about/>. Accessed 31 Jul 2012.
532. Page A, Tobias M, Glover J, Wright C, Hetzel D, Fisher E. *Australian and New Zealand atlas of avoidable mortality*. Public Health Information Development Unit, University of Adelaide: Adelaide; 2006.
533. Page A, Ambrose S, Glover J, Hetzel D. *Atlas of avoidable hospitalisations in Australia: ambulatory care-sensitive conditions*. Public Health Information Development Unit, University of Adelaide: Adelaide; 2007.
534. Porta MA, Greenland S, Last JM [editors]. *Dictionary of epidemiology*. 5th ed. Oxford: Oxford University Press; 2008.
535. World Health Organization. Chronic diseases. Available: http://www.who.int/topics/chronic_diseases/en/. Accessed 31 Jul 2012.
536. Council of Australian Governments. Welcome to the Council of Australian Governments' (COAG) website. Available: <http://www.coag.gov.au/>. Accessed 18 Jul 2012.

537. World Health Organization. What is chronic obstructive pulmonary disease (COPD)? Available: <http://www.who.int/features/qa/48/en/index.html> Accessed 19 Jul 2012.
538. Australian Bureau of Statistics. *Australian system of national accounts: concepts, sources and methods, Australia, 2012*. Edition 1. Cat. no. 5216.o. ABS: Canberra; 2012.
539. Australian Institute of Health and Welfare. *Australian hospital statistics 2007-08*. Cat. no. HSE 71. AIHW: Canberra; 2009.
540. Li Z, McNally L, Hilder L, Sullivan EA. *Australia's mothers and babies 2009*. Cat. no. PER 52. Australian Institute of Health and Welfare: Sydney; 2011.
541. National Health and Medical Research Council. NHMRC's role. Available: <http://www.nhmrc.gov.au/about/organisation-overview/nhmrcs-role>. Accessed 18 Jul 2012.
542. Organisation for Economic Co-operation and Development. About the OECD. Available: <http://www.oecd.org/about/>. Accessed 1 Aug 2012.
543. Laws PJ, Li Z, Sullivan EA. *Australia's mothers and babies 2008*. Cat. no. PER 50. Australian Institute of Health and Welfare: Canberra; 2010.
544. Australian Bureau of Statistics. *Information paper: use of the Kessler psychological distress scale in ABS health surveys, Australia, 2007-08*. Cat. no. 4817.o.55.001. ABS: Canberra; 2012.
545. World Health Organization. About WHO. Available: <http://www.who.int/about/en/>. Accessed 1 Aug 2012.

www.health.qld.gov.au/cho_report

