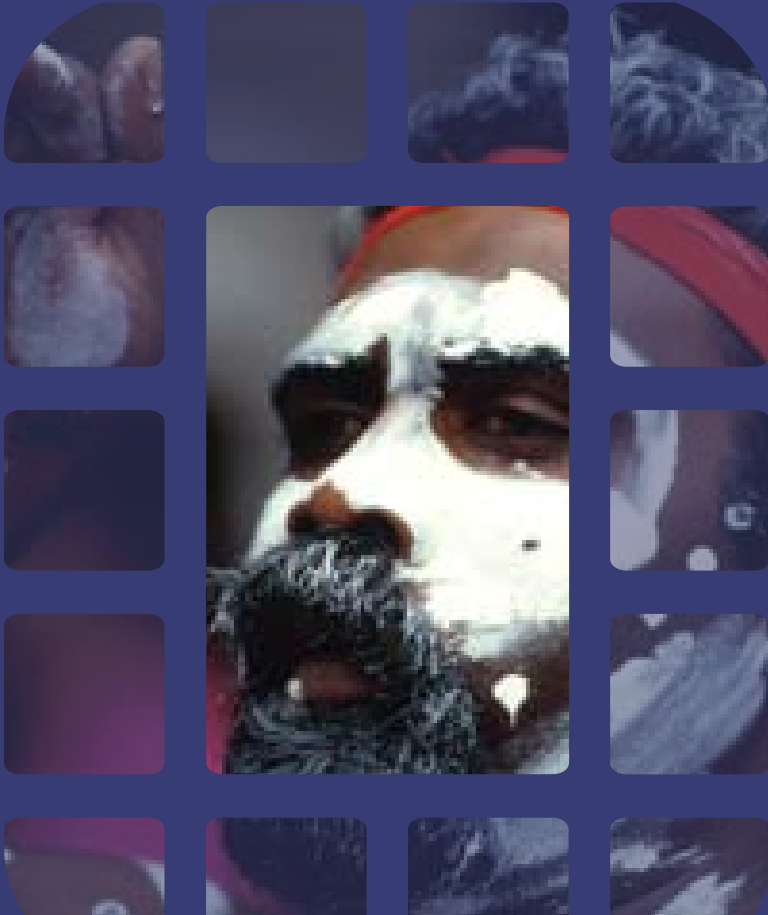
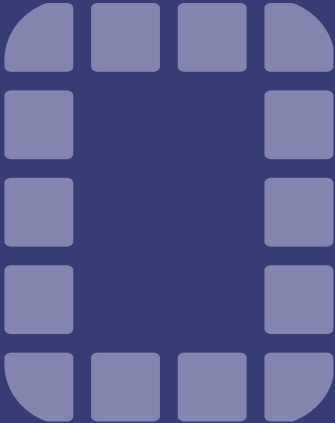
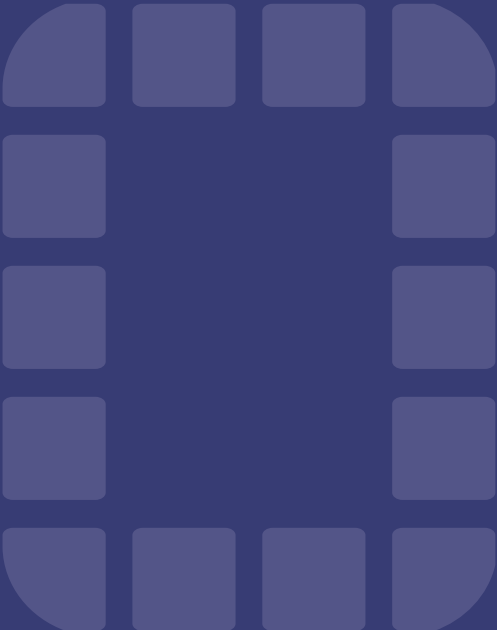


The Western Australian Chief Health Officer's Report 2010



Delivering a Healthy WA

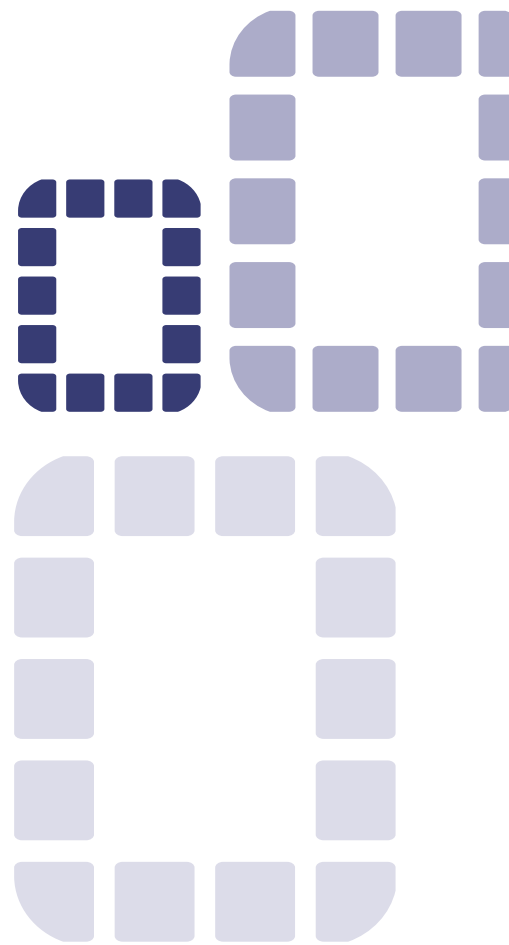
The Western Australian Chief Health Officer's Report 2010 is the first in a new series of reports that will examine the health status of the people of Western Australia. This report will be a useful resource for the public as well as for policy planners and researchers interested in health related matters.



The Western Australian Chief Health Officer's Report 2010

Epidemiology Branch, Public Health Division
Department of Health
Perth, Western Australia

March 2010



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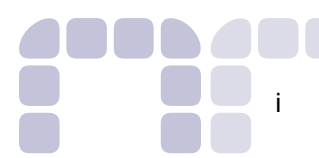
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Foreword

Western Australians enjoy a standard of living and a standard of health amongst the highest in the world, and consistent with that of a modern developed country. Public health is concerned with this big picture. About how and where we live, work and play – and how we organise society to maximise health and well being, and share benefits more equally.

This first Chief Health Officer's Report provides solid information to allow us to reflect on the past, learn its lessons and consider how the future could be better. Trends in life expectancy show a continuing improvement over time (with dramatic declines in deaths in infancy and from infectious diseases and heart disease for example), but further improvements will be harder to achieve ('the law of diminishing returns') and there are new threats, such as rising levels of obesity, that might lead to reversal of some gains in future generations.

Reflecting on the past also reminds us of what is so easy to take for granted unless an incident occurs – excellent health care, clean water, safe food, waste and rubbish disposal systems, control of environmental hazards, organised immunisation programs, control of disease vectors such as mosquitoes, responses to outbreaks of infectious disease, and organised screening for breast and cervical cancer. There is discussion in this report on the relative contribution of medical and social advances to improvements in life expectancy.

We use three newer measures (avoidable mortality, preventable hospital admissions, and burden of disease) to identify particular issues of public health significance, that are less emphasised in more routine hospital admission and mortality statistics. For example, the impact of mental illness and injuries are better shown using these newer measures. Some regional differences are also highlighted.

One group stands out in all these statistics – Indigenous Australians. Closing the Gap in life expectancy will require close attention to detailed data, so we can be sure the planned interventions (whether they be in improving housing, better access to primary care or anti-smoking interventions, for example) are having the effect that is needed.

There are some trends, such as the rise in dementia with the ageing population that need to be addressed, and other threats on the horizon, particularly climate change, that do not yet appear in the health statistics, but are real and material.

Public health practitioners – most of whom work for government (either state or local), in non-government or community organisations, or in universities – work behind the scenes to manage a variety of risks to the public. Our professional links are both within health, namely with our clinical colleagues, responsible for delivering high quality services, often with a preventive aspect; and outside health, in education, employment and community development sectors for example,

where they influence the underlying causes of health. But our most important link is with the public, making sure we are both responsive to and informing community debate about the kind of society we want to live in, and what we are prepared to do or forego to achieve that. This is the first in a series of reports that aims to inform such public discussion. Future reports in this series will look in more detail at specific groups of risk factors, vulnerable populations, and emerging issues.



Dr Tarun Weeramanthri
Executive Director Public Health

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Abbreviations

ABS:	Australian Bureau of Statistics
AIHW:	Australian Institute of Health and Welfare
C:	City
COPD:	Chronic Obstructive Pulmonary Disease
CVD:	Cardiovascular Disease
DALY:	Disability Adjusted Life Year
DOH:	Department of Health
ICD:	International Classification of Disease
IHD:	Ischaemic Heart Disease
PPH:	Potentially Preventable Hospitalisations
PYLL:	Persons Years of Life Lost
S:	Shire
T:	Town
YLD:	Years Lost to Disability
YLL:	Years of Life Lost
WA:	Western Australia





Summary

The Western Australian Chief Health Officer's Report 2010 highlights the contributions that Public Health has made to the health of Western Australians since the establishment of the first *Health Act (1911)*, and its role in contributing to the best possible health outcomes for all Western Australians.

The report examines the leading health issues currently facing Western Australia and the future role of public health in the twenty-first century.

Population Characteristics

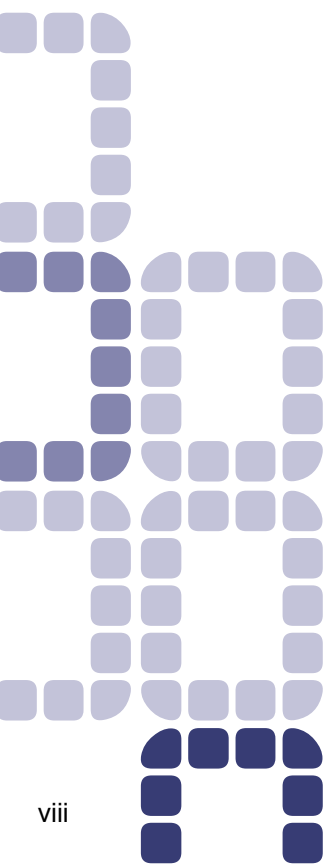
- The WA population is ageing. This is the result of a number of factors including increased longevity, and a fall in birth and fertility rates, until recent years. These factors have contributed to a greater proportion of the population being aged 65 years and over.
- The majority of the Western Australian population resides in the Perth metropolitan area (78%).
- Indigenous Western Australians represent 3.4% of the total WA population. Of these, 62% live in rural or remote areas of the State.
- Despite the ageing population, WA's population has continued to grow, recording a growth rate of 2.8% in 2007. Much of this growth was due to overseas and interstate migration.

Avoidable Mortality

- Chronic conditions such as ischaemic heart disease, lung cancer, colorectal cancer and cerebrovascular disease, along with suicide are the leading causes of potentially avoidable deaths in WA. In 2006, in WA, 64% of deaths in persons aged less than 75 years had the potential to be avoided.
- The proportion of deaths that had the potential to be avoided decreased in WA between 1997 and 2006.
- Males were more likely to die of an avoidable cause than females.
- In 1997–2006, 43% of deaths in Indigenous Western Australians aged less than 45 years were classified as avoidable. This was considerably higher than the figure recorded by their non-Indigenous counterparts (18%).

Hospital Separations

- Over the past two decades, the hospitalisation rate in WA has increased.
- In 2006/07, almost one in 10 hospitalisations (7.7%) had the potential to be prevented based on current preventative measures and primary medical care (such as the care delivered by a GP).
- Almost half (45%) of all potentially preventable hospitalisations were due to chronic conditions.
- Around 2% of all potentially preventable hospital admissions were due to diabetes and its complications.



Burden of Disease

- Burden of disease analysis takes into account the effects of deaths and non-fatal episodes for particular conditions on a population, therefore making it possible to determine the impact that a condition has on both length of life and quality of life throughout the lifespan, rather than at one set point.
- In 2003, the leading contributors to the burden of disease in WA were:
 - ischaemic heart disease,
 - anxiety and depression,
 - type 2 diabetes,
 - dementia and
 - stroke.
- In children aged 0–14 years, the leading cause of disease burden in 2003 was asthma. In adults aged 15–64 years the leading cause of disease burden was anxiety and depression. Among older persons aged 65 years and over, the leading cause of disease burden was ischaemic heart disease.





Public Health in WA

Public health can be defined as:

'The science and art of preventing disease, prolonging life, and promoting physical health and efficiency through organised community efforts ... which will ensure to every individual in the community a standard of living adequate for the maintenance of health' (*Winslow, 1920*).

Public health aims to improve community health through the delivery of various services and policies such as the regulation of food safety, vector control, waste-water management, immunisation, infectious disease surveillance, outbreak investigation and disaster management as well as both encouraging and enabling healthy lifestyles.

An essential element of public health is the collection and analysis of health information for surveillance and monitoring of a population's health status. These data also enable informed priority setting, appropriate targeting of programs and the evaluation of their effectiveness.

The History of Public Health in Western Australia

In Western Australia, traditional public health strategies were instigated early in our State's history. These strategies were primarily instigated with the aim of protecting the population of the fledgling colony from the many diseases that were rampant in other parts of the world.

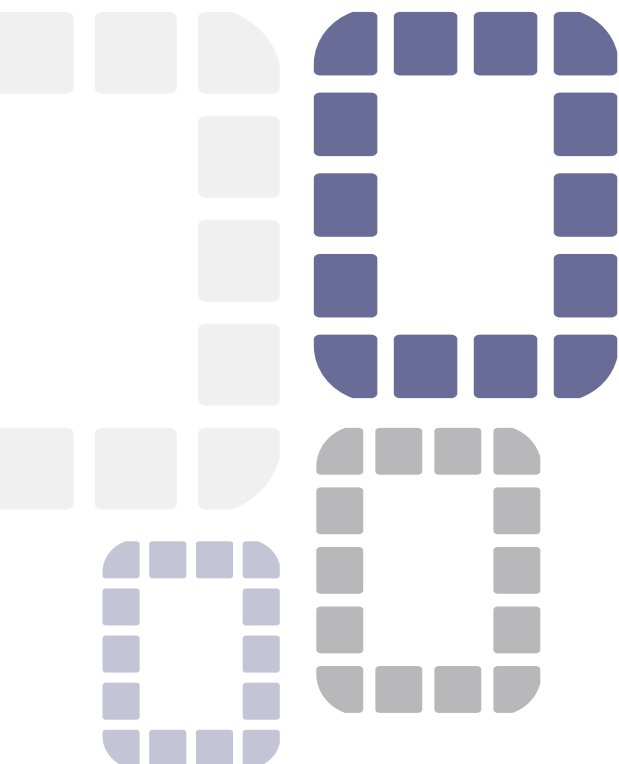
Initially, diseases associated with food quality and safety such as

scurvy, dysentery and diarrhoea were the most common diseases in Western Australia. This was for the most part due to the unavailability of fresh food. Once the colony became self-sufficient, the health profile of the population improved and began to resemble that of similar populations in Europe and North America.

Due to the isolation of the colony, the first public health measures used tended to revolve around quarantine. These measures were initially used to control infectious diseases. However, as the population grew and migration increased, other traditional containment measures were needed. In Perth, a vaccine program was introduced to eradicate smallpox, in 1878, while environmental controls were established to improve water quality, contain and remove sewage and improve drainage systems (Snow, 1981).

The introduction of traditional public health containment strategies such as sanitation, the supply of pure water, personal hygiene and food protection has been cited as one of the primary reasons for the dramatic decline in mortality that was recorded among the population throughout the first half of last century (Snow, 1981) (Figures 1 & 2).

A report on the general state of the Colony in 1876 stated a mortality rate of 14 deaths per 1,000 persons with an infant mortality rate of 114 per 1,000 live births.

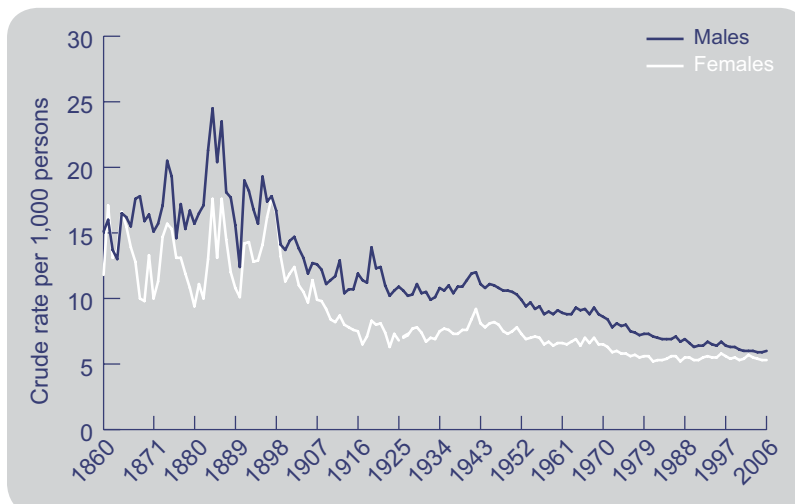


In the late 19th and early 20th century, the most common causes of death were:

- Communicable diseases (tuberculosis, influenza and pneumonia) and
- Injury

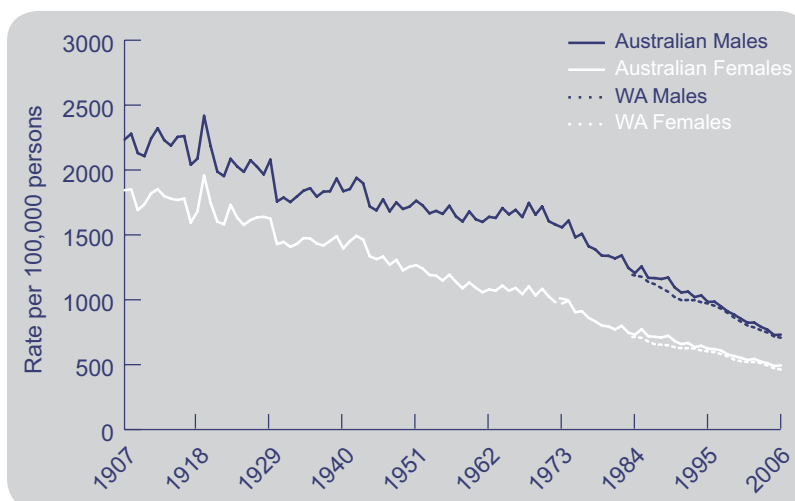
As a result, 20th century public health interventions tended to focus on infectious disease control and the development of maternal and child health services (Snow, 1981).

Figure 1: Crude mortality rate per 1,000 persons, WA, 1860–2006



Notes: (a) Excludes deaths of defence personnel from September 1939 to June 1947.
Source: ABS Data Cubes Cat No. 3105.0.65.001.

Figure 2: Age-standardised mortality rate, all causes, by sex, Australia and WA, 1907–2006



Source: AIHW GRIM Books.

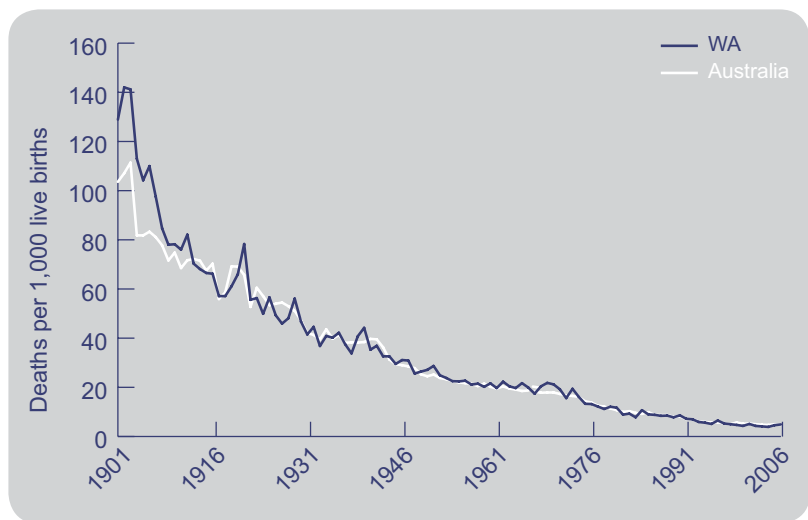
Reductions in mortality in more recent years have been influenced by:

- Public health interventions that focus on lifestyle behaviours,
- Introduction of specific vaccines,
- Antibiotics,
- Blood transfusions and
- Advances in both medical and surgical care.



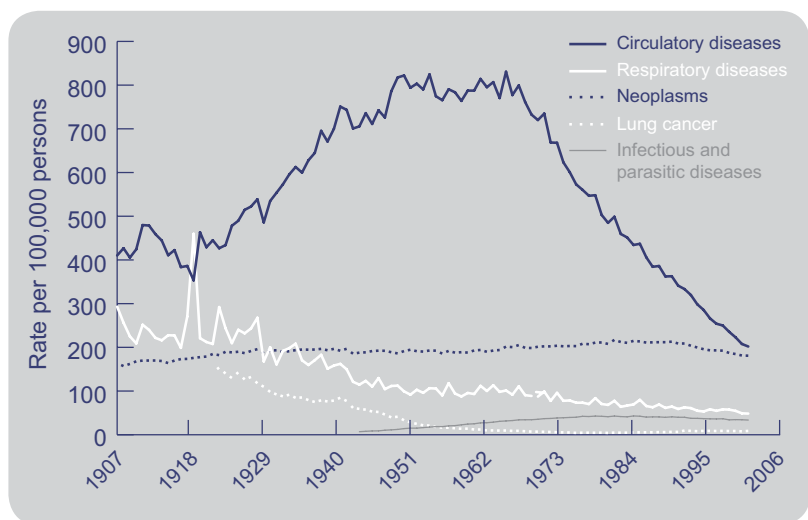
The introduction of antibiotics and improved maternal and perinatal care have contributed to continual improvement in infant mortality rates since the 1940s.

Figure 3: Infant mortality rate per 1,000 live births, Australia and WA, 1901–2006



Source: ABS Data Cubes Cat No. 3105.0.65.001.

Figure 4: Age-standardised mortality rate, various causes, Australia, 1907–2006

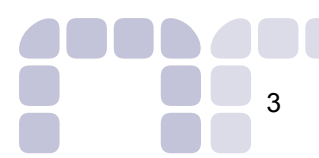


Source: AIHW GRIM Books.

In the early 20th century, the major contributors to all-cause mortality in WA were communicable and respiratory diseases. The impact of these diseases was greatest in infants.

Infant mortality is regarded as a major indicator of a population's overall health status. At the beginning of the 20th century in WA, infant mortality was approximately 125 deaths per 1,000 live births. This was similar to the rates experienced in North America and Europe at the time, and is similar to many modern day developing countries in Africa. The underlying causes of these deaths included poor education, inadequate diets and unsanitary living conditions (Lawson, 1998). Over the first half of the 20th century, infant mortality declined dramatically, due mainly to a gradual development of universal education, good housing, safe water supply, safe sewage and rubbish disposal and the general availability of good food (Figure 3). By 2006, the infant mortality rate in Western Australia had decreased to 4.9 deaths per 1,000 live births.

In the first half of the 20th century, measures were targeted at decreasing deaths due to communicable diseases. Consequently the decline in these deaths was equally dramatic as the decline in infant mortality. Mortality as a result of communicable diseases is now low due to vastly improved housing and living conditions, better diet, improved medical care (including antibiotics) and mass vaccination programs that started in the 1930s.



While the death rate due to respiratory disease has declined steadily, peaks in the 1920s and 1960s are reminders of the continual need for public health programs to contain epidemics. The peak recorded in the 1920s was due to the 1918 flu pandemic (commonly referred to as the Spanish flu) and highlights the need to maintain vigilance against future influenza outbreaks. An increase in the prevalence of respiratory diseases related to smoking, such as chronic obstructive pulmonary disease, was responsible for the peak in male deaths in the 1960s, demonstrating the importance of sustaining tobacco control measures.

During the second half of the 20th century, new public health challenges began to be identified, with the recognition that infectious diseases were contributing less to disease burden and chronic diseases were important causes of ill-health. Cardiovascular diseases and cancers emerged as the major causes of death in the second half of the last century. Lifestyle factors, such as a diet rich in fats and salt, increases in smoking prevalence and a decrease in physical activity due to more sedentary work practices, were responsible for the increase in deaths from cardiovascular disease and cancers.

Death rates from cardiovascular disease have declined since the 1960s due to the success of prevention strategies and through improvements in medical techniques for treatment of cardiovascular conditions (Capewell, et al., 2000; Unal, et al., 2004; Ford, et al., 2007).

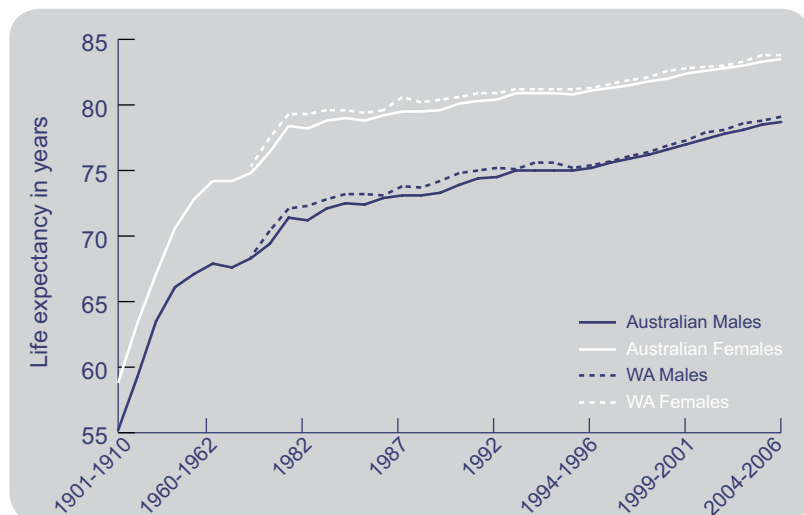
There was an increase in the proportion of deaths due to cancer over the 20th century making it the second most common cause of death behind cardiovascular disease. As there are many different types of cancer, each having different causes, public health interventions have addressed a range of behavioural and environmental factors to control its impact on the population. Along with these measures, screening programs have been introduced to ensure early diagnosis and treatment of some leading cancers.

To reduce the incidence of cancer, public health measures have targeted:

- Tobacco smoking,
- Alcohol consumption,
- Air pollution,
- Some industrial processes and manufactured products,
- Sun exposure,
- Certain viruses and
- Diet.



Figure 5: Life expectancy at birth by sex, Australia and WA, 1901–2006



Source: ABS Data Cubes Cat No. 3105.0.65.001.

From 1997 to 2006, the proportion of deaths that could have been prevented due to public health (primary intervention) and those that could have been prevented through medical and surgical treatment (secondary and tertiary intervention), have been roughly equal, averaging 54% and 46% respectively.

In the case of ischaemic heart disease, the decline in mortality is roughly 50:50 between public health and medical and surgical care (Capewell, et al., 2000; Unal, et al., 2004; Ford, et al., 2007). In this case, the modification of behavioural and biomedical risk factors, along with improved drug therapy and coronary bypass and stent surgery, have decreased mortality. However, this is not always the case. According to the intervention fractions for avoidable mortality for lung cancer, 95% of the potential

avoidance is due to public health and 5% due to medical and surgical treatment (NSW Population Health Division, 2006). Tobacco smoking has been attributed as a causal factor of 90% of all lung cancer cases in males and 65% of all cases in females (Ridolfo and Stevenson, 2001), therefore, the cessation of tobacco smoking has a major impact on the initial risk of developing lung cancer and as a result the mortality rate declines (Khuder and Mutgi, 2001; Ebbert, et al., 2003).

On the other hand, medical and surgical interventions have been the major contributor to the decline in mortality due to breast cancer in females, with 85% of the avoidable mortality for breast cancer due to medical and surgical treatment (NSW Population Health Division, 2006). In this case, the technology that made mammography possible for early detection and the completion of mastectomies, chemotherapy and radiation therapy have had the biggest impact on reducing breast cancer mortality.

The impact of public health programs and advances in medical technology on the health of the WA population over the past century is clearly demonstrated by the dramatic increase in life expectancy at birth. Since the early 1900s, life expectancy in WA increased by 28 years for males and 27 years for females. In 2006, life expectancy in WA was amongst the highest in the world, at 79 years for males and 84 years for females (Figure 5).



The disease history of the WA population has demonstrated the vital role public health has played in containing the impact of disease and its contribution to improved health outcomes. These traditional containment practices need to be maintained, along with the development of innovative public health measures to meet current and emerging public health concerns. Programs and interventions need to be responsive to changing population structures and characteristics, lifestyles and disease patterns, while considering the inequitable distribution of disease among population groups.

A New Public Health Act for Western Australia

A new Public Health Act is being developed for Western Australia to better protect and promote public health as well as prevent illness and injury.

The current *Health Act (1911)* is long overdue for replacement with modern, flexible health law, which provides appropriate and robust tools to tackle the traditional, as well as the new and emerging public health risks of the 21st century.

Modern public health legislation provides for:

- greater protection of individual rights, and improved accountability of statutory office holders,
- a greater focus on achieving public health outcomes, rather than simply meeting a checklist of prescribed processes,
- more flexibility for industry and businesses to develop their own risk management plans,
- an ability to distinguish between technical breaches of standards and serious risks to public health,
- dealing with serious and material risks, and preventing adverse outcomes in a timely fashion,
- a greater range of remedies ranging from education to improvement notices to enforcement orders to license suspension to prosecution,
- application of public health law across the State, through binding of the Crown and
- public health plans to be made available at a State and local level.





Population Characteristics

When establishing public health services, policy makers need to recognise the current and future size and structure of the State's population. Changes in size and structure of a population are dependent upon the mortality, fertility and migration history of that population.



Life Expectancy

The decline in mortality over the last century in WA is clearly reflected by the significant increase in life expectancy reported throughout the State (Figure 5). In 2006, life expectancy at birth in WA was 79 years for males and 84 years for females. While gains in life expectancy at birth in the early half of the last century were due to decreases in the infant mortality rate, more recent gains have been achieved through the reduction in deaths due to chronic diseases. The decline in chronic disease deaths has resulted in gains in life expectancy primarily among older people. Over the last decade, life expectancy at 65 years increased by 2.5 years for males and by 2.0 years for females.

Fertility

While life expectancy has been increasing in WA, the fertility rate has been in decline. Over the past century, fertility rates have tended to vary with historical events, such as the Great Depression, the Second World War, and the postwar baby boom. Since around 1971, fertility rates have been in a steady decline, reaching a low of 1.7 births per woman in 2002. The past few years, however, have seen the total fertility rate increase, reaching 1.9 births per woman in 2006 (Figure 6). The age of mothers is also increasing in WA (Figure 7). In 2007, there were 30,066 births in WA, exceeding 30,000 for the first time in the State's history (Nguyen, et al., 2008).

Migration

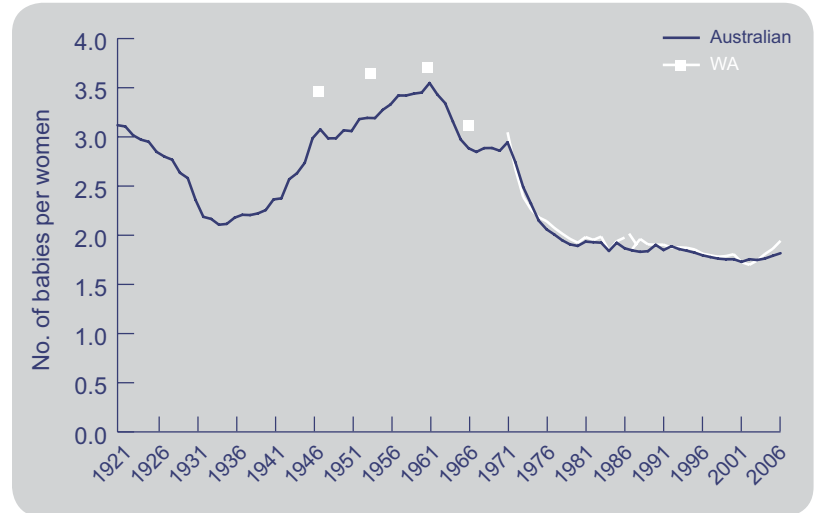
Overseas and interstate migration contributes significantly to population changes in WA. Each year, net interstate and overseas migration increases the State's population by a similar number to births. In 2006/07, net interstate and overseas migration accounted for 64% of the population growth recorded by the State (Australian Bureau of Statistics, 2008c), including 48,355 new arrivals (Australian Bureau of Statistics, 2008a). Many of these new arrivals come from culturally diverse and non-English speaking backgrounds and, as such, require health services to be designed appropriately in order to meet their needs.

Population Size, Structure and Distribution

In 2007, Western Australia recorded a growth rate of 2.8% taking the population size to 2.1 million people (Australian Bureau of Statistics, 2009). It is estimated that the total State population will increase to 2.6 million by 2051 (Australian Bureau of Statistics, 2008b).

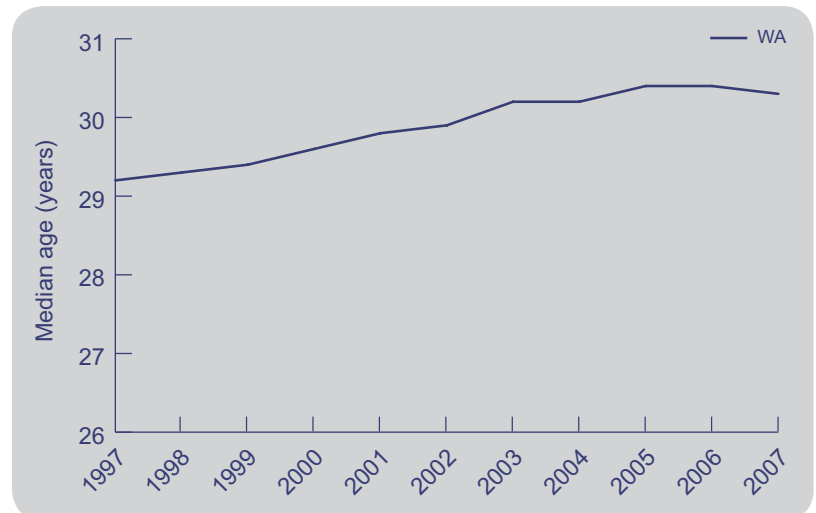
The decline in fertility and increased life expectancy experienced in WA over the past few decades has dramatically changed the age structure of the population, with a higher proportion of persons in older age-groups than 40 years ago (Figure 8). In 1966, children aged 0–14 years represented around 31% of the population, compared with 8% for those aged 65 years or older. In 2007, this had changed to 20% and 12% respectively.

Figure 6: Total fertility rate (TFR), women aged 15–49 years, Australia and WA, 1921–2006



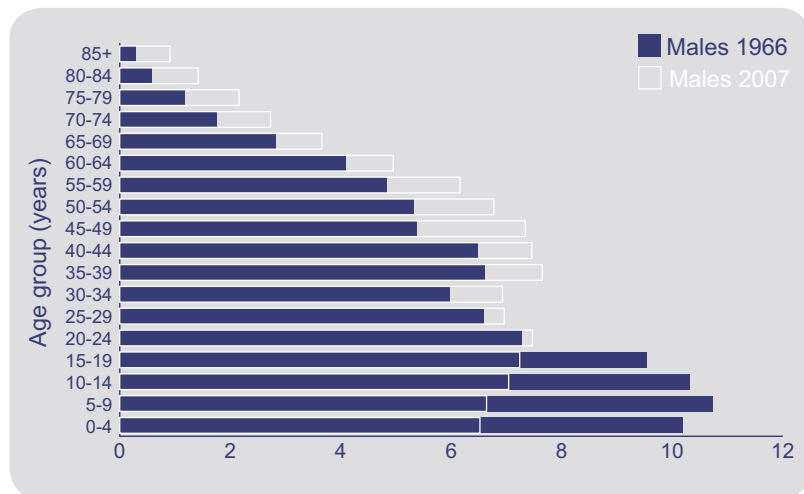
Source: ABS Historical Population Series, Cat No. 3105.0.65.001.

Figure 7: Median age of mother, all confinements, WA, 1997–2007



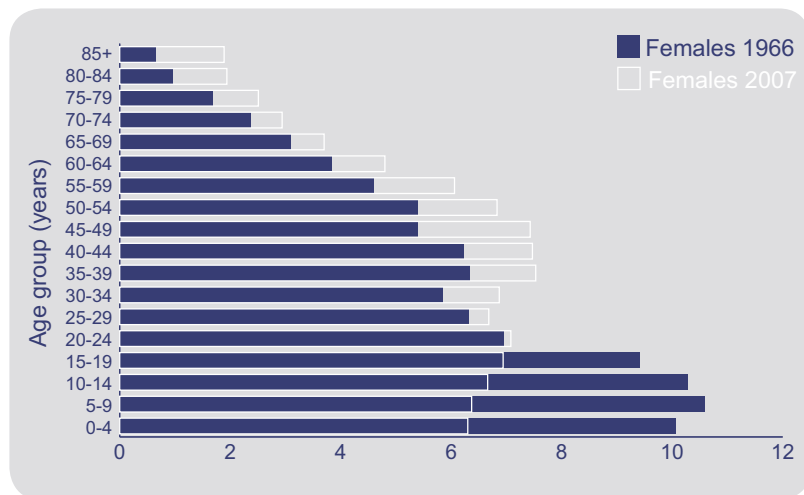
Source: ABS Data Cubes; Cat No. 33010DO004_2007.

Figure 8a: Male population by age, WA, 1966 and 2007



Source: ABS Data Cubes, Cat No. 3105.0.65.001; Epidemiology Branch, WA Department of Health.

Figure 8b: Female population by age, WA, 1966 and 2007



Source: ABS Data Cubes, Cat No. 3105.0.65.001; Epidemiology Branch, WA Department of Health.

A larger proportion of Indigenous Western Australians live in rural and remote areas of the State (62%) compared with their non-indigenous counterparts (22%) (Figure 9b).

By 2051, it is estimated that almost one in every three (29%) Western Australians will be aged 65 years or over (Australian Bureau of Statistics, 2008b).

The increase in the population aged 65 years and over will have a dramatic impact on the demand for health services throughout the State, with large increases expected in hospitalisations, the use of health care facilities, and nursing home-based care. As such, public health has a large and important role to play in reducing the impact of the ageing population by helping to decrease the prevalence of chronic diseases such as arthritis, osteoporosis, cardiovascular disease, respiratory diseases and dementia throughout the population.

The ageing population in Western Australia is not the only issue that needs to be considered when planning for the future. Throughout the State, there has also been a population shift away from rural areas to larger metropolitan areas.

In 1987, 74% of the WA population resided in metropolitan parts of the State. By 2007 this figure had increased to 78%. Information regarding these geographic shifts is vital and plays an important role in determining health policy. It provides valuable information for locating new services and areas to be targeted by specific health campaigns. Figure 9a demonstrates the total population distributions in 2006.



Figure 9a: Total population density maps, by statistical local area, WA, 2006

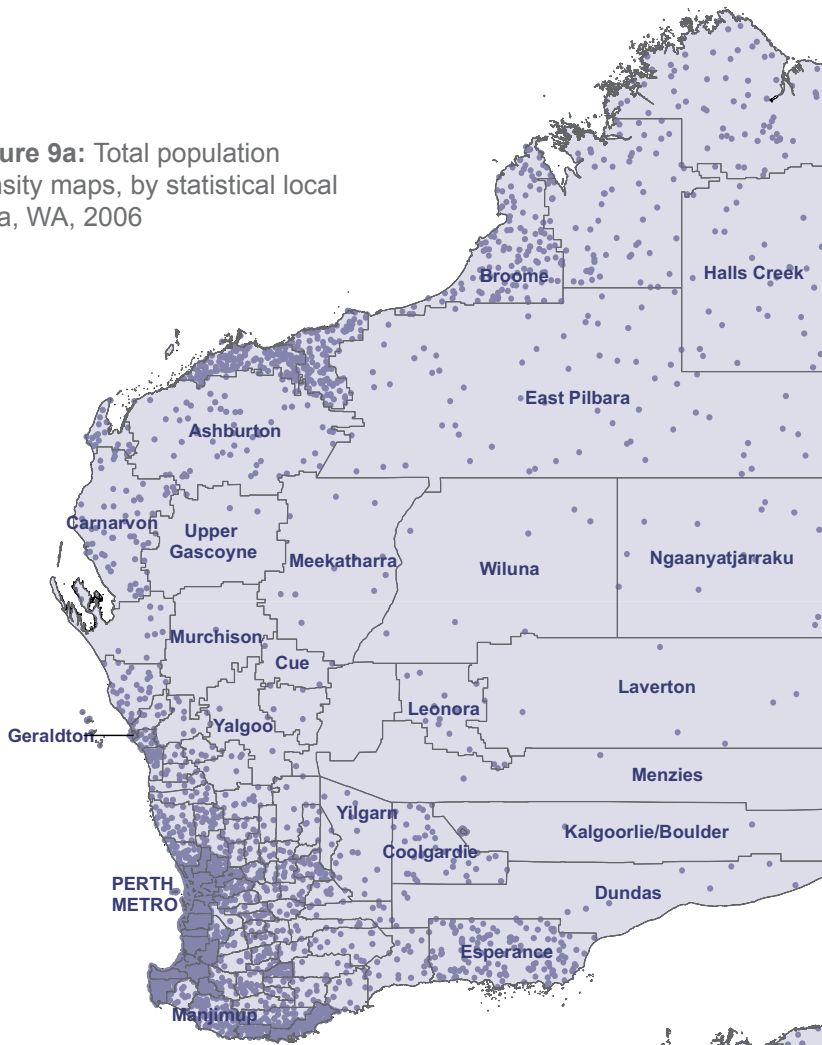
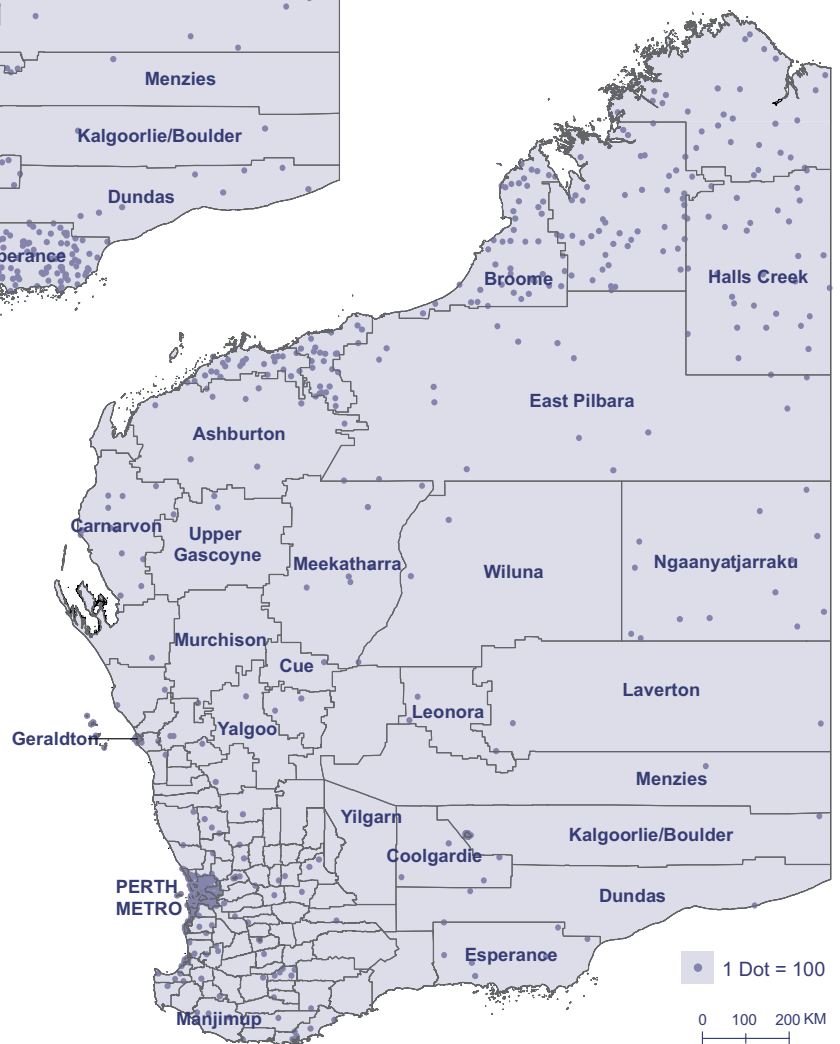
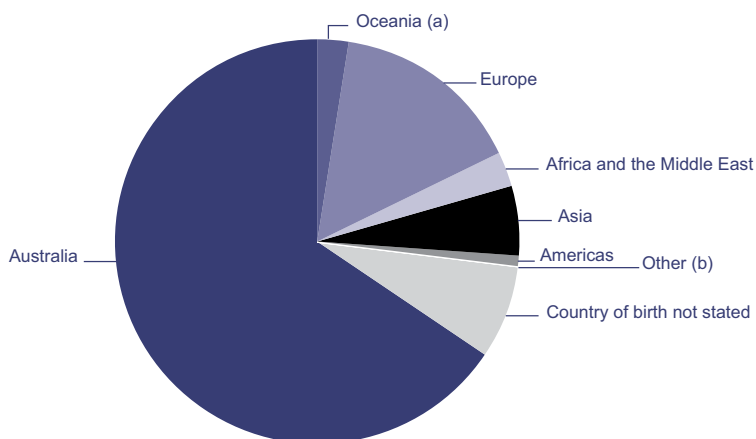


Figure 9b: Total Indigenous population density maps, by statistical local area, WA, 2006



Produced by: Epidemiology Branch, June 2009
Data Source: ABS Census 2006, Landgate

Figure 10: Population by region of birth (%), WA, 2006



Notes: (a) Includes 'Australian External Territories'.
 (b) Includes 'Inadequately described', (e.g. at sea and not elsewhere classified).
 Source: ABS Data Cubes Cat. No. 2068.0.

Each ethnic group has a distinct health profile, with health risk factors and diseases more common among some groups than others. As such, it is important that health service providers are conscious of the needs of various ethnic groups and are able to adapt where necessary.

In 2006, around one in four (27%) Western Australians were born overseas (Figure 10), while 3.4% were of Indigenous descent (Australian Bureau of Statistics, 2007).

Knowledge about the makeup of the WA population, by age, locations and ethnicity provides valuable baseline data that can help to determine both current and future needs of the population and guide new interventions.





Avoidable Mortality

Mortality is one of the most widely available measures of ill-health used to determine the current health status of a population. Monitoring changes in the pattern of mortality highlights changes in the population that may need investigation.

The term avoidable mortality (AM) describes a simple and practical population-based method for counting premature and unnecessary deaths that are the result of diseases for which effective public health and/or medical interventions currently exist. Avoidable mortality therefore refers to deaths that have the potential to be avoided. However, classifying a death as avoidable does not imply that the death could in fact have been avoided; it merely indicates that it had the potential to be avoided (Department of Human Services (DHS), 2008).

Avoidable mortality is an important research tool that enables epidemiologists and health practitioners to identify potential gaps and shortcomings within the health care system. An excess of deaths due to preventable causes can help to identify areas of need, and may reflect a lack of availability and/or use of available interventions. By identifying areas of need, valuable resources can be allocated in a more critical and informed manner.

Avoidable mortality is classified into three categories dependent on the type of intervention. The primary intervention group includes those deaths that could potentially have been avoided through the application of effective public health measures.

Interventions within this category aim to prevent the condition or cause of mortality from occurring. Deaths that could have been avoided by early intervention through primary health care services or early detection through screening are categorised into the secondary intervention group. Where the probability of death can be reduced using medical or surgical techniques, the deaths are categorised into the tertiary intervention group (for further reading on avoidable mortality methods see DHS, 2008; Avoidable Mortality in Victoria: Trends between 1997 and 2003).

Avoidable Mortality in Western Australia

In 2006, there were 11,660 deaths registered in WA, of which 4,541 (39%) were in persons aged less than 75 years. Of these deaths, 2,903 (64%) were classified as avoidable.

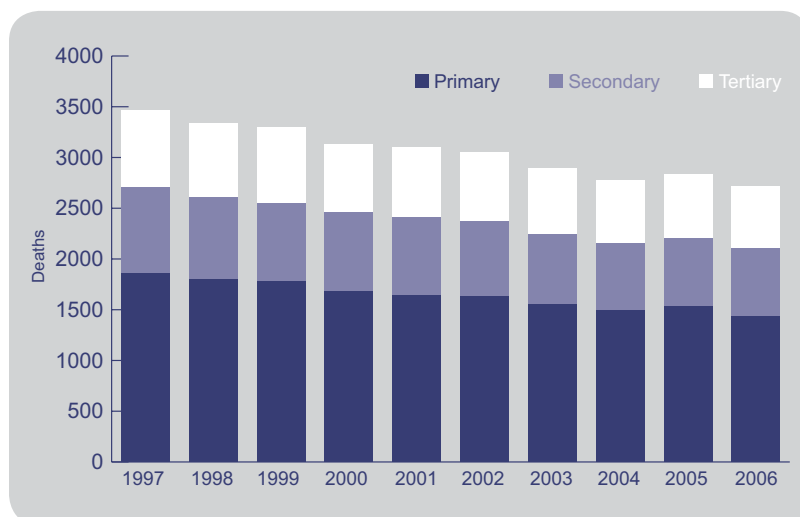
Between 1997 and 2006, the number of avoidable deaths reported in WA fell slightly from 3,322 to 2,903 deaths. The mortality rate for avoidable deaths fell by an average of 4.2% annually, from 211 to 150 deaths per 100,000 persons.

In 2006, more than half (53%) of all avoidable deaths could potentially have been avoided if appropriate primary interventions were applied. Of the remaining avoidable deaths, 24% could have been avoided through secondary interventions and 23% through tertiary interventions. These proportions have remained relatively stable since 1997 (Figure 11).

Leading Causes of Avoidable Mortality

Cancers and chronic diseases were the principal conditions contributing to avoidable deaths over the period 1997–2006. Primary interventions exhibited the greatest area for potential gains (Table 1). Overall, ischaemic heart disease was responsible for the highest proportion of deaths (21%), followed by lung cancer (12%) and suicide and self-inflicted injuries (7.5%).

Figure 11: Avoidable mortality by intervention type, WA, 1997–2006



Source: ABS Mortality Data.

Table 1: Leading causes of avoidable mortality by intervention type, persons aged 0–74 years, WA 1997–2006

Condition	No. Deaths	Per cent	Intervention type		
			Primary	Secondary	Tertiary
1 Ischaemic heart disease	6,317	20.6	3,159	1,579	1,579
2 Lung cancer	3,783	12.3	3,594	0	189
3 Suicide and self-inflicted injuries	2,313	7.5	1,388	694	231
4 Colorectal cancer	2,133	7.0	853	1,067	213
5 Cerebrovascular diseases	1,804	5.9	541	902	361
6 Breast cancer (Females only)	1,524	5.0	229	533	762
7 COPD	1,366	4.5	1,093	137	137
8 Diabetes	1,239	4.0	372	743	124
9 Alcohol-related disease	827	2.7	744	0	83
10 Melanoma of skin	653	2.1	392	65	196
11 Birth defect	651	2.1	65	130	456
12 Selected invasive bacterial and protozoal infections	650	2.1	195	260	195
13 Accidental poisonings	634	2.1	380	0	254
14 Stomach cancer	612	2.0	245	122	245
15 Cancer of the oesophagus	519	1.7	493	0	26
16 Cancer of the lip, oral cavity and pharynx	419	1.4	335	42	42
17 Liver cancer	399	1.3	279	40	80
18 Aortic aneurysm	354	1.2	106	106	106
19 Road traffic injuries, other transport injuries	353	1.2	212	0	141
20 Nephritis and nephrosis	345	1.1	35	69	242
Total Avoidable Mortality	30,684				

Source: ABS Mortality Data

Sex

In 1997–2006, 66% of all male deaths and 62% of female deaths in persons aged less than 75 years were classified as potentially avoidable.

While there were similarities in the type and order of leading causes between males and females, suicide, alcohol-related diseases and accidental poisoning contributed to a higher proportion of male avoidable deaths than females.

Among females, breast cancer, birth defects and selected invasive bacterial and protozoal infections contributed to a higher proportion of avoidable deaths than males (Table 2).

Indigenous Status

The rate of potentially avoidable deaths among the Indigenous population in 2006 was 830 per 100,000, more than five times the figure recorded for the total State population.

While the proportion of deaths classified as avoidable was similar among both non-Indigenous and Indigenous persons aged less than 75 years, the leading causes differed (Table 3). The proportion of deaths classified as potentially avoidable among Indigenous people were higher for diabetes, alcohol-related diseases, selected invasive bacterial and protozoal infections, birth defects and road traffic injuries, than among non-Indigenous people.

Determining conditions that impact on the population at a younger age than would be expected can aid in setting up public health interventions for specific population groups to reduce the early impact of disease on the population.

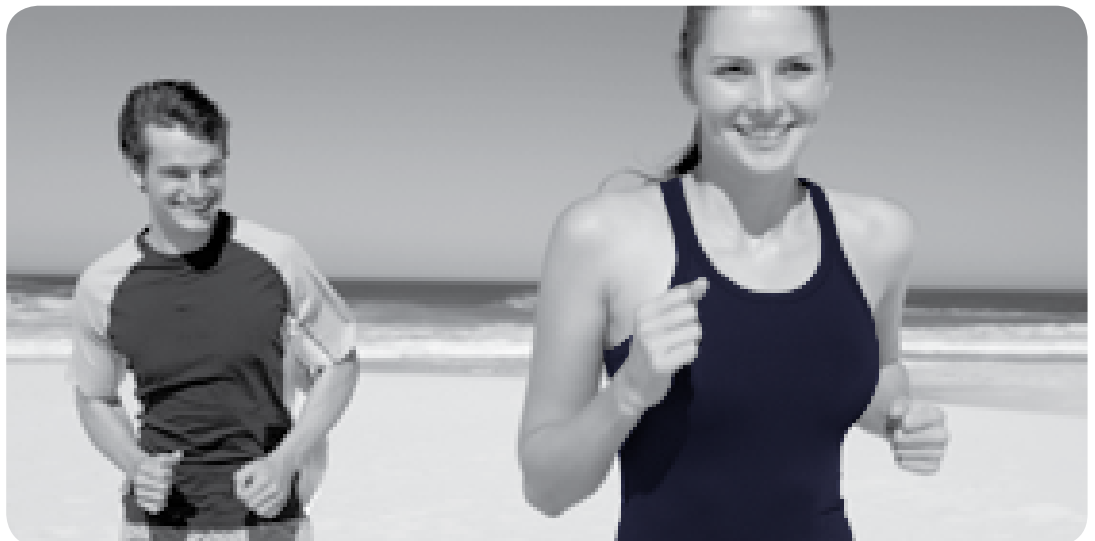


Table 2: Leading causes of avoidable mortality by sex, persons aged 0–74 years, WA, 1997–2006

Males			Females		
Condition	Deaths	Per cent	Condition	Deaths	Per cent
1 Ischaemic heart disease	4,770	15.8	1 Ischaemic heart disease	1,547	8.8
2 Lung cancer	2,543	8.4	2 Breast cancer (Females only)	1,524	8.7
3 Suicide and self-inflicted injuries	1,818	6.0	3 Lung cancer	1,240	7.1
4 Colorectal cancer	1,329	4.4	4 Colorectal cancer	804	4.6
5 Cerebrovascular diseases	1,028	3.4	5 Cerebrovascular disease	776	4.4
6 COPD	870	2.9	6 Diabetes	511	2.9
7 Diabetes	728	2.4	7 COPD	496	2.8
8 Alcohol-related diseases	640	2.1	8 Suicide and self-inflicted injuries	495	2.8
9 Accidental poisoning	454	1.5	9 Birth defects	281	1.6
10 Stomach cancer	433	1.4	10 Selected invasive bacterial and protozoal infections	251	1.4
Total Avoidable Mortality	19,793	65.5	Total Avoidable Mortality	10,891	62.1
Total Mortality under 75 yrs	30,207	100	Total Mortality under 75 yrs	17,534	100

Source: ABS Mortality Data.

Table 3: Leading causes of avoidable mortality by Indigenous status, persons aged 0–74 years, WA, 1997–2006

Non-Indigenous			Indigenous		
Condition	Deaths	Per cent	Condition	Deaths	Per cent
1 Ischaemic heart disease	5,612	12.8	1 Ischaemic heart disease	408	11.6
2 Lung cancer	3,537	8.1	2 Diabetes	273	7.7
3 Suicide and self-inflicted injuries	2,034	4.7	3 Alcohol-related diseases	162	4.6
4 Colorectal cancer	2,034	4.7	4 Suicide and self-inflicted injuries	139	3.9
5 Cerebrovascular diseases	1,603	3.7	5 Cerebrovascular disease	132	3.7
6 Breast cancer (Females only)	1,444	3.3	6 Selected invasive bacterial and protozoal infections	118	3.3
7 COPD	1,254	2.9	7 Lung cancer	81	2.3
8 Diabetes	911	2.1	8 Birth defects	78	2.2
9 Melanoma of skin	631	1.4	9 COPD	73	2.1
10 Alcohol-related disease	624	1.4	10 Road traffic injuries other transport injuries	70	2.0
Total Avoidable Mortality	27,152	62.1	Total Avoidable Mortality	2,186	62.0
Total Mortality under 75 yrs	43,741	100	Total Mortality under 75 yrs	3,524	100

Source: ABS Mortality Data.

Hospital Separations

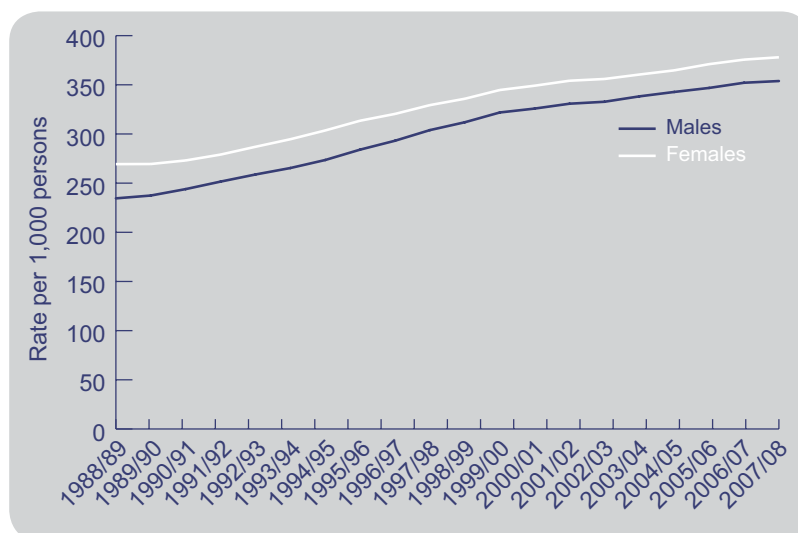
Measuring hospital separations is a useful measure of a population's health. This is especially so when one aims to determine conditions that have the potential to be managed in the community.

admission in WA. In order to reduce the hospitalisation rate, strategies are required that help to prevent the occurrence of these diseases as well as incorporating appropriate care in community-based services.

Despite the significant health gains achieved in Western Australia over the last two decades, the hospital admission rate continues to rise (Figure 12). Many chronic conditions such as heart disease, diabetes, cancers and respiratory diseases are among the leading reasons for

Public health has a role in reducing hospitalisation demand through the prevention and control of chronic and infectious diseases. Programs for population-based health promotion, vaccination, early intervention, screening and enabling people to control chronic conditions all contribute to preventing the need for hospitalisation.

Figure 12: Age-standardised hospitalisation rate per 1,000 persons by sex, WA, 1988/89–2007/08



Source: WA Hospital Morbidity Data System.

Potentially Preventable Hospitalisations

Potentially preventable hospitalisations (PPH) are defined as a group of conditions for which care in a primary health setting could prevent hospitalisation through the provision of preventive care and early disease management. Some conditions are more directly affected by public health interventions than others. Of the three major categories of potentially preventable hospitalisations (acute, chronic and vaccine preventable), public health interventions have most influence on vaccine preventable and chronic conditions, rather than the acute conditions included in the definition. The conditions included in the potentially preventable hospitalisations measure are not comprehensive; rather those conditions included provide a measure of possible reductions in hospitalisations potentially available through the provision of improved primary health services (Further information on potentially preventable hospitalisations is available in Australian hospital statistics 2007–08, (Australian Institute of Health and Welfare, 2009)).

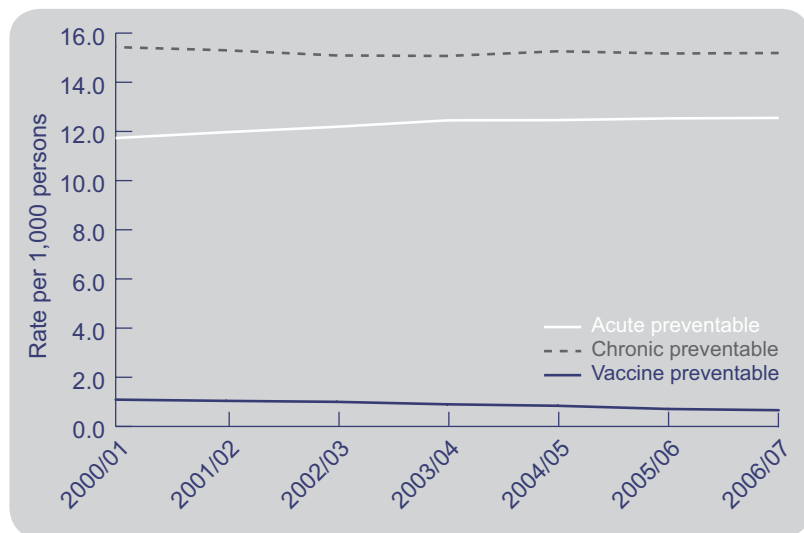
In 2006/07, conditions defined as potentially preventable accounted for 56,447 hospitalisations in WA (Table 4). Of all potentially preventable hospitalisations in 2006/07, vaccine preventable conditions accounted for 2%, chronic conditions 45% and acute conditions 53%.

Table 4: Number and proportion of potentially preventable hospitalisations, WA, 2006/07

PPH condition	No. hospitalisations	Percent
Diabetes and its complications (excluding renal dialysis)	14,177	1.9
Dental conditions	7,252	1.0
Dehydration and gastroenteritis	4,550	0.6
COPD	4,549	0.6
Pyelonephritis	4,447	0.6
Congestive heart failure	3,846	0.5
Ear, nose and throat infections	3,097	0.4
Epilepsy	2,880	0.4
Iron deficiency anaemia	2,875	0.4
Asthma	2,862	0.4
Cellulitis	1,454	0.2
Influenza and pneumonia	840	0.1
Angina	695	0.1
Perforated/bleeding ulcer	562	0.1
Gangrene	501	0.1
Pelvic inflammatory disease	477	0.1
Appendicitis	447	0.1
Hypertensions	424	0.1
Rheumatic heart disease	251	0.0
Other vaccine preventable conditions	235	0.0
Nutritional deficiencies	26	0.0
Total PPH Hospitalisations	56,447	7.7
Total Hospitalisations in 2006/07	735,620	100.0

Source: WA Hospital Morbidity Data System.

Figure 13: Age-standardised hospitalisation rates per 1,000 persons, potentially preventable hospitalisations, by category, WA, 2000/01–2006/07



Source: WA Hospital Morbidity Data System.

Between 2000/01 and 2006/07, the hospitalisation rate for vaccine preventable hospitalisations decreased significantly, from 1.1 to 0.7 separations per 1,000 persons. This represented an average annual decrease of 8.2% per year. Hospitalisation rates for potentially preventable chronic conditions remained relatively stable (15 separations per 1,000 persons), while the rate for acute conditions increased significantly (11.7 to 12.6 hospitalisation per 1,000 persons) by an average of 1.1% per year (Figure 13).

The lower rate of hospitalisation due to vaccine preventable diseases is due predominantly to free childhood vaccination programs in Australia.

Immunisation coverage is also improving. In the mid 1990s, in Australia, approximately 53% of children aged 12 months were fully vaccinated, while in 2005/06 to 2007/08 in Western Australia, approximately 83% of 12 month olds were fully immunised (Australian Government Department of Health and Ageing, 2007). Along with an increase in full vaccination coverage the number of diseases included in the childhood immunisation schedule has also increased. The current schedule (effective from 1st July 2007), includes 13 diseases for children to be vaccinated against over the period of 0–4 years of age, while in 1996 there were eight diseases (Australian Bureau of Statistics, 2003; Australian Government Department of Health and Ageing, 2007). To ensure that vaccination coverage continues to be high in Australia, many of the vaccines on the childhood schedule are combined in one injection (Brotherton, et al., 2007).

The ability to manage health conditions in the community is an important area of health, both from a service utilisation point of view, by reducing costs, and at an individual level. For the individual, being able to manage health conditions in the community ensures a greater quality of life by being able to live comfortably and maintain their own health with the support of primary health care services.





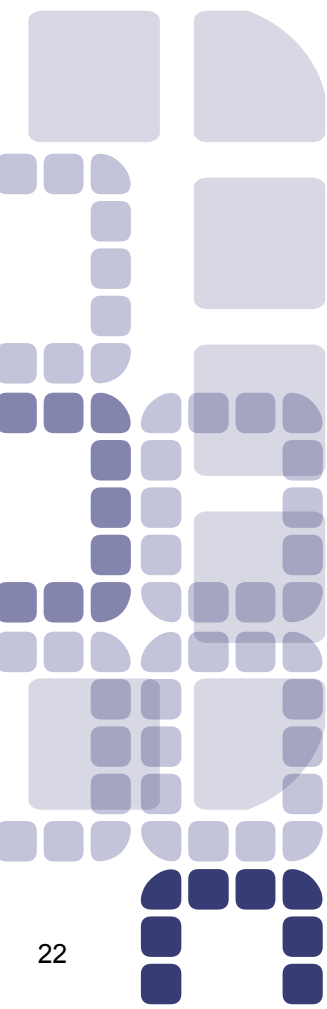
Burden of Disease

Previous sections have demonstrated how gains can be made through reducing premature mortality and preventing hospitalisations. Burden of disease estimates are population-based and provide a more holistic account of health outcomes than other measures such as avoidable mortality and potentially preventable hospitalisations.

Disability-Adjusted Life Years (DALY) measures disease burden by combining two additive components – mortality (Years of Life Lost) and disability (Years Lost due to Disability), thereby quantifying the impact on life expectancy and quality of life in a single measure. This means the health outcomes from a comprehensive range of diseases and injuries, whether fatal or non-fatal, can be compared to inform health policy development and priority setting.

A DALY represents one year of healthy, disease and injury free, life lost (For more on DALYs see Western Australian Burden of Disease Study: Disability-Adjusted Life Years: Technical overview (Sommerford and Katzenellenbogen, 2004)).

In 2003, the diseases responsible for the greatest burden of disease (BOD) in WA were predominantly lifestyle-related (cardiovascular, type 2 diabetes, lung cancer and COPD), mental disorders (anxiety and depression, personality disorders, suicide and self-inflicted harm) and conditions related to old age (dementia and osteoarthritis) (Figure 14).

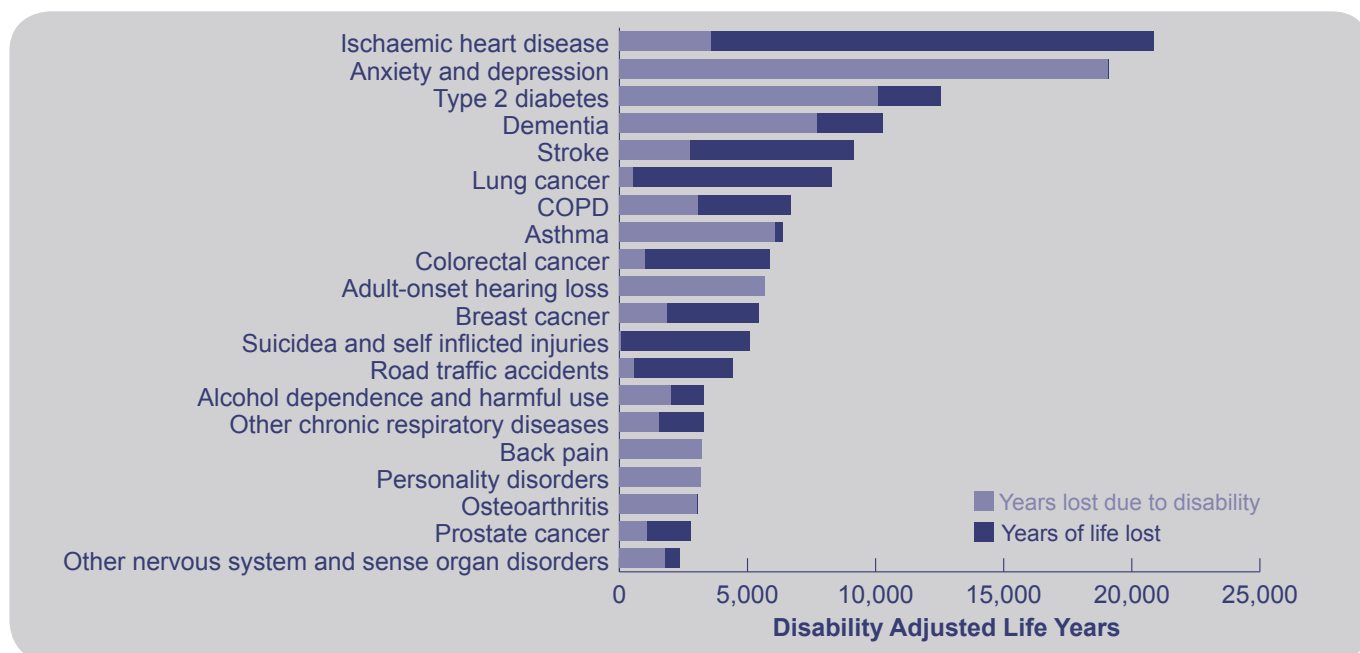


The five most common causes of disease burden in 2003 were:

- Ischaemic heart disease,
- Anxiety and depression,
- Type 2 diabetes,
- Dementia and
- Stroke.

For the lifestyle-related conditions, the majority of the burden was attributed to years lost due to death, while the majority of the burden was attributed to years living with a disability for mental health disorders and conditions related to old age.

Figure 14: Leading causes of disease burden, all ages, WA, 2003



Source: Epidemiology Branch, Department of Health, WA.

As with avoidable mortality, the leading causes of disease burden in WA differ by sex.

In 2003, the top 5 causes of burden of disease, by sex, were:

Males

- Ischaemic heart disease
- Anxiety and depression
- Type 2 diabetes
- Lung cancer
- Stroke

Females

- Anxiety and depression
- Ischaemic heart disease
- Dementia
- Type 2 diabetes
- Breast cancer

Children

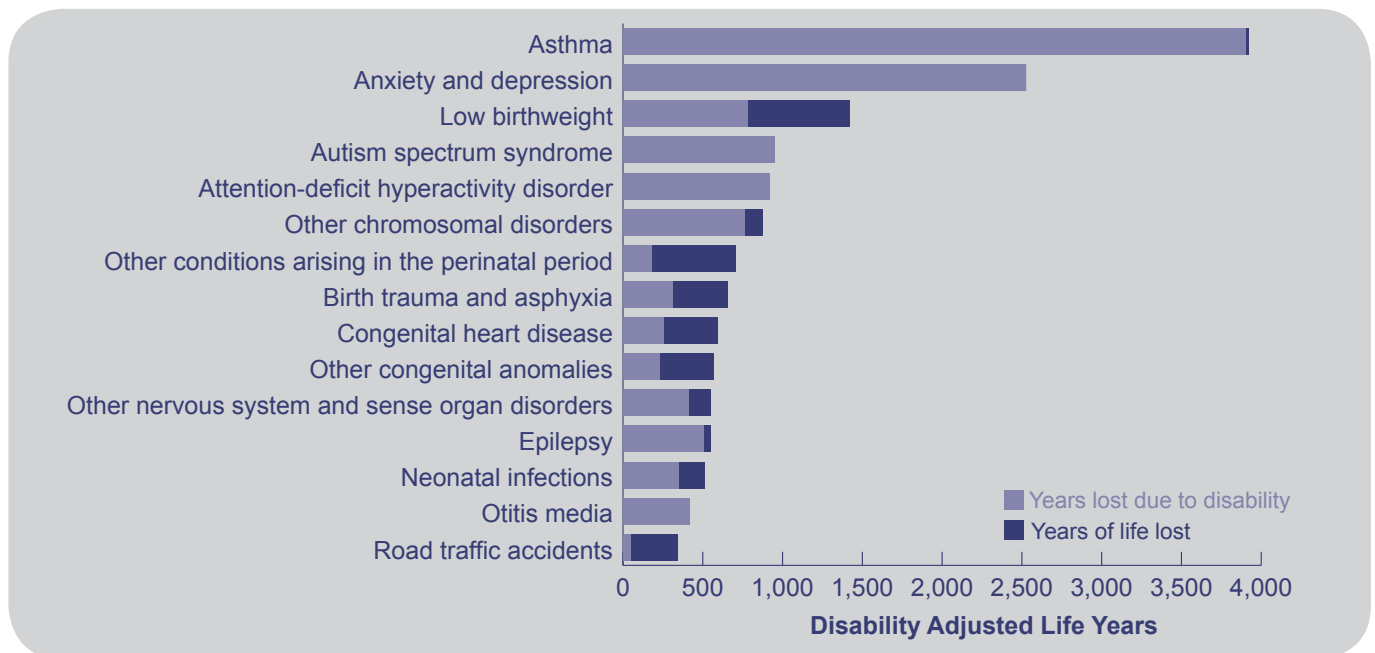
The disease burden experienced by children aged 0–14 years in WA is considerably different from that experienced by the total population. In 2003, the majority of the disease burden among children aged 0–14 years was due to years of life lost to disability (77%). The most common causes were asthma and anxiety and depression at 19% and 12% of the total disease burden respectively (Figure 15).

Asthma

In 2003, asthma was by far the leading cause of disease burden for children aged 0–14 years in WA at almost 4,000 DALYs. The majority of the asthma burden (99%) in the age group was attributed to years of life lost to disability (YLD) indicating the burden for asthma is mostly reflected in reduced quality of life.

In 2006/07, 12% of children aged 0–15 years in WA reported current symptoms or treatment for asthma in the last 12 months, while 19% reported experiencing asthma at some time in their life. Boys in this age group had a higher prevalence than girls (Wood and Daly, 2007).

Figure 15: Leading causes of disease burden, children aged 0–14 years, WA, 2003



Source: Epidemiology Branch, Department of Health, WA.

Despite being the leading cause of disease burden among WA children aged 0–14 years, between 1999/00 and 2007/08, the number of hospitalisations for asthma among children of this age decreased for boys and girls (8.4 to 4.8 and 5.0 to 3.1 separations per 1,000 persons respectively).

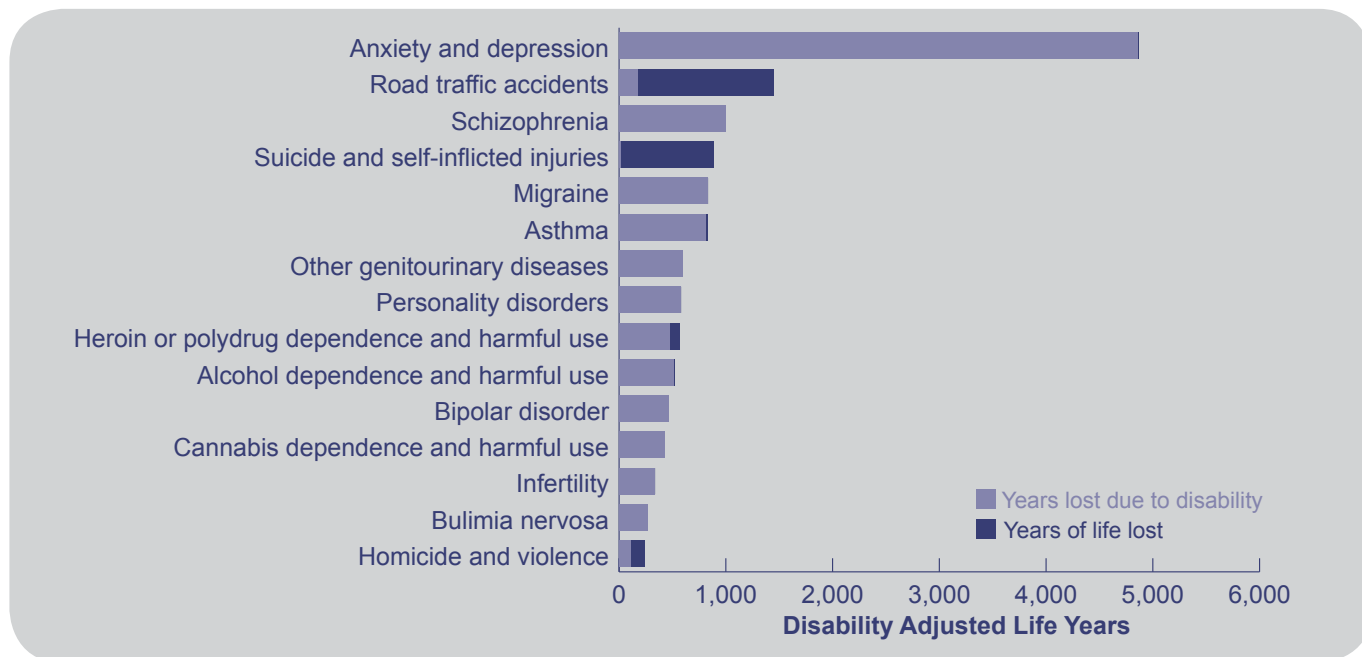
While the highest disease burden is seen in children, it also ranks highly for adolescents and young adults (Figure 16) and accounts for 2.6% of the total disease burden in the State.

Adolescents and Young Adults

In 2003, the disease burden among Western Australians aged 15–24 years was dominated by mental health disorders, drug-related conditions and injury. Anxiety and depression was responsible for 26% of the total disease burden for this age group (Figure 16). This was almost three times higher than the second most common cause of disease burden in this age group (road traffic accidents, 7.8% of the total disease burden).

In total, six of the top 15 BOD causes were related to mental health in adolescents and young adults.

Figure 16: Leading causes of disease burden, adolescents and young adults aged 15–24 years, WA, 2003



Source: Epidemiology Branch, Department of Health, WA.

The majority of the disease burden for mental health disorders was due to years of life lost to disability, while premature deaths due to transport accidents, suicide and homicide also made a large contribution to the burden of disease for this age group.

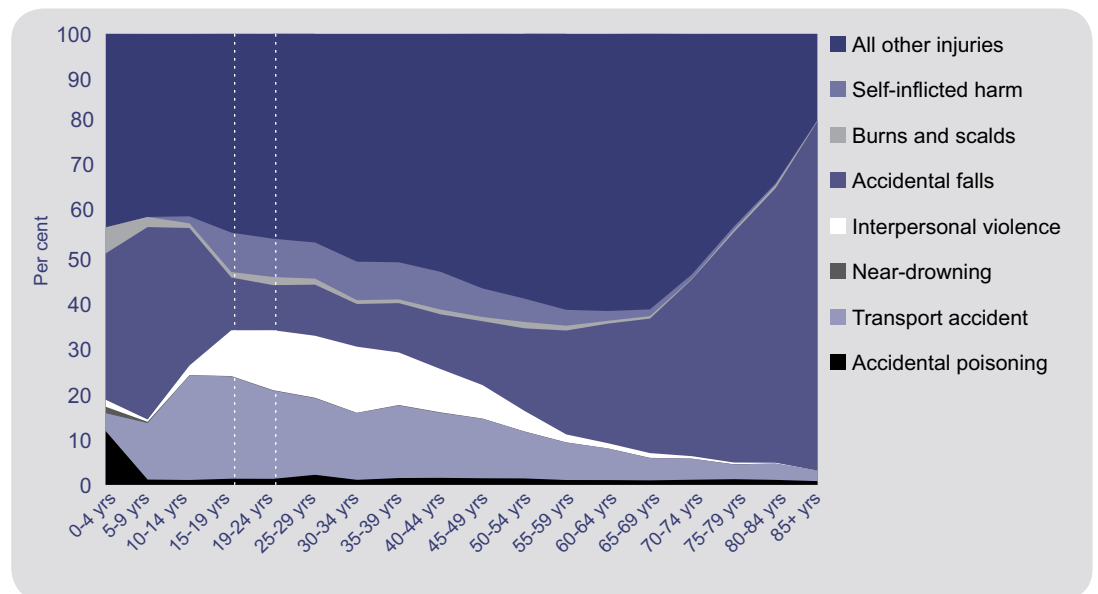
Injury

In 2007/08, Western Australians aged 15–24 years had the highest proportion of transport accident hospitalisations (Figure 17). Interpersonal violence and self-inflicted injuries were also major reasons for hospitalisation for this age group.

Suicide and Self-inflicted Injury

In 2003, the majority of the disease burden caused by suicide and self-inflicted injury was attributed to years of life lost (YLL), reflecting the high level of premature mortality resulting from suicide at young ages. While suicide and self-inflicted injury are a major cause of disease burden among the young, it is not restricted to that age group and accounts for 2.2% of the total disease burden in the State.

Figure 17: Hospital separations for injury and poisoning by cause and age, WA, 2007/08



Source: WA Hospital Morbidity System.



From 1997 to 2006, the suicide rate in WA, for all age groups, decreased for both males (25 to 16 deaths per 100,000 persons) and females (6 to 4 deaths per 100,000 persons). However, only the male trend was statistically significant.

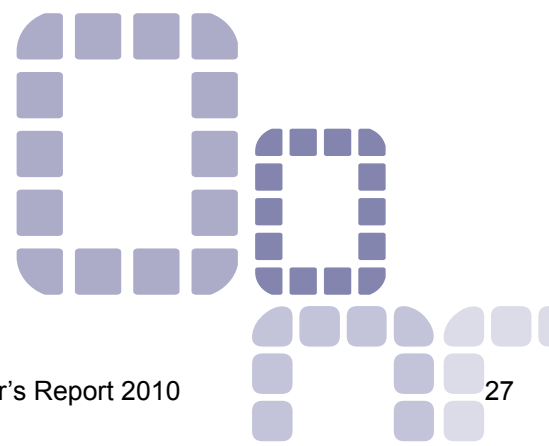
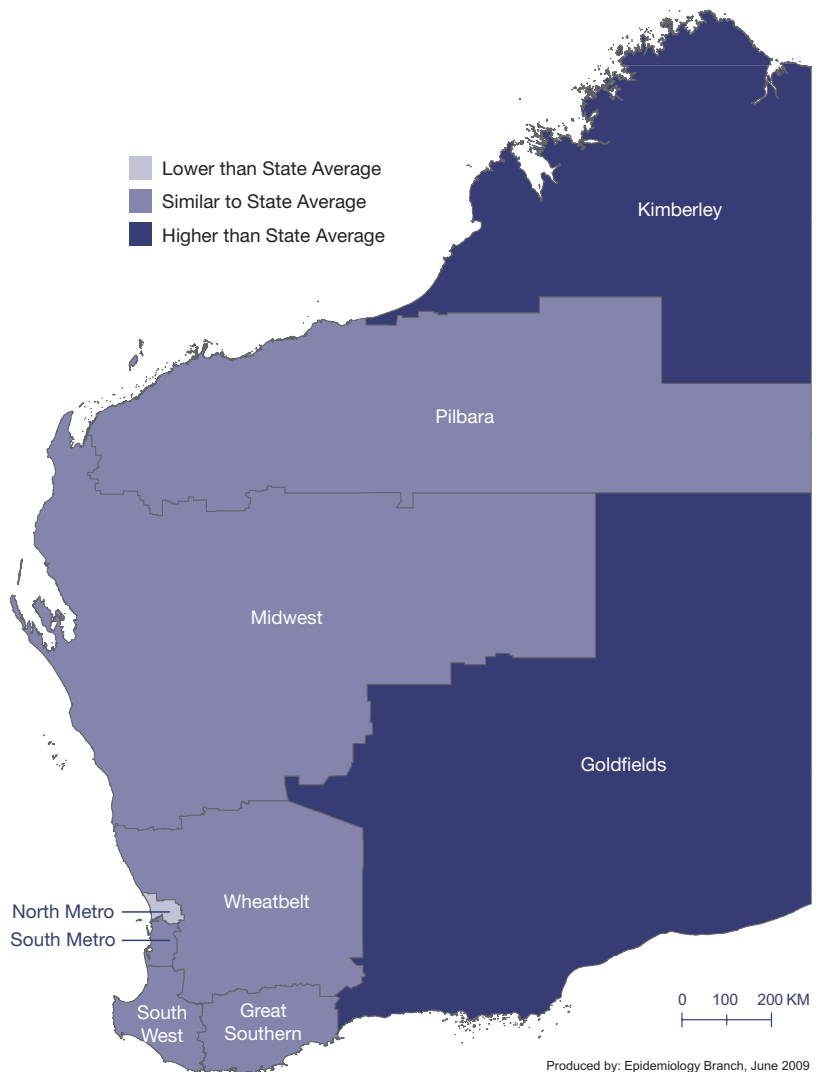
Suicide rates were higher than the State average in the Goldfields and Kimberley health regions and lower in the North Metropolitan health region (Figure 18).

In WA, males committed suicide at a rate almost four times higher than females.

WA males aged 20–34 years and 85 years and over experienced the highest suicide rates in 2006.

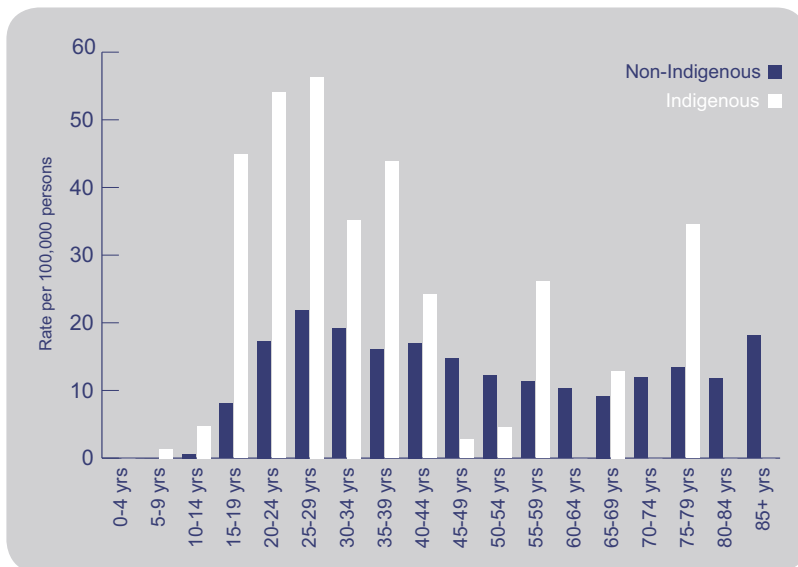
For females, those aged 35–49 experienced the highest suicide rate in WA in 2006.

Figure 18: Standardised mortality rate ratio, suicide, all ages, by health region, WA, 1997–2006



Among Indigenous Western Australians the highest suicide rates were recorded among the 20–29 year age group, while among non-Indigenous people those aged 25–34 years experienced the highest rates (Figure 19).

Figure 19: Age-specific mortality rate, suicide by Indigenous status and age, WA, 1997–2006



Source: ABS Mortality Data.

While males are more likely to commit suicide, females are more likely to be hospitalised due to self-inflicted injury. In 2007/08, there were a total of 2,341 hospitalisations due to self-inflicted injury, with females accounting for 61%. From 1999/00 to 2007/08, hospital separations for self-inflicted harm decreased by an average of 3.1% per year for males, while female rates remained relatively stable.

In WA, of all males, those aged 25–34 years were at the greatest risk of being hospitalised for self-inflicted injury while in the female population the highest hospitalisation rates were seen in the 15–19 year age group.

The highest hospitalisation rates for self-inflicted injury among Indigenous Western Australians were among those aged 25–34 years, while among non-Indigenous people it was among the 15–24 year age group (Figure 20).

Indigenous Western Australians were hospitalised at a rate 2.1 times higher than their non-Indigenous counterparts for self-inflicted injury in 2007/08.



Transport Accidents

In 2003, the majority of the disease burden due to transport accidents was attributed to years of life lost, indicating the high level of premature mortality resulting from transport accidents amongst the young. Based on avoidable mortality categories, primary interventions have the greatest potential to prevent these fatalities.

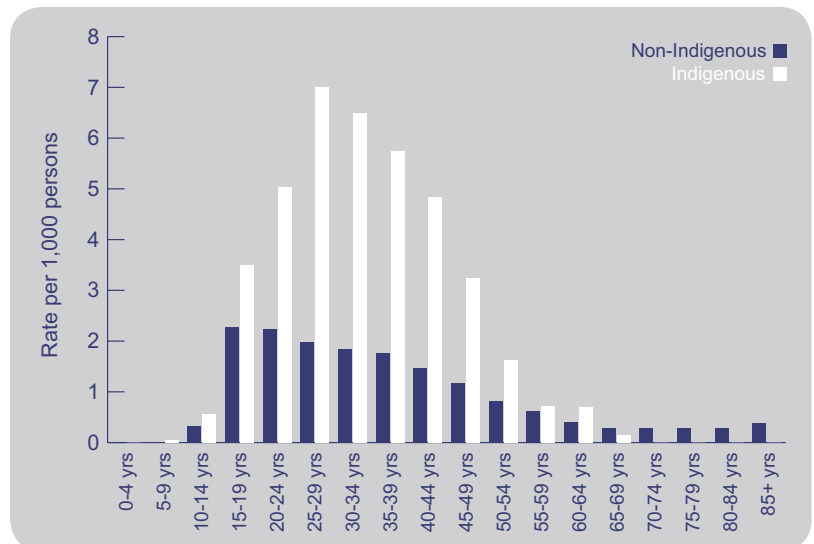
Between 1999/00 and 2007/08, separation rates for transport accidents, inclusive of all age groups, increased by an average of 1.3% per year for WA males while the female rate remained relatively stable.

Males aged 15–19 years and 20–24 years were hospitalised at a rate 2.6 and 3.3 times higher than females of the same age respectively.

In 2007/08, separation rates for transport accidents among WA males aged 15–19 years and 20–24 years were 8.1 and 8.2 separations per 1,000 persons, respectively, while their female counterparts recorded rates of 3.1 and 2.5 separations per 1,000 persons, respectively.

Deaths due to transport accidents decreased in WA for both males and females, inclusive of all age groups, between 1997 and 2006. Male mortality rates fell by an average of 3.9% per year while female rates fell by an average of 4.5% per year. However, despite this decline, mortality rates for transport accidents were around three times higher for males than females in 2006 (13.8 and 4.4 deaths per 100,000 persons, respectively).

Figure 20: Age-specific hospitalisation rate per 1,000 persons, self-inflicted injury by Indigenous status, WA, 1999/00–2007/08



Source: WA Hospital Morbidity Data System.



Figure 21: Standardised mortality rate ratio, transport-related accidents, all ages, by health region, WA, 1997–2006



Traffic accidents in WA

- In 2005/06–2007/08, Indigenous Western Australians were hospitalised at a rate twice that of non-Indigenous persons.
- Over the period 1999/00–2007/08, hospitalisation rates were significantly higher than the State in all rural and remote areas.
- In 2006, the Indigenous mortality rate for traffic accidents was four times higher than the non-Indigenous rate.
- In 2006, mortality rates for transport accidents were significantly higher than the State in all rural and remote areas (Figure 21).

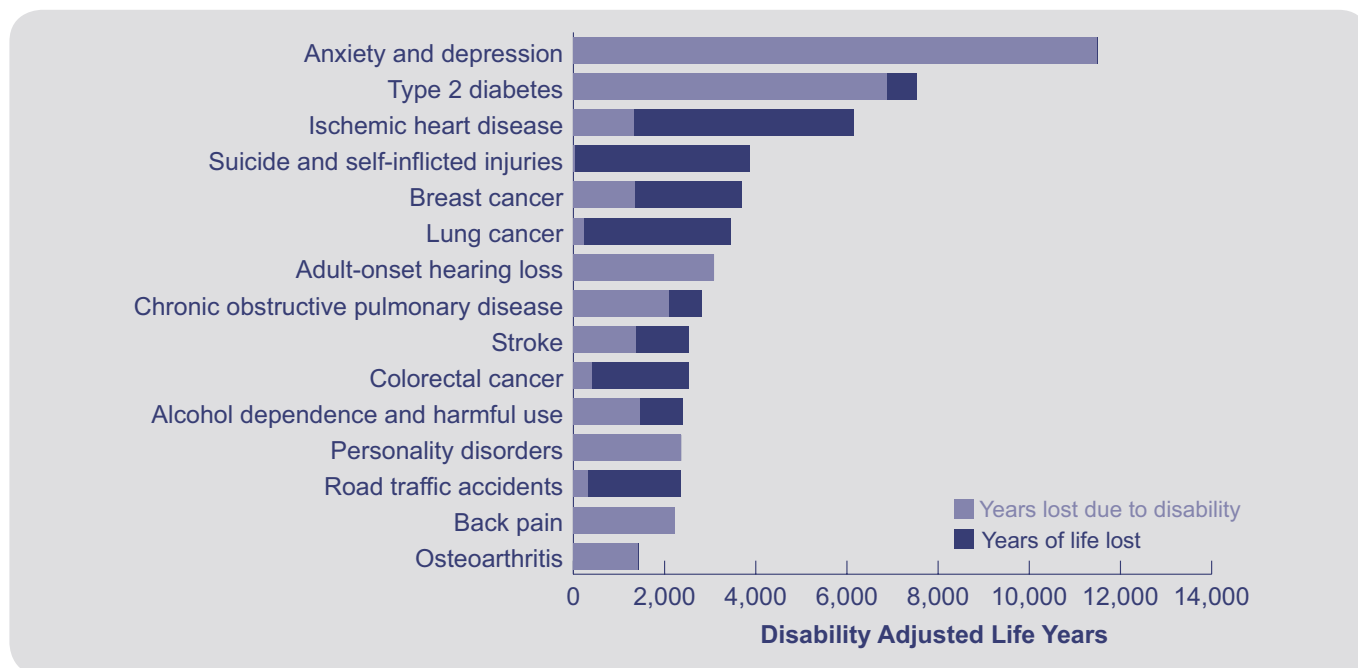
Adults

In 2003, anxiety and depression was the leading cause of disease burden (12%) for adults aged 25–64 years (Figure 22). Although mental health conditions and injuries remain amongst the leading cause of disease burden in this age group, lifestyle-related diseases, such as type 2 diabetes, cardiovascular disease, cancer and COPD have become more prominent.

Of the conditions where burden of disease was measured in 2003, the majority of the disease burden (59%) in adults aged 25–64 years was due to years of life lost to disability.



Figure 22: Leading causes of disease burden, persons aged 25–64 years, WA, 2003



Source: Epidemiology Branch, Department of Health, WA.

Mental Health

In 2003, the majority of the disease burden due to mental health conditions was attributed to years of life lost due to disability (Figure 22), indicating the disease burden from mental health conditions is reflected in reduced quality of life. Along with adults, mental health conditions were also major causes of disease burden for children, adolescents and young adults in 2003 and accounted for 14% of the total disease burden in the State.

In 2007/08, there were 28,932 hospitalisations in WA with a principal diagnosis due to a mental health condition, inclusive of all age groups. The most common conditions requiring hospitalisation were depressive episodes, followed by reactions to stress, and adjustment disorders (Table 5). Between 1999/00 and 2007/08, persons aged 20–39 years experienced the highest separation rates for mental health conditions.

Table 5: Top ten causes of hospitalisation due to mental health conditions, all ages, WA, 2007/08

Cause	No. hospitalisations	Percent
Depressive episode (F32)	5,207	18.0
Reaction to severe stress, and adjustment disorder (F43)	4,615	16.0
Mental and behavioural disorder due to use of alcohol (F10)	3,508	12.1
Bipolar affective disorder (F31)	2,447	8.5
Schizophrenia (F20)	2,395	8.3
Recurrent depressive disorder (F33)	2,324	8.0
Other anxiety disorder (F41)	1,810	6.3
Specific personality disorder (F60)	1,079	3.7
Schizoaffective disorder (F25)	636	2.2
Mental and behavioural disorder due to use of other stimulants, including caffeine (F15)	531	1.8
Total	28,932	100.0

Source: WA Hospital Morbidity Data System.

Diabetes

Diabetes is a chronic condition where there is too much glucose in the blood (hyperglycaemia), either because the body produces little or no insulin or because it cannot use insulin properly (Australian Institute of Health and Welfare, 2008a). Diabetes can be broken into three types, each of which occurs for different reasons; type 1, type 2 and gestational diabetes.

Type 1 diabetes usually develops in children and young adults. With this type of diabetes the body does not produce insulin. To survive, individuals with type 1 diabetes require insulin replacement.

Type 2 diabetes occurs when the body produces insulin, but not at a quantity which allows the body to properly store glucose, making the blood glucose level higher than the body can cope with. Management of type 2 diabetes may only require diet and exercise modifications. However, in some cases it may also require oral glucose-lowering medication and/or insulin injections. Type 2 diabetes predominantly affects persons aged 25 years and over, with the highest rates generally occurring among those aged 55–74 years (Australian Institute of Health and Welfare, 2008b).

Gestational diabetes is a type of diabetes that can occur in pregnant women. It is defined as an increase in blood glucose levels that only occurs during pregnancy and has not been previously diagnosed as another form of diabetes. Gestational diabetes usually disappears once the baby is born, but can be an indicator of an increased risk of developing type 2 diabetes in later life (Australian Institute of Health and Welfare, 2008a).

In 2003, the majority of the disease burden associated with type 1 and type 2 diabetes in the WA population was attributed to years of life lost to disability. This takes into account living with diabetes and its complications, such as, neuropathy, peripheral vascular disease, diabetic coma, foot amputation, retinopathy and renal failure, all of which can significantly reduce quality of life.



In the 2004/05 National Health Survey, type 2 diabetes was cited as the most common type of diabetes in Australia, accounting for approximately 83% of all diabetes cases (Australian Institute of Health and Welfare, 2008a).

In 2008, 6.5% of all Western Australians aged 25 years and over reported being diagnosed with some form of diabetes (Daly, 2009). Since 2002, there has been no change in the prevalence of diabetes; however, prevalence is higher among areas classified as the most disadvantaged and among Indigenous persons (Australian Bureau of Statistics, 2006; Daly, 2009).

While the overall prevalence of diabetes may not have changed in WA in recent years, the hospitalisation rate for diabetes has increased significantly for both males and females. From 1999/00 to 2007/08, based on a principal diagnosis, total population male hospitalisation rates increased on average by 6.7% per year, while total population female rates increased by an average of 7.0% per year.

The risk of developing diabetes increases with:

- A lack of physical activity,
- A diet high in sugars and fats and
- Excess body weight (Australian Institute of Health and Welfare, 2008a).

Developing diabetes can also increase an individual's risk of developing other chronic conditions such as ischaemic heart disease and stroke.

Persons with type 2 diabetes are at a higher risk of developing:

- Eye problems,
- Kidney failure and
- Nerve damage, which can lead to lower limb amputation.

(Australian Institute of Health and Welfare, 2008b).

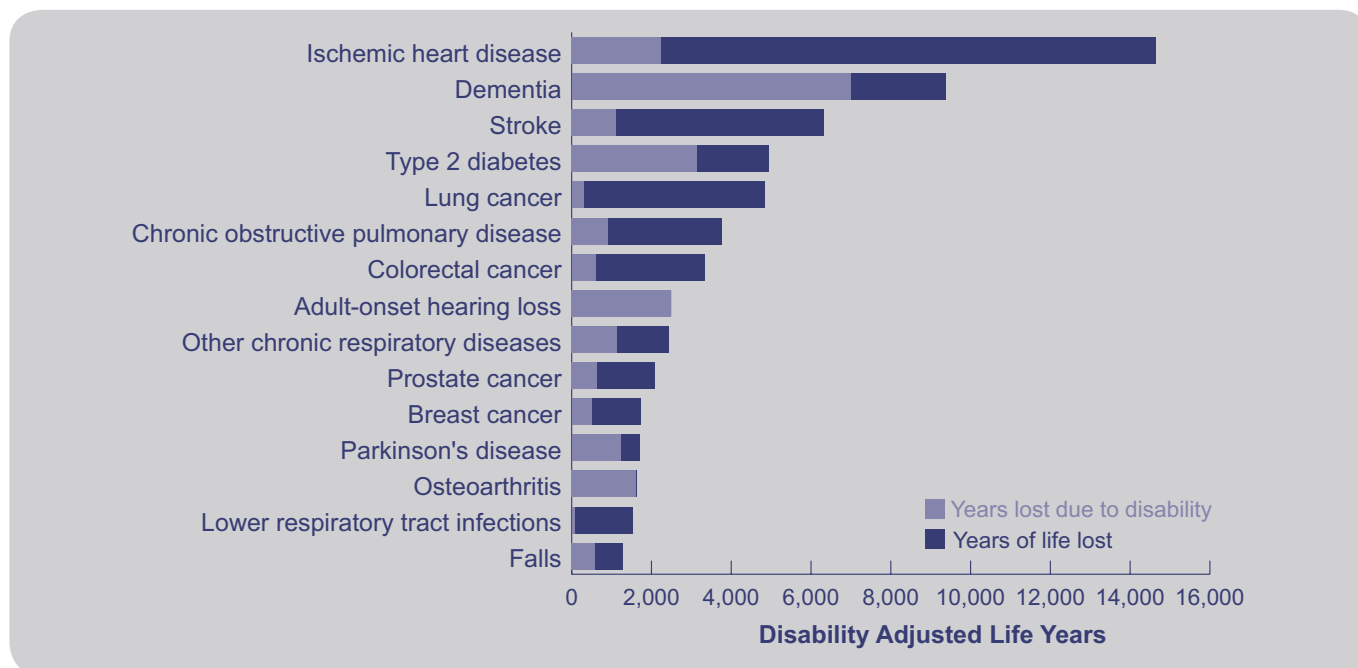
From 1997 to 2006, the mortality rate due to diabetes remained relatively stable for both males and females, inclusive of all ages. For males the mortality rate in 1997 was 19 deaths per 100,000 persons, compared with 21 deaths per 100,000 persons in 2006. For females, the mortality rate in 1997 was 16 deaths per 100,000 compared with 15 deaths per 100,000 persons in 2006.

Type 2 diabetes can lead to coma and death if blood glucose levels are not properly managed correctly. This can include:

- Diet and exercise modification,
- Oral glucose medication and/or
- Insulin injections.

(Australian Institute of Health and Welfare, 2008b).

Figure 23: Leading causes of disease burden, persons aged 65 years and over, WA, 2003



Source: Epidemiology Branch, Department of Health, WA.

Over the period 1997–2006, the mortality rate for diabetes was approximately nine times higher in the Indigenous population than the non-Indigenous population (151 compared to 16 per 100,000 persons).

Older Persons (65 years and over)

In 2003, the majority of the disease burden among Western Australians aged 65 years and over (63.0%) was due to years of life lost (Figure 23).

Ischaemic heart disease was responsible for around 16% of the total disease burden experienced by Western Australians aged 65 years or older in 2003.

Among this age group, the disease burden was primarily due to chronic conditions or cancer, with 10 of the

leading 15 conditions falling into one of these two categories. The remaining causes included dementia, adult onset hearing loss, Parkinson’s disease, lower respiratory tract infections and falls, with each cause contributing primarily to years lived with a disability.

Cardiovascular Disease

Cardiovascular disease (CVD) contributed the largest disease burden of any condition category in WA in 2003.

In 2006, CVD was the leading cause of death in the total WA population, with the most common types being ischaemic heart disease (heart attack) and cerebrovascular disease. Overall, there were 3,627 deaths registered in WA with CVD cited as the underlying cause of death in 2006.



Between 1997 and 2006, CVD mortality rates fell by an average of 4.8% and 4.3% per year among males and females respectively. Hospital separation rates fell by an average of 1.6% for males and 2.0% for females per year between 1999/00 and 2007/08.

In 2006, 32% of all deaths reported in Western Australia were the result of cardiovascular disease.

Of the various types of CVD, ischaemic heart disease (IHD) is responsible for the most deaths in WA. IHD occurs when a vessel supplying blood to the heart becomes blocked due to pasty fat deposits and other blood constituents, known as plaque, attaching to the walls of arteries. The accumulation of plaque restricts the blood flow to the heart and can also lead to bleeding at the site of a blockage or the formation of a blood clot on the surface of the blockage leading to a heart attack or stroke (Arnold, 1990).

Population groups at greater risk of developing ischaemic heart disease include:

- Males,
- Older Australians,
- Indigenous individuals and
- Those from lower socioeconomic backgrounds (Australian Institute of Health and Welfare, 2008a).

Risk factors for ischaemic heart disease include:

- High blood pressure,
- Elevated blood cholesterol,
- Cigarette smoking,
- Excess body weight,
- Diet high in salt and fat,
- Diabetes,
- Physical inactivity and
- Stress (Arnold, 1990).

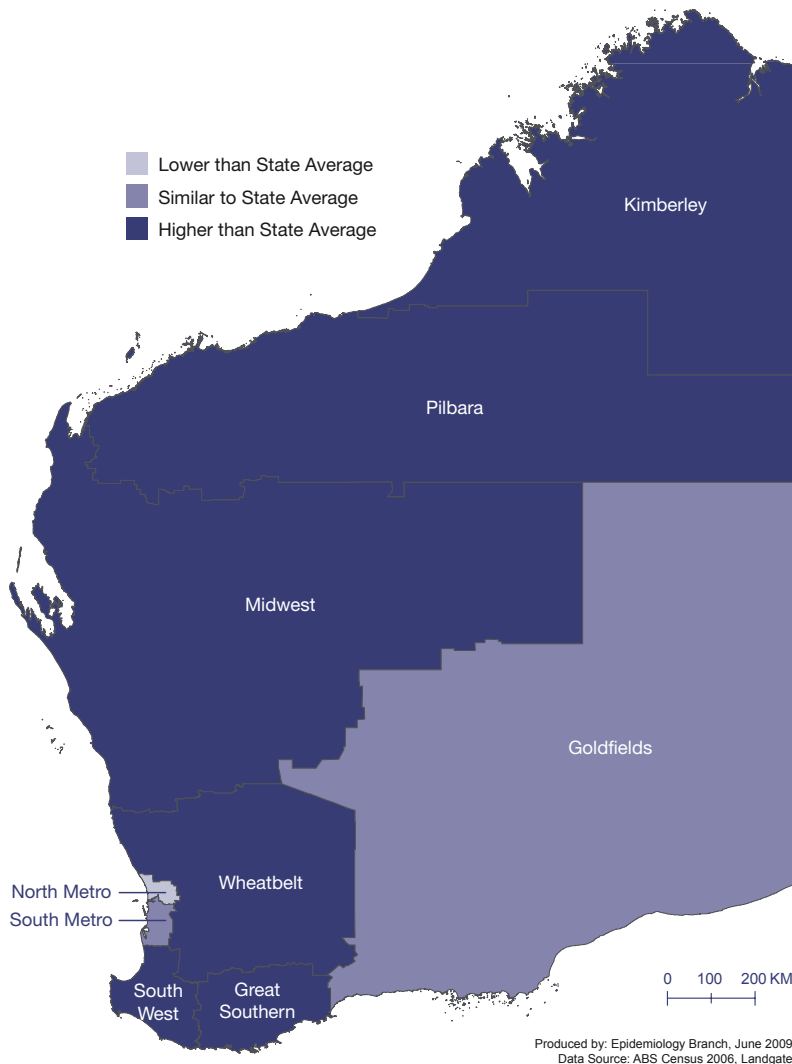
In 2006, ischaemic heart disease accounted for around 57% of all male and 44% of all female CVD deaths in WA.

In 2008, approximately 86,000 Western Australians aged 25 years and over had been diagnosed with IHD (Daly, 2009).

Between 1997 and 2006 in WA, mortality rates for IHD fell from 203 to 130 deaths per 100,000 persons for the total male population (an average annual decline of 5.4%), and from 109 to 70 deaths per 100,000 persons for females (an average annual decline of 4.8%) (Table 7).

The second most common CVD condition reported in WA is cerebrovascular disease (stroke). Stroke occurs when a blood vessel of the brain is blocked by a clot (ischaemic stroke) or bleeds (haemorrhagic stroke) restricting the blood flow to the brain. Such an event can lead to brain damage which can impair body function in an individual (Australian Institute of Health and Welfare, 2004).

Figure 24: Standardised hospitalisation rate ratio, stroke, all ages by health region, WA, 1999/00–2007/08



In 2007/08 there were a total of 4,367 hospital separations for stroke reported in WA (inclusive of all age groups), with males accounting for 54%. More than 70% of all stroke separations in 2007/08 occurred among persons aged 65 years and over, while one in every two separations occurred in persons aged 75 years or older.

Stroke separations in WA were:

- 13% lower than Australia.
- 47% higher among males than females.
- 170% higher for Indigenous Western Australians than their non-Indigenous counterparts.
- Significantly higher than the State average in all WA Country Health Service regions, except the Goldfields (similar to the State) and significantly lower than the State in the North Metro region (Figure 24).

From 1997 to 2006, stroke deaths in WA declined significantly for both the total male and female populations (Table 7). The male mortality rate decreased from 72 to 47 deaths per 100,000 persons, while the female rate decreased from 66 to 41 deaths per 100,000 in 2006.



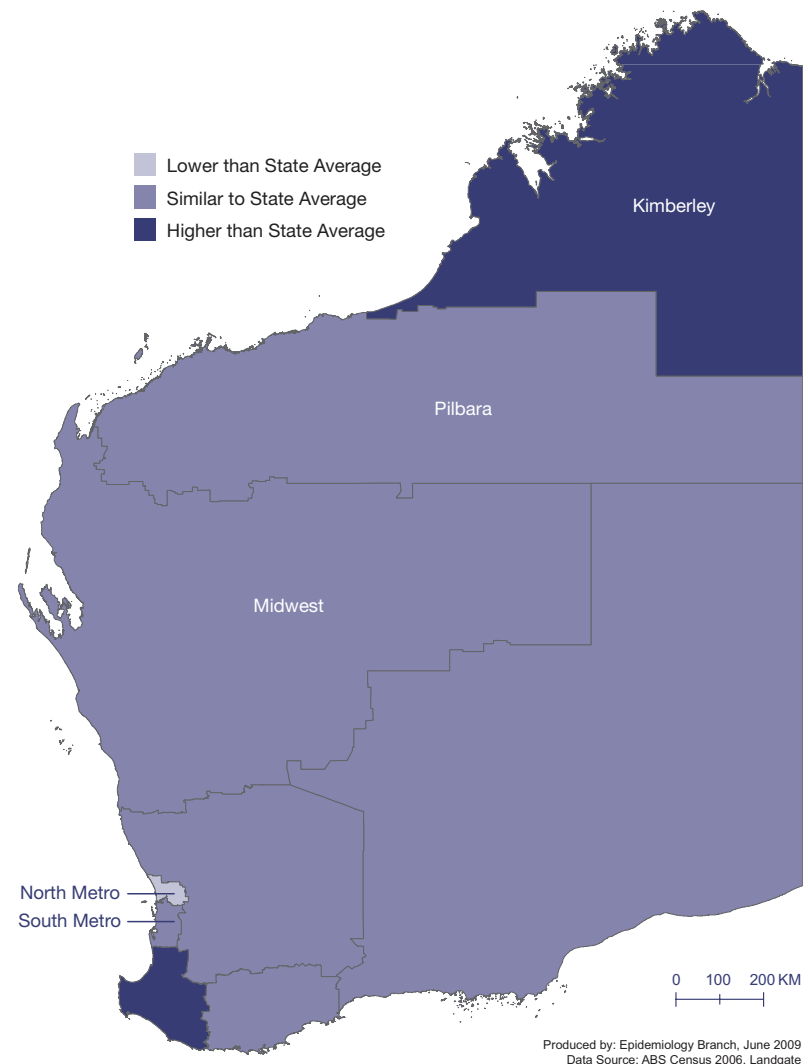
For the period 1997 to 2006, the mortality rates for stroke were significantly higher than the State rate in the Kimberley and South West health regions and significantly lower in the North Metropolitan health region (Figure 25).

Cancer

Cancer refers to a diverse range of diseases characterised by the abnormal proliferation of cells which do not respond to normal growth controls. Normal cells grow and multiply in an orderly manner; however, occasionally cells may multiply in an uncontrolled fashion after being affected by a carcinogen or random genetic mutation. This may result in the formation of a mass referred to as a tumour or neoplasm. Neoplasms may be malignant, with the potential to grow uncontrollably and invade surrounding cells and structures, or benign. Malignant neoplasms may be found at an early pre-invasive, or in situ, stage of development, or may be already invasive. Cancers often have the ability to spread to other parts of the body through the bloodstream or lymphatic system. This can result in a new or secondary tumour developing some distance from the original neoplasm, where it may again begin the process of invading the surrounding cells (Australian Institute of Health and Welfare and Australasian Association of Cancer Registries, 2003).

In 2003, the majority (83%) of the disease burden due to cancer was attributed to years of life lost in the WA population.

Figure 25: Standardised mortality rate ratio, stroke, all ages by health region, WA, 1997–2006



The Cancer Council of Australia has identified tobacco smoking, sun exposure, inadequate fruit and vegetable consumption, high consumption of red meat, alcohol consumption and physical inactivity as leading risk factors for developing cancer (Marks, et al., 2001).

However, the different survival rates for cancers can result in their contribution to the BOD being weighted more towards the loss of quality of life than years of life lost.

Between 1997 and 2007, cancer incidence rates in WA increased significantly in the total male population, with an average increase of 1.0% per year for males (from 513 to 563 cases per 100,000 persons), while for the total female population the incidence rate remained relatively stable (from 374 to 383 cases per 100,000 persons).

In 2006, cancers were second only to diseases of the circulatory system as the leading cause of death in WA, being cited as the underlying cause of death for 3,607 persons (31% of all deaths).

Despite an increasing and stable trend for cancer incidence in males and females respectively, the mortality rate over the past decade has fallen significantly in both sexes in WA (Table 7). Between 1997 and 2006, cancer mortality fell by 1.6% annually among WA males (from 256 to 231 deaths per 100,000 persons) and by 1.1% annually among WA females (from 155 to 138 deaths per 100,000 persons).

Among adults aged 25 years and over, lung cancer ranks highly as a cause of disease burden and is the leading cause of cancer-related death in WA. The majority of lung cancer cases are directly related to smoking (Ridolfo and Stevenson, 2001). The incidence of lung cancer is higher among Indigenous people, in areas classified as the most disadvantaged, and among males.

As there is an approximate 20-year delay between smoking and the development of lung cancer, decreases in smoking prevalence do not immediately reduce the incidence of lung cancer.

Table 6: Leading cancers by type and sex, WA, 2006

Males		Females	
Cancer type	Proportion (%) of all cancer incidence in 2006	Cancer type	Proportion (%) of all cancer incidence in 2006
Prostate Cancer	30	Breast Cancer	29
Melanoma	11	Colorectal Cancer	11
Colorectal Cancer	11	Melanoma	11
Lung Cancer	10	Lung Cancer	8

Source: Threlfall and Thompson, (2007).



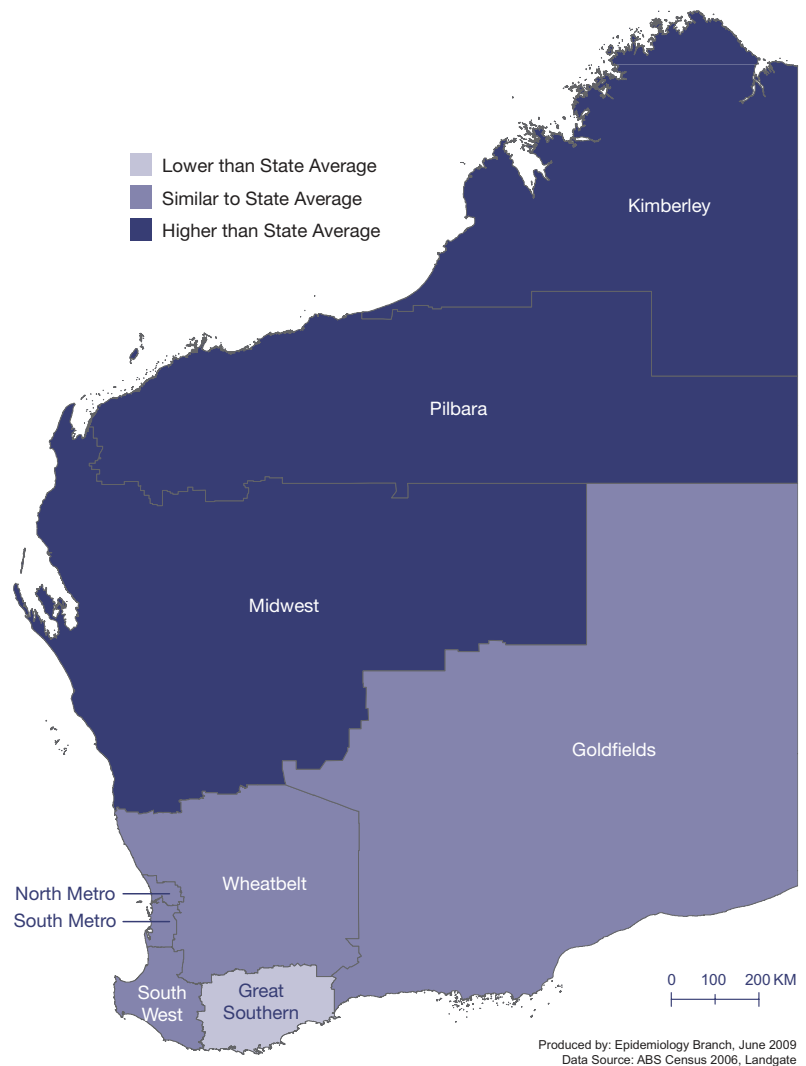
Between 1997 and 2007, the incidence of lung cancer decreased in the total male population from 68 to 57 cases per 100,000 persons. However, the same pattern has not been seen in WA females where the incidence of lung cancer, while lower than males has remained relatively stable (29 to 31 cases per 100,000 persons). This difference in incidence is due to the historical differences in smoking prevalence patterns between males and females.

In 2007, the incidence rate of lung cancer was 1.5 times higher among Indigenous people than non-Indigenous people (64 cases per 100,000 persons compared with 42 cases per 100,000 persons respectively).

Mortality rates for lung cancer among WA males and females have followed a similar pattern to incidence rates. Between 1997 and 2006, male mortality rates for lung cancer decreased by an average of 1.8% per year (58 to 53 deaths per 100,000 persons), while female rates remained relatively stable (23 to 25 deaths per 100,000 persons).

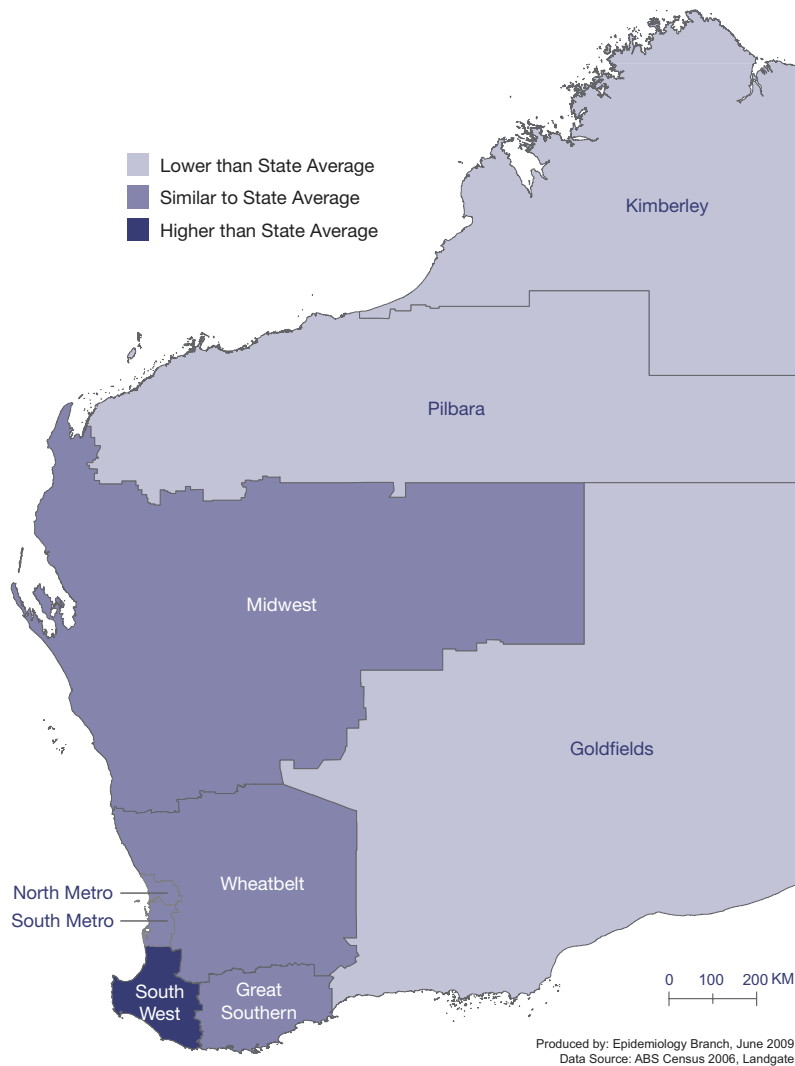
From 1997 to 2007, the incidence rate of lung cancer was significantly higher than the State rate in the Midwest, Pilbara and Kimberley, while rates were significantly lower than the State in the Great Southern region (Figure 26).

Figure 26: Standardised incidence rate ratio, lung cancer, all ages by health region, WA, 1997–2007



In 2006, the mortality rate of lung cancer was two times higher in the Indigenous population compared to the non-Indigenous population (74.6 cases per 100,000 persons compared with 37 cases per 100,000 persons respectively).

Figure 27: Standardised incidence rate ratio, melanoma, all ages by health region, WA, 1997–2007



Melanoma is a cancer of particular prominence in Australia, with the highest incidence of skin cancer in the world, and incidence rates at least three times higher than other countries that consider skin cancer to be a major public health problem. Of the States and Territories, Queensland has the highest incidence of skin cancer, followed by WA (Draper, et al., 2005).

The incidence rate for melanoma remained relatively stable from 1997 to 2007 for both males and females in WA. However, from 1997 to 2006, the mortality rate increased for males by an average of 3.7% annually (7.7 to 10 per 100,000 persons), while the mortality rate for females remained relatively stable over the same period (Table 7).

To prevent skin cancer, the National Health and Medical Research Council recommends:

- Reducing exposure to sun light,
- The wearing of long-sleeve shirts and hats, together with sunglasses and sunscreen when in the sun,
- Remaining in the shade if outdoors and remaining indoors during the middle of the day, when sun exposure is at its maximum

(National Health and Medical Research Council, 1996).

The risk of developing a skin cancer is related to:

- Sun exposure,
- Skin type,
- Geographic location,
- Existing moles,
- Number of birth marks and
- Previous melanoma (Austoker, 1994).



Colorectal cancer, commonly known as bowel cancer, is a malignant tumour that starts in the bowel wall. It is generally confined to a local area for a relatively long period before spreading through the bowel wall and metastasising to lymph nodes and other parts of the body. Survival rates are greatly improved when the disease is detected and treated in its early stages (National Health and Medical Research Council, 1999).

Early detection of colorectal cancer is vital in order to ensure the best possible outcome. In Australia, a National Bowel Cancer Screening Program was set up in 2006, following a pilot program that ran through 2002–2004. The aim of the program was to detect colorectal cancer at an early stage so that available treatment has an optimum chance for success. The second phase of the program commenced on 1 July 2008. The program offers screening to people turning 50, 55 or 65 years of age, between January 2008 and December 2010.

If colorectal cancer is detected, the most common treatment is the resection of the colon or rectum (or both). This treatment is often performed in conjunction with chemotherapy or radiotherapy (National Health and Medical Research Council, 1999).

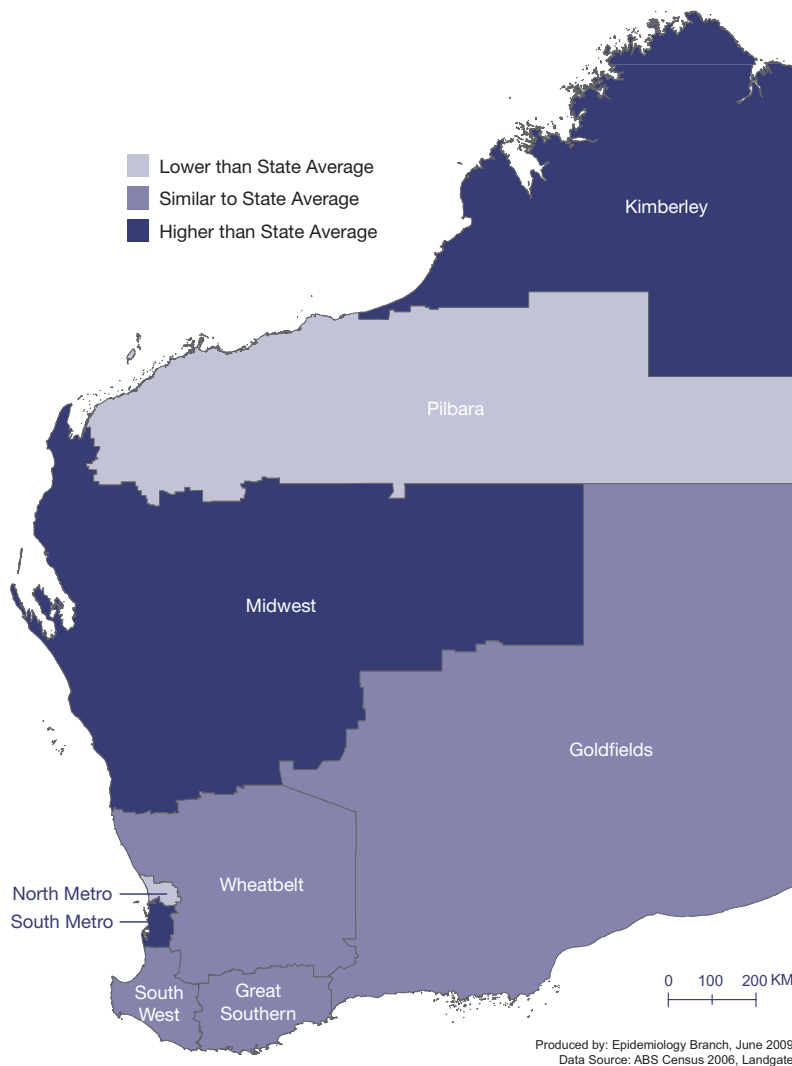
While genetic factors can lead to the development of colorectal cancer, the primary risk factors are:

- Age,
- A diet high in fat and low in fibre,
- High alcohol consumption and
- A lack of physical activity (Levi, et al., 1999; Bingham, et al., 2003; Chao, et al., 2005).

From 1997 to 2007, the incidence of colorectal cancer remained relatively stable for WA females, 49 to 46 new cases per 100,000 persons, and decreased for WA males from 75 to 64 cases per 100,000 persons (Table 7). From 1997 to 2006, the mortality rate for colorectal cancer decreased for both males and females in WA. Over this period, male rates fell by an average of 3.8% per year (34 to 25 deaths per 100,000 persons), while female rates fell by an average of 2.3% per year from 20 to 18 deaths per 100,000 persons.

Eating a diet high in fruits and vegetables, limiting red meat intake and eating whole grain products is associated with a reduced risk of colorectal cancer (Levi, et al., 1999; Bingham, et al., 2003).

Figure 28: Standardised incidence rate ratio, colorectal cancer, all ages, by health region, WA, 1997–2007



Compared with the State average, incidence rates for colorectal cancer were lower in the:

- North Metropolitan and,
- Pilbara health regions.

Incidence rates were higher than the state average in the:

- Kimberley,
- Midwest, and
- South metropolitan regions (Figure 28).

Breast cancer continues to be the most commonly diagnosed cancer in WA females. The incidence of breast cancer is strongly related to age, with rates doubling every 10 years until menopause after which the rate slows considerably (McPherson, et al., 2000). Breast cancer is one of the few conditions mentioned in this report where modifiable risk factors do not play a major role in the development of the condition.

The risk of developing breast cancer has been linked to:

- Early menarche,
- Late menopause,
- Mother’s age at first birth (highest risk for first time mother aged 35 years or over) and
- Not having children at all (McPherson, et al., 2000).

From 1997 to 2007, the incidence rate for breast cancer among WA females remained relatively stable (110 to 109 cases per 100,000 persons). However, from 1997 to 2006, the mortality rate for breast cancer fell significantly from 26 to 21 deaths per 100,000 persons. Keys to this decrease have been early detection and rapid initiation of treatment. This process has been greatly improved by the introduction of BreastScreen WA, which was established in 1989.

The target age group for breast screening in WA is 50–69 years. From 2000/01 to 2005/06, the participation rate for breast screening increased from 56% to 57% of the target population. In 2005, 65 cases of breast cancer were detected per 10,000 screens in the 50–69 age group (BreastScreen WA, 2008).

Prostate cancer is the most commonly diagnosed cancer in WA males (Threlfall and Thompson, 2007). The prostate is a walnut-size gland found only in males, situated where the bladder joins the urethra (Prostate Cancer Foundation of Australia, 2009). Prostate cancer is a malignant growth of the glandular cells of the prostate. Initially, the cancer will remain within the prostate, but as it grows it may spread outside the confines of the prostate gland into the fat surrounding the prostate. It may also grow into the bladder and seminal vesicles. The major problem with prostate cancer is that in many cases there are no symptoms or the symptoms are not specific and can be indicative of other health problems (Prostate Cancer Foundation of Australia, 2009).

From 1997 to 2007, the incidence of prostate cancer in WA males increased from 107 to 172 cases per 100,000 persons. Increased incidence is largely due to increased testing using prostate-specific antigen testing to screen men for

prostate cancer (Australian Institute of Health and Welfare, 2008a).

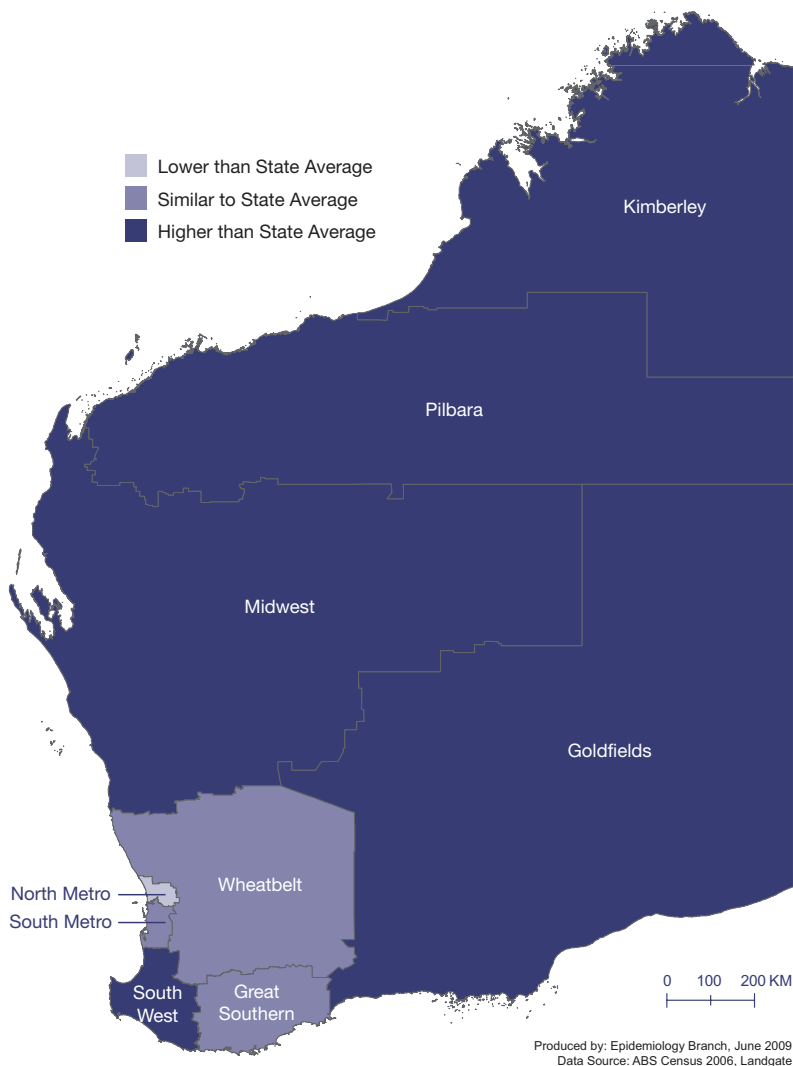
From 1997 to 2006, the mortality rate for prostate cancer remained relatively stable at around 30 cases per 100,000 persons. Rates were higher in the South West Health Region compared with the State average, while all other regions recorded similar rates to the State average.

Chronic Obstructive Pulmonary Disease

Chronic Obstructive Pulmonary Disease (COPD) encompasses the conditions of emphysema and chronic bronchitis. This condition is one of the top 10 causes of disease burden in both adults aged 25–64 years and adults aged 65 years and over (Figures 22 and 23). COPD is characterised by the breakdown of lung tissue and the narrowing of the airways, which reduces the amount of oxygen that can be taken into the lungs. This causes shortness of breath, combined with an overproduction of mucus and can also lead to chronic coughing fits (Australian Institute of Health and Welfare, 2008a). The main risk factor for COPD development is smoking.

From 1999/00 to 2007/08, the hospital separation rate for COPD decreased for both males and females in WA. For males, the rate fell by an average of 4.2% per year from 3.7 to 2.7 separations per 1,000 persons, while female rates decreased by an average of 1.5% per year (2.2 to 2.0 hospitalisations per 1,000 persons).

Figure 29: Standardised mortality rate ratio, COPD, all ages, by health region, WA, 1997–2006



From 1999/00 to 2007/08 Indigenous Western Australians recorded a significant fall in COPD separations. However, in 2007/08 COPD separation rates for Indigenous people were 6.7 times higher than non-Indigenous at 14 and 2.1 separations per 1,000 persons respectively.

COPD affects the Indigenous population at a younger age, with the highest hospitalisation rates in the 65–79 year age group compared with the 80+ year age group in the non-Indigenous population.

Both males and females in WA recorded declining mortality rates for COPD between 1997 and 2006. For males the rate fell by an average of 6.0% per year (46 to 27 deaths per year), while the female rate declined by an average of 1.9% per year (19 to 15 deaths per year). In 2006 the COPD mortality rate for the Indigenous population was 4.5 times higher compared with non-Indigenous rates (86 and 19 deaths per 100,000 persons respectively).

From 1997 to 2006, the mortality rate for COPD was significantly higher than the State in the Goldfields, Kimberley, Midwest, Pilbara and South West, while rates were significantly lower than the State in the North Metropolitan area (Figure 29).



Accidental Falls

In 2003, the disease burden due to falls was attributed equally to years lost to disability (45%) and years of life lost (55%) in persons aged 65 years and over. This is indicative of the higher number of deaths at older ages from falls and the long rehabilitation time required after acute care among the elderly.

In WA, falls related injuries were more common in children and persons aged 65 years and over (Figures 15 and 23). In the elderly, falls can result in fractures of the neck of the femur (fracture in the leg under the ball of the hip) which require hospitalisation and extensive rehabilitation. This is costly to the community through bed usage and resources as well as to the individual with respect to a reduced quality of life.

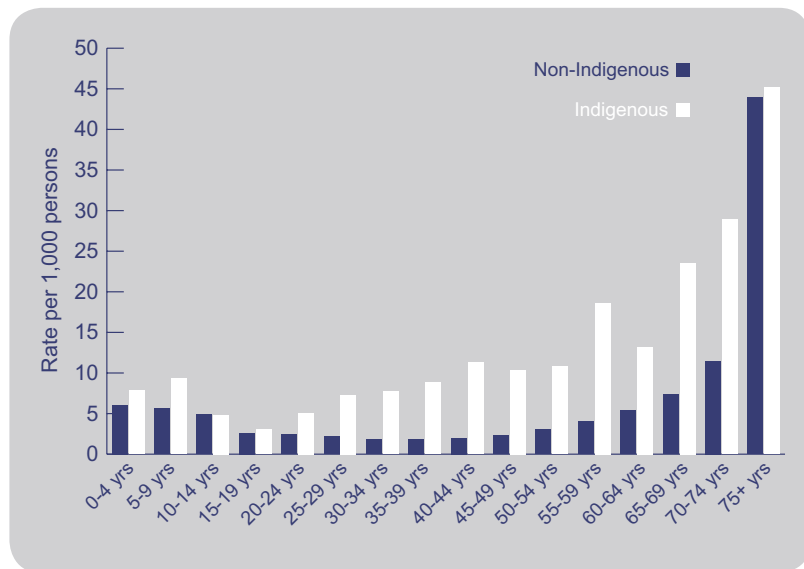
From 1999/00 to 2007/08, the hospitalisation rate for falls in the WA total population remained relatively stable for both males and females (Table 7). The highest rates of hospitalisation for males were experienced by those aged 65 years and over, followed by boys aged 14 years and younger. For females, those aged 65 years and over recorded the highest rates for accidental falls followed by girls aged nine years and younger.

Figure 30: Standardised hospitalisation rate ratio, accidental falls, all ages, by health region, WA, 1999/00–2007/08



Hospital separation rates for accidental falls were significantly higher than the State average in all rural and remote regions of WA in 1999/2000–2007/08 (Figure 30). However, there were no regional differences in the mortality rate.

Figure 31: Age-specific hospitalisation rate per 1,000 persons, accidental falls, by Indigenous status, WA, 2005/06–2007/08



Source: WA Hospital Morbidity Data System.

Over the period 1997–2006, Indigenous Western Australians recorded mortality rates 2.6 times higher than non-Indigenous Western Australians for accidental falls.

Age-specific patterns for accidental fall hospitalisations differed by Indigenous status (Figure 31). From 1999/00 to 2007/08, hospitalisation rates for accidental falls remained relatively stable for both Indigenous and non-Indigenous people. Despite this relative stability, Indigenous separation rates in 2007/08 were approximately twice that recorded by non-Indigenous people.

Between 1997 and 2006, mortality rates for accidental falls increased for males, while the female rate remained relatively stable (Table 7). For males, the rate increased by an average of 6.6% per year from 3.2 to 6.4 per 100,000 persons. Persons aged 85 years and over were the most likely to record an accidental fall as the primary cause of death in 2006.



Table 7: Age-standardised mortality and separation/incidence rate, various causes, by sex, WA

	Mortality rate ^(a)	Trend ^(b)	Separation ^(c) /Incidence ^(d) rate	Trend ^(e)
All causes				
Males	708.0	↓	353.8	↑
Females	462.7	↓	378.0	↑
Cardiovascular disease (I00–I99)				
Males	233.0	↓	24.1	↓
Females	153.5	↓	15.0	↓
Ischaemic heart disease (I20–I25)				
Males	129.9	↓	8.8	↓
Females	70.3	↓	3.9	↓
Stroke (I60–I69; G45)				
Males	46.6	↓	2.5	↔
Females	40.9	↓	1.8	↓
Cancer (C00–C96)				
Males	231.0	↓	563.1	↑
Females	137.5	↓	382.8	↔
Lung cancer (C33; C34)				
Males	53.1	↓	56.8	↓
Females	25.1	↔	30.9	↔
Colorectal cancer (C18–C21)				
Males	24.6	↓	64.2	↓
Females	17.6	↓	46.3	↔
Breast cancer (C50)				
Males	—		—	
Females	21.1	↓	108.8	↔
Prostate cancer (C61)				
Males	30.5	↔	171.9	↑
Females	—		—	
Melanoma (C43)				
Males	10.4	↑	59.7	↔
Females	3.8	↔	39.8	↔
Diabetes (E10–E14)				
Males	20.9	↔	4.4	↑
Females	15.0	↔	3.6	↑
Asthma (J45; J46)				
Males	1.5	↔	1.4	↓
Females	1.5	↓	1.5	↓

(Continued on next page.)

Table 7: Age-standardised mortality and separation/incidence rate, various causes by sex, WA (continued)

	Mortality rate ^(a)	Trend ^(b)	Separation ^(c) /Incidence ^(d) rate	Trend ^(e)
COPD (J40-J44; I27 excl I27.1)				
Males	27.4	↓	2.7	↓
Females	14.8	↓	2.0	↓
External causes (V01-Y98)				
Males	54.7	↓	27.0	↑
Females	22.7	↓	19.0	↔
Transport accidents (V01-V99)				
Males	13.8	↓	4.0	↑
Females	4.4	↓	1.6	↔
Accidental falls (W00-W19)				
Males	6.4	↑	5.7	↔
Females	4.2	↔	6.3	↔
Suicide/self harm (X60-X84)				
Males	15.7	↓	0.8	↓
Females	4.1	↓	1.4	↔

(a) Mortality rate for 2006.

(b) Trend calculated between 1997 and 2006.

(c) Separation rate for 2007/08.

(d) Incidence rate for cancers only in 2007.

(e) All trends calculated between 1999/2000 and 2007/08, except cancer rates where trends are calculated between 1997 and 2007.

↑ Increasing trend.

↓ Decreasing trend.

↔ No significant trend.

Note: Hospital separation rates are per 1,000 persons all other rates are per 100,000 persons.

Source: ABS Mortality Data; WA Hospital Morbidity Data System; WA Cancer Registry.





Future Challenges for WA Health

The epidemiological evidence from the history of public health in WA has demonstrated how health interventions and public health measures in particular, have improved the health of Western Australians. Further evidence is provided on the role public health has played in identifying and providing solutions to the past and current health issues facing the WA population. The monitoring and surveillance role of public health is of great importance in providing the evidence to describe and define health problems as well as identifying target populations at greatest risk.

The overview of health status presented in this report demonstrates that the current health of the Western Australian population is excellent and improving. Despite this, an assessment of the total WA population illustrates that there are still opportunities for health gains, particularly in addressing inequalities in health among population groups.

One area where health interventions can potentially provide large health gains is in the prevention and reduction of the impact of chronic disease and injury on the population. Although significant gains have been made in reducing the level of chronic disease and injury in recent years, they still contribute a large proportion of the avoidable premature deaths and disease burden in WA. There is also the potential to achieve gains in reducing hospitalisations as demonstrated by the level of chronic disease that contributes to potentially preventable hospitalisations.

It is even more imperative to reduce the impact of chronic disease and injury considering our ageing population. With chronic disease largely affecting the elderly, as the population ages there will be greater pressure on the health system if the level of chronic disease is not reduced.

A major focus should be on reducing the impact of chronic disease and injury through the promotion and protection of the health of the population. In WA there are two key strategies to achieve this: *The WA Health Promotion Strategic Framework 2007–2011* (Population Health Policy Branch, 2007) and the *Public Health Bill, 2009* (See box on page 9).

The WA Health Promotion Strategic Framework seeks to broaden the scope of health promotion through encouraging approaches to reduce the impact of chronic disease and injury, not only by reducing the risk of disease and injury, but also by delaying the onset of and minimising the complications of disease. The strategy aims to develop a comprehensive health promotion approach including policy and legislative initiatives, lifestyle and behavioural changes, improving health literacy and involvement of communities.



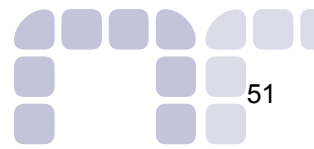
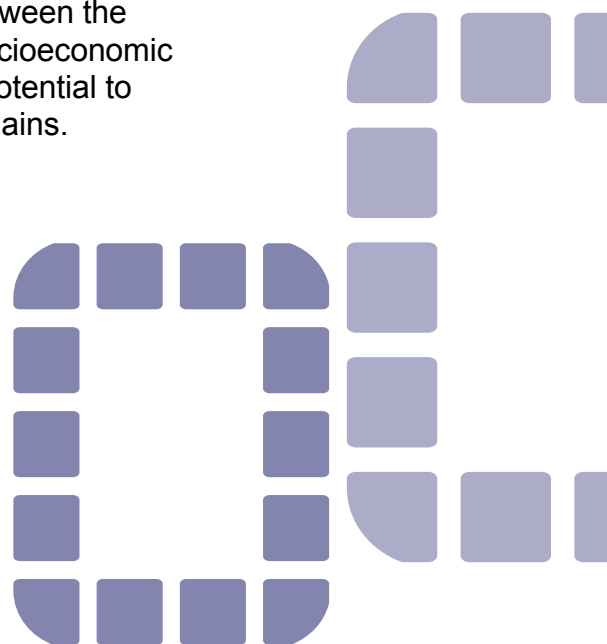
Programs developed under the *WA Health Promotion Strategic Framework 2007–2011* will be complemented by collaboration with the Commonwealth Department of Health and Ageing under the National Partnership Agreement on Preventive Health. The partnership plans to establish healthy behaviours regarding smoking, nutrition, alcohol and physical activity within community settings by influencing private service sectors and mobilising the resources of public and non-government sectors. Social marketing campaigns will be used to educate the public of the need for a healthy lifestyle.

Chronic disease and injury are also linked with poor mental health. People with mental disorders have a higher prevalence of chronic disease than the general public and mental disorders can increase the risk of chronic disease and injury (Australian Institute of Health and Welfare, 2008a). This report has identified mental disorders and suicide as leading causes of disease burden. The implementation of effective mental health promotion and illness prevention strategies in association with programs targeted at other chronic conditions has the potential for large health gains. The Mental Health Division has developed the *Western Australian Mental Health Promotion, Illness Prevention and Early Intervention Strategic Framework 2007–2009*

(Mental Health Division, 2007), a strategy for progressing mental health promotion and illness prevention in Western Australia.

While prevention and management of chronic disease and injury are priorities for the total population, there are groups within the population with poorer health outcomes and higher risk factor prevalence levels than the State average.

Aboriginal people continue to record higher avoidable premature death rates, earlier onset and higher prevalence of chronic disease and injury and worse health risk factor profiles than the total population. Individuals in the most socioeconomically disadvantaged group also have poorer health outcomes with higher death rates among both genders compared with the least disadvantaged groups. Improving the gap between the highest and lowest socioeconomic groups also has the potential to achieve large health gains.



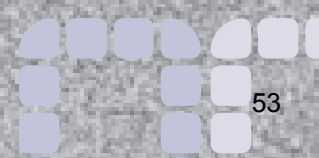
Reducing the disparity in health outcomes of Aboriginal people and individuals with low socioeconomic circumstances has specific challenges. Initiatives to improve Aboriginal health need to encompass cultural, social, economic and environmental conditions and socioeconomic disadvantage through collaboration with local communities. Since socioeconomic status is influenced by education, income, unemployment and marginalisation, it is imperative that health initiatives are developed in partnership with other government agencies.

While chronic disease has the greatest impact on older age groups, the environmental influences and development of behaviours in early life are important in preventing chronic disease and injury. *Our Children Our Future: A Framework for Child and Youth Health Services in Western Australia 2008–2012*

(Department of Health WA, 2008) provides a plan for improving the health and wellbeing of children and youths through interventions addressing the determinants of health in early childhood, ensuring early diagnosis, acute care and treatment, encouraging self-management of chronic disease, promoting health-enhancing behaviours, improving health service provision as well as guaranteeing specific population groups access to culturally sensitive services.

It should be borne in mind that some major issues, such as sexually transmitted infections, HIV/AIDS and hepatitis C are not highlighted in this report. Future reports will focus more on risk factors, both traditional and emerging, and vulnerable groups, such as children, the elderly, Aboriginal people and those in poorer pockets or regions of Western Australia.





Glossary

Age-specific rate

Age-specific rates are based on five-year age groups and are calculated by dividing the number of cases by the population of the same sex and age group.

Age-standardised rate (ASR)

Weighted average of age-specific rates according to a standard distribution to eliminate the effect of different age distributions and thus facilitate valid comparison of groups with differing age compositions. In this report the 2001 Australian population has been used as the standard.

Chronic

Persisting over a long period.

Chronic condition

Term applied to a diverse group of conditions, such as heart disease, cancer and arthritis, which tend to be long-lasting and persistent in their symptoms or development. Although these features also apply to some communicable diseases (infections), the term is usually confined to non-communicable diseases.

Communicable disease

Disease or illness due to an infectious organism or their toxic products. Communication may occur directly or indirectly via contact with other humans, animals or other environments that harbour the organism.

Crude rate

The number of cases (such as hospitalisations) divided by the population, expressed as per 100,000 population.

Crude birth rate

The number of births for women aged 15–44 years divided by the number of female population aged 15–44. Crude rates cannot be directly compared between population groups because of potential differences in population age structure.

Epidemic

An outbreak of a disease or its occurrence at a level that is clearly higher than usual, especially if it affects a large proportion of the population.

Epidemiology

The study of the distribution and determinants of health-related states and events in populations, and the application of this study to the control of health problems.

External cause

Environmental events, circumstances or conditions that are the cause of injury and poisoning or other adverse effects (World Health Organization (WHO), 1977).

Immunisation

The production of immunity by artificial means. Passive immunity, as produced by antisera, is temporary; active immunity involves production by the body of its own antibodies – see Vaccination.

Incidence rate

The number of instances of illness commencing, or of persons falling ill, during a given period in a specified population and divided by the population at risk.

Indigenous person

A person of Aboriginal or Torres Strait Islander descent who identifies as an Aboriginal person or Torres Strait Islander and is accepted as such by the community in which he or she lives.



Infant mortality rate

Number of infant deaths per 1,000 live births.

Lifetime risk

Lifetime risk is a measure which approximates the risk of contracting a disease in a lifetime (up to 74 years), if the risk at the time of estimation remained throughout life. No account has been taken of exposure to specific risk factors or the impact of screening. This is derived from the relevant cumulative incidence/mortality figure obtained by summing age-specific rates, and is calculated for ages 0–74 years. In this report, lifetime risk is restricted to a specific age group (e.g. 50 to 74 years).

Morbidity

Any departure, subjective or objective, from a state of physiological or psychological wellbeing.

Mortality

Death.

Neonatal death

Death within 28 days of birth of an infant weighing 400 grams or more at birth or of at least 20 weeks gestation.

Risk factor

An attribute or exposure that is associated with an increased probability of a specified outcome, such as the occurrence of a disease. Not necessarily a causal factor.

Perinatal

Pertaining to or occurring in the perinatal period and calculated as the sum of stillbirths and neonatal deaths. This period is usually 28 days.

Person years of life lost (PYLL)

A measure of premature death by estimating the number of years of potential life lost due to specific causes of death.

Prevalence

The number of instances of a given disease or other condition in a given population at a designated time.

Quintile

One of five groups containing equal numbers of measurements in a set of measurements that are ranked from lowest to highest value. The low quintile is that value that has at most 20% of the measurements below it and at most 80% above it.

Separation

Separation is the term used for the completion process at the end of a patient's episode of care, be it a discharge home, death, transfer to another hospital or change of care type.

Stillbirth

Birth of a foetus weighing at least 400 grams (or where birthweight is unavailable, of at least 20 weeks gestation), which shows no signs of life.

Total fertility rate

The number of live births a woman would have if, throughout her reproductive years, she had children at the rates prevailing in the reference calendar year. It is the sum of the age-specific fertility rates for that calendar year.

Vaccination

The production of active immunity by the use of a treated antigen to stimulate the body to produce its own antibodies. See also Immunisation.

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