2 Measurements and indicators of health status

2.1 Overview

Key knowledge

• Indicators used to measure the health status of Australians, including incidence and prevalence of health conditions, morbidity, rates of hospitalisation, burden of disease, mortality, life expectancy, core activity limitation, psychological distress and self-assessed health status

• The health status of Australia’s youth

Key skills

• Analyse the extent to which health status data reflects concepts of health and wellbeing
• Draw conclusions from health data about the health status of youth in Australia

FIGURE 2.1 The health status of Australia’s youth is generally good.
KEY TERMS

**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. (VCAA)

**Chronic conditions** any disease or condition that lasts a long time (usually longer than six months). It usually can’t be cured and therefore requires ongoing treatment and management. Examples include arthritis and asthma.

**Core activities** relate to three main areas of life: self-care, mobility and communication

**Core activity limitation** when an individual has difficulty, or requires assistance, with any of the three core activities

**Disability adjusted life years (DALY)** a measure of burden of disease. One DALY is equal to one year of healthy life lost due to illness and/or death. DALY 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. (AIHW, 2018)

**Health indicators** standard statistics that are used to measure and compare health status (e.g., life expectancy, mortality rates, morbidity rates)

**Health status** an individual’s or a population’s overall health (and wellbeing), taking into account various aspects such as life expectancy, amount of disability and levels of disease risk factors (AIHW, 2008)

**Hospital separations** episodes of hospital care that start with admission and end at transfer, discharge or death

**Incidence** refers to the number (or rate) of new cases of a disease/condition in a population during a given period

**Kessler Psychological Distress Scale (K10)** a scale of psychological distress based on the answers to ten questions about negative emotional and mental states in the four weeks prior to the interview. This system classifies psychological distress as low, moderate, high and very high.

**Life expectancy** the number of years of life, on average, remaining to an individual at a particular age if death rates do not change. The most commonly used measure is life expectancy at birth. (AIHW, 2018)

**Morbidity** ill health in an individual and levels of ill health within a population (often expressed through incidence, prevalence) (AIHW, 2018)

**Mortality** the number of deaths in a population in a given period (AIHW, 2018)

**Prevalence** the number or proportion of cases of a particular disease or condition present in a population at a given time (AIHW, 2008)

**Psychological distress** relates to unpleasant feelings and emotions that affect an individual’s level of functioning

**Years lost due to disability (YLD)** a measure of how many healthy years of life are lost due to disease, injury or disability

**Years of life lost (YLL)** a measure of how many years of expected life are lost due to premature death

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**2.2 Self-assessed health status and life expectancy**

**KEY CONCEPT** Exploring the self-assessed health status and life expectancy of Australian youth

**2.2.1 What is health status?**

So far, the concept of health and wellbeing, and the five dimensions that contribute to health and wellbeing, have been examined. As well as exploring physical, social, emotional, mental and spiritual health and wellbeing, it is useful to be able to measure the level of health and wellbeing that individuals, groups or whole populations are experiencing. Measurable aspects of health and wellbeing provide an ability to make judgements relating to the health status of individuals, groups or populations.
2.2.2 Measuring health status

Measuring health status is useful for a number of purposes. As already mentioned, it allows judgements to be made about the health and wellbeing of individuals, groups or populations. With this information, government and non-government organisations can take action to improve health and wellbeing in areas that need it. It also allows trends to be identified in health status over time. This can provide valuable feedback on actions that have already been implemented. Such information can further guide interventions aimed at improving health and wellbeing.

There are a number of ways of measuring health status and these measures are collectively known as health indicators (figure 2.2). Each health indicator provides specific information relating to the health status experienced. By examining a range of health indicators, a more complete assessment of health status can be made.

FIGURE 2.2 The health status indicators that will be explored in this topic

It can take some time for health statistics to become public — often around three years before data can be accurately collated and released. Some statistics are released only every two years (biannually) or less often. As a result, some statistics quoted in this book may date back to the early 2010s, yet they represent the most recent statistics available. Generally speaking, the rates and ratios derived from statistics change slowly over time, so even older statistics are relevant to what is happening today. Further, many statistics are available only for set age groups (often 12–24). When these statistics are used, it is important to remember that they include a proportion of those in the early adulthood stage.

Australia is one of the healthiest countries in the world and Australia’s youth (those aged 12–18) are among the healthiest individuals in the country. There have been constant improvements over time in most aspects of health and wellbeing. In order to adequately assess the health and wellbeing of Australia’s youth, it is important to understand the methods used for reporting health status.

Resources

Teacher-led video Measurements of health status (eles-3231)
Self-assessed health status
Self-assessed health status is based on an individual’s own perception of their health and wellbeing. People are asked to rate their level of health and wellbeing. Responses include excellent, very good, good, fair and poor. Self-assessed health status is a subjective measure as different people think about their health and wellbeing in different ways. One person may assess their health as excellent if they are physically fit, even if their mental and emotional health and wellbeing is poor. Another may take all five dimensions into account in forming their assessment. Young Australians generally rate their health status positively. Figure 2.4 shows the self-assessed health status of young Australians at selected ages. The majority of youth in both age groups rate their health status as excellent or very good, with slightly more youth aged 15–17 years rating their health status as excellent or very good compared to those aged 18–24.

Life expectancy
Life expectancy is one of the most common methods used to measure health status. It gives an indication of how long a person can expect to live if the current death rates stay the same. Unless stated otherwise, life expectancy data relate to a person born in the years provided. Table 2.1 shows life expectancy data for people of different ages in Australia.
According to the Australian Bureau of Statistics data shown in table 2.1, the life expectancy of a child born in 2017 was 80.5 years for a male and 84.6 years for a female. Compare this to a life expectancy of 55.2 years for males and 58.8 years for females born between 1901 and 1910. This represents an increase in life expectancy of more than 25 years over the past century. The life expectancy of Australians is constantly improving, while death rates are decreasing.

The life expectancy for Australia’s youth reflects the high figures experienced by all age groups in this country. According to table 2.2, a male aged 12 could expect to live to 80.9 years and a male aged 21 could expect to live to 81 years. As life expectancy is based on averages, it increases as people get older. Some individuals will not survive infancy or childhood, and this brings the average down for life expectancy at birth. Once an individual survives these stages, the likelihood that they will live beyond the life expectancy at birth increases.

**Source:** Adapted from ABS and AIHW data, 2019.

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### TABLE 2.1 Life expectancy at different ages, 1901–10 and 2015–17

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth</td>
<td>55.2</td>
<td>80.5</td>
<td>58.8</td>
<td>84.6</td>
</tr>
<tr>
<td>30</td>
<td>66.5</td>
<td>81.4</td>
<td>69.3</td>
<td>85.2</td>
</tr>
<tr>
<td>65</td>
<td>76.3</td>
<td>84.7</td>
<td>77.9</td>
<td>87.3</td>
</tr>
<tr>
<td>85</td>
<td>87.7</td>
<td>91.2</td>
<td>89.2</td>
<td>92.3</td>
</tr>
</tbody>
</table>

**Source:** Adapted from ABS and AIHW data, 2019.

### TABLE 2.2 Life expectancy for Australia’s youth and early adults at different ages

<table>
<thead>
<tr>
<th>Age</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>80.9</td>
<td>85.0</td>
</tr>
<tr>
<td>13</td>
<td>80.9</td>
<td>85.0</td>
</tr>
<tr>
<td>14</td>
<td>80.9</td>
<td>85.0</td>
</tr>
<tr>
<td>15</td>
<td>80.9</td>
<td>85.0</td>
</tr>
<tr>
<td>16</td>
<td>80.9</td>
<td>85.0</td>
</tr>
<tr>
<td>17</td>
<td>80.9</td>
<td>85.0</td>
</tr>
<tr>
<td>18</td>
<td>80.9</td>
<td>85.0</td>
</tr>
<tr>
<td>19</td>
<td>81.0</td>
<td>85.0</td>
</tr>
<tr>
<td>20</td>
<td>81.0</td>
<td>85.1</td>
</tr>
<tr>
<td>21</td>
<td>81.0</td>
<td>85.1</td>
</tr>
<tr>
<td>22</td>
<td>81.1</td>
<td>85.1</td>
</tr>
<tr>
<td>23</td>
<td>81.1</td>
<td>85.1</td>
</tr>
<tr>
<td>24</td>
<td>81.1</td>
<td>85.1</td>
</tr>
<tr>
<td>25</td>
<td>81.2</td>
<td>85.1</td>
</tr>
</tbody>
</table>

**Source:** Adapted from ABS, *Life Tables, States, Territories and Australia, 2015–2017*, ABS cat. No. 3302.0.55.001.
Although life expectancy is a valuable indicator and reflects the overall health status of a population group or country, it doesn’t provide information about how sick the population is or what the leading causes of death and ill health are. As a result, other indicators are required in order to make informed judgements about health status and these will be explored in the following subtopics.

### 2.2 Activites
Access the Life expectancy weblink and worksheet in the Resources tab then complete the worksheet.

#### 2.2 Exercise 1 TEST your knowledge
To answer questions online and to receive immediate feedback and sample responses for every question, go to your learnON title at www.jacplus.com.au.

1. Define health status.
2. Why is it useful to be able to measure health status?
3. (a) What is meant by health indicators?
   (b) Identify four health indicators that can be used to measure health status.
4. Explain the following health status indicators:
   (a) self-assessed health status
   (b) life expectancy.
5. What percentage of 15- to 24-year-olds assessed their health status as ‘excellent’ or ‘very good’ according to figure 2.4?
6. Identify a similarity and a difference between those aged 15–17 and 18–24, as shown in figure 2.4.
7. Using table 2.1, explain how life expectancy changed from 1901–10 to 2015–17 for:
   (a) males at birth
   (b) females at birth.

#### 2.2 Exercise 2 APPLY your knowledge
1. (a) Refer to figure 2.4 and outline the proportion of 15- to 24-year-olds assessing their health status as ‘good’ or ‘fair or poor’.
   (b) Brainstorm reasons that may account for youth assessing their health status as ‘good’ or ‘fair or poor’.
2. Outline one advantage and one limitation of using life expectancy in making judgements about the health status of a population or group.
3. (a) Using table 2.2, explain what happens to life expectancy as individuals move through youth and into the early adulthood stage of the lifespan.
   (b) Suggest reasons that account for this change.

#### 2.2 Exercise 3 studyON: Practice exam questions online
To answer practice exam questions online and to receive immediate feedback and sample responses for every question, go to your learnON title at www.jacplus.com.au.
2.3 Mortality

KEY CONCEPT Exploring the health status indicator of mortality among Australian youth

Mortality refers to death, particularly at a population level. There are two ways of considering mortality:
• the number or rate of deaths in a population. Mortality rates are usually presented per 100 000 population in a 12-month period
• the years of life lost (YLL), where one YLL is equal to one year of life lost due to premature death.

2.3.1 Mortality rate
The mortality rate is an indication of how many deaths occurred in a population in a given period for a specific cause/all causes. Mortality rates are usually presented per 100 000 population in a 12-month period. Some mortality rates are shown in table 2.3.

<table>
<thead>
<tr>
<th>Age group</th>
<th>Males</th>
<th>Females</th>
<th>Persons</th>
<th>Male:female ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–4</td>
<td>86.9</td>
<td>73.4</td>
<td>80.6</td>
<td>1.2</td>
</tr>
<tr>
<td>5–9</td>
<td>9.2</td>
<td>7.8</td>
<td>8.5</td>
<td>1.2</td>
</tr>
<tr>
<td>10–14</td>
<td>10.5</td>
<td>8.7</td>
<td>9.7</td>
<td>1.2</td>
</tr>
<tr>
<td>15–19</td>
<td>41.8</td>
<td>21.9</td>
<td>32.1</td>
<td>1.9</td>
</tr>
<tr>
<td>20–24</td>
<td>66.4</td>
<td>24.3</td>
<td>45.7</td>
<td>2.7</td>
</tr>
<tr>
<td>25–29</td>
<td>76.9</td>
<td>29.9</td>
<td>53.2</td>
<td>2.6</td>
</tr>
<tr>
<td>30–34</td>
<td>92.5</td>
<td>40.3</td>
<td>66.0</td>
<td>2.3</td>
</tr>
<tr>
<td>35–39</td>
<td>117.5</td>
<td>61.6</td>
<td>89.3</td>
<td>1.9</td>
</tr>
<tr>
<td>40–44</td>
<td>163.3</td>
<td>89.0</td>
<td>125.7</td>
<td>1.8</td>
</tr>
<tr>
<td>45–49</td>
<td>231.8</td>
<td>139.1</td>
<td>184.4</td>
<td>1.7</td>
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<tr>
<td>50–54</td>
<td>349.1</td>
<td>210.6</td>
<td>278.7</td>
<td>1.7</td>
</tr>
<tr>
<td>55–59</td>
<td>535.2</td>
<td>312.2</td>
<td>421.1</td>
<td>1.7</td>
</tr>
<tr>
<td>60–64</td>
<td>819.8</td>
<td>471.7</td>
<td>640.9</td>
<td>1.7</td>
</tr>
<tr>
<td>65–69</td>
<td>1288.0</td>
<td>738.7</td>
<td>1005.5</td>
<td>1.7</td>
</tr>
<tr>
<td>70–74</td>
<td>2110.4</td>
<td>1257.5</td>
<td>1672.3</td>
<td>1.7</td>
</tr>
<tr>
<td>75–79</td>
<td>3607.1</td>
<td>2262.8</td>
<td>2899.2</td>
<td>1.6</td>
</tr>
<tr>
<td>80+</td>
<td>10441.4</td>
<td>9159.9</td>
<td>9688.3</td>
<td>1.1</td>
</tr>
</tbody>
</table>

Source: Adapted from ABS data.

EXAM TIP
Understanding mortality rates
When drawing conclusions about causes of mortality among youth, it is important to ensure that fair comparisons are made between different groups.

Comparing the number of youth who die from a condition does not take the size of the population into account and therefore does not provide an accurate comparison. Figure 2.5, for example, shows the number of deaths among Indigenous and non-Indigenous Australians aged 15–19 in 2015.
FIGURE 2.5 The number of Indigenous and non-Indigenous deaths for those aged 15–19, 2015

Source: Adapted from AIHW, Aboriginal and Torres Strait Islander adolescent and youth health and wellbeing 2018 and GRIM Books, 2019.

Figure 2.5 appears to show that Indigenous people are better off as they have a much lower number of deaths. There were around 360 deaths for non-Indigenous people in this age group, compared to around 50 for Indigenous people. However, when the size of the population is taken into account, the data show a very different story.

FIGURE 2.6 The rate (per 100 000) of Indigenous and non-Indigenous deaths for those aged 15–19, 2015

Source: Adapted from AIHW, Aboriginal and Torres Strait Islander adolescent and youth health and wellbeing 2018 and GRIM Books, 2019.

When the total number of people making up each group is taken into account (the population of non-Indigenous Australians is much higher), Indigenous people experience much higher rates of mortality. The rate for non-Indigenous people is about 25 deaths per 100 000 people, whereas for Indigenous Australians the rate is about 60 deaths per 100 000 people. This difference could be missed unless the vertical axis on each graph is completely understood.

Youth has among the lowest mortality rates of all lifespan stages, second only to childhood mortality rates (see figure 2.7). Mortality rates have also decreased significantly over time among youth (figure 2.8). In 1990, mortality rates were around 67 per 100 000 people aged 15–19 and around 19 per 100 000 people aged 10–14. These figures had decreased in 2017 to around 32 deaths per 100 000 and 10 deaths per 100 000 for those aged 15–19 and 10–14 respectively. Advances in technology, education and medical treatment were largely responsible for these decreases.
**FIGURE 2.7** Death rates for infants, children, youths and early adults, 2017

Source: Adapted from healthdata.org.

**TRENDS**

A trend is a general movement or pattern. Sometimes trend data is valuable because it shows what has been happening to the data over a period of time. For example, the death rate for those aged 15–19 in 2017 was around 32 per 100 000. This figure may seem high considering that youth is one of the healthiest stages of the lifespan. Yet when trend data are explored, it shows that the rates have actually decreased significantly compared to years gone by (see figure 2.8).

**FIGURE 2.8** Death rates for Australians aged 10–14 and 15–19, 1990–2017

Source: Adapted from healthdata.org.
Death rates are low during youth because they have survived childhood (where factors associated with childbirth and genetic abnormalities are the leading causes of death) and lifestyle factors such as food intake, alcohol consumption and physical activity levels have generally not had time to have an impact on the body to the point of causing premature death.

The leading contributors to death among youth are shown in figure 2.9.

**FIGURE 2.9** Mortality rates due to selected causes for those aged 10–19 according to sex, 2017

Source: Adapted from healthdata.org, 2019.

**TABLE 2.4** The leading causes of mortality among youth explained

<table>
<thead>
<tr>
<th>Cause of mortality</th>
<th>Description</th>
<th>Specific links to youth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injuries and poisoning</td>
<td>Injuries relate to physical trauma or damage caused to body tissues by an external force. Specifically, injuries include road accidents, intentional self-harm, drowning and violence. Poisoning occurs when a substance interferes with normal body functions after it is swallowed, inhaled, injected or absorbed.</td>
<td>Deaths from accidental causes such as car accidents and drowning contribute significantly to mortality rates during the youth stage. Common causes of poisoning among youth include drug overdoses and alcohol poisoning.</td>
</tr>
</tbody>
</table>
| Cancers                       | Cancer is characterised by the uncontrolled growth of abnormal cells. These cells can interfere with healthy cells and prevent them from carrying out their normal functions. Although the mortality rate associated with cancer is relatively low among youth compared to other lifespan stages, it is still the second leading cause of mortality among youth. | Among youth, the most common cancers include:  
  - melanoma — cancer of the melanocytes, a type of skin cell  
  - Hodgkin lymphoma — a form of blood cancer  
  - testicular cancer — cancer of the testicles, therefore affecting only males.                                                                                                       |
| Diseases of the nervous system| Diseases of the nervous system were the third most common cause of death among youth in 2017. The nervous system is made up of the brain, spinal cord and nerves.                                                                                           | Diseases affecting these structures in youth include:  
  - cerebral palsy — a condition caused by damage to the brain that occurs either during pregnancy or shortly after birth                                                                                                                   |

*(Continued)*
TABLE 2.4 The leading causes of mortality among youth explained (Continued)

<table>
<thead>
<tr>
<th>Cause of mortality</th>
<th>Description</th>
<th>Specific links to youth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular diseases</td>
<td>Cardiovascular disease refers to diseases of the heart and blood vessels.</td>
<td>epilepsy — a brain condition characterised by recurrent seizures</td>
</tr>
<tr>
<td></td>
<td></td>
<td>muscular dystrophy — a range of related conditions that cause progressive weakness and loss of muscle mass.</td>
</tr>
</tbody>
</table>

2.3.2 Years of life lost (YLL)

Years of life lost (YLL) due to premature death is another way of measuring and comparing mortality. If a person dies from a given condition 30 years before the predicted life expectancy for their age, then they have contributed 30 YLL to that particular cause of death. For example, if a 14-year-old female dies in a car crash, and life expectancy for females that age is 84, then 70 years have been added to the YLL for injuries.

Figure 2.10 shows the total YLL and rate of YLL per 1000 people for both males and females in different age groups in 2017. Compared to other age groups, 10- to 19-year-olds experience relatively few YLL.

FIGURE 2.10 YLL number and rate for males and females by age group, 2017

Source: Adapted from https://vizhub.healthdata.org/gbd-compare/, 2019.

The YLL that were caused by a range of conditions among young Australians are shown in figure 2.11. For Australia’s youth, road traffic accidents are the leading specific cause of years of life lost, and injury-related deaths account for the top three specific causes of YLL. Cancer is the leading non-injury related cause of death, followed by nervous system and sense disorders that include epilepsy and muscular dystrophy.
FIGURE 2.11 Years of life lost (YLL) for selected conditions by sex and age group

Source: Adapted from AIHW data.
Note: ‘Other causes’ is not considered to be a leading cause of death because it encompasses a range of conditions, each of which on its own contributes very few YLL.

2.3 Activities
Access the Injury weblink and worksheet in the Resources tab then complete the worksheet.

2.3 Exercise 1 TEST your knowledge
To answer questions online and to receive immediate feedback and sample responses for every question, go to your learnON title at www.jacplus.com.au.

1. What is meant by ‘mortality’?
2. Examine table 2.3 and answer the following questions.
   (a) Which age group has the greatest male:female ratio for mortality?
   (b) What does this number (ratio) mean?
   (c) Discuss reasons that may account for the ratio identified in part a.
3. (a) According to figure 2.7, how do death rates change for 10- to 14-year-olds compared with 15- to 19-year-olds?
   (b) Suggest reasons for this change.
4. (a) Describe the trend in death rates as shown in figure 2.8.
   (b) What factors may have led to this trend?
5. (a) What are the top three broad causes of death for males and females according to figure 2.9?
   (b) For each broad cause of death identified in part a, list the specific diseases or conditions that are most likely to have caused these deaths.
6. (a) Explain how mortality rate due to injuries changes for those aged 15–19 compared to those aged 10–14 as shown in figure 2.9.
(b) Discuss possible reasons for these changes.
7. (a) State what the acronym ‘YLL’ stands for and explain what it means.
(b) Outline how YLL are calculated.
(c) If an individual dies at aged 15 and life expectancy for that person is 85 years, how many YLL have they contributed?
(d) If 10 people die at age 79 and their life expectancy is 80, how many YLL have been contributed by those 10 deaths?
(e) Out of c and d, which scenario has had a greater impact on the community in terms of YLL? Justify your response.
8. (a) Which sex contributes more YLL according to figure 2.11?
(b) Suggest reasons for this.

2.3 Exercise 2 APPLY your knowledge
1. Discuss why death rates might be a more useful statistic than the total number of deaths.
2. Examine table 2.3 and complete the following.
   (a) Graph the male:female mortality ratio across the lifespan.
   (b) Using data, describe the pattern with regard to male:female mortality rates across the lifespan.
3. Explain why mortality data is useful in addition to life expectancy data in analysing health status.

2.3 Exercise on studyON: Practice exam questions
To answer practice exam questions online and to receive immediate feedback and sample responses for every question, go to your learnON title at wwwjacplus.com.au.

2.4 Morbidity and burden of disease

2.4.1 Morbidity
Not all conditions end in death, so it is useful to examine the effect that non-fatal conditions have on a population. This is where morbidity data is useful. **Morbidity** refers to ill health — including disease, injury and disability — in an individual, and the level of ill health in a population. The morbidity rate therefore refers to the rate of ill health in a population in a given period. There are two ways of considering morbidity:
- the number or rate of people reporting a condition (often represented as a percentage of a population, or the incidence and prevalence rates)
- the **years lost due to disability (YLD)**, where one YLD is equal to one ‘healthy’ year of life lost due to time lived with disease, injury or disability.

By using two methods, it is possible to examine which conditions are the most common and which conditions have the biggest impact on health and wellbeing.
2.4.2 Incidence and prevalence of health conditions

Incidence and prevalence are two measures used to present morbidity data. **Incidence** refers to the number of new cases of a condition in a given period (usually 12 months) and **prevalence** refers to the total number of cases of a condition at a given time (see figure 2.13). Both incidence and prevalence data can be shown as the total number or the rate (often expressed per 1000 or per 100 000 population).

Incidence data are useful for identifying which conditions are increasing in diagnosis and which ones are decreasing. This can assist the government and health organisations in allocating resources and taking action to improve the health status of Australia’s youth. Incidence and prevalence (see figure 2.13) provide two ways to look at how many people experience particular conditions. New cases add to the overall prevalence of a condition, while those who are cured or die from it reduce the number.

Table 2.5 shows the estimated incidence rates (per 1000) for selected age groups and conditions in 2017.

### TABLE 2.5 Estimated incidence rates for selected conditions, per 1000 population, 2017

<table>
<thead>
<tr>
<th>Condition</th>
<th>Males 10–14</th>
<th>Males 15–19</th>
<th>Females 10–14</th>
<th>Females 15–19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthma</td>
<td>6.8</td>
<td>4.9</td>
<td>7.5</td>
<td>6.1</td>
</tr>
<tr>
<td>Migraine</td>
<td>24.0</td>
<td>22.8</td>
<td>31.5</td>
<td>30.8</td>
</tr>
<tr>
<td>Anxiety and depression</td>
<td>36.0</td>
<td>54.0</td>
<td>53.7</td>
<td>94.6</td>
</tr>
<tr>
<td>Eating disorders</td>
<td>3.6</td>
<td>8.18</td>
<td>6.6</td>
<td>14.8</td>
</tr>
<tr>
<td>Back and neck pain</td>
<td>18.9</td>
<td>33.4</td>
<td>23.3</td>
<td>42.2</td>
</tr>
<tr>
<td>Dental caries</td>
<td>304.5</td>
<td>487.7</td>
<td>333.3</td>
<td>500.5</td>
</tr>
</tbody>
</table>

**Source:** Adapted from [http://ghdx.healthdata.org/gbd-results-tool](http://ghdx.healthdata.org/gbd-results-tool), 2019.

### TABLE 2.6 Descriptions of the selected conditions shown in table 2.5

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthma</td>
<td>When exposed to certain triggers (e.g. cigarette smoke and air pollution), the lining of the air passages becomes inflamed and swollen, and extra mucus is produced. The muscles of the airways also tighten (bronchoconstriction), resulting in a narrowing of the airways that makes it difficult for the person to breathe.</td>
</tr>
<tr>
<td>Migraine</td>
<td>Migraine is a neurological condition characterised by severe headaches that can be experienced from as little as once or twice a year, or as often as two or three times a week. The pain is severe, throbbing and usually on one side of the head. A migraine attack can last from four hours to three days and is associated with a spasm of the blood vessels leading to the brain.</td>
</tr>
</tbody>
</table>

(Continued)
TABLE 2.6 Descriptions of the selected conditions shown in table 2.5 (Continued)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
</table>
| Anxiety and depression | Anxiety is a condition characterised by extreme worry that interferes with the sufferer’s daily life. Symptoms include panic attacks, physical fear reactions and attempts to avoid certain situations.  
Depression is a condition characterised by constant feelings of sadness and loss of interest, for no identifiable reason. |
| Eating disorders       | Eating disorders are types of mental illnesses and include:  
  • anorexia nervosa — symptoms include restricted eating, weight loss and a fear of weight gain  
  • bulimia nervosa — sufferers binge, often secretly, on high-kilojoule foods, then try to compensate by dieting, over-exercising or throwing up. Feelings of shame or loss of control often accompany the bingeing.  
  • binge eating disorder — symptoms include bouts of binge eating (e.g. eating much more than usual, to the point of discomfort, or when not physically hungry). Binge sessions can be followed by feelings of guilt, disgust and depression. |
| Back and neck pain     | Back pain is common among youth and can be caused by poor posture, inappropriate forms of exercise and carrying heavy schoolbags.                                                                                  |
| Dental caries          | Sometimes referred to as ‘cavities’ or ‘tooth decay’, dental caries occur when the tooth enamel breaks down due to excess acid in the mouth.                                                                       |

As can be seen from table 2.5, the incidence rate for asthma was 6.8 for every 1000 males in the 10–14 age bracket. If the size of the population in this age group is known, the total number of cases can be calculated (see box below).

CALCULATING THE TOTAL NUMBER OF NEW CASES OF A DISEASE

In 2017, there were approximately 756 500 males in the 10–14 age group. To calculate the total number of new cases, multiply the rate per 1000 by 756.5 (as there are 756.5 groups of 1000 in 756 500) to get the total number of new cases in 2017:

\[
756.5 \times 6.8 = 5144
\]

So in 2017 there were approximately 5144 new cases of asthma among males in the 10–14 years age group.

The prevalence, or total cases, of selected conditions is shown in table 2.7. Statistics on prevalence can be useful for comparing the number of individuals suffering from certain conditions during a specified period. As with incidence, information about prevalence can assist with allocating resources and planning for the future. It also enables trends to be identified over time so that the health system can adapt to cater for the changing needs of Australia’s youth.

TABLE 2.7 Prevalence (total number) of selected conditions, 2017

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th></th>
<th>Females</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10–14</td>
<td>15–19</td>
<td>10–14</td>
<td>15–19</td>
</tr>
<tr>
<td>Asthma</td>
<td>77 275</td>
<td>666 55</td>
<td>77 277</td>
<td>79 276</td>
</tr>
<tr>
<td>Migraine</td>
<td>81 777</td>
<td>128 361</td>
<td>102 149</td>
<td>165 825</td>
</tr>
<tr>
<td>Anxiety and depression</td>
<td>47 531</td>
<td>69 772</td>
<td>65 378</td>
<td>109 026</td>
</tr>
<tr>
<td>Eating disorders</td>
<td>1 118</td>
<td>4 153</td>
<td>3 590</td>
<td>16 150</td>
</tr>
<tr>
<td>Back and neck pain</td>
<td>23 291</td>
<td>51 641</td>
<td>25 994</td>
<td>60 308</td>
</tr>
<tr>
<td>Dental caries</td>
<td>112 486</td>
<td>178 378</td>
<td>115 733</td>
<td>178 442</td>
</tr>
</tbody>
</table>

Data in table 2.7 are presented as the total number of people in each age group experiencing each condition in Australia, but the rate of prevalence for each condition can be calculated if the approximate size of the population is known (see box below).

**CALCULATING THE RATE OF TOTAL CASES OF A DISEASE**

First, divide the population number by 1000 (or 100 000 if you want to display the rate per 100 000). For example, in 2017 there were approximately 715 500 females in the 10–14 age group:

\[
\frac{715\,500}{1000} = 715.5
\]

In other words, there were 715.5 groups of 1000.

To calculate the rate, divide the number of individuals suffering from the condition by 715.5. For asthma (table 2.7), there were 77 277 females in this age group suffering from asthma:

\[
\frac{77\,277}{715.5} = 108 \text{ cases per 1000 females in this age group.}
\]

Table 2.8 shows prevalence data for the same conditions as table 2.7, expressed per 1000 population.

<p>| TABLE 2.8 Prevalence (per 1000) of selected conditions, 2017 |</p>
<table>
<thead>
<tr>
<th>-----------------</th>
<th>-----------------</th>
<th>-----------------</th>
<th>-----------------</th>
<th>-----------------</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthma</td>
<td>88.1</td>
<td>101.7</td>
<td>108.0</td>
<td>109.5</td>
</tr>
<tr>
<td>Migraine</td>
<td>108.1</td>
<td>168.9</td>
<td>142.8</td>
<td>229.0</td>
</tr>
<tr>
<td>Anxiety and depression</td>
<td>62.8</td>
<td>91.8</td>
<td>91.4</td>
<td>150.5</td>
</tr>
<tr>
<td>Eating disorders</td>
<td>1.5</td>
<td>5.5</td>
<td>5.0</td>
<td>22.3</td>
</tr>
<tr>
<td>Back and neck pain</td>
<td>30.8</td>
<td>68.0</td>
<td>36.3</td>
<td>83.3</td>
</tr>
<tr>
<td>Dental caries</td>
<td>148.7</td>
<td>234.7</td>
<td>161.8</td>
<td>246.4</td>
</tr>
</tbody>
</table>

**Source:** Adapted from http://ghdx.healthdata.org/gbd-results-tool, 2019.

2.4.3 Years lost due to disability (YLD)

Years lost due to disability (YLD) is a measure of the impact of morbidity on a group or population. YLL and YLD are equal in value, in that one YLL and one YLD are each equal to one healthy year of life lost. The difference is that YLL is caused by premature death and YLD is caused by losing healthy years of life because of living with illness, disease or disability.

It would be difficult to compare the effect of asthma on an individual with the effect of losing a leg in a car crash. They are very different conditions and would impact on an individual in different ways. In order to address this issue, the World Health Organization (WHO) has given the most common conditions a disability weight, which is an indication of the severity of the condition and how much it interferes with normal life. The disability weights are incorporated into the YLD formula, so all YLD are relative and different conditions can be compared fairly. For example, even though headaches are more common among youth than asthma, they are considered to be less severe and this contributes to asthma contributing more YLD. As asthma contributes more YLD than headaches, it is considered to have a greater impact and be a greater concern.

Figure 2.14 shows the number and rate of YLD from age 0 to 39. Males experience a greater number of YLD in the 10–14 age group, but a lower rate than females. Females experience a greater rate of YLD in
both the 10–14 and the 15–19 age groups compared to males and the increase in mental disorders among females in this age group is largely responsible for this change. Figures 2.15 and 2.16 show the breakdown of YLD for 10- to 14-year-olds and 15- to 19-year-olds according to cause in 2017.

**FIGURE 2.14** YLD number and rate for males and females by age group, 2017

![Graph showing YLD number and rate for males and females by age group, 2017](image)


**FIGURE 2.15** Proportion of total YLD for 10- to 14-year-olds due to selected conditions, 2017

![Pie chart showing proportion of total YLD for 10- to 14-year-olds due to selected conditions, 2017](image)

As well as being leading causes of morbidity, injuries and diseases of the nervous system are leading causes of mortality and were discussed in the previous section.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mental and substance use disorders</td>
<td>Mental and substance use disorders include depression, anxiety and eating disorders, and alcohol and drug use disorders. Mental and substance use disorders are the largest contributor to YLD among youth and are therefore deemed to have the greatest non-fatal impact on health status. Mental and substance use disorders are common among youth and can be quite severe, which contributes to the high rate of YLD attributed to them.</td>
</tr>
<tr>
<td>Skin disorders</td>
<td>Skin disorders are the third leading contributor to YLD among youth and include acne, eczema, psoriasis and other forms of dermatitis. These conditions are often long lasting and, in some cases, can be severe.</td>
</tr>
</tbody>
</table>
| Musculoskeletal conditions       | Musculoskeletal conditions relate to a range of conditions affecting the bones, muscles and connective tissues (the tissues that connect bones to muscles). The most common musculoskeletal conditions among youth include:  
  • juvenile arthritis — a group of conditions that cause joint pain and swelling in children and teens under the age of 16, for unknown reasons  
  • back problems — include a range of conditions related to the bones, joints, connective tissue, muscles and nerves of the back, including back pain and disc disorders  
  • joint reconstruction surgery — involves surgically rebuilding structures of the joint. Examples include shoulder and knee reconstruction surgery. |
| Respiratory diseases             | Asthma and bronchitis account for the majority of YLD due to respiratory conditions among youth. Although more youth experience asthma than mental and substance use disorders, asthma is not considered to be as severe as mental and substance use disorders and therefore contributes fewer YLD. |
CASE STUDY

Australia endures ‘epidemic’ of preventable ACL injuries

John Roumeliotis’ promising football career was almost over before it had begun.

At 18 years old, the Epworth teenager had already suffered three crippling injuries to his anterior cruciate ligament, commonly known as the ACL.

The third time, he hadn’t even returned to playing when he snapped his ACL jumping for a mark at training two days before he was due to step back on the field in his comeback game.

‘I thought it was all over,’ said the Calder Cannons player, who is still hopeful of playing in the AFL.

‘I didn’t really know what to do with myself. I was devastated.’

These stories are not unusual. Every day on fields and courts across the country, sporting heartbreaks like this are being repeated.

New research has revealed Australia has the highest rates of ACL reconstructions in the world, and they are being reported in younger and younger athletes, some as young as seven or eight.

It is not yet clear what is causing the growing rates of ACL damage but leading knee surgeon Christopher Vertullo speculated it could be partly caused by a lack of ‘free play’ in a generation of children often glued to electronic devices.

Early specialisation in individual sports could also be to blame, he suggested.

Associate Professor Vertullo, the director of Knee Research Australia, said that when he began practising about 16 years ago, he rarely had to treat patients aged under 15, or visit paediatric wards.

‘Now every week I have to go there,’ he said.

It is a phenomenon that he finds particularly heartbreaking, as many ACL injuries can be prevented with proper agility training, yet cause devastating long-term effects, including future knee reconstructions and debilitating pain through osteoarthritis.

His suspicions of an ‘epidemic’ of ACL injuries was recently confirmed by a study he led that found there were almost 200,000 ACL reconstructions performed in Australia in the 15 years to 2015.

Over the same period, the number of reconstructions jumped by 74 per cent in those under 25.

But the biggest increase was seen in children aged five to 14, where the annual growth in ACL injuries was 8.8 per cent for girls and 7.7 per cent for boys.

Research out of La Trobe University in Melbourne has also identified a trend of repeat injuries in young people who undergo ACL surgery. In the 128 young people they studied who had undergone two surgeries, almost 30 per cent went on to have a third ACL injury.

The paper suggested that young people who sustained multiple ACL injuries may have to be counselled to switch to lower-risk sports.

‘We feel [like the rate of repeat injuries] is too high and it is certainly concerning for their future knee health,’ said lead researcher Associate Professor Kate Webster.

With the cost of ACL surgery in Australia estimated to come to $142 million each year, Associate Professor Vertullo is calling for a national prevention program to be established to teach volunteer coaches to introduce effective warm-up techniques.

‘As soon as you implement it, it pays for itself,’ he said.

The program is estimated to cost $2 million or $3 million, and would be delivered via an app.


Case study review

1. What does ACL damage refer to?
2. What factors does surgeon Christopher Vertullo think could be partly responsible for the growing rates of ACL damage?
3. How can ACL injuries be prevented?
4. What is the trend of repeat ACL injuries in young people?
5. What did the research paper suggest young people with multiple ACL injuries should do?
6. How can coaches assist in reducing ACL injuries?
7. Explain how an ACL injury could impact the health and wellbeing of youth.

2.4.4 Burden of disease

Burden of disease is a concept that combines mortality data with morbidity data so that conditions that contribute differently to death and illness can be compared. For example, cancer causes a lot of death and
illness while a chronic, or long-term, condition such as asthma causes a lot of illness but much less death. In the past, it was hard to compare these two conditions and decide where valuable funding should go. Burden of disease data was created to help overcome this problem.

Burden of disease is measured in disability adjusted life years (or DALY, pronounced ‘dally’), where 1 DALY equals one year of healthy life lost due to premature death and time lived with illness, disease or injury. Using DALY, it is possible to compare the impact of different conditions equally — those that cause death, those that cause disability and illness, and those that cause both (table 2.10). A person who has lived a healthy life but dies suddenly 30 years earlier than the current life expectancy of their age has contributed 30 DALY. In contrast, a person who is still alive but has spent their last 10 years at only ‘half health’ has contributed five DALY.

Although ill health generally has greater impacts towards the end of life, YLD can be contributed at any stage of a person’s life.

**FIGURE 2.17** DALY are calculated by adding the fatal (YLL) and non-fatal (YLD) impacts of disease and injury.

**TABLE 2.10** Ten leading causes of burden of disease and injury for 10- to 19-year-olds in Australia, 2017

<table>
<thead>
<tr>
<th>Disease group</th>
<th>10–14 years</th>
<th>15–19 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of DALY</td>
<td>Proportion of total DALY (%)</td>
</tr>
<tr>
<td>Mental and substance use disorders</td>
<td>26 622</td>
<td>28.3</td>
</tr>
<tr>
<td>Injuries</td>
<td>15 051</td>
<td>16.2</td>
</tr>
<tr>
<td>Skin disorders</td>
<td>11 284</td>
<td>12.1</td>
</tr>
<tr>
<td>Neurological conditions</td>
<td>8926</td>
<td>9.6</td>
</tr>
<tr>
<td>Infectious diseases</td>
<td>8100</td>
<td>8.7</td>
</tr>
<tr>
<td>Respiratory diseases (including asthma)</td>
<td>7033</td>
<td>7.5</td>
</tr>
<tr>
<td>Musculoskeletal conditions</td>
<td>5501</td>
<td>5.9</td>
</tr>
<tr>
<td>Cancer</td>
<td>3080</td>
<td>3.4</td>
</tr>
<tr>
<td>Infant and congenital conditions</td>
<td>2432</td>
<td>2.6</td>
</tr>
<tr>
<td>Oral disorders</td>
<td>675</td>
<td>0.7</td>
</tr>
<tr>
<td>All other conditions</td>
<td>19 647</td>
<td>21.1</td>
</tr>
</tbody>
</table>

Neurological disorders common among youth include migraine and headache disorders as well as epilepsy — a condition characterised by seizures caused by a disruption to the electrical activity in the brain. Infectious diseases include respiratory infections, meningococcal infections, food poisoning and sexually transmissible infections such as chlamydia, syphilis and gonorrhoea.

Infant and congenital conditions are those first occurring before or just after birth. Examples include:
- Down syndrome — a genetic condition characterised by having three chromosomes on the 21st pair instead of two. Individuals exhibit distinct facial features, reduced muscle mass and impaired intelligence.
- Muscular dystrophy — a group of disorders that cause progressive and irreversible weakness and wasting of the muscles.
- Birth defects — these result from missing or ill-formed body structures. They may have a genetic, infectious or environmental origin, although in most cases it is difficult to identify their cause.

Oral disorders include dental caries, gum disease and mouth injuries such as chipped or broken teeth.

Australia’s youth experience a significantly greater number of YLD than YLL. According to data, in 2017 those aged between 10 and 19 had 210,785 YLD compared to 43,010 YLL, giving a total of 253,975 DALY. The top causes of DALY (with a breakdown of YLL and YLD) for this age group is shown in figure 2.18.

**FIGURE 2.18** Burden (YLL, YLD and total DALY) for the top causes of DALY for 10- to 19-year-olds, 2017


**EXAM TIP**
Using the correct unit of measurement is always important when analysing or explaining data. For example, the data in figure 2.18 show the total DALY attributable to each cause and the contribution to total DALY by YLL and YLD. The number of total DALY is shown in thousands (represented by the three zeros shown after ‘DALY’) and this must be reflected in the discussion. If mental disorders are stated as contributing approximately 80 DALY, this would not receive marks as the total DALY is around 80,000.
2.4 Activities
Access the Burden of disease weblink and worksheet in the Resources tab, then complete the worksheet.

2.4 Exercise 1 TEST your knowledge
To answer questions online and to receive immediate feedback and sample responses for every question, go to your learnON title at www.jacplus.com.au.

1. (a) What is meant by the term ‘morbidity’?
   (b) Explain why it is useful to examine morbidity data in addition to mortality data.
2. Outline the difference between incidence and prevalence.
3. State what the acronym ‘YLD’ stands for and explain what it means.
4. (a) Describe the change in rate of YLD for males and females according to figure 2.14.
   (b) Approximately how many YLD were contributed by males and females aged 10–14 and 15–19?
5. What are the top three causes of YLD for young Australians according to figures 2.15 and 2.16?
6. (a) What is meant by ‘burden of disease’?
   (b) What is the unit of measurement for burden of disease?
7. What is the benefit of using DALY instead of morbidity or mortality data?

2.4 Exercise 2 APPLY your knowledge
1. If the incidence for a condition drops to 0 per 100 000 population, does this also mean the prevalence will be 0? Explain.
2. Explain how asthma can have a higher prevalence for males aged 10–14, but anxiety and depression have a higher incidence.
3. (a) Which three conditions led to the most burden of disease as shown in table 2.10?
   (b) For each of the three conditions, explain whether you think most DALY would be attributable to YLL or YLD.
4. Explain how mental and substance use disorders can be the leading burden of disease (DALY) for young Australians when these conditions cause relatively few deaths.
5. Referring to figure 2.18, identify:
   (a) the leading contributor to YLD
   (b) the leading contributor to YLL
   (c) the leading contributor to DALY.
6. According to figure 2.18, approximately how many DALY were contributed by:
   (a) mental and substance use disorders
   (b) injuries
   (c) skin disorders?

studyON

2.4 Exercise 3 studyON: Practice exam questions
To answer practice exam questions online and to receive immediate feedback and sample responses for every question, go to your learnON title at www.jacplus.com.au.
2.5 Hospitalisation, core activity limitation and psychological distress

2.5.1 Rate of hospitalisation

Exploring the rate of hospitalisation among youth provides an indication of levels of ill health that require medical treatment. Hospitalisation can occur as the result of requiring care for chronic conditions, where the patient is admitted to receive treatment, and emergency care that involves unforeseen events that end up requiring medical care, such as car crashes and sporting accidents. Overall, the youth stage of the lifespan is characterised by relatively low levels of hospitalisations compared to other lifespan stages (figure 2.20).

In 2016–17, there were a total of 380,208 hospital separations for those aged 10–19, with the majority occurring for those aged 15–19 (250,342 compared to 129,866 for those aged 10–14).
Males aged 10–14 experienced a higher rate of hospitalisation than females in the same age group. Females aged 15–19 experienced a significantly higher rate of hospitalisation than males in the same age group, largely as the result of:

- pregnancy and childbirth — there are over 20 000 hospitalisations across Australia each year due to pregnancy in the 15–19 years age group
- higher rates of mental and behavioural disorders, including eating disorders, which are significantly more common among females.

Overall, females in the 10–19 years age group were more likely to be hospitalised than males (203 025 and 177 159 separations respectively). The overall rate (per 1000) for hospitalisations is shown in figure 2.21.

**FIGURE 2.21** Hospitalisation rates for males and females aged 10–14 and 15–19

![Hospitalisation rates for males and females aged 10–14 and 15–19](image)


The five leading causes of hospitalisation for those aged 10–19 are shown in figure 2.22.

**FIGURE 2.22** Top five causes of hospitalisation for those aged 10–14 and 15–19, 2011

![Top five causes of hospitalisation for those aged 10–14 and 15–19, 2011](image)

Injury and poisoning are the leading cause of hospitalisation in the youth stage of the lifespan. Youth is a time of increasing independence and young people often have greater access to a range of settings that may be unsupervised, such as school, sporting grounds, streets and neighbourhoods. Youth is also characterised by an increase in risk-taking behaviours, particularly among boys. The peer group becomes increasingly important during this stage and risk-taking behaviour may be motivated by friends. The part of the brain that controls decision making is still developing during the youth stage. Valuing short-term gain over long-term consequences can lead to risky behaviours. As young people age, they often have more exposure to motorised transport, employment, alcohol and drugs which also contribute to this trend. The most common forms of injury requiring hospitalisation among youth are fractures and superficial wounds such as cuts and lacerations.

Diseases of the digestive system were the second most common cause of hospitalisation for 10- to 19-year-olds. The most common examples of these conditions include appendicitis (which requires the removal of the appendix) and dental surgery (including the extraction of wisdom teeth). Wisdom teeth are more likely to erupt during the later stage of youth.

Respiratory diseases were the third most common reason for hospitalisation and include conditions such as asthma and bronchitis.

Mental and behavioural problems were the fourth most common cause of hospitalisation for youth and include depression, anxiety, eating disorders and drug-induced mental disorders.

Diseases of the musculoskeletal system and connective tissues were the fifth most common cause of hospitalisation among youth and include muscle, joint and bone problems such as back and disc conditions, joint reconstruction surgery and treatment for arthritis.

2.5.2 Core activity limitation

Core activities relate to three main areas of life and are explained in table 2.11. If an individual has difficulty in any of the three core activities, they may have a core activity limitation. Core activity limitations can occur as the result of injury, developmental problems and chronic illness.

<table>
<thead>
<tr>
<th>Core activity</th>
<th>Examples relating to the core activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-care</td>
<td>• Bathing/showering&lt;br&gt;• Dressing/undressing&lt;br&gt;• Eating/feeding&lt;br&gt;• Going to the toilet&lt;br&gt;• Bladder/bowel control</td>
</tr>
<tr>
<td>Mobility</td>
<td>• Moving around away from home&lt;br&gt;• Moving around at home&lt;br&gt;• Getting in or out of bed or chair</td>
</tr>
<tr>
<td>Communication in own language</td>
<td>Understanding/being understood by strangers, friends or family, including use of sign language/lip reading</td>
</tr>
</tbody>
</table>
Surveys relating to core activities ask respondents whether they have difficulty or require assistance from another person or an aid (such as a wheelchair) to carry out the three core activities. Core activity limitations are classified based on whether, and how often, a person needs help, has difficulty, or uses aids or equipment with any core activities. A person’s overall level of core activity limitation is determined by their highest level of limitation in any of the three core activities.

According to the Australian Institute of Health and Welfare, there are four main levels of core activity limitation:

- **Profound** — those who answered yes to always needing help are classified as having a ‘profound core activity limitation’
- **Severe** — those who don’t always need help, but may require help at times, are classified as having a ‘severe core activity limitation’
- **Moderate** — those who have difficulty with the tasks are classified as having a ‘moderate core activity limitation’
- **Mild** — those who simply require aids to undertake the task are classified as having a ‘mild core activity limitation’.

The proportion and level of core activity limitations among young people are shown in figure 2.25. Note that the data available relate to those aged 5–24 and therefore include people in the childhood and adulthood stages of the lifespan. Although other lifespan stages are included, these data provide a reflection of the level of core activity limitation experienced by youth in Australia.

Males experience higher rates of core activity limitation than females in both age groups. Males in the 5–14 age group experience the overall highest rate of core activity limitations and the highest level of profound limitation.
2.5.3 Psychological distress

Psychological distress relates to unpleasant feelings and emotions that have an impact on an individual’s level of functioning. Measuring psychological distress can provide information about the level of mental and emotional health and wellbeing experienced.

![Psychological distress reflects mental and emotional health and wellbeing.](image)

The proportion of individuals with very high levels of psychological distress can be measured using the Kessler Psychological Distress Scale (K10).

The K10 is a scale of psychological distress based on the answers to ten questions about negative emotional and mental states in the four weeks prior to the interview.

1. During the last 30 days, about how often did you feel tired out for no good reason?
2. During the last 30 days, about how often did you feel nervous?
3. During the last 30 days, about how often did you feel so nervous that nothing could calm you down?
4. During the last 30 days, about how often did you feel hopeless?
5. During the last 30 days, about how often did you feel restless or fidgety?
6. During the last 30 days, about how often did you feel so restless you could not sit still?
7. During the last 30 days, about how often did you feel depressed?
8. During the last 30 days, about how often did you feel that everything was an effort?
9. During the last 30 days, about how often did you feel so sad that nothing could cheer you up?
10. During the last 30 days, about how often did you feel worthless?

The overall score is calculated by adding up the scores for each question which results in a score from 0 (the lowest possible score) to 40 (the highest possible score). Respondents can answer:

1. None of the time (0 point)
2. A little of the time (1 point)
3. Some of the time (2 points)
4. Most of the time (3 points)
5. All of the time (4 points).
For the data provided in this section, the overall score was used to classify the level of psychological distress according to the values shown in table 2.12.

<table>
<thead>
<tr>
<th>K10 total score levels</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–5</td>
<td>Low</td>
</tr>
<tr>
<td>6–11</td>
<td>Moderate</td>
</tr>
<tr>
<td>12–19</td>
<td>High</td>
</tr>
<tr>
<td>20–40</td>
<td>Very high</td>
</tr>
</tbody>
</table>

Note that the Kessler Psychological Distress Scale is not a diagnosis, but an indication of the level of psychological distress experienced. While high levels of distress are often associated with mental illness, it is not uncommon for some people to experience psychological distress, but not meet criteria for a mental disorder. A diagnosis of a mental disorder can only be made by a medical doctor.

In 2013–14, one in five (19.9 per cent) youth aged 11–17 years had very high or high levels of psychological distress, at 6.6 per cent and 13.3 per cent respectively (figure 2.27).

The proportion of those experiencing very high or high levels of psychological distress was higher for females aged 11–15 and 16–17 than males of the same age (9.5 per cent and 16.4 per cent compared with 4 per cent and 10.4 per cent respectively). A higher proportion of 16- to 17-year-olds had very high and high levels of psychological distress compared to those aged 11–15 (11 per cent and 16.2 per cent of 16- to 17-year-olds compared with 4.8 per cent and 12.2 per cent of 11- to 15-year-olds), shown in table 2.13.
TABLE 2.13 Kessler 10 level of psychological distress among 11- to 17-year-olds by sex and age group

<table>
<thead>
<tr>
<th>Sex</th>
<th>Age group</th>
<th>Low (%)</th>
<th>Moderate (%)</th>
<th>High (%)</th>
<th>Very high (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>11–15 years</td>
<td>57.6</td>
<td>29.2</td>
<td>9.9</td>
<td>3.3</td>
</tr>
<tr>
<td></td>
<td>16–17 years</td>
<td>53.0</td>
<td>29.4</td>
<td>11.8</td>
<td>5.8</td>
</tr>
<tr>
<td></td>
<td>11–17 years</td>
<td>56.3</td>
<td>29.3</td>
<td>10.4</td>
<td>4.0</td>
</tr>
<tr>
<td>Females</td>
<td>11–15 years</td>
<td>49.8</td>
<td>28.9</td>
<td>14.7</td>
<td>6.6</td>
</tr>
<tr>
<td></td>
<td>16–17 years</td>
<td>34.8</td>
<td>29.0</td>
<td>20.3</td>
<td>15.9</td>
</tr>
<tr>
<td></td>
<td>11–17 years</td>
<td>45.1</td>
<td>29.0</td>
<td>16.4</td>
<td>9.5</td>
</tr>
<tr>
<td>Persons</td>
<td>11–15 years</td>
<td>53.9</td>
<td>29.1</td>
<td>12.2</td>
<td>4.8</td>
</tr>
<tr>
<td></td>
<td>16–17 years</td>
<td>43.6</td>
<td>29.2</td>
<td>16.2</td>
<td>11.0</td>
</tr>
<tr>
<td></td>
<td>11–17 years</td>
<td>50.9</td>
<td>29.1</td>
<td>13.3</td>
<td>6.6</td>
</tr>
</tbody>
</table>


2.5 Exercise 1 TEST your knowledge

To answer questions online and to receive immediate feedback and sample responses for every question, go to your learnON title at www.jacplus.com.au.

1. Complete the following table:

<table>
<thead>
<tr>
<th>Concept</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital separations</td>
<td></td>
</tr>
<tr>
<td>Chronic conditions</td>
<td></td>
</tr>
<tr>
<td>Core activity</td>
<td></td>
</tr>
<tr>
<td>Core activity limitation</td>
<td></td>
</tr>
<tr>
<td>Psychological distress</td>
<td></td>
</tr>
</tbody>
</table>

2. Outline the different classifications of core activity limitation.

3. According to figure 2.25, approximately what proportion of the population experienced a core activity limitation in each of the following groups?
   (a) Males aged 5–14
   (b) Males aged 15–24
   (c) Females aged 5–14
   (d) Females aged 15–24

4. Briefly explain how psychological distress is measured.

2.5 Exercise 2 APPLY your knowledge

1. (a) Outline the change in the total number of hospitalisations between the ages of 0 and 39 as shown in figure 2.20.
   (b) Suggest possible reasons for the changes outlined in part a.

2. (a) Outline the difference in the overall hospitalisation rate for males and females aged 10–14 and 15–19 as shown in figure 2.21.
   (b) Suggest possible reasons for the differences outlined in part a.

3. (a) Outline one similarity and one difference between males and females as shown in figure 2.22.
   (b) Suggest possible reasons for the similarity and difference outlined in part a.

4. (a) Which age group (11–15 or 16–17) was most likely to experience high or very high psychological distress?
(b) What proportion of the age group identified in part a experienced high or very high psychological distress for the following groups?
   i. Males
   ii. Females
   iii. Persons

(c) In pairs, brainstorm reasons why youth may experience psychological distress.

5. Using data to support your response, write a paragraph describing the health status of Australian youth.

2.5 Exercise 3 studyON: Practice exam questions online
To answer practice exam questions online and to receive immediate feedback and sample responses for every question, go to your learnON title at www.jacplus.com.au.

2.6 Topic 2 review

2.6.1 Key skills

**KEY SKILL** Analyse the extent to which health status data reflect concepts of health and wellbeing

For this key skill, a sound understanding of the concepts of health and wellbeing is essential, including knowledge of the five dimensions and examples that relate to each. Health status data can relate to any of the indicators discussed in this topic. To varying degrees, health indicators reflect various aspects of health and wellbeing. For this key skill, indicators and related data can be analysed to explain the extent that it relates to health and wellbeing. For example, life expectancy data provides an indication of how long an individual can expect to live, if mortality or death rates do not change. This reflects one aspect of the physical dimension of health and wellbeing, as it relates to the length of time the average individual can expect to live, but does not provide information relating to other aspects of physical health and wellbeing or the quality of life experienced in the other four dimensions.

The following steps can be taken to ensure an appropriate analysis of the extent to which health status data reflect concepts of health and wellbeing:

1. determine which health status indicator/s are evident in the data
2. consider which concepts of health and wellbeing are reflected by the indicator and associated data
3. identify the dimension/s of health and wellbeing that are reflected by the health indicator evident in table/graph and justify your choice
4. identify the dimension/s of health and wellbeing that are not reflected by the health indicator evident in table/graph.

In the following example, rates of low levels of psychological distress are analysed in relation to the extent that they reflect the concepts of health and wellbeing.

Psychological distress relates to unpleasant feelings and emotions that have an impact on an individual’s level of functioning. Psychological distress can be measured using the Kessler Psychological Distress Scale which is based on ten questions that relate to various feelings and emotions and reflect aspects of emotional and mental health and wellbeing. The questions ask about feeling depressed which is an aspect of mental health and wellbeing. Although most people feel sad from time to time, if these feelings are experienced most, or all of the time, it can indicate that emotional health and wellbeing is not optimal.
Although psychological distress data provides an indication of emotional and mental health and wellbeing, it does not reflect every aspect of these dimensions. It also does not provide any specific reflection on physical, social and spiritual health and wellbeing.\(^3\) The graph shows that males have higher rates of low levels of psychological distress than females for both age groups which may indicate a higher level of emotional and mental health and wellbeing for the areas addressed in the Kessler Psychological Distress Scale.\(^4\)

3 Aspects of psychological distress as a health status indicator are linked to the concept of health and wellbeing.

4 Data from the graph are referred to and linked to the concept of health and wellbeing.

**FIGURE 2.28** Proportion of 11- to 15-year-olds and 16- to 17-year-olds classified as experiencing low levels of psychological distress, according to sex

<table>
<thead>
<tr>
<th></th>
<th>11- to 15-year-olds</th>
<th>16- to 17-year-olds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportion experiencing low levels of psychological distress (%)</td>
<td>70</td>
<td>50</td>
</tr>
</tbody>
</table>


Practise the key skill

1. Table 2.14 shows the proportion of 15- to 17-year-olds who assessed their health status as fair or poor. Using data from the table, discuss the extent to which self-assessed health status reflects the concept of health and wellbeing.

2. Discuss the extent to which rates of hospitalisation reflect the concept of health and wellbeing.

**TABLE 2.14** Proportion of 15- to 17-year-olds who assessed their health as fair or poor, 2011–12

<table>
<thead>
<tr>
<th></th>
<th>Fair or poor self-assessed health status (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>4.9</td>
</tr>
<tr>
<td>Females</td>
<td>8.3</td>
</tr>
</tbody>
</table>

KEY SKILL Draw conclusions from health data about the health status of youth in Australia

This key skill relates to the interpretation and analysis of data. Data concerning health status are presented using a range of different measurements and an understanding of the measures commonly used will assist in developing this skill.

Measures used to present data relating to health status include:
- self-assessed health status
- life expectancy
- mortality
- morbidity (including incidence and prevalence of health conditions)
- burden of disease (including DALY, YLL and YLD)
- rates of hospitalisation
- core activity limitation
- psychological distress.

To become proficient at data analysis, it is necessary to be able to interpret data available in the form of graphs, tables and charts. A range of exercises in this topic provides the opportunity to practise this skill.

The following steps offer a systematic approach to interpreting graphs and tables:
1. Read the title of the graph or table — the title usually gives an indication about what information is presented in the graph. It may be located at the top of the graph or next to the figure number.
2. Read the horizontal and vertical axes (for a bar graph) and look at the units (e.g. is it percentage, year, number, rate, proportion, $, etc.).
3. Look at the key if there is one — this helps identify various elements of the data.
4. Read any notes that relate to the data — there may be additional written information at the bottom of the graph explaining various elements of the graph. An element of the data that may not make sense may become clear after reading these notes.
5. Look for trends, similarities and differences between the data. This will enable a better understanding of the data that the graph is actually presenting.

Figure 2.29 shows the injury death rate over time for males and females aged 15–19.

**FIGURE 2.29** Injury death rate over time for males and females aged 15–19

Source: Adapted from AIHW, GRIM Books, 2019.
A response to the task ‘Draw two conclusions relating to injury death rates according to figure 2.29’ might include the following points.

- Males experienced poorer health status than females relating to injury death rates. According to the data, males consistently had higher death rates due to injuries between 1980 and 2016. In 2016, the rate for females was around 10 per 100 000 and for males at the same time was around 30 per 100 000.  
- The death rate due to injuries for males decreased more than the death rate for females between 1980 and 2016. The male death rate decreased by around 80 per 100 000 (approximately 110 per 100 000 in 1980 down to 30 per 100 000 in 2016). The death rate for females decreased by around 20 per 100 000 (down from around 30 per 100 000 in 1980 to around 10 per 100 000 in 2016).

Practise the key skill

3. Using data from figure 2.10 (in subtopic 2.3), draw conclusions relating to health status for 10- to 14-year-olds and 15- to 19-year-olds compared with other age groups.

4. Using data from figure 2.14 (in subtopic 2.4), draw conclusions relating to health status for 10- to 14-year-olds and 15- to 19-year-olds compared with other age groups.

2.6.2 Topic summary

Self-assessed health status and life expectancy

- Health status is an individual’s or a population’s overall health (and wellbeing), taking into account various aspects such as life expectancy, amount of disability and levels of disease risk factors (AIHW, 2008).
- Australia’s youth generally experience excellent health status.
- Self-assessed health status, life expectancy, mortality, morbidity (including incidence and prevalence of health conditions), burden of disease, rates of hospitalisation, core activity limitation and psychological distress are all used to assess health status.
- Self-assessed health status is based on an individual’s own perception of their health and wellbeing. Most youth in Australia assess their health status as excellent or very good.
- 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).
- For a male born in 2017, the life expectancy was 80.5 years and for a female it was 84.6 years.
- Life expectancy and death rates are continually improving for Australia’s youth.

Mortality

- Mortality refers to death, particularly at a population level. The mortality rates for Australia’s youth are among the lowest when compared to other lifespan stages.
- YLL relates to the fatal burden of disease.
- The leading cause of death and YLL among youth is injury and poisoning, and males are more likely to experience mortality during the youth stage than females.

Morbidity and burden of disease

- Morbidity relates to ill health in an individual and levels of ill health within a population.
- Morbidity can be measured using YLD, incidence and prevalence.
- YLD relates to the non-fatal burden of disease.
• Mental and substance use disorders, respiratory disease and skin conditions are the leading contributors to YLD among youth in Australia.
• DALY are used to measure burden of disease and are calculated by adding YLL and YLD.
• Mental and substance use disorders contribute most to the overall burden of disease for youth.

Hospitalisation, core activity limitation and psychological distress
• Hospitalisation rates of youth provide an indication of levels of ill health that require medical treatment.
• Youth experience low levels of hospitalisation compared to other lifespan stages.
• The leading causes for hospitalisations in youth are injury and poisoning, diseases of the digestive system and diseases of the respiratory systems.
• A core activity limitation exists when an individual sometimes or always requires assistance in one or more of three areas of life: self-care, mobility and communication.
• Over 4 per cent of youth experience a core activity limitation.
• Psychological distress relates to unpleasant feelings and emotions that have an impact on an individual’s level of functioning.
• Females and older youth are more likely to experience psychological distress.

2.6 Exercise 1 Exam preparation
To answer questions online and to receive immediate feedback and sample responses for every question, go to your learnON title at www.jacplus.com.au.

Question 1
Figure 2.30 shows the rate of DALY (per 1000 people) and contribution to total DALY by YLL and YLD for those aged 10–14 and 15–19 in 2017. DALY is a measure of health status.

**FIGURE 2.30** The rate of DALY (per 1000 people) and the contribution from YLL and YLD for those aged 10–14 and 15–19 in 2017

a. Identify what DALY stands for.  
1 mark

b. What does one DALY equal?  
1 mark

c. Explain what is meant by health status.  
1 mark

d. Using data from the graph, draw a conclusion relating to the health status of those aged 10–14 compared with those aged 15–19.  
2 marks

e. Discuss how DALY reflects the concept of health and wellbeing.  
3 marks

**studyON**

2.6 Exercise 2 studyON: Topic test online

To answer practice exam questions online and to receive immediate feedback and sample responses for every question, go to your learnON title at www.jacplus.com.au.

**on Resources**

Interactivities Crossword (int-6866)  
Definitions (doc-6873)