CHAPTER 1

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 DALYs, life expectancy, under-5 mortality rate, mortality, morbidity, incidence, prevalence

WHAT'S AHEAD?

- Defining health and health status
- Defining the dimensions of health
- Measurements of health status
- The determinants of health

KEY TERMS

health, wellbeing, homeostasis, health status, physical health, social health, mental health, health continuum, life expectancy, health promotion, health-adjusted life expectancy (HALE), mortality, under-5 mortality rate (U5MR), morbidity, disability-adjusted life year (DALY), burden of disease, YLL (years of life lost), YLD (years lost due to disability), incidence, prevalence, determinants of health, biological determinants, behavioural determinants, social determinants, environmental determinants, physical environment

ISBN: 978-0-521-73983-2

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. The status of an individual and a population's health can be measured in various ways.

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, emotional and social wellbeing, and not merely the absence of disease or infirmity'. This broad definition of health also includes the concept of **wellbeing**.

Whilst 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**. This is a state of balance, with inputs and outputs designed to create equilibrium.

Overall the concept of health needs to acknowledge that it is the complex state or process towards wellbeing and 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 level of 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 or through the use of more objective measures such as statistical data.

health

A complete state of physical, social and mental wellbeing, and not merely the absence of disease or infirmity (WHO, 1946).

wellbeing

The state of being healthy, happy and contented, usually determined through self-assessment.

homeostasis

The property within a living organism that regulates its internal and external environment to maintain stability and constancy.

health status

An individual's or population's overall level of health, taking into account various aspects such as life expectancy, amount of disability, and levels of disease risk factors (AIHW, 2008).

ISBN: 978-0-521-73983-2

THINK // PAIR // SHARE

What is the difference between health and wellbeing? Develop your own definition of health.

Figure 1.1 Health and wellbeing also require social wellness.

Defining the dimensions of 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.

social health

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

There are three components or dimensions of health, which combine to form what is known as an individual's or group's health status. These dimensions include physical health, social health and mental health. Good 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.

Figure 1.2 Physical health requires good nutrition and physical activity.

1 **Physical health** refers to the efficient functioning of the body and its systems. It includes factors such as level of fitness, appropriate body weight for height, as well as the functioning of the body's organs and systems. Healthy eating and appropriate levels of physical activity are important for good physical health.

2 **Social health** refers to being able to interact with others and participate in the community in both an independent and cooperative way. It 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.

ISBN: 978-0-521-73983-2

Figure 1.3 Families are important to an individual's social health.

Figure 1.4 Feeling like we belong is important for good mental health at every age.

3 **Mental 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. It 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 feeling of belonging is important for good mental health, as is maintaining a high level of self-esteem.

mental 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).

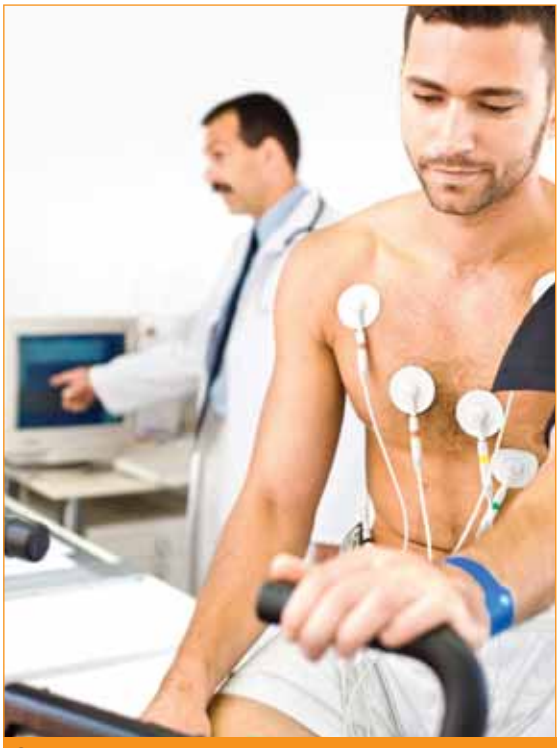
Physical dimension of health

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 discernable 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.

Figure 1.5 Good physical health encourages regular physical activity.

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



THINK // PAIR // SHARE

Physical ill health

Why is the level of physical health of an individual what most people think of when they hear the term 'health'?

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, and the application of knowledge about food and nutrition. It also discourages the use of tobacco, drugs and excessive alcohol consumption.

Social dimension of 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

Figure 1.6 Social health is maintained through close friendships.

ISBN: 978-0-521-73983-2

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.

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.

What impact does physical health have on a person's social and mental health?

THINK // PAIR // SHARE

ACTIVITY 1.1

VERBAL // LINGUISTIC

Biologist says social networking sites bad for your health

By Daniel Martin

Social networking sites such as Facebook and MySpace could raise your risk of serious health problems by reducing personal contact, a doctor says.

Increased isolation could alter the way genes work and upset immune responses, hormone levels and the function of arteries, said psychologist Dr Aric Sigman.

It could also impair mental performance and increase the risk of serious illnesses such as cancer, strokes, heart disease and dementia, Dr Sigman wrote in *Biologist*, the journal of the Institute of Biology.

Interacting 'in person' had effects on the body not seen when writing emails, Dr Sigman said.

'There seems to be a difference between "real presence" and the virtual variety,' he added.

Some genes, including ones involved with the immune system and stress responses, acted differently according to how much social interaction a person had with others, he said.

Dr Sigman added: 'Social networking sites should allow us to embellish our social lives, but what we find is very different. It's not that I'm old fashioned in terms of new technology, but its purpose should be to provide a tool that enhances our lives.'

He says that even though social networking sites such as MySpace and Facebook allow people to keep in touch with friends over the web, they were actually playing a significant role in people becoming more isolated.

Research suggested that the number of hours people spent speaking to others face-to-face had fallen dramatically since 1987 as the use of electronic media increased.

Source: *Daily Mail*, 20 February 2009

(continued)

ISBN: 978-0-521-73983-2

Cambridge University Press

ACTIVITY 1.1 (continued)

1 Why is face-to-face communication important to the social health of an individual?
2 Why is increased isolation linked to the use of social networking sites?
3 What illnesses are identified in the article as affected by increased isolation?
4 In your opinion, in what ways might social networking sites enhance the lives of individuals?
5 Approximately how many hours do you spend communicating with others without face-to-face contact? Evaluate whether this is a healthy level of non face-to-face contact based on what you have read in the article.

Figure 1.7 Too much time spent on social networking sites may lead to serious health problems.

Mental dimension of health

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

According to the World Health Organization, there is no single definition of mental health. 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, 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 enables 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 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 integrate feelings, thoughts and behaviours. 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.

ISBN: 978-0-521-73983-2

TABLE 1.1 SUMMARY OF THE DIMENSIONS OF HEALTH

Physical health How efficiently and/or effectively the body and its systems are able to function.	Some examples for optimal health: • having reliable body function • having a healthy blood pressure level • being a healthy weight for height • being physically fit • having flexibility of muscles and joints • being free from disease or illness
Social health Being able to interact with others and participate in the community in both an independent and cooperative way.	Some examples for optimal health: • maintaining a network of friends • communicating effectively with others • obeying the laws and rules of society • accepting responsibility for actions
Mental 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 is able to make a contribution to his or her community.	Some examples for optimal health: • recognising and expressing feelings • being resilient and able to cope with a range of situations • supporting and helping family • feeling good about oneself • having coping mechanisms for stress

ACTIVITY 1.2

Healthy behaviour survey

Create a survey that determines the level of healthy behaviour of different groups within the population by investigating the health behaviour of approximately 10 people of different age groups (for example, children, youth, adults or older adults) and different genders. In your survey have a minimum of four behaviours that are relevant to each of the dimensions of health.

Some examples of possible topics/questions that your statements may relate to include:

- Having adequate coping mechanisms for dealing with stress.
- Having a network of close friends and/or family.
- Being able to communicate with and get along with a wide variety of people.
- Getting an adequate amount of sleep.
- Being able to maintain close relationships.
- Feeling good about themself.
- Eating fruits, vegetables and whole grains every day.
- Exercising for 30 minutes at least three times per week.

Analyse your survey results by answering the following questions:

1 Were there any differences in healthy behaviour between the age groups you have surveyed? If so, provide possible reasons for the differences.
2 In which of the dimensions of health were the healthiest behaviours demonstrated? Provide possible reasons to explain why this was the case.
3 Were there any noticeable differences between females and males in your results? Identify the differences and provide possible reasons to explain why this was the case.
4 Compare your results with other students in the class. Explain differences and similarities you found in the results.
5 Identify the information you would require in order to make a more accurate assessment of the healthiness of individuals in your sample.

ISBN: 978-0-521-73983-2

Health as a changing entity

health continuum

The level of healthiness that a person is experiencing illustrated on a line ranging from optimal health to death.

An individual's state of health is an ever-changing entity that is affected by dynamic interactions with the environment. A combination of physical, mental and social wellbeing is necessary to achieve overall health. A combination of physical, mental and social wellbeing is necessary to achieve overall health. An individual will have fluctuating states relating to their capacities in body structure and function, emotional functioning and social activities/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 1.8). 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 important dimensions of health, and freedom from any type of illness or disease. 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.

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. For example, even though an individual may lack physical symptoms of illness, they may still be depressed, tense, anxious or unhappy. Such mental states often set the stage for physical and mental illness. Health is not a static state. A high level of wellbeing does not exclude periods of illness.

Figure 1.8 The health continuum.

ACTIVITY 1.3

The health continuum

1. Where are you on the health continuum now? Justify the reason for your choice of position by explaining why you have placed yourself there.
2. Which of the dimensions of health has most influenced your position on the health continuum? Why?
3. Has your position on the health continuum fluctuated in the past year? Explain.
4. Identify five things that you could do to better your position on the health continuum.

Maintaining an optimal level of wellbeing or health requires a balance and interaction between all of the dimensions of health. Therefore, there is a strong interrelationship between all of the dimensions of health. 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.

ISBN: 978-0-521-73983-2

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 and the impact of mental health on physical performance is generally accepted. 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 a host of outcomes. These include positive mood, lower levels of depression and elevated alertness and concentration, enhanced self-esteem, and a sense of direction. Many people would attribute these associations to chemical changes occurring within the body when physical exercise is performed. Other explanations implicate factors such as the social aspects of exercise or the sense of mastery achieved in participating in sport and its impact on self-esteem.

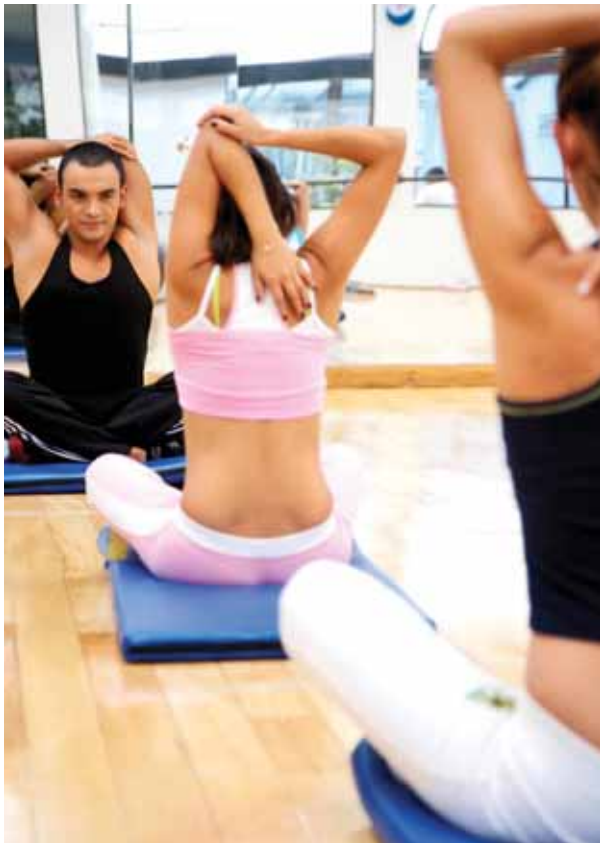


Figure 1.9 Physical activity can enhance both mental and social health.

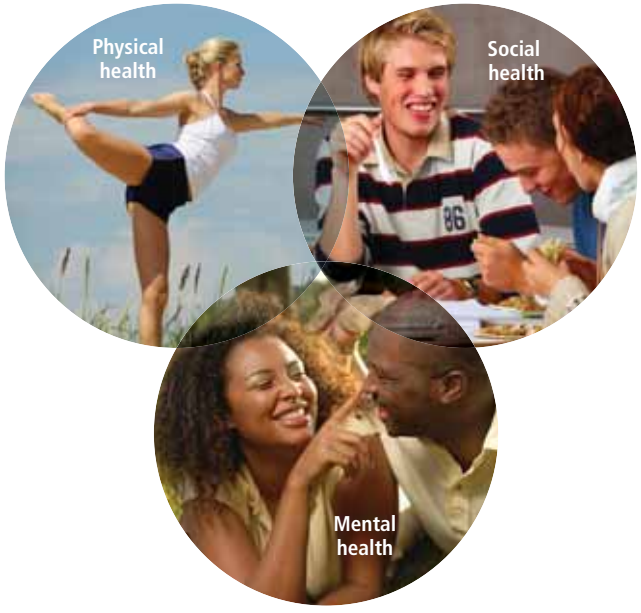


Figure 1.10 Interrelationship between the dimensions of health.

ISBN: 978-0-521-73983-2

ACTIVITY 1.4

INTERPERSONAL ACTIVITIES

Case study analysis

CASE STUDY: THE DIMENSIONS OF HEALTH

A – Lauren

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 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

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

Agium is a Year 10 student who is a recent arrival in Australia. She is 19 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. Whilst 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 now 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.

(continued)

ISBN: 978-0-521-73983-2

ACTIVITY 1.4 (continued)

1 Identify the examples of the dimensions of health in each case study.
2 Provide three examples from each case study where one dimension of health is having an effect on another dimension.
3 Is the interrelationship between the dimensions of health identified in this chapter a positive or negative one? Justify your response.
4 Which of the individuals do you believe is the healthiest? In pairs, compare your choices and discuss the reasons for your choice.

Measurements of health status

As already indicated, the health of an individual can be measured via an examination by a health professional. In this examination, a rating may occur on any of the dimensions of health by determining the presence or absence of life-threatening illness, risk factors for premature death, severity of disease, and overall health. Individual health status may also be 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 prevalence of preventable diseases or deaths, and the availability of health services are examples of indicators of the health status of a particular population. Judgments 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

ISBN: 978-0-521-73983-2

life expectancy

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).

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.

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 concern with healthy life expectancy is due largely to advances in medical technology and greater awareness of **health promotion** and disease prevention. 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.' 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. The average number of years spent in unhealthy states is subtracted from the overall life expectancy, taking into account the relative severity of such states. 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.

health promotion

Activities aimed at improving health and preventing disease by enabling people to increase control over and improve their health.

health-adjusted life expectancy (HALE)

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, morbidity and burden of disease

Mortality and under-5 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 are routinely collected and readily available, and are 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.

mortality

The number of deaths caused by a particular disease, illness or other environmental factor.

ISBN: 978-0-521-73983-2

One of the major measures of health status of a population is **under-5 mortality rate (U5MR)**. Under-5 mortality estimates the number of deaths of children under five years of age per 1000 live births. Under-5 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, if subject to age-specific mortality rates of that period.

under-5 mortality rate (U5MR)

The number of deaths of children under five years of age per 1000 live births (WHO, 2008).

The infant- and under-5 mortality rates are widely used indicators of a population's health status because it is associated with education, 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 in a population is another measure of health status. This is known as morbidity. **Morbidity** refers to the ill-health in an individual and the levels of ill-health in a population or group. 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.

morbidity

Ill health in an individual and the levels of ill health in a population or group (AIHW, 2008).

Burden of disease

Whilst the commonly used measures of mortality and morbidity have merit in telling us about the health of a population, they are inadequate for assessing people who are not ill but have some limited function that affects 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 has an affect on the health of an individual that cannot be measured or included in mortality and morbidity data.

During the last few decades new health indicators or health outcome measures have been developed to assist in the analysis of the consequences of disease. A unit of measure called the **DALY** (a disability-adjusted life year) has been developed to compare the impact of different diseases and injuries on an equal basis. As noted, disability-adjusted life years are a measure of burden of disease, where one DALY equals one year of healthy life lost due to premature death and time lived with illness, disease or injury.

disability-adjusted life year (DALY)

A measure of burden of disease – one DALY equals one year of healthy life lost due to premature death and time lived with illness, disease or injury.

ISBN: 978-0-521-73983-2

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. This is referred to as the **burden of disease**, which 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.

burden of disease
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.

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 – YLL and YLD. **YLL (years of life lost)** refer to the fatal burden of disease of a population and is defined as the years of life lost due to death. YLL are 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 age and lower weight to deaths at older age.

YLL (years of life lost)
The fatal burden of disease of a population, defined as the years of life lost due to death.

YLD (years lost due to disability) refer 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.

YLD (years lost due to disability)
The non-fatal component of the disease burden and is a measurement of the healthy years lost due to diseases or injuries.

Incidence and prevalence

The measurement of the health status of a country 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** 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.

incidence
The number or rate of new cases of a particular condition during a specific time.

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

prevalence
The number or proportion of cases of a particular disease or condition present in a population at a given time (AIHW, 2008).

ISBN: 978-0-521-73983-2

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.

ACTIVITY 1.5

LOGICAL // MATHEMATICAL 1+1

Burden of disease

1 Define the terms DALY, YLL and YLD.
2 Why has burden of disease been developed as a measure of health status? What is it measuring?
3 Which diseases were the two leading causes of burden of disease for 15–24 year olds in 2003?
4 Compare and contrast the DALYs due to death and DALYs due to disability for these two diseases.
5 Identify the number of DALYs for each of the fatal component and the non-fatal component for neurological and sense disorders. Give examples of two of these disorders.

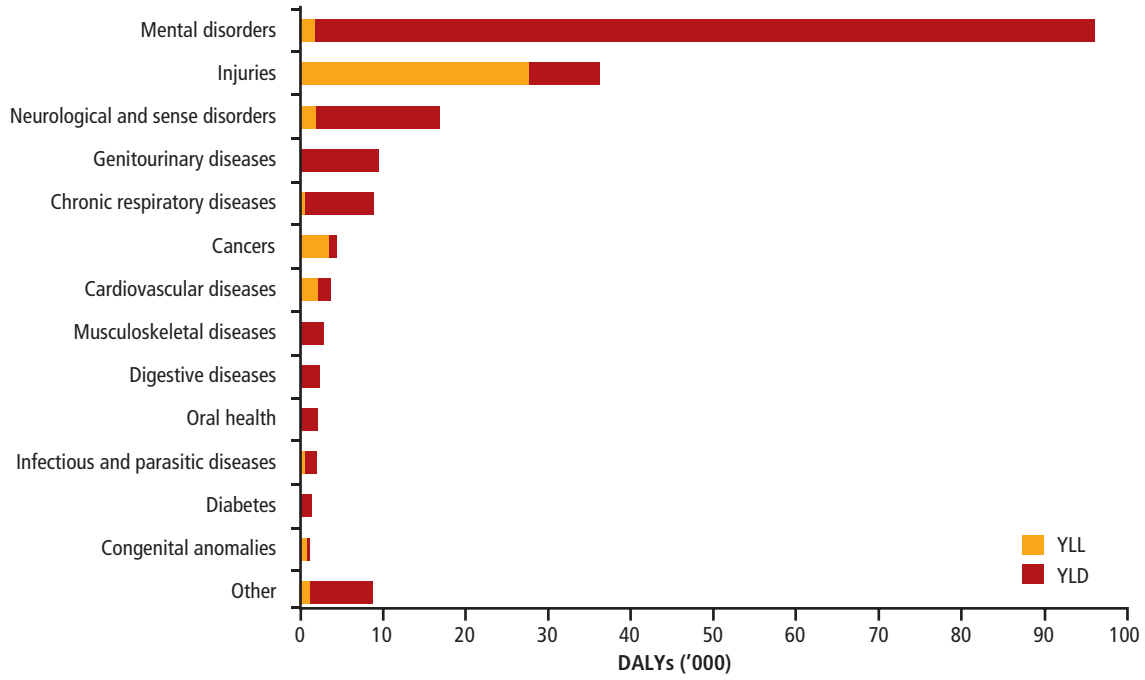


Figure 1.11 Burden of major disease groups for 15–24 year olds, 2003.
Source: AIHW, 2007

The determinants of health

An individual's health is complex and determined by a number of interacting factors. These factors can include:

- the amount and quality of food a person consumes
- genetics
- whether the person's various organ systems are functioning well

ISBN: 978-0-521-73983-2

- the adequacy of the hormones controlling aspects of growth and physical activity levels
- a person's emotional wellbeing
- the environment in which a person lives.

There are further factors that influence an individual's health throughout the lifespan. The rise of a number of chronic diseases over the past century, including cardiovascular disease 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 smoking in determining health. As such, health has come to be seen as the result of the interactions of biological factors, behavioural factors, social factors as well as environmental factors. All of these can be defined as the **determinants of health**.

determinants of health

'Factors that raise or lower a 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.' Determinants can be classified in many ways such as biological, behavioural and social (AIHW, 2006).

The determinants of health refer to 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 and protection against ill-health.

There are three main categories of determinants:

- biological determinants
- behavioural determinants
- social determinants.

Although these three groups of determinants are the primary focus for the study of VCE Health and Human Development in Units 3 and 4, it is important to acknowledge that environmental determinants (which include the social environment and physical environment) can also have an impact on an individual's health.

biological determinants

Factors relating to the body that impact on health, such as genetics, hormones, body weight, blood pressure, cholesterol levels and birth weight.

Figure 1.12 Blood pressure is a biological determinant of health.

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 makeup 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.

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

ISBN: 978-0-521-73983-2

body types including 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.

Other examples of biological determinants of health relating to body functioning include factors such as blood cholesterol levels, blood sugar levels and blood pressure levels.

Figure 1.13 Sun protection is a behavioural determinant of health.

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. In 2005, for example, tobacco smoking, physical inactivity, alcohol consumption, use of illicit drugs, and unsafe sex were contributing factors to many of the top 10 causes of death in Australia (AIHW, 2007).

Other examples of behavioural determinants of health include level of use of healthcare, immunisation and sun-protection behaviour.

behavioural determinants

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

Aspects of society and the social environment that impact on health, such as poverty, early life experiences, social networks and support.

Social determinants

The **social determinants** of health refers to aspects of society and the social environment that impact on health, such as poverty, early life experiences, social networks and social 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 in relation

Figure 1.14 Having support from friends is a social determinant of health.

ISBN: 978-0-521-73983-2

to development. 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, provide opportunities for people's physical, social and mental health and wellbeing. A supportive social environment is critical to health.

environmental determinants

All external factors that impact on the health and development of an individual or group.

Environmental determinants

Environmental factors that influence health refer to all external factors on an individual or group. In particular, the environment includes the physical and social factors, situations and surroundings that exert an influence on the development and health of people. The environment can have a direct affect on the wellbeing of a person by exposing them to certain situations that can be detrimental or beneficial to their health.

physical environment

The physical surroundings in which individuals exist on a daily basis.

Environmental determinants can also affect the decisions that individuals make regarding their health. Environmental influences on health can be direct or indirect, simple or complex, and immediate or delayed. The physical surroundings in which individuals exist on a daily basis 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 refers to the natural resources in the surroundings. For some people, the physical environment may contain harmful or toxic substances that also impact on the health and development of individuals.

Discuss the difficulties that might be associated with gaining access to adequate healthcare in an environment such as this.

ISBN: 978-0-521-73983-2

TABLE 1.2 DETERMINANTS AND ASSOCIATED HEALTH ISSUES

Determinants and their risk factors	Associated ill health, disability and mortality
Biological	
Genetic diseases/disorders	Some examples include Down Syndrome, muscular dystrophy, cystic fibrosis, haemophilia
Overweight and obesity	Coronary heart disease, Type 2 diabetes, breast cancer, gallstones, degenerative joint disease
High blood pressure	Coronary heart diseases, stroke
High blood cholesterol level	Coronary heart diseases, stroke
Behavioural	
Smoking	Coronary heart disease, several cancers including lung, mouth and cervical cancers, stroke, chronic lung disease
Excess alcohol consumption	Coronary heart disease, liver and pancreatic disease, stroke, high blood pressure, cancers of the digestive system, accidents, mental illness, violence
Poor diet and nutrition	Coronary heart disease, stroke, breast and digestive system cancers, Type 2 diabetes, gallstones, osteoporosis, malnutrition, dental conditions
Other drug abuse	HIV/AIDS, hepatitis, renal failure, mental illness, suicide, violence, accidents
Inadequate sun protection	Melanoma, and other skin cancers, premature aging of the skin
Lack of vaccination	Measles, diphtheria, tetanus, pertussis, poliomyelitis
Unprotected sexual activity	HIV/AIDS, hepatitis, cervical cancer, infertility, pelvic infection, sexually transmitted diseases such as gonorrhoea, chlamydia, syphilis
Inadequate physical activity	Coronary heart disease, stroke, obesity, Type 2 diabetes, colorectal cancer, osteoporosis, bone fractures, falls, mental illness
Social	
Poor education level	May lead to poor health choices due to lack of knowledge, may lead to high-risk or low-pay employment increasing risk of injury
Unemployment	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
Low family income	May lead to lack of access to health resources such as dental care, may increase mental disorders such as depression
Cultural traditions, attitudes and beliefs	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
Environmental – physical environment	
Low quality water	May cause increase of infectious diseases, for example, Ross River virus, Murray Valley encephalitis, Japanese encephalitis, dengue fever, Barmah Forest virus
Chemical hazards	Low-level lead exposure of children, respiratory problems related to urban pollution
Biological hazards	May cause increase of infectious diseases such as legionellosis, some suppression of the immune system
Ozone depletion	Skin cancer, cataracts

Source: AIHW, 2000

ISBN: 978-0-521-73983-2

VERBAL // LINGUISTIC

ACTIVITY 1.6

Examples of determinants

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

- 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
- being overweight
- being part of a church group
- smoking tobacco
- 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

ISBN: 978-0-521-73983-2

CHAPTER SUMMARY

Measuring health status

- Health is a complex, multi-dimensional 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.
- Health is defined as 'a state of complete physical, emotional and social wellbeing, and not merely the absence of disease or infirmity' (WHO).
- Health status refers to an individual's or a population's overall level of health, taking into account various factors such as life expectancy, amount of disability and levels of disease.
- There are three dimensions of health – physical, social and mental health.
- 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 refers to how effectively people are able to interact with others in their society and/or the environment. The social dimension of health encourages an individual to contribute to their environment in order to increase the welfare of their community.
- Mental health refers to an individual's emotional and psychological wellbeing. 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 entity that is affected by dynamic interactions with the environment.
- The concept of being in a certain state or level of health refers to the capacity of an individual in all dimensions of health, including those relating to body structure and function, emotional functioning and social activities/participation.
- 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.
- Life expectancy is an approximation of the total number of years, usually from the time of birth, a person is expected to live.
- Health-adjusted life expectancy (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.
- Mortality data are routinely collected and readily available, and are 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-5 mortality rates estimate the number of newborn babies that will die before reaching their fifth birthday, based on current age-specific mortality rates for each country.
- The infant- and under-5 mortality rates are widely used indicators of a population's health status because it is associated with education, economic development and availability of health services, and therefore it estimates the overall health and wellbeing of a population.
- Morbidity refers to the rate at which a particular disease or illness occurs within a population.
- Burden of disease can be defined as the impact of a particular disease in relation to the amount of healthy life lost due to premature death, illness and/or disability.
- 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 and YLD.
- Incidence is the number or rate of new cases of a particular condition during a specific time.
- Prevalence refers to the total number of people experiencing a particular condition at a specific time.
- The determinants of health refer to the factors that raise or lower a 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.

ISBN: 978-0-521-73983-2

- There are three main categories of determinants: biological, behavioural and social.
- Biological determinants of health refer to factors relating to the body that impact on health including genetics, hormones, body weight, blood pressure, cholesterol levels, birth weight.
- Behavioural determinants of health are actions or patterns of living of an individual or a group that impact on health. Examples include factors 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, early life experiences, social networks and support.

ISBN: 978-0-521-73983-2

Measuring health status

Summary questions

1 Define the terms health and health status.

2 Define each of the dimensions of health and provide three examples of each dimension.

3 An individual's health is not static but is dynamic. What does this mean and why is it the case?

4 How is an optimum level of health obtained or maintained?

5 Explain the concept of the interrelationship between the dimensions of health and provide a brief example.

6 Why is the health status of a population measured? Identify some of the uses of this information.

7 Define the following key terms relating to the measurement of health status: life expectancy, HALE, mortality, under-5 mortality, morbidity, incidence, prevalence, DALYs, YLL, YLD and burden of disease.

8 Why are infant and under-5 mortality rates widely used indicators of a population's health status?

9 Identify the three categories of the determinants of health.

10 Define and provide an example for each of the determinants of health.

Extension questions

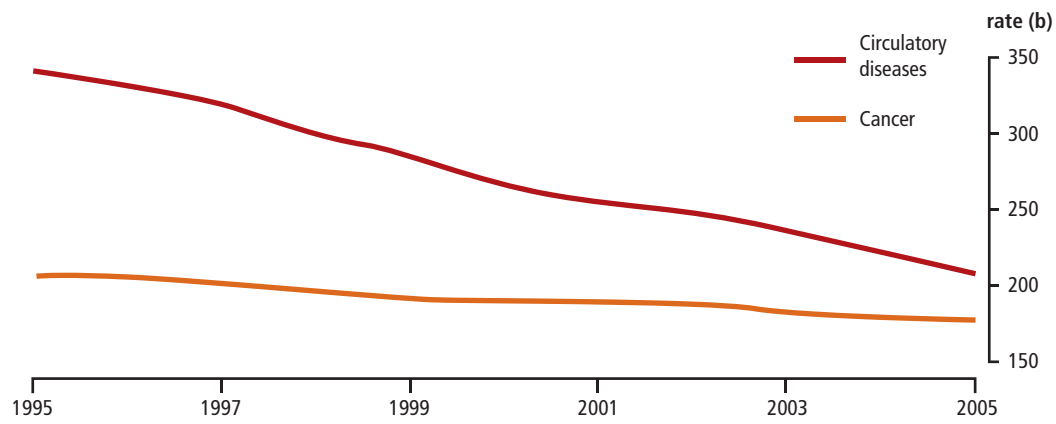
1 Describe the difference between the measures 'life expectancy' and 'health-adjusted life expectancy'. In your answer explain which term is a more accurate measure of a population's health status and why.

2 Research a chronic disease from the following list and provide examples for each of the categories of the determinants of health that may increase or decrease an individual's risk of suffering from the disease. Choose from:

- cardiovascular disease
- cancer
- musculoskeletal disorders (e.g. osteoporosis)
- chronic respiratory diseases
- mental disorders
- injuries
- diabetes
- asthma.

ISBN: 978-0-521-73983-2

Examination preparation question



(a) Diseases of the circulatory system (ICD-10 code 100-199), Malignant neoplasms (cancer) (ICD-10 code 000-097).
(b) Per 100 000 population, age-standardised to the 2001 population (persons).

Figure 1.15 Mortality rates of circulatory diseases and cancer, 1995 to 2005.
Source: www. abs.gov.au

A Define the term mortality. (1 mark)

B Describe the trends evident in Figure 1.15. Justify your response using the data provided. (4 marks)

C Identify the four categories of the determinants of health and provide two examples from each category that may have been a contributing factor to the trends evident in Figure 1.15. (8 marks)

Total 13 marks

ISBN: 978-0-521-73983-2