The Kimberley region is the State's most northerly region. Encompassing 420,000 square kilometres, it is twice the size of Victoria. It is remote from major metropolitan areas, with the nearest major city to Broome being Darwin in the Northern Territory, 829 kilometres away by road.

The Kimberley has four Local Government Areas (LGAs); the Shires of Broome, Derby/West Kimberley, Halls Creek, and Wyndham/East Kimberley. Major population centres in the Kimberley are Broome, Derby, Fitzroy Crossing, Halls Creek, Kununurra and Wyndham.

According to the Accessibility/Remoteness Index of Australia (ARIA), almost the entire region (97%) is classified as Very Remote with the remaining 3% being classified as Remote.

**Kimberley health services**

The Kimberley region incorporates a network of public hospital facilities supported by a range of community-based services including public health, aged care and mental health services as well as a number of public and private health partners and providers.

The two major hospital facilities in the Kimberley region are located in Broome and Kununurra. These support smaller regional hospitals in Derby, Fitzroy Crossing, Halls Creek, Kununurra and Wyndham.

There are seven Aboriginal Community Controlled Health Services (ACCHSs) operating in the Kimberley region. The Kimberley Aboriginal Medical Services (KAMS) is a regional ACCHS that provides support and a collective voice for a network of member ACCHSs from towns and remote communities across the Kimberley region. KAMS provides centralised advocacy and resource support for a number of independent member services. More information on ACCHSs in the Kimberley can be viewed on the KAMS website.

**Population**

The estimated residential population of the Kimberley was 36,392 in 2016, which represented 1.4% of the State's population. There are approximately 0.09 people per square kilometre in the Kimberley, which is lower than the State and rural averages at 1.0 and 0.24 per square kilometre respectively.

The Kimberley has a younger age structure when compared to other regions, with a large concentration of the population between the ages of 0-14 years and 20-44 years (see Figure 1 – page 2).

The Aboriginal population of the Kimberley makes up 45% of the Kimberley region's population. This proportion is far greater than the State average of 3.6%. The age structure of the Aboriginal population is younger when compared to the non-Aboriginal residents of the Kimberley.

With thanks to WA Country Health Service for permission to use data from various sources including the Kimberley Regional Health Profile 2015 which can be accessed at www.wacountry.health.wa.gov.au/index.php?id=445 listed under Regional Health Profiles
Measure of disadvantage

Socio-Economic Indexes for Areas (SEIFA) measures a broad range of determinants of disadvantage. A score of 1,000 is considered a baseline and scores over or below are considered to represent advantage or disadvantage respectively. Research has shown that a lower SEIFA score is correlated with increased factors contributing to poor health.

The Kimberley LGA with the lowest SEIFA score is Halls Creek (718) and the highest is Broome (979). Halls Creek and Derby/West Kimberley have scores in the lowest 10% in Australia. Consequently, 32% of Kimberley residents residing in these LGAs live with considerable disadvantage.

Hospitalisations

The overall hospitalisation rate in the Kimberley was significantly greater (2.4 times) than the State. The main causes of hospitalisation were injury and poisoning, pregnancy and childbirth, digestive diseases, respiratory diseases and ill-defined conditions.

Potentially preventable hospitalisations

In the Kimberley, rates of potentially preventable hospitalisations (PPH) were significantly greater when compared to the State (4 times greater). Table 1 represents a list of leading causes of PPH in the period 2011-2015.

Rates of PPH were significantly greater in the Aboriginal population in the Kimberley from 2011-2015 when compared to the State Aboriginal PPH rate, as well as the Kimberley and State rates for non-Aboriginal people.

**Table 1 – 2011-2015 top five leading causes of PPH in ages 15-64 years**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Number</th>
<th>% of total PPH</th>
<th>Rate vs State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cellulitis</td>
<td>1,419</td>
<td>17</td>
<td>6.2</td>
</tr>
<tr>
<td>Convulsions and epilepsy</td>
<td>803</td>
<td>10</td>
<td>5.3</td>
</tr>
<tr>
<td>UTIs incl. pyelonephritis</td>
<td>797</td>
<td>10</td>
<td>3.3</td>
</tr>
<tr>
<td>Diabetes complications</td>
<td>601</td>
<td>7</td>
<td>3.4</td>
</tr>
<tr>
<td>Dental conditions</td>
<td>509</td>
<td>6</td>
<td>1.4</td>
</tr>
</tbody>
</table>

Source: DOH, Health Tracks

Mortality

Mortality is an important population health indicator. Knowing the reasons for and causes of death can assist in the planning of health services to prevent and avoid mortality where possible.

There is a demonstrable gap in life expectancy between rural Western Australia and metropolitan Perth. This gap increases the more remotely a person lives.

There is also a discrepancy between the life expectancy of Aboriginal and non-Aboriginal people in Australia. This gap is estimated by the Australian Bureau of Statistics to be 8.6 years for males (71.6 years life expectancy), and 7.8 years for females (75.6 years life expectancy)¹.

¹ ABS, Life Tales for Aboriginal and Torres Strait Islander Australians, 2015-2017
In the Kimberley during the period 2011-2015, the top five leading causes of death were all experienced at a rate greater than that of the State (see Table 2).

Table 2 – 2011-2015 Kimberley leading causes of mortality

<table>
<thead>
<tr>
<th>Condition</th>
<th>% of all deaths</th>
<th>Rate ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ischaemic heart disease</td>
<td>11</td>
<td>1.6</td>
</tr>
<tr>
<td>Intentional self-harm</td>
<td>10</td>
<td>3.4</td>
</tr>
<tr>
<td>Diabetes and impaired glucose regulation</td>
<td>7</td>
<td>4.8</td>
</tr>
<tr>
<td>COPD</td>
<td>6</td>
<td>3.1</td>
</tr>
<tr>
<td>Lung cancer</td>
<td>4</td>
<td>1.3</td>
</tr>
</tbody>
</table>

Source: DOH, Health Tracks

Sixty-one per cent of deaths in the Kimberley during the period 2011-2015 under the age of 75 were classed as avoidable. Avoidable mortality in the Kimberley occurred at a rate 2.2 times greater than the State. Table 3 shows the causes and rate ratios of the top five causes of avoidable mortality in the Kimberley.

Table 3 – 2011-2015 Kimberley leading causes of avoidable mortality

<table>
<thead>
<tr>
<th>Condition</th>
<th>% of all deaths</th>
<th>Rate ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suicide and self-inflicted injuries</td>
<td>22</td>
<td>3.4</td>
</tr>
<tr>
<td>Ischaemic heart disease</td>
<td>19</td>
<td>2.7</td>
</tr>
<tr>
<td>Diabetes</td>
<td>10</td>
<td>5.9</td>
</tr>
<tr>
<td>COPD</td>
<td>8</td>
<td>4.7</td>
</tr>
<tr>
<td>Transport accidents</td>
<td>8</td>
<td>2.4</td>
</tr>
</tbody>
</table>

Source: DOH, Health Tracks

**Child and adolescent health**

**Low birth weight**

Low birth weight is defined by the World Health Organisation as less than 2,500 grams. From the period 2007-2008 to 2015-2016, the proportion of low birth weight full-term babies born to Kimberley mothers was greater than the State average at 3.8% and 2.1% respectively. The proportion was greater amongst Aboriginal babies (6.1%) which was greater than the State rate (5.1%).

**Australian Early Development Census**

The Australian Early Development Census (AEDC) is a measure of how children are developing across five domains upon commencing full-time school. These domains are physical health and wellbeing, social competence, emotional maturity, language and cognitive skills, communication skills and general knowledge. For more information on the AEDC, visit https://www.aedc.gov.au/about-the-aedc.

Within the Kimberley, proportions of developmentally vulnerable children ranged from 34% in Broome to 69% in Halls Creek. The proportion of developmentally vulnerable children in two or more domains was between 22% in Broome and 50% in Halls Creek. Table 4 shows the AEDC scores of LGAs in the Kimberley.

Table 4 – 2015 Kimberley AEDC scores

<table>
<thead>
<tr>
<th>Community</th>
<th>One or more domains</th>
<th>Two or more domains</th>
<th>Total surveyed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
<td>#</td>
</tr>
<tr>
<td>Broome</td>
<td>91</td>
<td>33.7</td>
<td>60 22.1</td>
</tr>
<tr>
<td>Derby/West Kimberley</td>
<td>66</td>
<td>47.8</td>
<td>41 30.0</td>
</tr>
<tr>
<td>Halls Creek</td>
<td>50</td>
<td>69.4</td>
<td>36 50.0</td>
</tr>
<tr>
<td>Wyndham/East Kimberley</td>
<td>55</td>
<td>44.7</td>
<td>33 27.0</td>
</tr>
<tr>
<td>Australia</td>
<td></td>
<td>22.0</td>
<td>11.1</td>
</tr>
</tbody>
</table>

Source: DOH, Health Tracks

**OUTREACH SERVICE CONSIDERATIONS**

- There is a high need for child development services including access to multidisciplinary teams made up of medical services, child health nurses, speech pathologists, physiotherapists and occupational therapists in the Kimberley.
Immunisation

The Australian target for immunisation is a rate of greater than 90% of children with a complete vaccination schedule at two years of age, with the recommendation that 100% of children are vaccinated at the age of school entry.

In the Kimberley in 2017, the proportion of all children vaccinated exceeded the target of 90%. Table 5 describes the immunisation status of children in the Kimberley.

Table 5 – 2017 Kimberley immunisation rates by age and Aboriginality

<table>
<thead>
<tr>
<th>Age group</th>
<th>Aboriginal</th>
<th>Non-Aboriginal</th>
<th>All persons</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 to &lt; 15 months</td>
<td>91%</td>
<td>96%</td>
<td>93%</td>
</tr>
<tr>
<td>24 to &lt; 27 months</td>
<td>90%</td>
<td>92%</td>
<td>91%</td>
</tr>
<tr>
<td>60 to &lt; 63 months</td>
<td>96%</td>
<td>96%</td>
<td>96%</td>
</tr>
</tbody>
</table>

Source: DOH, Health Tracks

Adult health

Chronic disease

Chronic diseases are long-lasting conditions with persistent effects\(^2\). The self-reported, doctor-diagnosed prevalence of chronic disease in regional Western Australia is collected via the Western Australian Health and Wellbeing Surveillance System (HWSS) survey. In 2013-2016, the HWSS found that of the Kimberley residents:

- 26% of adults reported requiring medical treatment for an injury in the previous year;
- 13% reported having arthritis;
- 11% had asthma;
- 15% reported a current mental health problem; and
- the prevalence rate of osteoporosis was significantly lower than the State average.

Chronic diseases in Aboriginal people

In 2018-2019, 46% of Aboriginal people reported having at least one chronic disease that posed a significant health problem. This represents an increase of 6% since 2012-2013\(^3\).

National evidence reports a greater burden and prevalence of chronic disease among Aboriginal people when compared to non-Aboriginal people. The demographic factors of remoteness (isolation) and socio-economic disadvantage of the Aboriginal population contribute to this burden of disease.

When compared to non-Aboriginal people, Aboriginal people in Western Australia are:

- 9.4 times more likely to have chronic kidney and/or urinary disease;
- 8.7 times more likely to have diseases of the endocrine system including diabetes;
- 4.1 times to have gastrointestinal disease; and
- 4 times more likely to have a long term injury.

Ear health

Hearing problems and ear diseases such as otitis media occur at greater rates in Aboriginal children than non-Aboriginal children (7% and 3.6% respectively). Chronic otitis media is a key concern in the Kimberley because of the consequences of the condition in relation to language, social development and education.

The following trends have been observed in the Kimberley regarding ear health:

- In 2011-2015, ear, nose and throat infections were the highest cause of PPH in children aged 0-14 accounting for 38% of all PPH for that age group and occurring at a rate 4.8 times greater than the State.
- Between 2006 and 2015, the rate of disease of the ear and mastoid process hospitalisations were 3.7 times greater for Aboriginal children than for non-Aboriginal children.

The Kimberley Aboriginal Health Planning Forum (KAHPF), recognised the need for greater coordination of ear health services and established the Kimberley Ear Health Coordinating Panel in 2018 as subcommittee of the KAHPF. This group is responsible for the oversight and delivery of the Kimberley Regional Ear Health Strategic Plan.

OUTREACH SERVICE CONSIDERATIONS

- Culturally appropriate services delivered through Aboriginal Community Controlled Health Services (ACCHSs) are crucial in addressing the disparity in health between Aboriginal and non-Aboriginal people.
- Telehealth is a viable way of increasing the frequency of services while keeping costs low.

3 ABS 2019. National Aboriginal and Torres Strait Islander Health Survey, 2018-2019
Eye health

Eye health conditions are very common in Australia and can contribute to disadvantage due to childhood learning delays, lower participation in education and employment, and social isolation.

Based on national data, 13 million Australians (or 55% of the population) have one or more long-term eye conditions. Aboriginal people experience greater rates of visual impairment and blindness than non-Aboriginal people. Nationally, an estimated 18,300 Aboriginal people aged 40 and over experience vision impairment and blindness.

Trachoma

Trachoma is an eye infection that is caused largely by environmental factors such as sub-standard living conditions and overcrowded housing. Trachoma has been largely eliminated from the developed world; however, it is still prevalent in some remote Aboriginal communities in Australia.

Recent improvements in trachoma control in Aboriginal communities across Western Australia show that the number of at-risk communities has halved from 2010 to 2017; however, there are still some remote communities that only experienced a marginal decrease in trachoma incidence.

Maternal health

Overview of rural maternity services

Community based pregnancy and maternity care services are provided by WA Country Health Service (WACHS), regional hospitals, private general practitioners, ACCHSs and a range of community-based and non-governmental organisations.

Birth rates

In 2015, the age-specific birth rate was greater in the Kimberley when compared to metropolitan Perth at 72 and 62 per 1,000 women respectively. The age-specific birth rate was 1.5 times greater (92 per 1,000 women) for Aboriginal residents of the Kimberley than for non-Aboriginal residents (60 per 1,000 women).

Teenage mothers

The Kimberley experiences a high number of births to teenage mothers. In 2015-2016, the proportion of births to women aged less than 20 years was significantly greater (3.7 times) than the State.

Over the same time period, the rate of birth to teenage mothers that were Aboriginal was 17%, and 1% for non-Aboriginal mothers in the Kimberley.

Smoking in pregnancy

The risks associated with smoking in pregnancy include low birth weight, premature birth, placental complications, and stillbirths.

Figure 2 (above) shows the proportion of women who smoked during pregnancy from 2011-2012 to 2015-2016. Reported smoking during pregnancy amongst Aboriginal women has experienced an upward trend over this time period, peaking at 61% in 2013-2014. The five-year average proportion of births to Aboriginal mothers who smoked was 53% over this time period. Conversely, there was a downward trend in smoking during pregnancy for non-Aboriginal mothers, with the five year average being 9%.
Alcohol in pregnancy

The effects of alcohol consumption during pregnancy are well documented. The prevalence of Fetal Alcohol Spectrum Disorder (FASD) in Western Australia has been estimated at 0.26 per 1,000 births with a disproportionate amount being observed in Aboriginal children (89%). It has been estimated that the prevalence rate has doubled over the past 30 years.

In some remote Aboriginal communities where high rates of prenatal alcohol exposure have been recorded, FASD and partial FASD rates of 120.4 per 1,000 children have been observed.

Figure 3 shows an indication of alcohol use during pregnancy in the Kimberley. There were 77% of mothers in the Kimberley who reported not consuming alcohol while pregnant. Of the respondents to a survey, 65% of Aboriginal women reported not consuming alcohol while pregnant. Of those who reported drinking, 11% reported only occasional consumption.

Gestational Diabetes Mellitus

In the period 2011-2012 to 2015-2016, it was reported that 6.6% of Kimberley Aboriginal women who gave birth had a diagnosis of Gestational Diabetes Mellitus (GDM). This is compared to 6.1% in non-Aboriginal women. Percentages of Aboriginal and non-Aboriginal women with GDM across the WACHS catchment was 7.1% and 5.9% respectively.

Mental health

Suicide was the leading cause of death in Kimberley residents aged 15-25 in 2011-2015. Rates of youth suicides were significantly greater in the Kimberley when compared to the State and metropolitan Perth (see Table 6). The youth suicide rate was 8.9 times greater than the State rate, being 8.4 greater for males and 6.6 times greater for females.

In 2013-2016, one-in-seven (15%) of Kimberley adults aged 16 and over reported having a current diagnosis of a mental health problem. Females experienced a disproportionately high prevalence when compared to males (20% and 13% respectively). While these rates are lower than the State (17% for females and 10% for males), less than 8% of those surveyed in the Kimberley reported using a mental health care service in the past 12 months.

Kimberley residents aged between 15-64 accessed mental health services at a rate 1.5 times greater than the State accounting for over 70,000 occasions of service. Intentional self-harm was the second highest cause of mortality after ischaemic heart disease in the Kimberley, at a rate 3.4 times greater than the State.

Table 6 – 2006-2015 youth suicides per 100,000 persons by gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>Kimberley</th>
<th>Metropolitan</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males (15-24 years)</td>
<td>164.4</td>
<td>15.1</td>
<td>19.6</td>
</tr>
<tr>
<td>Females (15-24 years)</td>
<td>51</td>
<td>6.4</td>
<td>7.7</td>
</tr>
</tbody>
</table>

Source: DOH, Health Tracks

OUTREACH SERVICE CONSIDERATIONS

- Increase access to mental health services targeting youth and the Aboriginal people in the Kimberley.
- Collaborate with other service providers delivering social and emotional wellbeing programs in the Kimberley.