**Area of study** | **Outcomes**
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1. Understanding Australia’s health | Compare the health status of Australia’s population with that of other developed countries, compare and explain the variations in health status of population groups within Australia and discuss the role of the National Health Priority Areas in improving Australia’s health status.
2. Promoting health in Australia | Discuss and analyse approaches to health and health promotion, and describe Australia’s health system and the different roles of government and non-government organisations in promoting health.
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MEASURING HEALTH STATUS
KEY KNOWLEDGE

- Definitions of physical, social and mental dimensions of health and health status
- Different measures of health status of Australians, including the meaning of burden of disease, Health Adjusted Life Expectancy and Disability Adjusted Life Years (DALYs), life expectancy, under-five mortality rate, mortality, morbidity, incidence and prevalence
- The role of determinants of health, including the physical environment, biological, behavioural and social, in explaining variations in health status

KEY SKILLS

- Define key health terms
INTRODUCTION

Health is a complex concept. The overall state of a person’s health is dependent on the interaction between the three dimensions of health – physical health, social health and mental health. Throughout a person’s life their level of health does not always remain the same – it can be affected by their genetic make-up, their environment and the individual choices they make. Measuring the health status of individuals and populations and analysing the factors that impact on their health is important for understanding the wellbeing of Australians and for determining potential ways of improving the health of the population. The status of an individual and a population’s health can be measured in various ways.

1.1 Defining health and health status

Health is a complex, multidimensional concept that is usually measured in terms of the absence of physical pain, physical disability or a condition that is likely to cause death; emotional and mental wellbeing; and adequate social functioning. The most universally used definition of health was developed by the World Health Organization (WHO) in 1946. At this time, health was defined as ‘a state of complete physical, mental and social wellbeing, and not merely the absence of disease or infirmity’. This broad definition of health also includes the concept of wellbeing.

While the WHO definition of health will be used throughout the study of Health and Human Development, it is important to acknowledge other concepts relevant to an understanding of how we define health. In 1986, the World Health Organization, in the Ottawa Charter for Health Promotion, stated that health is ‘a resource for everyday life, not the objective of living. Health is a positive concept emphasising social and personal resources, as well as physical capacities’. Health can therefore be defined in multiple ways, including a focus on the absence of illness, the ability to cope with everyday activities, or on wellbeing. In any organism, health is a form of homeostasis – a state of balance, with inputs and outputs designed to create equilibrium.

Overall, when considering the concept of health there needs to be an acknowledgement that it is the complex process of attainment of wellbeing and progression away from disease and infirmity. This commonly accepted definition of health incorporates physical, mental and social aspects of health. Therefore, being healthy does not just mean being physically fit, it also means feeling good about every aspect of one’s life. In this way, being of sound mind is also important, as is social wellness or the ability to form and maintain a network of friends.
**Health status** refers to an individual’s or population’s overall health, taking into account various factors such as life expectancy, amount of disability and levels of disease risk factors. An individual’s health status is an overall evaluation of their degree of wellbeing or illness with a number of indicators, including quality of life and functionality. The level of health of an individual, group or population can be assessed subjectively by the individual through self-assessment or through the use of more objective measures such as statistical data.

**Think, Pair, Share**

What is the difference between health and wellbeing? Considering these two concepts, develop your own description of health.

### 1.2 Defining the dimensions of health

**Physical dimension of health**

Relates to the efficient functioning of the body and its systems, and includes the physical capacity to perform tasks and physical fitness.

**Social dimension of health**

Being able to interact with others and participate in the community in both an independent and cooperative way.

**Mental dimension of health**

‘State of wellbeing in which the individual realises his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community.’ (WHO, 2009)

**Chronic diseases**

Diseases marked by a long duration and frequent recurrence that often progress slowly, especially degenerative diseases such as osteoarthritis. Also known as non-communicable diseases.

There are three dimensions of health that combine to determine an individual’s or group’s overall level of wellbeing. These include **physical dimension of health**, **social dimension of health** and **mental dimension of health**. What are considered to be good levels of physical, social and mental health will differ from one person to another. The mental and social dimensions of health are often overlooked in order to focus on the more visible physical functioning. If a person ‘looks’ healthy, we often assume that they are without looking beyond their physical condition. This is due to the fact that risk factors such as physical fitness and chronic disease are often more easily defined and unambiguous. In order to achieve a state of wellbeing, however, each of the dimensions must be given due attention. Importantly, their interdependence should be recognised. For example, high levels of health in one dimension can to a certain degree compensate for attributes lacking in another of the dimensions. The three dimensions of health will be defined and elaborated on below.

**Physical dimension of health**

The physical dimension of health refers to the efficient functioning of the body and its systems and includes the physical capacity to perform tasks and physical fitness.

Physical health includes factors such as appropriate body weight for height, level of fitness, as well as the functioning of the body’s organs and systems, which will impact on body functions such as blood cholesterol and glucose levels. Healthy eating, reduced levels of risk-taking behaviour such as tobacco use, reduced exposure to damaging environmental conditions and appropriate levels of physical activity are important for good physical health.
The physical dimension of health is often the first dimension considered when examining an individual’s level of health. This may be due to the fact that the outcomes of physical health, or ill health, are often visibly discernible and easily diagnosable by healthcare professionals.

Physical health is the overall physical condition of an individual at a given time. It includes the reliability of their body function, freedom from disease or illness, and the condition of optimal physical wellbeing. If an individual is experiencing good physical health then they are able to perform according to the way their body has been designed to function.

A high level of physical health is the result of regular exercise, suitable diet and nutrition and proper rest for physical recovery. In order to obtain and maintain good physical health, an individual needs to take responsibility and care for minor illness, take actions to prevent injury and disability where possible, seek professional medical attention when necessary, and understand the relationship between sound nutrition and physical activity and the functioning of the body. Physical activity is important for physical fitness. This optimises lung capacity and function, cardiovascular strength and overall flexibility of muscles and joints. An appropriate level of physical activity can also optimise immune response, which can provide beneficial defence against some viruses and other microorganisms.

A high level of physical health also necessitates appropriate use of knowledge and decision-making. For example, good physical health encourages regular physical activity, appropriate use of medical care, the undertaking of safety practices such as wearing a seatbelt when travelling in a car or a helmet when riding a bicycle, and the application of knowledge about food and nutrition. It also discourages the use of tobacco, drugs and excessive alcohol use.
Social dimension of health

The social dimension of health refers to being able to interact with others and participate in the community in both an independent and cooperative way.

Social health depends on how effectively people are able to interact with others in their society and/or the environment. Being accepted by others and interacting well within different groups of people, including family and peers, is very important for good social health.

The definition of social health incorporates elements of personality and social skills, and reflects social norms and social functioning. The consideration of social health as a major dimension of health was stimulated by its inclusion in the World Health Organization’s definition of health, and by the resulting emphasis for the healthcare system to treat patients as social beings who live in a complex social context. Social health has also become relevant with the increasing evidence that those who are well integrated into their communities tend to live longer and recover faster from disease. Conversely, social isolation has been shown to be a risk factor for illness. Hence, social health may be described in terms of social adjustment and social support and the ability to perform normal roles in society.

The social dimension of health encourages an individual to contribute to their environment in order to increase the welfare of their community. Social health emphasises interdependence with others and being aware of each person’s importance in society as well as the impact they have on their community. A major component of an individual’s social health involves experiencing better communication with those around them.

Figure 1.4 Health and wellbeing also require social wellness
A high level of social health involves positive interactions and enjoyment with others. Positive interaction implies being comfortable and at ease during various social situations and communicating effectively to others. In order for this to occur, building close friendships is important, as well as effective listening, caring about others, recognising the need for leisure and recreation that involves others, and ensuring time is made for these activities. Shared social support is also commonly viewed as an aspect of social health. Social support contributes to positive adjustment in children and adults, and encourages personal growth. Having a sense of community is an important indicator of social health.

**Mental dimension of health**

The mental dimension of health refers to the state of wellbeing in which the individual realises his or her own abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to his or her community.

Mental health is dependent on how well a person can function where their thoughts, feelings and behaviours are concerned, not only relevant to themselves but to the world around them. A key facet of mental health is the ability to control one’s response to stress. A feeling of belonging is important for good mental health, as is maintaining a high level of self-esteem as it increases coping abilities.

Mental health also includes consideration of an individual’s emotional and psychological wellbeing. Mental health involves an individual being able to use their emotional capabilities, being able to function in society and being able to meet the common demands of everyday life.

According to the World Health Organization, there is no singular definition of mental health that can be applied worldwide.
Cultural differences, subjective assessments, and competing professional theories all affect how mental health is defined. A high level of mental health enables an individual to feel capable and competent, to handle normal levels of stress, to maintain satisfying relationships and to be able to lead an independent life. Another indication of good mental health is being able to recover from difficult situations with relative ease, which reveals healthy resilience capabilities. A positive state of mind and a sense of self-esteem enable a person to function effectively within society. Individuals who have good mental health are well adjusted to society, are able to relate well to others, and maintain a basic feeling of satisfaction with themselves and their role in society.

Overall, the mental dimension of health emphasises an awareness and acceptance of one’s feelings, thoughts and behaviours, as well as those of others. The individual is able to freely express their own feelings and manage them effectively to arrive at personal choices that allow them to be a productive member of the community. Self-esteem allows the individual to form interdependent relationships with others based upon a foundation of mutual commitment, trust and respect where emotional needs are met constructively. The maintenance of good mental health, a positive attitude, high self-esteem and a strong self-image facilitates the individual’s ability to respond resiliently to emotional states and the stresses of everyday life.

According to recent research, understanding the way humans interact – whether it is in person or online – could help to prevent disease and promote general health.

Most people easily recognise the positives of social networking: the ability to connect with people even when you’re in an isolated situation, experiencing happiness from staying in touch with friends and family who are far away, and having the flexibility to communicate whenever time allows. The negatives are often more difficult to recognise, but one of the most obvious effects is that it encourages a lifestyle shift from active to sedentary activity. The greatest concerns for young people who overuse social networking are bullying and depression.
Health is a changing entity
An individual’s state of health is an ever-changing entity that is affected by dynamic interactions with the environment. A high level of wellbeing does not exclude periods of illness. A combination of physical, mental and social wellbeing is necessary to achieve overall health. An individual will have fluctuating states of health relating to their capacities in body structure and function, emotional functioning, and social activities and participation. This state or level of health can be determined by the use of a health continuum. Health falls somewhere on a line (continuum) from a high level to a low level (refer to Figure 1.7). The choices made by an individual determine whether they have a high or low level of health.

A high level of health could be characterised by optimal levels of functioning or capacity in all the dimensions of health, and freedom from any type of illness or disease. As an individual moves towards the other end of the continuum...
they are progressing towards chronic illness and premature death. In between these states there are many degrees of wellness or illness. Maintaining an optimal level of wellbeing or health requires a balance and interaction between all of the dimensions of health. **Optimal health** involves an individual taking good care of their physical self, using their mind constructively, expressing emotions effectively and being successfully involved with those around them. No one dimension of health works independently and each dimension will influence the others to determine the overall level of wellbeing, and hence the health status of the individual.

For example, an individual who is working long hours in an office and feeling the effects of being away from their family may experience a negative impact on their physical, mental and social health. They may be advised to incorporate more physical activity with their family into their lifestyle in order to bring the dimensions of health into balance. Making even a small effort in a previously neglected dimension often results in a much more balanced perspective.

Many athletes would agree that it takes a great deal of mental effort to sustain physical performance. There is also evidence supporting the notion that physical activity has the capacity to enhance mental and social health. Physical activity has been linked to positive mood, lower levels of depression and elevated alertness and concentration, enhanced self-esteem and a sense of direction.

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**Figure 1.7** The health continuum

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**optimal health** The best possible state of an individual’s health for their age.

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**Figure 1.8** Interrelationship between the dimensions of health
**THINK, PAIR, SHARE**

Discuss the positive and negative impacts physical health can have on a person's mental and social health.

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**Fig. 1.9 Concept map of the dimensions of health**

**ACTIVITY 1.2**

**Case study analysis**

**The dimensions of health**

Lauren is a 45-year-old woman with three children – Sophie aged six months, David aged 12 years and Kyle aged 15 years. Lauren's third pregnancy was unplanned and has had quite an impact on her life. She needed to go back to work when the baby turned five months old due to financial reasons. This required her to book Sophie into crèche three days a week, but she would rather be home looking after her as she did for her two other children. She feels guilty about this as she thoroughly enjoys the time she spends with each of her...
children. When Lauren is not working she is very busy meeting the different needs and obligations of the three children. For example, she spends a great deal of time travelling in the car getting the two older children to their sporting events. Lauren is beginning to feel quite time-pressured due to this and she is also feeling socially isolated because all of her close friends have teenage children and therefore have a greater level of freedom. Lauren is currently underweight and even though she has tried to gain weight, her lack of time for appropriate exercise is limited and her high stress levels are affecting her appetite negatively.

B Jack is a 10-year-old primary school child. His parents were divorced two years ago – an experience that upset him very much. As a result, Jack’s mother initiated sessions with a counsellor and the result has been an increase in his happiness levels as well as confidence. Jack currently plays a musical instrument quite well and has just performed in a concert for which he received a small trophy. He has put this up in his room and it seems that he is feeling more positive about himself. Jack also participates in football in winter and cricket in summer, which allows him to spend time with his friends outside of school.

C Agium is a Year 10 student who is a recent arrival in Australia. She is 17 years old so much older than her co-students in Year 10. She has originally come from Sudan but has spent the last two years in a refugee camp in Kenya where the conditions were quite harsh. While in the refugee camp, Agium had limited access to many resources such as healthcare, adequate food and quality housing. There was very limited schooling opportunity (two hours in an outdoor classroom per week – but without pens or paper) and there was also a lot of violence in the camp, which did affect Agium directly when she was attacked by a group of teenage males. Now that Agium is in Australia she is extremely happy as she has access to the things she needs to stay healthy, including regular, high-quality schooling. She now eats well and gets plenty of physical exercise. One of the things that Agium enjoys most about school is the friends she has made. She is finding the work extremely difficult, however, because of her limited experience of schooling and her poorer English skills. Reading and writing are a challenge.

1 Identify examples for each of the dimensions of health in each case study.
2 Provide two examples from each case study where one dimension of health is having an effect on another dimension.
3 Choose three of your examples from question 2 and discuss if the interrelationship between the dimensions of health identified is a positive or negative one. Justify your response by explaining further.
4 Provide examples of how the health of each individual described above could be improved to further correspond to the WHO definition of health.
1.3 Measurements of health status

The health of an individual can be measured via an examination by a health professional. In this examination, a rating may occur by determining the presence or absence of illness, risk factors for premature death, severity of disease and overall health. Individual health status may also be self-assessed by asking the person to rate his or her own health by gauging physical function, emotional wellbeing, pain or discomfort and overall perception of health.

The level of health, or health status, of a population can be measured with the use of data and statistics gathered by various organisations. The average lifespan, the occurrence of preventable diseases, and the magnitude and cause of premature deaths are examples of indicators of the health status of a particular population. Judgements regarding the level of health of a particular population are often made by comparing one population to another, or by studying the trends in a health indicator within a population over time.

The statistics used for the determination of health status draw on many sources of data, each with their own strengths and limitations. Generally, the data used to measure health status focuses on assessing the level and distribution of health issues of a population. Even though the goal is to promote good health, this measurement has most often focused on the negative aspects of health, including illness, disease, disability and death.

At present, in Australia there is increasing interest in population health outcomes. This interest relates to changes in the orientation of health policies and has important implications for health information used by the healthcare system and provided to the public in order to optimise the health of the population.

Life expectancy and Health Adjusted Life Expectancy

In the absence of comprehensive measures of the health of a population, the average lifespan (life expectancy) may be used as an indicator of health status. Life expectancy is an indication of how long a person can expect to live. It is the number of years of life remaining to a person at a particular age if death rates do not change.

Life expectancy can be measured from any specified age, in particular at ages 30, 65 and 85 years of age. However, the most commonly used measure is the expectation of the length of life from birth. This calculation is based on changing mortality patterns. Therefore, it is a theoretical measure and can alter for an individual with changing trends in disease frequency in the population and with individual behavioural changes.

Life expectancy estimates alone certainly do not fully reflect the health status of the population. These estimates provide no indication of the quality of life, only the quantity.

Health Adjusted Life Expectancy (HALE) is a more comprehensive health status indicator than that of life expectancy because it comprises the concept of ‘quality of life’. As total life expectancy has risen in recent years, greater attention has shifted to determining the number of healthy years that individuals can expect to live. Increased focus on attaining healthy life expectancy...
expectancy is due largely to advances in medical technology and greater awareness of health promotion and disease prevention.

In general terms, HALE is an estimate of the number of healthy years (free from disability or disease) that a person born in a particular year can expect to live based on current trends in deaths and disease patterns. To calculate HALE, the average number of years spent in unhealthy states or reduced functioning is subtracted from the overall life expectancy; however, it is calculated using a formula that takes into account the relative severity of the ill health. The amount of ill health needed to be subtracted is often determined through the use of self-assessed data and Disability Adjusted Life Years (DALY).

Traditional life expectancy and HALE figures are compared to arrive at an estimate of the burden of ill health. HALE can also allow the health of the population to be monitored over time and compared with that of other states and countries.

Mortality, morbidity and burden of disease

Mortality and under-five mortality rate

Data on death and its causes are vital measures of a population’s health. Examining trends and patterns in mortality can help to explain changes and differences in health status, evaluate health strategies, and guide planning and policy-making.

Mortality data is routinely collected and readily available, and is therefore the most often used instrument for monitoring health. Mortality refers to the number of deaths caused by a particular disease, illness or other environmental factor. Causes of death are also widely used for international comparisons of health and disease. The mortality rate is equivalent to the number of deaths in the population during a specified time period divided by the total number of persons in the population during the specified time period. Mortality rates can be calculated for deaths from specific causes and for specific age and gender groupings. Death rates can be calculated for all causes combined, specific causes and particular age or sex groups.
One of the major measures of health status of a population is the **under-five mortality rate (U5MR)**. The under-five mortality rate estimates the number of deaths of children under five years of age per 1000 live births. The under-five mortality rate is, strictly speaking, not a rate (i.e. the number of deaths divided by the number of population at risk during a certain period of time) but a probability of death derived from a life table. It is sometimes referred to as child mortality and it also encompasses infant mortality. The infant mortality rate is the probability of a child born in a specific year or period dying before reaching the age of one.

The under-five mortality rate is a widely used indicator of a population’s health status because it is associated with a population’s access to education, level of economic development and availability of health services. Such a measure estimates the overall health and wellbeing of a population. This measure enables the monitoring of the number of deaths to specific childhood illness, but may also help to monitor other social conditions, such as access to food, clean water and healthcare; infectious diseases; gender discrimination and the socioeconomic status of a population.

**Morbidity**

The occurrence of disease, illness, disability and injury in a population is another measure of health status. This is known as morbidity.
morbidity “Refers to ill health in an individual and the levels of ill health in a population or group.” (AIHW, 2008)

Morbidity refers to the ill health in an individual and the levels of ill health in a population or group.

According to the World Health Organization (WHO), morbidity can be measured in terms of the number of individuals who are ill, the illnesses these individuals are experiencing and the duration of these illnesses. As well as chronic disease levels, morbidity data can also include the prevalence of long-term conditions such as hay fever and allergies, long or short sightedness, deafness and hypertensive disease. Long-term conditions are health conditions that have lasted, or are expected to last, at least six months. These conditions are commonly analysed in the collection of health data in government health surveys.

Morbidity data is useful in determining patterns in disease occurrence. However, compared with mortality data, the collection of morbidity data is often incomplete and as a result poses significant measurement problems. A more effective measure of the amount of disease or illness in a population is burden of disease.

Burden of disease

While the commonly used measures of mortality and morbidity have merit in telling us about the health of a population, they are inadequate for providing the information required for developing informed health policies and for assessing the impact on individuals of having limited function and ill health that affect their everyday life. These measures also make it difficult to obtain an unambiguous representation of the extent of disease and injury in a population. For example, some chronic diseases or injuries may cause few fatalities but cause long-term debilitation for an individual, and therefore have an effect on the health of an individual that cannot be measured or included in mortality and morbidity data.

New health indicators or health outcome measures have been developed to assist in the analysis of the consequences of disease and the burden that it is having on the population.

Burden of disease is a concept that was developed in the 1990s by organisations such as WHO to describe death and loss of health due to diseases, injuries and risk factors for all regions of the world. Burden of disease can be defined as a measure of the impact of diseases and injuries. Specifically, it measures the gap between current health status and an ideal situation where everyone lives to an old age free of disease and disability.

The burden of a particular disease or condition is estimated by adding together the number of years of life a person loses as a consequence of dying early because of the disease and the number of years of life a person lives with disability caused by the disease.

A unit of measure called the Disability Adjusted Life Year (DALY) has been developed to compare the impact of different diseases and injuries on an equal basis. One DALY equals one year of healthy life lost due to premature death and time lived with illness, disease or injury.

The use of DALYs as a measurement of health status allows the determination of how much illness or disease exists in a population and the effect it is having on the population’s quality of life. The DALY has been specifically developed in order to enable international...
comparative assessments in health to be made. Thus, the disease burden between different population groups and for different countries (allowing for different population sizes) can be measured. DALYs can also be applied to the impact of risk factors as well. The more DALYs (lost ‘healthy life’) a population has, the greater the burden of disease that population is experiencing. That lost healthy life can be from premature death, prolonged illness or disability, or a combination.

DALYs are measured through the use of two key indicators: Years of Life Lost (YLL) and Years Lost due to Disability (YLD). YLL refers to the fatal burden of disease of a population and is defined as the years of life lost due to death. YLL is calculated from the number of deaths multiplied by a standard life expectancy at the age at which death occurs. The standard life expectancy used for YLL at each age is the same for deaths in all regions of the world and is the same as that used for the calculation of DALYs. YLL take into account the age at which deaths occur by giving greater weight to deaths at younger ages and lower weight to deaths at older ages.

YLD (Years Lost due to Disability) refers to the non-fatal component of the disease burden and is a measurement of the healthy years lost due to diseases or injuries. YLD presents a substantially different picture from that provided by YLL. More than half of the burden of disease is due to non-fatal consequences of disease.

\[ \text{YLL} + \text{YLD} = \text{DALYs} \]

**Incidence and prevalence**

The measurement of the health status of a country or population group is very important for enabling the development of health policies and programs. The research and statistics undertaken can also provide fundamental information necessary for disease prevention and treatment. Monitoring health trends over time is also important in providing useful insights into the development of disease patterns and the health of a population. Analysis of trends can reveal changes in disease or injury incidence and prevalence and allows for the creation of appropriate health interventions for a specific period of time. Incidence and prevalence are terms used when measuring morbidity data.

**Prevalence** refers to the number or proportion of cases of a particular disease or condition present in a population at a given time. It is calculated by dividing the number of cases of disease present in the population at a specified period of time by the number of persons at risk of having the disease at that specified time. The ratios used to calculate incidence and prevalence are then multiplied by 1000 or 100,000 to yield statistics that are more readily interpretable.

**Incidence** is the number or rate of new cases of a particular condition during a specific time. Incidence rates are calculated by dividing the number of new cases of a disease occurring in the population during a specified time period by the number of persons exposed to risk of developing the disease during that period of time.
1.4 The determinants of health

An individual’s health is complex and determined by a number of interacting factors. These influences can include access to healthcare services, where one lives, the quality of the environment, genetics, income and education level, as well as relationships with friends and family.

There are further factors that influence an individual’s health throughout the lifespan. Some factors influencing health are not modifiable, such as one’s age, sex and genetic make-up. Modifiable health determinants are those over which individuals have some influence and which can be grouped into health-related behaviours (for example, diet, exercise, smoking and alcohol use) and biomedical factors (for example, raised blood pressure value and abnormal cholesterol level).

Modifiable health risk factors, in particular, are important targets for preventative health interventions. The rise of a number of chronic diseases over the past century, including cardiovascular disease (CVD) and several different types of cancers, has led to wider views in regard to their causes. Research on populations shows the importance of behaviours and choices made by individuals in relation to food intake, physical activity and tobacco use in determining health.
As such, health has come to be seen as the result of the interactions of biological factors, behavioural factors, and social factors as well as the physical environment. All of these are referred to as the determinants of health.

The determinants of health are defined as the factors that raise or lower the level of health in a population or individual. Determinants of health help to explain or predict trends in health and why some groups have better or worse health than others. Understanding the determinants of health is important for understanding the trends in health issues and the potential for prevention of and protection against ill health.

There are four main categories of determinants:

- physical environment
- biological determinants
- behavioural determinants
- social determinants.

**Physical environment**

The physical environment refers to the physical situations and surroundings that exert an influence on the health of people. The physical environment can have a direct effect on the wellbeing of a person by exposing them to certain situations that can be detrimental or beneficial to their health. The physical environment refers to the physical surroundings in which individuals exist on a daily basis. These surroundings may include home, school, workplace, geographical location (whether a person lives in a city area or a rural area) and the wider community environment.

The physical environment also includes the natural resources in the surroundings. Environmental determinants can also affect the decisions that individuals make regarding their health.

**Figure 1.14** A person’s access to open spaces can have an impact on their health status
Environmental influences on health can be direct or indirect, simple or complex and immediate or delayed. For some people, the physical environment may contain harmful or toxic substances that also impact on the health and development of individuals.

**Air, water and sanitation quality**

Many environmental influences are involuntary. For example, indoor air may contain constituents such as asbestos, moulds, radon gas, carbon monoxide and methane that affect health. A range of ailments related to living or working in closed buildings with poor air quality is recognised, including higher levels of respiratory diseases. However, the greatest environmental hazard to healthy indoor air quality remains tobacco smoke, especially for children living in the homes of smokers. These children experience more asthma and bronchitis, are at a higher risk for sudden infant death syndrome, and have more lung and ear infections than children living in homes without tobacco smoke.

Around the world, millions of people live in places that have unhealthy levels of ozone or other air pollutants. In some countries, there is often a higher prevalence of asthma in both adults and children compared with the national averages in areas where ozone pollution is high. In the developing world, hundreds of millions of people suffer from respiratory diseases caused by biological and chemical agents in the air; both indoors and outdoors.

In Australia there are national initiatives to reduce the impact of road transport on environmental air quality to reduce pollution; however, it is still ranked by the population as a major environmental issue and impacts on cardiovascular and respiratory health due to the particulate matter and nitrogen dioxide it contains, which lead to inflammation of the airways.

Water quality in Australia is extremely high in comparison to other countries and overall has a very positive influence on health as Australia’s waterways are of a high quality according to global standards and generally have a low count of fecal contamination and industrial pollution – commonly used indicators of water quality. Drinking water, recycled water and wastewater are all subject to Water Quality Guidelines in Australia.

The Australian Drinking Water Guidelines (ADWG) have been developed by the National Health and Medical Research Council (NHMRC) in collaboration with the Natural Resource Management Ministerial Council (NRMMC). The ADWG provide the Australian community and the water supply industry with guidance on what constitutes good-quality drinking water. NHMRC has also examined a wide range of chemicals for treating water in Australia. To be acceptable, a chemical must be non-toxic and have practical application (e.g. must clarify dirty water or remove harmful organisms).

An excellent sanitation system as well as water-quality control measures, particularly in Australia’s largest cities, also contribute to a high water-quality ranking. In countries in Europe and Asia with a high population density, sewage
outfalls and factory pollution have a huge national impact on the water.

Poor-quality water can be a risk factor for illness. Unsanitary water is contaminated water containing a number of viruses and harmful bacteria that can be detrimental to health. Diseases associated with the consumption of water of poor quality include gastroenteritis, diarrhoea, typhoid fever and hepatitis. Parasitic diseases associated with contaminated water include giardiasis, dysentery and diarrhoea. Consumption of unsafe drinking water can result in dehydration due to loss of fluids when experiencing diarrhoea and can lead to loss of life.

Infrastructure – roads and buildings, including housing

Road infrastructure and lack of access to recreational facilities such as walking and cycling tracks are increasingly identified as risk factors for chronic diseases, especially respiratory conditions. As urban areas spread and people live further from the city centre, they drive more, resulting in more vehicle collisions, as well as higher rates of heart and respiratory diseases and obesity, and elevated stress related to both commuting among congested traffic and increased noise levels.

In rural areas where transportation is limited to private car use or where walking or cycling is impractical, obesity is higher than in urban areas. Also, road traffic injuries are higher due to poorer road conditions, the presence of wildlife and livestock as road hazards and increased time spent in car travel.

The safety of road infrastructure for cyclists remains an issue. Cycling has the potential to improve fitness, diminish obesity, and reduce noise, air pollution and greenhouse gases associated with travel. However, cyclists incur a higher risk of injuries requiring hospitalisation than motor vehicle occupants. Road infrastructure that is purpose-built with bicycle-specific facilities reduces crashes and injuries among cyclists. Street lighting, paved surfaces and low-angled grades are additional road infrastructure factors that appear to improve cyclist safety.

The impact of housing on physical health is associated with the material condition of housing. Conditions of the greatest concern include inadequate water supply, washing facilities, sanitation and overcrowding. Living in poor housing conditions can influence the mental health and wellbeing of households due to the many social issues that arise from inadequate material resources. Overcrowding also puts increased stress on health infrastructure, such as water supply and sewage disposal systems, and is closely linked to housing standards and conditions. Generally, overcrowding is considered to have its main impact on the health of children and can cause respiratory conditions, skin infections and meningitis.

According to Australian Bureau of Statistics (ABS) data (2008), links between inadequate

Figure 1.16 An example of poor-quality housing
rubbish disposal and health include: trauma from slipping on wet/dirty surfaces; trauma from glass or other sharp objects and infections from injuries; suffocation of children from plastic bags; fire risk from inflammable materials; and health problems associated with blocked health infrastructure such as sewerage systems.

Also of concern is an inadequate power and electricity supply, which may restrict the capacity of people to carry out healthy living practices such as washing, cooking, food storage, temperature control and lighting. Poor electricity supply or inadequately maintained power supply may also cause injury through fire damage.

**Natural environment – climate change and natural disasters**

It has been established that the Earth is warming and climatic conditions are changing. In Australia many areas have been experiencing rainfall reductions for several decades and other areas across the country have experienced droughts and other natural disasters due to changing climate. Even though efforts are being made to reduce greenhouse gas emissions and reduce climate change, the trends in altered climate are expected to continue and will impact health through their effects on the physical environment.

Expected events include:
- increase in sea level
- heatwaves – more per year
- droughts – more frequent and severe
- bushfires – increased risk
- flooding – increased intensity
- storms – increased intensity
- tropical cyclones (in areas prone to them) – increased intensity.

The links between a climate variable and a health impact can be very direct, including physical injuries suffered during an event such as flooding, or increases in respiratory symptoms during heatwaves.

As the climate continues to get hotter, this impacts on food production, resulting in a change in fresh food consumption due to high costs of food, which could increase a range of diet-related diseases such as **type 2 diabetes, cardiovascular disease** and obesity. Mosquito breeding patterns are increasing due to weather change, resulting in an increase in mosquito-borne diseases such as Ross River virus.
and Murray Valley encephalitis virus. Changes to exposure to UV due to changing temperatures can increase the prevalence of skin cancer, melanoma and eye diseases.

When natural disasters occur there can be multiple outcomes for health, some of which are quite direct and immediate but others can be unseen and long-term. Examples of natural disasters include floods, droughts, bushfires, severe storms and cyclones. Immediate health outcomes for individuals can be physical injuries and fatalities, and exposure to chemicals that cause respiratory distress and allergic reactions. Other effects on health can include an increase in water-borne illnesses leading to gastrointestinal diseases, diarrhoea and vomiting, and increase in diseases spread by mosquitoes including Ross River virus, Barmah Forest virus, dengue fever and Murray Valley encephalitis virus.

When natural disasters occur, such as droughts and bushfires, the air quality can change, leading to an increase in air pollutants and smog, which can trigger asthma episodes and allergic reactions. In terms of social and mental health, damaged infrastructure and buildings – including loss of homes, loss of income and assets, loss of transport systems and communication systems, as well as dislocation – can all cause trauma and lead to mental health stress conditions.

**Biological determinants**

**Biological determinants** of health refer to factors relating to the body that impact on health, including genetics, hormones, body weight, blood pressure, cholesterol levels and birth weight. The genetic make-up of an individual can determine many aspects of their life-long health. In particular, the inheritance of sex determines not only physical functioning in relation to reproductive systems, but also the types and quantities of hormones that are released and the effect they have on the body and its physical functioning.

**Genetics**

Genetic inheritance plays a role in determining lifespan, healthiness and the likelihood of developing specific illnesses. Genes can influence your risk of getting some diseases, such as breast cancer, heart disease, asthma, diabetes and thyroid conditions. This is referred to as predisposition to disease. However, other factors, such as lifestyle and environment, also play a role in developing these conditions and there is an increased risk of disease development due to a combination of these factors.

Other conditions that are related to genetic inheritance are caused by the inheritance of DNA variants, referred to as mutations, which result in a change in one of the genes affecting the way the body works or develops. A condition caused by mutations in one or more genes is called a genetic disorder. Some, like muscular dystrophy, cystic fibrosis and sickle-cell disease, cause serious health problems for those who inherit them.

**Body weight**

Body weight is an influence on health and of particular concern is the incidence of overweight and obesity in Australia. Body weight is influenced by genetics and body functioning in relation to metabolism and hormonal control of body functions.

A biological influence on body weight is the inheritance of a certain body type from genes. Body type relates to a combination of body shape and size. There are three general body types: ectomorph (thin and tall shape), endomorph (round shape) and mesomorph (muscular shape). Biological factors are also often influenced by behavioural factors, which
are in turn influenced by environmental factors. For example, the health-related behaviours of physical activity and food intake can affect the biological factor of body weight.

**Blood cholesterol, impaired glucose regulation and blood pressure**

**BLOOD CHOLESTEROL**

Cholesterol is a waxy, fat-like substance that’s found in all cells of the body. Cholesterol is used by the body for the production of hormones, vitamin D and digestive enzymes. Because cholesterol is a fat-based chemical and the bloodstream consists mainly of water, in order for cholesterol to travel around the body it needs to be carried in small packages called lipoproteins. There are two types of lipoproteins and it is important to have healthy levels of both. LDL cholesterol is sometimes called ‘bad’ cholesterol. A high LDL level leads to a build-up of cholesterol in your arteries.

HDL cholesterol is sometimes called ‘good’ cholesterol. This is because it carries cholesterol from other parts of your body back to the liver, which then removes it from the body. High blood cholesterol is a condition in which there is too much cholesterol in the bloodstream. A consistently high level of LDL cholesterol in the bloodstream can build up in the walls of arteries, referred to as plaque. Narrowing of coronary arteries due to plaque can stop or slow down the flow of blood to your heart. When the arteries narrow, the amount of oxygen-carrying blood is decreased, causing coronary heart disease.

**BLOOD PRESSURE**

Blood pressure is the force of blood against the walls of arteries. Blood pressure rises and falls during the day. When blood pressure stays elevated over time, it is called **high blood pressure**. The medical term for high blood pressure when blood is being pumped through the arteries at a harder and faster rate than one that is considered to be normal and healthy. This is also known as hypertension.

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*Figure 1.18 Blood pressure is a biological determinant of health*
high blood pressure is hypertension. A blood pressure level of 140/90 mmHg or higher is considered high. High blood pressure is a threat to health because it makes the heart work too hard and contributes to atherosclerosis (hardening of the arteries). High blood pressure can also result in other conditions, such as congestive heart failure, kidney disease and blindness, and it can increase the risk of having a stroke. The causes of high blood pressure vary. Causes may include narrowing of the arteries, a greater than normal volume of blood, or the heart beating faster or more forcefully than it should. Risk factors for high blood pressure include age, genetic predisposition, being overweight or obese, excessive alcohol use, tobacco use, too much sodium (salt) in the diet and stress.

**Birth weight**

Birth weight is the first weight of the newborn measured immediately after birth. Birth weight of less than 2500 grams is considered low birth weight. Some low-birth-weight babies are healthy, even though they’re small, but being low birth weight can cause serious health problems for some babies. There are two main reasons why a baby may be born with low birth weight: premature birth or foetal growth restriction. Premature birth is when a baby is born before 37 completed weeks of pregnancy. Foetal growth restriction is when the foetus doesn’t gain an appropriate amount of weight before birth due to problems with the placenta, infections, the age of the mother — low birth weight is more prevalent for young mothers aged 15–17 and older mothers aged in their 40s — or lifestyle choices of the mother including smoking and alcohol use.

Health problems for low-birth-weight babies include:

- **Respiratory distress syndrome:** This breathing problem is common in babies born before 34 weeks of pregnancy. Babies with RDS don’t have a protein called surfactant that keeps small air sacs in the lungs from collapsing.
- **Bleeding in the brain:** Bleeding in the brain can affect low-birth-weight babies in the first three days of life. Most brain bleeds are mild and fix themselves with no or few lasting problems. More severe bleeds can cause pressure on the brain that can cause fluid to build up in the brain, causing brain damage.
- **Heart problems:** As a foetus, a large artery called the ductus arteriosus lets the baby’s blood bypass the lungs. This artery closes after birth so that blood can travel to the baby’s lungs where oxygen is collected. When the artery doesn’t close properly, it can lead to heart failure.
• Eye conditions: Babies born before 32 weeks of pregnancy can have problems with the blood vessels in their eyes. This may require treatment to prevent vision loss, although in some cases it can heal itself.

In terms of later life for the low-birth-weight baby, studies have shown they may be more likely than babies born at a normal weight to have certain medical conditions, including high blood pressure, diabetes and heart disease.

**Behavioural determinants**

The **behavioural determinants** of health are actions or patterns of living of an individual or a group that impact on their health. Examples of behavioural determinants include factors such as smoking, sexual activity, participation in physical activity, and eating practices. Health-related behaviour is an important determinant of a person’s current and future health status.

Health-related behaviours are adjustable actions undertaken by individuals that affect their health either positively or negatively. In most cases, an individual can choose whether to behave in a way that has a positive or negative impact on their health.

Health behaviours account for the greatest burden of disease and injury in Australia.

For example, tobacco use, physical inactivity, alcohol use, use of illicit drugs and unsafe sex are contributing factors to many of the top 10 causes of death in Australia.

**Tobacco use, excessive alcohol use and illicit drug use**

Smoking remains one of the leading causes of preventable illness, disability and premature death in Australia. Tobacco smoke contains more than 4000 chemicals. Many are known to be harmful substances, including tar, nicotine, carbon monoxide, benzene, formaldehyde and hydrogen cyanide, and these chemicals adversely affect all organs and body systems as
many of these chemicals are known carcinogens (cancer causing) and tobacco smoke itself is carcinogenic.

Smoking may be a detriment to physical fitness as it reduces the ability of the blood to carry oxygen and increases the heart rate and basal metabolic rate. This counteracts the benefits of physical activity by impacting on cardiovascular fitness. Tobacco use causes reduced circulation by narrowing the blood vessels.

Diseases and conditions associated with tobacco use include:
• coronary heart disease
• peripheral vascular disease (circulatory problems)
• high cholesterol (LDL)
• lung cancer
• cancer of the mouth, throat pharynx, larynx and oesophagus
• cancer of the pancreas
• cancer of the kidney and urinary bladder
• chronic obstructive pulmonary disease (COPD)
• chronic bronchitis
• emphysema
• pneumonia
• peptic ulcers
• chronic bowel disease (Crohn’s disease)
• gum disease
• osteoporosis
• cataracts
• thyroid disease.

Smoking also causes respiratory problems, which can include increased coughing, phlegm, wheezing, chest colds and shortness of breath.

Passive smoking can also lead to health problems and long periods of exposure can cause many of the same health problems as active smoking. For children who are exposed to passive smoking on a regular basis, passive smoking can cause respiratory infections, ear infections and slower lung growth and decreased lung function. Smoking during pregnancy can cause miscarriages, low birth weights and other complications with foetal development, premature births and stillborn births, and newborn babies are more susceptible to sudden infant death syndrome (SIDS).

According to the NHMRC study on Alcohol and Health in Australia (2011), alcohol-related harm in individuals arises not only from the quantity of alcohol consumed but also from a complex interaction between their sex, body size and composition, age, experience of drinking, genetics, nutrition, individual metabolism and social factors. The effects of alcohol on the body can be immediate and intoxication is the most common cause of alcohol-related problems, leading to injuries and premature deaths, including suffocation due to inhibition of normal breathing.

Alcohol is responsible for:
• 30% of road accidents
• 44% of fire injuries
• 34% of falls and drownings
• 16% of child abuse cases
• 12% of suicides
• 10% of industrial accidents.
Other short-term effects can include loss of balance, nausea and loss of productivity, which can cause stress.

Long-term health concerns from excessive alcohol use can include:

- **Overweight and obesity**: Alcohol adds kilojoules to the normal diet and may increase energy intake and fat storage further by increasing appetite.
- **Cardiovascular disease**: Long-term use of excessive amounts of alcohol can cause high blood pressure, some types of cardiac failure, stroke and other circulatory problems.
- **Cancer**: Alcohol is carcinogenic and is related to cancers of the mouth, pharynx, larynx, oesophagus, liver and colorectum.
- **Liver disease**: Alcohol use is the most common cause of cirrhosis of the liver.
- **Mental health conditions**: There is growing evidence that alcohol increases the risk of mental health conditions such as depression and anxiety.
- **Foetal defects**: Alcohol use during pregnancy is also a health concern for the foetus and can cause a range of birth defects and growth and developmental problems, including foetal alcohol spectrum disorder (FASD).

Illicit drug use refers to the use of illegal drugs (including marijuana/cannabis, heroin, ecstasy and cocaine), the use of volatile substances as inhalants (such as glue, solvents and petrol) and the abuse of pharmaceutical drugs (including over-the-counter and prescription). Illicit drug use is a risk factor for a range of health concerns, including infection with blood-borne viruses, low birth weight, undernutrition, poisoning, mental illness, suicide, self-inflicted injury and overdose (AIHW, 2012).

### Physical activity level

Physical activity is defined as ‘any force exerted by skeletal muscles that results in energy expenditure above resting level’. Participation in regular physical activity – at least 30 minutes of moderate activity on at least five days per week for adults – is critical to sustaining good health. Habitual physical activity leads to cardiovascular fitness, which decreases the risk of cardiovascular disease mortality in general and coronary heart disease mortality in particular. High blood pressure is a major underlying cause of cardiovascular complications and mortality. Regular physical activity can prevent or delay the development of high blood pressure, and reduces blood pressure in people with hypertension. Regular physical activity is also important for maintaining muscle strength, joint structure, joint functioning and bone health. Weight-bearing physical activity is essential for normal skeletal development during childhood and adolescence and for achieving and maintaining peak bone mass in young adults, which is required for the prevention of osteoporosis.

Regular physical activity reduces morbidity and mortality from mental health disorders and some studies suggest physical activity prevents depression. Participation in physical activity and sports can promote social wellbeing, as well as good physical and mental health, among young people. Research has shown that students who participate in interscholastic sports are less likely to be regular and heavy smokers or use drugs. Currently, almost 60% of Australians aged 15 and over do not do enough physical activity to benefit their health, as defined by national guidelines.

Overall, an appropriate and ongoing routine of physical activity is associated with:

- reduced risk of dying prematurely from heart disease
MEASURING HEALTH STATUS

Chapter 1

• reduced risk of developing diabetes
• reduced risk of developing high blood pressure
• reduced risk of developing some cancers, including colorectal and breast cancer
• maintaining a healthy weight
• building and maintaining healthy bones, muscles and joints and helping to prevent osteoporosis
• reduced feelings of depression and anxiety and more positive mental wellbeing.

Food intake
The nutrients in food enable the cells in our bodies to perform their necessary functions. If the correct balance of nutrients is not obtained by the body then metabolic processes suffer and health declines. For example, when nutrient intake does not regularly meet the nutrient needs dictated by the cell activity, the metabolic processes are negatively affected. Getting too much food or consuming large amounts of unhealthy food can result in becoming overweight, undernourished and at risk for the development of diseases and conditions, such as obesity, osteoporosis, diabetes and cardiovascular disease. The burden of disease due to poor diet is often associated with large intakes of energy-dense foods, with high saturated fat, sugar and/or salt content, and low intakes of nutrient-dense foods, such as vegetables, fruit and wholegrain cereals. This is discussed in greater detail in Chapter 4.

Immunisation
Immunisation refers to becoming immune to a disease as a result of receiving a vaccine. It is an effective and safe way of preventing an individual from acquiring an infectious disease. Vaccination involves the administration of an antigen to produce immunity to a specific disease. It works by presenting an antigen to the immune system to evoke an immune response. The Australian Standard Vaccination...
Schedule outlines the recommended and fully funded vaccine plan by age group for the Immunise Australia Program. The schedule of childhood immunisations in Australia protects against diphtheria, tetanus, pertussis (whooping cough), polio, pneumococcal disease, meningococcal C disease, hepatitis B, Haemophilus influenzae type b (Hib), rotavirus, chicken pox, measles, mumps and rubella (German measles). Many vaccines result in both a benefit to health and savings in direct medical care costs.

Other than children, immunisation can be of benefit for other groups within the community at greatest risk of infectious diseases. For example, elderly people with an impaired immune system are particularly vulnerable to vaccine-preventable diseases such as influenza and pneumococcal disease, and people aged 65 years and over qualify for free pneumococcal and seasonal flu vaccines.

In addition, some occupations may put people at risk of some diseases such as hepatitis A, hepatitis B, tuberculosis or Q fever. As well as the vaccines on the schedule, Aboriginal and Torres Strait Islanders are offered additional vaccinations:

- Indigenous children living in Queensland, Western Australia, Northern Territory and South Australia are also eligible for the hepatitis A vaccination program and it’s suggested they are given an additional dose of the pneumococcal vaccine between 18–24 months.
- For Indigenous people over 50, and those aged 15 to 49 who are at high risk, there are free pneumococcal and influenza immunisations.

Figure 1.22 Immunisation is an effective and safe way of preventing an individual from acquiring an infectious disease.
Sun-protection behaviour

Australia has the highest rate of skin cancer in the world. While the sun’s ultraviolet (UV) radiation is the major cause of skin cancer, it is also a valuable source of vitamin D and therefore it is important to use appropriate sun-protection measures in order to help with vitamin D levels while minimising the risk of skin cancer.

Prolonged exposure to UV is not necessary to boost vitamin D levels and short periods of time in the sun are regarded as more efficient for the production of vitamin D, particularly in summer.

Spending too much time in the sun without protection will cause sunburn, which is an indication of skin being damaged. There are three types of UV rays – UVA, UVB and UVC. UVB rays are the main ones to cause sunburn, suntan, skin damage (wrinkles, brown age spots, leathery skin) and skin cancer.

Different types of skin have different levels of protection. People with fair skin and blonde or red hair have the least protection. Those with dark skin and black hair have the most; however, a person with a darker complexion is still able to suffer from skin damage.

In order to be protected from the sun the following is recommended by the Cancer Council:

• Seek shade between peak UV times (generally 10 a.m. to 3 p.m.).
• Wear sun-protective clothing that covers as much skin as possible, especially shoulders, arms and legs.
• Wear a broad-brimmed hat to protect the face, ears and neck.
• Apply SPF 30+ or SPF 50+ broad spectrum sunscreen at least 20 minutes before going outside or swimming, and re-apply every two hours.
• Wear sunglasses that fit well and wrap around the face (damage to the eye caused...
by ultraviolet radiation can cause vision impairment and, in some cases, blindness; cancer can also develop on the surface of the eye).

One of the biggest risk areas for getting sun damage is in the outdoor workplace. Between 2000 and 2009, a total of 1360 workers’ compensation claims for sun-related injury/ disease were made in Australia, at a total cost of $38.4 million. In Australia it is estimated that approximately 200 melanomas and 34 000 non-melanoma skin cancers per year are due to occupational exposure to UV. Workplaces are encouraged by the government to have adequate workplace sun-protection plans in place.

Road safety behaviour
According to the World Health Organization, an estimated 1.3 million people worldwide are killed each year on the roads; more than 3000 people die every day, including 500 children. In addition, 50 million people are estimated to be injured in road crashes each year. In Australia, fatalities have averaged approximately 1700 per annum during the past five years. While the fatality levels are of enormous concern, it is important to acknowledge that injury and property damage are also substantial issues.

Each year in Australia there are more than:
• 600 000 reported road crashes
• 200 000 reported injuries
• 22 000 serious injuries requiring long-term care and treatment
• 1700 people killed in road crashes.

The World Report on Road Traffic Injury Prevention, published by WHO and the World Bank, indicates that the major contributing factors to road crashes and injury severity include drink driving, lack of helmet use, seat belt non-compliance, excessive speed, and poor infrastructure design and management.

In addition to the grief and suffering they cause, road traffic crashes result in considerable economic losses to victims and their families, impacting negatively on mental health.

Sexual behaviour
Sexual health is defined by the WHO as the enjoyment of sexual relations without exploitation, oppression or abuse. Safe sexual behaviour includes:
• safe pregnancy and childbirth
• avoidace of unintended pregnancies
• absence and avoidance of sexually transmitted infections, including HIV.

Unhealthy sexual behaviour is any deviation from any of these three behaviours. Consequences of poor sexual behaviour are complex and poor sexual health can have many effects on the social and mental health of individuals as well as their relationships. Some examples of possible health consequences of poor sexual behaviour are:
• Unintended pregnancies: If occurring at a young age, unintended pregnancy can lead to a lack of social and economic opportunities for the young mothers.
• STIs:
  – Genital herpes: A common virus infection caused by herpes simplex virus. Genital herpes infection occurs through exposure of the genitals to the virus from a partner with active herpes.
  – Chlamydia: This can lead to pelvic inflammatory disease, leading to infertility.
  – Hepatitis B: This is spread via sexual contact and contact with body fluids.
  – Human Papilloma virus: This is the most significant risk factor for cervical cancer.
  – HIV: The Human Immunodeficiency Virus (HIV) attacks the body’s immune system; the body therefore becomes more susceptible to opportunistic infections.
Social determinants

The **social determinants** of health refer to aspects of society and the social environment that impact on health, such as poverty, early life experiences, social networks and support. The social determinants of health generally relate to influences involving contact with other members of the community such as families, peers, significant adults, members of schools and workplaces, and community groups (religious, sporting or musical).

Elements of culture, such as film and television, can also have a social influence on an individual’s health.

The most important social determinant of a person’s health is the environment shaped by their family. The majority of the social influence in this area relates to the features of family structure and function. The close proximity means family members’ experience may directly or indirectly influence the health-related behaviours that are undertaken by each member.

The wider community – including friendship groups, schools, sports and cultural groups – provides opportunities for people’s physical, social and mental health and wellbeing. A supportive social environment is critical to health.

**Socioeconomic status**

An individual’s socioeconomic status is determined by the key elements of income, education level, employment status and occupational type.

Research suggests that both physical and mental health are associated with socioeconomic status. In particular, studies suggest that lower socioeconomic status is linked to poorer health outcomes. Poor health
may in turn decrease an individual’s capacity to work, thereby reducing their ability to improve their socioeconomic status.

According to ‘Australia’s Health 2012’ (AIHW, 2012), relatively disadvantaged members of the community live shorter lives and have higher rates of illness, disability and death than those who are relatively advantaged. Of particular concern is the fact that Aboriginal and Torres Strait Islander people and people in lower socioeconomic groups generally have higher rates of death from cardiovascular disease and mental health illnesses than other Australians (AIHW, 2012).

Socioeconomically disadvantaged groups are also more likely to engage in health-damaging behaviours, experience poorer psychosocial health, make less use of the healthcare system for preventative purposes, and have a more adverse risk-factor profile.

Aboriginal and Torres Strait Islander people, people in lower socioeconomic groups, and those living in regional and remote Australia generally have higher rates of death from cardiovascular disease than other Australians (AIHW, 2011). Those living in areas of greater socioeconomic disadvantage rated their own health more negatively, had higher rates of some illnesses and had less healthy lifestyles than those in other areas. They visited their doctors more often, but made less use of some preventative health measures.

**Type of work and employment security**

Work affects health in many ways. The place of employment can influence health, not only by exposing individuals to physical conditions that have health effects, but also by providing a setting where healthy activities and behaviours can be promoted. Work can provide a sense of identity, social status and purpose in life, as well as social support. Work environments that facilitate mutual support between co-workers can reduce job stress and may provide a buffer against physical and mental health stressors related to work.

Employment also provides a source of income, which gives people the opportunity to pursue health-promoting behaviours and the ability to live in circumstances that promote health. Lack of employment among those who are unable to work due to ill health can lead to further economic and social disadvantage and fewer resources and opportunities to improve health, perpetuating a cycle of health issues.

Employment-related health problems have significant human and economic costs for individuals and for the community overall. Fatal and non-fatal work-related injuries and illnesses reported in private industry workplaces are high; approximately half of the non-fatal injuries result in time away from work due to recuperation, job transfer or job restriction. There is widespread awareness that both the physical tasks involved in a job and the physical work environment can have important health effects. These concerns have been the traditional domain of occupational health and safety.

The type of work and the tasks involved influence a worker’s risk of physical injury and illness. Certain jobs are also associated with higher risks. Manual labour jobs in particular have a high percentage of reported occupational illnesses and injuries.

Physically demanding daily tasks and uncomfortable working positions can lead to physical strain and injury, increasing the risk of long-term absence from work, causing stress for the employee as well as the employer; Jobs requiring repetitive movements and those with high physical workload including lifting, pushing or pulling heavy loads put workers at higher
risk for musculoskeletal injuries and disorders, overextension and repetitive strain injuries.

Sedentary jobs allow few opportunities for movement or exercise, and physical inactivity contributes to risk of obesity and chronic diseases such as diabetes and heart disease.

In addition, workplace conditions such as inadequate ventilation or temperature control can aggravate allergies or asthma and cause respiratory illnesses. Shift work, in particular night work, can have a negative impact on health and wellbeing of workers as it can cause disturbances in sleep and difficulties in maintaining the usual relationships, both at family and social levels, with consequent negative influences on family relationships and other social contacts.

Unemployment is known to be detrimental to health as well and is a greater risk factor than poverty and prior ill health. Being unable to obtain permanent work or full-time study is associated with being trapped in a cycle of unemployment, part-time work or labour market programs (work placement programs for those that are long-term unemployed).

Young people carry the greatest burden of unemployment and the economic and health consequences of this burden. Unemployment has a significant adverse effect on both physical and mental health. Unemployed people and their families suffer a substantially increased risk of premature death. They have more serious chronic illnesses, greater prevalence of disability and suffer more psychological illness, stress and anxiety.

Unemployed people are less likely to have strong support networks and long-term unemployment increases the risk of self-harm, suicide and attempted suicide. Children with no parent in paid employment also experience...
negative health outcomes and are more likely to have serious chronic illnesses. Limited finances can also limit healthy lifestyle choices, increasing other behavioural risk factors such as tobacco, alcohol or drug use.

**Food security**
The World Food Summit of 1996 defined food security as existing ‘when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life’. Commonly, the concept of food security is defined as including both physical and economic access to food that meets people’s dietary needs as well as their food preferences. The major physical outcome of food insecurity is undernutrition; however, lack of food can have an impact on mental health. Food security encompasses three main concepts:

- **Food availability**: Sufficient quantities of food available on a consistent basis.
- **Food access**: Having sufficient resources to obtain appropriate foods for a nutritious diet.
- **Food use**: Appropriate use based on knowledge of basic nutrition and care, as well as adequate water and sanitation.

Although Australia is a food-exporting country, approximately 5% of Australian families suffer food insecurity – inadequate access to or supply of food, or inadequate food preparation. Many suffer diet-related health problems, such as obesity, because of inadequate food, while others are suffering undernutrition from lack of food or lack of nutrient-dense food.

**Early life experiences**
There is very strong evidence that social disadvantages experienced in childhood can limit children’s opportunities for health throughout their entire life, particularly adulthood.

The earliest years of our lives are crucial in many ways, including how they set an individual on the path towards, or away from, good health. Family income, education, community resources, and other social and economic factors affect

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<th>Table 1.1 Food security</th>
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<tbody>
<tr>
<td><strong>Number of people who are hungry.</strong></td>
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<tr>
<td>Source: UN Food and Agriculture Organization, The State of Food Insecurity in the World 2012.</td>
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<tr>
<td><strong>Proportion of the world’s hungry living in the Asia–Pacific region.</strong></td>
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<td><strong>Proportion of the world’s hungry who are women.</strong></td>
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<tr>
<td>Source: UN Economic and Social Council, Strengthening efforts to eradicate poverty and hunger, including through the global partnership for development, 2007.</td>
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<tr>
<td><strong>Proportion of the world’s underweight children living in South Asia.</strong></td>
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<tr>
<td><strong>Number of children (under five) who die each year from undernutrition.</strong></td>
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<tr>
<td><strong>Proportion of child deaths (under five) in the developing world as a result of undernutrition and hunger-related diseases.</strong></td>
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health at every stage of life, but the effects on young children are particularly dramatic. While all parents want the best for their children, not all parents have the same resources to help their children grow up healthy. Parents’ education and income levels can create or limit their opportunities to provide their children with nurturing and stimulating environments and to adopt healthy behaviours for their children to model.

The association between socioeconomic factors and child health is evident from birth, as children born to mothers with low income and educational levels are more likely to be premature or of low birth weight. In addition, it is widely recognised that factors such as nutrition, housing quality, household size and community safety are strongly linked with child health. Research also shows that children’s nutrition varies with parents’ income and education and can have lasting effects on health throughout life; for example, inadequate nutrition is linked with obesity during childhood, which in turn is a strong predictor of adult obesity and its accompanying risks of chronic disease such as diabetes and cardiovascular disease, disability and shortened life.

Similarly, children exposed to lead-based paint, most commonly found in lower-income neighbourhoods, are more likely to suffer from lead poisoning, which can lead to irreversible neurological damage. In terms of mental health, the effects of chronic stress in early childhood have been linked with depression, anxiety, diabetes, cardiovascular disease and stroke later in life.

**THINK, PAIR, SHARE**

Discuss the impact that the early life experiences of a child living in these conditions may have on his or her later life.

**Social support**

Social support is the perception and actuality that individuals are cared for, have assistance available from other people when needed and that they are part of a supportive social network. The support that can be provided by the social network can be emotional (e.g. nurturing, encouraging), tangible (e.g. financial assistance), informational (e.g. advice) or companionship (e.g. sense of belonging).

The concept of social support and its relation to health outcomes have been a focus of many studies in recent years. In general, social support is said to increase overall wellbeing, a result of which is higher levels of self-esteem and a higher level of mental health. High levels
of social support are also thought to protect the physical health of people, offering some protection from disease and early death. The strongest evidence that social support is related to health or disease comes from studies of large populations demonstrating that social support or social networks are protective against all-cause mortality.

It also appears that social support has a positive influence on health by reducing the prevalence of cardiovascular death, increasing survival rates from HIV and possibly cancer, and reducing complications arising during pregnancy.

Table 1.2 Determinants and associated health issues

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<tr>
<th>Determinants and their risk factors</th>
<th>Associated ill health, disability and mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Biological</strong></td>
<td></td>
</tr>
<tr>
<td>Genetic diseases/disorders</td>
<td>Some examples include Down syndrome, muscular dystrophy, cystic fibrosis, haemophilia</td>
</tr>
<tr>
<td>Overweight and obesity</td>
<td>Coronary heart disease, type 2 diabetes, breast cancer, gallstones, degenerative joint disease</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>Coronary heart diseases, stroke</td>
</tr>
<tr>
<td>High blood cholesterol level</td>
<td>Coronary heart diseases, stroke</td>
</tr>
<tr>
<td><strong>Behavioural</strong></td>
<td></td>
</tr>
<tr>
<td>Smoking</td>
<td>Coronary heart disease, several cancers including lung, mouth and cervical cancers, stroke, chronic lung disease</td>
</tr>
<tr>
<td>Excessive alcohol use</td>
<td>Coronary heart disease, liver and pancreatic disease, stroke, high blood pressure, cancers of the digestive system, accidents, mental illness, violence</td>
</tr>
<tr>
<td>Poor diet and nutrition</td>
<td>Coronary heart disease, stroke, breast and digestive system cancers, type 2 diabetes, gallstones, osteoporosis, undernutrition, dental conditions</td>
</tr>
<tr>
<td>Other drug abuse</td>
<td>HIV/AIDS, hepatitis, renal failure, mental illness, suicide, violence, accidents</td>
</tr>
<tr>
<td>Inadequate sun protection</td>
<td>Melanoma and other skin cancers, premature ageing of the skin</td>
</tr>
<tr>
<td>Lack of vaccination</td>
<td>Measles, diphtheria, tetanus, pertussis, poliomyelitis</td>
</tr>
<tr>
<td>Unprotected sexual activity</td>
<td>HIV/AIDS, hepatitis, cervical cancer, infertility, pelvic infection, sexually transmitted diseases such as gonorrhoea, chlamydia, syphilis</td>
</tr>
<tr>
<td>Inadequate physical activity</td>
<td>Coronary heart disease, stroke, obesity, type 2 diabetes, colorectal cancer, osteoporosis, bone fractures, falls, mental illness</td>
</tr>
<tr>
<td><strong>Social</strong></td>
<td></td>
</tr>
<tr>
<td>Poor education level</td>
<td>May lead to poor health choices due to lack of knowledge, may lead to high-risk or low-pay employment increasing risk of injury</td>
</tr>
<tr>
<td>Unemployment</td>
<td>May increase mental disorders such as depression, more likely to exhibit behaviours such as smoking and heavy use of alcohol leading to related negative health outcomes</td>
</tr>
</tbody>
</table>

Continued on next page
**Determinants and their risk factors**

<table>
<thead>
<tr>
<th>Determinants and their risk factors</th>
<th>Associated ill health, disability and mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low family income</td>
<td>May lead to lack of access to health resources such as dental care, may increase mental disorders such as depression</td>
</tr>
<tr>
<td>Cultural traditions, attitudes and beliefs</td>
<td>May lead to social exclusion or lack of social support leading to increases in mental disorders; health-related practices and beliefs can lead to positive or negative health outcomes</td>
</tr>
</tbody>
</table>

**Physical environment**

<table>
<thead>
<tr>
<th>Physical environment</th>
<th>Associated ill health, disability and mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-quality water</td>
<td>May cause increase of infectious diseases; for example, Ross River virus, Murray Valley encephalitis virus, Japanese encephalitis, dengue fever, Barmah Forest virus</td>
</tr>
<tr>
<td>Chemical hazards</td>
<td>Low-level lead exposure to children, respiratory problems related to urban pollution</td>
</tr>
<tr>
<td>Biological hazards</td>
<td>May cause increase of infectious diseases such as legionellosis, some suppression of the immune system</td>
</tr>
<tr>
<td>Ozone depletion</td>
<td>Skin cancer, cataracts</td>
</tr>
</tbody>
</table>

*Source: AIHW, 2000*

**ACTIVITY 1.4**

### Examples of determinants

Classify each of the following examples of determinants as: physical environment, biological, behavioural and social. Once you have completed classifying them, choose three from each category of determinants and outline their impact on health. Your discussion should include both positive and negative examples of the impact on health. Determinants include:

- being overweight
- being part of a church group
- tobacco use
- regular pap smears
- low level of social support
- eating few vegetables
- being a volunteer worker
- wearing sunscreen
- skipping breakfast
- low education level
- being immunised
- using recreational facilities
- using illicit drugs
- air pollution
- blood pressure.

- being employed full-time
- exercising regularly
- having a local community centre
- regular use of alcohol
- women having more protection against cardiovascular disease (until they reach menopause) due to their hormone production
1.5 CHAPTER SUMMARY

- Health is defined as ‘a state of complete physical, emotional and social wellbeing, and not merely the absence of disease or infirmity’ (WHO, 1946).
- Health status refers to ‘an individual’s or a population’s overall health, taking into account various aspects such as life expectancy, amount of disability and levels of disease risk factors’ (AIHW, 2008).
- There are three dimensions of health – physical, social and mental health.
- Physical health relates to the efficient functioning of the body and its systems, and includes the physical capacity to perform tasks and physical fitness.
- Physical health is the overall physical condition of an individual at a given time. It includes the reliability of their body function, freedom from disease or illness, and the condition of optimal physical wellbeing.
- Social health is defined as being able to interact with others and participate in the community in both an independent and cooperative way.
- The social dimension of health encourages an individual to contribute to their environment in order to increase the welfare of their community.
- Mental health is defined as the ‘state of wellbeing in which the individual realises his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community’ (WHO, 2009).
- Mental health involves an individual being able to use their emotional capabilities, function in society, and meet the common demands of everyday life.
- An individual’s state of health is an ever-changing identity that is affected by dynamic interactions with the environment.
- Maintaining an optimal level of wellbeing or health requires a balance and interaction between all of the dimensions of health.
- The level of health, or health status, of a population can be measured with the use of data and statistics gathered by various organisations. Self-assessment can also be used to determine the health status of an individual.
- Life expectancy is ‘an indication of how long a person can expect to live, it is the number of years of life remaining to a person at a particular age if death rates do not change’ (AIHW, 2008).
- Health Adjusted Life Expectancy (HALE) is a measure of burden of disease based on life expectancy at birth, but including an adjustment for time spent in poor health. It is the number of years in full health that a person can expect to live, based on current rates of ill health and mortality.
- Mortality data is routinely collected and readily available and is therefore the most often used instrument for monitoring health. Mortality refers to the number of deaths caused by a particular disease, illness or other environmental factor.
- Under-five mortality rate is ‘the number of deaths of children under five years of age per 1000 live births’ (WHO, 2008).
• The infant and under-five mortality rates are widely used indicators of a population’s health status because they are associated with education, economic development and availability of health services, and therefore they estimate the overall health and wellbeing of a population.

• Morbidity ‘refers to the ill health in an individual and the levels of ill health in a population or group’ (AIHW, 2008).

• Burden of disease is a measure of the impact of diseases and injuries. Specifically it measures the gap between current health status and an ideal situation where everyone lives to an old age free of disease and disability. Burden of disease is measured in a unit called the DALY.

• Disability Adjusted Life Years (DALYs) are a measure of the years of healthy life lost due to premature death, illness or injury. One DALY is a lost year of ‘healthy’ life. DALYs are measured through the use of two key indicators – YLL (Years of Life Lost) and YLD (Years Lost due to Disability).

• Prevalence is ‘the number or proportion of cases of a particular disease or condition present in a population at a given time’ (AIHW, 2008).

• Incidence is the number or rate of new cases of a particular condition during a specific time.

• Determinants of health help to explain or predict trends in health and why some groups have better or worse health than others.

• There are four main categories of determinants: physical environment, biological, behavioural and social determinants.

• Physical environment determinants refer to the physical surroundings in which individuals exist on a daily basis. Examples include: air and water quality, infrastructure, natural environment and climate change.

• Biological determinants of health refer to factors relating to the body that impact on health, such as genetics, hormones, body weight, blood pressure and cholesterol levels.

• Behavioural determinants of health are actions or patterns of living of an individual or a group that impact on health, such as smoking, sexual activity, participation in physical activity and eating practices.

• Social determinants refer to aspects of society and the social environment that impact on health, such as poverty, work, early life experiences, social networks and support.
1.6 KEY QUESTIONS

Summary questions

1 Define the terms health and health status.
2 Describe the difference between the WHO definition and the Ottawa Charter definition of health.
3 Define each of the dimensions of health and provide three examples of each dimension.
4 Add your own personal examples of health to the concept map in Figure 1.9.
5 Why is the health status of a population measured? Identify some of the uses of this information.
6 Define the following key terms relating to the measurement of health status: life expectancy, HALE, mortality, under-five mortality, morbidity, incidence, prevalence, DALYs, YLL, YLD and burden of disease.
7 Why are infant and under-five mortality rates widely used indicators of a population’s health status?
8 Identify the four categories of the determinants of health. Define and provide an example for each of the determinants of health.
9 Choose a physical environment determinant of health and describe in detail its possible impact on each (where possible) of the dimensions of health.
10 Choose a behavioural determinant of health and describe in detail its possible impact on each (where possible) of the dimensions of health.
11 Choose a biological determinant of health and describe in detail its possible impact on each (where possible) of the dimensions of health.
12 Choose a social determinant of health and describe in detail its possible impact on each (where possible) of the dimensions of health.

Extension questions

1 Describe the difference between the measures ‘life expectancy’ and ‘Health Adjusted Life Expectancy’. In your answer explain which term is a more accurate measure of a population’s health status and why.
2 Research a chronic disease from the following list and provide examples of measurements of health status in relation to it. Choose mortality, morbidity, burden of disease, incidence or prevalence rate. Be sure to describe your data carefully, including the year that the data was collected. Compare your results to another person’s who has chosen a different chronic disease. Choose from:
   • cardiovascular disease
   • cancer (or a particular type of cancer)
   • mental health disorders
   • injuries
   • diabetes
   • asthma.
3 For the chronic disease chosen above, list and provide examples for each of the categories of the determinants of health that may increase or decrease an individual’s risk of suffering from the condition.
Figure 1.27 Trends in leading causes of death, 1979–2009  Source: AIHW, Australia’s Health 2012

Note: Leading causes are determined by number of deaths by sex each year. Causes that were consistently among the five leading causes of death every year are indicated by a solid line, causes that were among the five leading causes for any one year are indicated by a dashed line.
A Define the term mortality. (1 mark)

B Describe two trends evident in Figure 1.27. (2 marks)

C Identify the four categories of determinants of health and provide an example from each category that may have been a contributing factor to the trends evident in Figure 1.27. (4 marks)

D Select two determinants from part C and explain how they could impact on the trends identified in part B. (4 marks)

Total 11 marks