Chapter 2. CHILDREN

PUBLIC HEALTH SERVICES AND
HEALTH INFORMATION CENTRE
Foreword

The health of the people of Queensland is very good overall and continues to improve. However, recent declines in the amount of physical activity undertaken, poor nutrition, an increase in overweight and obesity, as well as high levels of smoking and alcohol misuse, tell us that this is not a time for complacency. In addition, the increasing inequalities in health and the poor health of Indigenous peoples require specific attention.

In order for us to address these issues, Queensland Health and others whose work impacts on health and wellbeing, need to focus on the areas that will have the greatest gains for all Queeslanderators. Information is critical to enable us to make decisions about where to focus and invest.

*Health Determinants Queensland 2004* is a key resource in this regard. It provides a summary of the most important factors influencing the health status of Queenslanders today and the areas of potential gain, and highlights the key responses needed to address them. This report brings together indicators of the major behavioural, social, economic and environmental determinants of health and their recent trends in Queensland. In doing so, it provides valuable guidance to government, non-government agencies and the community for improving health and reducing the burden of disease tomorrow and into the future.

It is absolutely clear that the influences on the health of Queenslanders go well beyond the scope of health agencies. All parts of society are and need to be engaged in the effort. Promoting and sustaining the health of the public is one of the most important functions of government and Queensland Health’s new strategic intention highlights this.

Our mission is to promote a healthier Queensland. Our vision is to be leaders in health and partners for life. We will be successful in promoting a healthier Queensland through acting on the following five strategic intents:

- **Healthier staff** – optimise staffing levels, provide staff with the right knowledge and skills, and provide an environment that values their experience and which supports positive ideas to drive innovation, creativity and health enhancements
- **Healthier partnerships** – work with others to harmonise programs and activities that impact on health
- **Healthier people and communities** – promote healthier lifestyles and environments for individuals, families and communities and improve community-based chronic disease management
- **Healthier hospitals** – provide high quality and equitable acute emergency care, integrated with enhanced community-based services
- **Healthier resources** – use finite resources to maximum advantage.

*Health Determinants Queensland 2004* provides an information basis from which we can make informed decisions about how to best action each of these intents – what initiatives need to be implemented in which areas to achieve the greatest possible gains in health.

I encourage everyone with an interest in health – which is all of us – to familiarise yourself with the information in this report and to use this information in planning priority setting, and decisions about resource allocation.

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Health Determinants Queensland 2004

Chapter 1 Whole of population
Chapter 2 Children
Chapter 3 Young people
Chapter 4 Older people
Chapter 5 Indigenous peoples
Chapter 6 Health service district profiles

Companion documents:

Health Determinants Queensland 2004 at a glance.
Health Determinants Queensland 2004: Statistical report.
Table of Contents

2.1 Children summary.................................................................2-1
2.2 Introduction ...........................................................................2-4
  2.2.1 Life course approach ..................................................2-5
  2.2.2 Social determinants of health .......................................2-6
2.3 Health status and outcomes ..............................................2-8
  2.3.1 Burden of disease ..........................................................2-8
  2.3.2 Life expectancy ..............................................................2-10
       Infant mortality rate .......................................................2-11
  2.3.3 Maternal and infant conditions .....................................2-11
       Maternal age .................................................................2-11
       Antenatal visits ............................................................2-12
       Gestational diabetes ......................................................2-12
       Congenital anomalies ..................................................2-12
       Low birth weight ..........................................................2-12
       Gestational age ..............................................................2-13
       Sudden infant death syndrome ......................................2-13
       Postnatal depression .......................................................2-13
  2.3.4 Activity limitation .........................................................2-13
  2.3.5 National health priority area conditions ......................2-14
       Asthma .................................................................2-14
       Injury and poisoning ......................................................2-15
       Drowning .................................................................2-16
       Falls .................................................................2-17
       Fire, burns and scalds ......................................................2-17
       Poisoning .................................................................2-18
       Road transport injury ....................................................2-18
       Homicide and intentional injury by another ......................2-19
       Mental health ..............................................................2-20
       Suicide and Intentional self-harm ..................................2-21
       Diabetes .................................................................2-21
       Cancer .................................................................2-22
  2.3.6 Oral health .................................................................2-22
  2.3.7 Communicable diseases .............................................2-24
       Invasive meningococcal disease ....................................2-24
       Invasive pneumococcal disease ....................................2-25
       Vaccine preventable diseases .......................................2-25
       Gastrointestinal conditions .........................................2-27
2.4 Health determinants .........................................................2-28
  2.4.1 Environmental factors ...............................................2-28
       Household safety devices .............................................2-29
       Drugs and poisons storage ..........................................2-29
       Exposure to environmental tobacco smoke .................2-29
  2.4.2 Socioeconomic factors ................................................2-30
       Income .................................................................2-30
       Pensions and disability support ....................................2-30
       Literacy and numeracy ..................................................2-31
       Unemployment ..............................................................2-32
2.4.3 Community capacity............................................................. 2-33
Families and parenting................................................................. 2-33
Behavioural problems ............................................................... 2-33
Child care services................................................................. 2-34
Participation in out of school activities ................................... 2-34
Abuse and neglect .................................................................. 2-35
Homelessness .......................................................................... 2-35
Safety and crime ..................................................................... 2-35

2.4.4 Health behaviours ............................................................. 2-36
Maternal smoking and substance abuse .................................... 2-36
Healthy weight ......................................................................... 2-37
Breastfeeding .......................................................................... 2-37
Nutrient intake ......................................................................... 2-38
Food and drink advertising...................................................... 2-39
Fast food consumption ............................................................ 2-40
Physical activity ...................................................................... 2-40
Sun protection .......................................................................... 2-40
Vaccination rates ...................................................................... 2-40

2.5 Interventions to address the burden of disease ................. 2-42
Alcohol ..................................................................................... 2-43
Injury ....................................................................................... 2-44
Mental health........................................................................... 2-45
Nutrition.................................................................................. 2-46
Oral health .............................................................................. 2-48
Physical activity ...................................................................... 2-49
Smoking................................................................................... 2-50
Social determinants ................................................................. 2-51
Sun protection .......................................................................... 2-52

2.6 Methodology and guide for users......................................... 2-53
2.7 List of tables .......................................................................... 2-69
2.8 List of figures ......................................................................... 2-70
2.9 References ........................................................................... 2-71
2.1 Children summary

The health of children and young people has been identified as a target health improvement area in the Smart State: Health 2020 Directions statement strategic vision for Queensland Health. Children aged 0-14 years represent 21% of the Queensland population.

The health of children is the result of a complex interplay of genetic, social, environmental, economic and cultural factors. The impact of these factors in childhood also affects health in adult life. There is growing evidence that maternal health in the antenatal period, effective nurturing in the early years, early brain development through infancy and toddlerhood, and the psychosocial transitions to young adulthood, have significant effects on health and wellbeing throughout the life course.

The health status of children in Queensland is relatively high compared with other age groups, and by international comparison. However, some key issues remain:

- poorer health of Indigenous children
- asthma
- mental health problems and disorders
- injury
- inappropriate nutrition
- overweight and obesity
- physical inactivity.

For the first time in Queensland, Health Determinants Queensland 2004 combines indicators of the major behavioural, social, economic and environmental determinants of health for children. This report describes the relationship between health determinants and health outcomes. In doing so, it provides: evidence for investment in population health, both in the health sector and across government; priority areas for investment; and interventions which can most improve the health of children in Queensland.

What is the health status of children in Queensland?

- The life expectancy of Queensland children born in 1999-2001 was 76.9 years for males and 82.5 years for females, similar to that of Australia. Australia has one of the highest life expectancies in the world.
- On average, Indigenous women in the State give birth at a younger age than non-Indigenous women. Almost two thirds of Queensland's total Indigenous population is under 25 years of age, hence the health of Indigenous children and young people is critical to the health of Indigenous peoples in this State.
- Asthma is the biggest cause of burden of disease and injury in Australian children. The level of asthma in Australia is among the highest in the world. After years of increasing steadily, the prevalence in children may have reached a plateau or may even be declining. Asthma is one of the most frequent reasons Australian children are admitted to hospital. Over the past ten years in Queensland, boys were more likely to be hospitalised for asthma than girls.
- Injury is the biggest cause of death in children. In 1996-98 in Queensland, injury and poisoning caused one third of all deaths in children. Half of these children were younger than five years. Boys are more likely than girls to be hospitalised for injury. In Australia, children living in remote areas are more likely to be hospitalised than those living in rural areas. They are in turn more likely to be hospitalised than children living in urban areas. Indigenous children are more likely to be hospitalised than non-Indigenous children.
- In Queensland in 2000/01, the incidence rates for Type 1 diabetes in children aged 0-14 years were 21.5 per 100,000 for boys and 18.7 for girls, similar to that of Australia. The incidence rate of Type 1 diabetes in Australian children is increasing. The number of children in Queensland or Australia who have Type 2 diabetes is unknown. However, it is expected to increase, since Type 2 diabetes is linked to lifestyle factors such as obesity and insufficient physical activity, which are rapidly increasing.
- Tooth decay is the single most common chronic childhood disease. Queensland children are more likely to experience tooth decay than Australian children as a whole. Infants and children are less likely to have tooth decay if they have access to fluoridated water and if frequent exposure to foods and drinks containing added sugars are avoided.
- About three-quarters of the cases of invasive meningococcal disease are aged less than 25 years; those less than five years make up 36% of cases. Similarly, for invasive pneumococcal disease, children aged 0-4 years make up the largest single age group (40%).
• In recent years, many cases of pertussis (25%) have occurred in young adolescents aged 10-14 whose immunity has waned. Booster doses are recommended at 15 years of age.

Key population groups

Infants and young children
• The infant death rate in Queensland in 2000 was 6.2 deaths per 1,000 live births, higher than Australia at 5.2 deaths per 1,000 live births.
• In Queensland in 2000, there were 48,524 births. Seven percent of infants had low birth weight, similar to that of Australia. One in twelve children was born premature.
• Asthma is the biggest cause of burden of disease and injury in Australian children aged 0-4 years, followed by health problems associated with low birth weight.
• Low speed run-over (usually a car reversing over a child) is the third most frequent cause of injury death in Queensland children aged 1-4 years. Boys are more likely to be hospitalised due to road transport injury than girls.

Older children
• For Australian children aged 5-14 years, the biggest cause of disease burden is asthma, accounting for about one third of the burden. Mental health conditions such as depression, attention-deficit hyperactivity disorder and separation anxiety disorder, collectively account for 22% of the disease burden.
• Of all injuries, falls are the most common reason Australian children are hospitalised. In Queensland, boys are more likely to be hospitalised than girls.
• Girls are more likely to be hospitalised due to intentional self-harm than boys. Over the past 10 years, rates of hospitalisation for intentional self-harm have increased for boys and girls.
• In Australia, boys are more likely to have attention-deficit hyperactivity disorder than girls. Girls are more likely to have eating disorders than boys.
• For children aged 5-14 years in the State, 11% have a disability, and half of these children have a profound or severe limitation to core life activities. These figures were similar to Australia.

What are the health determinants impacting on Queensland children?

Health determinants can be broadly divided into:
- ‘upstream’ (education, employment, income, living and working conditions);
- ‘midstream’ (health behaviours and psychosocial factors); and
- ‘downstream’ (physiological and biological factors).

In this report, the upstream determinants of health for children are addressed in sections on environmental factors and socioeconomic factors, and midstream determinants in sections on community capacity and health behaviours. The downstream effects are addressed in the health behaviour section.

Environmental factors
• Many childhood injuries occur in the home. Households in Queensland with young children are more likely to have smoke alarms/detectors installed, and an adjustable hot water thermostat, than households without young children. The rate of hospitalisation for fire, burns and scalds in children has increased during the last decade. Boys are more likely to be hospitalised than girls. About one third of all hospitalisations for these injuries are for children aged 0-4 years.
• Nearly a quarter of households with young children have a swimming pool. Of these, 82% have child resistant fencing or self-locking gates. In the last 15 years, there has been an overall reduction in drowning rates in Queensland children aged 0-4 years.
• In Queensland in 2003, just over half of households with children, kept household cleaners and poisons locked away or out of reach. About 88% of such households kept paracetamol products, and 85% kept other medicines and vitamins, locked away or out of reach.
• In 1995, 40% of Queensland children aged 0-14 years lived in a household with at least one smoker, similar to that of Australia. In 1999-2001, environmental tobacco smoking caused 21 deaths each year in children aged 0-4 years. Low birth weight, followed by respiratory illness, was the leading cause of hospitalisations in children aged 0-4 years due to tobacco smoking.
**Socioeconomic factors**

- In Queensland in 2001, the weekly income of a quarter of Queensland families was less than $500 per week. Of these low income families, 27% were one parent families and 30% were couple families with children. Children from low income families are more likely to suffer from chronic illness than those from high income families.
- Children with poor literacy and numeracy skills are more likely to be unemployed as adults. In Queensland in 2003, 92.6% of children in Year 3 reached the national reading benchmark, and 91.4% reached the numeracy benchmark, similar to that of Australia.
- In 2002, 20.5% of Queensland children aged 0-14 years did not have an employed parent, compared to 17.9% nationally.

**Community capacity**

- In Queensland in 2001, 59% of the population were living in couple families with children and 14% of the Queensland population were in one parent households. In 1996, 19.8% of Queensland children lived in one parent families, and by 2021, this is expected to increase up to one in three children.
- In 2001, 10% of homeless people in Australia were estimated to be children aged 0-11 years.
- One quarter of Queensland parents have participated in a parenting program.
- Based on parents’ reports, the behaviour of almost 9% of children aged 2-12 years was assessed as disruptive or antisocial. Five percent of parents reported their child’s behaviour as very or extremely difficult to manage. One quarter of parents who considered their child to have emotional or behavioural problems had consulted a professional for advice.
- In 2000, Queensland children aged less than three years spent a median of 16 hours per week in child care, compared to 13 hours per week for all Australian children.
- In Queensland, the rates of substantiated child abuse and neglect have been increasing, as in other states and territories of Australia.
- In Australia in 2000, 59% of children aged 5-14 years participated in organised sport (mainly boys) and about 29% of children participated in organised cultural activities (mainly girls). The most common leisure activity was watching television or videos (97%), followed by playing electronic or computer games (69%).

**Health behaviours**

- In Australia in 1995, one in six boys and girls aged 2-18 years were overweight, and a further 5% of boys and girls were obese. In 2002 in South Australia, about 20% of four year old children were overweight or obese, an increase of 60% since 1995. No recent Queensland statistics are available on growth and overweight and obesity levels in children.
- In Queensland in 1999-01 for children aged 0-4 years, hazardous and harmful alcohol consumption caused two deaths per year and illicit drugs caused three deaths. Of these deaths, newborn drug toxicity was the leading cause.
- In the State in 2000, 83.2% of infants were exclusively breastfed at discharge from hospital. Exclusive breastfeeding for the first six months of an infant's life is recommended.
- Australian children aged 5-12 years watch an average of 23 hours per week of television, including four hours of advertisements. Much of this is food advertising, where most is for foods of poor nutritional value.
- Data on the regularity of children’s participation in physical activity is not available. Of Queensland children aged 5-14 years, 56% participate in organised sport, which is lower than for Australia.
- In Queensland in 2003, the majority of parents said it was not difficult to prevent their child from becoming sunburnt. However, 19% of parents reported one episode of painful sunburn in their child in the preceding summer, and 5% reported between two and ten episodes.
- In Queensland in 2003, 92.1% of children were fully vaccinated at 12 months of age, 90% were fully vaccinated at two years of age, and 94.5% had received their first dose of measles/mumps/rubella vaccine. These rates were similar to those of Australia.

Evidence based strategies which address the determinants of health have the potential to reduce the burden of ill health and premature death in the lives of Queensland children, particularly those who are most disadvantaged.
2.2 Introduction

Children living in Queensland enjoy a quality of life and health that is comparable to, or exceeds that found almost anywhere in the world. Good health is one of Queensland’s greatest assets. The health of Queenslanders generally continues to improve. Despite this overall high standard, it is important to ensure that health is shared equally among all populations in Queensland and that the rate of improvement equals that of other states.

For the purposes of this report, children are defined as aged 0 to 14 years. In Queensland in 2001, there were 772,559 children, including almost 250,000 younger than five years of age. Children comprise 21% of the Queensland population. The health status of children in Queensland is relatively high compared with other age groups and by international comparison. Some key issues remain, such as mental health problems, asthma, abuse and neglect, injuries, inappropriate nutrition and obesity, physical inactivity and the poorer health status of Indigenous children.

The factors that lead to someone developing disease are likely to have had their beginnings years earlier, through a complex chain of events fashioned by interactions of the individual, the environment, and broader social and economic factors. Determinants of health is the term used for those factors that have either a positive or negative influence on health at the individual or population level. Health determinants can be broadly divided into ‘upstream’ determinants (education, employment, income, living and working conditions), ‘midstream’ (health behaviours and psychosocial factors) and ‘downstream’ (physiological and biological factors).

Health Determinants Queensland 2004 is the second in a series of Health Indicator reports produced by Queensland Health. This report compiles a consolidated set of indicators of the major behavioural, social, economic and environmental determinants of health and their recent trends in Queensland. Selected health outcome indicators are also reported. This report describes the relationship between the determinants and health outcomes, and recommends some evidence based interventions to improve the health of Queenslanders. More detailed statistics and information are provided in Health Determinants Queensland 2004: Statistical report.

The sequence and scope of indicators in this report are structured following the National Health Performance Framework. This framework has three tiers: Health status and outcomes; Determinants of health; and Health system performance. The framework was chosen for consistency with national and state directions; to help readers access and reference their particular areas of interest; and to better identify challenges and points of intervention. As the focus of this report is determinants of health, limited health outcome indicators are presented. Extensive health outcomes indicators were previously reported for Queensland in the first Health Indicators report, Health Indicators for Queensland. The third tier of the framework, measurement of health system performance, is beyond the scope of this publication. The National Health Performance Framework is included in section 2.6 of this report. An explanation of the terms used in this report, as well as the data sources and limitations, are also described in section 2.6.

Health Determinants Queensland 2004 is comprised of five population based chapters, reflecting the life course approach and the age specific nature of health determinants and outcomes. This Children chapter reports the determinants of health which affect the age group 0-14 years, key health outcomes and interventions to address these determinants. The Whole of population, Young people, Older people and Indigenous peoples chapters reflect the health determinants of specific relevance to those populations.

The report provides the burden of disease and injury data for Queensland to allow assessment of the relative impact of conditions and health behaviours on the health of the population. Population groups within Queensland with excess mortality and morbidity associated with conditions and determinants are also identified. This information is then related to the sociodemographic profile of each Health Service District to estimate those conditions and health determinants which warrant specific attention. Interventions to address these determinants in each population group are also included in each chapter.

Health Determinants Queensland 2004 provides epidemiological evidence for investment in population health both in the health sector and across government and will assist policy development and decision making on balanced investment in line with national and state priorities. At a Health Service District
level, these reports will complement district population and health status profiles to support decision makers at the local level to identify priority areas for primary prevention and practical interventions where investments can be made.

2.2.1 Life course approach

Health outcomes reflect the accumulation of exposures to both advantageous and disadvantageous experiences and environments over varying stages of life. In recent years, a life course approach to the study of health and illness has helped to explain the existence of wide socioeconomic differentials in adult mortality and morbidity rates. Evidence suggests that such exposures accumulate throughout life and increase the risk of illness and premature death.9 Exposure to disadvantageous experiences and environments do not equally impact on all people, or all stages through the life cycle. Some determinants have an immediate impact on health, while other early life or continuous physical and psychosocial exposures have a lag time and manifest in compromised health status later in life.

The Strategic Policy Framework for Children’s and Young People’s Health 2002-20074 reports there is growing evidence that maternal health and wellbeing in the antenatal period; effective nurturing in the early years; early brain development in infancy and early childhood, and the psychosocial transitions to young adulthood, have significant and lasting effects on health and wellbeing in later life.4 Associations between environmental and social exposures and health status are bi-directional, with a stronger influence of social disadvantage on poor health. The underlying nature of these associations and interactions is not yet fully understood. Some hypotheses indicate that the duration and intensity of exposure to adverse social and environmental determinants and subsequent risk factors are important in selected health outcomes.10 For example, the risk of adverse effects of smoking is believed to proportionally increase if exposure commences early in life and if duration of exposure reaches older age. Similarly, longer exposures to poor diet, poverty, alcohol and/or a lack of physical activity are all seen to be more strongly predictive of negative health outcomes than shorter exposures. However, removal of some exposures can dramatically alter the course of health outcomes. For example, the adverse health effects of smoking are reduced following cessation of smoking at any age.

The association between intrauterine and neonatal exposures and adverse health outcomes in adults, has been extensively explored. The Barker hypothesis attempts to explain these associations.11 Some risks for adult health are predetermined at birth. Deficient maternal nutrition can impact on foetal growth and development, and lead to organ impairment and chronic disease later in life. Likewise, low birth weight babies, adjusted for gestational age, have an increased risk of early death and, if they survive, an increased risk of disability and chronic disease during childhood and adult life.12 Air pollution, urbanisation, residential proximity to mines and factories, occupational exposure to fumes, exposure to cigarette smoking, and inadequate nutrition during childhood and early adulthood have been identified as having potential for lifetime damaging effects and for generating and/or maintaining social class differentials in health.13 Chronic illness in childhood, more common in socially disadvantaged groups, can have long term consequences both for health and socioeconomic circumstances in later life. Exclusive breastfeeding to around six months has been identified as a protective factor for emotional wellbeing and chronic diseases such as diabetes and asthma.14 Slow growth and short adult stature may be a reflection of nutritional status and adverse socioeconomic and psychosocial conditions in childhood.15 Lifestyle factors such as a high-fat diet and lack of physical activity are associated with the development of obesity and pathological cardiovascular lesions as early as four years of age, and certainly by young adulthood.16 The presence of chronic disease in early life, such as infectious diseases or respiratory illness, can lead to both long-term ill health and possible socioeconomic disadvantage later in life as a consequence of disability or unemployment.17

A major longitudinal Queensland study has followed children to 14 years, and reported that a child’s future health as an adult is influenced by the social and economic circumstances of their family. Children born to mothers experiencing the greatest socioeconomic disadvantage are more likely to experience mental and
emotional health problems, and poorer learning ability. They are also more likely to be early adopters of high risk behaviours such as cigarette smoking.18

2.2.2 Social determinants of health

Most of the burden of disease affecting children and resulting in health problems in later life is the result of complex interactions between individuals and socio-economic and environmental determinants of their health.4 Current epidemiological trends in the health of children (such as mental health problems, asthma, abuse and neglect, injuries, inappropriate nutrition, obesity, and physical inactivity) reflect the impact of extensive socio-cultural shifts experienced over recent decades. Issues around economic disadvantage, cultural diversity and tolerance, the changing nature of work and family structures, family violence and homelessness challenge the health system to meet increasingly complex health needs for children in collaboration with other sectors.4

The greatest burden of ill health is borne by those most disadvantaged in Australia. One of the dominant features affecting the health situation of all industrialised countries is the social gradient in health and disease.19 This gradient in health and disease is prevalent in all socioeconomic strata of society. On every rung up the socioeconomic disadvantage ladder from least to most disadvantaged, people experience more sickness, shorter life expectancy and poorer health. People of greater socioeconomic disadvantage experience worse health than those of higher socioeconomic status for almost every major cause of mortality or morbidity.20 Moreover, socioeconomic differences in health are evident for both females and males at every stage of the life course. Socioeconomic inequalities in health have been extensively reported for Queensland.3 Social and economic disparities are one of the major public health challenges confronting Queensland.21

A safe environment, adequate income, meaningful social roles, secure housing, higher levels of education and social support are all associated with better health and wellbeing.22-24 In addition to health behaviours, these social, cultural, economic and environmental factors comprise what we call population health determinants and are the focus of this report. While each of these influences is dealt with in a separate section of this report, the interaction of all these factors ultimately determines the health of individuals, families and communities.25

A wealth of evidence supports the strong association between poverty and ill health.9,21,26 In Australia, children living in single-parent households and without both biological parents, or with parents with lower formal education and income, are more likely to experience behavioural and emotional problems as well as physical limitations, than their less disadvantaged counterparts.27 Socioeconomically disadvantaged adults who are less formally educated or poorly educated experience the highest rates of illness such as cardiovascular disease and diabetes.28 They also have the highest prevalence of risky behaviours such as smoking and hazardous use of alcohol. In addition, income inequality has a significant impact on population health.29 Specifically, income and wealth inequalities have been correlated with increased all-cause mortality.30-32

While our socioeconomic position connects us to the physical and social resources which can make our life better, the feelings of empowerment and status that go with the connection to these resources are also important. This second dimension is important because people who feel in control of their lives are also more likely to take control of their health.33 A lack of control over work and home life has powerful effects on our health.19 Like continuing anxiety, feelings of insecurity and social isolation, the psychosocial impact of a lack of control at home or at work accumulate during life and increase the chances of poor mental health, physiological wear and tear and premature death. Psychosocial factors affect physical health through the stress response. Although the stresses of modern life rarely demand strenuous or even moderate physical responses, turning on the stress response diverts energy and recourses away from many physiological processes important to long-term health maintenance.19 For brief periods, this stress response has minimal impact, however, if people feel tense too often or the tension goes on for too long, they become more vulnerable to a wide range of conditions including infections, diabetes, high blood pressure, heart attack, stroke, depression and aggression. The lower people are in the social hierarchy of industrialised countries such as Australia, the more common these problems become.19
While many population health interventions target lifestyle factors where health gains can be made, the social influences on health behaviours must be considered in both the design and implementation of these interventions. The World Health Organisation identifies the need to understand the interaction between material disadvantage and social meanings. “It is not simply that poor material circumstances are harmful to health; the social meaning of being poor, unemployed, socially excluded, or otherwise stigmatised also matters.”

As well as income and education, other social factors are also known to affect the health of populations. For example, unmarried and divorced people, and men have consistently higher age-adjusted death rates than married people and women. Additionally, social trends such as the increase in one-parent families, the ageing population and an increase in the age of people starting families are already influencing the economic environment and the health status of the population.

Ethnicity also can influence health outcomes. This may be due to limited service knowledge, poor language skills, employment discrimination, an associated low socioeconomic living environment, and absence of social networks within minority migrant communities and refugees, as well as due to genetic determinants. For example, racial minorities in Britain experience interpersonal violence, institutional discrimination, or socioeconomic disadvantage, all of which have independent detrimental effects on health, regardless of the health indicator used.

Social determinants of health are often beyond the control of the individual. Addressing them through multidisciplinary efforts at the population level can assist in preventing illness and improving the overall health of the community. While universal access to healthcare is one of the social determinants of health, more important to the health of the population as a whole are the social and economic conditions that make people ill and in need of healthcare in the first place.
2.3 Health status and outcomes

“Although the health status of children and young people in Queensland is relatively high, some key issues remain: significant health differentials, mental health problems and disorders, abuse and neglect, alcohol, tobacco and other drugs, injuries, suicide, attempted suicide and self-harm, inappropriate nutrition, physical inactivity and obesity.”

Strategic Policy Framework for Children’s and Young People’s Health 2002-2007

Determinants of health are the principal focus of this report. However, an initial overview of the health status and health outcomes for children in Queensland provides the context for the importance of the health determinants that follow in section 2.4.

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

– How healthy are children in Queensland?
– Is it the same for everyone?
– Where is the most opportunity for improvement from a population health perspective?

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

Actions to address these health needs are described in section 2.5.

2.3.1 Burden of disease

“The leading causes of disease burden for Australian children aged 0 to 14 years are asthma, low birthweight and attention deficit hyperactivity disorder (ADHD), followed by neonatal and congenital conditions, SIDS and injuries.”

Strategic Policy Framework for Children’s and Young People’s Health 2002-2007

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

Asthma is the leading cause of disease burden in Australian children aged 0-4 years (Figure 2.1). For infants and young children, 12% of the burden is due to this single cause. Low birth weight, birth trauma and asphyxia account for 14.2% of the burden of disease in boys and 16.9% in girls. While the burden of disease is similar in boys and girls aged 0-4 years, males have a greater burden due to attention-deficit hyperactivity disorder, autism and Asperger’s syndrome than females. Females have a greater burden due to low birth weight and acute respiratory infections than males. Perinatal and neonatal conditions, congenital malformations, and chromosomal anomalies also are substantial contributors to the burden of disease in this age group.

For Australian children aged 5-14 years, asthma accounts for about one third of the disease and injury burden (Figure 2.2). Mental health conditions, which include depression, attention-deficit hyperactivity disorder and separation anxiety disorder, collectively account for 22% of the burden of disease in this age group. While the burden of disease, and specifically mental health conditions, is similar in boys and girls aged 5-14 years, boys have twice the burden due to attention deficit hyperactivity disorder, while 5% of the burden in girls is due to eating disorders.
Figure 2.1: Leading causes of the burden of disease and injury for children 0-4 years, DALYs by sex, Australia 1996

Source: AIHW Burden of disease and injury in Australia 1996
2.3.2 Life expectancy

Most Queenslanders can expect to live relatively long and healthy lives. In Queensland in 1999-2001, life expectancy at birth was 76.9 years and 82.5 years for males and females respectively, similar to that of Australia (Table 2.1). Australians continue to have one of the highest life expectancies in the world. Australia is in the top ten OECD countries for life expectancy. Healthy life expectancy for Australian males is 70.1 years and for females 73.2 years, which is around 9% of life ‘lost’ due to illness. Healthy life expectancy is life expectancy weighted for health status. More information on life expectancy can be found in the Whole of population chapter.
Table 2.1: Life expectancy at birth by sex, Queensland, Australia and other states, 1999-2001

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queensland</td>
<td>76.9</td>
<td>82.5</td>
</tr>
<tr>
<td>New South Wales</td>
<td>76.9</td>
<td>82.4</td>
</tr>
<tr>
<td>Victoria</td>
<td>77.5</td>
<td>82.7</td>
</tr>
<tr>
<td>South Australia</td>
<td>77.0</td>
<td>82.5</td>
</tr>
<tr>
<td>Western Australia</td>
<td>77.3</td>
<td>82.8</td>
</tr>
<tr>
<td>Tasmania</td>
<td>76.0</td>
<td>80.2</td>
</tr>
<tr>
<td>Northern Territory</td>
<td>70.8</td>
<td>76.5</td>
</tr>
<tr>
<td>Australian Capital Territory</td>
<td>78.5</td>
<td>82.9</td>
</tr>
<tr>
<td>Australia</td>
<td>77.0</td>
<td>82.4</td>
</tr>
</tbody>
</table>

Source: ABS Deaths 2001

Infant mortality rate

The infant mortality rate in Queensland in 2000 was 6.2 deaths per 1,000 live births (Table 2.2). The infant mortality rate in Queensland is higher than Australia and all states and territories excluding the Northern Territory. Infant mortality rates are on average 27% higher in boys than girls. Infant mortality is recognised internationally as one of the most important measures of the health of a nation and its children. It is also an important indicator of the health of pregnant women. A low infant mortality rate is a major contributor to increased life expectancy. The Indigenous infant mortality rate for Queensland is more than twice that of non-Indigenous children.

The rate of infant deaths in Australia has declined dramatically from 10.7 deaths per 1,000 live births in 1980 to 5.2 deaths per 1,000 live births in 2000. These dramatic gains have been achieved through improvements in public sanitation and health education, the development of vaccines and the effective use of antibiotics.

Table 2.2: Infant mortality rate, by state and territory, Australia, 1980, 1990 and 2000

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

Source: ABS Australian Social Trends 2002  Note: Rate per 1,000 live births

2.3.3 Maternal and infant conditions

“Consistent with national statistics, the majority of childhood deaths in Queensland occurred in the first year of life, with the greatest percentage of these being due to perinatal and congenital conditions and sudden or unexpected infant death”

Strategic Policy Framework for Children’s and Young People’s Health 2002-2007

Maternal age

In Queensland in 2000, there were 48,524 births. Mothers were most commonly aged between 20 and 34 years (78.6%). Twenty-two births were to mothers aged less than 15 years, while 3,161 (6.5%) births were to mothers aged 15-19 years. On average, Indigenous women give birth at a younger age than non-Indigenous women. In Queensland in 1999, for Indigenous women aged 15-19 years, the birth rate was 71.2 per 1,000. The birth rate for non-Indigenous women aged 15-19 years was 22.4 per 1,000.

The age of the mother can impact on the development of the foetus. Older and younger mothers are at greater risk of delivering an infant that is preterm and/or low birth weight. Adolescent pregnancies are more likely to miscarry. The infants of older mothers are at higher risk of perinatal death and are more likely to be born with a chromosomal abnormality. Australian research has found that infants born to women under the age of 20 years, or who were single, separated or divorced, Aboriginal, or who smoked during pregnancy, were at increased risk of being premature or of low birth weight.
**Antenatal visits**
The majority of Queensland mothers (65.5%) attended at least eight antenatal appointments in 2000 (Table 2.3). Antenatal care is known to be an important protective factor in the health of the neonate.

<table>
<thead>
<tr>
<th>Number of antenatal visits</th>
<th>Mothers attending</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 2</td>
<td>704</td>
<td>1.5</td>
</tr>
<tr>
<td>2-4</td>
<td>4431</td>
<td>9.1</td>
</tr>
<tr>
<td>5-7</td>
<td>11479</td>
<td>23.7</td>
</tr>
<tr>
<td>8 or more</td>
<td>31791</td>
<td>65.5</td>
</tr>
<tr>
<td>Not stated</td>
<td>119</td>
<td>0.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>48524</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Source: Perinatal statistics Queensland 2000

**Gestational diabetes**
In Queensland in 2000, there were 1,898 (3.9%) mothers with gestational diabetes as a complication of pregnancy. It has been reported that gestational diabetes occurs in 3-8% of pregnant females in Australia. Rates may reach as high as 20% for high risk groups such as Indigenous females. Poorly managed diabetes during pregnancy can result in spontaneous abortion, stillbirth or difficult births.

**Congenital anomalies**
Congenital anomalies in Australia in 1996 accounted for 18.4% of the burden of disease in males and 20.6% of the burden of disease in females in the 0-4 year age group, as measured by DALYs. In Queensland in 2000, there were 2,090 births with at least one anomaly, a rate of 42.4 per 1,000 births.

Congenital malformations are anatomical defects, chromosomal abnormalities or other genetic diseases that are present at birth. The causes of most congenital malformations cannot be determined. Congenital malformations can be caused by a single major mutant gene. Malformations can also be caused by an interaction between genetic and non-genetic factors such as in Down’s syndrome, which becomes more common as maternal age increases.

Congenital malformations also can be caused by environmental factors such as rubella infection during pregnancy, teratogenic agents taken during pregnancy and nutritional deficiencies such as folate deficiency. The risk may be reduced by care in prescribing drugs to pregnant women, immunising against rubella before pregnancy and increasing the intake of folate prior to conception to decrease the risk of neural tube defects in the foetus. It is becoming increasingly clear that there is a continuous association between the risk of many diseases and prevalence of risk factors, such as low maternal plasma folate associated with neural tube defects.

**Low birth weight**
Low birth weight in Australia in 1996 accounted for 8.6% of the burden of disease in males and 10.6% of the burden of disease in females in the 0-4 year age group as measured by DALYs. Of the 49,372 babies born in Queensland in 2000, 1.6% weighed less than 1,500 grams and 5.4% of babies weighed between 1,500 and 2,499 grams (Table 2.4). Similarly, about 7% of all babies born in Australia in 1999 were born weighing less than 2,500 grams.

Low birth weight is a major indicator for infant health. Babies with birth weight under 2,500 grams are at a greater risk of early death, require a longer period of hospitalisation after birth and are at higher risk of ongoing health problems and disabilities. Low birth weight infants, adjusted for gestational age, have an increased risk of early death and, if they survive, an increased risk of disability and chronic disease during childhood and adult life.

<table>
<thead>
<tr>
<th>Type of birth</th>
<th>&lt;1500</th>
<th>1500-2499</th>
<th>2500 and above</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singleton</td>
<td>1.3</td>
<td>4.3</td>
<td>94.5</td>
</tr>
<tr>
<td>Multiple</td>
<td>12.5</td>
<td>41.2</td>
<td>45.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1.6</strong></td>
<td><strong>5.4</strong></td>
<td><strong>92.8</strong></td>
</tr>
</tbody>
</table>

Source: Perinatal statistics Queensland 2000
Gestational age

In Queensland in 2000, 89.7% of all live births were at full term (37 to 41 weeks), and 8.6% were preterm (less than 37 weeks). Of the preterm infants, 7.6% were between 28 and 36 weeks at birth and 1% were less than 28 weeks (Table 2.5). Low gestational age is often associated with low birth weight. Birth weight is an important indicator of pregnancy outcome and is a major risk factor for neonatal morbidity and mortality.50

Table 2.5: Gestational age, proportion of live births, Queensland, 2000

<table>
<thead>
<tr>
<th>Gestation Weeks</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 22</td>
<td>89</td>
<td>0.2</td>
</tr>
<tr>
<td>22-24</td>
<td>176</td>
<td>0.4</td>
</tr>
<tr>
<td>25-27</td>
<td>175</td>
<td>0.4</td>
</tr>
<tr>
<td>28-31</td>
<td>476</td>
<td>1.0</td>
</tr>
<tr>
<td>32-36</td>
<td>3249</td>
<td>6.6</td>
</tr>
<tr>
<td>37-41</td>
<td>44209</td>
<td>89.7</td>
</tr>
<tr>
<td>42 and over</td>
<td>933</td>
<td>1.9</td>
</tr>
<tr>
<td>Total</td>
<td>49307</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Perinatal statistics Queensland 2000

Sudden infant death syndrome

Sudden infant death syndrome (SIDS) accounted for 4.8% of the total burden of disease and injury in Australia in 1996 in 0-4 year olds, as measured by DALYs.38 In Queensland in 2001, there were 29 deaths recorded due to sudden infant death syndrome in infants aged 0-1 year, 16 of the deaths in boys. The SIDS rate in Queensland in 2001 was 65.6 per 100,000 for boys and 55.8 per 100,000 for girls. In Australia in 2001, there were 101 deaths due to SIDS, a rate of 41 deaths per 100,000 live births (48 per 100,000 for boys and 33 per 100,000 for girls).51 The incidence of SIDS among 0 -1 year old Indigenous infants is 2-3 times that of non-Indigenous infants.4

SIDS was the main cause of infant death in Australia for most of the 1990s, however rates have since declined largely due to a national education campaign. Since 1991, the national SIDS rate has generally been falling.45 Queensland has experienced higher rates of SIDS than the Australian average since the early 1990’s. The reasons have not been determined, although possibilities include lower uptake of supine sleeping positions or differences in diagnostic methods across the States.52

SIDS rates are higher in low birth weight infants compared to infants with normal birth weight.45 Current Australian recommendations to reduce the risk of SIDS include placing an infant on its back to sleep, making sure the infant’s head remains uncovered during sleep and protecting the child from cigarette smoke during pregnancy and after birth.53

Postnatal depression

In the first week after the birth of a baby, up to 80% of all women will experience a period of mild depression. Postnatal depression has a much slower and insidious onset. It is most likely to occur between the third and ninth month after the birth of the baby, and may persist for 6-15 months or longer.54 An Australian study found that about 35% of a community sample reported experiencing difficulty in the transition to motherhood.55 Around 25% of these first-time mothers were identified as being at risk of developing postnatal depression, and of these, 10-16% were at risk of severe depressive symptoms.55

2.3.4 Activity limitation

In 1998, one in five (19.9%) Queenslanders reported that they had a disability, including those with profound/severe, moderate or mild core activity restriction, or schooling or employment restriction. For children aged 5-14 years, 11.0% had a disability (boys 13.7%, girls 8.1%).56

The prevalence of profound or severe core activity limitation for all Queenslanders was 6.6% (females 6.5%, males 6.8%). For children aged 5-14 years, the prevalence of profound or severe core activity limitation was 5.7% (girls 4.2%, boys 7.0%) (Figure 2.3).56 Disability prevalence is similar in Queensland to that in Australia. Core activities comprise communication, mobility and self care.

For more information on activity limitation in the Queensland population, refer to the Whole of population, Older people and Young people chapters.
In Australia in 1998, the rate of disability was estimated to be about 75.4 per 1,000 children aged 0-14 years. Intellectural and other mental disorders were the most commonly reported main disabling condition of children aged 0-14 years, and were most common in the 10-14 years age group. Respiratory diseases, especially asthma, were the second most frequently reported disabling condition of children aged 0-14 years. Children with severe disabilities may be in good health, but their condition may cause restrictions in activity and participation. Parents and carers can also be affected financially, and the family may be restricted in its ability to undertake normal social activities outside of the home.

**Hearing and sight impairment**

Less than 1% of babies born each year in Queensland have significant hearing loss (0.6%). In Australia in 1998, of all children aged 0-14 years, just over 0.7% had some form of hearing impairment and about 0.4% had some form of visual impairment. Hearing loss frequently escapes detection until the age when hearing children normally begin to talk. Unmanaged hearing loss in childhood is associated with poor language development and with lower educational achievement and employment opportunities later in life.

**2.3.5 National health priority area conditions**

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

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

Indicators for key NHPA conditions are reported in the Whole of population chapter. Further information on NHPA conditions was reported in Health Indicators Queensland 2001. This Children’s chapter reports those NHPA conditions of particular importance to children, and identifies potential significant health gains through modification of the determinants of health.

**Asthma**

In 1996, asthma was the leading cause of the total burden of disease in Australian children. Asthma accounted for 11.8% of the burden of disease and injury for 0-4 year olds and 29.9% in children aged 5-14 years, as measured by DALYs. The majority of the asthma burden was related to disability (99%), with mortality contributing only 1%.

The number of deaths due to asthma in Queensland children aged 0-14 years ranged from 0-6 deaths per year over the ten year period 1992-2001, an average of 2.6 deaths per year. No deaths were recorded in 2001. Asthma is one of the most frequent reasons for hospitalisation of Australian children. In Queensland...
in 2001/02, there were 3,052 hospital separations due to asthma in children, of which 64% were male. From 1992/93 to 2001/02, the rates of hospital separations were significantly higher for boys than girls (Figure 2.4).

Figure 2.4: Asthma in children 0-14 years, age standardised hospital separation rates by sex, Queensland 1992/93-2001/02

The prevalence of asthma in Australia is among the highest in the world.58 Surveys have shown that 14 to 16% of children have a diagnosis of asthma that remains a current problem.58 There was an increase in the proportion of children with asthma in the 1980s and early 1990s with the prevalence in boys higher than girls.58 However, after years of increasing steadily, the reported prevalence of asthma in young Australian children seems to have reached a plateau and may even be declining. A recent study found that the prevalence of reported current wheezing episodes in Melbourne primary school children fell by 26% between 1993 and 2002.59

Asthma is a disease of unknown cause, although a number of developmental and environmental factors continue to be investigated.45 A familial link has been observed and the disease is closely related to allergy triggers, such as pollen, tobacco smoke, physical activity and other respiratory conditions.45 Stressful life events also appear to predict asthma attacks.60 Studies indicate that breastfeeding for the first four months of life is a protective factor for asthma in children at age six years.61

Injury and poisoning

In Australia in 1996, injury and poisoning (excluding suicide and medical and surgical harm) were estimated to account for 10.9% of the total disease burden in children aged 0-14 years, as measured by DALYs.38 Of this burden, unintentional injury accounted for 10.5%, and boys represented 64.2% of these unintentional injuries.38 For the purposes of this report, injury and poisoning excludes suicide and self-inflicted harm which are considered under mental health, and excludes complications of medical and surgical care.

In Queensland in 2001, there were 68 deaths due to injury and poisoning in children aged 0-14 years, of which 66% were males. During the period 1992-2001, mortality rates for boys were higher than for girls, although the differences were not significant (Figure 2.5). Injury and poisoning accounted for one third of all deaths in Queensland children aged 0-14 years in the period 1996-1998, where more than half were children under five years.62

In Queensland in 2001/02, there were 16,721 hospital separations due to injury and poisoning in children, of which 64% were male. From 1992/93 to 2001/02, the rates of hospital separations were significantly higher for boys than girls (Figure 2.6).

Injury is the leading cause of child mortality in Australia.45 For every child who dies many more require medical attention. Outcomes from injury such as disability or disfigurement can have long lasting detrimental effects on the child’s development and also impact on the child’s family. The risk of injury in children is strongly associated with gender, age, geographical location and socioeconomic status of the family.45 After infancy, boys are consistently more likely than girls to suffer most types of injury.45 These differences are presumed to be related to differences in socialisation behaviours. Boys are recognised as being greater risk takers than girls.45,63
Risk of injury is strongly associated with the age of the child. For example, the risk of hospitalisation for falls increases with age, but for other conditions such as drowning and poisoning, young children (0-4 years) are most at risk.\textsuperscript{45,64} The geographical location of children affects the type and rate of injury. Children living on farms are more likely to suffer particular types of injuries.\textsuperscript{45} In 1999/00 in Australia, the rate of hospitalisation due to injury and poisoning was highest for children living in rural areas, followed by those in rural areas, and was lowest for children in urban areas.\textsuperscript{45} Many children in rural and remote areas are Indigenous. In Australia in 1999/00, Indigenous children had higher hospitalisation rates for falls, burns and scalds, assault and pedestrian accidents than other Australian children.\textsuperscript{45}

In addition, the rate and type of injury are associated with socioeconomic status. Children from socioeconomically disadvantaged groups are more likely to be injured and are more likely to die from their injuries.\textsuperscript{45}

**Drowning**

Drowning accounted for 1.4\% of the total burden of disease and injury in Australia in 1996 for 0-4 year olds and 0.7\% for 5-14 year olds, as measured by DALYs.\textsuperscript{38} In Queensland in 2001, there were ten deaths recorded due to drowning in children aged 0-4 years, with an equal number of deaths in boys and girls. From 1992/93 to 2001/02, the rates of hospital separations were higher for boys than girls, although the differences were not significant (Figure 2.7).

Overall, there has been a net reduction in mortality rates from drowning in Queensland children aged 0-4 years between 1984 and 1999. However, there has been no observable decrease in hospital separation rates of near drowning over the past ten years.\textsuperscript{62}
Deaths from drowning occur most commonly in children aged 0-4 years. Although drowning can occur in domestic baths or natural water hazards such as farm dams, the greatest number of drowning incidents in children aged 0-4 years occur in domestic swimming pools. Uniform minimum domestic pool fencing legislation was introduced in Queensland in 1992. Of the 38 domestic pools in Queensland where drowning occurred between April 1992 and March 1997, 33 (87%) did not fully comply with the fencing legislation. In the nine years before the introduction of fencing requirements, an average of 12 children aged 0-4 years drowned in domestic pools in Queensland each year. In the first two years after the introduction of the requirements, the average number of drownings dropped to four per year, and has since fluctuated.

Falls

In Australia in 1996, falls accounted for 1.6% of the total burden of disease and injury for 0-4 year olds and 3.4% for 5-14 year olds, as measured by DALYs. On average, each year 1.1 deaths due to falls in children aged 0-14 years were reported in Queensland between 1992 and 2001, of which 82% were males. In Queensland in 2001, there was one death due to falls. In Queensland in 2001/02, there were 5,984 hospital separations due to falls in children, of which 62% were male. Hospital separation rates have remained relatively stable during the period 1992/93-2001/02, with the rates of hospitalisation significantly higher for boys than girls (Figure 2.8). Falls are the most common cause of injury hospitalisation for Australian children.

Fire, burns and scalds

In Australia in 1996, fire, burns and scalds accounted for 0.8% of the total burden of disease and injury for 0-4 year olds, and 0.5% for 5-14 year olds, as measured by DALYs. There have been 37 deaths due to fire, burns and scalds in children aged 0-14 years in Queensland between 1992 and 2001. No such deaths were recorded in 2001. Children aged 0-4 years are one of the most vulnerable age groups for this type of injury. In 2001/02, there were 1,078 hospital separations due to fire, burns and scalds in children in Queensland, of which 60% were male. From 1992/93 to 2001/02, the rates of hospital separations were significantly higher for boys than girls (Figure 2.9). Between 1992/93 and 2001/02, hospital separation rates for fire, burns and scalds have significantly increased for boys and girls in Queensland (6.6% and 7.2% increase, per year respectively; Figure 2.9).
In Queensland in 1998/99, about one third (31%) of all hospital separations for fire, burns and scalds were in children aged 0-4 years. In this age group, 45% of hospital separations were due to hot liquids such as coffee or tea, excluding hot tap water. Hot tap water was responsible for 19% of the separations in this age group. Current legislation requiring all new hot water systems to deliver water at a temperature of 50 degrees Celsius was introduced in 1998 and should reduce the number of children being hospitalised for hot water scalds in the longer term.

Poisoning

In Australia in 1996, poisoning accounted for 0.1% of the total burden of disease and injury for 0-4 year olds and 0.2% for 5-14 year olds, as measured by DALYs. On average, one death due to accidental poisoning in children aged 0-14 years was recorded in Queensland each year between 1992 and 2001. In Queensland in 2001, there were two deaths recorded. In Queensland in 2001/02, there were 1,027 hospital separations due to poisoning in children, of which 49% were male. From 1992/93 to 2001/02, there were no significant differences in hospital separation rates for boys and girls.

Road transport injury

Road traffic accidents (including pedestrian and bicycle accidents) accounted for 1.3% of the total burden of disease and injury in Australia in 1996 for 0-4 year olds and 5.7% for 5-14 year olds, as measured by DALYs. In Queensland in 2001, there were 19 deaths recorded due to road transport accidents in children aged 0-14 years, of which 68% were male.

In 2001/02, there were 1,667 hospital separations due to road transport accidents in children in Queensland, of which 69% were male. From 1992/93 to 2001/02, the rates of hospital separations were significantly higher for boys than girls.
Low speed run-over
According to the Queensland Injury Surveillance Unit, in the seven-year period 1994-2000, 28 children aged five years and younger died as a result of a low-speed run-over in Queensland. Low-speed run-over is the third most frequent cause of injury death for toddlers (1-4 years). Most of the vehicles involved in the deaths (60%) were reversing at the time and 41% of the vehicles were 4WDs, although 4WDs make up only 6% of passenger vehicles in Queensland. Almost 60% of the deaths occurred in the driveway or garage of the victim’s home. The driver was most frequently a relative or family friend (54%). These deaths most often involved children aged between 12 and 23 months, an age when independent mobility becomes established but when the concept of personal safety is absent. Low-speed run-over is often the predictable consequence of a child following a relative into the driveway area without their knowledge.

Homicide and intentional injury by another
Homicide and intentional injury accounted for 0.5% of the total burden of disease and injury in Australia in 1996 for 0-4 year olds and 0.5% for 5-14 year olds, as measured by DALYs. In Queensland in 2001, there were 12 deaths recorded due to homicide and intentional injury in children aged 0-14 years, where seven deaths were in boys. The mortality rate from homicide in the 0-9 year age group has remained relatively steady over the past 20 years in Queensland, with an average rate of about one death per year.

In Queensland in 2001/02, there were 300 hospital separations due to intentional injury in children, of which 58% were male (Figure 2.12).
Mental health
In 1996, mental disorders including depression (7.8%), attention-deficit hyperactivity disorder (7.7%) and anxiety disorders (4.3%) contributed significantly to the burden of disease in Australian children aged 5-14 years. While the burden of disease associated with mental health conditions is similar in boys and girls, boys have twice the burden (10.4% of total DALYs) due to attention deficit hyperactivity disorder than girls (4.6%). Girls have a much higher burden of disease associated with eating disorders (5.2% of total DALYs), compared to boys (0.2%).

Mental health is the embodiment of social, emotional and spiritual wellbeing. Mental health provides individuals with the vitality necessary to achieve goals and to interact with one another in ways that are respectful and just. Mental disorders have defined diagnostic criteria that must be met for a disorder to be diagnosed, including symptoms that cause clinically significant impairment in ability to function. Mental health problems also affect the individual’s ability to function, but are defined at a lower threshold of symptoms than mental disorders.

It is acknowledged that mental illness results from complex causal interactions and is influenced by a number of risk and protective factors, as discussed in Community Capacity section 2.4.3. However, there is not an established standard set of indicators with which to measure and monitor these factors. Work is currently underway at the national and state levels to define indicative data, integrate data collection tools and coordinate information systems. This section reports on available indicators of incidence and prevalence of mental disorders and illnesses in Queensland.

In Queensland in 2001/02, there were 917 hospital separations due to mental disorders in children, of which 57% were male. From 1992/93 to 2001/02, there were no significant differences in hospital separation rates for boys and girls (Figure 2.13).

The age profile of specific mental conditions varies considerably and is reported in the companion document Health Determinants Queensland 2004: Statistical report. Age standardised mental disorders mortality and hospital separation rates for Queensland and 16 smaller geographic areas for 1986-1998 have previously been reported. Hospital separation rates for mental disorders must be interpreted with caution as variable admission practices and access to services, re-admissions and coding methods substantially affect rates. In addition, hospital separations due to mental disorders indicate a very small proportion of the burden of mental disorders in the community.

In Australia in 2000, the prevalence of total mental health problems in children aged 4-12 years was 15.0% in boys and 14.4% in girls. Prevalence was generally higher among children living in low income households or living with parents who were not in paid employment, step/blended and sole-parent families. More boys (3.7%) aged 6-12 years were reported as experiencing depressive disorder than girls (2.1%). Conduct disorder (antisocial behaviour) was also more prevalent in boys (4.8%) than girls (1.9%). Attention-deficit/hyperactivity disorder (ADHD) was the most prevalent mental disorder in the age group 6-12 years. It accounted for 19.3% of boys and 8.8% of girls. The high prevalence of ADHD should be viewed with caution due to methodological issues, however the authors of the study state that it is unlikely that the children identified with ADHD in the survey were free from problems, and recommend further studies to more accurately address the issue.

Figure 2.13: Mental disorders in children 0-14 years, age standardised hospital separation rates by sex, Queensland 1992/93-2001/02

In 1999/2000, for Australian boys aged 1-14 years, the most frequent diagnosis group was conduct disorders, accounting for 17% of all childhood hospitalisations for mental and behavioural disorders. The next most frequent group was hyperkinetic disorders (attention deficit disorder) accounting for 16% of hospitalisations. Most boys hospitalised for these disorders were aged 5-14 years. For Australian girls aged 1-14 years, the most frequent diagnosis group was eating disorders, accounting for 6% of all childhood hospitalisations for mental and behavioural disorders. The majority of girls hospitalised for eating disorders were aged 5-14 years. The next most frequent diagnosis group was depressive episode accounting for 4% of hospitalisations.

In the context of mental health, risk factors increase the likelihood that a disorder will develop or can exacerbate an existing problem. Protective factors reduce the likelihood that a disorder will develop. Risk factors may include factors associated with the individual (low birth weight, physical and intellectual disability, chronic illness, low self-esteem); family or social factors (having a teenage mother, absence of father in childhood, family disharmony and violence, neglect in childhood); school context (bullying, inadequate behaviour management); life events (child abuse, family break-ups, poverty); and community factors (socioeconomic disadvantage, isolation, neighbourhood violence and crime).

Suicide and Intentional self-harm

In 1996, suicide and intentional self-harm accounted for 0.6% of the total burden of disease and injury for children aged 5-14 years in Australia, as measured by DALYs. In Queensland in 2001, there were four deaths recorded due to suicide in children aged 10-14 years, where three of the deaths were boys. In Queensland in 2001/02, there were 129 hospital separations due to intentional injury in children, of which 82% were female. From 1992/93 to 2001/02, hospital separation rates for intentional self-harm were significantly higher for girls than boys (Figure 2.14). Between 1992/93 and 2001/02, hospital separation rates for intentional self-harm significantly increased for boys and girls in Queensland (9.7% and 9.4% increase per year respectively; Figure 2.14).

Figure 2.14: Self inflicted injury in children 10-14 years, age standardised hospital separation rates by sex, Queensland 1992/93-2001/02


Diabetes

In 1996, diabetes accounted for 0.4% and 2.2% of the burden of disease in 0-4 year olds and 5-14 year olds respectively in Australia, as measured by DALYs. In Queensland in 2001/02, there were 416 hospital separations due to diabetes in children, of which 55% were male. From 1992/93 to 1999/2000 rates for boys and girls were not significantly different (Figure 2.15).

In the two-year period 2000-01, there were 1,565 new cases of Type 1 diabetes recorded in Australian children aged 0-14 years. This equates to an annual incidence rate of around 19 per 100,000 (20.3 in boys, 18.9 in girls). The current incidence is higher than previously reported, and shows a rising trend of Type 1 diabetes in Australian children. The Queensland incidence rates in 2000-2001 were 21.5 per 100,000 for boys and 18.7 for girls. These rates are similar to those seen in Canada (20 per 100,000) and the United Kingdom (18 per 100,000). The incidence and prevalence of Type 2 diabetes in Australian children is not known. However, they can be expected to increase, as Type 2 diabetes is linked to lifestyle factors such as obesity and insufficient physical activity which are rapidly increasing in the Australian population.

More information on diabetes can be found in the Whole of population and Indigenous peoples chapters.
Figure 2.15: Diabetes in children 0-14 years, age standardised hospital separation rates by sex, Queensland 1992/93-1999/2000

Cancer

In 1996, malignant neoplasms accounted for 1.4% and 4.0% of the total burden of disease and injury in 0-4 year olds and 5-14 year olds respectively in Australia. Leukaemia and brain cancer each accounted for 0.4% of the burden of disease in children aged 0-4 years, and 1.7% and 0.8% respectively, in children aged 5-14 years, as measured by DALYs.38

In Queensland in 2000, there was a cancer incidence rate in children aged 0-14 years of 13.5 cases per 100,000 population (102 incident cases), representing 0.6% of all cancers.71 In Australia in 2000, there was a cancer incidence rate in children aged 0-14 years of 14.3 cases per 100,000 population (560 incidence cases), representing 0.7% of all cancers.72

Although childhood cancer is relatively uncommon, the case fatality rate can be high. In Australia in 2000, cancer was the second leading cause of death in children aged 1-14 years.45 The cause of most of these cancers remains unknown. However, genetic factors and environmental and chemical exposures have been linked with cancer in this age group. Childhood cancers tend to differ from adult cancers, and most are sarcomas originating in tissues such as bone marrow, lymph nodes and muscle. Leukaemia (a cancer of white blood cells) is the most common malignancy accounting for about one third of childhood cancers.45 Brain tumours are the most frequent solid tumour representing around 20% of childhood cancers.45

2.3.6 Oral health

Oral health accounted for 0.4% of the burden of disease in Australian children aged 0-4 years in 1996, and 0.5% in 5-14 year olds as measured by DALYs.38

Dental caries (tooth decay) is the single most common chronic childhood disease.73 Despite a decline in caries prevalence in Australia over the last 30 years, caries rates in children remain high. Queensland children have significantly higher rates of tooth decay than the national average (Figure 2.16). Caries prevalence is measured by the proportion of persons with one or more teeth that are decayed, missing (due to caries) or filled. In 1999, the prevalence of caries in Queensland six-year-olds was 50%, compared with 40% nationally, a difference of 25%. For 12-year-olds, the equivalent results were 48.3% and 35.5%, a difference of 36%.74 While the overall trend in caries prevalence continues to show improvement, recent Queensland and national results raise concerns that this may not continue without new interventions.

No data are currently collected on the prevalence of other oral conditions affecting children, for example, developmental defects of enamel, and malocclusion.

The average number of teeth affected by tooth decay provides a measure of the burden of disease, and is much higher in Queensland children than the national average (Figure 2.17). In 1999, the average number of deciduous teeth with caries experienced in six-year-olds in Queensland was 2.25, compared with 1.53 nationally, a difference of nearly 50%. Equivalent results for permanent teeth in 12 year olds were 1.30 and 0.83 respectively, a difference of 57%.74

Tooth decay is not distributed evenly across the child population, and variations are inversely associated with socioeconomic status and with availability of fluoride.75,76 While nearly 50% of six-year-olds have no decay experience in their deciduous teeth, 21% of children have 68% of their teeth affected by decay (Figure 2.18). In the case of 12-year-olds, while 56% have no decay experience in their permanent teeth, 66% of the teeth affected by decay are found in only 17% of children.
The prevalence of dental caries is lower where infants and children have access to fluoridated water and when frequent exposure to foods and drinks containing added sugars is avoided. It is recommended that bottles are not left with a sleeping infant, that bottles are not used as a pacifier, and that night-time or extended use of baby bottles with fluids other than water is avoided. The practice of dipping teats or pacifiers in honey or sugar also increases the risk of dental caries and should be avoided. The Queensland Health Guidelines on Fluoride Supplements do not recommend the use of fluoride supplements in children under 3-4 years, except those identified by a dentist as being at high risk of dental caries.

The oral health of a population is affected by age, exposure to fluorides, dietary patterns, preventive dental behaviours, smoking, alcohol consumption, stress, infection and immunity, access to and use of preventive and dental restorative services, and attitudes towards treatment preferences.

In 2003, 4.7% of the Queensland population lived in areas with satisfactory fluoridation levels, compared to 69.1% of Australians. Queensland has the lowest proportion of population living in areas with fluoridated water in Australia, with the proportion in the other states and territories in the range 77-100%. Both children and adults benefit from fluoridation. Water fluoridation at optimal levels provides significant benefits in the prevention of caries for both deciduous and permanent teeth.
2.3.7 Communicable diseases

In the five-year period 1997-2001 in Queensland, 115,014 notifications of more than 50 different communicable diseases were received for the total population. This was an average of 23,003 per year (range: 21,201-24,846). Although notified cases are likely to only represent a percentage of the total cases in the community, they provide an estimate of the burden of disease. The Notifiable Disease Report 1997-2001 includes detailed analysis of notifiable conditions in Queensland and national comparisons.

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

This section covers communicable disease of particular concern to children. Vaccination rates are covered in Section 2.4.4. More information on communicable diseases can be found in the Whole of population, Young people and Indigenous peoples chapters of this report.

Invasive meningococcal disease

About 100 cases per year of invasive meningococcal disease (IMD) are notified in Queensland, similar to the national rate. Year to year fluctuations in case numbers and deaths are typical of this disease. About three-quarters of cases are in people aged less than 25 years, with young children aged less than five years (36%), older teenagers (15-19 years, 19%) and young adults (20-24 years, 11%) comprising the largest groups (Table 2.6). Cases occur throughout the year, although winter to early spring is the peak season. Cases are mostly sporadic, as outbreaks or related cases occur infrequently.

Table 2.6: Notification rates of invasive meningococcal disease by age and sex, Queensland 1997-2001

<table>
<thead>
<tr>
<th>Age group</th>
<th>Sex</th>
<th>1997</th>
<th>1998</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
</tr>
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<tbody>
<tr>
<td>0-4</td>
<td>Male</td>
<td>14.4</td>
<td>18.5</td>
<td>12.9</td>
<td>7.3</td>
<td>18.7</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>16.1</td>
<td>10.2</td>
<td>14.4</td>
<td>11.1</td>
<td>12.8</td>
</tr>
<tr>
<td>5-9</td>
<td>Male</td>
<td>0</td>
<td>3.9</td>
<td>5.3</td>
<td>1.5</td>
<td>6.8</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>0.8</td>
<td>2.4</td>
<td>3.2</td>
<td>1.6</td>
<td>5.6</td>
</tr>
<tr>
<td>10-14</td>
<td>Male</td>
<td>1.5</td>
<td>1.6</td>
<td>0.8</td>
<td>1.5</td>
<td>3.1</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>4.1</td>
<td>4.1</td>
<td>0.8</td>
<td>2.4</td>
<td>1.6</td>
</tr>
<tr>
<td>Total (all ages)</td>
<td></td>
<td>2.1</td>
<td>3.1</td>
<td>2.6</td>
<td>1.9</td>
<td>3.6</td>
</tr>
</tbody>
</table>

Source: QH Notifiable diseases report 1997-2001 Note: Rate per 100,000 population

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

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

In 2003, the Australian Government announced a National Meningococcal C Vaccination Program. Over a period of four years the program will offer free meningococcal C vaccine to all individuals aged one to 19 years in 2003. Higher risk groups (secondary school students and children aged one to five years) are being vaccinated first. Secondary and primary school age children are offered vaccination through school based programs. With good vaccination coverage, this program could be expected to prevent 10 to 15 cases of IMD per year in Queensland.
Invasive pneumococcal disease

In Queensland in recent years, the notification rate of invasive pneumococcal disease (IPD) in children aged less than five years has reached 50 to 90 per 100,000 population (Table 2.7). In the five-year period 1997-2001, 40% of notifications were aged 0-4 years. Death as a result of this infection in this age group is rare. The rate of IPD in children aged under five years residing in the north of the State appears to be falling, although this decline has not yet had a major impact on Queensland’s rates.87

Of all children aged under five years notified with IPD in 2002, fifty cases (30%) were in children with conditions recognised to predispose them to invasive pneumococcal disease. This included Aboriginal or Torres Strait Islander children, and children with one or more medical risk factors. In 2002, 13% of notified cases of IPD in children aged under two years were potentially avoidable as they occurred in children eligible to receive funded vaccine. Attaining high coverage for eligible groups is a challenge for the Queensland vaccination program.87

In 2001, a publicly funded conjugate pneumococcal vaccine program commenced for children at high risk. These included Aboriginal and Torres Strait Islander children under 2 years and children with medical conditions predisposing them to invasive pneumococcal disease. The Australian Standard Vaccination Schedule endorsed by the National Health and Medical Research Council in September 2003 expands the eligibility of predisposing medical conditions.87 Pneumococcal vaccine is now recommended universally for all Australian infants, however at the time of preparing this report, the vaccine is funded under the National Immunisation Program only for those groups described above.87

Table 2.7: Notification rates of invasive pneumococcal disease by age and sex, Queensland 1997-2001

<table>
<thead>
<tr>
<th>Age group</th>
<th>Sex</th>
<th>1997</th>
<th>1998</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>Male</td>
<td>25.6</td>
<td>36.9</td>
<td>53.2</td>
<td>91.7</td>
<td>75.4</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>21.2</td>
<td>44.1</td>
<td>36.5</td>
<td>53.6</td>
<td>70.6</td>
</tr>
<tr>
<td>5-9</td>
<td>Male</td>
<td>3.9</td>
<td>3.9</td>
<td>9.2</td>
<td>6.8</td>
<td>8.3</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>2.5</td>
<td>4.1</td>
<td>5.6</td>
<td>9.6</td>
<td>2.4</td>
</tr>
<tr>
<td>10-14</td>
<td>Male</td>
<td>0</td>
<td>2.3</td>
<td>1.5</td>
<td>1.5</td>
<td>3.8</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>1.6</td>
<td>2.5</td>
<td>0.8</td>
<td>1.6</td>
<td>3.2</td>
</tr>
<tr>
<td>Total (all ages)</td>
<td>4.5</td>
<td>7.5</td>
<td>7.7</td>
<td>12.2</td>
<td>11.9</td>
<td></td>
</tr>
</tbody>
</table>


Vaccine preventable diseases

Notifications of Haemophilus influenza type B, measles, mumps, rubella and pertussis (whooping cough) in Queensland have decreased over the five-year period 1997-2001, although pertussis peaks were observed in 1997 and 2001 (Table 2.8). These decreases can be attributed to successful vaccination programs, which have resulted in high coverage rates among Queensland children.82

Almost half of the Haemophilus influenza type B (Hib) notifications (48%), in the five-year period 1997-2001, were from children aged 0-4 years, and most of these children were under two years of age. In this reporting period, 80% of infants aged one year or younger were unvaccinated when they contracted the disease.82

A vaccination program for hepatitis B in “at risk” infants began in 1987, and the program was expanded to include all infants from May 2000. This strategy will gradually impact on rates in adult life.82 In Queensland, a school based program commenced in 2004 for Year 8 students. In general practice, vaccines have been made available for 13 year olds.
CHILDREN

Table 2.8: Notification rates of selected vaccine preventable diseases by age and sex, Queensland 1997-2001

<table>
<thead>
<tr>
<th>Age group</th>
<th>Sex</th>
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<th>1998</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haemophilus influenza (type B)</td>
<td>0-4</td>
<td>Male</td>
<td>4.0</td>
<td>2.4</td>
<td>1.6</td>
<td>1.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td>3.4</td>
<td>2.5</td>
<td>2.5</td>
<td>2.6</td>
</tr>
<tr>
<td></td>
<td>5-9</td>
<td>Male</td>
<td>2.4</td>
<td>0.0</td>
<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>10-14</td>
<td>Male</td>
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<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>0.0</td>
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<td>0.0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td>0.4</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Hepatitis B (all)</td>
<td>0-4</td>
<td>Male</td>
<td>0.8</td>
<td>1.6</td>
<td>0.0</td>
<td>4.1</td>
</tr>
<tr>
<td></td>
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<td>Female</td>
<td>1.7</td>
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</tr>
<tr>
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<td>5-9</td>
<td>Male</td>
<td>2.4</td>
<td>0.8</td>
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</tr>
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<td>0.8</td>
<td>2.4</td>
<td>1.6</td>
</tr>
<tr>
<td></td>
<td>10-14</td>
<td>Male</td>
<td>19.3</td>
<td>14.8</td>
<td>8.5</td>
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</tr>
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<td>7.4</td>
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</tr>
<tr>
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<td>25.3</td>
<td>26.4</td>
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<td></td>
<td></td>
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<td>35.7</td>
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<td>19.7</td>
<td>1.6</td>
<td>3.1</td>
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<td></td>
<td></td>
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<td>0.8</td>
</tr>
<tr>
<td></td>
<td>Total</td>
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<td>0.9</td>
<td>0.8</td>
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</tr>
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<td></td>
<td></td>
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<td>7.6</td>
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<td>1.6</td>
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</tr>
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<td></td>
<td></td>
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<td>0.0</td>
</tr>
<tr>
<td></td>
<td>10-14</td>
<td>Male</td>
<td>19.3</td>
<td>14.0</td>
<td>2.3</td>
<td>1.5</td>
</tr>
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<td></td>
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<td>Female</td>
<td>16.4</td>
<td>15.6</td>
<td>3.0</td>
<td>0.0</td>
</tr>
<tr>
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<td>Total</td>
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<td>10.8</td>
<td>4.5</td>
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</tr>
<tr>
<td>Pertussis</td>
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<td>13.8</td>
</tr>
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<td></td>
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<td>59.3</td>
<td>20.4</td>
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<td></td>
<td></td>
<td>Female</td>
<td>230.8</td>
<td>135.7</td>
<td>61.4</td>
<td>51.7</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td>55.9</td>
<td>40.3</td>
<td>27.4</td>
<td>15.0</td>
</tr>
</tbody>
</table>

Note: Rate per 100,000 population

In the past, rates for measles were highest in 0-4 year age group, however, rates of all age groups have fallen dramatically between 1997 and 2001 (Table 2.8). A national Measles Control Campaign was implemented in 1998 targeting primary school aged children in Australia. During the campaign, around 96% of Australian primary school students were immunised. The campaign also had an effect on the preschool age group, where it was estimated that 97.5% of children aged 12-42 months had received their first dose of MMR vaccine. In 2001, there were no rubella notifications in children ten years and younger. Rates for rubella in children, especially males aged 0-4, have fallen dramatically since 1997. This is due to the impact of the Measles Control Campaign in 1998 and the provision of the second dose measles/mumps/rubella vaccine at four years of age (Table 2.8).

Epidemics of pertussis (whooping cough) occur every three to four years. Maternal antibody does not give adequate protection against pertussis, and so infants are particularly vulnerable. In recent years among highly immunised populations, many cases of pertussis have occurred in adolescents and adults whose immunity has waned. These individuals then become a reservoir of infection for infants and young children. In Queensland, the 10-14 year age group accounted for 25% of pertussis notifications in the five-year period 1997-2001. These data are consistent with national data and support the need for booster doses in individuals over the age of 10 years, both to reduce morbidity in this age group and to reduce transmission to those most at risk (infants less than six months of age). Immunisation of adolescents, who have a high risk of pertussis infection, and adults in contact with very young infants, would be expected to result in the greatest health benefits.
Gastrointestinal conditions

Routine surveillance detects only a small proportion of gastrointestinal illness in the community, with a bias in testing and hence notifications of young children. Young children aged 0-4 years are more than three times more likely than adults to have a specimen requested for pathology testing to investigate food-borne illness. Partly because of this testing bias, notification rates of campylobacter are consistently highest in children aged 0-4 years (Table 2.9). Rates of salmonellosis in the five-year reporting period were highest in 0-4 age group. Almost half (47%) of notifications were in the under five age group. This age group may also be over-represented due to a higher rate of testing.

Table 2.9: Notification rates of selected gastrointestinal diseases by age and sex, Queensland 1997-2001

<table>
<thead>
<tr>
<th>Disease</th>
<th>Age group</th>
<th>1997</th>
<th>1998</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Campylobacter enteritis</td>
<td>0-4</td>
<td>Male</td>
<td>341.8</td>
<td>331.4</td>
<td>270.2</td>
<td>280.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td>257.3</td>
<td>255.2</td>
<td>215.5</td>
<td>225.3</td>
</tr>
<tr>
<td></td>
<td>5-9</td>
<td>Male</td>
<td>137.3</td>
<td>134.9</td>
<td>92.3</td>
<td>114.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td>102.8</td>
<td>108.3</td>
<td>73.8</td>
<td>80.5</td>
</tr>
<tr>
<td></td>
<td>10-14</td>
<td>Male</td>
<td>103.6</td>
<td>99.5</td>
<td>74.3</td>
<td>103.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td>50.7</td>
<td>60</td>
<td>42.5</td>
<td>49.2</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>120</td>
<td>126.9</td>
<td>91.2</td>
<td>103.1</td>
</tr>
<tr>
<td>Salmonellosis (all)</td>
<td>0-4</td>
<td>Male</td>
<td>391.5</td>
<td>613.8</td>
<td>437.2</td>
<td>365.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td>367.8</td>
<td>548.5</td>
<td>438.6</td>
<td>349.4</td>
</tr>
<tr>
<td></td>
<td>5-9</td>
<td>Male</td>
<td>51.3</td>
<td>82.2</td>
<td>54.2</td>
<td>51.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td>38.1</td>
<td>67.6</td>
<td>53</td>
<td>41.4</td>
</tr>
<tr>
<td></td>
<td>10-14</td>
<td>Male</td>
<td>29.4</td>
<td>47.4</td>
<td>44.9</td>
<td>25.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td>27</td>
<td>33.7</td>
<td>31.9</td>
<td>34.7</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>56.1</td>
<td>82.1</td>
<td>63.9</td>
<td>51.2</td>
</tr>
<tr>
<td>Cryptosporidiosis</td>
<td>0-4</td>
<td>Male</td>
<td>132.9</td>
<td>265.6</td>
<td>75.8</td>
<td>117.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td>107.9</td>
<td>195.8</td>
<td>78.9</td>
<td>92.7</td>
</tr>
<tr>
<td></td>
<td>5-9</td>
<td>Male</td>
<td>21.3</td>
<td>45.7</td>
<td>11.4</td>
<td>19.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td>24.9</td>
<td>35.8</td>
<td>8.8</td>
<td>23.1</td>
</tr>
<tr>
<td></td>
<td>10-14</td>
<td>Male</td>
<td>11.6</td>
<td>19.4</td>
<td>10.8</td>
<td>7.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td>9</td>
<td>15.6</td>
<td>8.2</td>
<td>8.1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>15.5</td>
<td>27.8</td>
<td>9.5</td>
<td>12.9</td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>0-4</td>
<td>Male</td>
<td>28.8</td>
<td>37.7</td>
<td>11.3</td>
<td>2.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td>17.8</td>
<td>25.4</td>
<td>13.6</td>
<td>3.4</td>
</tr>
<tr>
<td></td>
<td>5-9</td>
<td>Male</td>
<td>21.5</td>
<td>38</td>
<td>28.2</td>
<td>5.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td>19.7</td>
<td>56.2</td>
<td>28.9</td>
<td>5.8</td>
</tr>
<tr>
<td></td>
<td>10-14</td>
<td>Male</td>
<td>15.5</td>
<td>28</td>
<td>5.4</td>
<td>4.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td>18.6</td>
<td>23</td>
<td>4.1</td>
<td>2.4</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>27</td>
<td>30.4</td>
<td>10.2</td>
<td>3.7</td>
</tr>
</tbody>
</table>


Cryptosporidiosis has been notifiable in Queensland from 1996. In the five-year period 1997-2001, over half (55%) of all notifications were in the 0-4 age group. Annual rates in the northern zone of Queensland have been up to six times that of rates in the other zones. Increased notifications in summer, in young children and in northern areas of the State, indicate an increased risk in children not fully toilet trained who frequently spend time swimming in pools. Children with diarrhoea should be excluded from all swimming activities to avoid spreading the organism to others. As with campylobacter, there is probably a bias in testing towards young children.

Hepatitis A infection in young children (0-4 years) usually results in mild or asymptomatic illness. In general, severity of illness increases with age. In 1998 and 1999, rates of hepatitis A were particularly high in the northern zone of the State in the 5-9 year age group. In 1999, a successful vaccination campaign commenced among Indigenous children in North Queensland. This campaign resulted in a dramatic decrease in notifications from 1998 to 2001 in this area. Hepatitis A can be a problem in child care centres, where children who are not fully toilet trained may transmit the infection to other children and adults. Good hygiene measures are essential to reduce risk of transmission.
2.4 Health determinants

“Most of the burden of disease affecting children and young people and culminating in health problems in later life is the result of complex interactions between individuals and socio-economic and environmental determinants of their health. Health policy, programs and services which address the determinants of health are necessary to prevent the occurrence, and reduce the burden of ill-health.”

Strategic Policy Framework for Children’s and Young People’s Health 2002-2007

The factors that lead to someone developing disease or a mental disorder are likely to have their beginnings years earlier, through a complex chain of events and interactions among the individual, the environment and broader social and economic factors. Determinants of health is the term used for those factors that have either a positive or negative influence on physical and mental health at the individual or population level.

The aim of this section is to answer the following questions:
- Are the factors that determine good health for children in Queensland changing for the better?
- Is it the same for everyone?
- Where and for whom are these factors changing?

Health determinants can be broadly divided into ‘upstream’ determinants (education, employment, income, living and working conditions), ‘midstream’ (health behaviours and psychosocial factors) and ‘downstream’ (physiological and biological factors). In this section, the upstream determinants are addressed in sections on environmental factors and socioeconomic factors, and midstream determinants in community capacity and health behaviour sections. Environmental, socioeconomic and community capacity dimensions impact on physical and mental health within the spheres of societal or community, household and individual determinants of health.

As this report focuses on modifiable determinants of health, the person-related factors dimension of the National Health Performance Framework is not included. All determinants of health indicators are reported in the domain where there is the greatest opportunity for health gains. Thus, physiological and biological factors which may be partially addressed through behaviour change, have been included in the health behaviour section of this report.

Actions to address these health determinants are described in section 2.5.

2.4.1 Environmental factors

Queenslanders enjoy a relatively healthy physical environment. We have one of the safest food supplies in the world, the overall quality of our air and drinking water is good, and the built environment is generally clean and healthy. The quality of the physical environment cannot be taken for granted however, because there are regional differences.

Population health status is influenced by the interaction of social, economic and environmental health determinants. The biological, physical and chemical environments have the potential to impact on health. The extent of this impact is modified by the scale and nature of human activities. Human activities include agricultural, industrial and energy production; the use and management of water and wastes; urbanisation; the quality of health services; and the extent of the protection of the living, working, and natural environment.

The impact of environmental factors on population health outcomes is difficult to assess due to the multi-factorial nature of many of the outcomes of importance. Thus, indicators relating exposure to environmental determinants and processes to manage such exposures are commonly used to measure the influence of the environment on health, rather than health outcomes indicators. The need for environmental health indicators was highlighted by the National Environmental Health Strategy (1999). Development of a national set of environmental health indicators is occurring. In future, indicators to monitor environmental health and quality data to support these indicators should be more readily available and more clearly defined.

For information on some key environmental factors that influence health, such as air quality, water quality, water fluoridation, food safety and security, healthy food access, physical activity environment, housing,
household safety devices and homelessness, please refer to the Whole of population chapter. Specific environmental factors relating to Indigenous health are described in the Indigenous peoples chapter.

There are other less well characterised environmental factors that have the potential to impact on health. Many of these factors have evolved from changes in our society and present new potential health risks. These include the changes in the way we manage our waste, changes in construction materials for our housing, issues relating to securing adequate and safe water supplies, increased urbanisation and urban densities, and global climate change resulting from increased greenhouse gas emissions. The extent to which these emerging issues impact on the environment and population health is not well characterised.

**Household safety devices**

Children are particularly vulnerable to a range of injuries associated with the home, including drowning, fire, burns and scalds, and accidental poisoning. In 2001 in Queensland, one quarter (25.6%) of households reported having one usual resident aged four years or less or having at least one young child visit at least once a week.\(^9^1\) Households with young children reported a greater prevalence of smoke alarms/detectors installed (74.1%) than households without children (67.3%).\(^9^1\) Of Queensland households with young children, 53.0% had an adjustable hot water thermostat compared to 47.2% of households with no young children. Nearly one in four households with young children did not know whether the hot water system had an adjustable thermostat.\(^9^1\)

Nearly a quarter of households with young children (24.2%) had a swimming pool or outdoor spa compared to 19.4% of households with no young children.\(^9^1\) The most common safety precaution was child resistant fencing/self-locking gates (82.0%). However, households with young children were less likely to use this precaution (71.1%) than households with no young children (86.6%).\(^9^1\)

**Drugs and poisons storage**

In Queensland in 2003, over half (53.3%) of households with children aged 12 years or younger reported that laundry, kitchen and household cleaners, insecticides and poisons were all locked away or stored out of the reach of children.\(^9^2\) With regard to paracetamol products, 88.4% of eligible respondents reported that such products were kept locked away or out of the reach of children.\(^9^2\) Similarly, 84.5% of households reported that other medicines and vitamins were kept locked away or out of reach of children.\(^9^2\)

**Exposure to environmental tobacco smoke**

In Queensland in 1995, 40.0% of children aged 0-14 years lived in a household with at least one smoker, similar to Australia (39.2%).\(^9^3\) Passive smoking in children causes lower respiratory illnesses (croup, bronchitis, bronchiolitis and pneumonia), onset of asthma and worsening of asthma, respiratory symptoms, reduced lung function, middle ear disease, eye and nasal irritation, low birth weight and SIDS.\(^9^3-9^6\) There has also been an association identified between exposure to tobacco smoke and invasive meningococcal disease in children.\(^9^7\)

Exposure to tobacco smoke during infancy and early childhood is a significant public health problem. Relative to adults, infants are particularly susceptible to the effects of tobacco smoke, due to their immature immune and pulmonary systems and their increased respiratory rate.\(^9^8\)
2.4.2 Socioeconomic factors

“Social and economic status is a significant determinant of health and well-being at the population level. There are striking health and developmental disparities associated with socio-economic disadvantage, and the lower placed individuals are on the socio-economic gradient, the more likely they are to suffer from physical and mental ill-health.”

Strategic Policy Framework for Children’s and Young People’s Health 2002-2007

Evidence shows that health is linked to socioeconomic position, with the socioeconomically disadvantaged having higher mortality rates for most major causes of death. Their morbidity pattern indicates they experience more ill health and their use of healthcare services suggests they are less likely to act to prevent disease or to detect it at an asymptomatic stage. Socioeconomic indicators for children are reported in this section and build on those reported in section 1.4.2 in the Whole of population chapter.

Income

The weekly income of a quarter (25.3%) of Queensland families was less than $500 per week in 2001 (Table 2.10), where 27% of these families were one-parent families and 30% were couple families with children. In 2001, the median gross weekly income of one-parent households was $386 and the median gross weekly income of ‘couple with dependents’ households was about two and a half times higher ($933).

Table 2.10: Weekly family income received (percentage) and numbers of families by type of family in occupied private dwellings, Queensland 2001

<table>
<thead>
<tr>
<th>Income Range</th>
<th>Couple family with children</th>
<th>Couple family without children</th>
<th>One parent family</th>
<th>Other family</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;300</td>
<td>1.4</td>
<td>2.7</td>
<td>13.6</td>
<td>7.7</td>
<td>4</td>
</tr>
<tr>
<td>300-499</td>
<td>7.4</td>
<td>29.5</td>
<td>37.9</td>
<td>26</td>
<td>21.3</td>
</tr>
<tr>
<td>500-999</td>
<td>34.2</td>
<td>28.8</td>
<td>35.1</td>
<td>37.8</td>
<td>32.7</td>
</tr>
<tr>
<td>1000-1499</td>
<td>28.3</td>
<td>19.5</td>
<td>9.6</td>
<td>18.8</td>
<td>21.7</td>
</tr>
<tr>
<td>1500+</td>
<td>28.7</td>
<td>18.4</td>
<td>3.8</td>
<td>9.7</td>
<td>20.3</td>
</tr>
</tbody>
</table>

Source: ABS Census of population and housing 2001

The link between poverty and poor health is well established. Those with lowest incomes are more likely to experience the highest rates of illness and premature death. Both poverty and income inequality have increased in Australia over the last decade. Australian data have shown that children from low income families have significantly more chronic illnesses than children from high income families. Children aged 0-4 years in low income families were more likely not to have been breastfed for at least three months. Boys aged 2-6 years in low income families were nearly three times more likely not to be immunised against measles than boys in high income families. Girls (but not boys) in low income families had significantly fewer dental visits.

Pensions and disability support

Almost half of all Queensland children aged under 16 years (48.2%) lived in families receiving income support payments in 1996 (Table 2.11). Income support payments include age, disability, Newstart allowance, sickness and special benefits, youth training allowance, sole-parent pensions and family allowance payments. The proportion of children in families receiving income support payments was generally higher in Brisbane than in most other capital cities in Australia, while Queensland’s non-metropolitan areas were similar to non-metropolitan areas in other states. The number and proportion of dependent children in families receiving an income support payment in Brisbane increased in the period 1989 to 1996. Unskilled and semi skilled workers and early school leavers were significantly more likely to receive support payment. In contrast, high-income families, managers and administrators, and professionals were less likely to receive support payment.
The percentage of older people on an aged pension and the percentage of people on a disability support pension in Queensland in 2001 were similar to Australia (Table 2.12). In 1997-98, government payments were the main income Source of a greater proportion of Queensland households of couples with dependent children and one-parent families than comparable households in Australia (Table 2.12).

Table 2.11: Percentage of dependent children living in a family receiving income support, Queensland and Australia 1989, 1996

<table>
<thead>
<tr>
<th></th>
<th>Queensland</th>
<th>Australia</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capital city</td>
<td>43.7</td>
<td>39.2</td>
</tr>
<tr>
<td>Other major urban centres</td>
<td>48.4</td>
<td>44.0</td>
</tr>
<tr>
<td>Rest of State</td>
<td>52.5</td>
<td>51.4</td>
</tr>
<tr>
<td>Whole of State</td>
<td>48.2</td>
<td>43.5</td>
</tr>
<tr>
<td>1989</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rest of State</td>
<td>41.0</td>
<td>37.8</td>
</tr>
</tbody>
</table>

Source: A Social health atlas of Australia 1999

Table 2.12: Selected income support indicators, Queensland and Australia, 2001

<table>
<thead>
<tr>
<th></th>
<th>Queensland</th>
<th>Australia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aged on aged pension (%)</td>
<td>65.3</td>
<td>67.8</td>
</tr>
<tr>
<td>Disability support pensioners (%)</td>
<td>4.1</td>
<td>4.1</td>
</tr>
<tr>
<td>Single parent payment (%)</td>
<td>3.3</td>
<td>3.6</td>
</tr>
<tr>
<td>Main income source from government payments (%) (of couple with dependents households)</td>
<td>12.2</td>
<td>11.1</td>
</tr>
<tr>
<td>Main income source from government payments (%) (of one parent households)</td>
<td>66.5</td>
<td>64.6</td>
</tr>
</tbody>
</table>

Source: ABS Australian social trends 2002  *Calculated by QH **1997-98

Literacy and numeracy

“...the central purpose of schooling in Queensland should be to create a safe, tolerant and disciplined environment within which young people prepare to be active and reflective Australian citizens with a disposition to lifelong learning.”

2010 A Future Strategy, Education Queensland

In Queensland in 2000, 92.6% of children in Year three reached the national reading benchmark and 91.4% reached the numeracy benchmark, which were similar to Australian figures (Table 2.13).

In 2000, for reading skills in Year three, Queensland girls had slightly higher reading scores than boys, and urban students had better reading scores than rural students. Indigenous children had a lower mean reading score than non-Indigenous children. Children where the main language spoken at home was not English, had similar reading scores to children with an English speaking background. For children in Year five, the patterns were similar, although the disparities between the groups had increased slightly, and by Year seven the same patterns were evident but with even wider disparities.

For numeracy (specifically number skills) in Year three, Indigenous children in Queensland recorded lower mean scores than non-Indigenous children. Boys had slightly higher mean number scores than girls. Rural students had lower mean number scores than urban students. As with literacy skills, the disparity between Indigenous children and non-Indigenous children increased with age.

For numeracy (specifically number skills) in Year three, Indigenous children in Queensland recorded lower mean scores than non-Indigenous children. Boys had slightly higher mean number scores than girls. Rural students had lower mean number scores than urban students. As with literacy skills, the disparity between Indigenous children and non-Indigenous children increased with age.

Literacy and numeracy are basic skills needed to function in the workplace and in every day life. Children with poor literacy and numeracy skills are more likely to be unemployed as adults. Performance in literacy and numeracy is associated with a number of social and demographic factors such as sex, geographical area of residence, cultural and family background, personal attitude and school attended. Socioeconomic status is a major predictor of achievement, with students from areas with greatest disadvantage recognised as scoring lower on reading literacy. High levels of social communication with parents, supportive school environments and positive attitudes also positively influence student outcomes.
Table 2.13: Percentage of children in Year 3 reaching benchmark by State and Territory, 2000

<table>
<thead>
<tr>
<th>State or Territory</th>
<th>Reading (%)</th>
<th>Numeracy (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australian Capital Territory</td>
<td>95.1</td>
<td>95.7</td>
</tr>
<tr>
<td>New South Wales</td>
<td>93.1</td>
<td>93.2</td>
</tr>
<tr>
<td>Northern Territory</td>
<td>65.3</td>
<td>81.4</td>
</tr>
<tr>
<td>Queensland</td>
<td>92.6</td>
<td>91.4</td>
</tr>
<tr>
<td>South Australia</td>
<td>86.8</td>
<td>85.3</td>
</tr>
<tr>
<td>Tasmania</td>
<td>91.2</td>
<td>92.8</td>
</tr>
<tr>
<td>Western Australia</td>
<td>95.8</td>
<td>90.5</td>
</tr>
<tr>
<td>Victoria</td>
<td>93.0</td>
<td>96.5</td>
</tr>
<tr>
<td>All students</td>
<td>92.5</td>
<td>92.7</td>
</tr>
</tbody>
</table>

Source: ABS Australia social trends 2002

Unemployment
In Queensland in 2002, the percentage of couple families with children aged 0-14 years, where both parents were employed, was 55.4%, similar to the national percentage of 57.1%. However, the percentage of one-parent families with children aged 0-14 years where that parent was employed was 42.3% in Queensland in 2002, compared to 46.2% nationally. The percentage of children aged 0-14 years where no parent was employed was 20.5% in Queensland in 2002, compared to 17.9% nationally.
2.4.3 Community capacity

“Social cohesion in communities and families is an important determinant of health status, with factors such as poor access to social support networks, marginalisation and isolation having lasting negative effects on physical and emotional health and well-being”.

Strategic Policy Framework for Children’s and Young People’s Health 2002-2007

The health and wellbeing of Queenslanders is generally enhanced by social participation and community life. Current evidence indicates that active, participant directed communities are healthy places to live. Furthermore, health outcomes are more likely to be maximized when government and communities work together in partnership. This requires support for communities to develop capacity to become active partners in the process. This includes involvement in identifying relevant health determinant issues, and in the planning, implementing and evaluating activities to address these issues.

While the impact of community factors on population health is generally accepted, a standard set of indicators to measure and monitor community capacity is yet to be established. This section reports on selected indicators of relevance to children such as families and parenting, behavioural problems, abuse and neglect, and crime. Because there is considerable interaction and overlap among determinants, some community capacity indicators are reported in other sections of this document. For example, socioeconomic indicators such as income, education and employment are reported in section 2.4.2, and demographic indicators in the Health service district profiles chapter. This suite of community capacity indicators is incomplete due to lack of data or limited quality data, such as some community support services. It is envisaged that in future, indicators to monitor community capacity and quality data to support these indicators will be more readily available, and more clearly defined. For more information on community capacity refer to the Whole of population chapter.

Families and parenting

In 2001, 77% of all Queenslanders were living in a family household. Of these, 59% were living in couple family households with children, 25% were living in couple family households without children, 14% were in one-parent family households and the remaining 1% were described as living in ‘other’ family households. In 1996, 19.8% of Queensland children lived in one-parent families, and by 2021, this is expected to increase to up to one in three children.

There were 12,085 divorces granted in Queensland in 2001, representing a crude divorce rate of 3.3 divorces granted per 1,000 estimated resident population. By comparison, the Australian crude divorce rate was 2.8 per 1,000 population. In 2001, 55% of divorces in Queensland involved at least one child under 18 years of age. A total of 12,534 children were involved in 6,600 divorces, giving an average of 1.9 children per divorce where children were involved. This average has remained constant over the last 10 years.

Changes in partner and conflict between partners may result in child behaviour problems. Conflict between partners appears to have a greater impact than changes of partner. Where there is no change of partner or conflict, mothers encounter fewer child behaviour problems.

In Queensland in 1999, 22.6% of parents of children aged 0-12 years reported that they had ever participated in a parenting program. A total of 6.4% reported that they had participated in or received parenting support through the Triple P - Positive Parenting Program, which facilitates the development of positive parenting skills through group and individually tailored interventions. A further 16.6% of parents reported that they had participated in another parenting education program or parenting course.

Behavioural problems

In Queensland in 1999, according to a parenting survey, the majority of parents (86-89%) reported that parenting was rewarding and fulfilling. This is important given that families have a crucial role in determining children’s overall health status. It is recognised that family risk factors such as poor parenting, family conflict, family breakdown and parental stress are significant indicators for behavioural problems in children.

The above survey was particularly interested in the extent of conduct related problems. Although not designed to assess the prevalence of the full range of childhood behavioural and emotional problems, it was possible to assess the prevalence of disruptive or externalising (antisocial) behaviour difficulties. Parents with children aged 2-12 years were asked to indicate whether their child had engaged in any of eight specific types of conduct problems over the previous six months. Responses to these questions
were used to establish the State prevalence of oppositional defiant disorders (ODD) in children. These eight difficult behaviours included; losing temper, arguing with adults, defying/refusing to cooperate with adults, deliberately annoying people, blaming others for their mistakes, being touchy or easily annoyed by others, being angry or resentful, and being spiteful and vindictive (Figure 2.19). A diagnosis of ODD was made when a parent reported that their child had often or very often engaged in four or more of these behaviours in the last six months. Based on parents’ reports of symptoms, almost 9% of children exhibited clinical levels of ODD. A small proportion of parents (5%) reported that their child’s behaviour was very or extremely difficult to manage.110

**Figure 2.19: Prevalence of conduct related problems in children aged 2-12 years, Queensland 1999**

![Graph showing prevalence of conduct related problems in children](image)

Such behavioural patterns indicate the child is at increased risk of outcomes such as antisocial behaviour, drug use, poor school performance, and attention-deficit hyperactivity disorder (ADHD).110,111 Parents who reported their child to be difficult were more likely to perceive parenting as a negative experience. In addition, parents who perceived parenting as a negative experience were more likely to be mothers, to not have a partner, and to report lower levels of confidence in their parenting role. The survey revealed that one quarter of parents, who considered their child to have an emotional or behavioural problem in the previous six months, had consulted a professional about their child’s behaviour in the past 12 months. This finding is consistent with other data showing that the majority of Australian parents of children with behavioural or emotional problems do not seek professional help.110,112

**Child care services**

There are a number of licensed child care services available in Queensland, including family day care, kindergartens, long day care and limited hours day care. In Queensland in 2000, for licensed child care services, the largest proportion of children aged 0-5 years were placed in long day care.103 This includes 80% of two-year-old children and 73% of children aged less than two years. Among children aged less than two years who utilised licensed child care services, 24% were in family day care.103

In 2002, more Queensland children aged under three years were placed in licensed child care (29.7%) than all Australian children under three years (25.2%). Among children aged 3-4 years, more Queensland children (75.0%) were in formal child care than all Australian children aged 3-4 years (72.8%).41

In 2002, Queensland children aged under three years spent a median of 16 hours per week in formal and informal child care combined, compared to a median of 13 hours per week for all Australian children. Queensland children aged 3-4 years spent a median of 18 hours per week in formal and informal child care compared to 16 hours per week for all Australian children aged 3-4 years.41

**Participation in out of school activities**

In Australia in 2000, 59% of children aged 5-14 years participated at least once in an organised sport outside of school hours in the 12 months prior to survey.41 About 29% of children participated in selected organised cultural activities outside of school hours. Cultural activities included playing a musical instrument, singing, dancing and drama. Overall, boys (66%) were more likely to participate in organised sport than girls (52%). However, girls (40%) were twice as likely to participate in cultural activities compared to boys (20%).41 In addition to organised activities, children take part in a range of leisure
activities. In the two weeks prior to the survey, the most common leisure activity was watching TV or videos (97%), followed by playing electronic or computer games (69%) and bike riding (64%).

Children’s participation in sporting, cultural and leisure activities contributes to their physical, mental and social development. There is concern that sedentary activities, such as watching television and playing computer games, may be taking the place of physical activity in children’s lives. For more information refer to sections on ‘Food and drink advertising’ and ‘Physical activity’ in section 2.4.4.

Abuse and neglect
There are currently no standardised measures of the prevalence of child abuse and neglect in Australia, mainly due to difficulties in both defining and measuring abuse and neglect. In addition, there are different policies and practices in place in the various States and Territories, hence data collected are not strictly comparable between different jurisdictions. A substantiation is a child protection notification made to relevant authorities which was investigated and where there was found to be reasonable cause to believe that the child had been, was being or was likely to be abused, neglected or otherwise harmed.

In Queensland between 1997/98 and 2001/02, rates of substantiations in children aged 0-16 years, increased from 5.1 per 1,000 children to 8.3 per 1,000. The increase in rates over this period in Queensland was higher than that recorded in other states and territories of Australia. The increased rates in Queensland were partly due to a broader definition of child abuse and neglect or harm that is used in this State. Among children aged 0-16 years, the highest rate in 2001/02 occurred in infants aged one year and younger (15.6 per 1,000). Aboriginal and Torres Strait Islander children were more likely to be the subject of substantiations than non-Indigenous children. In Queensland in 2001/02, the rate of Indigenous children aged 0-16 years who were subjects of substantiations was 14.3 per 1,000 children, compared to a rate of 7.9 per 1,000 children in non-Indigenous children.

Child abuse and neglect are usually classified into four categories; physical abuse, sexual abuse, emotional abuse and neglect. In Queensland, the most common type of substantiation is neglect, partly due to policies in this State which focus on identifying the protective needs of a child and assessing whether parents have protected the child from harm or risk of harm. In Queensland in 2001/02, 50% of Indigenous children in substantiations were the subject of a substantiation of neglect, compared with 37% of non-Indigenous children.

Child abuse and neglect is associated with a number of risk factors including socioeconomic disadvantage, family breakdown and domestic violence. Because of the substantial negative impact of abuse and neglect, such children require protection. Abuse and neglect can result in short or long term consequences. Physical and sexual abuse can have immediate impact on the child’s health due to resultant injury. Long term consequences of abuse and neglect can include impaired developmental outcomes such as lower educational attainment and poor social skills.

Homelessness
In 2001, 10% of homeless people in Australia were estimated to be children in the age group 0-11 years, that is, those accompanying homeless adults. While this is a small proportion (0.3%) of all children of this age group, it represents 9,941 children without a home. This indicator is reported more fully in the Whole of population chapter.

Safety and crime
In Queensland in 2002/03, at every age, females were more likely to be victims of sexual offences than males, with girls in the 10-14 year age group the most likely. In this age group, girls (629 victims per 100,000 population) were more than five times more likely to be victims of sexual offences than boys (119 per 100,000). Under Queensland law, children aged 0-9 years are not held criminally responsible, therefore figures for criminal offences begin at the age group 10-14 years. Criminal offences include offences against the person, offences against property (unlawful entry, arson, theft etc) and other offences such as trespassing and traffic offences. In Queensland in 2002/03, 16,404 offences were committed by children aged 10-14 years. Of the 1,375 offences against another person committed by 10-14 year olds, 75.9% were committed by boys. Similarly, of the 12,038 offences against property, 72.1% were committed by boys.
2.4.4 Health behaviours

“The focus is on addressing the determinants of health, decreasing risk factors and increasing protective factors for children and young people within the context of the family, community, society and the environment.”

Strategic Policy Framework for Children’s and Young People’s Health 2002-2007

Health risk factors such as physical inactivity, overweight, smoking, excessive alcohol consumption, hypertension, high blood cholesterol and insufficient fruit and vegetable consumption are responsible for a substantial proportion of the overall burden of disease in Australia. The burden of disease and injury attributed to health risk factors has not been determined for sub-populations such as children. Indicators of major risk factors for children are reported below. In addition, the health impact of these health behaviours is described where possible. Section 2.5 describes interventions to address the key health behaviours.

Maternal smoking and substance abuse

In Australia in 2001, women who were pregnant and/or breastfeeding in the previous 12 months were less likely to consume alcohol (53%), tobacco (23%) and any illicit drug (8%) while they were pregnant and/or breastfeeding compared with when they weren’t (83%, 24%, and 17% respectively). Tobacco was the drug that women were least likely to cease using during pregnancy and/or breastfeeding.

Tobacco smoking

Smoking during pregnancy increases health risks for both the mother and baby. Although there are currently no long-term data on Australian trends in smoking prevalence during pregnancy, it was reported in 2002 that about one in five women continue to smoke during pregnancy. It has been reported that women who continue to smoke during pregnancy are more likely to be young, unmarried, less educated, of higher socioeconomic disadvantage, and to have two or more children. About one quarter of Australian women who were smokers at the time they became pregnant, quit smoking for the pregnancy. However, about half the women who quit smoking during pregnancy relapse within six months of delivery. Pregnancy or the desire to become pregnant can provide powerful motivation to quit smoking. A national drug strategy report quotes studies that suggest a lack of success in quitting smoking during pregnancy, and relapse after giving birth, have been associated with high alcohol consumption, a lack of confidence in the ability to quit, concern about weight gain and shorter duration of breastfeeding.

In Queensland in 1999-01, there were on average 21 deaths per year in children aged 0-4 years attributed to tobacco smoking. In Queensland between 1999/00-2001/02, there were on average 1,150 hospital separations per year in children aged 0-4 years attributed to tobacco smoking. Of the hospital separations attributed to tobacco smoking, low birth weight was the leading cause (71.0%), followed by lower respiratory illness (23.2%). In Australia in 1999, of the 155 deaths due to sudden infant death syndrome (SIDS), 51 were attributed to active smoking.

Women who smoke during pregnancy can have problems with delayed conception and infertility, and are at higher risk of certain complications of pregnancy such as ectopic pregnancy, spontaneous abortion (miscarriage) and placenta previa. Smoking during pregnancy also increases risks for the baby. Infants born to women who smoke tend to have lower average birth weight, are more likely to be small for gestational age and are at increased risk for pre-term delivery. Smoking does not appear to affect the overall risk for congenital malformations. However, the risks for still birth, neonatal death, perinatal death and sudden infant death syndrome are all increased.

Alcohol

In Queensland in 1999-01, there were on average 1.8 deaths per year in children aged 0-4 years attributed to hazardous and harmful alcohol consumption. In Queensland between 1999/00-2001/02, there were on average 45 hospital separations per year in children aged 0-4 years attributed to alcohol-related conditions.

Maternal alcohol intake can have a number of effects on the developing baby, such as an increased heart rate and dilation of the small blood vessels. Severe maternal alcohol misuse can cause foetal alcohol syndrome.
Illicit drugs
In Queensland in 1999-01, there were on average 2.7 deaths per year in children aged 0-4 years attributed to illicit drugs. Of these deaths, newborn drug toxicity was the leading cause (49.8%). In Queensland between 1999/00 and 2001/02, there were on average 286 hospital separations per year in children aged 0-4 years attributed to illicit drugs. Of the hospital separations attributed to illicit drugs in children aged 0-4 years, low birth weight was the leading cause (65.3%) followed by newborn drug toxicity (34.1%).

Healthy weight
While no recent Queensland specific data is available on growth and overweight/obesity in children and adolescence, national data highlights the magnitude of this health problem. Using standard international definitions on childhood levels of overweight and obesity, it has been reported that in Australia in 1995, among 2-18 year olds, 16% of girls and 15% of boys were overweight, and a further 4.9% and 4.5% of girls and boys respectively, were obese. The highest prevalence of overweight/obesity among girls was in the 8-11 year age group (25%), and for boys in the 12-15 year age group (26%). The prevalence of overweight doubled and the prevalence of obesity trebled between 1985 and 1995. More recent data from South Australia found that approximately 20% of four-year-old children were overweight in 2002, an increase of 60% since 1995.

Australia and Queensland are experiencing an epidemic of overweight and obesity in the entire population. A general pattern has become apparent in populations as they modernize. Obesity first becomes most prevalent in middle-aged females, then in middle-aged males, then in young adults and finally in adolescents and children. Australia has currently moved into phase four of this cycle with almost one quarter of children between two and 17 years now categorized as overweight or obese.

Overweight and obesity in children is a serious problem. It has been associated with numerous health risks for children, including stress on weight bearing joints, high blood pressure, abnormal blood lipids, type 2 diabetes and respiratory problems. Overweight during childhood can also have a damaging impact on psychosocial and emotional development. Further, child onset overweight increases adult morbidity and mortality risk. In the long term, overweight children are more likely to develop chronic diseases such as cardiovascular disease, type 2 diabetes and some forms of cancer.

More evidence is needed to describe the factors that contribute towards the increasing trend in overweight and obesity in Australian children. In general, physical inactivity and inappropriate eating patterns, or a combination of both, cause overweight and obesity. The ‘obeseogenic’ environment the technological, social and economic changes that encourage and support reduced activity and over consumption of energy dense food, plays a significant role in influencing these trends. Despite obesity having strong genetic determinants, the genetic composition of the population does not change rapidly. Therefore, the large increase in obesity in recent years must reflect changes in non-genetic factors.

Breastfeeding
In Queensland in 2000, 83.2% of infants were exclusively breastfed at discharge from hospital. Older mothers were more likely to breastfeed, with 84.4% of mothers aged 35 and older breastfeeding at discharge from hospital, compared to 75.3% of mothers aged younger than 20 years. It is estimated that by three months of age, only 56% of infants are exclusively breastfed and by six months of age only 19% are exclusively breastfed. These figures are in line with national data, however, they fall significantly short of international, national and state recommendations. By 2008, Queensland Health aims to increase breastfeeding rates to 90% at discharge from hospital, 60% exclusive breastfeeding at three months of age, and 50% exclusive breastfeeding at six months of age. These targets support the recently released National Dietary Guidelines for Children and Adolescents that recommend exclusive breastfeeding for the first six months of an infant’s life.

Optimal infant nutrition for a child in the first 12 months of life provides a sound basis for normal growth and development and the enhancement of health throughout life. Optimal infant nutrition is provided through exclusive breastfeeding for the first six months with the introduction of appropriate solid food at this age, in addition to continued breastfeeding to at least 12 months of age.

Breast milk provides all the energy, nutrients, vitamins and minerals needed for healthy growth to six months of age. It contains components that enhance and develop an infant’s immune system and reduce the risk of developing preventable diseases throughout life. Of particular relevance to the current childhood obesity epidemic, a number of large scale epidemiological studies indicate that exclusive...
breastfeeding is protective against obesity in later life. As well as significant benefits to the infant, breastfeeding provides positive health benefits to the mother including; increased fertility control, increased likelihood of postpartum weight loss, reduced risk of developing breast and ovarian cancer, and improved recovery of the mother’s body to pre-pregnant state.

**Nutrient intake**

In Australia in 1995, fat contributed between 32.0% and 35.3% of total energy in children in the age range 2-15 years. This is in excess of the recommended level of 30% of total kilojoules from fat (Table 2.14). In all age groups, for both boys and girls, saturated fats accounted for the highest proportion of fat intake, and intake was above the recommended 10% of total fat intake coming from saturated fat.

Intake of total sugars, as a proportion of total energy, decreased for boys as age increased (Table 2.14). For females (aged 2-11 years) a similar trend was seen, with the exception of an increase in intake of total sugars in ages 12-15 years. Total sugars refers to monosaccharides and disaccharides such as sucrose, glucose and fructose that are found naturally in foods or added in processing. It has been suggested that excess consumption of sugar contributes to an energy dense diet that may contribute to obesity. However, these links are still not clear. National data indicate a 20% increase in consumption of sugars for children aged 10 to 15 years in the 10-year period 1985 to 1995.

**Table 2.14: Median contribution of carbohydrate, protein, total starch and total sugars (kJ) as a proportion of total energy (J) by age and sex, Queensland 1995**

<table>
<thead>
<tr>
<th></th>
<th>Males (years)</th>
<th>Females (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2-3</td>
<td>4-7</td>
</tr>
<tr>
<td>Protein</td>
<td>14.2</td>
<td>14.5</td>
</tr>
<tr>
<td>Total fat</td>
<td>33.3</td>
<td>32.0</td>
</tr>
<tr>
<td>Saturated fat</td>
<td>14.8</td>
<td>14.6</td>
</tr>
<tr>
<td>Monosaturated fat</td>
<td>10.2</td>
<td>11.2</td>
</tr>
<tr>
<td>Polyunsaturated fat</td>
<td>3.9</td>
<td>3.9</td>
</tr>
<tr>
<td>Carbohydrate</td>
<td>52.2</td>
<td>52.0</td>
</tr>
<tr>
<td>Total sugars</td>
<td>31.6</td>
<td>25.7</td>
</tr>
<tr>
<td>Total starch</td>
<td>21.3</td>
<td>24.5</td>
</tr>
</tbody>
</table>

Source: ABS National nutrition survey 1995

The National Health and Medical Research Council recommend that in the first six months of life, fat should make up about 50% of the energy requirements for both breastfed and formula fed infants. For infants not breastfed, infant formula should be the primary milk feed until 12 months of age. In the latter part of the first year and during the second year of life, the fat target should be about 40% of energy intake. For children aged 2-5 years, there should be a gradual reduction in fat intake to 30% total fat with no more than 10% saturated fat. Reduced fat milks are suitable for this age group. Skim milk however, is not suitable for children aged 2-5 years. Children aged 5-14 years should obtain 30% of their total energy requirements from fat, with no more than 10% of this being saturated fat.

Substantial proportions of children in Queensland potentially did not meet recommended daily intake (RDI) for a number of key micronutrients (Table 2.15). Due to methodological limitations, a more accurate measure of the proportion of children who consume recommended daily intake of these micronutrients cannot be assessed. Specifically, between 25-90% of children met or exceeded the recommended daily intake (RDI) of vitamin A (retinol equivalent), folate, vitamin C, calcium, iron and zinc. These data suggest that there is still a significant proportion of children who may not meet the RDI for these key essential nutrients. For calcium, between 25-50% of males and females met or exceeded the RDI, suggesting for some age groups there is a majority who do not meet these levels. Median intakes of zinc are also low in males and females aged 8-11 years and 12-15 years respectively (Table 2.15). Additional information relating to macro- and micro-nutrient intake in Queensland is available from the Health Information Centre, Queensland Health.
Table 2.15: Percentage (%) of children who met or exceeded recommended daily intake of micronutrients by age, Queensland 1995

<table>
<thead>
<tr>
<th>Micronutrient</th>
<th>2-3 years Male</th>
<th>2-3 years Female</th>
<th>4-7 years Male</th>
<th>4-7 years Female</th>
<th>8-11 years Male</th>
<th>8-11 years Female</th>
<th>12-15 years Male</th>
<th>12-15 years Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vit. A - retinol equivalent</td>
<td>75</td>
<td>75</td>
<td>75</td>
<td>75</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Folate</td>
<td>90</td>
<td>90</td>
<td>90</td>
<td>90</td>
<td>75</td>
<td>75</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>75</td>
<td>75</td>
<td>75</td>
<td>75</td>
<td>75</td>
<td>75</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>Calcium</td>
<td>50</td>
<td>25</td>
<td>50</td>
<td>25</td>
<td>50</td>
<td>25</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Iron</td>
<td>50</td>
<td>50</td>
<td>90</td>
<td>75</td>
<td>90</td>
<td>75</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>Zinc</td>
<td>75</td>
<td>75</td>
<td>75</td>
<td>75</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>25</td>
</tr>
</tbody>
</table>

Source: ABS National nutrition survey 1995
Note: Calculated by QH Data was not adjusted for within person variation
Note: The RDI used in this analysis were as recommended in 1991 and are currently under revision. It is quite likely that some nutrients, particularly folate, may be changed.

There is evidence that Australian children and adolescents are eating more. Between 1985 and 1995, in 10-15 year old children, increases in energy and protein for both boys and girls were reported (Table 2.16). In 1995, on the day prior to survey, more than one third of children did not eat any fruit, and about 20% did not eat vegetables on the day prior to the survey. In contrast, one third of children consumed snack foods such as potato crisps and extruded snacks, 50% ate confectionery such as lollies and chocolates, and 75% ate high fat foods such as commercial hamburgers and pastries, on the day prior to the survey.

Table 2.16: Increased nutrient intake (percent) 1985 to 1995: in children aged 10-15 years by sex, Australia 2001

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Kj</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>Protein</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>Carbohydrate</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Sugar</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

Source: Cook T, Australia Food and Nutrition Monitoring and Surveillance Unit, 2001

In addition, the proportion of Australian children consuming non-alcoholic sweet beverages (fruit juice, soft drinks etc) increased for both boys and girls between 1985 and 1995. For boys the increase was from 83% to 87% and for girls from 84% to 86%. The mean intake of non-alcoholic sweet beverages also increased significantly for both boys (increased by more than 200g) and girls (increased by more than 150g).

The proportion of Australian children consuming milk products decreased slightly for both boys and girls between 1985 and 1995. For boys the proportion decreased from 95% to 92% and for girls from 95% to 91%. The mean intake of milk and milk products also decreased for both boys and girls but the decrease was significant only for boys. For boys, mean intake decreased by about 60g per day.

A two-year longitudinal study of ethnically diverse school children in the United States of America found that an increase in consumption of sweetened soft drink was linked to increasing body mass index and risk of obesity. For children aged 8-11 years and 12-15 years, percentage of energy from total carbohydrates and total sugars increased between 1983 and 1995 from 8 to 14% in boys and from 8 to 13% in girls. Similarly, the contribution of sugars from sweetened soft drinks and fruit and vegetable juices increased from 9 to 20% in boys and remained the same for girls at 20%. There is good evidence that a high intake of sugar-sweetened drinks is a probable cause of obesity.

Information relating to introduction to solid food, cow’s milk and sweet drinks to infants and children, was collected in Queensland in 2003. Detailed analysis is planned to be released in late 2004.

Food and drink advertising

Australian children aged between 5-12 years are watching an average of 23 hours per week of television; an average of two hours 31 minutes daily. Between 9 and 13 minutes of advertising is broadcast per hour, thus children on average view 240 minutes of advertising per week. In a recent content analysis of the types of foods advertised during programs which have appeal to children, Zuppa et al found there were 544 food advertisements, some 21% were for core foods and 79% for non-core foods according to the Australian Guide to Healthy Eating.

In addition to its detrimental effects on children’s physical activity levels, television exposes children to numerous food advertisements. Television is an important media source of education for children,
influencing them from a very young age. However, Australia has one of the highest levels in the world of food advertising during children’s television viewing times. The National Health and Medical Research Council has reported that television may be more influential than family in setting children’s food preferences. An association between television watching and consumption of ‘unhealthy’ foods has been demonstrated.\textsuperscript{134,137}

**Fast food consumption**

In Queensland in 2003, 56% of children in the age group 2-12 years were reported by their parents as consuming take-away food less than once per week.\textsuperscript{92} A further 43% of parents reported that their children consumed take-away food once or twice a week. A very small proportion (0.96%) of children reportedly ate this type of food three or more times per week.\textsuperscript{92}

**Physical activity**

In Queensland in 2000, 56% of children aged 5-14 years participated in organised sport, compared to the national average of 59%. More boys (64%) participated than girls (47%).\textsuperscript{138} Queensland children’s participation in sport and leisure activities is one of the lowest in Australia. About two thirds of Queensland children participated in bicycle riding and about one third in skateboarding or rollerblading.\textsuperscript{138}

The data presented here do not give an indication of the regularity of children’s participation in physical activity. Such data are not currently available. Since physical activity needs to be regular for health benefits, some caution needs to be taken in the interpretation of these data for health benefits.

Although there are no formal activity guidelines for Australian children, the American and Australian Heart Foundations recommend that children aged five years and older should participate in at least 30 minutes of moderate intensity physical activity every day, which can include organised sports, recreational games or other family or school activities.\textsuperscript{139}

Children who are sufficiently active, particularly if they participate in additional vigorous intensity physical activity three or four times a week, have a lower risk of developing chronic diseases such as diabetes and cardiovascular disease in later life. In addition to encouraging children to participate in physical activities, parents should also limit the time that children are permitted to spend in sedentary recreation such as watching television or playing computer games.\textsuperscript{140}

**Sun protection**

In Queensland in 2003, over three-quarters (78.7%) of parents with children aged 0-12 years agreed that children need to get some direct sunlight to be healthy.\textsuperscript{92} The majority of parents (81.2%) stated that it was not difficult to prevent their child from becoming sunburnt during summer. However, 18.9% of parents reported one episode of painful sunburn in their child and 4.9% reported between two and 10 episodes of painful sunburn in the preceding summer. With regard to parental behaviour, 15.9% of parents reported they always applied sunscreen to themselves if outside on a sunny day for 15 minutes or more, 22.0% reported that they applied sunscreen most of the time, 24.8% applied sunscreen sometimes and 37.3% rarely or never applied sunscreen.\textsuperscript{92}

Of parents of children aged 2-12 years, 84.8% explained the danger of being unprotected in the sun to their child ‘always’ or ‘mostly’ and 95.2% of parents encouraged their child to protect themselves from the sun ‘always’ or ‘mostly’. On sunny days when the child was outside for at least 15 minutes, 71.9% of parents encouraged the child to apply sunscreen to exposed areas of skin ‘always’ or ‘mostly’, 92.6% encouraged them to wear a hat ‘always’ or ‘mostly’, and 72.9% encouraged the child to wear sun protective clothing ‘almost’ or ‘mostly’. On sunny days 24.0% of parents encouraged their children to stay indoors ‘always’ or ‘mostly’. Most parents (76.9%) encouraged their children to protect themselves from the effects of the sun ‘always’ or ‘mostly’ on cloudy days.\textsuperscript{92}

**Vaccination rates**

Overall, high immunisation coverage for vaccines due in the first two years of life has been achieved in Queensland. In 2003, a child was defined as fully vaccinated at 12 months of age if they had received a third dose of pertussis-tetanus-diphtheria-hepatitis B (DTPa-Hep B) and poliomyelitis vaccines as well as three doses of HibTiter or two doses of PedvaxHIB. At the second milestone of 24 months, a child was defined as fully vaccinated if they had received the third dose of poliomyelitis vaccine, the first dose of measles-mumps-rubella (MMR) vaccine (due at 12 months of age), the fourth dose of pertussis-tetanus-
diphtheria (DTPa) vaccine (due at 18 months of age) and the fourth dose of HibTiter or third dose of PedvaxHIB vaccine.

In Queensland in October 2003, 92.1% of children were fully vaccinated at 12 months of age, 90.0% were fully vaccinated at two years of age, and 94.5% had received a first dose of MMR vaccine. Vaccination coverage rates presented here refer to Queensland children provided with free vaccine through the childhood immunisation program and were calculated from the Australian Childhood Immunisation Register (Table 2.17).141

Immunisation coverage for children at six years of age remains lower than optimum. A child was defined as up-to-date at six years if they had received a fifth dose of pertussis-tetanus-diphtheria, a fourth dose of poliomyelitis and a second dose of measles-mumps-rubella vaccine (all due at four years of age), and a fourth dose of HibTiter or third dose of PedvaxHIB vaccine. In Queensland in October 2003, 82.4% of children were fully vaccinated at six years of age (Table 2.17).141 Future cohorts of children will be assessed as fully vaccinated for each milestone according to an amended schedule introduced in September 2003.

While much of the effort in immunisation over the last decade has resulted in demonstrated successes indicated by the above coverage rates, a significant number of children in all cohorts remain incompletely vaccinated. There is general agreement in the literature on the factors associated with the incomplete vaccination status of children. These include failure to commence primary vaccination, high mobility, socio-economic disadvantage, being from a single parent family, parental unemployment, coming from a culturally or linguistically diverse background or being of Aboriginal or Torres Strait Islander descent. The challenge is to develop strategies that effectively target these groups.87

Table 2.17: Vaccination coverage rates by milestone and age cohort, Queensland and Australia, 2003

<table>
<thead>
<tr>
<th></th>
<th>Fully vaccinated 12&lt;15 months</th>
<th>First MMR 24&lt;27 months</th>
<th>Fully immunised 24&lt;27 months</th>
<th>Fully immunised 72&lt;75 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queensland</td>
<td>92.1</td>
<td>94.5</td>
<td>90</td>
<td>82.4</td>
</tr>
<tr>
<td>Australia</td>
<td>91.7</td>
<td>94.1</td>
<td>89.2</td>
<td>83.1</td>
</tr>
</tbody>
</table>

Source: QH Communicable Disease Unit (based on data supplied by Australian Childhood Immunisation Register)
2.5 Interventions to address the burden of disease

The work of many government and non-government agencies, industry and community groups impacts directly and indirectly on the health of Queenslanders. *Health Determinants Queensland 2004* has been produced to assist these organisations to gain a clearer understanding of the determinants and risks of ill health, as well as the broader social implications to the whole population and specific target groups. The interventions outlined build upon the Queensland Health directions statement *Smart State: Health 2020 Strategic Vision for Queensland Health*.

There is now good evidence that a range of interventions are effective in preventing disease, illness and injury, and in promoting health and wellbeing through action on the broad range of determinants of health and ill health. The key challenges are to ensure these initiatives are ongoing and widespread, and at a level sufficient to achieve broad based population-wide outcomes as well as reduce health inequalities across population subgroups.

Since population health issues are being addressed by multiple organisations and communities, the aim of these intervention sections is to identify key evidence based strategies that are currently being undertaken, are planned or are required to be undertaken, based upon best practice. This intervention list is intended to be a useful resource for about three years. These interventions will be led by many organisations in partnership with other sectors.

There are a number of ways of influencing systems and settings to improve population health and wellbeing, or to create healthy environments that are conducive to health and wellbeing. These include, but are not limited to:

- Community public health planning: A broad range of bottom-up planning processes that engage communities and partner agencies,\(^ {142}\) and,
- Health Impact Assessment: An approach used to assess and judge an initiative or policy for its potential effects on the health of the population and the distribution of those effects within the population.\(^ {143,144}\)

It is clear that there are no simple, quick fixes to these complex issues. Action on all determinants requires multi-strategy approaches which:

- include both population wide and at risk group approaches
- involve sectors working together at state and local levels
- focus on both risk and protective factors
- address social, behavioural, economic and environmental factors
- specifically address equity and reduce disparities by focusing on the needs of the most disadvantaged communities and population groups
- take a life course perspective.

Key action areas and evidence based strategies unique for children are described. These strategies complement those provided in the Whole of population chapter, although the interventions may be population specific.

There are no specific strategies for children for communicable disease, food safety, immunisation and sexual health.
### Alcohol

<table>
<thead>
<tr>
<th>Key action areas</th>
<th>Key evidence based strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection of those at higher risk</td>
<td>• Deliver education and intervention programs that address alcohol and/or other drug use by the parents and children of high-risk families.</td>
</tr>
<tr>
<td></td>
<td>• Implement multi-strategy prevention campaigns targeting 12-29 year olds particularly during high-risk transitional periods, such as leaving school. For example, Rumble in the Jungle, Rock Eisteddfod and Croc Festivals.</td>
</tr>
<tr>
<td></td>
<td>• Increase the capacity of workers in the education system to address alcohol issues, eg. Queensland School Drug Education Strategy and Service Based Policing Program.</td>
</tr>
<tr>
<td></td>
<td>• Establish Child Care and Family Support hubs as single entry points at the local level, for services to meet the diverse needs of children and families including child care and early childhood services, family support services, parenting support, child health services, community activities and education services.</td>
</tr>
</tbody>
</table>

Further information regarding the intervention strategies above can be accessed from:

Injury

<table>
<thead>
<tr>
<th>Key action areas</th>
<th>Key evidence based strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community awareness</td>
<td>• Implement social marketing campaigns to increase awareness of the preventability of child injuries, means of preventing these injuries, and measures to take in the event of an injury, eg. Kidsafe House, Giddy Goanna booklets and Queensland Ambulance Service One Step Ahead Course.</td>
</tr>
</tbody>
</table>
| Supportive public policies and safer environments | • Enforce relevant legislation and regulations/standards by state and local authorities, eg. use of child restraints/seat belts, labelling of children’s nightwear to indicate flammability, bicycle helmet wearing, maintenance of pool fencing and playgrounds.  
  • Promote the modification of rules and use of protective equipment such as mouthguards and padding on goal posts, to reduce injury during training and competition in organised sports.  
  • Implement the KidPower Resource Kit in primary schools.  
  • Equip health professionals with the knowledge, skills and resources to provide developmentally appropriate anticipatory guidance to care givers of young children as part of a routine consultation. |

Further information regarding the intervention strategies above can be accessed from:

## Mental health

<table>
<thead>
<tr>
<th>Key action areas</th>
<th>Key evidence based strategies</th>
</tr>
</thead>
</table>
| Supportive environments and infrastructure | • Support and sustain maternal health, infant (0 – 1yrs) health and wellbeing through family-friendly policies and practices in workplaces and community settings. For example, workplace policies that support breastfeeding, flexible working hours and job-share practices.  
• Provide screening programs for infant health and parental mental health problems particularly maternal depression.  
• Provide safe, nurturing and quality child care that implements consistent fair behaviour management practices, builds good social and language skills and establishes good dietary choices and physical activity practices. For example Positive Parenting Programs, After School Programs, Health Promoting Early Child Care Pilot Project.  
• Provide emotional, physical and financial support to parents during early years, eg. home visiting programs, affordable accredited childcare, Supported Housing, Family Allowance.  
• Support participation in a range of formal and informal recreational, social and cultural opportunities, eg. unstructured play, Arts Queensland Development programs, Sport and Recreation Youth Development programs. |
| Personal efficacy and resiliency to positively manage life transitions and adverse life events | • Increase support during periods of transition, including:  
  - from home to child care and from child care to pre-school (School Readiness Initiative)  
  - to and from primary school  
  - from childhood to adolescence.  
• Implement evidence based programs aimed at increasing self-worth (including healthy body image), social competency, coping skills and resilience in children, eg. Helping Friends, Heart Masters.  
• Provide opportunities for personal development and exploration through structured and unstructured play and participation in a diverse range of cultural activities.  
• Increase opportunities for meaningful participation by children in home, school and community decision-making.  
• Increase knowledge of health information, the range of available health services and promote health seeking behaviour by children, eg. Kids Help Line. |

Further information regarding the intervention strategies above can be accessed from:

1. Waters E, Goldfeld S and Hopkins S. (2002), Indicators for child health, development and wellbeing: A systematic review of the literature and recommendations for population monitoring, Centre for Community Royal Children’s Hospital, Melbourne.
**Nutrition**

<table>
<thead>
<tr>
<th>Key action areas</th>
<th>Key evidence based strategies</th>
</tr>
</thead>
</table>
| Nutritional health of mothers, infants and children | • Implement a coordinated statewide strategic approach to nutrition promotion in schools, pre-schools and child care within the health promoting schools approach, eg. Joint Work Plan between Queensland Health and Education Queensland.  
• Increase healthy eating practices and learning opportunities in child care settings as part of a broader health promoting child care approach, eg. NHMRC Dietary Guidelines for Children and Adolescents in Australia, policies regarding food supplied from home, and educational activities for children, parents and grandparents.  
• Establish regular, consistent, standardised monitoring and surveillance of infant and child nutrition throughout the State, linked with National initiatives.  
• Support the provision of family and community programs such as local Breastfeeding Coalitions.  
• Increase breastfeeding through family and community programs and support policies and programs for workplaces, eg. local Breastfeeding Coalitions.  
• Provide consistent evidence-based nutrition information and support to antenatal programs and as a pre-conception counselling especially for young women, Indigenous women, and others at greater risk.  
• Incorporate nutrition as part of early intervention outreach programs for families with newborns at risk of poor health or social outcomes, eg. the me-visitation programs.  
• Provide consistent evidence-based nutrition and support as part of primary healthcare services for new mothers, eg. GPs, child health services. |
| Child care settings | • Introduce standards for child care settings on healthy eating and physical activity that meet the NHMRC Dietary Guidelines for Children and Adolescents in Australia and form part of the accreditation and funding framework, eg. Better Food Better Care and Your Child Care Centre Nutrition Policy.  
• Implement healthy eating practices and learning opportunities in child care settings as part of a broader health promoting child care approach, eg. policies regarding food supplied from home, educational activities for children and parents such as Better Food Better Care.  
• Reduce barriers to the achievement of standards and guidelines, eg. legal liability issues and food safety regulations.  
• Implement interventions, including training for childcare workers and information and support for parents, grandparents and carers on healthy eating, including breastfeeding. |
| School settings | • Implementation of the Healthy Weight component of the Education Qld/Qld Health joint action plan, which addresses:  
– policy issues, eg. tuckshops, vending machines, sponsorship by “fast food” companies, use of school recreational facilities out of school hours, supervision of physical activity in school breaks, out of schools hours care programs  
– programs relevant to curriculum and the whole school environment  
– linkages to Queensland Health programs in schools such as the School-based Youth Health Nurse program curriculum and school environment.  
• Implement programs that promote healthy eating behaviours, including Outside School Hours Care programs, eg. Physical Activity and Nutrition Out of School Hours (PANOSH) nutrition and physical activity resources, and Better Food Better Preschool in early education sector.  
• Implement curricula and environmental interventions to increase knowledge of healthy eating, eg. fruit and vegetable schemes, cooking skills, ActiveAte. |
| Healthy weight | • Extend family-focused programs to prevent, manage and treat overweight and obesity in children for young families at risk and families with overweight children. For example, Kids on Track and Lifestyle Triple P. |
Further information regarding the intervention strategies above can be accessed from:

## Oral health

<table>
<thead>
<tr>
<th>Key action areas</th>
<th>Key evidence based strategies</th>
</tr>
</thead>
</table>
| **Supportive policies and treatment** | • Target and deliver prevention focused school dental services based on need.  
• Implement programs to increase the capacity of primary care providers to engage parents and children in opportunistic health education and skill development, eg. Happy Teeth Happy Child, Healthy Teeth for Life, and Indigenous Oral Health Flip Chart. |
| **Community awareness** | • Work with governments, industry and the media to limit the promotion and advertising of foodstuffs and beverages that are harmful to the oral health of children.  
• Link with and build upon existing common risk factor strategies within sport and recreational settings to promote oral health, eg. mouthguards, SunSmart and nutrition.  
• Develop environments in child care, preschools, and primary schools to promote oral health, eg. through curriculum, canteen and parents. |
| **Workforce capacity and infrastructure** | • Progress the enhancement of the skill base in paediatric dentistry to ensure the effective provision of oral health services for children, including better utilisation of Allied Oral Health Professionals.  
• Foster research to determine the causal and contributing factors associated with dental caries in high risk children, and identify appropriate interventions. |

Further information regarding the intervention strategies above can be accessed from:

Physical activity

<table>
<thead>
<tr>
<th>Key action areas</th>
<th>Key evidence based strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community awareness and provision of physical activity options</td>
<td>• Implement physical education and nutrition curriculum within the Education Queensland Health and Wellbeing Framework, eg. Health and Physical Education Syllabus.</td>
</tr>
<tr>
<td></td>
<td>• Provide parents, carers, teachers, clinicians and others with targeted, relevant and credible information about physical activity, healthy eating and healthy weight, eg. Draft National Physical Activity Guidelines for Children and Young People.</td>
</tr>
<tr>
<td></td>
<td>• Implement a social marketing strategy to increase awareness and knowledge relating to getting active and eating well in key settings, eg. early childhood settings including child care centres, and schools. This will include using accreditation options and programs such as Moving with Young Children.</td>
</tr>
<tr>
<td></td>
<td>• Implement programs to assist parents to encourage their children to be physically active eg. Active Baby and Toddler, Support an Active Learner and Fair Play Fair Choices.</td>
</tr>
<tr>
<td></td>
<td>• Include appropriate physical activity options into after-school care programs.</td>
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<tr>
<td></td>
<td>• Encourage parents to limit access to sedentary recreation such as television, videos, computers and video games to a reasonable maximum, eg. Victoria’s Turn Off and Turn On program, and use of the mass media.</td>
</tr>
<tr>
<td></td>
<td>• Implement programs to support children and adolescents to be advocates for healthy eating and active living, eg. ActiveAte, Get Active Queensland and Kids Playground.</td>
</tr>
<tr>
<td>Supportive environments and policies</td>
<td>• Develop and implement targeted strategies such as the ‘Get Active Children and Young People’ strategy (Sport and Recreation Queensland), which includes incentives and networking opportunities to assist parents, carers, teachers, providers, children and young people to increase safe participation in physical activity.</td>
</tr>
<tr>
<td></td>
<td>• Provide support to coaches to assist them to provide positive engagement in organised sport.</td>
</tr>
<tr>
<td>Workforce capacity</td>
<td>• Increase tertiary and in-service education in fundamental movement skills for early childhood and primary teachers.</td>
</tr>
<tr>
<td></td>
<td>• Provide training for childcare staff, early childhood teachers, before and after school hours care staff and family day care providers to assist them to incorporate appropriate physical activity experiences into their programs.</td>
</tr>
</tbody>
</table>

Further information regarding the intervention strategies above can be accessed from:

5. ActiveAte program - www.health.qld.gov.au/ActiveAte/about/default.asp
10. For more information on Queensland Health programs and resources see: http://www.health.qld.gov.au/healthyliving/Physical_Activity_P.htm
## Smoking

<table>
<thead>
<tr>
<th>Key action area</th>
<th>Key evidence based strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community awareness</td>
<td>• Implement the 'Poison' campaign (including mass media and a health promoting schools resource) to help reduce smoking uptake and smoking experimentation by young people.</td>
</tr>
<tr>
<td></td>
<td>• Provide anti-smoking education in the school curriculum in line with the health promoting schools approach.</td>
</tr>
</tbody>
</table>

Further information regarding the intervention strategies above can be accessed from:

4. Quitline – www.quitnow.info.au
Social determinants

<table>
<thead>
<tr>
<th>Key action areas</th>
<th>Key evidence based strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Settings and Partnerships</td>
<td>• Invest in early childhood development and learning.</td>
</tr>
<tr>
<td></td>
<td>• Enhance access to education, and school and community support for highly transient children.</td>
</tr>
<tr>
<td></td>
<td>• Implement Working Together for Healthy Schools position statement and practice framework.</td>
</tr>
<tr>
<td></td>
<td>• Implement interventions that improve family functioning for example, preschool and home visiting programs to address issues of child abuse, delinquency, substance abuse and teen pregnancy.</td>
</tr>
</tbody>
</table>

The work of a multitude of government and non-government agencies impacts directly and indirectly on the social determinants of health. Further information regarding the intervention strategies above can be accessed from:

2. Queensland Health multicultural policy.
### Sun protection

<table>
<thead>
<tr>
<th>Key action areas</th>
<th>Key evidence based strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Community Awareness</strong></td>
<td>• Implement social marketing campaigns to increase parental and carer awareness of skin cancer prevention and SunSmart behaviours for children, eg. Working Towards a SunSmart Queensland: Early Childhood Centres &amp; Primary Schools.</td>
</tr>
<tr>
<td></td>
<td>• Promote use of sun protection garments, sunscreen and shaded areas, eg. Queensland Cancer Fund Community Speakers Program, No Hat No Play policy, and Sun Protection in Queensland early childhood services.</td>
</tr>
<tr>
<td></td>
<td>• Promote the use of Queensland Health’s sun protection resources, eg. Sun protection in Queensland early childhood services to increase awareness of child care centre requirements for sun protection and shade provision.</td>
</tr>
<tr>
<td><strong>Supportive public policies and safer environments</strong></td>
<td>• Include sun protective policies in childcare accreditation and licensing.</td>
</tr>
<tr>
<td></td>
<td>• Implement sun protection policies such as the Queensland Cancer Fund’s SunSmart policy for kindergartens, long day care and occasional care centres.</td>
</tr>
<tr>
<td></td>
<td>• Implement sun protection policies in primary school settings, eg. Queensland Cancer Fund’s Working Towards a SunSmart Queensland – Primary Schools.</td>
</tr>
<tr>
<td></td>
<td>• Recognise and reward good sun protection practices within early childhood centres and primary schools, eg. National SunSmart Schools Program SunSmart Schools and Centres awards.</td>
</tr>
<tr>
<td><strong>Shade provision</strong></td>
<td>• Provide guidelines such as Creating Better Shade to early childhood organisations and centres to assist with the provision of shade and shade structures.</td>
</tr>
<tr>
<td></td>
<td>• Implement and monitor compliance with Creating Shade at Public Facilities-Policy &amp; Guidelines for Local Government.</td>
</tr>
<tr>
<td></td>
<td>• Provide financial assistance for the purchase of materials to create shade through funding/grants programs, eg. Sunbusters Program.</td>
</tr>
<tr>
<td></td>
<td>• Implement natural shade protection projects in schools, eg. Shade and Spade Committee Queensland: SunSmart Schools Arbor Day Awards.</td>
</tr>
<tr>
<td></td>
<td>• Monitor compliance with sun protection regulation in early childhood settings, eg. provision of shade and sun protective behaviours.</td>
</tr>
<tr>
<td><strong>Community capacity to prevent skin cancer</strong></td>
<td>• Incorporate sun protection modules into existing curriculum for Early Childhood Carers courses: TAFE, and University settings.</td>
</tr>
<tr>
<td></td>
<td>• Promote the Queensland Cancer Fund Community Speakers Program for training staff, carers and parents in Early Childhood settings.</td>
</tr>
</tbody>
</table>

Further information regarding the intervention strategies above can be accessed from:


2.6 Methodology and guide for users

*Health Determinants Queensland 2004* reports on the prevalence of health determinant indicators of population subgroups in Queensland. In addition, this report includes a profile for each Health Service District (HSD) in Queensland detailing key sociodemographic data and health status estimates, using synthetic estimation methods. This methodology and guide for users is included in all chapters of this report.

Selection criteria for inclusion of indicators in this report

The inclusion and sequence of indicators is structured using the *National Health Performance Framework* (2.18). This was chosen for consistency with national and state directions, to help the reader find indicators of interest to their area of expertise through the various chapters, and to assist in systematic identification of challenges and points for intervention. This Framework has three tiers; Health status and outcomes; Determinants of health; and Health system performance.

The focus of this report is health determinants. Limited health outcome indicators are also presented. The key health outcome indicators not reported in *Health Determinants Queensland 2004* are included in *Health Indicators for Queensland 2001* and other documents, where specific references to these publications are quoted throughout the text. Links between health determinants and health outcomes are provided. Indicators of health system performance are beyond the scope of this publication.

Indicators listed in this report were selected on the basis of the following criteria:

- nationally/internationally accepted core indicators (that is, complies with National Health Data Dictionary (NHDD) definitions or have been reported in a recognised publication)
- relevance to the Queensland/Australian public health policy context
- available sources contain reliable, integral, representative data for the particular population sub-group
- the set of indicators reflect a balance between determinants and outcomes, with limited overlap with *Health Indicators for Queensland Southern, Central and Northern Zones 2001* 6-8
- the wording can be understood by people who are in a position to take action
- the issue measured is such that action can be taken at a state or local level to address it.

The order of indicators in each chapter of *Health Determinants Queensland* is consistent with the *National Health Performance Framework*. Health status and outcome indicators are reported for the National Health Priority Areas, ordered from highest to lowest according to the burden of disease attributed to the area. In general, the order of indicators is based upon a combination of aggregates of indicators of similar aetiology or outcome, hierarchy based upon either breadth of indicator (e.g., all cancer mortality followed by breast cancer mortality) or sphere of impact (societal, household followed by individual), and alphabetical order. As this report focuses on modifiable determinants of health, the person-related factors dimension of the *National Health Performance Framework* is not included. All determinants of health indicators are reported in the domain where there is the greatest opportunity for health gains. Thus, physiological and biological factors which may be partially addressed through lifestyle behaviour change have been included in the health behaviour dimension of this report.
### HEALTH STATUS AND OUTCOMES

**How healthy are Australians? Is it the same for everyone? Where is the most opportunity for improvement?**

<table>
<thead>
<tr>
<th>Health conditions</th>
<th>Human function</th>
<th>Life expectancy and wellbeing</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevalence of disease, disorder, injury or trauma or other health-related states.</td>
<td>Alterations to body, structure or function (impairment), activities (activity limitation) and participation (restrictions in participation).</td>
<td>Broad measures of physical, mental, and social wellbeing of individuals and other derived indicators such as Disability Adjusted Life Expectancy (DALE).</td>
<td>Age and/or condition specific mortality rates.</td>
</tr>
</tbody>
</table>

### DETERMINANTS OF HEALTH

**Are the factors determining health changing for the better? Do the determinants affect everyone in the same way? Where and for whom are they changing?**

<table>
<thead>
<tr>
<th>Environmental factors</th>
<th>Socioeconomic factors</th>
<th>Community capacity</th>
<th>Health behaviours</th>
<th>Person-related factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical, chemical and biological factors such as air, water, food and soil quality resulting from pollution and waste disposal.</td>
<td>Socioeconomic factors such as education, employment, per capita expenditure on health, and average weekly earnings.</td>
<td>Characteristics of communities and families such as population density, age distribution, health literacy, housing, community support services and transport.</td>
<td>Attitudes, beliefs, knowledge and behaviours e.g. patterns of eating, physical activity, excess alcohol consumption and smoking.</td>
<td>Genetic related susceptibility to disease and other factors such as blood pressure, cholesterol levels and body weight.</td>
</tr>
</tbody>
</table>

### HEALTH SYSTEM PERFORMANCE

**How well is the health system performing in delivering quality health actions to improve the health of all Australians? Is it the same for everyone?**

<table>
<thead>
<tr>
<th>Effective</th>
<th>Appropriate</th>
<th>Efficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Care, intervention or action achieves desired outcome.</td>
<td>Care/intervention/action provided is relevant to the client’s needs and based on established standards.</td>
<td>Achieving desired results with most cost effective use of resources.</td>
</tr>
<tr>
<td>Responsive</td>
<td>Accessible</td>
<td>Safe</td>
</tr>
<tr>
<td>Service provides respect for persons and is client orientated and includes respect for dignity, confidentiality, participation in choices, promptness, quality of amenities, access to social support networks, and choice of provider.</td>
<td>Ability of people to obtain healthcare at the right place and right time irrespective of income, physical location and cultural background.</td>
<td>The avoidance or reduction to acceptable limits of actual or potential harm from healthcare management or the environment in which healthcare is delivered.</td>
</tr>
<tr>
<td>Continuous</td>
<td>Capable</td>
<td>Sustainable</td>
</tr>
<tr>
<td>Ability to provide uninterrupted, coordinated care or service across programs, practitioners, organisations and levels over time.</td>
<td>An individual’s or service’s capacity to provide a health service based on skills and knowledge.</td>
<td>System or organisation’s capacity to provide infrastructure such as workforce, facilities and equipment, and be innovative and respond to emerging needs (research, monitoring).</td>
</tr>
</tbody>
</table>

### Analysis

All mortality and hospital separation rates and ratios were calculated using the Health Information Analysis System (HIAS). HIAS calculates the direct age standardised rate per 100,000 population using the 1991 Australian population (persons) as the standard population, 95% confidence intervals for these rates, actual and expected counts and rate ratios with 95% confidence limits. Year of death registration
was used. Confidence intervals were estimated by assuming Normal approximations to the Poisson distribution. The Queensland population in the comparable year, by sex, was used as the standard population for calculation of standardised ratios, where the reference figure of 100 for Queensland was applied in all cases.

Throughout this report the term 'significant' is used to indicate 'statistically significant' rather than necessarily of clinical or public health importance. Determination of statistically significant differences was based on the standardised ratio, where differences are reported as statistically significant if the 95% confidence limits population group do not include 100.

All rates and ratios are reported to limited decimal points. Thus statistical significance for some differences may not be apparent from the reported data. No statistical methods were applied for adjustment of multiple comparisons. Therefore caution must be used in the interpretation of individual or small numbers of data points.

Due to the small population numbers in some disease or age groups, numbers for some specific causes of deaths or hospital separations were very small or zero in a single year. In an attempt to produce meaningful rates and reduce the fluctuation from year to year, three-year averages were calculated instead of single year counts. Generally case numbers, and age standardised and age specific mortality and hospital separation rates are reported in the Health Determinants Queensland Statistical Report.

Poisson regression models in SPSS statistical software (version 10) were used to test for age adjusted linear trends in mortality and hospital separation rates in the period 1992 to 2001. The predictor variables in these multivariate analyses were single year of death or single year of hospital separation and age, which was generally expressed in five-year age groups as indicator variables. The outcome variable was the number of deaths or hospital separations, with the log of the age specific populations used as the offset variable in the Poisson model. The Poisson regression model assumed that the annual trend in rates was linear, and hence departures from this linear trend have not been tested. Linear trends were expressed in terms of the per cent change per year, based on the parameter estimates of the Poisson model. The standard errors of the parameter estimates were corrected for evident overdispersion. Confidence intervals (95%) for the per cent change per year were calculated using the parameter estimates of the Poisson model and standard error of those estimates.

Comparability between ICD-9 and ICD-10

In 1997, the ABS implemented an Automated Coding System (ACS) for cause of death coding. The coding system changed from ICD-9 to ICD 10. From 1999, deaths were coded using ICD-10 and from 1999/00 hospital separations were coded using ICD-CM-10. The comparability factors between data coded using ICD-9 and ICD-10 are listed in Table 2:19. These factors were generated from mortality data from the years of joint coding, 1997 and 1998.

There were differences in the number of deaths coded by the two systems for many mortality indicators in this report. However where the comparability factor was in the range 0.9 to 1.1, comparability issues were not highlighted in the text and Poisson trend analysis was reported. Where the comparability factor was outside this range, no Poisson trend analysis was reported and the issue of lack of comparability was noted in the text. An additional consideration for diabetes was the effect of changes in instructions to coders between ICD-10 version 1 and version 2 in 2000, resulting in a larger number of cases being coded as diabetes principle cause. Changes in hospital separation rates over the period prior to 2000 were reported. No comparisons of diabetes hospital separation rates prior to 2000 with rates after 2000 were conducted. Lack of comparability of coding for COPD between ICD-9 and ICD-10 precluded comparison of rates across the reporting period.
Attributable fractions

Attributable fractions, also referred to as aetiologic or aetiological fractions, are used to measure the impact of risk factors on morbidity and mortality. Calculation of fractions takes into account both the age and sex specific prevalence of a risk factor in the population of interest, and the strength of the relationship between the risk factor and outcome conditions (relative risk) for that age group and sex. The number of deaths or hospital separations caused by (or preventable for) a risk factor can then be calculated by multiplying the number of age and sex specific cases of each outcome condition related to the risk factor, by the corresponding attributable fraction.

Table 2.19: Comparability factors for pre 1997 manual coding of ICD-9 and Automatic Coding System for ICD-10, for reported diseases and conditions

<table>
<thead>
<tr>
<th>Disease</th>
<th>ICD-9/ICD-9-CM</th>
<th>ICD-10/ICD-10-CM</th>
<th>Calculated Comparability Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malignant Neoplasms</td>
<td>140 - 208</td>
<td>C00 - C97</td>
<td>1.01</td>
</tr>
<tr>
<td>Colorectal cancer</td>
<td>153 - 154</td>
<td>C18 - C21</td>
<td>1.00</td>
</tr>
<tr>
<td>Lung cancer</td>
<td>162</td>
<td>C33, C34</td>
<td>0.99</td>
</tr>
<tr>
<td>Melanoma of skin</td>
<td>172</td>
<td>C43</td>
<td>1.01</td>
</tr>
<tr>
<td>Breast cancer in women</td>
<td>174</td>
<td>C50</td>
<td>1.01</td>
</tr>
<tr>
<td>Cervical cancer in females</td>
<td>180</td>
<td>C53</td>
<td>0.99</td>
</tr>
<tr>
<td>Prostate cancer in males</td>
<td>185</td>
<td>C61</td>
<td>1.01</td>
</tr>
<tr>
<td>Diabetes (principal cause)</td>
<td>250</td>
<td>E10 - E14</td>
<td>1.03</td>
</tr>
<tr>
<td>Mental and behavioural disorders</td>
<td>290 - 319</td>
<td>F00 - F99</td>
<td>0.79</td>
</tr>
<tr>
<td>Coronary Heart Disease</td>
<td>410 - 414</td>
<td>I25 - I25</td>
<td>1.01</td>
</tr>
<tr>
<td>Stroke</td>
<td>430 - 438</td>
<td>G45, G46, I60-I69</td>
<td>1.02</td>
</tr>
<tr>
<td>COPD (not including Asthma)</td>
<td>491, 492, 496</td>
<td>J41-J44</td>
<td>1.11</td>
</tr>
<tr>
<td>Asthma</td>
<td>493</td>
<td>J45,J46</td>
<td>0.71</td>
</tr>
<tr>
<td>Musculoskeletal</td>
<td>710-739</td>
<td>M00-M99</td>
<td>1.10</td>
</tr>
<tr>
<td>SIDS</td>
<td>798</td>
<td>R95</td>
<td>0.67</td>
</tr>
<tr>
<td>Injury and poisoning, excludes intentional self harm and complications of medical and surgical care</td>
<td>E800-869, E880-929, E960-999</td>
<td>V01-Y98, excluding X60 - 84 and Y40-84</td>
<td>1.07</td>
</tr>
<tr>
<td>Road transport related injury</td>
<td>E810-819, E826-829</td>
<td>V02-04 (.1,.9); V09.2; V12-V14(.3-.9); V19 (.4-.9); V20-28 (.3-.9); V29 (.4-.9); V30-V39 (.4-.9); V40-49 (.4-.9); V50-S9 (.4-.9); V60-69 (.4-.9); V70-79 (.4-.9); V80 (.3-.5); V81.1, V82.1, V83, V86 (.0-.3); V87 (.4-.9); V89 (.2); V91 (.0,.1,.9); V96 (.0,.1,.9); V09 (1,.3,.9); V10-V11 (.0-.5,.9); V16-V18 (.0-.5,.9); V19 (3,.8,.9); V80 (.0 2,.7,.9); V82(.2-.7,.9); V87.9; V88.9, V89 (1,.3,.9)</td>
<td>1.04</td>
</tr>
<tr>
<td>Accidental Poisoning</td>
<td>E850 - 869</td>
<td>X40 - X49</td>
<td>1.01</td>
</tr>
<tr>
<td>Falls</td>
<td>E880 - E886, E889</td>
<td>W00 - W1999</td>
<td>1.00</td>
</tr>
<tr>
<td>Fires, Burns and Scalds</td>
<td>E890 - E899, E924</td>
<td>X00 - X19</td>
<td>1.00</td>
</tr>
<tr>
<td>Drowning</td>
<td>E910</td>
<td>W65 - W74</td>
<td>1.04</td>
</tr>
</tbody>
</table>

Source: Health determinants Queensland 2004
Risk factors included in this report are alcohol, smoking, illicit drugs and physical inactivity. The attributable fractions for alcohol, smoking and illicit drugs were those created by the Australian Institute of Health and Welfare in 2001. The fractions were originally developed by Holmen et al. and revised by English et al. Relative risk estimates of physical inactivity used to calculate Queensland fractions were developed by the World Health Organisation.

**Indigenous health**

Aboriginal populations and Torres Strait Islander populations have different health status. However, in this report these populations are generally reported together as Indigenous peoples. This report includes data and indicators to describe Indigenous health where the data is available, using methodologies listed below. It builds on information provided in earlier reports for Queensland Health. Comparisons between the health of the population groups were performed using five proxies:

1. Stratification of Queensland into areas by the proportion of Census respondents who identified as Indigenous;
2. Indigenous status field from the Queensland Hospital Admitted Patient Data Collection
3. Utilisation of the locality field in the Queensland Hospital Admitted Patient Data Collection to consider remote Indigenous communities.
4. Reference to Australian Indigenous identified data
5. 2001 Census demographic data.

The first of these proxy methods was extensively used in the Whole of population and Indigenous peoples chapter. Statistical Local Areas (SLAs) were clustered into five groups based on the proportion of Indigenous population in the SLA, as derived from the 1996 census. These groups were: less than 5% Indigenous population; 5% to less than 10%; 10% to less than 20%; 20% to less than 40%; and, greater than 40% Indigenous population. These groups are indicated as less than 5%, 5-10%, 10-20%, 20-40%, and greater than 40%, respectively in this report.

The remaining four proxy methods were used exclusively in Chapter 5: Indigenous peoples.

**Analysis for Health Service District profiles**

The provision of appropriate health services is significantly enhanced by knowledge of the health status of the target population. The measurement of area specific health status or health service needs is difficult for small geographical areas. Measures of population health available from routine collections do not always allow for calculation of small area estimates. Periodic or ad hoc surveys generally do not provide small area estimates either, having usually been designed to generate population estimates at only a state or national level. Furthermore, health status in small populations is subject to considerable variation in numbers of cases, deaths or behaviours due to unexpected or non-representative events.

Assessment of the health status of an area requires consideration of two major components: the health status of all Queenslanders and the relative health status of residents of the area in comparison with all Queenslanders. The health status of all Queenslanders in terms of health outcomes, risk factor prevalence and the burden of disease and injury attributable to diseases, injury and risk factors, are documented elsewhere in Health Determinants Queensland 2004, Health Indicators for Queensland, 2001 and other publications. However, the prevalence of health outcomes and health determinants for small populations is unknown and therefore cannot be compared with Queensland overall.

The health status of a population is largely predicted by the sociodemographic characteristics of the population. The key sociodemographic predictors of health status are age distribution of the population, sex distribution, proportion of Indigenous peoples, socioeconomic profile, and to a lesser extent, urban, rural or remote location.

The health status of each Health Service District (HSD) was estimated by determining the key sociodemographic characteristics of its population and comparing these to Queensland in conjunction with the epidemiology of health status indicators in the key sociodemographic groups within Health Determinants Queensland 2004. This same methodology could also be used to estimate the health status of populations within HSDs. This method of synthetic estimation relies on the fact that the health status of a population is largely predicted by sociodemographic characteristics of the population, and thus varies considerably across the state. This is because in Queensland and elsewhere, patterns of disease prevalence are strongly based on age and sex eg, older people are likely to develop coronary heart disease; males are more likely to have lung cancer etc.
To estimate the relative prevalence of key health outcomes and determinants in a population the following process was undertaken:

A. Determine the sociodemographic characteristics of the population, specifically:
   - age distribution
   - sex distribution
   - proportion of Indigenous peoples
   - socioeconomic advantage/disadvantage profile; and
   - classification as urban, rural or remote location, or accessibility category.

B. Source the distribution of health status indicators (deaths, hospital separations, risk and protective factor prevalence) between sociodemographic groups for Queensland in *Health Determinants Queensland 2004*.

C. Where the area has a greater proportion of a sociodemographic group in comparison with Queensland, determine those health status indicators that are more prevalent in that sociodemographic group.

For example:
If a population has a higher proportion than Queensland of Indigenous peoples, it is estimated that this population will have a higher prevalence of deaths due to all causes and in particular; cardiovascular disease, diabetes and suicide. Determinants of these conditions include tobacco smoking and overweight and obesity, excessive alcohol consumption and poor nutrition.

Note: This methodology only provides an estimate of health status in populations. In addition where the method indicates that in all probability a population will have an excess prevalence of a health status indicator, the method does not provide information on the health significance of this excess.

**Excess prevalence of sociodemographic factors and health status in Health Service Districts**
In Chapter 6, an excess population was determined for those Health Service Districts (HSDs) where the proportion of a sociodemographic group was greater than the Qld mean. Of those HSD where there was an excess proportion, half of the HSD were called ‘greater than’ and the other half, ‘much greater than’. Excess sociodemographic groups were reported in the HSD profile if there were:
- much greater proportion of a current or projected age group (with age groups; 0-4, 5-14, 15-24, 65-74 and 75+ years);
- much greater proportion of a current sex;
- greater or much greater than proportion of Indigenous peoples;
- greater or much greater than proportion of people living in the most socioeconomically disadvantaged quintile;
- greater or much greater than proportion of people who speak a main language other than English at home;
- greater or much greater than proportion of people who speak a main language other than English at home and who speak English not well or not at all.

This same methodology was applied to the thematic mapping of age groups, Indigenous population and proportion of population in the socioeconomically disadvantaged quintile. In the maps however, excess was based on stratification by all Collection Districts in Queensland, rather than by HSDs as above. The minimum areas for shading were Collection Districts (an area of approximately 225 dwellings with fewer dwellings in rural areas as population densities decrease).

**Interventions to address the burden of risk factors**
Intervention sections are included in each of the five population based chapters of this report. These sections aim to provide the key audiences (health sector managers, planners and service managers, local government and other key partners) with a snapshot of the effective interventions that can and should be implemented to impact positively on the health determinants of Queensland or smaller populations.
A whole of government approach has been taken; where the action by numerous partners is required to effectively meet the health needs of the population. Population health interventions to address the burden of disease and injury caused by the reported health determinants were derived from published national and state strategic documents, and other published international literature. Specifically where these interventions are currently implemented or proposed for Queensland Health, they are described in the Outcome Area Plans and Health Outcome Plans of Queensland Health.

Data sources and specific limitations

ABS Cause of death
Mortality data were derived from the Queensland Registrar of Births, Deaths and Marriages, where cause of death and usual residential address were recorded on death certificates. All disease specific mortality data were derived using the principal cause of death. In addition, deaths in 1999-2001 where diabetes was reported as an underlying cause in deaths were also reported. The external causes of injuries and poisoning are reported. These data were coded by the ABS using the International Classification of Diseases, version 10 (ICD-10). There have been two major changes in death coding practices by the ABS in the reported period; conversion from manual ICD-9 coding to automatic ICD-9 coding; and, conversion from ICD-9 to ICD-10. The comparability factors between data coded at the start and end of the reported period are listed in Table 2.19.

For consistency with national reporting, year of registration of the death rather than year of death is used for all indicators, except those for reporting of Indigenous health outcomes. Year of death is used for reporting of Indigenous health outcomes due to the variable time between death and registration in some Indigenous communities in Queensland.

AusDiab
The Australian Diabetes, Obesity and Lifestyle Study (AusDiab) was a national survey conducted in 2000 by the International Diabetes Institute. The objectives of the survey were to estimate the prevalence of diabetes and related conditions (using blood tests), to assess the distribution and relationships of cardiovascular risk factors and to assess trends in risk factor levels as compared with those obtained in previous surveys in Australia. The AusDiab study employed stratified cluster sampling to recruit subjects. In Queensland, 1,634 adults from six urban centres completed the biomedical examinations. The response rate in the study was low, with only 29% of those estimated to be eligible in the total population, 34% of those estimated to be eligible from contacted households and 50% of those invited actually completed the study. These response rates are just slightly below the national AusDiab rates. Data from the Queensland cohort suggest that the Queensland-AusDiab participants may have been from lower socioeconomic disadvantaged areas and/or may have been more health conscious than the general Queensland population; with lower smoking rates and higher intakes of vegetables and fruit than the general population. These possible biases may result in underestimates of the true prevalence cardiovascular risk factors.

Bettering the evaluation and care of health (BEACH)
The BEACH project is an ongoing survey of general practice conducted by the Australian Institute of Health and Welfare (AIHW) and the General Practitioner Statistics Collection Unit, University of Sydney. Approximately 1,000 general practitioners (selected from the Medical Benefits Scheme provider database) from across Australia are surveyed annually. The program aims to establish an ongoing database of GP-patient encounter information and to assess patient risk factors and the relationship these factors have with health service activity.

Cancer deaths
Cancer death data was reported from the Queensland Registrar of Births, Deaths and Marriages, and is consistent with all other death data in this report. Cancer death data was also reported directly from other sources in Queensland Health where the Queensland Cancer Registry was used. The registry file is based on place of first diagnosis of the cancer, in contrast to the ABS coded file based on place of usual residence of death.
Census of population and housing
The national census is conducted every five years by the Australian Bureau of Statistics (ABS) to collect detailed demographic information about individuals which can be reported at levels ranging from small area through to national data. Data from the 1996 and 2001 census are reported. Age and sex distributions were derived from 2001 census and 2002 estimated resident populations (ERP)\(^1\). Indigenous population, birthplace, and language spoken at home were derived from the 2001 Census. Population growth and projections for Health Service Districts reported in Chapter 6 Health Service District profiles were derived from the 1996 Census. Denominator populations for rates and ratios were calculated using data from the 1991, 1996 and 2001 Census’ with estimations for the intervening years.

All maps in this report were prepared using Cdata 2001 software with MapInfo (version 7.0).

Cancer screening: breast and cervical cancer
Breast cancer screening information was derived from data collected at all BreastScreen Queensland Program throughout the State. It should be noted that mammographic services provided outside the BreastScreen Program are not included in this data. PAP smear data was derived from the PAP Smear Register.

Child health dental survey
The prevalence of dental caries in children was obtained from the National Child Health Dental survey conducted by the AIHW Dental Statistics and Research Unit, and reported using definitions consistent with the national survey reports. Although the results of the Child Health Dental survey provide an indication of the trends in oral diseases, it should be noted that:

- the sample is drawn solely from children treated by school dental services and may therefore be unrepresentative of the child population
- different sampling regimes adopted by states and territories may mean that the results are not comparable
- potential biases may exist due to variations in the assessment of decay and lack of standardisation of the large number of examiners
- the small size of the sample precludes small area or regional analysis of the results
- variations exist in compliance with the sampling requirements.\(^74\)

Community housing and infrastructure needs survey (CHINS)
This survey was undertaken by the ABS in 1999 and then again in 2001, following on from the 1992 Housing and Community Infrastructure Needs Survey commissioned by ATSIC. The 1999 survey was developed to provide a new baseline for data on the adequacy and condition of housing, infrastructure and facilities in discrete Indigenous communities, and the housing stock provided to Aboriginal and Torres Strait Islander peoples by Indigenous Housing Organisations (IHO). In 2001, this survey collected information for 616 IHOs, which managed a total of 21,287 permanent dwellings. This represented 1,216 discrete indigenous communities in 2001 and a total reported usual population of 108,085 people. Although called a survey, CHINS was a complete enumeration of all larger Indigenous housing organisations and discrete communities. Smaller organisations were considered out of scope.\(^155\) Data were collected by personal interview, following extensive testing and validation to confirm the suitability of the survey method. Results from the validation process indicated that aggregated data are considered fit for the intended purpose. Data quality on some un-aggregated data items was considered unsatisfactory. This represents a limitation to the data.

Crime and safety survey
This survey was conducted by the ABS in 2002 throughout Australia. It focuses on those categories of serious crime that affect the largest number of people including household break-in, motor vehicle theft, assault and robbery. The survey was conducted as part of the ABS Monthly Population Survey where questions on labour force are asked and in scope respondents were then sent a paper questionnaire for self-completion. Information was sought from 54,000 persons (aged 15 years and older), of which 76% responded. Household data was sought from 27,100 households with 20,400 (75%) responding. A complex set of multistage weighting procedures was used to adjust for non-response and for the particular demographic characteristics of respondents to the Monthly Population Survey.
General social survey
Information about family and community involvement, perceptions of safety and experiences with crime was obtained from the General Social Survey conducted by the ABS. The survey was conducted throughout Australia from March to July 2002, and information collected by trained interviewers by personal interview with 15,500 people aged 18 years and over. The response rate (fully responding, adequate/complete) was 79.3%. Individual information and household information was collected. Population estimates were weighted according to the age and sex distribution of the Queensland population and the number of adults per household. The results were not age standardised.

Household, income and labour dynamics for Australia (HILDA)
HILDA is a longitudinal survey, commenced in 2001, and is funded by the Commonwealth Department of Family and Community Services. This survey aims to support research questions related to three broad areas; income dynamics, labour market dynamics and family dynamics, and to undertake annual surveying for an undefined period. Data from the first wave was used in this report. Full responses were received from 6872 (in scope) Australian households comprising 13,969 individuals. Four questionnaires were utilised, three of which involved face to face interview with the fourth being a self-completion questionnaire. The household response rate was 58.8% (full responders) and the person response rate within those households was 92.3% (37% for self-completion questionnaire). Population estimates were weighted to the Australian population according to age and sex and number of adults per household. The results were not age standardised.

National drug strategy household survey
The prevalence of alcohol consumption, tobacco smoking and illicit drug use were obtained from the 1998 and 2001 National Drug Strategy Household Survey, and reported using definitions consistent with the national survey reports. Population estimates were weighted according to the age and sex distribution of the 2000 Estimated Resident Population for Queensland, with adjustment for changes to the survey period. The results are not age standardised. These estimates are based on data obtained through the Australian Social Science Data Archives of the Australian National University. The data were deposited with the Archives by the AIHW. The estimates however have been calculated within the Alcohol, Tobacco and Other Drug Services Unit of Queensland Health, and the latter takes full responsibility for the analysis and interpretation.

National health survey
Information about the prevalence of health risk factors and health-related behaviours was obtained from the 1995 and 2001 National Health Surveys (NHS) conducted by the ABS. The 2001 survey was conducted by personal interview with people in 19,408 private dwellings in Australia, with completed questionnaires from 26,863 people from these dwellings. 156 Household response rates for non sparse households was 89% (including sample losses) and 58% in sparse households (including sample losses). Person responses varied. Population estimates were weighted according to the age and sex distribution and the number of adults per household. Some age standardization was undertaken for reporting Indigenous and non Indigenous data.

National nutrition survey
Information relating to diet and items derived from measured height, weight and body circumference was obtained from the 1995 National Nutrition Survey (NNS) conducted by the ABS although jointly sponsored by the ABS and the Commonwealth Department of Health and Family Services. A sample of 13,800 people was invited to participate in the NNS having previously been included in the 1995 NHS. 157 A sub sample of 1,490 NNS participants provided additional (day 2) food intake data. Detailed information was collected from people aged two years and older and nutrient information was later derived from reported food and beverage intake. Population estimates were weighted according to the age and sex distribution of the Queensland population and the number of adults per household. The results were not age standardised.

Recommended daily intakes (RDI) of micronutrients are the amounts of nutrients that should be available per head of a population group if the needs of practically all members of the population group are to be met. All RDIs calculated from the 1995 National Nutrition Survey are based upon the 1982-1988 revised nutrient intake requirements and the 1989 revised energy requirements. All RDIs are based upon estimates of requirements with a generous ‘safety factor’ added. RDIs for thiamine, riboflavin, niacin and vitamin B-6 are based on energy requirements in existence when these B vitamin recommendations were...
revised.\textsuperscript{158} Niacin values are presented as a single figure, the midpoint of the range adopted in 1984. Iron is expressed as a range to allow for differences in bioavailability of iron from different Australian foods. The RDIs for pregnancy are for the second and third trimesters. The following factors were used: thiamine - 0.1 mg/1000 kJ; riboflavin - 0.15 mg/1000 kJ; niacin - 1.6 mg/1000 kJ; vitamin B-6 - 0.02 mg/g protein (based on protein as 10-15 per cent of recommended energy intake).

**National survey of mental health and wellbeing of adults**

This survey was conducted by the ABS in 1997 as part of the National Mental Health Strategy. Approximately 10,600 people aged 18 years and older participated in the survey, representing a response rate of 78\%. Mental health was measured in this survey using a modified version of the Composite International Diagnostic Interview. This is a comprehensive computer based interview for adults which can be used to assess current and lifetime prevalence of mental disorders through symptoms and their impact on day to day activities. Where standardisation of data was undertaken, the estimated total Australian population was used.

**Notifiable conditions**

Notifiable condition data were derived from the Queensland Health Notifiable Conditions System (NOCS). Crude notification rates for all years were calculated using estimated resident populations. Identification of Indigenous status remains poorly completed within NOCS.

**Persons aged fifty years and over survey**

This survey was conducted by the ABS throughout Queensland in 1998. It was a supplement to the Australia-wide Monthly Population Survey. The survey was conducted using a multi-stage area sample with information obtained from approximately 1,800 private dwellings with usual residents aged fifty years and over. One person per household was surveyed. Information was obtained by interview using trained interviewers. Estimation procedures accounted for independent estimated distributions of the total population by age, sex and area. This procedure compensates for under-enumeration and leads to more reliable estimates.

**Perinatal death collection**

Data on perinatal statistics are collected under State legislation. These data provide a source of information for research into obstetrics and neonatal care, and assist with the planning of Queensland’s health services. The data collection forms are forwarded to Queensland Health by all public hospitals, private hospitals and home birth practitioners.

**Population projections**

The Queensland Government population projections released in 2003, (based on Census 2001) were developed by the Queensland Centre for Population Research at the University of Queensland in conjunction with the Office of Economic and Statistical Research. These projections have been produced for Queensland Statistical Divisions and Local Government Areas, but are not currently available for Statistical Local Areas. Consequently all projections used in this report are those developed from the 1996 Census by Department of Information, Local government and Planning, with Health Service District groupings added by Health Information Centre (and last updated August 2002).

**Queensland household gambling survey**

The Office of the government statistician conducted this survey in 2001 by computer assisted telephone interviewing. People 18 years and over were included, with a total of 13,082 completed interviews achieved, giving a response rate of 72.3\%. Technical details have been published.\textsuperscript{159}

**Queensland Health telephone surveys**

Self-reported quality of life, general health, oral health, chronic disease status, health determinant prevalence and social capital were obtained from the Omnibus health surveys, conducted by Queensland Health between 1993 and 2003. The majority of surveys were conducted for a random sample of Queensland adults, aged 18 years and older, except where noted in Table 2.20. All surveys were conducted using computer-assisted telephone interview (CATI) methodology. Response rates for these surveys ranged from 72\% to 92\% (Table 2.20). For all adult health data, population estimates were weighted according to the age and sex distribution of the Queensland population for the relevant period, and the number of adults per household. For children related data, the estimates were weighted according to the age and sex of the child concerned. The results were not age standardised.
Table 2.20: Queensland Health surveys 1998 to 2003

<table>
<thead>
<tr>
<th>Year</th>
<th>Survey title</th>
<th>Response rate</th>
<th>Number surveyed</th>
<th>Comments (eg oversampled rural)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>Statewide Health Survey</td>
<td>72%</td>
<td>5,594</td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td>Parenting Survey</td>
<td>82%</td>
<td>4,010</td>
<td>Respondents were principal care-givers of children aged 0-12yrs</td>
</tr>
<tr>
<td>2000</td>
<td>Chronic Diseases-General Population Survey</td>
<td>80%</td>
<td>1,625</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>Sunsafes Survey</td>
<td>81%</td>
<td>1,534</td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>Omnibus Survey</td>
<td>77%</td>
<td>3,083</td>
<td></td>
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<tr>
<td>2002</td>
<td>Omnibus Survey</td>
<td>75%</td>
<td>2,481</td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td>Social Capital Survey</td>
<td>79%</td>
<td>2,667</td>
<td>Oversampling in rural and remote areas</td>
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<tr>
<td>2003</td>
<td>Omnibus-General Population</td>
<td>73%</td>
<td>1,575</td>
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<tr>
<td>2003</td>
<td>Omnibus-Infant Nutrition</td>
<td>92%</td>
<td>1,200</td>
<td>Respondents were biological mothers of children 0-4yrs</td>
</tr>
<tr>
<td>2003</td>
<td>Omnibus-Child Health</td>
<td>87%</td>
<td>1,596</td>
<td>Respondents were principal care-givers of children aged 0-12yrs</td>
</tr>
</tbody>
</table>

Source: Epidemiology Services Unit, Health Information Centre, Queensland Health

Queensland hospital admitted patient data collection

Hospital separation data were derived from the Queensland Hospital Admitted Patient Data Collection, including private and public hospitals. All disease-specific hospital separations were derived using the principal diagnosis of inpatient episodes of care, except for episodes of care in 2000/01 where diabetes was identified as an underlying condition in episodes of care due to diabetes-related conditions. The external cause(s) of injury and poisoning is reported. All separations were coded using the International Classification of Diseases version 10 Clinical Modification (ICD-10-CM: Table 2:20).

Recorded crime

This publication presents national crime statistics relating to victims of a selected range of offences that have been recorded by police. Data on official crime reports are provided to the ABS in aggregated form by the reporting authorities in each jurisdiction. The aim of national crime statistics is to provide one view of crime (police reported) and to provide comparisons across States and Territories and provide a basis for measuring changes over time. National crime statistics are produced annually. The offence categories are based on the Australian Standard Offence Classification. Rates are based on the Estimated Resident Population for each of the States and Territories for the reference period. Variation in recording of crime occurs across jurisdictions. However national crime statistics are compiled to maximise comparability.

Safety in the home

This survey was conducted by the ABS in Queensland in 2001 as a supplement to the Australia-wide Monthly Population Survey. The supplementary survey provided a sample of approximately 4,700 dwellings from which a full response was obtained. Any responsible adult aged 15 years or over was interviewed either by telephone or personal interview.

Socioeconomic indices

The 1996 Index of Relative Socioeconomic Disadvantage was used to undertake mortality stratifications in the Whole of population chapter. The 2001 Index of Relative Socioeconomic Advantage/Disadvantage was used for aetiological mortality analyses in Whole of population chapter, for mapping in Chapter 6 Health Service District profiles and in selected socioeconomic discussions in other chapters. Both indices were reported in five quintiles based on Collection Districts in Queensland. These indices were developed by the ABS from the relevant Census*. There are a number of general limitations which apply to these indices and are detailed by ABS. Specifically, Collection Districts (CD) are excluded from analysis where one or more of the following characteristics are found:

- populations smaller than ten
- five people or fewer employed
- 70% or more people not responding to questions included in the Index as variables
- more than 20% of dwellings non private
- off shore and migratory CDs

CDs not included in analysis were noted in maps in Chapter 6 Health Service District profiles.
Survey of disability, aging and carers

This survey was conducted by the ABS in 1998. It is the fourth survey in a series with a five-six year frequency of collection. The first survey was conducted in 1981 and the next survey scheduled for 2003. The survey collects information on three population groups; people aged 60 and older, people with disabilities, and their carers. Concepts and definitions used in this survey were taken from the International Classification of Impairments, Disabilities and Handicaps. The final sample in 1998 comprised 36,951 persons in private and non-private dwelling units, and 5,716 persons in cared accommodation. Personal computer assisted interviews were conducted with adults over 15 years of age and proxy interviews for young people under 15 years and interviews with those between 15 and 17 years of age were based on parent permission. Data were weighted to account for different sampling fractions, to represent the entire Australian population. This weighting included age group, sex, Territory/State, and capital city/balance of State.

Survey of education and training (1997) and education and training experience (2001)

These surveys were conducted by the ABS in 1997 and 2001. Information collected included sociodemographic characteristics and work history details together with educational qualifications held, recent and intended study, and details of training courses completed in the last 12 months. The survey included persons 15-64 years who met selected criteria for inclusion, the effective survey sample was approximately 13,800 dwellings yielding 22,700 completed interviews in 1997. Data were collected by personal interview conducted by trained interviewers.

Vaccinations rates

Vaccination data for children were derived from the Australian Childhood Immunisation Register (ACIR). Pneumococcal, influenza and Hepatitis B vaccination data for older persons and Indigenous peoples were derived from Queensland Health Vaccination Information and Vaccination Administration System (VIVAS).

Well persons health check

The Well Person’s Health Check was a community based screening program designed to provide early detection and treatment of sexually transmitted infections and non-communicable disease risk factors and to provide health information to assist the community and health services in planning for improved health. The program was implemented in remote Indigenous communities in North Queensland and represented a collaborative effort of the Tropical Public Health Unit Network, Apunipima-Cape York Health Council, District Health Services of Queensland Health and the individual communities. The screening was conducted in 1998-2000.

General limitations of data

Cause of death or hospital separation

Recorded ‘cause of death’ and ‘cause of hospital separation’ are well known to suffer from significant error throughout the world. Notably, hospital separation statistics reflect events of separation rather than individuals; thus re-admissions to another hospital or the same hospital are included in the statistics. Further to these general sources of error, specific mention must be made of the underestimation of recording of diabetes, mental disorders and self-inflicted injury burden of disease in these databases, and the exclusion of psychiatric hospitals from the hospital separation data prior to 1997. Death and hospitalisation results are presented without attempts at correction for underlying cause. Furthermore coding practice may vary over time and between areas. Knowledge of specific changes (eg change in coding practice related to diabetes hospital separations in 2000/01) has precluded certain comparisons. These limitations are noted in the text, where applicable. Lack of comparability of conditions based on coding using ICD-9 and ICD-10 has been identified as a limitation in some trend analyses in this report. These limitations have been noted in the text where applicable and derive from comparability data reported in Table 2.19.

Indigenous identification

 Poor Indigenous identification in death and hospital separation data is one of the main limitations of these data sets. A variable proportion of the death certification and hospital separation data presented here does not include any Indigenous identification. Identification that is recorded is a mixture of self-
identification and identification assigned by the person completing the form. Census data records ethnicity according to self-identification, and there are indications of possible under-enumeration of Indigenous peoples in remote areas in the 2001 census. Due to these problems with both the case number and population, accurate rates in Indigenous peoples cannot be calculated.

Using rates in geographic areas with a high proportion of Indigenous population as a proxy for Indigenous rates could be subject to four possible sources of bias:

- Under-estimation of the proportion of Indigenous population in areas leading to inaccurate classification of areas by Indigenous population, leading to exaggeration of the excess mortality and hospitalisation.
- In the cluster of five SLAs with the greatest proportion of Indigenous population there may be “dilution” of the Indigenous population by about 30% non-Indigenous population. The health status of the non-Indigenous peoples is likely to be better than the Indigenous, thus underestimating the true morbidity and mortality of Indigenous peoples in these areas.
- The five SLAs with the greatest proportion of Indigenous population are all in remote parts of the State where the general health status of people is considered to be worse than in towns or cities. Therefore, using these areas as proxies for Indigenous health status throughout the State would fail to differentiate between the health status of Indigenous peoples living in larger towns or cities and those living in remote areas.
- In Torres SLA, a significant number of deaths for Indigenous peoples were unregistered in the period 1992 to 1998. In addition, research indicates that the health of Torres Strait Islanders is better than that of Aboriginal people for most health indicators, excluding diabetes.

Survey biases

Each of the surveys sourced in this report are subject to a number of biases, specifically recall bias, exclusion of Indigenous and Culturally and Linguistically Diverse (CALD) populations due to telephone access, cultural appropriateness and language barriers. Most ABS and Queensland Health surveys had very good response rates of 75% or above indicating that response bias has been minimised as much as is practicable. In contrast, AusDiab achieved very low response rates, as discussed under that survey heading.
Glossary of terms

**Accessibility/remoteness** – Three measures of accessibility/remoteness were used in this report: Rural, Remote and Metropolitan Area classification (RRMA), the Accessibility/Remoteness Index of Australia (ARIA) and the Remoteness Areas (RA). The measure used depended primarily upon data availability. Due to small numbers in some sub-classifications, categories have been aggregated where appropriate.

The three zone/seven category Rural, Remote and Metropolitan Area classification (RRMA) was developed in 1994 jointly by the Commonwealth Department of Primary Industries and Energy and the Commonwealth Department of Human Services and Health. The seven RRMA categories are ‘capital cities’, and ‘other metropolitan centres’ within the metropolitan zone, ‘large rural centres’, ‘small rural centres’ and ‘other rural centres’ within the rural zone, and ‘remote centres’ and ‘other remote centres’ within the remote zone.\textsuperscript{164} Accessibility/remoteness was determined using the Accessibility/Remoteness Index of Australia (ARIA).\textsuperscript{165} In ARIA, remoteness, a geographic variable, is measured in terms of how far the population must travel to access services. Remoteness was also determined using the six category Remoteness areas (RA); Major cities, Inner regional, Outer regional, Remote, Very remote and Migratory.\textsuperscript{166} This latter classification was introduced in 2002, and was based on the ARIA Index scores. The Remoteness area classification has been adopted to generate consistency with other recent published analyses.

**Body Mass Index (BMI)** estimates the proportion of body fat, calculated from height and weights where BMI=\(\frac{\text{weight (kg)}}{\text{height (m)}^2}\). BMI values are grouped into categories. For adults 18 years and older, underweight is BMI score less than 20, acceptable weight is 20-24.9, overweight 25-29.9 and obese >30. In 2003, NHMRC and WHO amended these definitions to underweight is a BMI score less than 18.5, acceptable weight is 18.5-24.9, overweight 25-29.9 and obese >30. All studies reported in Health Determinants Queensland 2004 use the former definitions. For children, BMI is compared with age and gender-specific BMI percentile charts.

**Children not fully immunised** – the proportion of children reported as not having received all the required vaccinations for diphtheria, tetanus, poliomyelitis, whooping cough, measles and mumps for their age. The required vaccinations are based on the 1986 NH&MRC Standard Childhood Vaccination Schedule.

**Cholesterol** – by clinical assessment, classification of blood lipid values:

<table>
<thead>
<tr>
<th>Classification</th>
<th>Cholesterol</th>
<th>HDL-cholesterol</th>
<th>Triglycerides</th>
<th>LDL-cholesterol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&lt;5.5</td>
<td>≥ 1.0</td>
<td>&lt;2.0</td>
<td>&lt;3.5</td>
</tr>
<tr>
<td>Abnormal</td>
<td>≥ 5.5</td>
<td>&lt;1.0</td>
<td>≥ 2.0</td>
<td>≥ 3.5</td>
</tr>
</tbody>
</table>

**Community capacity** is a collection of characteristics and resources which, when combined, improve the ability of a community to recognise, evaluate and address key problems.\textsuperscript{167}

**Dental caries prevalence** is the proportion of the population with one or more teeth that are either decayed (D), missing (M), or filled (F) due to caries.

**Diabetes prevalence** by clinical assessment, classification of abnormal blood glucose based on values for the oral glucose tolerance test and venous plasma glucose concentrations:

<table>
<thead>
<tr>
<th>Glucose Tolerance</th>
<th>Fasting glucose (mmol/l)</th>
<th>2-hr glucose (mmol/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 2 Diabetes</td>
<td>≥ 7.0</td>
<td>Or</td>
</tr>
<tr>
<td>Impaired glucose tolerance (IGT)</td>
<td>&lt; 7.0</td>
<td>And</td>
</tr>
<tr>
<td>Impaired fasting glucose (IFG)</td>
<td>6.1-6.9</td>
<td>And</td>
</tr>
</tbody>
</table>

**Disability with selected restrictions** – people with a disability which restricts their participation in self-care, mobility, communication, employment and/or education. Includes all children with a disability aged less than 5 years.\textsuperscript{162}

**Foetal death (stillbirth) rate** – the number of foetal deaths as a proportion of the total number of births.

**Hazardous and harmful alcohol consumption** – the levels of risk associated with alcohol consumption calculated from the 1998 and 2001 National Drug Strategy Household Surveys were as below.\textsuperscript{168} These guidelines were revised by NHMRC in October 2001.
<table>
<thead>
<tr>
<th>Gender</th>
<th>Low Risk</th>
<th>Hazardous</th>
<th>Harmful</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>&lt; 40 grams of pure alcohol or four standard drinks per day</td>
<td>41-60 grams or five or six standard drinks per day</td>
<td>&gt; 60 grams of pure alcohol or more than six standard drinks per day</td>
</tr>
<tr>
<td>Female</td>
<td>&lt; 20 grams of pure alcohol or two standard drinks per day</td>
<td>21-40 grams or three or four standard drinks per day</td>
<td>&gt; 40 grams of pure alcohol or more than four standard drinks per day</td>
</tr>
</tbody>
</table>

**Hospital separation rate** – the total number of separations in all hospitals (public and private) providing acute care services per 100,000 estimated resident population at 31 December of the reference year. 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). The inclusion of status changes has been progressively introduced since 1995-96. Hospitals providing acute care services are those in which the treatments typically require short durations of stay. Rates and case numbers are reported using financial years.

**Hypertension** – by clinical assessment, untreated hypertension was defined as systolic pressure greater than or equal to 140mmHg or diastolic pressure greater than or equal to 90mmHg and not on hypertensive treatment. Classification of blood pressure:

<table>
<thead>
<tr>
<th>Classification</th>
<th>Systolic</th>
<th>Diastolic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&lt;140</td>
<td>And &lt;90</td>
</tr>
<tr>
<td>Borderline mild hypertension</td>
<td>140-159.9</td>
<td>Or 90-94.9</td>
</tr>
<tr>
<td>Mild (above borderline) hypertension</td>
<td>160-179.9</td>
<td>Or 95-104.9</td>
</tr>
<tr>
<td>Moderate and Severe hypertension</td>
<td>≥180</td>
<td>Or ≥105</td>
</tr>
</tbody>
</table>

**Index of socioeconomic disadvantage/ SEIFA** – Five indices are compiled by the ABS following each population Census. Each index summarises different aspects of the socioeconomic condition of areas. The Index of Relative Socioeconomic Disadvantage is the SEIFA index most frequently used in health analysis. The particular attributes summarised by this index include low income, low educational attainment, high unemployment and jobs in relatively unskilled occupations.

Most commonly, SEIFA indices are used to group survey respondents into quintiles or deciles of a particular index. Comparisons can then be made between respondents living in areas based on SEIFA quintiles (or deciles) across a range of health-related characteristics such as self-assessed health status. The Indices are compiled at the level of the Census Collector’s District (CD) in which a person lives but are most commonly reported at the Statistical Local Area (SLA) level.

**Infant mortality rate** – the number of deaths of children under one year of age per 1,000 live births.

**Life expectancy** – the average number of years a newborn infant of a given sex would be expected to live if the age specific death rates of the reference period continued throughout his or her lifetime. For persons aged 65 years of a given sex, it is the average additional years of life expected if the age specific death rates of the reference period continued throughout his or her remaining life.

**Live birth** – the delivery of a child weighing at least 500 grams at delivery (or, when birth weight is unavailable, of at least 22 weeks gestation) who after being born, breathed or showed any other evidence of life such as a heart beat.

**Metabolic syndrome** – the term given to a clustering of CHD risk factors with insulin resistance at its core. The European Group for the Study of Insulin Resistance (EGIR) defines metabolic syndrome as the presence of insulin resistance and at least two of the following components: impaired glucose metabolism (impaired glucose tolerance (IGT) or impaired fasting glycaemia (IFG) or diabetes), hypertension, dyslipidaemia or central obesity. Analysis of Ausdiab data reported in the HDQ used the EGIR definition, minus the insulin resistance requirement.

**Neonatal death** – death of any child weighing at least 500 grams at delivery (or, when birth weight is unavailable, of at least 22 weeks gestation) who was born alive (as defined under live birth) and who died within 28 days of birth.

**Notifiable conditions** – Under section 32(1) of the Health Act 1937 any disease or disability may be declared notifiable. The list of notifiable conditions appears in the schedule of the Health Regulations 1996. Medical practitioners and laboratories are required to notify the Chief Health Officer of Queensland Health of any person suffering from a notifiable condition.
**Perinatal mortality rate** – the annual number of foetal and neonatal deaths per 1,000 live births and foetal deaths combined.

**Primary prevention** is the protection of health by measures which eliminate causes and determinants of departures from good health and control exposure to risk. Primary prevention decreases the number of new cases of a disorder or illness and premature death (reduces incidence).

**Secondary prevention** is defined as the measures available to individuals and populations for the early detection and prompt and effective intervention to correct departures from good health. Secondary prevention may lower the rate of established disease in the community.

**Social capital** consists of those features of social organisation such as density of association membership, levels of interpersonal trust and norms of reciprocity (ie give and take or mutual action) which act as resources for individuals and facilitate collective action. It is a collective dimension of society external to the individual and is an ecological characteristic.

**Standardisation of rates** is a method used to compare populations which have different age-sex structures thereby precluding the comparison of unadjusted outcome rates. Two methods are available: direct and indirect standardisation. The direct rate is the rate experienced by a standard population, if the age specific rates of the population in the geographical area of interest applied to the standard population. The indirect rate is the ratio of the total number of people observed (actual number) having an attribute compared to the total number of people expected (expected number) having an attribute (disease or condition, cause of death) in the geographical area of interest. The expected number is calculated based upon the assumption that the population in the geographical area of interest experienced the same age specific rates as the standard population.

The standard population used in this report varies according to the years of data that are being considered for the population of interest. Typically the standard population is the estimated resident population for Australia 1991.

**Tertiary prevention** consists of the measures available to reduce or eliminate long term impairments, disabilities and complications from established disease, and to minimise suffering caused by existing departures from good health.
2.7 List of tables

Table 2.1: Life expectancy at birth by sex, Queensland, Australia and other states, 1999-2001 ................................ 2-11
Table 2.2: Infant mortality rate, by state and territory, Australia, 1980, 1990 and 2000 ........................................... 2-11
Table 2.3: Antenatal visits, proportion of mothers by visit number, Queensland 2000 .............................................. 2-12
Table 2.4: Birth weight, proportion of population, by singleton and multiple births, Queensland, 2000 ............ 2-12
Table 2.5: Gestational age, proportion of live births, Queensland, 2000 ............................................................. 2-13
Table 2.6: Notification rates of invasive meningococcal disease by age and sex, Queensland 1997-2001 ............. 2-24
Table 2.7: Notification rates of invasive pneumococcal disease by age and sex, Queensland 1997-2001 ........ 2-25
Table 2.8: Notification rates of selected vaccine preventable diseases by age and sex, Queensland 1997-2001 ....................... 2-26
Table 2.9: Notification rates of selected gastrointestinal diseases by age and sex, Queensland 1997-2001 ........ 2-27
Table 2.10: Weekly family income received (percentage) and numbers of families by type of family in occupied private dwellings, Queensland 2001 .......................................................... 2-30
Table 2.11: Percentage of dependent children living in a family receiving income support, Queensland and Australia, 1996 and 1989 .......................................................... 2-31
Table 2.12: Selected income support indicators, Queensland and Australia, 2001 .................................................. 2-31
Table 2.13: Percentage of children in Year 3 reaching benchmark by State and Territory, 2000 ......................... 2-32
Table 2.14: Median contribution of carbohydrate, protein, total starch and total sugars (kJ) as a proportion of total energy (J) by age and sex, Queensland 1995 ........................................... 2-38
Table 2.15: Percentage (%) of children who met or exceeded recommended daily intake of micronutrients by age, Queensland 1995 .......................................................... 2-39
Table 2.16: Increased nutrient intake (percent) 1985 to 1995: in children aged 10-15 years by sex, Australia 2001 ................. 2-39
Table 2.17: Vaccination coverage rates by milestone and age cohort, Queensland and Australia, 2003 ........ 2-41
Table 2.18: National Health Performance Framework .......................................................... 2-54
Table 2.19: Comparability factors for pre 1997 manual coding of ICD-9 and Automatic Coding System for ICD-10, for reported diseases and conditions .................................................. 2-56
Table 2.20: Queensland Health Surveys 1998 to 2003 .......................................................... 2-63
2.8 List of figures

Figure 2.1: Leading causes of the burden of disease and injury for children 0-4 years, DALYs by sex, Australia 1996................................................................. 2-9

Figure 2.2: Leading causes of the burden of disease and injury for children 5-14 years, DALYs, by sex, Australia 1996................................................................. 2-10

Figure 2.3: Age specific percentage of population reporting a disability and severe or profound core activity limitations, Queensland 1998................................................................. 2-14

Figure 2.4: Asthma in children 0-14 years, age standardised hospital separation rates by sex, Queensland 1992/93-2001/02................................................................................................. 2-15

Figure 2.5: Injury and poisoning in children 0-14 years, age standardised mortality rates by sex, Queensland 1992-2001 ........................................................................................................................................ 2-16

Figure 2.6: Injury and poisoning in children 0-14 years, age standardised hospital separation rates by sex, Queensland 1992/93-2001/02................................................................................................. 2-16

Figure 2.7: Near drowning in children 0-4 years, age standardised hospital separation rate by sex, Queensland 1992/93-2001/02. ........................................................................................................... 2-17

Figure 2.8: Falls-related injury in children 0-14 years, age standardised hospital separation rate by sex, Queensland 1992/93-2001/02. ........................................................................................................... 2-17

Figure 2.9: Fire, burns and scalds-related injury in children 0-14 years, age standardised hospital separation rates by sex, Queensland 1992/93-2001/02. ........................................................................................................... 2-18

Figure 2.10: Accidental poisoning in children 0-14 years, age standardised hospital separation rate by sex, Queensland 1992/93-2001/02................................................................................................. 2-18

Figure 2.11: Road transport-related injury in children 0-14 years, age standardised hospital separation rate by sex, Queensland 1992/93-2001/02................................................................................................. 2-19

Figure 2.12: Intentional injury (assault, excluding self-inflicted) in children 0-14 years, age standardised hospital separation rates by sex, Queensland 1992/93-2001/02................................................................................................. 2-19

Figure 2.13: Mental disorders in children 0-14 years, age standardised hospital separation rates by sex, Queensland 1992/93-2001/02................................................................................................. 2-20

Figure 2.14: Self inflicted injury in children 10-14 years, age standardised hospital separation rates by sex, Queensland 1992/93-2001/02................................................................................................. 2-21

Figure 2.15: Diabetes in children 0-14 years, age standardised hospital separation rates by sex, Queensland 1992/93-1999/00 ...................................................................................................................................... 2-22

Figure 2.16: Prevalence of dental caries in deciduous teeth in six years olds, and permanent teeth in 12 years olds, Queensland and Australia, 1989-1999 ................................................................................................. 2-23

Figure 2.17: Mean dental caries, by age, Queensland and Australia 1989-99. ...................................................................................................................................... 2-23

Figure 2.18: Proportion of children by number of teeth with dental caries per child and age, Queensland 2000. ...................................................................................................................................... 2-23

Figure 2.19: Prevalence of conduct related problems in children aged 2-12 years, Queensland 1999................................. 2-34
2.9 References


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<table>
<thead>
<tr>
<th>No.</th>
<th>Reference</th>
</tr>
</thead>
</table>


