2 Measuring health status

Unit	**3**	**Australia's health in a globalised world**
Area of Study	**1**	**Understanding health and wellbeing**
Topic	**2**	**Measuring health status**
Subtopic	**2.2**	**Self-assessed health status and life expectancy**

Summary

- **Health status** is 'an individual's or population's overall health, taking into account various aspects such as life expectancy, amount of disability and levels of disease risk factors' (AIHW, 2008).
- Health indicators, used to measure and understand health status, include:
  - life expectancy
  - health-adjusted life expectancy (HALE)
  - mortality (including maternal, infant and under-5)
  - morbidity
  - prevalence
  - incidence
  - self-assessed health status
  - burden of disease
  - disability-adjusted life years (DALYs).

- **Life expectancy** is an indication of how long a person can expect to live, i.e. the number of years of life remaining to a person, at a particular age, if death rates do not change.
- Life expectancy for Australians born in 2015 is:
  - 80.4 years for males
  - 84.5 years for females
- **Health adjusted life expectancy (HALE)**. The average length of time an individual at a specific age can expect to live in full health; that is, time lived without the health consequences of disease or injury (AIHW, 2018)
- HALE for Australians born in 2015 is:
  - 70.8 years for males
  - 72.9 years for females

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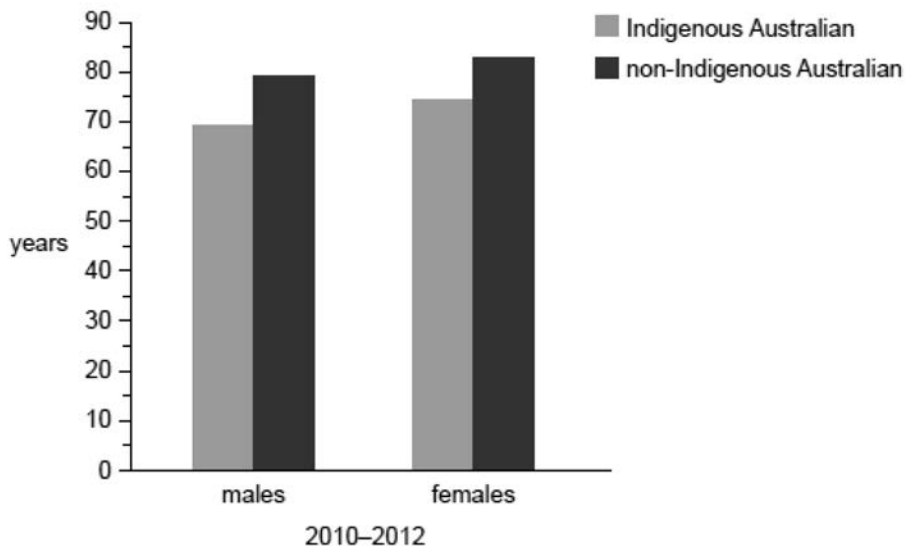
Past VCAA exam questions

Source: *VCAA 2015, Health and Human Development Exam, Q1a*

Question 1

Life expectancy at birth, by sex and Indigenous status, 2010–2012



Data: Australian Bureau of Statistics, *Fact sheet: Life expectancy estimates for Aboriginal and Torres Strait Islander Australians, 2010–2012*, cat. no. 3302.0.55.003

Explain the difference between life expectancy and health-adjusted life expectancy. **2 marks**

Source: *VCAA 2010 Health and Human Development Exam, Section A, Q2*

Question 2

Briefly outline two indicators that are used to measure the health status of populations. **4 marks**

Source: *VCAA 2013, Health and Human Development Exam, Q5a*

Question 3

Define 'health status'. **1 mark**

Source: *VCAA 2008 Health and Human Development Exam, Q5a*

Question 4

Define the term 'life expectancy'. **1 mark**

Source: *VCAA 2007 Health and Human Development Exam, Q6b*

Question 5

What is the difference between life expectancy and healthy life expectancy? **2 marks**

Source: *VCAA 2009, Health and Human Development Exam, Q3b*

Question 6

Australian life expectancy at different ages: 1901–1910 and 2003–2005 for males

	1901–1910	2003–2005
From birth	55.2 years	78.5 years
From 30 years	66.5 years	79.7 years

Source: Adapted from Australian Institute of Health and Welfare, *Australia's Health* 2008 p.27

Explain two reasons why life expectancy has increased since 1901. **4 marks**

Source: *VCAA 2009, Health and Human Development Exam, Q3c*

Question 7

Australian life expectancy at different ages: 1901–1910 and 2003–2005 for males

	1901–1910	2003–2005
From birth	55.2 years	78.5 years
From 30 years	66.5 years	79.7 years

Source: Adapted from Australian Institute of Health and Welfare, *Australia's Health* 2008 p.27

Outline why life expectancy from 30 years of age is higher than life expectancy from birth. **2 marks**

Exam practice questions

Source: *Jacaranda (John Wiley & Sons Australia, Ltd), Practice VCE Question*

Question 8

List four measures of health status. **4 marks**

Source: *Jacaranda (John Wiley & Sons Australia, Ltd), Practice VCE Question*

Question 9

Health status indicators **1 mark**

A. enable judgements to be made about health status experienced by individuals, groups and countries.

B. allow governments and other groups to identify trends in levels of health.

C. usually relate to physical ill health and wellbeing as this is the easiest to measure and therefore forms the basis of a majority of the health data available.

D. All of the above

Source: *Jacaranda (John Wiley & Sons Australia, Ltd), Practice VCE Question*

Question 10

Explain the difference between life expectancy and health adjusted life expectancy (HALE). **2 marks**

Source: *Jacaranda (John Wiley & Sons Australia, Ltd), Practice VCE Question*

Question 11

Life expectancy is described as **1 mark**

A. an indication of how long a person can expect to live, i.e. the number of years of life remaining to a person, at a particular age, if death rates do not change.

B. a measure of burden of disease based on life expectancy at birth, but including an adjustment for time spent in poor health, i.e. the number of years in full health that a person can expect to live, based on current rates of ill health and mortality.

C. an indication of how long a person can expect to live, i.e. the number of years of life remaining to a person, at a particular age, if illness rates do not change.

D. a measure of burden of disease based on life expectancy at birth, but including an adjustment for time spent in good health, i.e. the number of years in full health that a person can expect to live, based on current rates of ill health and mortality.

Unit	**3**	**Australia's health in a globalised world**
Area of Study	**1**	**Understanding health and wellbeing**
Topic	**2**	**Measuring health status**
Subtopic	**2.3**	**Mortality**

Summary

Indicator	Description	Australian data
Mortality	The number of deaths in the population	159 052 (2015)
Maternal mortality	The number of deaths of mothers during pregnancy, childbirth or within six weeks of delivery	6 deaths, per 100 000 births (2015)
Infant mortality	The number of deaths of infants between birth and their first birthday, per 1000 live births	3.2 deaths, per 1000 live births (2015)
Under-five mortality rate (U5MR)	The number of deaths of children under five years of age, per 1000 live births	4 deaths, per 1000 live births (2015)

Source: AIHW and WHO

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Past VCAA exam questions

Source: *VCAA 2011, Health and Human Development Exam, Section A, Q6*

Question 1

Define the following terms. **2 marks**

- Under-five mortality rate
- Morbidity

Source: *Adapted from VCAA 2009, Health and Human Development Exam, Q4d*

Question 2

Identify two principles of the social model of health. Give one example of how each principle is reflected in health services in Australia. **6 marks**

Source: *VCAA 2013, Health and Human Development, Section A, Q1b*

Question 3

Outline the difference between mortality and morbidity as measurements of health status. **2 marks**

Unit	**3**	**Australia's health in a globalised world**
Area of Study	**1**	**Understanding health and wellbeing**
Topic	**2**	**Measuring health status**
Subtopic	**2.4**	**Morbidity**

Summary

- **Morbidity** refers to ill health in an individual and levels of ill health within a population (often expressed through incidence, prevalence and comorbidity measures) (AIHW, 2018)
- **Prevalence** is the number or proportion of cases of a particular disease or condition present in a population at a given time.
- **Incidence** is the number or rate of new cases of a disease during a specified period of time
- **Self-assessed health status** is a measure based on a person's own opinion about how they feel about their health, their state of mind and their life in general.

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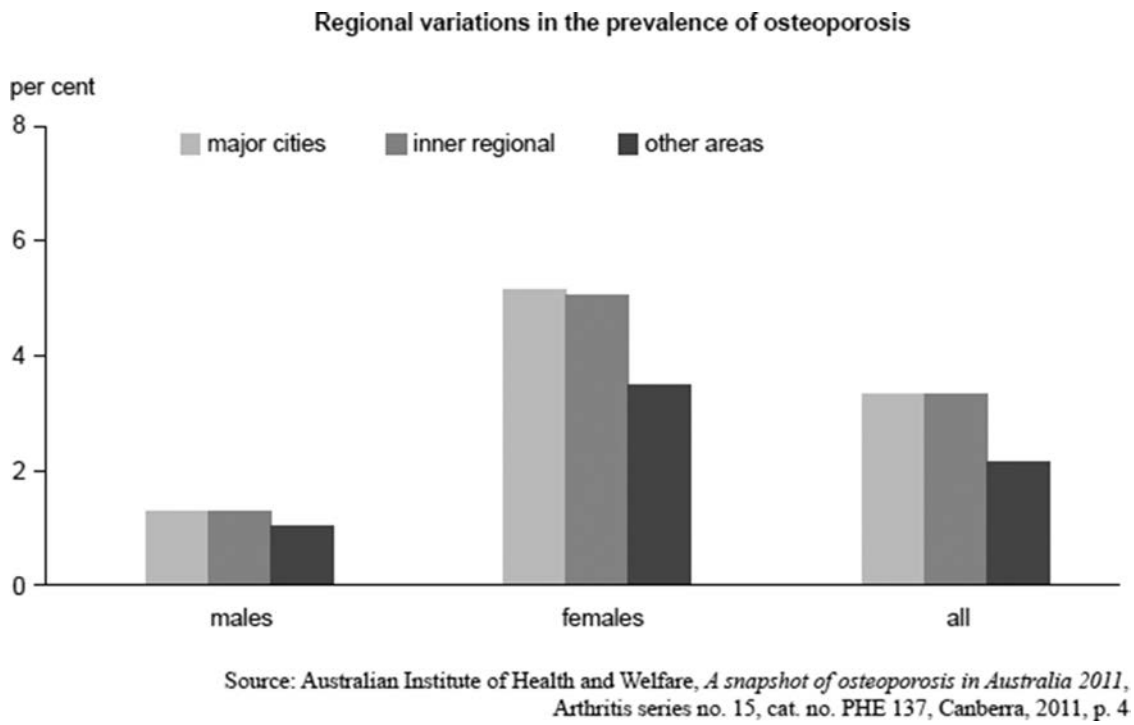
Past VCAA exam questions

Source: *VCAA 2015, Health and Human Development Exam, Q5a*

Question 1

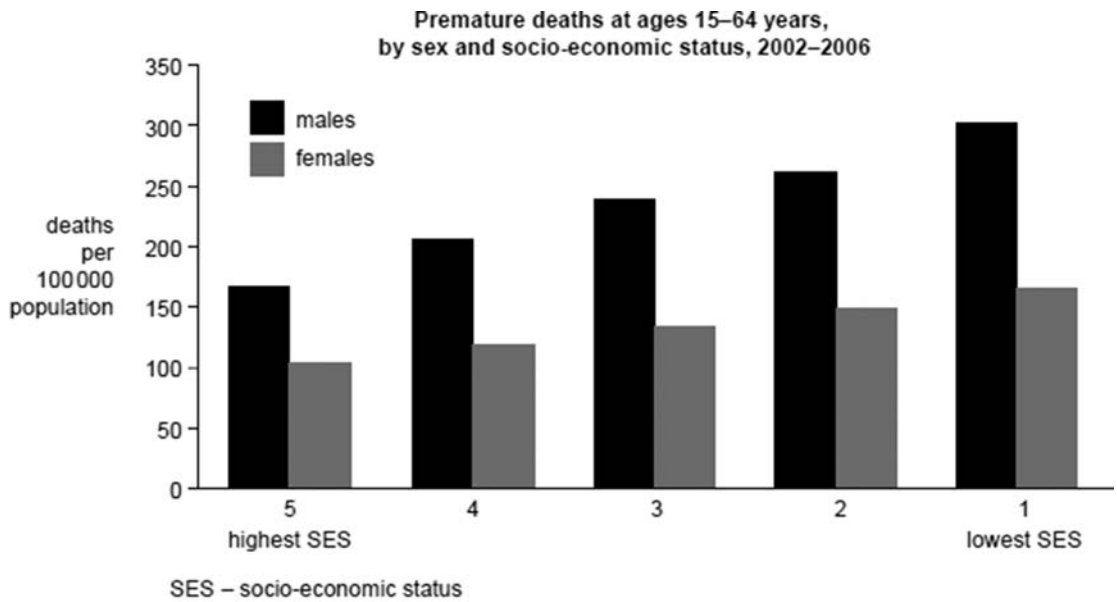


Source: Australian Institute of Health and Welfare, *A snapshot of osteoporosis in Australia 2011*, Arthritis series no. 15, cat. no. PHE 137, Canberra, 2011, p. 4

Define 'prevalence'. **1 mark**

Source: *VCAA 2013, Health and Human Development, Section B, Q5c*

Question 2



Source: Australian Institute of Health and Welfare, *Australia's health 2010*, Australia's health series no. 12, cat. no. AUS 122, Canberra, 2010, p. 254

Death rates are one way in which health status can be measured. Incidence and prevalence are other measurements of health status.

Outline the difference between incidence and prevalence. **2 marks**

Source: *Adapted from VCAA 2010 Health and Human Development Exam, Section B, Q1a*

Question 3

Diabetes Australia Vic. has ranked the City of Moonee Valley 57th in Victoria for the number of cases of Diabetes Mellitus. Although not considered a 'hot spot' it has had an increase of 94% in the prevalence of Diabetes in its population.

Source: Diabetes Australia

Define prevalence. **1 mark**

Exam practice questions

Source: *Jacaranda (John Wiley & Sons Australia, Ltd), Practice VCE Question*

Question 4

'Swine flu has been called a pandemic by the World Health Organization because the disease has spread to affect people in 77 countries and has caused 254 206 cases and 2837 deaths. In Victoria, with a population of about 5 million, 2420 people have been diagnosed with the disease, and 30 new cases are being diagnosed each day. Swine flu has killed 24 people in Victoria.'

From the passage above, identify an example of each of incidence, prevalence, mortality and morbidity.

4 marks

Unit	**3**	**Australia's health in a globalised world**
Area of Study	**1**	**Understanding health and wellbeing**
Topic	**2**	**Measuring health status**
Subtopic	**2.5**	**Burden of disease**

Summary

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.

Disability-adjusted life year (DALY) One year of healthy life lost due to illness and/or death. DALYs are calculated as the sum of the years of life lost due to premature death and the years lived with disability for people living with the health condition or its consequences.

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Past VCAA exam questions

Source: *VCAA 2016, Health and Human Development Exam, Q8c*

Question 1

Cardiovascular diseases contribute to 14% of the total burden of disease in Australia and New Zealand. **3 marks**

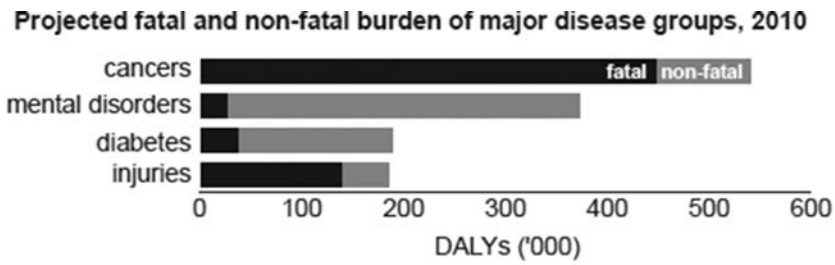
i. What is meant by 'burden of disease'? **2 marks**

ii. How is burden of disease measured? **1 mark**

Source: *VCAA 2011, Health and Human Development Exam, Section A, Q3*

Question 2

A measure known as the burden of disease shows the impact of different health problems.
The graph below shows the projected fatal and non-fatal burden of some major disease groups in Australia.



Source: Australian Institute of Health and Welfare, Australia's health 2010

Define burden of disease and use an example from the graph to illustrate its meaning. **3 marks**

Source: *VCAA 2007 Health and Human Development Exam, Q2ai*

Question 3

Table 2 below shows the Disability-Adjusted Life Years (DALYs) by age, sex and cause in Victoria 2001.

	Males by age group years (years)					Females by age group (years)				
Broad Disease Group	**0–14**	**15–34**	**35–54**	**55–74**	**75+**	**0–14**	**15–34**	**35–54**	**55–74**	**75+**
Cancer	592	1581	11 849	38 954	18 165	373	2098	15 660	28 248	17 632
Diabetes	175	496	5450	7017	2177	169	381	4180	5818	3320
Mental disorders	4408	25 421	12 665	3429	467	2477	23 376	17 074	4570	530
Cardiovascular diseases	121	1488	9869	26 332	22 579	220	1188	4567	16 821	31 868
Musculoskeletal disease	63	592	2613	3648	1239	66	724	3555	5335	2814
Injuries	2138	14 479	8830	3209	1050	1207	4172	3340	1793	1690
Other	21 575	9056	16 641	33 024	27 017	16 869	13 450	15 115	25 638	38 393
Total	29 072	53 113	67 917	115 613	72 694	21 381	45 389	63 491	88 223	96 247

Source: Adapted from Public Health Group, Rural and Regional Health and Aged Care Services Division, 2005, Victorian Burden of Disease Study, Mortality and morbidity in 2001, Victorian Government Department of Human Services, Melbourne, p. 177

Which disease group contributes **most** to the DALYs for the 15–34 year age group for males **and** females?

1 mark

Source: *Based on VCAA 2007 Health and Human Development Exam, Q2aii*

Question 4

Table 2 below shows the Disability-Adjusted Life Years (DALYs) by age, sex and cause in Victoria 2001.

	Males by age group years (years)					Females by age group (years)				
Broad Disease Group	**0–14**	**15–34**	**35–54**	**55–74**	**75+**	**0–14**	**15–34**	**35–54**	**55–74**	**75+**
Cancer	592	1581	11 849	38 954	18 165	373	2098	15 660	28 248	17 632
Diabetes	175	496	5450	7017	2177	169	381	4180	5818	3320
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Cardiovascular diseases	121	1488	9869	26 332	22 579	220	1188	4567	16 821	31 868
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Total	29 072	53 113	67 917	115 613	72 694	21 381	45 389	63 491	88 223	96 247

Source: Adapted from Public Health Group, Rural and Regional Health and Aged Care Services Division, 2005, Victorian Burden of Disease Study, Mortality and morbidity in 2001, Victorian Government Department of Human Services, Melbourne, p. 177

Are mental disorders likely to contribute more to DALYs through years of life lost to premature death (YLL), or healthy years lost due to disability (YLD)? Explain why. **3 marks**

Source: *VCAA 2014 Health & Human Development Exam, Q1a*

Question 5

Define 'disability adjusted life year (DALY)'. **2 marks**

Exam practice questions

Source: *Jacaranda (John Wiley & Sons Australia, Ltd), Practice VCE Question*

Question 6

Disability adjusted life years is described as **1 mark**

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

B. 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.

C. a measure of burden of disease based on life expectancy at birth, but including an adjustment for time spent in poor health, i.e. the number of years in full health that a person can expect to live, based on current rates of ill health and mortality.

D. a measure of the impact of diseases and injuries. Specifically it measures the gap between life expectancy and health-adjusted life expectancy.

Answers and marking guide

2.2 Self-assessed health status and life expectancy

Question 1

Life expectancy is an indication of how long a person can expect to live at a particular age if death rates do not change. Whereas health-adjusted life expectancy is the number of years in full health that a person can expect to live, based on current rates of ill health and mortality.

Award 1 mark for the description of life expectancy.

Award 1 mark for the description of health-adjusted life expectancy.

***VCAA Assessment Report* note:**

This question was generally answered well, although a number of students did not include the full definition of life expectancy.

Question 2

Indicators may include:

- **Life expectancy —** an indication of how long a person can expect to live; the number of years of life remaining for a person of a particular age if death rates do not change.
- **Health Adjusted Life Expectancy (HALE) —** the number of years of full health that a person can expect to live, based on current rates of ill health and mortality.
- **Under-five mortality rate (U5MR) —** the number of deaths of children under five years of age per 1000 live births.
- **Maternal mortality —** the number of deaths of women during pregnancy or childbirth.
- **Mortality —** the number or rate of deaths in a specified time.
- **Morbidity —** ill health in an individual and the levels of ill health in a population group.
- **Burden of disease —** a measure of the impact of diseases and injuries, specifically the gap between current health status and an ideal situation where everyone lives to an old age, free of disease and disability.
- **Disability Adjusted Life Years (DALY) —** a measure of the burden of disease; one DALY equals one year of healthy life lost due to premature death and time lived with illness, disease or injury.
- **Incidence —** the number of new cases of an illness occurring during a given period.
- **Prevalence —** the number or proportion of cases of a particular disease or condition present in a population at a given time.

Award one mark for each of two indicators.

Award one mark each for the description of each indicator.

Question 3

Health status is an individual's or population's level of health, taking into account various aspects such as life expectancy, amount of disability and levels of disease risk factors.

Award 1 mark for a valid definition.

***VCAA Assessment Report* note:**

Health status is a key health term in the study design and the majority of students were able to accurately define the term.

Question 4

Life expectancy is the measurement of the number of years a person would be expected to live given the current conditions **[1 mark]**.

That is, life expectancy is the number of years of life remaining to a person, at a particular age, if death rates do not change.

Question 5
Life expectancy refers to the number of years newborns can expect to live given that current mortality rates remain the same **[1 mark]**.
Healthy life expectancy refers to the number of years a newborn can expect to live in full health and without significant disability **[1 mark]**.

Question 6
Explanation may include:
- Better public health, such as access to safe water and sanitation. This decreases the prevalence of illnesses such as diarrheal disease so fewer people die at a younger age, leading to higher life expectancy.
- Advances in medical technology and medicines such as x-rays, sophisticated heart surgery and antibiotics have meant that diseases such pneumonia, coronary heart disease and cancer can be detected early and treated, contributing to higher life expectancy.
- Government funding and advancement of immunisations has contributed to higher life expectancy. Many infectious diseases such as measles and polio are now easily prevented through immunisation, which prevents many people from dying at a young age.

For each of 2 reasons:
- award 1 mark for each relevant reason
- award 1 mark for each reason linking to higher life expectancy.

Question 7
Explanation may include:
- the first year and/or five years of life have the highest mortality rates, affecting life expectancy
- people who reach 30 have passed through the most dangerous lifespan stages.

Sample response:
Life expectancy at birth takes into account infant mortality and mortality rates for children under five years of age. Death rates for infants and those under five years of age are much higher than for any other age group.
Individuals who reach their fifth birthday are more likely to reach adulthood. Therefore, individuals who have reached the age of 30 have passed through the dangerous under five years of age stage of the lifespan.
Award 1 mark for each of two valid points.

Question 8
Measures of health status include:
- life expectancy
- Health Adjusted Life Expectancy (HALE)
- mortality (maternal mortality, infant mortality, under-5 mortality)
- morbidity
- prevalence
- incidence
- self-assessed health status
- burden of disease
- Disability Adjusted Life Years (DALYs).

Award 1 mark for each of four valid measures.

Question 9
Correct Answer is D
Health status indicators:
- enable judgements to be made about health status experienced by individuals, groups and countries
- allow governments and other groups to identify trends in levels of health
- usually relate to physical ill health and wellbeing as this is the easiest to measure and therefore forms the basis of a majority of the health data available.

Question 10
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. Health adjusted life expectancy, however, is the number of years you are expected to live in good health, based on current rates of ill health and mortality.
Award 1 mark for an explanation of life expectancy.
Award 1 mark for explaining how this is different to health adjusted life expectancy (HALE).

Question 11
Correct Answer is A
Life expectancy is described as an indication of how long a person can expect to live, i.e. the number of years of life remaining to a person, at a particular age, if death rates do not change.

2.3 Mortality

Question 1
Award 1 mark for the definition of under-five mortality.
Award 1 mark for the definition of morbidity.
Under-five mortality — The number of deaths of children under five years of age per 1000 live births **[1 mark]**
Morbidity — Refers to ill health in an individual and the levels of ill health in a population or group **[1 mark]**

Question 2
Principles of the social model of health include:
- empowers individuals and communities
- addresses the broader determinant of health
- acts to enable access to health care
- acts to reduce social inequities
- involves intersectorial collaboration.

Sample respsonses may include:
- Addresses the broader determinants of health - This is reflected in our national health insurance system, Medicare, which provides access to essential healthcare services to all Australians regardless of their social, environmental or economic situation.
- Involves intersectorial collaboration (lots of government departments, not just the health department) - Health promotion campaigns such as Arrive Alive are joint initiatives involving the department of transport and the department of health and ageing.
- Aims to reduce social inequities - A range of healthcare services is targeted specifically to those groups who experience inequality in health outcomes. These include Aboriginal healthcare services, women's health centres, men's health clinics and adolescent health clinics.
- Empowers individuals and communities - Many health promotion campaigns, such as Quit, SunSmart and Go For Your Life, are designed to educate and raise awareness of the risk factors associated with many diseases and illnesses. Education empowers individuals to take control over their health.
- Enables access to health care - Medicare is a low-cost service for all Australians. All Australians have in theory access to bulkbilling GPs and public hospitals regardless of income or where they live.

Award 1 mark for identifying each of two relevant principles of the social model of health.
Award 1 mark for each of two links to a relevant health service.
Award 1 mark for each of two examples showing how the health service reflects the social model of health principle.

***VCAA Assessment Report* note:**
If students used the elements of the Ottawa Charter they were not awarded any marks. This question was answered poorly; this was disappointing considering that the social model of health is a dot point in the study design. Many students did not answer this question, indicating that this area may not have been covered in all schools.

Question 3
Mortality refers to the number of deaths in a population at a given time. **[1 mark]**
Morbidity refers to ill health in an individual and/or levels of ill health in a population at a given time. **[1 mark]**
***VCAA Assessment Report* note:**
Students were expected to show an understanding of the difference between the two key health terms of mortality and morbidity. While the majority of students were able to demonstrate their understanding, many students confused these two terms.

2.4 Morbidity

Question 1
Prevalence is the number of cases of a particular disease or condition present in the population at a given time.
Award 1 mark for an accurate definition of prevalence.

Question 2
Prevalence refers to the proportion of a population affected by a disease or condition at a particular time, whereas incidence is the rate at which new cases occur in a population during a specific time period.
Award 1 mark for outlining incidence.
Award 1 mark for outlining prevalence.
(Only 1 mark was awarded if the outlines did not identify a difference between the terms.)
***VCAA Assessment Report* note:**
The majority of students were able to outline the difference between incidence and prevalence.

Question 3
The number or proportion of cases of a particular disease or condition present in a population at a given time. **[1 mark]**
***VCAA Assessment Report* note:**
Many students did not answer this question.

Question 4
Incidence - 30 new cases diagnosed each day
Prevalence - 2420 of about 5 million people in Victoria and 254 206 of about 6.7 billion people worldwide
Morbidity - 2420 cases in Victoria and 254 206 cases worldwide
Morbidity - 2420 cases in Victoria and 254 206 cases worldwide
Award 1 mark for each of four correct identifications.

2.5 Burden of disease

Question 1
i. Burden of disease is a measurement of the impact of disease and injuries **[1 mark]**, specifically measuring the gap between current health status and an ideal situation where everyone lives to an old age, free of disease and disability. **[1 mark]**
ii. Burden of disease is measured by Disability Adjusted Life Years (DALYs). **[1 mark]**

***VCAA Assessment Report* note:**
Students are advised to use the full name rather than acronyms such as DALYs when answering a question such as this. Use of an acronym does not show an understanding of the measurement used.

Question 2
Burden of disease is the impact of a disease or injury on a population group. It measures the gap between current health status and an ideal situation where everyone lives to an old age free of disease and disability. It is measured in DALYs, which combine the years of life lost due to premature death (YLL) and the years of life lost due to disability (YLD).
For example, the burden of disease for diabetes and injuries are similar with approximately 200 000 DALYs. Yet injuries have a much higher fatal component (YLL) than diabetes, and diabetes has a much higher non-fatal component (YLD) than injuries, illustrating the overall impact of the disease and not just the death or illness rates.
Award 1 mark for defining burden of disease.
Award 1 mark for how burden of disease is measured.
Award 1 mark for an example to illustrate its meaning.
***VCAA Assessment Report* note:**
Many students were able to write a definition but did not know how to use the material in the graph to illustrate its meaning.

Question 3
Award 1 mark for correctly identifying mental disorders as the disease group that contributes most to the DALYs.

Question 4
YLD would be more significant, as people suffering mental illness lose more years due to impaired functioning, compared with a smaller number of years lost to premature death due to suicide.
Award 1 mark for stating that YLD (years of life lost due to disability) would be more significant.
Award 1 mark for each of two points of explanation.
***VCAA Assessment Report* note:**
The following student answer achieved full marks.
It is most likely to contribute to DALYs through healthy years lost due to disability because mental disorders are a psychological and usually non-fatal disease possibly resulting in reduced functioning therefore contributing to YLD. It can contribute slightly to YLL as a result of committing suicide due to their feelings of depression.

Question 5
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.
Award 1 mark for recognising it is a measure of burden of disease.
Award 1 mark for recognising it equals one year of healthy life lost due to premature death and time lived with illness, disease or injury.

Question 6
Correct Answer is B
Disability adjusted life years is described as 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.