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Metro South Public Health Unit

Health Indicators Report:

Redland local government area, Metro South Health

V1.0 Date: 25 November 2022

ICARE² values

INTEGRITY COMPASSION ACCOUNTABILITY RESPECT ENGAGEMENT EXCELLENCE

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An electronic version of this document is available at https://qheps.health.qld.gov.au/metrosouth/public-health/epidemiology

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Redland LGA at a glance

Redland LGA population

- In 2021, estimated resident population: 161,730 people
- Represents 3.1% of the Queensland population
- By 2041, projected to increase by 19% to 192,431 people
- Largest percentage increase in residents 85+ years
- By 2041, there will be almost 10,000 residents 85+ years

Key Redland LGA health stats

- 94,003 hospital separations per year for all causes
- 6,886 potentially preventable hospitalisations (PPH)
- 1,119 deaths per year from all causes
- 174 deaths per year classed as potentially avoidable
- 1,085 new cases of cancer per year

Impact of COVID-19

- Increased rates of PPH for dental conditions, diabetes complications and urinary tract infections – may reflect drop in management and prevention during pandemic
- Reduction in hospitalisation rates for respiratory conditions owing to pandemic control measures
- Hospitalisations for anxiety & depression fell
- Fall in bowel and breast cancer screening participation
- Substantial increase in birth rate in 2021

Areas of health success for Redland LGA

Hospitalisations

- Rate of acute PPHs lower than Queensland
- Hospitalisation rate for arthropathies, COPD, coronary heart disease (CHD), diabetes and self-inflicted injury lower than Queensland
- Hospitalisation rate for CHD decreasing

Deaths

- Avoidable mortality rate lower than Queensland
- Death rates for CHD and stroke decreasing
- Male death rates for COPD & diabetes lower than Queensland

Cancer

- Incidence rate of colorectal cancer decreasing
- Lung cancer death rate in men decreasing strongly

Risk factors

- Adult smoking rates decreasing
- Smoking in pregnancy below 10%
- Slightly lower levels of risky drinking than Queensland

Specific health challenges for Redland LGA

Hospitalisations

- Diabetes complications account for 28% of PPHs, with higher rate than Queensland
- Hospitalisation rates for all causes, influenza & pneumonia, stroke, heart failure (females), diabetes (males), falls, road transport injuries, all mental health conditions (females) and anxiety & depression increasing
- Hospitalisation rate for all causes, asthma, stroke and anxiety & depression higher than Queensland

Deaths

- Death rates for falls in the elderly and mental health conditions increasing

Cancer

- Melanoma incidence rate higher than Queensland
- Incidence rates for melanoma, breast, haematological and lung cancers increasing

Risk factors

- 30% of Indigenous mothers smoked during pregnancy
- Gestational diabetes has more than doubled to 15% in last 14 years
- Over half of adults (61%) are overweight or obese
- Adults less likely to do enough exercise than Queensland
- Key emerging issue – health effects of e-cigarettes use

Broad future challenges for Redland LGA

How to continue to provide quality healthcare when:

- Redland LGA population is rapidly ageing
- Hospitalisations are increasing, especially in conditions associated with ageing (e.g. diabetes, falls, mental health conditions [especially anxiety & depression and dementia])
- Many modifiable chronic disease risk factors remain high and likely will contribute to high hospitalisation rates
- Cancer screening rates are declining

Areas of specific challenge:

- Diabetes - increases in hospitalisation, preventable hospitalisation and incidence in pregnant women
- Mental health, especially anxiety & depression
- Recovering from the impacts of COVID-19, particularly in the areas of preventable hospitalisations and cancer screening
- Reduction of PPHs – currently 7% of all hospitalisations

Executive summary

This report describes the health status of the Redland local government area (LGA) population, identifying important and emerging health issues. The focus is on demographics and health outcomes including mortality and hospitalisation rates for major diseases, mortality and incidence rates for selected cancers, as well as avoidable mortality and potentially preventable hospitalisations. The report also includes sections on cancer screening rates, maternal and child health indicators and chronic disease risk factors. Where data for the relevant period are available, the impact of the COVID-19 pandemic on key indicators is discussed.

Key findings

Demographics

As at 30 June 2021, Redland LGA had an estimated resident population of 161,730 people, representing 3.1% of the Queensland population. Compared with Queensland as a whole, Redland LGA had a much larger proportion of older persons (55 years and over), and much smaller proportions of younger children (birth to 9 years) and younger adults (20 to 39 years). In 2020, Indigenous people represented an estimated 2.4% of the population of Redland LGA, compared with 4.6% of the Queensland population.

It is projected that the overall population of Redland LGA will increase by about 19% between 2021 and 2041, significantly below the projected state average increase of 37%. The largest percentage increase in Redland LGA (150%) is expected in the 85+ years age group. By 2041 it is projected that there will be over 54,500 Redland LGA residents of ‘retirement age’ (65+ years) which will represent almost 30% of the total population of the LGA. This substantial increase in the number and proportion of older persons has major implications for health service delivery.

Hospital separations

On average there were just over 94,000 hospital separations per year in Redland LGA residents in the three years to 2020/21. Rates of hospital separation in Redland LGA were significantly higher than Queensland for all conditions combined (all causes) and for the sub-categories of asthma, influenza & pneumonia (in females only), stroke, falls (females only), road transport injury (males only), all mental health conditions (females only) and anxiety & depression.

Hospital separation rates were significantly lower in Redland LGA residents than Queensland for arthropathies and systemic connective tissue disorders, chronic obstructive pulmonary disease (COPD), coronary heart disease, diabetes, all mental health conditions (males only) and self-inflicted injury.

In Redland LGA over the past ten years, hospital separation rates trended upwards for all causes and for the subcategories of influenza & pneumonia, stroke, heart failure (females only), diabetes (males only), falls, road transport injuries, all mental health conditions and anxiety & depression.

Redland LGA hospital separation rates trended downwards over the past ten year period for coronary heart disease.

COVID-19 pandemic impact:

International border closures, travel restrictions and the suite of public health mitigation measures implemented from 2020 onward were likely to have been key factors contributing to recent sharp downward movement in separation rates recorded for the respiratory conditions chronic obstructive pulmonary disease (COPD) and influenza & pneumonia. Separation rates for stroke (females only) also rose during the pandemic period. The pandemic appears to have had no consistent or appreciable effect on separation rates for diabetes or most cardiovascular disease conditions (coronary heart disease, stroke (males only), heart failure).

Separation rates for anxiety & depression fell during the pandemic period in Redland LGA and Queensland. In Queensland separations for self-inflicted injury rose sharply, particularly in young people (15 to 24 years) however this was not seen in Redland LGA. It is reasonable to suggest that access to some health services such as mental health services were more difficult during the pandemic. This in turn could partially explain the drop in hospitalisation rate for anxiety & depression and possibly consequent higher rate for self-harm episodes seen statewide. The relatively high socioeconomic status of the Redland LGA may have locally mitigated some of this effect.

Potentially preventable hospitalisations (PPH)

In 2020/21 there were almost 6,900 hospitalisations of Redland LGA residents classified as 'potentially preventable'. The rate of the sub-category of all acute PPHs was significantly higher in Redland LGA residents than in Queensland, while the sub-category all vaccine preventable PPHs was significantly higher in Redland LGA residents than Queensland.

Overwhelmingly the condition with the highest rate of PPH in Redland LGA residents was diabetes complications which represented 28% of all Redland LGA PPHs.

COVID-19 pandemic impact:

Rates of PPH for respiratory and respiratory-related conditions fell during the pandemic period. Rates of PPH for dental conditions, diabetes complications and urinary tract infections increased during this time. This may reflect a drop in management and preventative measures usually associated with these conditions during this period.

Mortality

On average there were 1,119 deaths from all causes per year in Redland LGA residents in the three years to 2019. Mortality rates in Redland LGA were significantly lower than Queensland for all causes combined (males only) and for the sub-categories of COPD (males only) and diabetes (males only). The mortality rate for stroke (females only) was significantly higher in Redland LGA than in Queensland.

Over the past ten years Redland LGA mortality rates for all causes, coronary heart disease and stroke all trended downwards while rates for falls in those 65 years and over and all mental health conditions trended upwards.

In 2016-19 there was an average of 174 deaths per year among Redland LGA residents which were classified as 'avoidable'. The age standardised avoidable mortality rate in Redland LGA was significantly lower than the rate in Queensland over this period.

COVID-19 pandemic impact:

At time of publication, deaths data was only available up to 2019, therefore the impact of the COVID-19 pandemic on death rates cannot yet be assessed at the local government area level. In Australia, all causes mortality rates decreased in 2020, the first year of the pandemic, but increased in 2021.

Cancer

On average there were 1,085 new cases of cancer and 332 cancer deaths per year in Redland LGA residents in 2015 to 2019. Over this period, age standardised death rates for all cancer groups were statistically similar in Redland LGA and Queensland.

Almost one in five (19%) cancer deaths in Redland LGA residents were due to lung cancer. The other cancers most commonly causing death in Redland LGA were colorectal (12%), hepatobiliary (11%), and haematological (10%).

Lung cancer death rates among Redland LGA males trended strongly downwards between 2002 and 2019 while rates in females did not show a consistent trend.

In 2015 to 2019, the age standardised rate of new cases (incidence) of melanoma was significantly higher in Redland LGA residents than in Queensland. Of the new cancers diagnosed in Redland LGA residents in this period, the most common were melanoma (15% of new cases), prostate (13%), female breast (12%), colorectal (11%), haematological (11%) and lung (9%) cancers.

Redland LGA incidence rates of melanoma, female breast, haematological and lung cancers trended upwards between 2010 and 2019 while colorectal cancer trended downwards in this period.

Cancer screening

In 2019-20 the National Bowel Cancer Screening Program participation rate in Redland LGA (41%) was higher than the Queensland rate (39%). Program participation rates increased with increasing age and were consistently higher in women than in men. The Redland LGA participation rate trended upwards between 2014-15 and 2018-19.

At time of publication of this report BreastScreen Queensland and the Queensland Cervical Screening Program did not publish participation rates at the LGA-level. In Metro South Health (MSH) participation rates in BreastScreen Queensland trended downwards between 2014-15 and 2019-20, reaching 51% in 2019-20. In 2018-20, MSH participation in cervical screening was 56%.

COVID-19 pandemic impact:

The COVID-19 pandemic impacted people's access to and use of health services such as screening programs. Participation in the bowel cancer screening program by Redland LGA residents decreased in 2019-20 to the lowest level seen since 2014-15.BreastScreen participation rates in MSH fell in 2019-20 more sharply than in previous years.

It is not possible to determine the exact scale of the impact of the pandemic on cervical screening because of recent changes to the program.

Maternal and child health

In 2021 there were 1,736 births to 1,714 Redland LGA mothers. The total life-time fertility rate per female aged 15-49 years in Redland LGA (1.96 births per woman) was significantly higher than the Queensland rate. Total life-time fertility rates fell between 2010 and 2020 with a substantial increase recorded in 2021.

The overall median maternal age in Redland LGA in 2021 was 30 years while the median Redland LGA Indigenous maternal age was 27 years.

In 2020-21, 9% of pregnant women in Redland LGA reported smoking cigarettes for all or part of their pregnancy (significantly lower than the Queensland prevalence of 12%). However, 30% of Indigenous Redland LGA mothers smoked during pregnancy.

The prevalence of gestational diabetes more than doubled in Redland LGA between 2007 (6%) and 2021 (15%). This substantial increase indicates a likely increase in related adverse pregnancy outcomes, especially if the trend is sustained over time.

The infant mortality rate (deaths in the first year of life) in Redland LGA (3.5 deaths per 1,000 live births) was statistically similar to the Queensland rate (4.0 deaths per 1,000 births) in 2016 to 2020.

The perinatal mortality rate (stillbirths and deaths in the first 28 days of life) in Redland LGA (8.1 deaths per 1,000 live births) was statistically similar to the Queensland rate (10.3 per 1,000 births) in 2017 to 2021.

COVID-19 pandemic impact:

A substantial increase in total life-time fertility rate was recorded in Redland LGA women in 2021, despite Australian survey results from late 2020 indicating that the pandemic had a negative impact on many women's intentions of having children.

Chronic disease risk factors

In 2019 to 2020, 61% of adult Redland LGA residents were overweight or obese (self-reported data) and 8% reported being daily smokers.

Just over half (52%) of Redland LGA adults reported doing sufficient physical exercise for health benefit which was significantly lower than in Queensland. Over half (54%) reported adequate fruit intake for health benefit.

Only 8% of Redland LGA adults reported adequate vegetable consumption for health benefit which was the same as the Queensland prevalence. Over half (54%) of Redland LGA adults reported being sunburnt in the last 12 months which was also statistically similar to the prevalence in Queensland (53%).

COVID-19 pandemic impact:

At the time of publication, insufficient data was available to assess the impact of the COVID-19 pandemic on risk factor behaviours in Redland LGA.

Introduction

The aim of this report is to examine the health status of people living within the geographical boundaries of the Redland local government area (LGA). Redland LGA is located south-east of Brisbane LGA and encompasses 12 mainland suburbs, along with North Stradbroke Island and the Southern Moreton Bay Islands.

There is no single, main population centre within the LGA, however Capalaba and Cleveland are major public transport hubs. In 2021 Redland LGA had an estimated resident population of over 160,000 persons, the majority of whom lived in metropolitan/suburban settings

Redland LGA contains one major public referral hospital (Redland Hospital) and one private hospital: the 60-bed Mater Private Hospital Redland which provides a range of specialised surgical and medical services.

Community Health Services and public dental services in Redland LGA operate from the Community Health Centre and Dental clinic respectively, both located in Cleveland (Redland Hospital).

Metro South Health

Redland LGA sits within the geographical area covered by Metro South Health (MSH). MSH is the major provider of public health services and health education and research in this area. It is one of 16 hospital and health services in Queensland and serves an estimated population of just over 1.2 million people representing 23 per cent of Queensland's population. In addition to Redland LGA, MSH also encompasses the geographical areas of Logan LGA, Brisbane LGA south of the Brisbane River and part of Scenic Rim LGA.

Metro South Public Health Unit

Metro South Public Health Unit (MSPHU) is located at Queensland Health Forensic and Scientific Services, Coopers Plains. Public Health Units focus on protecting health; preventing disease, illness and injury; and promoting health and wellbeing at a population or whole of community level. This is distinct from the role of the rest of the health system which is primarily focused on providing healthcare services to individuals and families.

The key functions of MSPHU include:

- coordinate disease control initiatives, including response to disease outbreaks
- undertake a range of environmental health initiatives, including monitoring compliance with and enforcing public health legislation in relation to food safety and standards, water quality standards, regulated drugs and poisons, and tobacco control
- assess and coordinate local responses to environmental health risks
- undertake epidemiology and health surveillance activities, including the collation, analysis, monitoring and dissemination of information on health status and disease trends

- provide specialist public health advice to health services, other sectors and the community, and develop their capacity to collaboratively plan and implement effective public health programs
- provide education, training and clinical support for immunisation programs, and coordinate school-based vaccination programs.

Data Sources

This report was produced by MSPHU and utilised the most recent available data at the time of writing. Years and sources for specific datasets are as follows:

Dataset	Years reported	Data source
Mortality (non-cancer)	2010 - 2019	Cause of Death Unit Record File (COD URF), Australian Coordinating Registry Data extracted by Statistical Service Branch, Queensland Health, September 2021.
Hospital separations	2011/12 - 2020/21 *(reported by financial year/s)*	Queensland Hospital Admitted Patient Data Collection (QHAPDC), Department of Health Data extracted by Statistical Services Branch, Queensland Health, June 2022
Cancer incidence and mortality	2010 – 2019	Oncology Analysis System (OASys), Cancer Alliance Queensland, Queensland Cancer Control Analysis Team. Data extracted by MSPHU, July 2022.
Cancer screening	2014-15 – 2019-20	Australian Institute of Health and Welfare. Cancer screening programs: quarterly data
Maternal and child health	2017 - 2021	Queensland Perinatal Data Collection (QPDC) Data extracted by Statistical Services Branch, Queensland Health, September 2022
Chronic disease risk factors	2018 – 2019 and 2019 – 2020 *(varies with risk factors)*	Queensland Survey analytics system (QSAS), Detailed Queensland and regional preventive health survey results. Data extracted by MSPHU, September 2022.

Population profile

Geographical area

The LGA of Redland is located on the Moreton Bay coast sharing a boundary with Brisbane LGA to the west and Logan LGA to the south. It encompasses 12 mainland suburbs (Alexandra Hills, Birkdale, Capalaba, Cleveland, Mount Cotton, Ormiston, Redland Bay, Sheldon, Thorneside, Thornlands, Victoria Point and Wellington Point) in addition to North Stradbroke Island and the Southern Moreton Bay Islands of Russell, Karragarra, Macleay, Lamb and Coochiemudlo (Figure 1).

The LGA covers a geographic area of 537.1 km², representing less than 0.1% of the total area of Queensland.

Figure 1: Map showing the boundary of Redland local government area

Demographics

The estimated resident population of Redland LGA as at 30 June 2021 was 161,730 persons, representing 3.1% of the Queensland population. Compared with Queensland, Redland LGA had a much larger proportion of older persons (55 years and over), and much smaller proportions of younger children (birth to nine years) and young adults (20 to 39 years) (Figure 2).

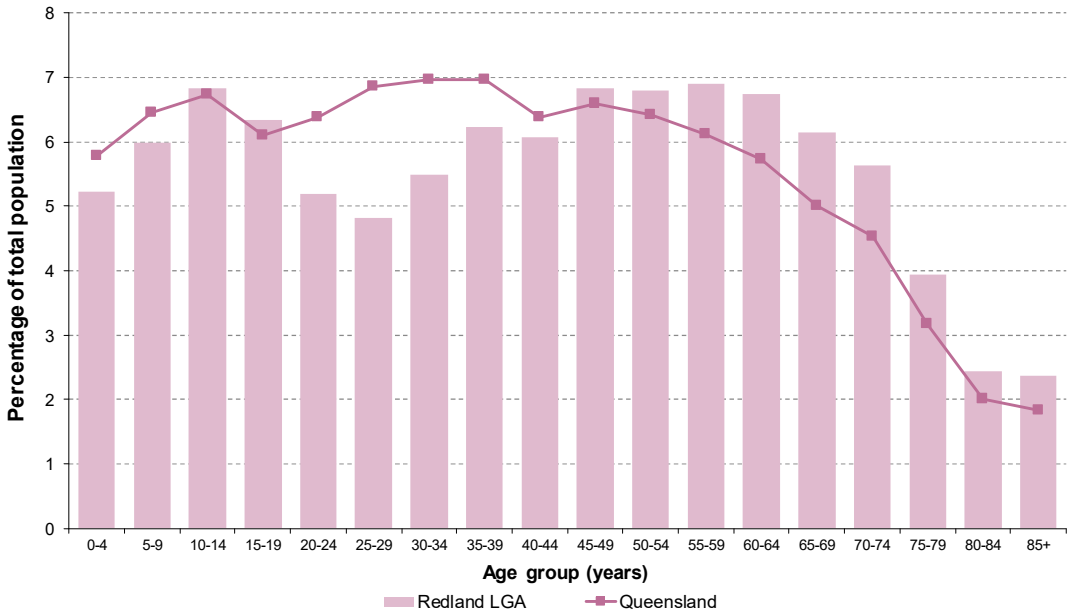


Figure 2: Percentage of total estimated population by age group, Redland LGA and Queensland, 30 June 2021

Figure 3 shows a population pyramid for Redland LGA, as at 30 June 2021, illustrating its very unconventional shape with a major population bulge between approximately 45 and 74 years.

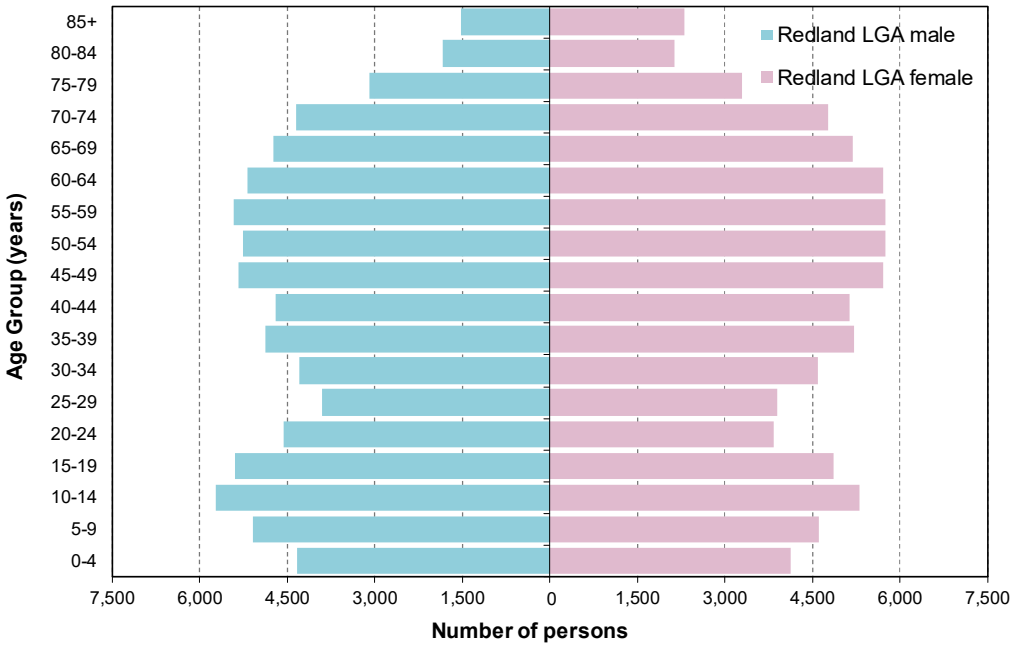


Figure 3: Estimated resident population by age group and sex, Redland LGA, 30 June 2021

In 2020, Indigenous people represented an estimated 2.4% of the population of Redland LGA, compared with 4.6% of the Queensland population. The Indigenous population of Redland LGA had a much higher proportion of people aged under 30 years and a much lower proportion of people aged 30 years and over in comparison with the overall population of the LGA (Figure 4). It is to be noted that Indigenous population estimates should be interpreted with caution as they are likely to be underestimates.

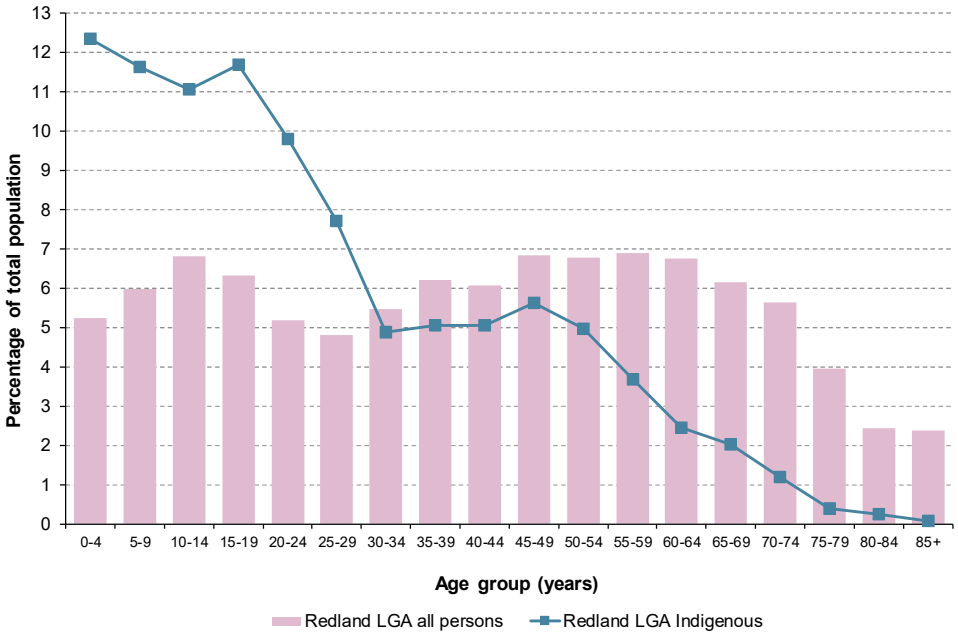


Figure 4: Percentage of estimated resident population by age group, Redland LGA all persons and Redland LGA Indigenous, 2020

Population projections

2021 to 2031

The most recent population projections (undertaken in 2018) estimate an increase in overall population of about 11% in Redland LGA between 2021 and 2031 (Table 1). This compares with a projected increase of 19% across all of Queensland over the same period. In Redland LGA the largest percentage increases are projected to occur in the age groups over 65 years largely representing retirees (Table 1; Figure 5). By 2031, it is projected that there will be over 12,000 additional Redland LGA residents aged 65 years and over compared with 2021, with the greatest part of this increase among those over 75 years of age.

Table 1: Projected population count and percentage increase by age group, Redland LGA with Queensland comparison, 2021 to 2031

Age group (years)	Redland LGA population		Percentage increase	
	2021 (ERP)	2031 (proj.)	Redland LGA	Queensland
0 to 14	29,180	29,410	0.8	15.0
15 to 24	18,645	20,364	9.2	21.3
25 to 44	36,568	38,670	5.7	15.9
45 to 64	44,124	45,157	2.3	11.6
65 to 74	19,048	22,886	20.1	23.2
75+	14,165	22,755	60.6	57.3
Total	161,730	179,241	10.8	19.0

Redland LGA is expected to experience lower population growth than Queensland across all five-year age groups except those aged 75 to 84 years (Figure 5). Population growth is expected to be negative in those aged 10 to 14 and 50 to 54 years and positive but less than two percent in those 30 to 39 and 45 to 49 years (Figure 5). These growth projections represent major demographic changes for the Redland LGA in the near-term.

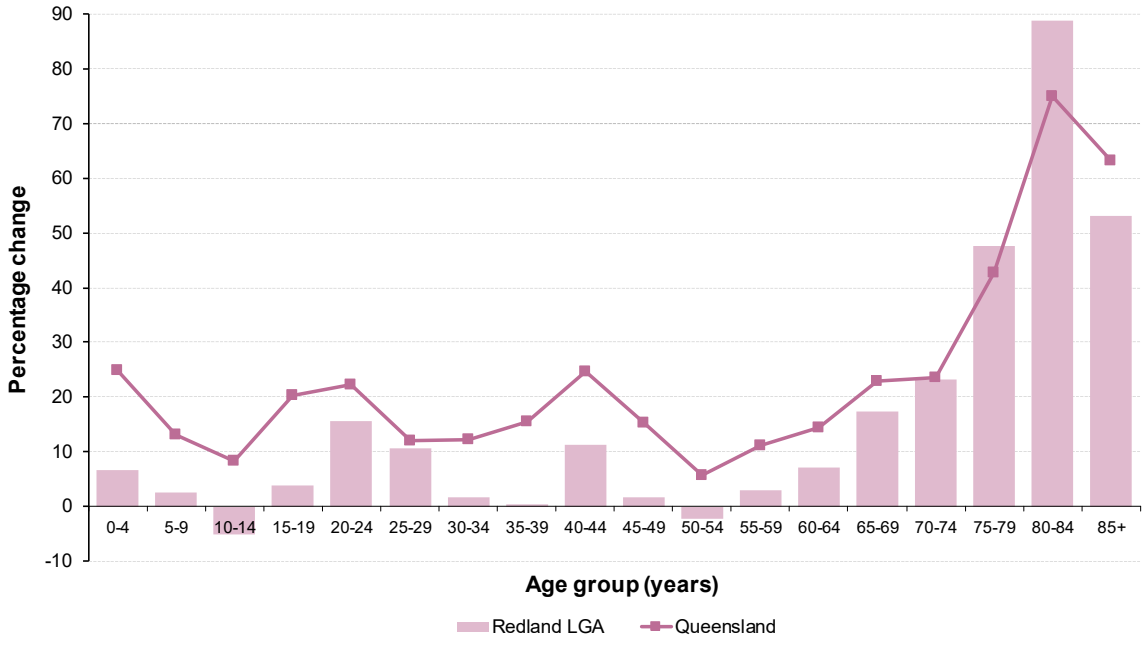


Figure 5: Projected percentage population changes by age group, Redland LGA and Queensland, 2021 to 2031

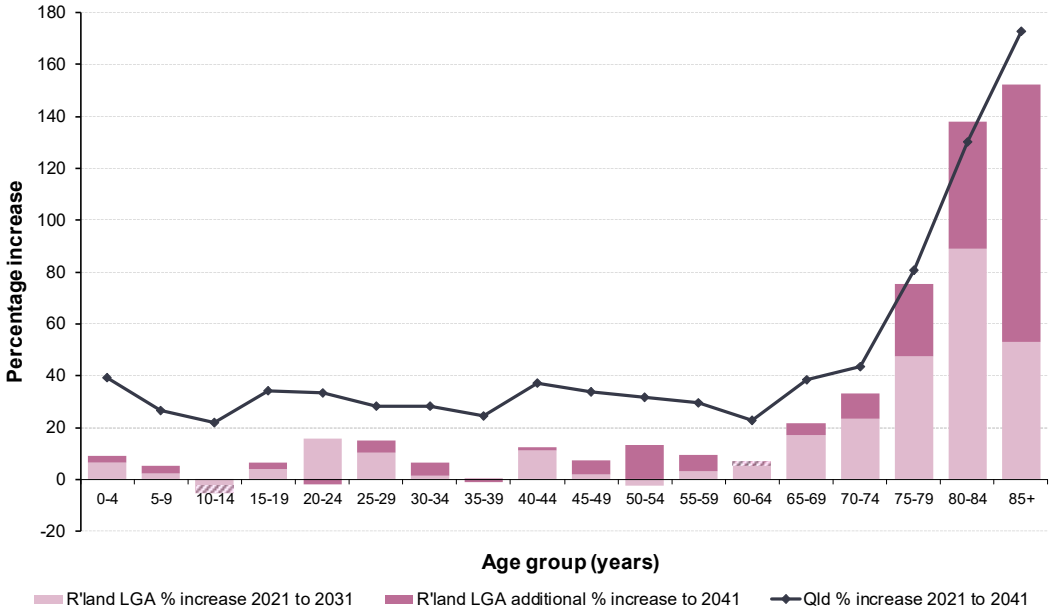
2021 to 2041

Taking a slightly longer-term perspective, it is projected that there will be a population increase of about 19% in Redland LGA between 2021 and 2041. This is around half of the projected increase across all of Queensland over the same period (37%). By far the largest increases are projected to occur in the age groups over 75 years (Table 2; Figure 6).

Table 2: Projected population count and percentage increase, Redland LGA with Queensland comparison, 2020 to 2041

Age group (years)	Redland LGA population		Percentage increase	
	2021	2041	Redland LGA	Queensland
0 to 14	29,180	30,222	3.6	28.8
15 to 24	18,645	20,484	9.9	33.6
25 to 44	36,568	39,464	7.9	29.4
45 to 64	44,124	47,755	8.2	29.7
65 to 74	19,048	24,229	27.2	40.9
75+	14,165	30,278	113.8	118.9
Total	161,730	192,431	19.0	37.3

In Redland LGA the number of residents aged over 85 years is predicted to increase by over 150% by 2041 (Figure 6). This will result in approximately additional 5,800 residents in this age group within 20 years.



* Where a population reduction is projected in 2041, this is represented by a shaded area on the relevant age group bar

Figure 6: Projected percentage population changes by age group, Redland LGA and Queensland, 2021 to 2041

The balance between working and retirement ages is projected to undergo substantial change by 2041. In 2021, 21% of the Redlands LGA residents were of 'retirement age' (65 years and over). By 2041, the number in this age group is projected to increase by over 21,000 to around 54,500 which will represent 28% of the LGA population. Those of 'retirement age' are also projected to become proportionally older with the percentage of this group who are 85 years and older increasing from 12% in 2021 to 18% in 2041.

Contrasted with the increases in the elderly population is a very low level of projected increase in all age groups under 65 years. In 2021, 55% of Redland LGA residents were in the 'working ages' of 20 to 64. By 2041 it is projected that this will have dropped to 50%.

By 2041, real term decreases in the number of Redland LGA residents aged 10 to 14 and 35 to 39 years are projected to occur. All of these major demographic shifts are generating a population pyramid which is starting to change to a more inverted shape, with the greater proportion of the population at the top (older) and a smaller proportion at the bottom (younger) (Figure 7)

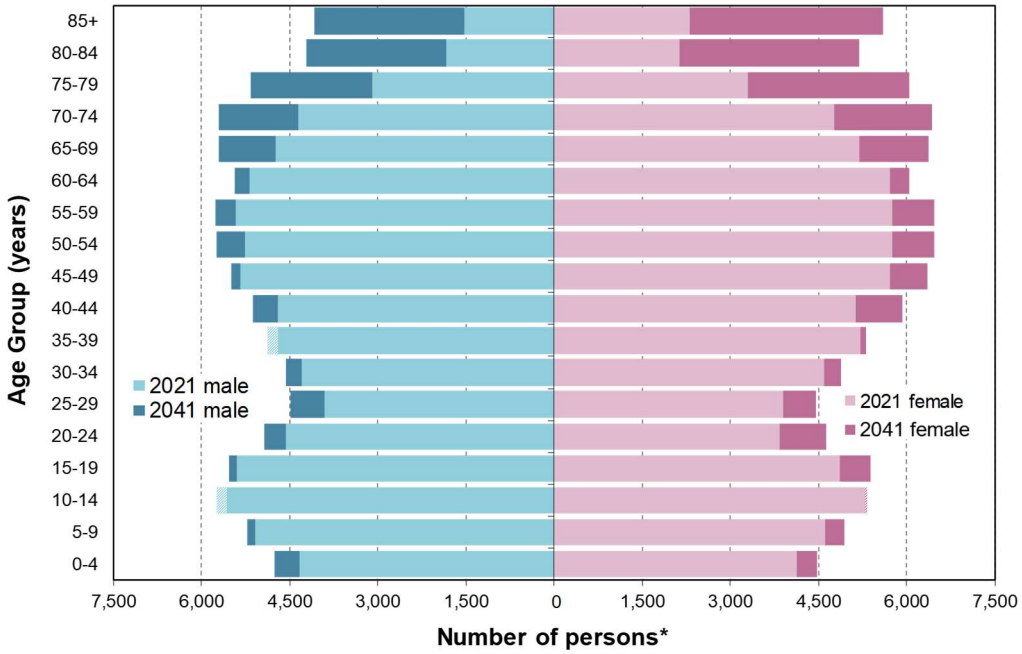


Figure 7: Estimated resident population by age group and sex, Redland LGA South Health, as at 30 June 2021 and projection to 2041*

* Where a population reduction is projected in 2041, this is represented by a shaded area on the relevant age group bar

Substantial ageing of the population with little or no growth in younger age groups will have major implications for the health and hospital system in Redland LGA . It can be expected that Redland LGA will experience and have to manage more people living with disability and chronic health conditions, an increasing demand for GP and other primary health services and a substantially increasing need for aged care services and hospital beds.

Avoidable mortality

A death is defined as being premature if it occurs in a person less than 75 years of age[1]. In 2018, 37% of all Queensland deaths were premature and just over half (51%) of these were defined as being potentially avoidable under nationally agreed criteria[2]. The proportion of premature deaths that were potentially avoidable was higher in males (52%) than in females (48%). Avoidable deaths are those premature deaths which, in the context of the present health system, are from conditions potentially preventable through individualised care and/or treatable through existing primary or hospital care[2].

Prior to 2015, avoidable deaths were classified as either being 'treatable' (amenable to healthcare) or 'preventable' (those deaths which result from conditions which could have been prevented from occurring in the first place)[1]. However, this classification and the definitions underpinning it were not without complications. Therefore, throughout 2014 work was undertaken on this indicator by the Potentially Preventable Hospitalisations/Potentially Avoidable Deaths Working Group, with further revisions by the Australian Institute of Health and Welfare (AIHW) including an examination of international work in avoidable mortality. As a result of this work, the sub-classifications of 'treatable' and 'preventable' were abolished from 2015 onwards and the National Healthcare Agreement (NHA) (2022) Health, Standard 24/09/2021 now includes the PI-16 Potentially avoidable deaths, 2022 indicator[3].

Because of this relatively recent change in the definition of 'avoidable mortality', no time series data are presented in this report. It is also important to note that further revisions of this NHA potentially avoidable deaths standard are proposed, so stability of definitions is unlikely to be achieved over the coming years.

Between 2016 and 2019, an average of 174 Redland LGA resident deaths per year were classified as potentially avoidable. This represented 15% of all of the potentially avoidable deaths throughout Metro South Health over that period, which was slightly more than the 13% which would have been expected on a purely population proportional basis.

The age standardised avoidable mortality rate in Redland LGA (97 per 100,000 persons; [95% CI: 90 – 105]) was significantly lower than the rate in all of Queensland (110 per 100,000 persons; [95%CI: 109 – 111]).

In 2016 to 2019, in both Redland LGA residents and all Queenslanders, avoidable mortality rates for males were significantly higher than for females (

Figure *8*). In Redland LGA, the avoidable mortality rate for males was 73% higher than the female rate while in Queensland the male rate was 87% higher. Rates for Redland LGA and Queensland females were statistically similar while rates for Queensland males were significantly higher than Redland LGA males (

Figure *8*).

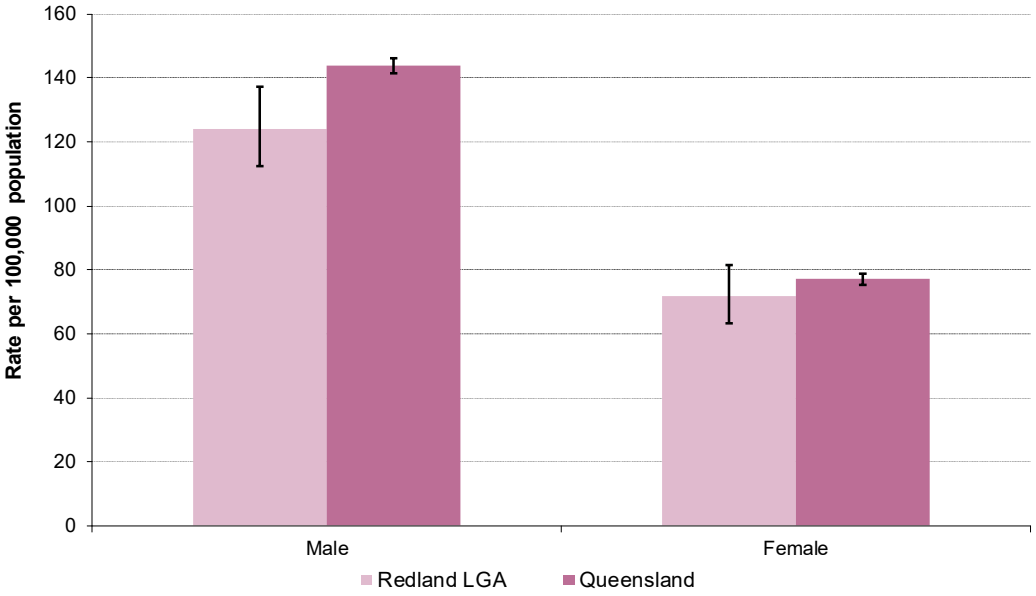


Figure 8: Age standardised avoidable mortality rates by region and sex with 95% confidence intervals, 2016 to 2019

Potentially preventable hospitalisations

Potentially preventable hospitalisations (PPHs) are defined by the AIHW (*National Healthcare Agreement: 2022*) as 'admissions to hospital for a condition where the hospitalisation could have potentially been prevented through the provision of appropriate individualised preventative health interventions and early disease management usually delivered in primary care and community-based care settings (including by general practitioners, medical specialists, dentists, nurses and allied health professionals)'. Separation rates for PPHs therefore have potential as indicators of the quality or effectiveness of non-hospital care[4]. For the purposes of this report, the Queensland Health definition which excludes renal dialysis was used, owing to inconsistencies in coding practices across Queensland.

PPHs are a key indicator of primary care provision under the 2022 National Healthcare Agreement[3]. A high rate of PPHs may indicate an increased prevalence of the conditions in the community in question, poorer functioning of or limitations in access to primary healthcare such as general practitioners and community health centres, or an appropriate use of the hospital system to respond to greater need. PPHs are usually classified into three broad categories[4].

- ***Vaccine preventable***. These diseases can be prevented by appropriate vaccination and include influenza, bacterial pneumonia, hepatitis, tetanus, diphtheria, pertussis (whooping cough), chicken pox, measles, mumps, rubella, polio and haemophilus meningitis. The conditions themselves are considered to be preventable, rather than the hospitalisation.
- ***Acute***. These conditions may not be preventable, but theoretically would not result in hospitalisation if adequate and timely care (usually non-hospital) was received. These include eclampsia, pneumonia (not vaccine-preventable), pyelonephritis, perforated ulcer, cellulitis, urinary tract infections, pelvic inflammatory disease, ear, nose and throat infections and dental conditions.
- ***Chronic***. These conditions may be preventable through behaviour modification and lifestyle change, but can also be managed effectively through timely care (usually non-hospital) to prevent deterioration and hospitalisation. These conditions include diabetes complications, asthma, angina, hypertension, congestive heart failure, nutritional deficiencies and chronic obstructive pulmonary disease (COPD).

The specification for this indicator was revised during 2014, and this new specification has been applied to all years of data presented in this report. Therefore, the data presented here are not comparable with data presented in reports dated pre-2016 and caution should be used in making comparisons over time using different specifications[4].

PPHs by category

In 2020/21 there were 6,886 potentially preventable hospitalisations among Redland LGA residents, representing 7% of all hospitalisations. The age standardised rate was 3,603 PPHs per 100,000 persons.

The rate of potentially preventable hospitalisation was significantly higher in Redland LGA than in Queensland for acute conditions and significantly lower than Queensland for vaccine preventable conditions.

However, the PPH rates for all conditions and chronic conditions were statistically similar in Redland LGA and Queensland (Figure 9; Table 3).

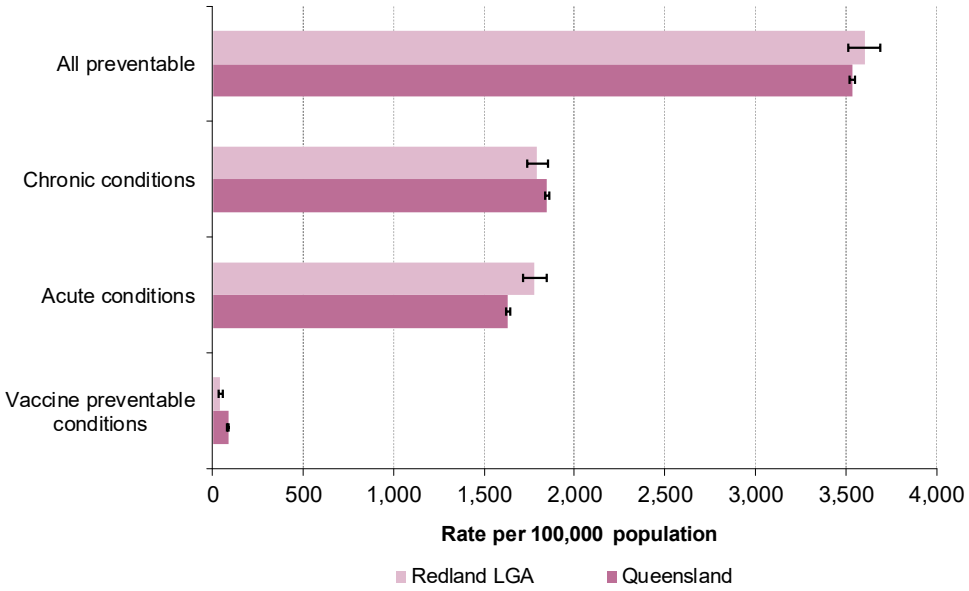


Figure 9: Potentially preventable hospitalisations by category, age standardised rates with 95% confidence intervals, Redland LGA and Queensland, 2020/2021

There were over 3,700 PPHs for chronic conditions and over 3,000 for acute conditions among Redland LGA residents in 2020/21 (Table 3). By comparison there were just 87 Redland LGA PPHs for vaccine preventable conditions in this period which included 14 for influenza and pneumonia (Table 3; Table 4).

Table 3: Potentially preventable hospitalisations by category, Redland LGA and Queensland, 2020/21

Category of PPH	Number of PPHs		Age standardised rate per 100,000 persons		Statistically significant difference Redland LGA–QLD*
	Redland LGA	QLD	Redland LGA	QLD	
All preventable	6,886	202,759	3,603	3,538	—
Chronic conditions	3,767	111,645	1,794	1,850	—
Acute conditions	3,068	88,128	1,780	1,634	↑
Vaccine preventable	87	4,855	46	86.5	↓

* ↑ LGA statistically significantly higher than Queensland; ↓ LGA statistically significantly lower than Queensland; — no statistically significant difference between LGA and Queensland

PPHs by condition

Overwhelmingly the chronic condition with the highest rate of PPH in Redland LGA residents (almost 900 PPHs per 100,000 persons) was diabetes complications which represented almost 30% of all PPHs in Redland LGA residents. The chronic conditions congestive cardiac failure and COPD had the next highest rates with over 400 PPHs per 100,000 persons each. Among acute conditions, the highest rate was for urinary tract infections followed by cellulitis (Table 4).

Table 4: Number and rate of potentially preventable hospitalisations by sub-category and condition, Redland LGA, 2020/21

Sub-category and condition	Number	Rate per 100,000 persons	% of total count
Vaccine Preventable	**87**	**45.6**	**1.3**
Other vaccine-preventable conditions	73	38.2	1.1
Influenza and pneumonia (vaccine preventable)	14	**	0.2
Chronic*	**3,767**	**1,794.4**	**54.7**
Diabetes complications	1,907	882.4	27.7
Congestive cardiac failure	515	222.1	7.5
COPD	415	193.3	6.0
Iron deficiency anaemia	305	160.1	4.4
Angina	292	131.6	4.2
Asthma	242	148.2	3.5
Hypertension	217	103.5	3.2
Bronchiectasis	95	47.2	1.4
Rheumatic heart disease	15	**	0.2
Nutritional deficiencies	13	**	0.2
Acute	**3,068**	**1,780.0**	**44.6**
Urinary tract infections	974	515.3	14.1
Cellulitis	743	411.2	10.8
Dental conditions	473	295.5	6.9
Ear, nose and throat infections	404	280.3	5.9
Convulsions and epilepsy	306	186.1	4.4
Gangrene	92	47.5	1.3
Perforated/bleeding ulcer	47	22.7	0.7
Pneumonia (not vaccine preventable)	<5	**	**
Total preventable hospitalisations	**6,886**	**3,603.3**	**100.0**

* As more than one condition may be reported for a separation, the sum of all conditions does not necessarily equal the total number of separations recorded for each category

** Cell counts are inadequate to produce age standardised rate

PPH rates were significantly lower in Redland LGA than in Queensland for dental conditions, iron deficiency anaemia, gangrene and 'other vaccine preventable' conditions (those other than influenza and pneumonia) (Figure 10).

In comparison, PPH rates were significantly higher in Redland LGA than Queensland for a range of conditions including: urinary tract infections, cellulitis, ear, nose & throat infections, asthma, angina and hypertension (Figure 10).

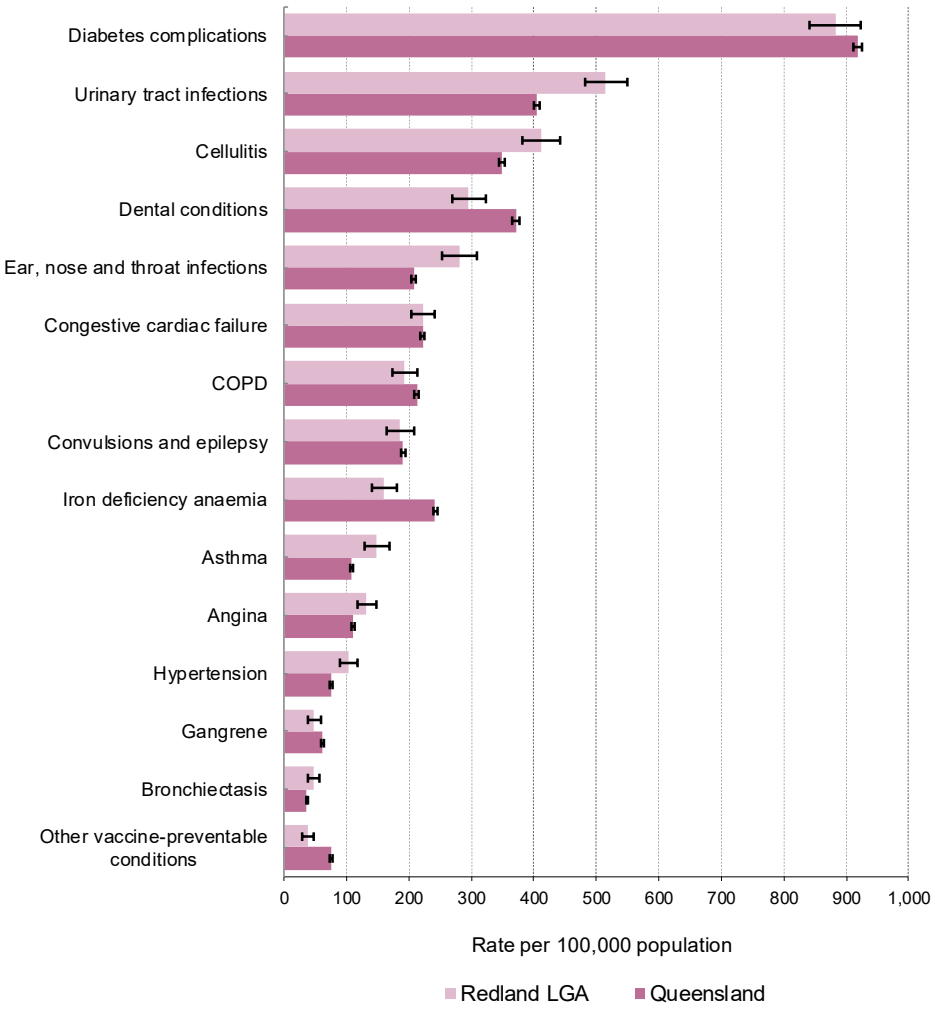


Figure 10: Potentially preventable hospitalisations, age standardised rates and 95% confidence intervals by condition, Redland LGA and Queensland, 2020/21

PPH time series

Historically time series for PPHs have been difficult to interpret owing to periodic changes to clinical coding practices. However coding has been stable since 2012/13 enabling time series data to be presented in this report for the first time.

The rate of PPHs in Redland LGA residents increased steadily from 2012/13 to a peak in 2017/18 after which a decline was recorded (Figure 11). The rates of chronic and vaccine preventable PPHs followed a similar pattern while acute PPH rates plateaued between 2018/19 and 2020/21 (Figure 11).

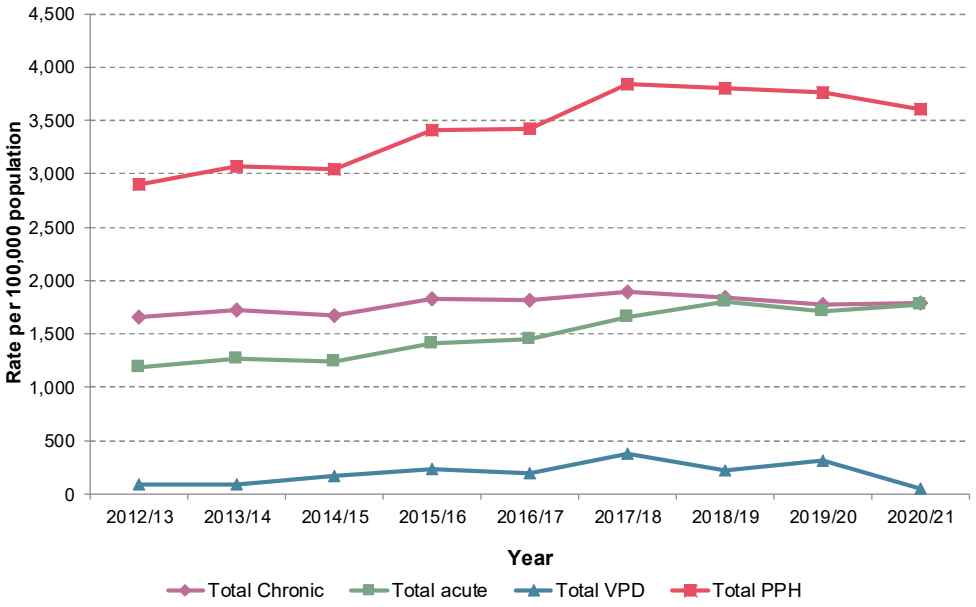


Figure 11: Age standardised rates of total potentially preventable hospitalisations and three sub-categories, 2012/13 to 2020/21, Redland LGA

Vaccine preventable PPHs experienced a substantial rate drop in 2020/21. This was most likely the result of the public health measures (including closure of the international border, local lockdowns, social distancing) implemented from late-March 2020 onwards and through 2021 in response to the COVID-19 pandemic (Figure 11). During this period influenza notifications in Redland LGA and the rest of Queensland dropped to and remained close to zero[5]. The rate of PPHs for vaccine preventable influenza and pneumonia fell from over 240 per 100,000 persons in 2019/20 to less than ten per 100,000 persons in 2020/21 (Figure 12).

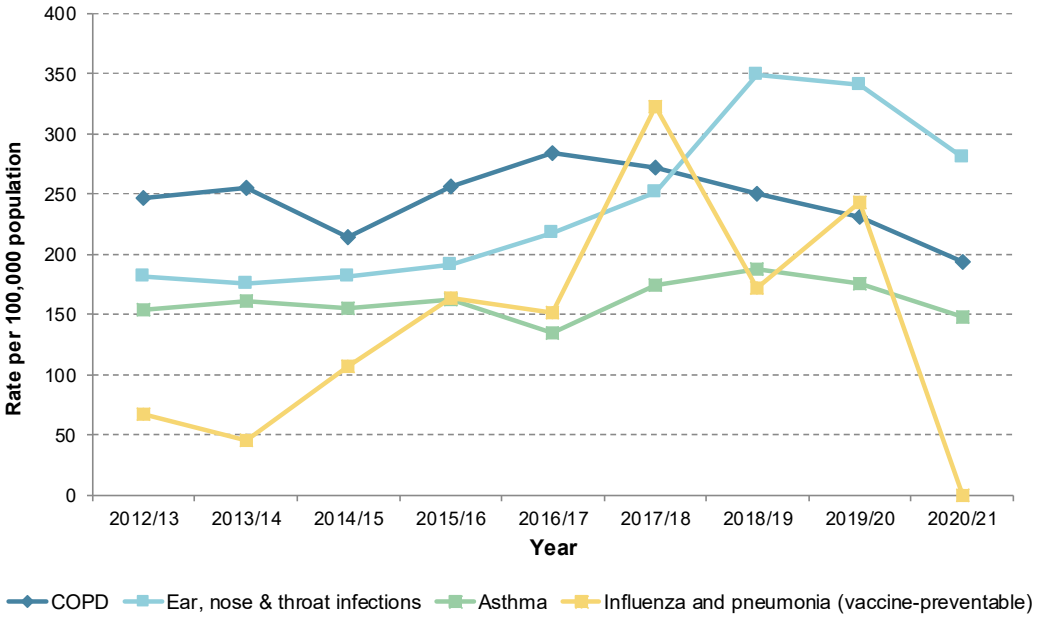


Figure 12: Age standardised rates of potentially preventable hospitalisations for selected conditions, 2012/13 to 2020/21, Redland LGA

Along with vaccine preventable influenza & pneumonia, rates of other respiratory-related PPHs also fell during the period of the COVID-19 pandemic. These included COPD, ear, nose and throat infections and asthma (Figure 12).

Rates of some PPH conditions experienced a noticeable increase in 2020/21 during the main part of the COVID-19 response and lockdowns. These included PPHs for dental conditions, diabetes complications and urinary tract infections (Figure 13). These increases may indicate that management of and preventative measures usually associated with these conditions may have fallen during the COVID-19 pandemic period, leading to hospitalisations which would have been preventable under normal conditions.

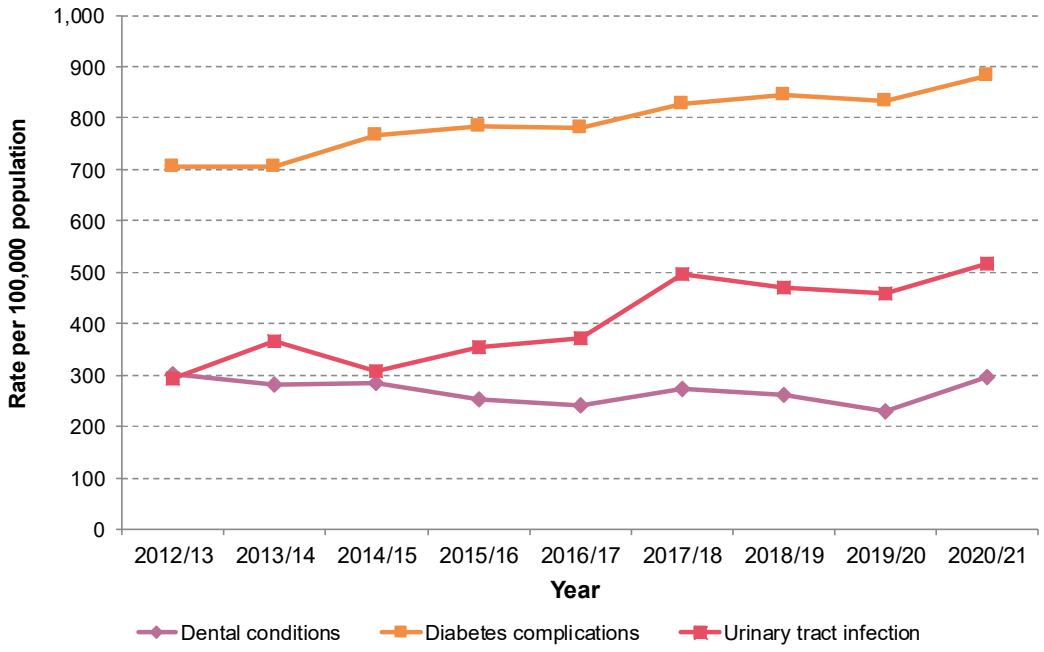


Figure 13: Age standardised rates of potentially preventable hospitalisations for selected conditions, 2012/13 to 2020/21, Redland LGA

Health outcomes

In this section mortality and hospital separation rates are outlined for selected conditions including all causes, arthritis and musculoskeletal conditions, respiratory disease, cancer, cardiovascular disease, diabetes mellitus, injury and mental health. Rates and numbers pertain to events (separations; deaths) occurring to residents of the relevant geographical area (Redland LGA; Queensland), irrespective of the geographical area in which the event occurred. For example, if the text states that there were 100 hospital separations for a condition in Redland LGA, this means 100 residents of Redland LGA were hospitalised for the condition, irrespective of the place in which they were hospitalised. It does not mean that there were 100 hospitalisations in facilities within Redland LGA.

All causes

The term 'all causes' includes all conditions, diseases or injuries considered to be the primary underlying cause of death (all causes mortality) or hospital separation (all causes separations).

Mortality

On average there were 1,119 deaths per year from all causes among residents of Redland LGA in the three-year period 2017 to 2019. From 2010-12 to 2017-19, mortality rates due to all causes of death declined for males and females in both Redland LGA and Queensland. Males consistently had significantly higher mortality rates than females (Figure 14).

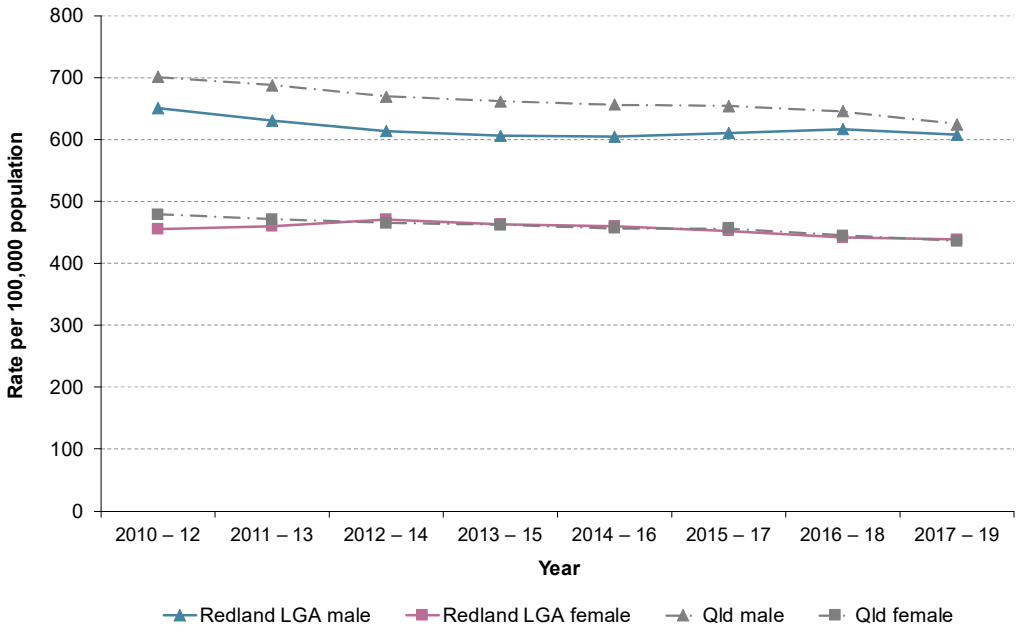


Figure 14: All causes age standardised mortality rates by sex, Redland LGA and Queensland, three-year moving averages 2010–12 to 2017–19

Indirect standardised mortality ratios indicate that the average mortality rate for all causes was significantly lower in Redland LGA than in Queensland for males (5% lower) in the five years from 2015 to 2019 (Table 5). There was no significant difference between Redland LGA and Queensland for females (Table 5).

Table 5: All causes standardised mortality ratios by sex, Redland LGA, 2015 to 2019

Region	Sex	Ratio (95% confidence interval)	Statistically significant difference: Redland LGA – QLD*
Redland LGA	Male	0.95 (0.91 – 0.98)	↓
	Female	1.02 (0.98 – 1.05)	—
	Persons	0.98 (0.95 – 1.01)	—

* ↑ LGA statistically significantly higher than Queensland; ↓ LGA statistically significantly lower than Queensland; — no statistically significant difference between LGA and Queensland

In Redland LGA and Queensland mortality rates had a small peak in the birth to four years age group. Rates were lowest in the years after infancy to around age 14 years. Mortality then increased with age, with the increase following an exponential curve from about the age of 60 years (Figure 15). Death rates were higher in males than in females in each age group.

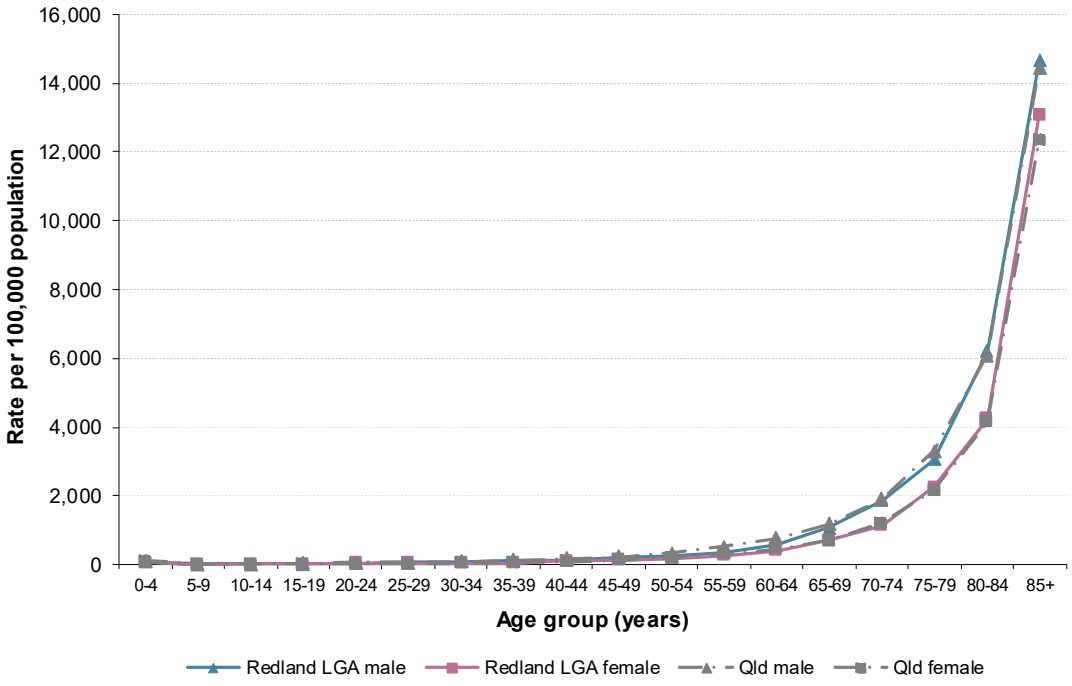


Figure 15: All causes age specific mortality rates by sex, Redland LGA and Queensland, 2013 to 2019

At the time of publication, deaths data for Redland LGA was available up to 2019 only. As a result, the impact of the COVID-19 pandemic on mortality rates in the LGA cannot yet be assessed. However, the Australian Bureau of Statistics has examined the impact of the pandemic on Australian mortality in 2020[6] and 2021[7].

Australia was one of a handful of countries (including New Zealand and Denmark) which recorded a significantly lower than expected mortality rate during the first year of the pandemic (2020)[6]. The all causes rate decrease between 2019 and 2020 the largest single year change in the past ten years, with rates decreasing across all age groups[6]. In contrast, 2021 showed an increase in Australian mortality rates across all age groups except those 25 to 44 years[7]. Almost all deaths occurred in July to December during the Delta-variant wave[7]

Subsequent reports will explore the COVID-19 impact on mortality rates in Redland LGA.

Hospital separations

On average there were 94,003 separations per year for all causes among Redland LGA residents in the three-years from 2018/19 to 2020/21. Age standardised separation rates due to all causes were consistently significantly higher in Redland LGA females than in males between 2011/12 and 2020/21 (Figure 16). This is largely due to women being admitted to hospital to give birth. Rates in both males and females trended upwards between 2011/12-13/14 and 2018/19-20/21, with rates for Redland LGA all persons increasing by 33% over this period.

From 2017/18-19/20 onwards there was a noticeable flattening of the upwards trend in Redland LGA and Queensland males. This was likely the result of various effects of the COVID-19 pandemic which started in 2019/20, including reductions in elective surgery, travel and infectious disease transmission owing to public health measures such as mask wearing and social distancing. It is not clear why the flattening did not occur in Redland LGA females.

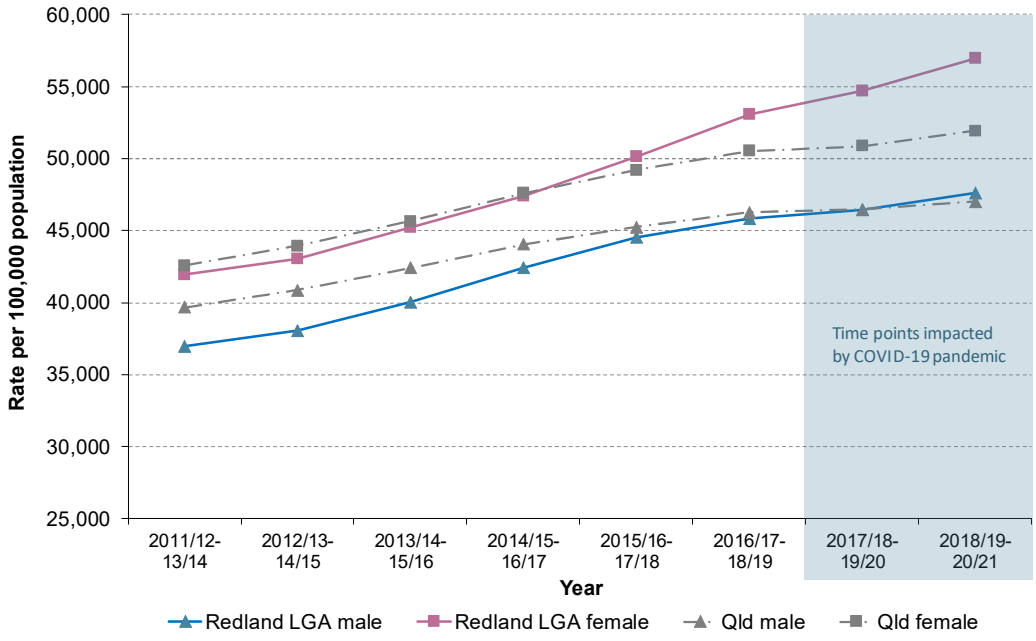


Figure 16: All causes age standardised hospital separation rates by sex, Redland LGA and Queensland, three-year moving averages 2011/12 to 2020/21

Indirect standardised separation ratios indicate that the average separation rate for all causes of hospitalisation was significantly higher in Redland LGA than in Queensland for males (1% higher) and females (7% higher) in 2018/19 to 2020/21 (Table 7).

Table 6: All causes standardised separation ratios by sex, Redland LGA, 2018/19 to 2020/21

Region	Sex	Ratio (95% Confidence Interval)	Statistically significant difference Redland LGA – QLD*
Redland LGA	Male	1.01 (1.01 – 1.02)	↑
	Female	1.07 (1.06 – 1.07)	↑
	Persons	1.04 (1.04 – 1.04)	↑

* ↑ LGA statistically significantly higher than Queensland; ↓ LGA statistically significantly lower than Queensland; — no statistically significant difference between LGA and Queensland

In both Queensland and Redland LGA, age specific rates of hospital separation were higher for women in the child-bearing years (15 to 44 year age groups) than for men (Figure 17). This was mostly related to women attending hospital to give birth. From the age of 60 years, males were more likely to be hospitalised than females (Figure 17).

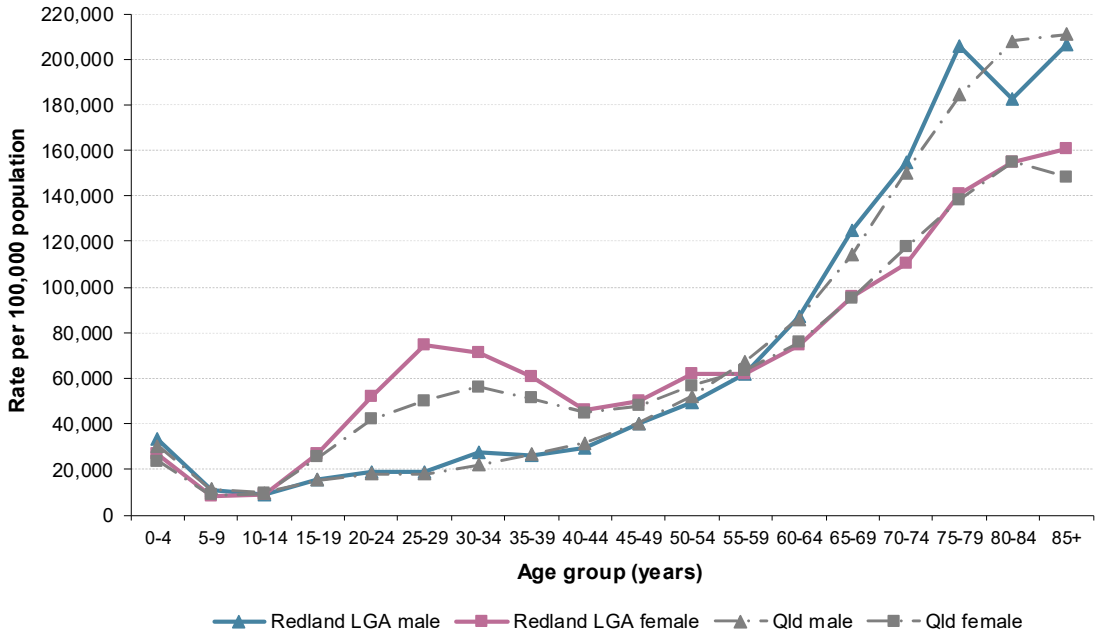


Figure 17: All causes age specific hospital separation rates by sex, Redland LGA and Queensland, 2018/19 to 2020/21

Arthritis and musculoskeletal conditions

Arthritis literally means 'inflamed joint' and is an umbrella term for a range of inflammatory conditions affecting the bones, muscles and joints[8]. It is characterised by pain, swelling, redness and stiffness in affected joints and can result in joint damage and deformity. Arthritis is a common condition, especially in older Australians and has a significant impact on quality of life due to acute and chronic pain, physical limitations and management and mental health issues. Risk factors for developing arthritis include age, overweight and obesity, injury and genetic factors. There are many forms of arthritis, however the most common types are osteoarthritis (due to cartilage loss from overuse), rheumatoid arthritis (an autoimmune disease) and gout (due to excess uric acid in the bloodstream)[8].

Mortality

On average there were fewer than five deaths per year from arthropathies and systemic connective tissue disorders among Redland LGA residents in the three years from 2017 to 2019.

Hospital separations

In 2018/19 to 2020/21, there was an average of 2,536 hospital separations per year for arthropathies and systemic connective tissue disorders among Redland LGA residents. In past years[9] and up to 2013/14 – 15/16, age standardised separation rates were consistently significantly higher in males than in females in both Redland LGA and Queensland. However this pattern changed in more recent timepoints with rates in Redland LGA females and males very similar from 2015/16–17/18 onwards (Figure 18).

In Queensland rates in both males and females trended upwards until 2017/18–19/20 after which there was a noticeable decline (Figure 18). This was likely the result of the reduction in elective surgery-related separations resulting from the COVID-19 pandemic. In Redland LGA rates were relatively stable from 2016/17-18/19 prior to the pandemic.

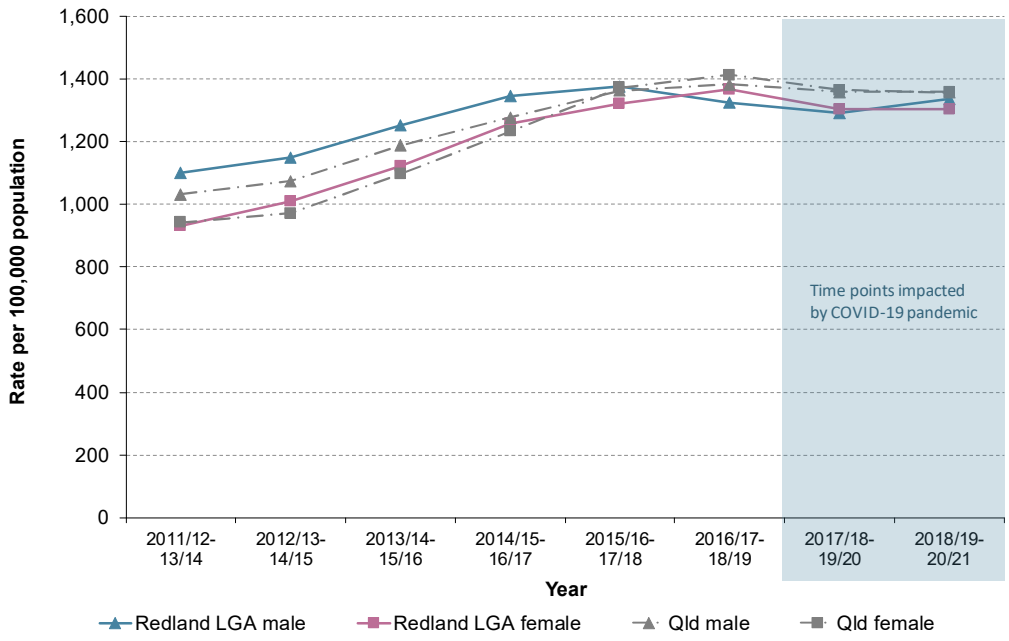


Figure 18: Arthropathies and systemic connective tissue disorders age standardised hospital separation rates by sex, Redland LGA and Queensland, three-year moving averages 2011/12 to 2020/21

Indirect standardised separation ratios indicate that the average separation rates for arthropathies and systemic connective tissue disorders were significantly lower in Redland LGA than in Queensland for both males (4% lower) and females (8% lower) in 2018/19 to 2020/21 (Table 7).

Table 7: Arthropathies and systemic connective tissue disorders standardised separation ratios by sex, Redland LGA, 2018/19 to 2020/21

Region	Sex	Ratio (95% Confidence Interval)	Statistically significant difference Redland LGA – QLD*
Redland LGA	Male	0.96 (0.93 – 0.99)	↓
	Female	0.92 (0.89 – 0.95)	↓
	Persons	0.94 (0.92 – 0.96)	↓

* ↑ LGA statistically significantly higher than Queensland; ↓ LGA statistically significantly lower than Queensland; — no statistically significant difference between LGA and Queensland

Age specific rates of hospital separations for arthropathies and systemic connective tissue disorders in Queensland and Redland LGA generally increased with age, peaking in the 70 to 84 years age groups before declining with increasing age (Figure 19).

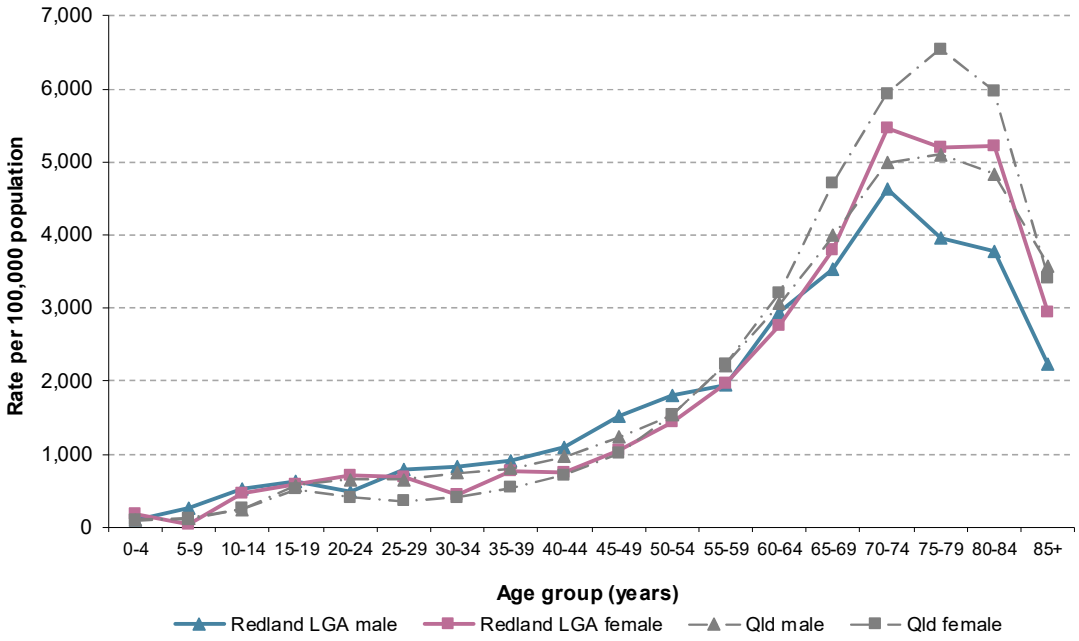


Figure 19: Arthropathies and systemic connective tissue disorders age specific hospital separation rate by sex, Redland LGA and Queensland, 2018/19 to 2020/21

Respiratory diseases

Asthma and chronic obstructive pulmonary disease (COPD) together contribute the greatest burden to respiratory diseases. Asthma is a chronic inflammatory condition of the airways associated with episodes of wheezing, breathlessness and chest tightness. The underlying causes of asthma are still not fully understood however the symptoms can be triggered by viral infections, exposure to allergens and air pollution including tobacco smoke. Although there is currently no cure, good management can control the disease and prevent symptoms from occurring or worsening. Asthma remains a significant health problem in Australia, with a relatively high prevalence by international comparison. According to the Australian Centre for Asthma Monitoring, the majority of people with asthma do not have a written action plan, despite national guidelines recommending their use[10].

COPD is a serious chronic lung disease mainly affecting older people. It is progressive, largely irreversible and characterised by shortness of breath, cough and wheeze. Tobacco smoking is the main cause of COPD[10].

Respiratory diseases: asthma

Mortality

On average there were fewer than five deaths per year from asthma among Redland LGA residents in the three years from 2017 to 2019.

Hospital separations

On average there were 278 hospital separations per year for asthma among Redland LGA residents in the three-year period 2018/19 to 2020/21. About one-third (34%) of these separations were in persons aged five to 34 years.

In Queensland, asthma age standardised separation rates were consistently significantly higher in females than in males from 2011/12-13/14 onwards. In Redland LGA the same pattern was observed, with higher rates in females than males, however the observed differences were not statistically significant owing to the relatively small number of separations per year (Figure 20).

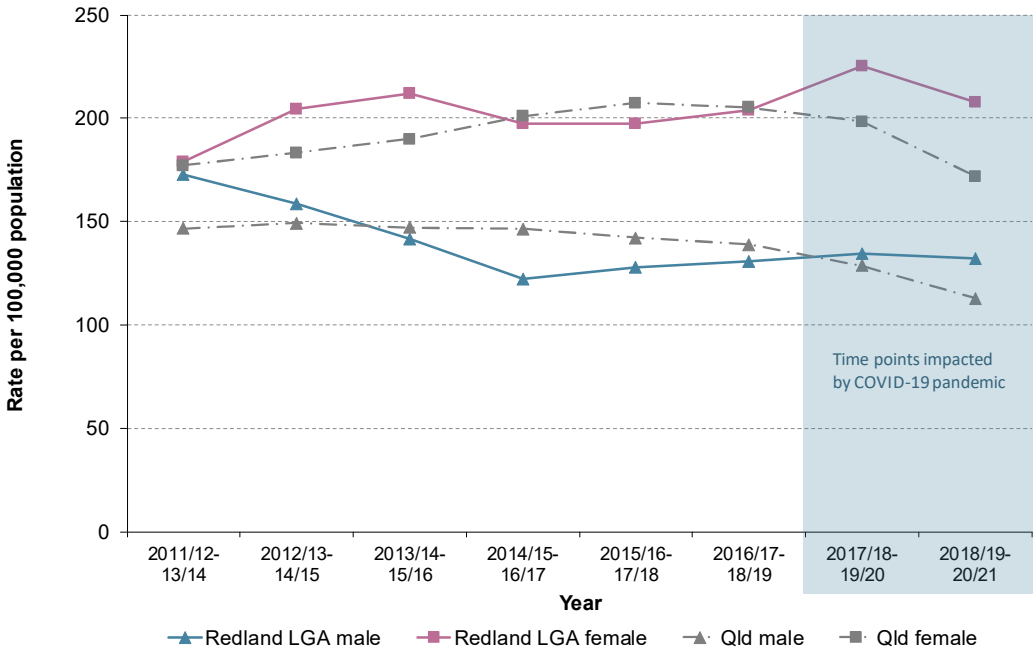


Figure 20: Asthma age standardised hospital separation rate by sex, Redland LGA and Queensland, three-year moving averages 2011/12 to 2020/21

Separation rates in Redland LGA males trended downwards over the first half of the reported period then remained relative stable, while rates in females trended upwards with a decrease in 2018/19–20/21 (Figure 20). This sharp decrease in Redland LGA females and similar decreases in Queensland rates may be the result of the reduced prevalence of influenza-like illness in Queensland from April 2020 onwards, with limited

opportunity for virus importation and community spread due to the international border closure, travel restrictions and public health mitigation measures such as mask wearing and social distancing.

Indirect standardised separation ratios indicate that the average separation rate for asthma was significantly higher in Redland LGA than in Queensland for all ages males (15% higher) and females (24% higher) in 2018/19 to 2020/21 (Table 8). When only separations among people aged five to 34 years were considered, there were no significant rate differences between Redland LGA and Queensland (Table 8).

Table 8: Asthma standardised separation ratios by sex, Redland LGA, 2018/19 to 2020/21

Region	Age group	Sex	Ratio (95% Confidence Interval)	Statistically significant difference Redland LGA – QLD*
Redland LGA	All ages	Male	1.15 (1.02 – 1.11)	↑
		Female	1.24 (1.13 – 1.07)	↑
		Persons	1.21 (1.13 – 1.07)	↑
	Ages 5 to 34 years	Male	1.02 (0.85 – 1.20)	—
		Female	1.11 (0.94 – 1.30)	—
		Persons	1.06 (0.94 – 1.19)	—

* ↑ LGA statistically significantly higher than Queensland; ↓ LGA statistically significantly lower than Queensland; — no statistically significant difference between LGA and Queensland

In 2018/19 to 2020/21, age specific rates of hospital separation for asthma in Redland LGA and Queensland showed a strong peak in children aged five to nine years (Figure 21). In all adult age groups in Queensland separation rates in females were two to three times higher than the corresponding rates in males (Figure 21).

Age specific rates for Redland LGA are not presented separately for males and females because the numbers of separations are too small for reliable estimates to be produced for most age groups. In Redland LGA separations exhibited a second peak in the 35 to 44 years age groups. They then dropped to a low point in the 45 to 54 years age groups and thereafter increased with increasing age (Figure 21).

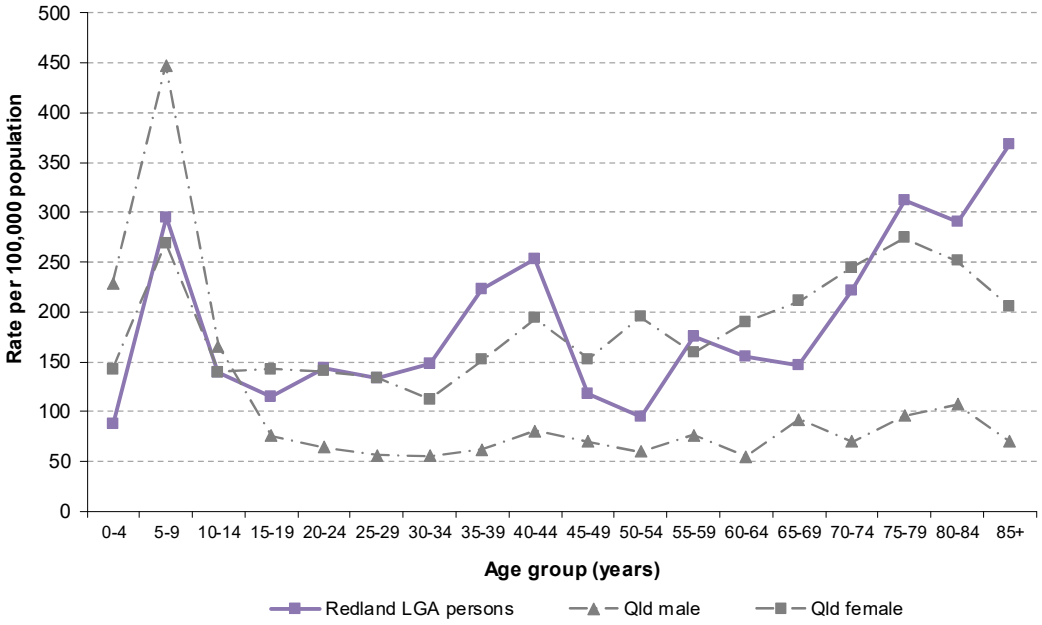


Figure 21: Asthma age specific hospital separation rate, Redland LGA all persons and Queensland by sex, 2018/19 – 2020/21

Respiratory diseases: chronic obstructive pulmonary disease (COPD)

Mortality

On average there were 44 deaths per year from COPD among residents of Redland LGA in the three years from 2017 to 2019. Males accounted for 49% of these deaths.

Mortality rates for COPD in Queensland were significantly higher in males than in females at all timepoints between 2010-12 and 2017-19 (Figure 22). Over this period rates in Redland LGA males and females were statistically similar although male rates were consistently numerically higher than those in females (Figure 22). Rates in Redland LGA did not show any consistent pattern of increase or decrease over the report period (Figure 22).

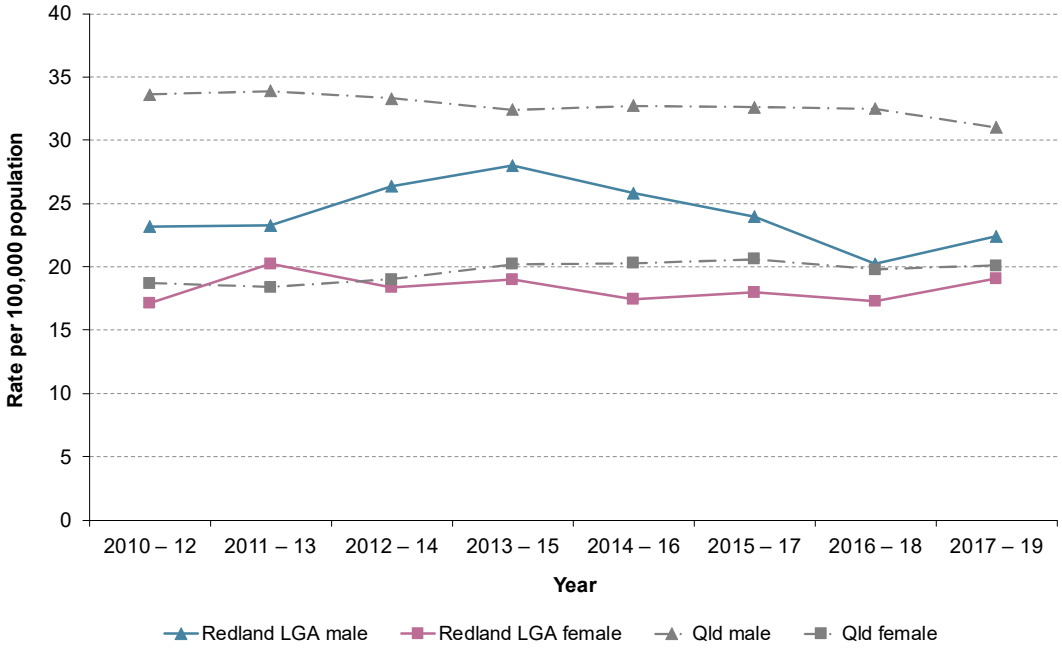


Figure 22: COPD age standardised mortality rate by sex, Redland LGA and Queensland, three-year moving averages 2010–12 to 2017–19

Indirect standardised mortality ratios indicate that the average mortality rate for COPD was significantly lower in Redland LGA than in Queensland for males (27% lower) and all persons (21% lower) in the five years from 2015 to 2019 (Table 9).

Table 9: COPD standardised mortality ratios by sex, Redland LGA, 2015 to 2019

Region	Sex	Ratio (95% confidence interval)	Statistically significant difference: Redland LGA – QLD*
Redland LGA	Male	0.73 (0.60 – 0.88)	↓
	Female	0.88 (0.72 – 1.06)	–
	Persons	0.79 (0.69 – 0.91)	↓

* ↑ LGA statistically significantly higher than Queensland; ↓ LGA statistically significantly lower than Queensland; – no statistically significant difference between LGA and Queensland

Hospital separations

On average there were 482 hospital separations per year for COPD among residents of Redland LGA in 2018/19 to 2020/21. These separations were evenly spread between males and females. Age standardised separation rates were significantly higher in males than in females in Queensland at all timepoints from 2011/12-13/14 to 2018/19-20/21 (Figure 23). In Redland LGA rates in males were significantly higher than females only in the last two timepoints of the reported period (Figure 23). Rates in both males and females in Redland LGA generally trended upwards until the timepoints impacted by the COVID-19 pandemic from 2019-20 onwards when strong decreases were recorded (Figure 23). This was likely the result of various impacts of the COVID-19 pandemic including the reduction in influenza-like illness in the community from April 2020 onwards that resulted from the effects of the COVID-19 pandemic response (including reduced travel, mask wearing and social distancing).

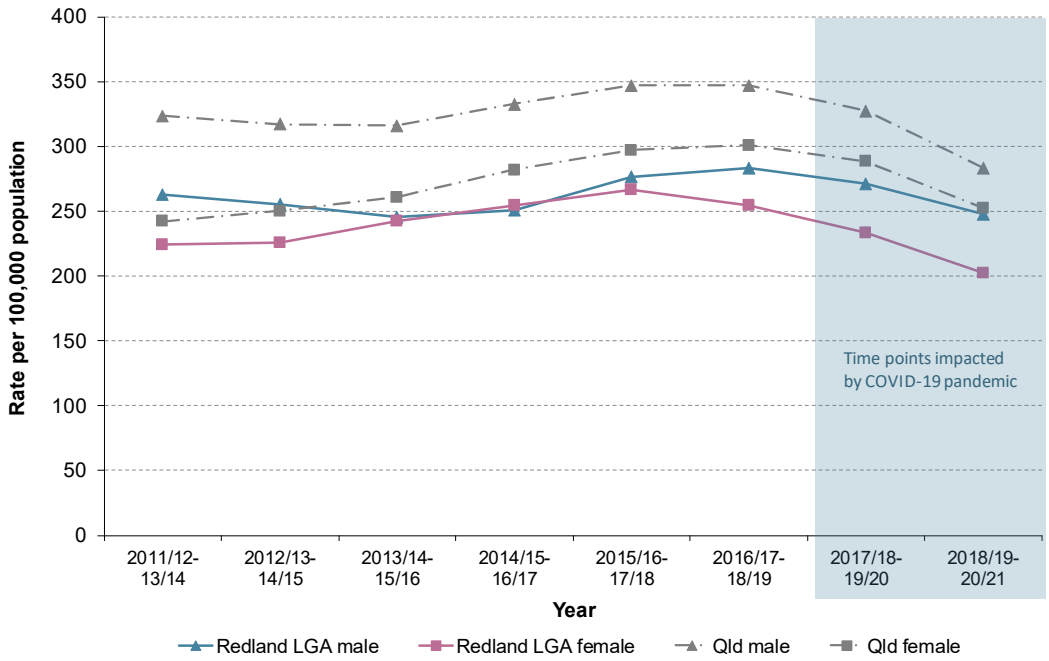


Figure 23: COPD age standardised hospital separation rate by sex, Redland LGA and Queensland, three-year moving averages 2011/12 to 2020/21

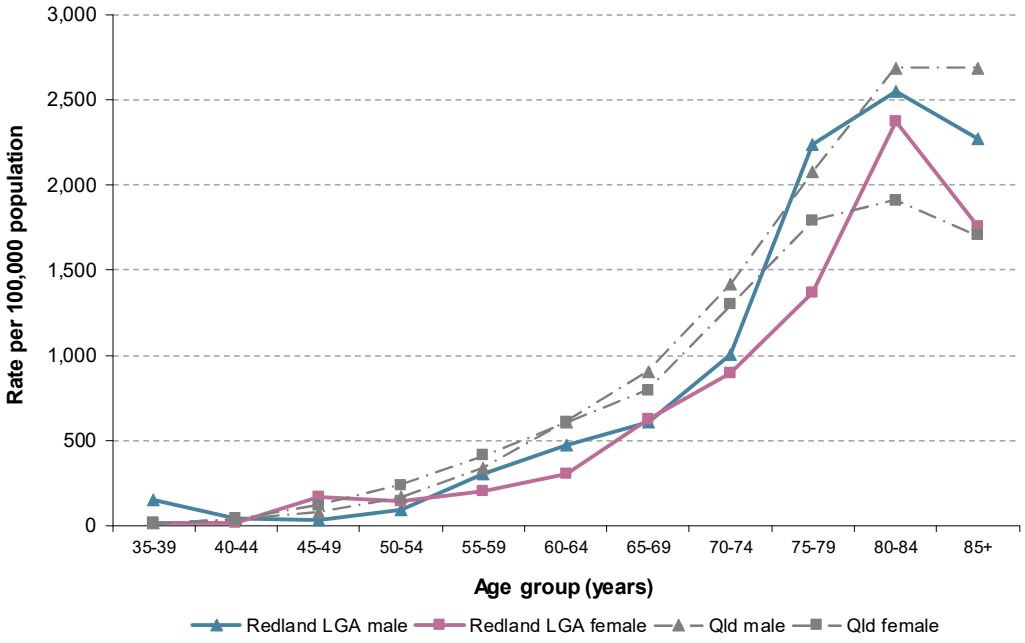
Indirect standardised separation ratios indicate that the average separation rate for COPD was significantly lower in Redland LGA than in Queensland for both males (15% lower) and females (20% lower) in the three years from 2018/19 to 2020/21 (Table 10).

Table 10: COPD standardised separation ratios by sex, Redland LGA, 2018/19 to 2020/21

Region	Sex	Ratio (95% Confidence Interval)	Statistically significant difference Redland LGA – QLD*
Redland LGA	Male	0.85 (0.79 – 0.92)	↓
	Female	0.80 (0.74 – 0.86)	↓
	Persons	0.83 (0.78 – 0.87)	↓

* ↑ LGA statistically significantly higher than Queensland; ↓ LGA statistically significantly lower than Queensland;
— no statistically significant difference between LGA and Queensland

Age specific rates of hospital separation for COPD were negligible before the age of 35 years but then rose steadily with age. Rates for both sexes peaked in the 80 to 84 years age group at over 2,500 separations per 100,000 persons for males and almost 2,400 per 100,000 persons for females in Redland LGA (Figure 24).



* rates not presented for age groups under 35 years because of low or zero counts

Figure 24: COPD age specific hospital separation rate by sex, Redland LGA and Queensland, 2018/19 to 2020/21*

Respiratory diseases: influenza and pneumonia

Mortality

On average there were 26 deaths per year from influenza and pneumonia among residents of Redland LGA in the three years from 2017 to 2019.

Hospital separations

On average there were 800 hospital separations per year for influenza and pneumonia among Redland LGA residents in 2018/19 to 2020/21. Age standardised separation rates for influenza and pneumonia were consistently similar in males and females in Redland LGA in contrast to Queensland where rates were consistently significantly higher for males than females (Figure 25).

Separation rates for both males and females in Redland LGA and Queensland trended upwards over most of the reported period until steeply declining in 2018/19-20/21, the first timepoint at which a major COVID-19 pandemic impact would be expected (Figure 25).

Immediately pre-COVID-19, the 2020 influenza season started very early (late February) however, with the closure of the international border and the implementation of pandemic response measures including local lockdowns and social distancing from late March, influenza notifications dropped to and remained at essentially zero for the remainder of 2020 and throughout 2021[5].

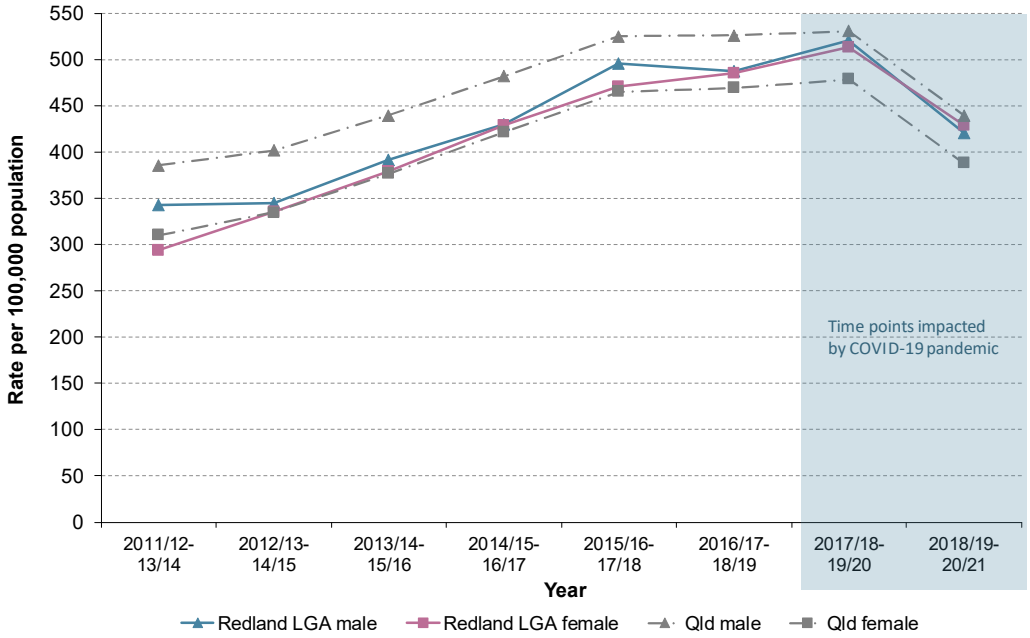


Figure 25: Influenza and pneumonia age standardised hospital separation rate by sex, Redland LGA and Queensland, three-year moving averages 2011/12 to 2020/21

Indirect standardised separation ratios indicate that the average separation rate for influenza and pneumonia was significantly higher in Redland LGA than in Queensland for females (9% higher) but not different for males in 2018/19 to 2020/21 (Table 11).

Table 11: Influenza and pneumonia standardised separation ratios by sex, Redland LGA, 2018/19 to 2020/21

Region	Sex	Ratio (95% Confidence Interval)	Statistically significant difference Redland LGA – QLD*
Redland LGA	Male	0.94 (0.89 – 1.00)	—
	Female	1.09 (1.03 – 1.15)	↑
	Persons	1.01 (0.97 – 1.06)	—

* ↑ LGA statistically significantly higher than Queensland; ↓ LGA statistically significantly lower than Queensland; — no statistically significant difference between LGA and Queensland

Age specific rates of hospital separation for influenza and pneumonia increased exponentially from the age of approximately 60 years. There was also a small peak in the separation rate among children under five years of age (Figure 26).

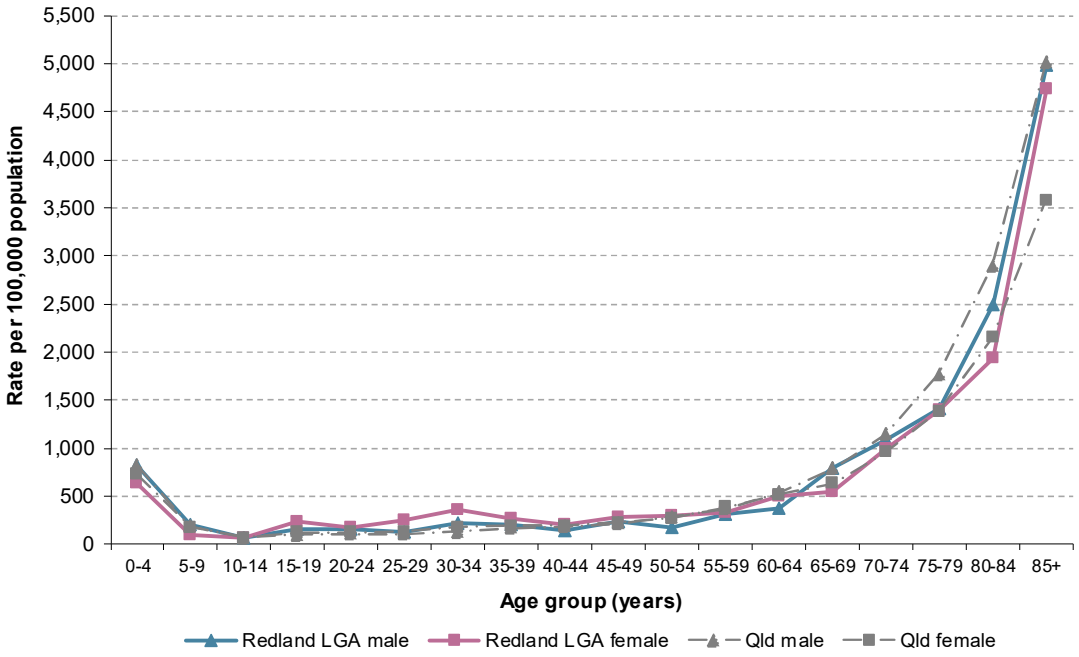


Figure 26: Influenza and pneumonia age specific hospital separation rate by sex, Redland LGA and Queensland, 2018/19 to 2020/21

Cardiovascular disease

The term cardiovascular disease (CVD) refers to a number of conditions affecting the heart and blood vessels. The most common and serious types of CVD in Australia are coronary heart disease (CHD), stroke and heart failure. The main underlying cause of CVD is a process where abnormal deposits of fats build up in the inner lining of the arteries, known as atherosclerosis. When atherosclerosis blocks the blood supply to the heart it causes angina or heart attack and if it blocks the blood supply to the brain it causes stroke. Risk factors for CVD are well known and include overweight and obesity, smoking, high blood pressure, high cholesterol, insufficient physical activity and diabetes[8].

CVD is the largest cause of death in Queensland and the largest cause of health system expenditure[2]. It is largely preventable, with an estimated 68% of the total disease burden attributable to CVD in Australia due to the joint effects of modifiable risk factors[9].

Cardiovascular disease: coronary heart disease

Coronary heart disease (CHD), also known as ischemic heart disease, is the most common form of heart disease. Heart attack (acute myocardial infarction) and angina are the two major clinical forms[8].

Mortality

On average there were 145 deaths per year from CHD among Redland LGA residents in the three years from 2017 to 2019. This represented 13% of all deaths of Redland LGA residents in this period. By comparison, in 2010 to 2012 CHD represented 17% of all Redland LGA resident deaths.

Mortality rates for CHD were significantly higher in males than in females at all timepoints between 2010-12 and 2017-19 in both Redland LGA and Queensland (Figure 27). In both males and females, mortality rates trended downwards over this period (Figure 27).

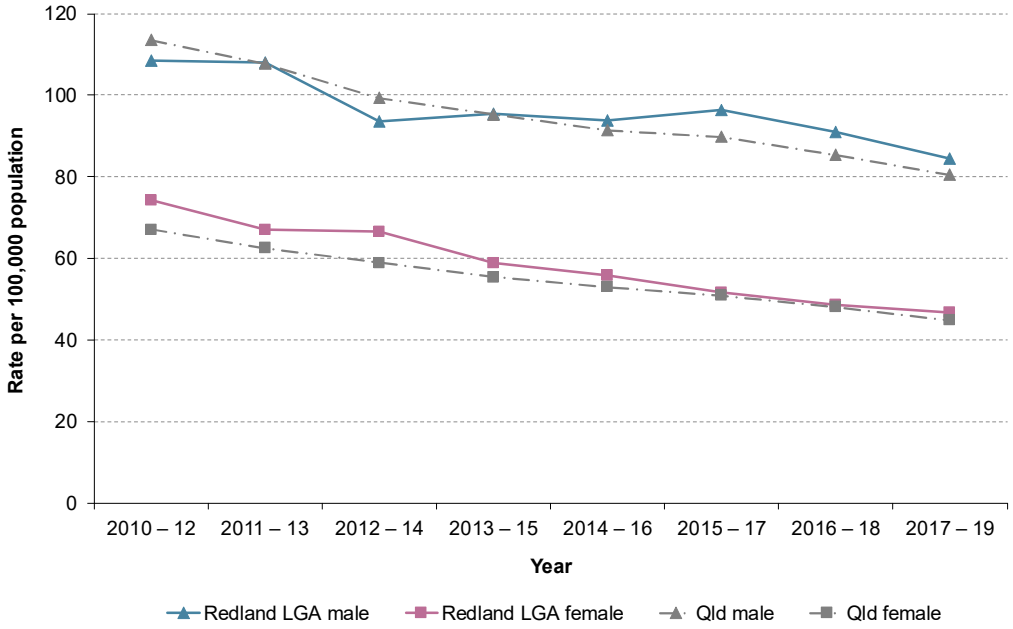


Figure 27: Coronary heart disease age standardised mortality rate by sex, Redland LGA and Queensland, three-year moving averages 2010–12 to 2017–19

Indirect standardised mortality ratios indicate that there was no significant difference in the average mortality rate for CHD between Redland LGA and Queensland in the five years from 2015 to 2019.

Hospital separations

On average there were 1,173 hospital separations per year for CHD among residents of Redland LGA in the three years from 2018/19 to 2020/21. Males accounted for 67% of these separations.

In both Redland LGA and Queensland age standardised separation rates for males were significantly higher than for females at all timepoints from 2011/12-13/14 to 2018/19-20/21. Rates among males were more than double the female rates during this time (Figure 28).

In Redland LGA and Queensland, CHD separation rates for both males and females trended downwards over this period (Figure 28). In Redland LGA, separation rates in females decreased by 22% over this period while male rates decreased by 13%. The COVID-19 pandemic did not appear to have a significant effect on CHD separation rates in Queensland or Redland LGA. While rates did decrease in the timepoints impacted by the pandemic, this was in line with established trends.

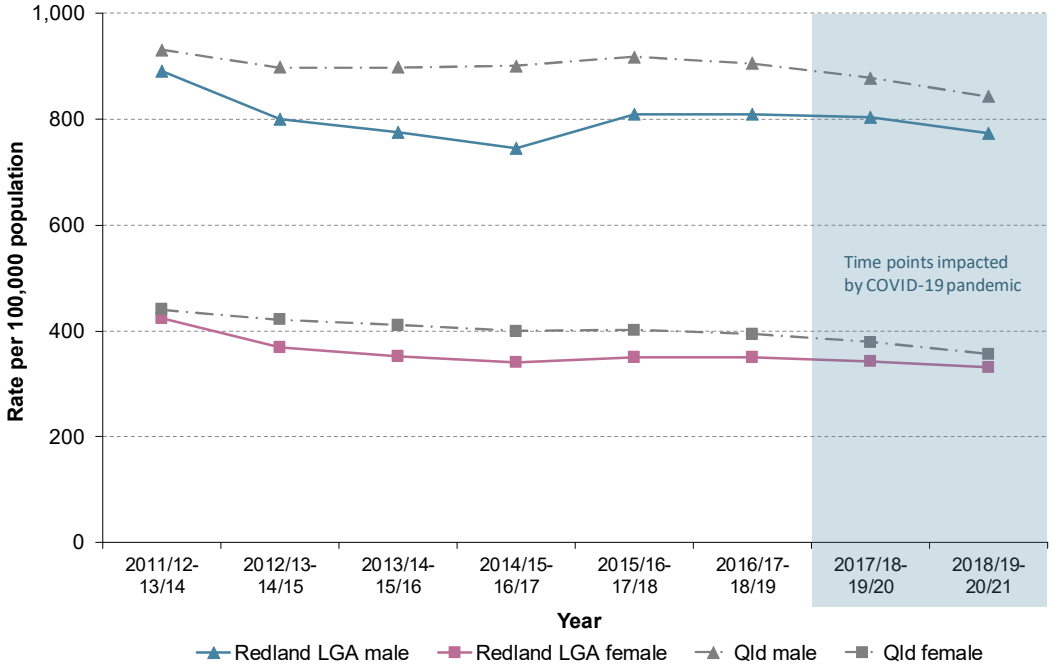


Figure 28: Coronary heart disease age standardised hospital separation rate by sex, Redland LGA and Queensland, three-year moving averages 2011/12 to 2020/21

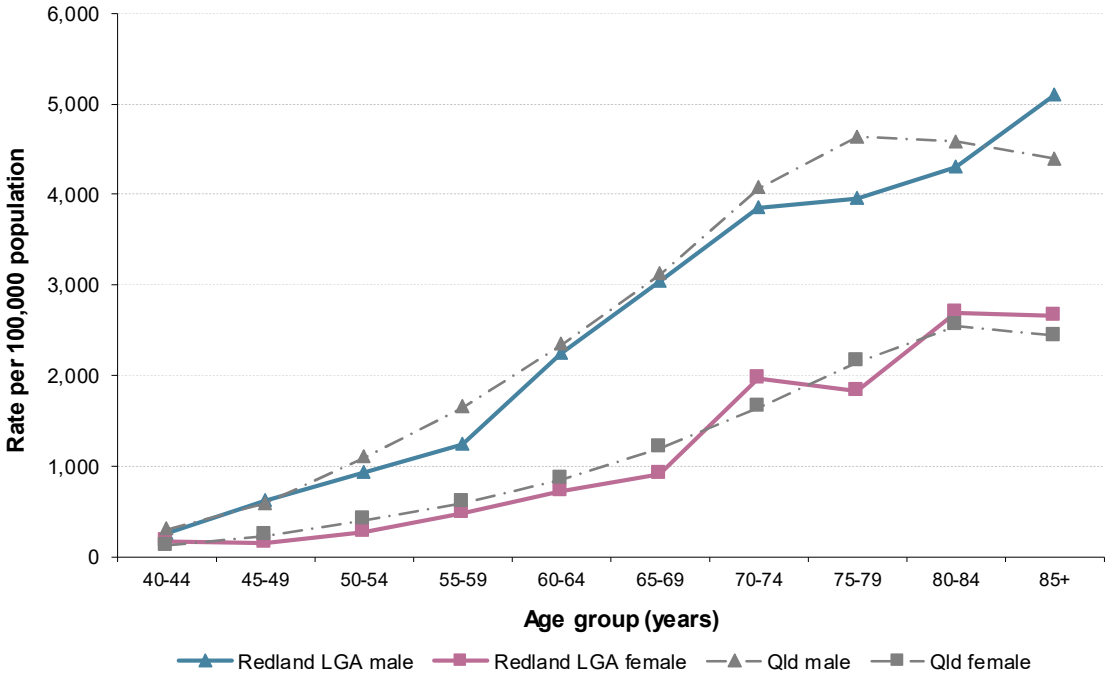
Indirect standardised separation ratios indicate that the average separation rate for CHD was significantly lower in Redland LGA than in Queensland for both males (8% lower) and females (6% lower) in 2018/19 to 2020/21 (Table 12).

Table 12: Coronary heart disease standardised separation ratios by sex, Redland LGA, 2018/19 to 2020/21

Region	Sex	Ratio (95% Confidence Interval)	Statistically significant difference Redland LGA – QLD*
Redland LGA	Male	0.92 (0.89 – 0.96)	↓
	Female	0.94 (0.89 – 0.99)	↓
	Persons	0.92 (0.89 – 0.95)	↓

* ↑ LGA statistically significantly higher than Queensland; ↓ LGA statistically significantly lower than Queensland; — no statistically significant difference between LGA and Queensland

Age specific hospital separation rates for CHD were negligible before the age of 25 years and then increased with age in both males and females (Figure 29).



* rates not presented for age groups under 40 years because of low or zero counts

Figure 29: Coronary heart disease age specific hospitalisation rate by sex, Redland LGA and Queensland, 2018/19 to 2020/21*

Cardiovascular disease: stroke

Stroke occurs when a blood vessel to the brain is suddenly blocked or bleeds. As a result, brain function may be lost and activities such as speech, swallowing, vision and thinking may be impaired. Stroke is often fatal[8].

Mortality

On average there were 84 deaths per year from stroke among Redland LGA residents in the three years from 2017 to 2019. Females accounted for more than half (58%) of these deaths. Male and female stroke mortality rates were statistically similar in Redland LGA and Queensland at all timepoints from 2010-12 to 2017-19

Age standardised mortality rates for stroke in Redland LGA decreased for both sexes between 2010-12 and 2017-19 (Figure 30).

Indirect standardised mortality ratios indicate that the average mortality rate for stroke was significantly higher in Redland LGA than in Queensland for females (16% higher) and all persons (13% higher) in the five years from 2015 to 2019 (Table 13).

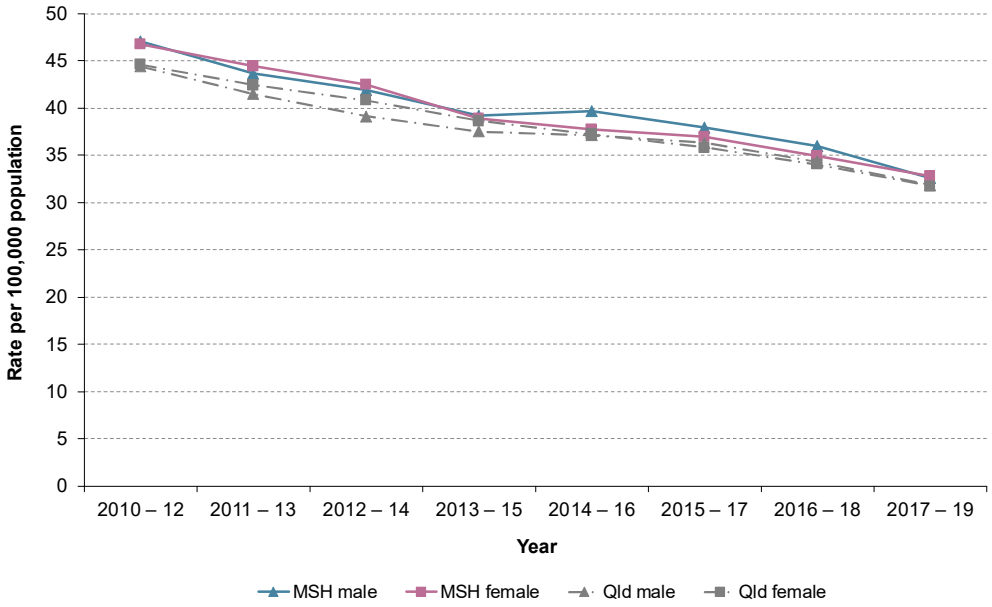


Figure 30: Stroke age standardised mortality rates by sex, Redland LGA and Queensland, three-year moving averages 2010–12 to 2017–19

Table 13: Stroke standardised mortality ratios by sex, Redland LGA, 2015 to 2019

Region	Sex	Ratio (95% confidence interval)	Statistically significant difference: Redland LGA – QLD*
Redland LGA	Male	1.09 (0.93 – 1.27)	—
	Female	1.16 (1.02 – 1.31)	↑
	Persons	1.13 (1.02 – 1.24)	↑

* ↑ LGA statistically significantly higher than Queensland; ↓ LGA statistically significantly lower than Queensland; — no statistically significant difference between LGA and Queensland

Hospital separations

When interpreting recent hospital separation data for stroke, it is important to note that a significant change to clinical coding practice was introduced from 1 July 2015. From this point onwards, rehabilitation episodes of care have been assigned the principal diagnosis code for the underlying condition. Prior to this time a code from the range Z50. – Care involving rehabilitation procedures was assigned as the principal diagnosis code[13].This change resulted in a large increase in the number of hospital separations recorded for stroke (a common underlying condition for rehabilitation episodes). This increase in numbers does not represent a real increase in stroke separations; it is merely an artefact of an administrative change. Because the time series data are presented as three-year moving averages, it will take three data points for this change to be fully reflected in the data and any new time-trends to become apparent.

On average there were 996 hospital separations per year for stroke among Redland LGA residents in the three years from 2018/19 to 2020/21. The age standardised stroke hospital separation rate for males was significantly higher than for females at all timepoints between 2011/12-13/14 and 2018/19-20/21 in both Redland LGA and Queensland (Figure 31).

Prior to the coding change introduced from 1 July 2015, stroke hospital separation rates were steady in Queensland and trending slightly downwards in Redland LGA[14]. Following the coding change, rates in Queensland males and females trended very slightly downwards while in Redland LGA, male rates were relatively stable and females rates increased slightly (Figure 31). The COVID-19 pandemic does not appear to have had any clear effect on stroke separation rates (Figure 31).

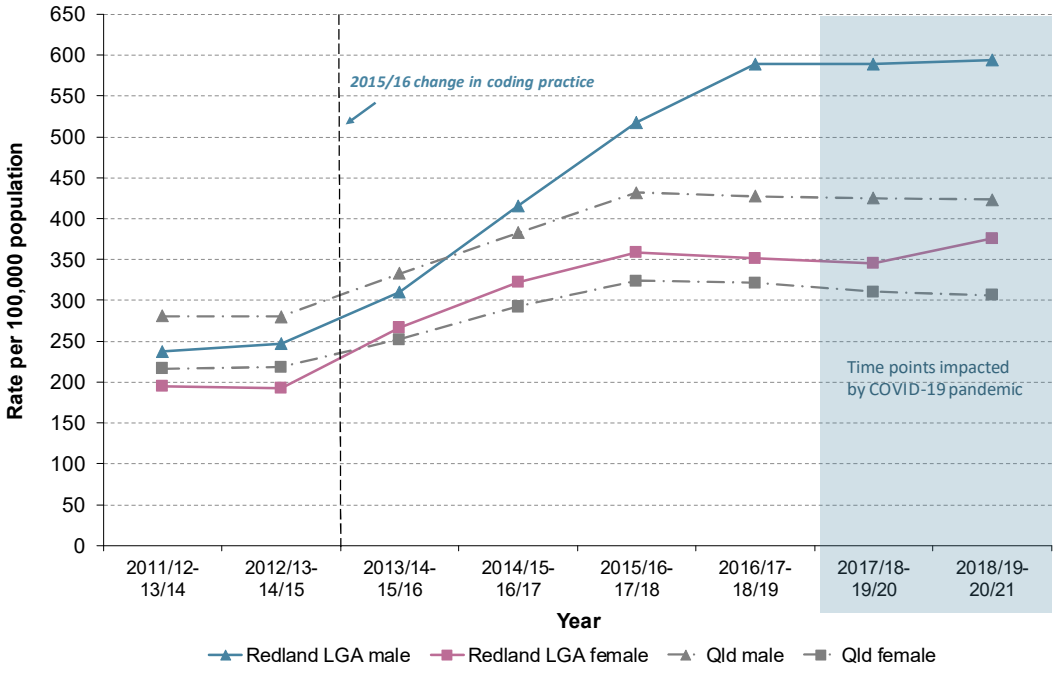


Figure 31: Stroke age standardised hospital separation rate by sex, Redland LGA and Queensland, three-year moving averages 2011/12 to 2020/21

Indirect standardised separation ratios indicate that the average separation rate for stroke was significantly higher in Redland LGA than in Queensland for both males (33% higher) and females (27% higher) in 2018/19 to 2020/21 (Table 14). This is a departure from the results prior to the coding change when Redland LGA rates were consistently lower than Queensland rates.

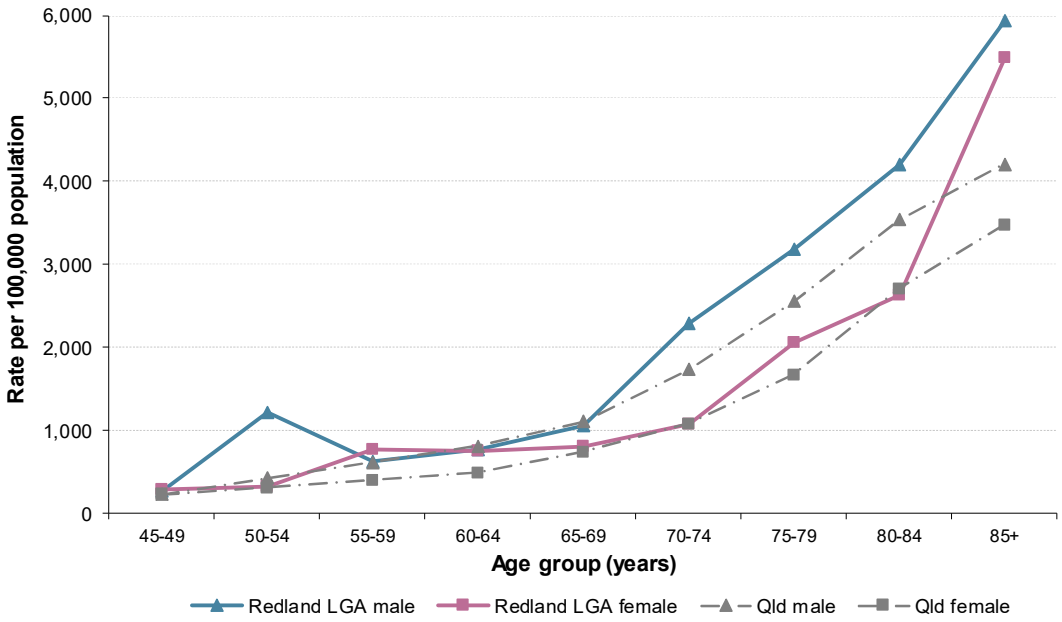
Table 14: Stroke standardised separation ratios by sex, Redland LGA, 2018/19 to 2020/21

Region	Sex	Ratio (95% Confidence Interval)	Statistically significant difference Redland LGA – QLD*
Redland LGA	Male	1.33 (1.27 – 1.40)	↑
	Female	1.27 (1.20 – 1.34)	↑
	Persons	1.30 (1.25 – 1.35)	↑

* ↑ LGA statistically significantly higher than Queensland; ↓ LGA statistically significantly lower than Queensland; — no statistically significant difference between LGA and Queensland

Patterns of age specific rates for stroke were similar in Redland LGA and Queensland in 2018/19 to 2020/21, with hospital separation rates negligible before the age of about 15 years and then increasing with age, following an exponential curve from the age of about 70 years (Figure 32).

Age specific hospitalisation rates for Redland LGA males in age groups 70 years and over and Redland LGA females aged 85 years and over were significantly high than the corresponding Queensland rates. The difference was greatest in Redland LGA females aged 85 years who had a separation rate 57% higher than their Queensland counterparts.



* rates not presented for age groups under 45 years because of low or zero counts

Figure 32: Stroke age specific hospital separation rate by sex, Redland LGA and Queensland, 2018/19 to 2020/21*

Cardiovascular disease: heart failure

Heart failure (also known as congestive cardiac failure) occurs when the heart muscle has become too weak to maintain a strong enough blood flow to meet the body's needs. Although it can occur suddenly, it usually develops over many years as the heart gradually becomes weaker and works less effectively[8]. Mild heart failure may cause few symptoms, but more severe cases can result in chronic tiredness, shortness of breath and reduced capacity for physical activity. Heart failure can be life-threatening and severe cases are associated with poor survival[8].

Mortality

On average there were 12 deaths per year from heart failure among Redland LGA residents in the three years from 2017 to 2019.

Hospital separations

On average there were 495 hospital separations per year for heart failure among Redland LGA residents in the three years from 2018/19 to 2020/21. In both Redland LGA and Queensland, age standardised separation rates for males were significantly higher than for females at all timepoints from 2011/12-13/14 to 2018/19-20/21 (Figure 33). Separation rates for Queensland males and females increased by 4% and 8% respectively over this period (Figure 33). In comparison, rates among Redland LGA females increased by 17% over this

time while Redland LGA male rates decreased very slightly by 2% (Figure 33). The COVID-19 pandemic does not appear to have had any appreciable effect on heart failure separation rates (Figure 33).

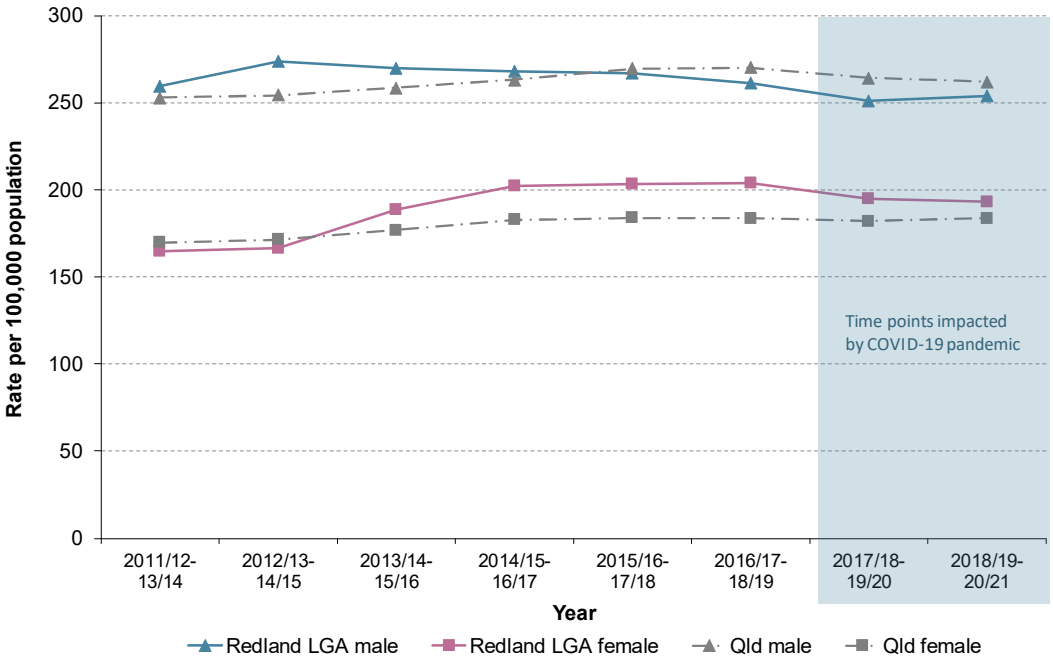
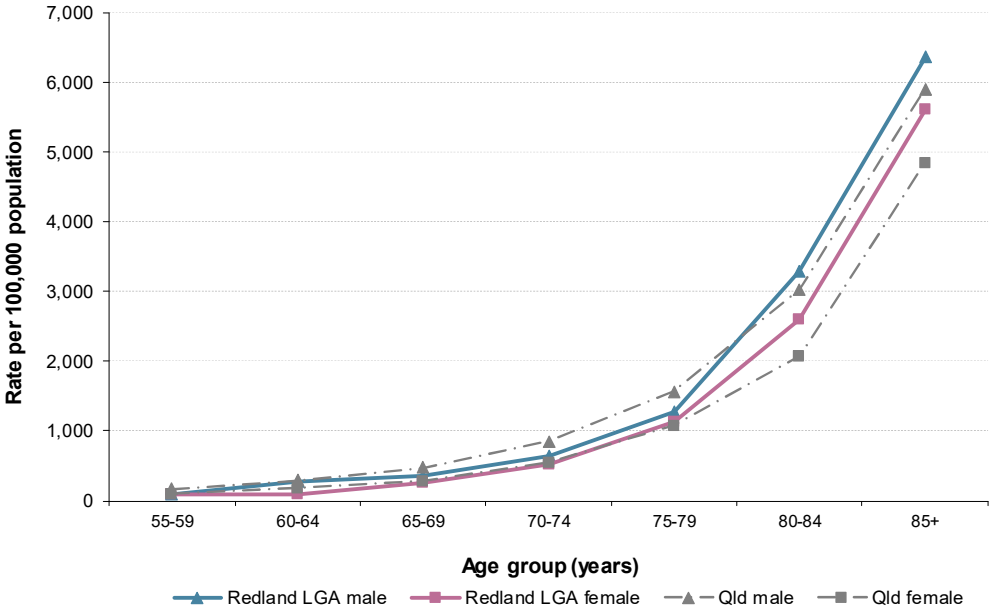


Figure 33: Heart failure age standardised hospital separation rate by sex, Redland LGA and Queensland, three-year moving averages 2011/12 to 2020/21

Indirect standardised separation ratios indicate that there was no difference in average separation rate for heart failure between Redland LGA and Queensland for males or females in 2018/19 to 2020/21.

Following a similar pattern to stroke, age specific hospital separation rates for heart failure were negligible before the age of about 30 years and then increased with age, following an exponential curve from the age of about 75 years (Figure 34). Unlike stroke, there were no significant differences in separation rates between Redland LGA and Queensland males in any age groups. Rates in Redland LGA females were significantly higher than Queensland females in age groups over 80 years however the difference was less pronounced than was seen for stroke.



* rates not presented for age groups under 55 years because of low or zero counts

Figure 34: Heart failure age specific hospital separation rate by sex, Redland LGA and Queensland, 2018/19 to 2020/21*

Diabetes mellitus

Diabetes mellitus is a disease marked by high blood glucose levels resulting from defective production and/or utilisation of insulin, the hormone produced by the pancreas that regulates blood sugar[15].

Type 1 diabetes is an autoimmune condition in which the pancreas stops making insulin. Without insulin, cells cannot turn glucose (sugar) into energy and the body then starts to burn fats as a substitute. It usually has onset in childhood but can occur at any age. There is currently no cure and people with type 1 diabetes require daily insulin treatment[15].

Type 2 diabetes is the most common form of diabetes (85% of cases) and is largely preventable as it is often associated with lifestyle factors (overweight and obesity and insufficient physical activity). Type 2 diabetes occurs when insulin secretion becomes progressively slower and key organs become resistant to the effects of insulin. Although it is usually older adults who are affected, increasingly younger people, even children, are being diagnosed[15].

Unless otherwise specified, the diabetes data presented in this report include both type 1 and type 2 diabetes.

Mortality

On average there were 25 deaths per year from diabetes mellitus among Redland LGA residents in the three years from 2017 to 2019. Numbers were too small to accurately test for any differences in rates between the sexes in Redland LGA, however in Queensland rates were significantly higher in males than females at all timepoints of the period 2010-12 to 2017-19. (Figure 35).

In Queensland the all persons mortality rate for diabetes trended very slightly downwards over the reported period while in Redland LGA after 2014-16 the rate trended upwards (Figure 35).

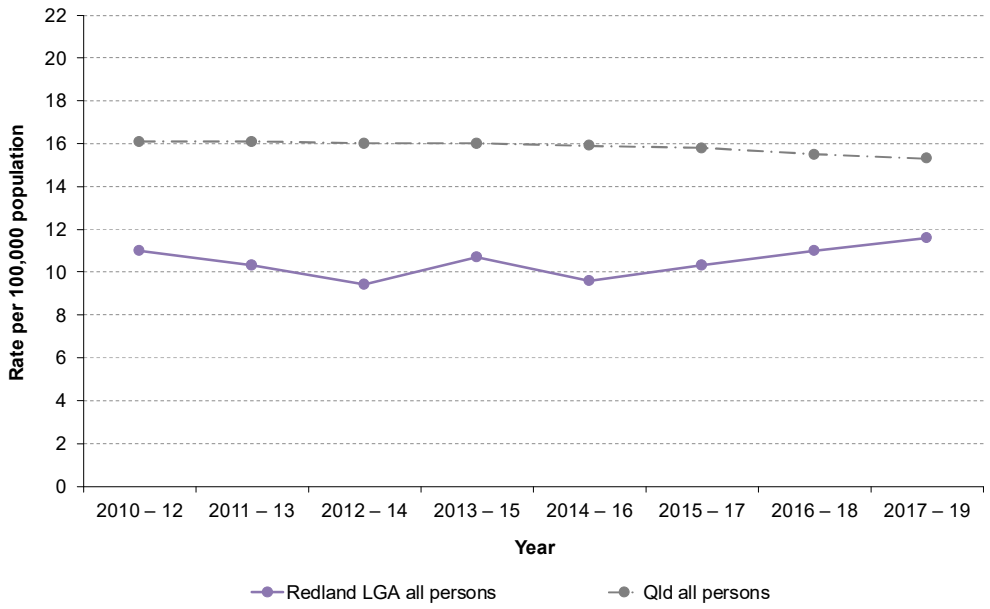


Figure 35: Diabetes mellitus age standardised mortality rate by sex, Redland LGA all persons and Queensland by sex, three-year moving averages 2010–12 to 2017–19

Indirect standardised mortality ratios indicate that the average mortality rate for diabetes was significantly lower in Redland LGA than in Queensland for males (37% lower) and all persons (28% lower) in 2015 to 2019 (Table 15).

Table 15: Diabetes standardised mortality ratios by sex, Redland LGA, 2015 to 2019

Region	Sex	Ratio (95% confidence interval)	Statistically significant difference: Redland LGA – QLD*
Redland LGA	Male	0.63 (0.48 – 0.82)	↓
	Female	0.83 (0.63 – 1.07)	–
	Persons	0.72 (0.59 – 0.86)	↓

* ↑ LGA statistically significantly higher than Queensland; ↓ LGA statistically significantly lower than Queensland; – no statistically significant difference between LGA and Queensland

Hospital separations

On average there were 368 hospital separations per year for diabetes mellitus among Redland LGA residents in the three years from 2018/19 to 2020/21. In Redland LGA, age standardised separation rates for males were significantly higher than rates for females at all timepoints except the first in the reported period from 2011/12-13/14 to 2018/19-20/21 (Figure 36). The difference between male and female rates in Redland LGA increased with time (Figure 36).

In the reported period, hospital separation rates for diabetes in males and females in Queensland and males only in Redland LGA trended strongly upwards (Figure 36). Over this period Redland LGA males rates

increased by 60% while female rates showed no consistent pattern (Figure 36). The COVID-19 pandemic did not appear to have a significant effect on diabetes separation rates in Queensland or Redland LGA. While rates did increase in the timepoints impacted by the pandemic, this was in generally line with established trends.

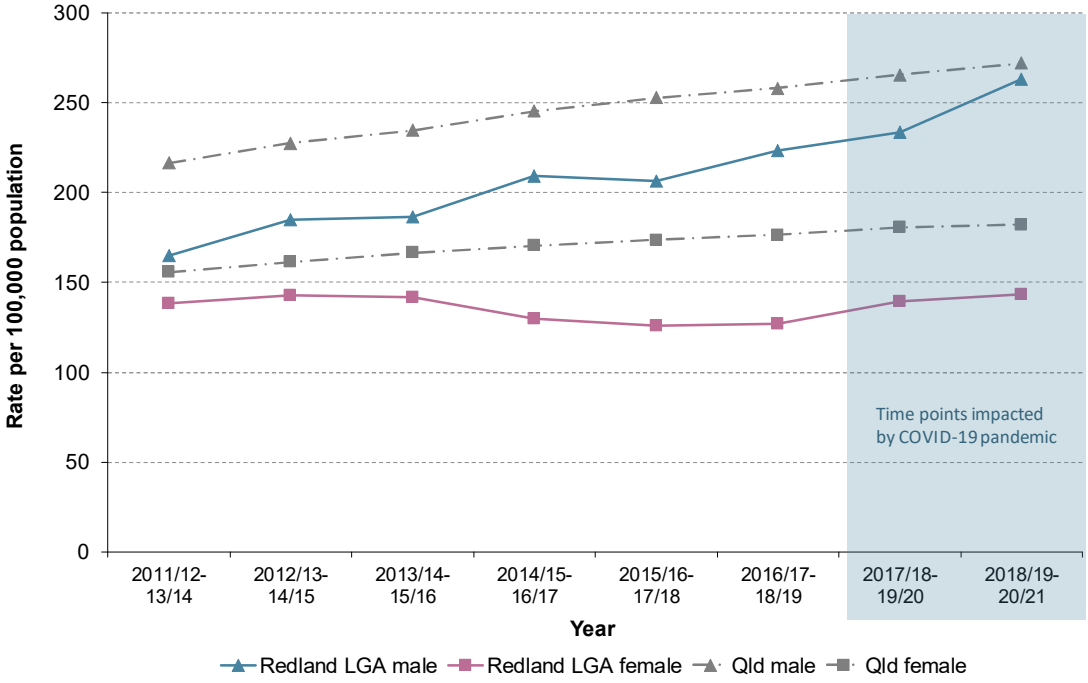


Figure 36: Diabetes mellitus age standardised hospital separation rate by sex, Redland LGA and Queensland, three-year moving averages 2011/12 to 2020/21

Indirect standardised separation ratios indicate that the average separation rate for diabetes was significantly lower in Redland LGA than in Queensland for females (22% lower) and for all persons (13% lower) in 2018/19 to 2020/21 (Table 16).

Table 16: Diabetes mellitus standardised separation ratios by sex, Redland LGA, 2018/19 to 2020/21

Region	Sex	Ratio (95% Confidence Interval)	Statistically significant difference Redland LGA – QLD*
Redland LGA	Male	0.93 (0.87 – 1.01)	—
	Female	0.78 (0.71 – 0.86)	↓
	Persons	0.87 (0.82 – 0.92)	↓

* ↑ LGA statistically significantly higher than Queensland; ↓ LGA statistically significantly lower than Queensland;
— no statistically significant difference between LGA and Queensland

In 2018/19 to 2020/21, age specific hospital separation rates for diabetes in Queensland were relatively stable in persons aged 10 and 49 years after which they rose sharply with increasing age (Figure 37). Prior to the age of 49 years, rates in Queensland males and females were broadly comparable, however from 50 years onwards rates in males increased with age at a greater rate than was seen in females (Figure 37). This resulted in the rate in Queensland males aged 85 years and over being almost double the rate in Queensland females of the same age (Figure 37).

Age specific rates for Redland LGA are not presented separately for males and females because the numbers of separations are too small for reliable estimates to be produced for many age groups. In Redland LGA the all persons separation rate increased steeply with age from approximately 60 years onwards, generally following the same pattern and scale of increase as Queensland females (Figure 37).

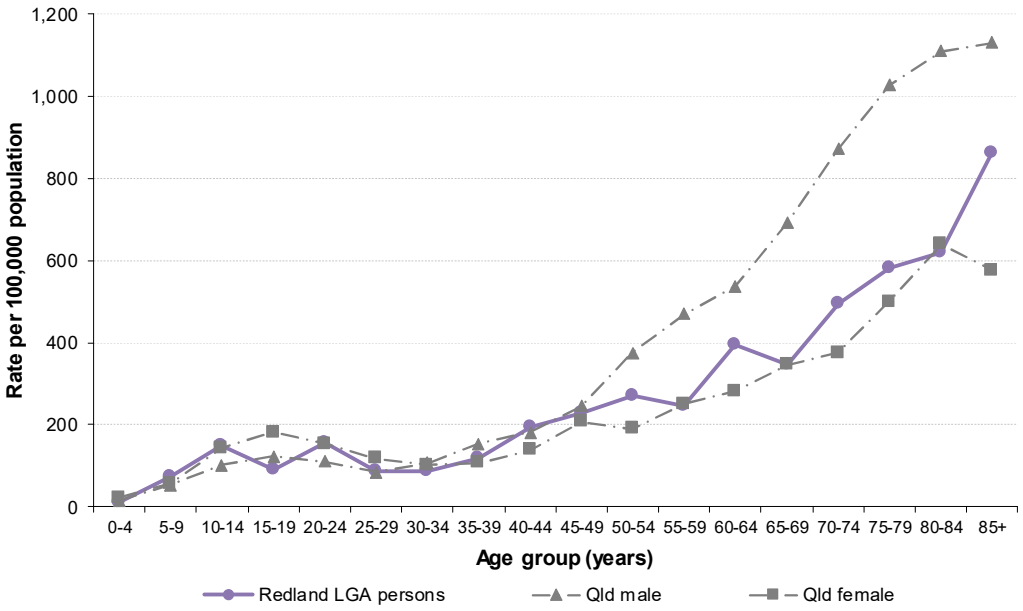


Figure 37: Diabetes mellitus age specific hospital separation rate, Redland LGA all persons and Queensland by sex, 2018/19 to 2020/21

Injury

Injury is a major cause of preventable death and disability in Queensland. Survey results from 2008 indicated approximately one in five Queenslanders, or a member of their immediate family, had been injured in a way that permanently affected their lifestyle, work or leisure activities[16]. Injuries are classified according to the type of injury and whether or not it was intentional. Intentional injuries include those that were self-inflicted such as suicide and self-harm while unintentional injuries include categories such as falls and road transport injury[17].

Injury: falls

Falls are Australia's largest contributor to hospitalised injuries and a leading cause of injury deaths[18]. Falls are common among older people and often result in fractures and other serious injuries, with people aged 65 years and over more likely to die or be hospitalised due to a fall[18].

Mortality

On average there were 41 deaths per year from falls among Redland LGA residents in the three years from 2017 to 2019. Almost all of these deaths (97%) occurred in the 65 years and over age group.

In the 65 years and over age group, mortality rates for falls in Redland LGA (all persons) increased by 12% over between 2010-12 and 2017-19 while in Queensland the all persons mortality rate was stable (Figure 38).

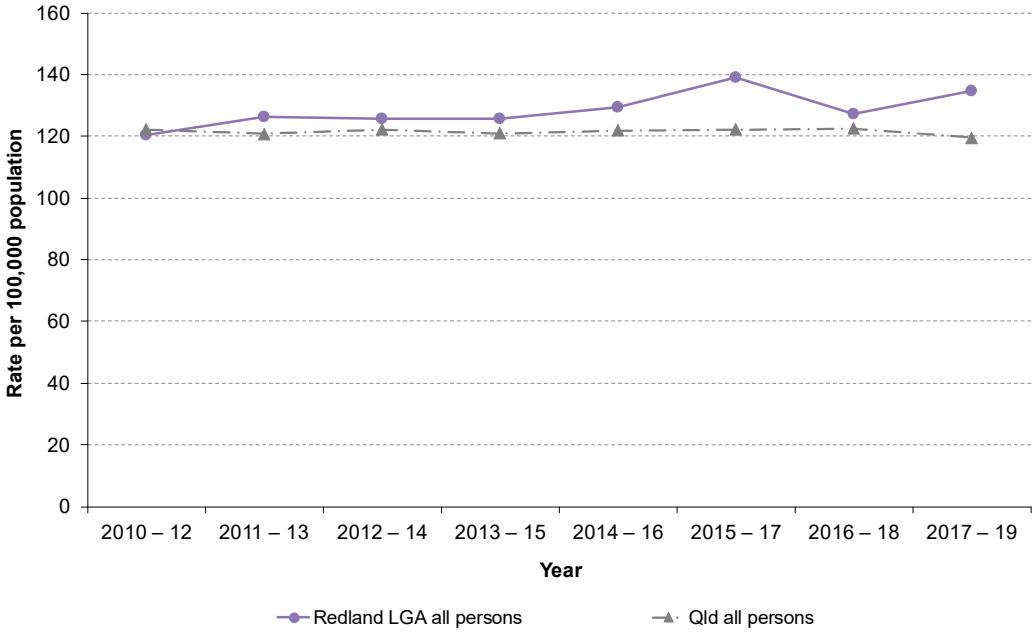


Figure 38: Falls in the 65+ years age group, age standardised mortality rate, Redland LGA all persons and Queensland by sex, three-year moving averages 2010–12 to 2017–19

Indirect standardised mortality ratios indicate that average mortality rates for falls in the five years from 2015 to 2019 were statistically similar in Redland LGA and Queensland for both males and females in both all ages and the 65 years and over age group.

Hospital separations

On average there were 2,222 hospital separations per year for falls among Redland LGA residents in the three years from 2018/19 to 2020/21. Age standardised separation rates for females were consistently significantly higher than those among males in both Redland LGA and Queensland from 2011/12-13/14 onwards (Figure 39).

In both Redland LGA and Queensland, falls separation rates in both sexes trended strongly upwards between 2011/12-13/14 and 2018/19-20/21 (Figure 39). In Redland LGA rates among males and females increased by 54% and 62% respectively over this time. The COVID-19 pandemic did not appear to have a significant effect on falls separation rates in Queensland or Redland LGA. While rates did increase in the timepoints impacted by the pandemic, this was broadly in line with established trends (Figure 39).

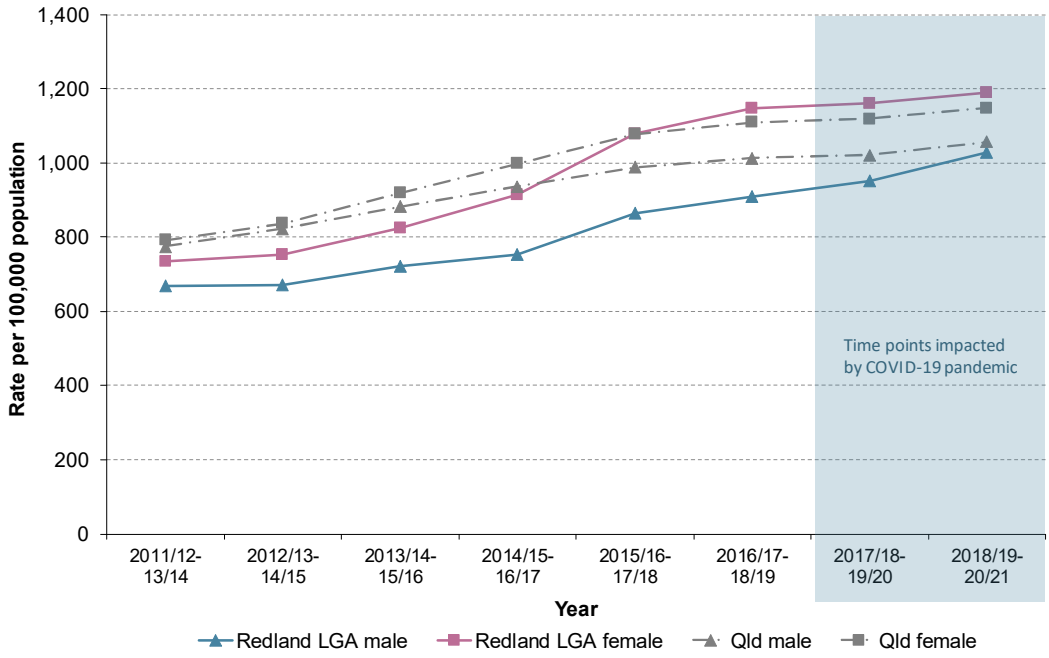


Figure 39: Falls age standardised hospital separation rate by sex, Redland LGA and Queensland, three-year moving averages 2011/12 to 2020/21

In the 65 years and over age group, there was an average of 1,416 hospital separations per year for falls in the three years from 2018/19 to 2020/21 among Redland LGA residents. From 2011/12-13/14 to 2018/19-20/21 age standardised separation rates for females in this age group were consistently significantly higher than rates for males with rates in females consistently 50% or more higher than rates in males at each timepoint (Figure 40). Falls separation rates trended very strongly upwards in this age group with Redland LGA males increasing by 78% and females by 59% over the reported period (Figure 40).

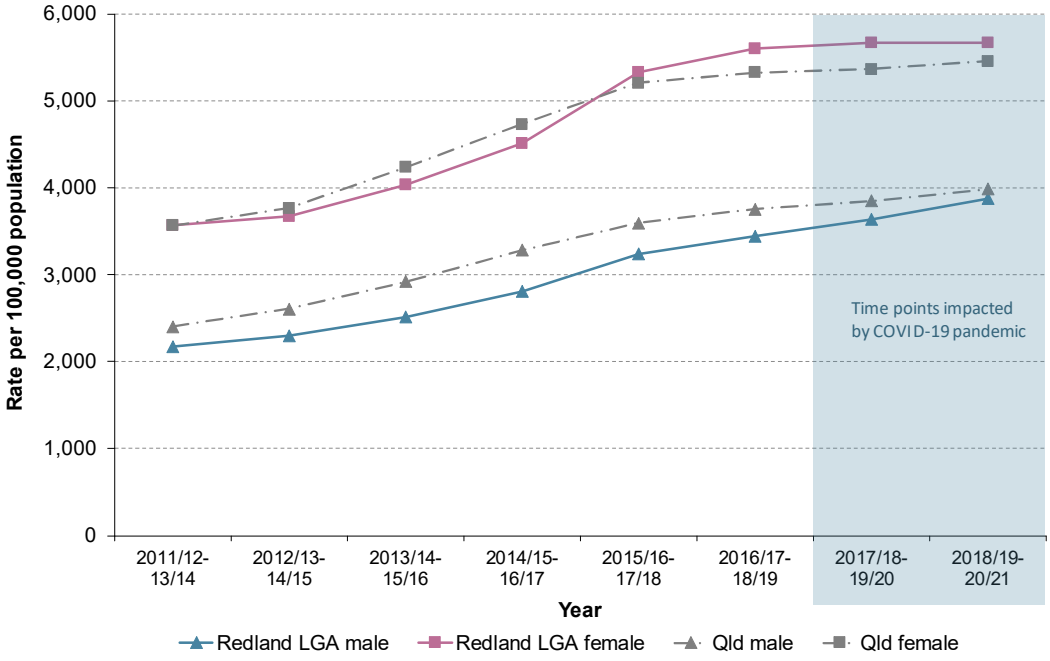


Figure 40: Falls in the 65+ years age group, age standardised hospital separation rate by sex, Redland LGA and Queensland, three-year moving averages 2011/12 to 2020/21

Indirect standardised separation ratios indicate that the average separation rate for falls was significantly higher in Redland LGA than in Queensland for females (4% higher) but not males in 2018/19 to 2020/21. In the high risk 65 years and over age group over the same period, rates among females were 5% higher than the Queensland rates (Table 17).

Table 17: Falls standardised separation ratios by sex, Redland LGA, 2018/19 to 2020/21

Region	Age group	Sex	Ratio (95% confidence interval)	Statistically significant difference Redland LGA – QLD*
Redland LGA	All ages	Male	0.98 (0.94 – 1.02)	—
		Female	1.04 (1.01 – 1.07)	↑
		Persons	1.02 (0.99 – 1.04)	—
	65+ years	Male	0.98 (0.93 – 1.03)	—
		Female	1.05 (1.01 – 1.08)	↑
		Persons	1.03 (0.99 – 1.06)	—

* ↑ LGA statistically significantly higher than Queensland; ↓ LGA statistically significantly lower than Queensland; — no statistically significant difference between LGA and Queensland

Injury: road transport injury

This section refers to road vehicle traffic crashes only, that is, accidents occurring in traffic conditions on a public road. Road vehicles include motor vehicles, motor cycles and pedal cycles.

Mortality

On average there were fewer than five deaths per year from road transport injury among Redland LGA residents in the three years from 2017 to 2019. Males accounted for the majority of these deaths. In Queensland in this period males accounted for 75% of all road transport injury deaths.

Hospital separations

On average there were 536 hospital separations per year for road transport injury among Redland LGA residents in the three years from 2018/19 to 2020/21. Males accounted for almost two-thirds (64%) of these separations.

Age standardised separation rates were significantly higher for males than for females in Redland LGA (by 1.8 to 2.1 times) and in Queensland across all timepoints from 2011/12-13/14 to 2018/19-20/21 (Figure 41). Over this period rates in both males and females in Redland LGA and Queensland trended steadily upwards (Figure 41). The increase was more pronounced in Redland LGA where male rates increased by 63% and female rates by 88% over this time. The COVID-19 pandemic did not appear to have a significant effect on road transport injury separation rates in Queensland or Redland LGA. While rates did increase in the timepoints impacted by the pandemic, this was in line with established trends (Figure 41) so cannot be attributed to the pandemic.

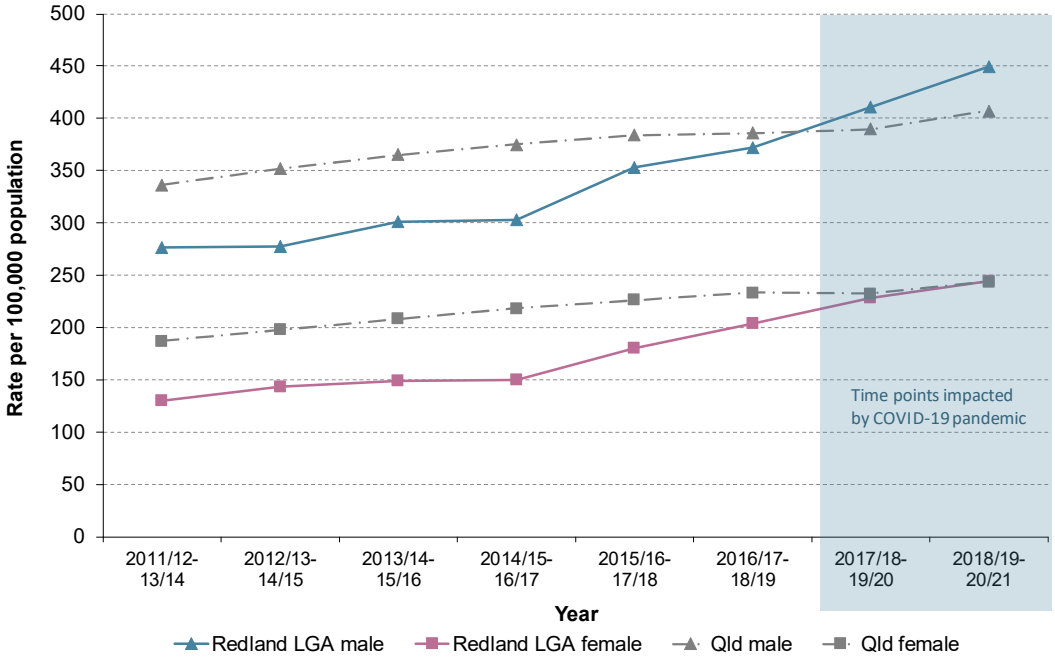


Figure 41: Road transport injury age standardised hospital separation rate by sex, Redland LGA and Queensland, three-year moving averages 2011/12 to 2020/21

In the 15 to 24 years age group, there was an average of 109 hospital separations per year for road transport injury in Redland LGA in 2018/19 to 2020/21. Males accounted for 63% of these separations.

In this younger age group, age standardised separations rates for males were significantly higher than for females in Redland LGA (by 1.5 to 1.8 times) and in Queensland in all timepoints from 2011/12-13/14 to 2018/19-20/21 (Figure 42).

Over this period rates in Redland LGA males and females trended strongly upwards (Figure 42), with the female rate increasing by 83% and the male rate by 61%. The COVID-19 pandemic did not appear to have a significant effect on road transport injury separation rates in Redland LGA females, with observed increases unable to be attributed to the pandemic because they were largely in line with established trends (Figure 42).

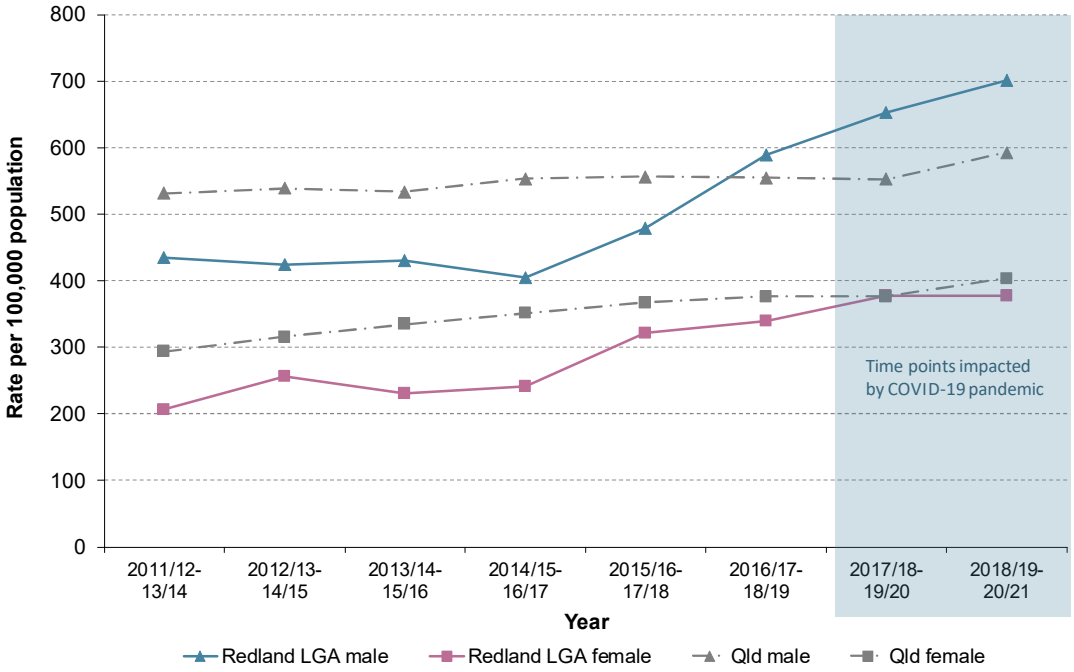


Figure 42: Road transport injury (15 to 24 years) age standardised hospital separation rate by sex, Redland LGA and Queensland, three-year moving averages 2011/12 to 2020/21

Indirect standardised separation ratios indicate that the average separation rate for road transport injury was significantly higher in Redland LGA than in Queensland for males (9% higher) but not females in 2018/19 to 2020/21. When only young people in the high-risk age group 15 – 24 years were considered, the difference between Redland LGA and Queensland was greater with the rate among Redland LGA males 18% higher than their Queensland counterparts (Table 18).

Table 18: Road transport injury standardised separation ratios by sex, Redland LGA, 2018/19 to 2020/21

Region	Age group	Sex	Ratio (95% confidence interval)	Statistically significant difference Redland LGA – QLD*
Redland LGA	All ages	Male	1.09 (1.03 – 1.16)	↑
		Female	1.00 (0.92 – 1.08)	—
		Persons	1.05 (1.00 – 1.11)	—
	15-24 years	Male	1.18 (1.03 – 1.35)	↑
		Female	0.93 (0.76 – 1.13)	—
		Persons	1.09 (0.97 – 1.22)	—

* ↑ LGA statistically significantly higher than Queensland; ↓ LGA statistically significantly lower than Queensland;
— no statistically significant difference between LGA and Queensland

Rates of age specific hospital separation for road transport injury were highest between the ages of 15 and 24 years for both males and females. Following this peak, rates generally declined with increasing age before increasing again in the older age groups over 70 years (Figure 43).

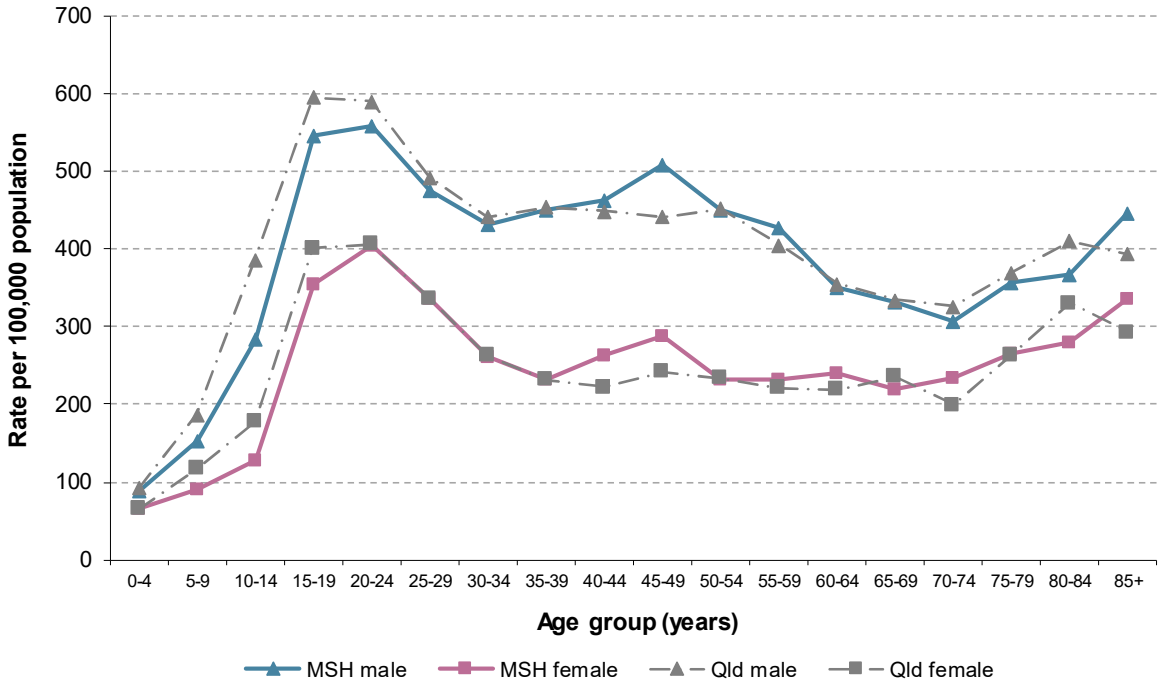


Figure 43: Road transport injury age specific hospital separation rate by sex, Redland LGA and Queensland, 2018/19 to 2020/21

Mental health

Mental health is defined by the World Health Organisation as 'a state of wellbeing in which the individual realises his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community'[19,20]. Conversely the term mental illness refers to a wide range of conditions that interfere with normal functioning and wellbeing. Episodes of mental illness of sufficient severity to require professional intervention and diagnosis are known as mental disorders and are referred to in this report as mental health conditions. Examples of mental disorders include anxiety disorders, eating disorders, psychotic disorders and substance-abuse. These data do not include cases of dementia. Mental disorders are very common. A survey in 2007 found that almost half the adult population of Queensland had experienced a mental disorder in their lifetime[21].

Note in this section of the report, all of the separations data presented pertain to separations from acute public and private hospitals only, that is, they exclude psychiatric hospitals. Also specifically excluded are 'ambulatory-equivalent' episodes of care which are defined by the Australian Institute of Health and Welfare as episodes in which a patient is admitted to hospital and provided with care that is similar to the care provided by community mental health care services[22]. Typically this type of care is for attendance at cognitive behaviour therapy, through a day program or a group program. An example may be a day program for veterans or a post-natal depression group. It appears that the majority of the episodes of care in this category occur in the private system where patients receiving treatment are admitted and then discharged. In the public system these types of episodes would more usually occur through the ambulatory service and be recorded in a different data collection system. Because of this public/private system difference in administration, the inclusion of 'ambulatory-equivalent' separations in the data can give rise to what appear to be anomalies. To

control for this effect, separations which meet the standard definition of 'ambulatory equivalent' have been excluded from the data presented in this section of the report.

Mental health: all mental health conditions

Mortality

On average there were 73 deaths per year from mental health conditions among Redland LGA residents in the three years from 2017 to 2019. Females accounted for almost two-thirds (62%) of these deaths.

Age standardised mortality rates for all mental health conditions in both Redland LGA and Queensland increased markedly between 2010-12 and 2017-19 (Figure 44). In Redland LGA over this period there was a 56% increase in the all persons mortality rate, more than double the 24% increase experienced in Queensland.

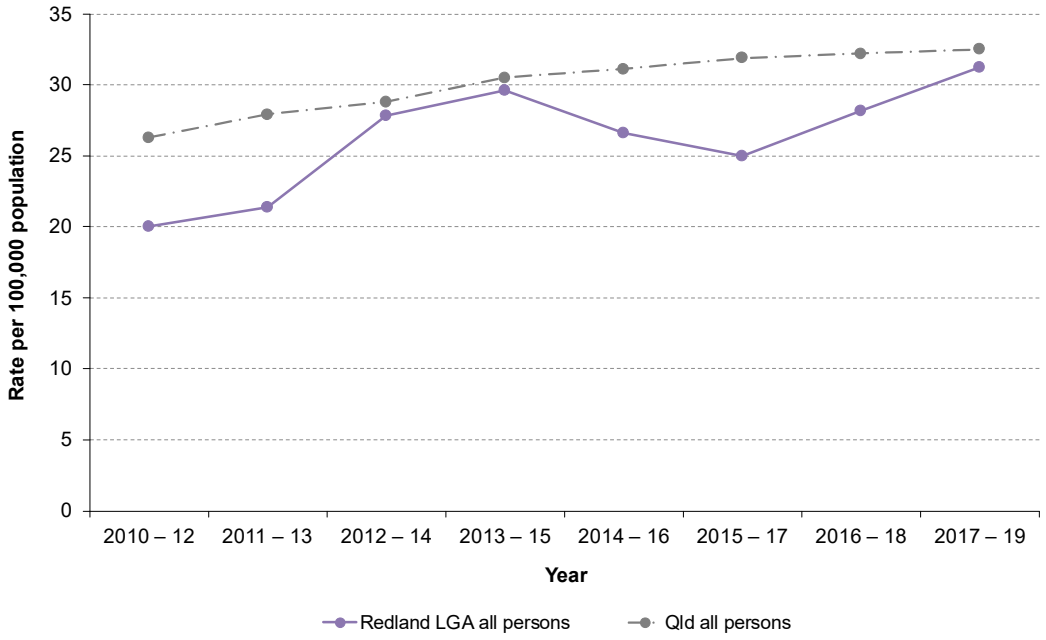


Figure 44: All mental health conditions age standardised mortality rates, Redland LGA all persons and Queensland by sex, three-year moving averages 2010–12 to 2017–19

Indirect standardised mortality ratios indicate that there was no significant difference in the average mortality rate for all mental health conditions between Redland LGA and Queensland in the five years from 2015 to 2019.

Hospital separations

On average there were 2,135 hospital separations per year for mental health conditions (excluding ambulatory-equivalent) among Redland LGA residents in 2018/19 to 2020/21. Age standardised separation rates were significantly higher for females than for males in both Redland LGA and Queensland at all timepoints from 2011/12-13/14 to 2018/19-20/21 (Figure 45).

Over this period both Redland LGA and Queensland separation rates for males and females trended upwards (Figure 45). Rates in Redland LGA males and females increased by 73% and 77% respectively over this time. Up until 2015/16-17/18 separation rates in both sexes in Redland LGA increased steeply. In females this increase continued in the timepoints impacted by the COVID-19 pandemic (Figure 45). However in Redland LGA males rates stabilised after 2015/16-17/18 with a small increase recorded in 2018/19-20/21. It is unclear whether the COVID-19 pandemic had an effect on these separation rates in Redland LGA

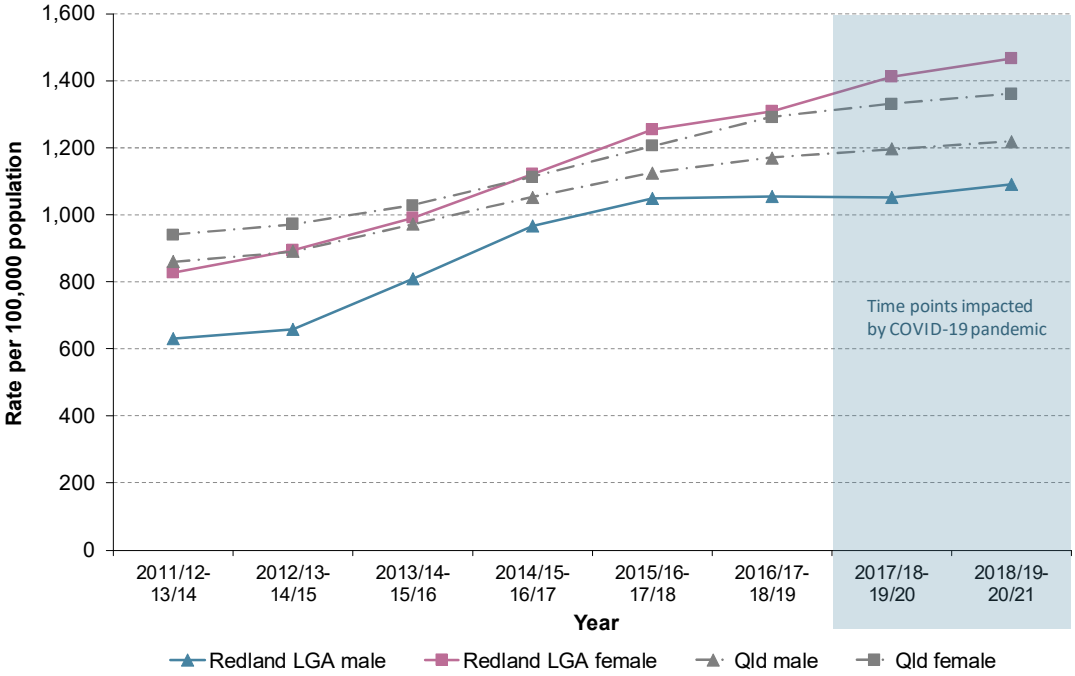


Figure 45: Mental health conditions age standardised hospital separation rate by sex, Redland LGA and Queensland, three-year moving averages 2011/12 to 2020/21

Indirect standardised separation ratios indicate that the average hospital separation rate for all mental health conditions was significantly lower in Redland LGA than in Queensland for males (8% lower) while being significantly higher in Redland LGA for females (12% higher) in 2018/19 to 2020/21 (Table 19).

Table 19: All mental health conditions standardised separation ratios by sex, Redland LGA, 2018/19 to 2020/21

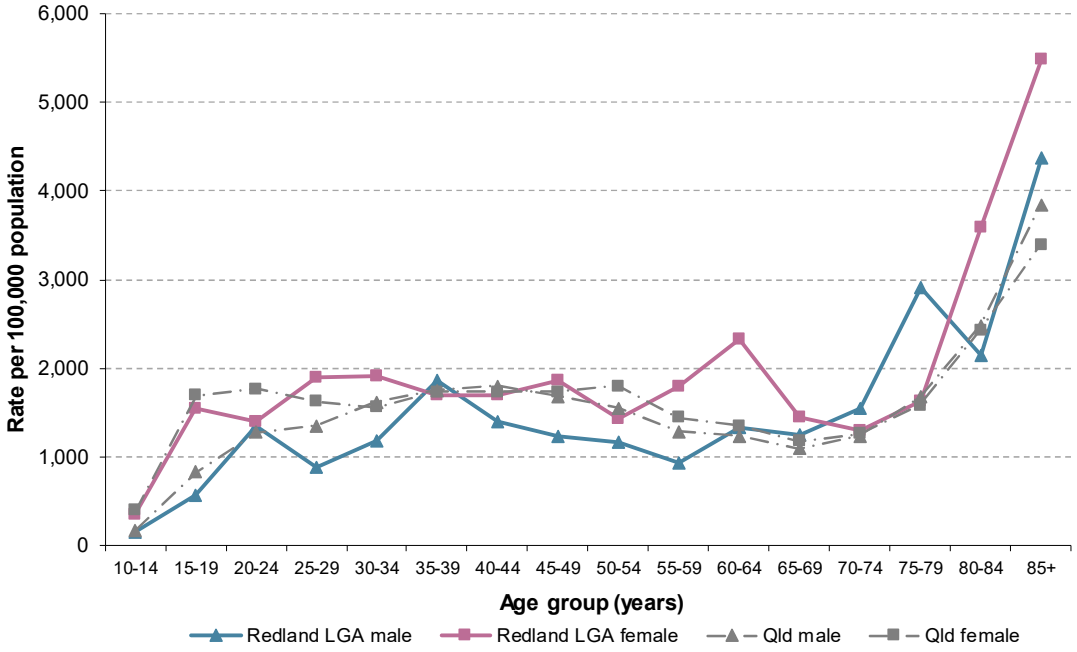
Region	Sex	Ratio (95% confidence interval)	Statistically significant difference Redland LGA – QLD*
Redland LGA	Male	0.92 (0.89 – 0.96)	↓
	Female	1.12 (1.09 – 1.16)	↑
	Persons	1.03 (1.01 – 1.06)	↑

* ↑ LGA statistically significantly higher than Queensland; ↓ LGA statistically significantly lower than Queensland; — no statistically significant difference between LGA and Queensland

Age specific hospital separation rates for mental health conditions in both sexes increased substantially between the age groups of 10 to 14 and 20 to 24 years. In Redland LGA, female rates then remained fairly consistently just under 2,000 per 100,000 persons before increasing steeply in those aged 80 years and

over (Figure 46). The peak in Redland LGA females aged 85 years and over was more than 60% higher than the equivalent peak in Queensland females.

Among adult males, rates were variable but consistently under 2,000 per 100,000 persons but increased steeply in those aged 75 years and over. The male rate peaked in the 85 years and over group at a level substantially below the Redland LGA peak female rate (Figure 46).



* rates not presented for age groups under 10 years because of low or zero counts

Figure 46: Mental health conditions age specific hospital separation rate by sex, Redland LGA and Queensland, 2018/19 to 2020/21*

Mental health: anxiety and depression

Hospital separations

On average there were 815 hospital separations per year for anxiety and depression (excluding ambulatory-equivalent) among Redland LGA residents in the three years from 2018/19 to 2020/21. Females accounted for 63% of these separations. Female age standardised separation rates were significantly higher than male rates in both Redland LGA and Queensland at all timepoints from 2011/12-13/14 to 2018/19-20/21 (Figure 47).

Over this period Redland LGA and Queensland separation rates for both males and females trended upwards (Figure 47). Rates in Redland LGA females increased by 57% while rates for males doubled over this time. Prior to the COVID-19 pandemic, rates in both sexes in Redland LGA increased steeply. However for those timepoints impacted by the pandemic, separation rates fell in males and stabilised in females. It is plausible to suggest that persons with anxiety and depression may have experienced greater than usual difficulty accessing hospitalisation for their condition and/or may have had a greater reluctance to attend treatment services at a healthcare service during the pandemic period.

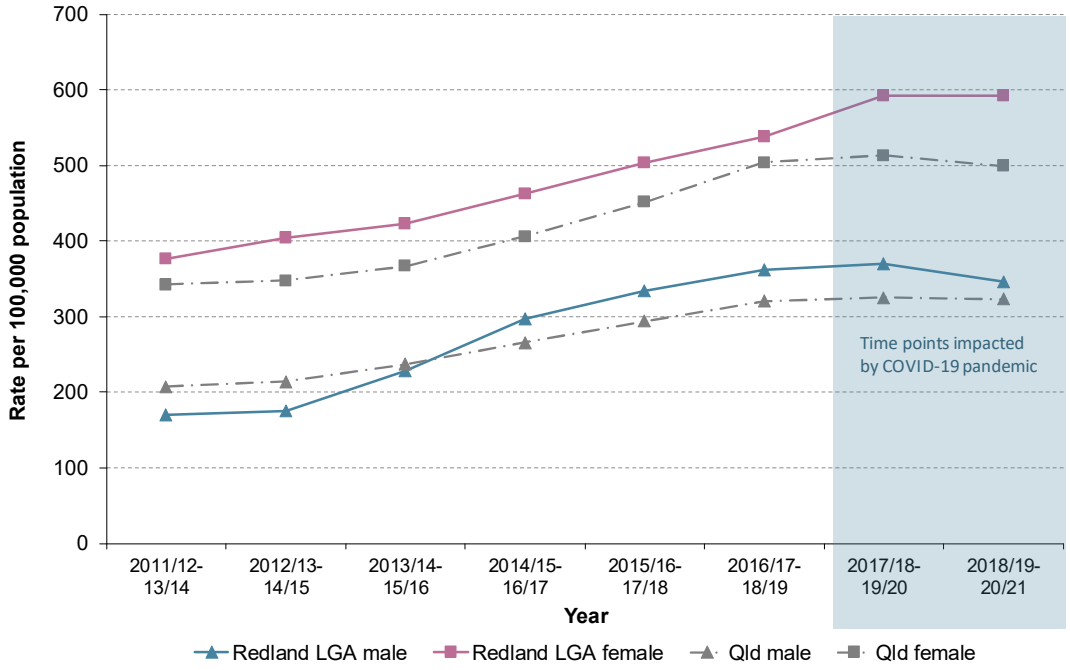


Figure 47: Anxiety and depression age standardised hospital separation rate by sex, Redland LGA and Queensland, three-year moving averages 2011/12 to 2020/21

Indirect standardised separation ratios indicate that the average separation rate for anxiety and depression was significantly higher in Redland LGA than in Queensland for males (16% higher) and for females (25% higher) in 2018/19 to 2020/21 (Table 20).

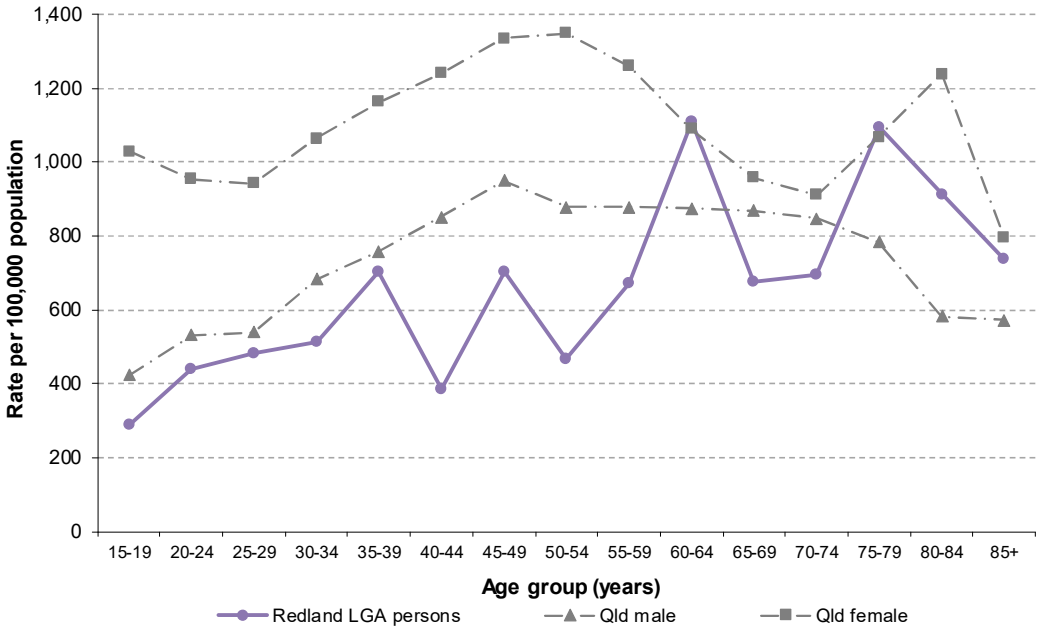
Table 20: Anxiety and depression standardised separation ratios by sex, Redland LGA and Queensland, 2018/19 to 2020/21

Region	Sex	Ratio (95% Confidence Interval)	Statistically significant difference Redland LGA – QLD*
Redland LGA	Male	1.16 (1.09 – 1.24)	↑
	Female	1.25 (1.19 – 1.32)	↑
	Persons	1.22 (1.17 – 1.27)	↑

* ↑ LGA statistically significantly higher than Queensland; ↓ LGA statistically significantly lower than Queensland; — no statistically significant difference between LGA and Queensland

In 2018/19 to 2020/21, age specific hospital separation rates for anxiety and depression in Queensland increased sharply between the ages of 10 and 19 years (Figure 48). They then rose to a peak in the middle years, 45 to 54 years before generally declining with ageing (Figure 48).

Age specific rates for Redland LGA are not presented separately for males and females because the numbers of separations are too small for reliable estimates to be produced for many age groups. Rates in Redland LGA persons varied greatly between age groups but generally increased with increasing age (Figure 48).



* rates not presented for age groups under 15 years because of low or zero counts

Figure 48: Anxiety and depression age specific hospital separation rate, Redland LGA all persons and Queensland by sex, 2018/19 to 2020/21*

Mental health: suicide and self-inflicted injury

Suicide is classified as death due to intentional self-harm and excludes death due to natural causes. A coronial inquiry must establish that the death resulted from an intentional act of the deceased with the intent of ending his or her own life. Hospitalisations due to self-inflicted or intentional self-harm include injuries in attempted suicide and other self-inflicted injuries or poisonings specified as intentional. Intent must be documented by clinicians in the medical record for self-inflicted injuries to be classified as intentional self-harm[23].

Mortality

On average there were 22 deaths per year from suicide among Redland LGA residents in the three years from 2017 to 2019. Males accounted for almost three-quarters (71%) of these deaths.

Indirect standardised mortality ratios indicate that there was no significant difference in the average mortality rate for suicide in people of all ages or in the age group 15 to 24 years between Redland LGA and Queensland in the five years from 2015 to 2019.

Hospital separations

On average there were 243 hospital separations per year for self-inflicted injury (all ages) among Redland LGA residents in the three years from 2018/19 to 2020/21. Females accounted for over two thirds (68%) of these separations. Female age standardised separation rates in Redland LGA were significantly higher than male rates by 1.7 to 2.2 times at all timepoints from 2011/12-13/14 to 2018/19-20/21 (Figure 49).

Over this reported period, Redland LGA self-inflicted injury separation rates for both males and females showed no consistent trend, while Queensland rates trended upwards (Figure 49). In the timepoints impacted by the COVID-19 pandemic, both male and females Redland LGA rates decreased (Figure 49).

On average there were 69 hospital separations per year for self-inflicted injury in Redland LGA 15 to 24 year olds in the three years from 2018/19 to 2020/21. This represented 28% of all Redland LGA separations for self-inflicted injury in this period. Females accounted for 77% of these separations and age standardised separation rates for females were consistently two to three times higher than rates in males (Figure 49).

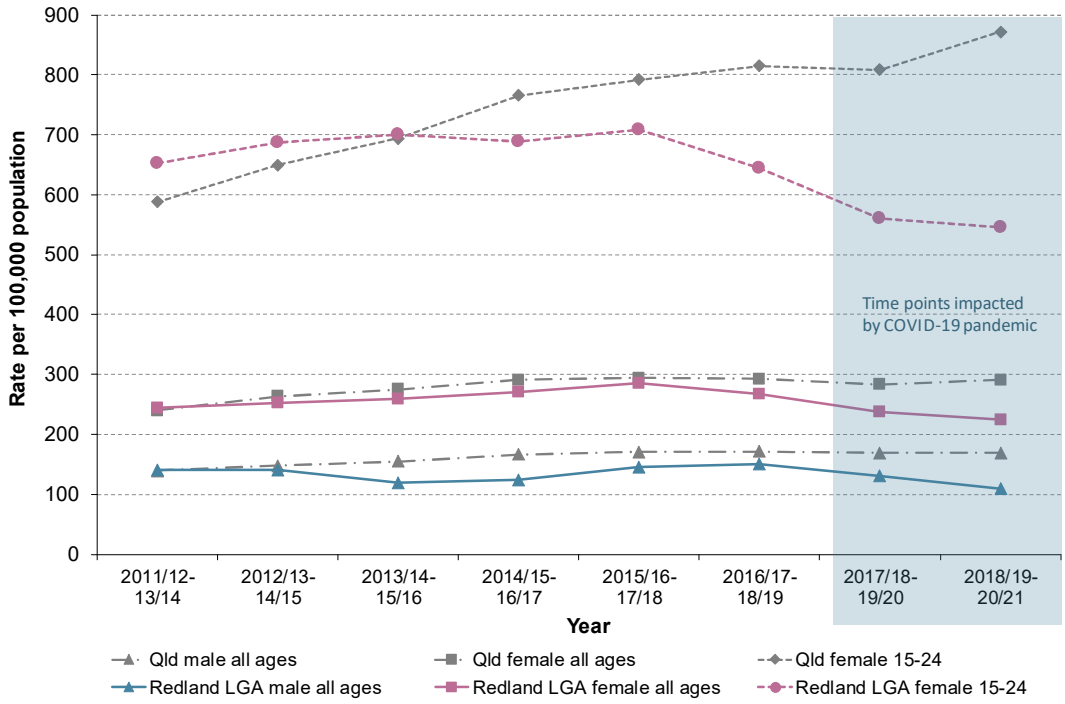


Figure 49: Self-inflicted injury age standardised hospital separation rate by sex and age group, Redland LGA and Queensland, three-year moving averages 2011/12 to 2020/21

In Queensland hospital separation rates for self-inflicted injury among young people (15 to 24 years) and particularly young females increased far more steeply over the reported period than the all ages group (Figure 49). However in Redland LGA, while rates in young females initially increased, they then stabilised and then declined sharply between 2015/16-17/18 and 2017/18-19/20 (Figure 49). Note that separation rates in young Redland LGA males are not presented because counts were too small for accurate rates to be calculated.

The age standardised hospital separation rate among young females was more than double the rate in females of all ages at each timepoint of the reported period (Figure 49).

In 2018/19-20/21, the timepoint with the greatest COVID-19 pandemic impact to date, the separation rate in young Redland LGA females fell slightly (by 3%) from the previous timepoint. This drop is inconsistent with a strong upwards movement recorded in young females in Queensland (Figure 49). The increases in hospitalisation for youth self-harm recorded in Queensland are consistent with anecdotal news reports

throughout 2020-2021 regarding the social impact of the COVID-19 pandemic and pandemic response measures such as lockdowns and isolation The relatively high socio-economic status of the population of Redland LGA among other factors may have mitigated some of this pandemic impact in Redland LGA.

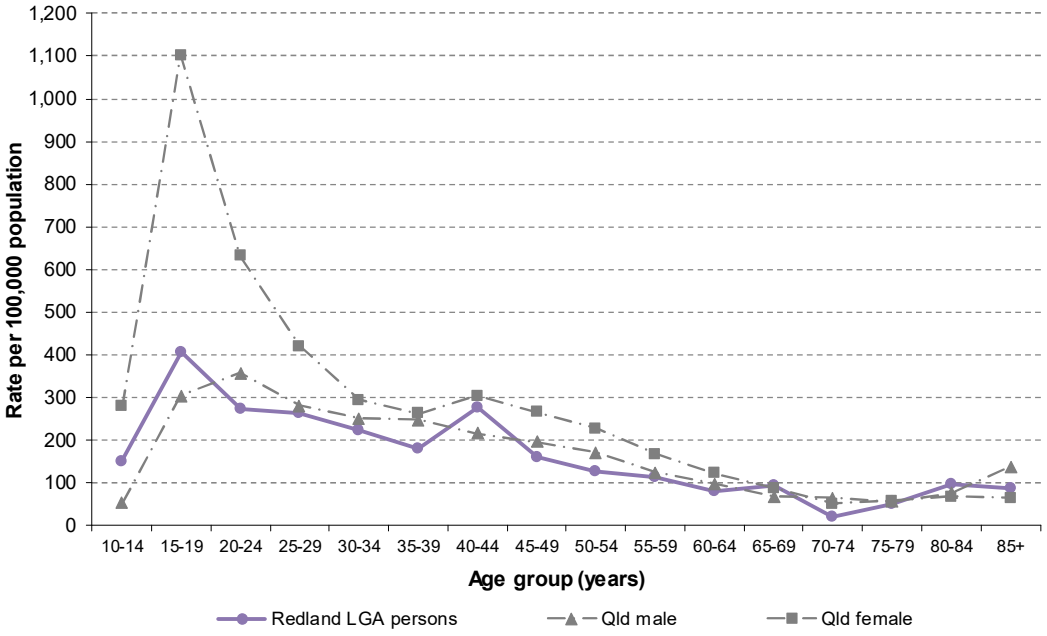
Indirect standardised separation ratios indicate that the average separation rate for self-inflicted injury among persons of all ages was significantly lower in Redland LGA than in Queensland for males (35% lower) and for females (23% lower) in 2018/19 to 2020/21. Among young people in the high-risk 15 to 24 years age group, the differences between Redland LGA and Queensland were ever greater with Redland LGA males 53% lower and females 37% lower than the equivalent Queensland rates (Table 21).

Table 21: Self-inflicted injury standardised separation ratios by sex, Redland LGA, 2018/19 to 2020/21

Region	Age group	Sex	Ratio (95% confidence interval)	Statistically significant difference Redland LGA – QLD*
Redland LGA	All ages	Male	0.65 (0.57 – 0.74)	↓
		Female	0.77 (0.70 – 0.84)	↓
		Persons	0.72 (0.67 – 0.78)	↓
	15-24 years	Male	0.47 (0.34 – 0.62)	↓
		Female	0.63 (0.53 – 0.73)	↓
		Persons	0.57 (0.50 – 0.66)	↓

* ↑ LGA statistically significantly higher than Queensland; ↓ LGA statistically significantly lower than Queensland; — no statistically significant difference between LGA and Queensland

Age specific hospital separation rates for self-inflicted injury among Queensland females had a substantial peak in the 15 to 19 years age group and then decreased with increasing age. Queensland males recorded a much lower, slightly later peak in those aged 20 to 24 years and then also decreased with age (Figure 50).



* rates not presented for age groups under 10 years because of low or zero counts

Figure 50: Self-inflicted injury age specific hospital separation rate, Redland LGA all personsand Queensland by sex, 2018/19 to 2020/21*

Age specific rates for Redland LGA are not presented separately for males and females because separation counts are too small for reliable estimates to be produced for many age groups. The all persons Redland LGA separation rate peaked in the 15 to 19 years group and then generally decreased with increasing age broadly following the pattern seen in Queensland males (Figure 50).

Cancer

Cancer is a diverse group of diseases in which abnormal cells multiply out of control and can spread to other parts of the body (metastasise) through the blood and lymphatic systems. There are over 100 known different types of cancer and most are named after the organ or type of cell in which they start. In Queensland as at 2017, the one in two men and one in two women would develop cancer before their 85th birthday[24]. In 2018 cancer (malignant + benign neoplasms) was the leading broad cause of death in Australia and was responsible for 19% of deaths overall[24]. For most cancers, the causes are not fully understood. However factors that place individuals at a greater risk of particular cancers include smoking, alcohol consumption, diet, obesity, physical inactivity, chronic infections, family history and genetic susceptibility[25].

All cancers

Mortality

On average there were 332 deaths per year from all cancers among Redland LGA residents in the five years from 2015 to 2019. Six types of cancer (lung, colorectal, hepatobiliary, colorectal, haematological, prostate and breast) together accounted for two thirds (67%) of all cancer deaths in Redland LGA in 2015 to 2019 (Table 22). Lung cancer alone accounted for almost one in five (19%) cancer deaths in Redland LGA in this period.

The average annual age standardised mortality rate for all cancers in Redland LGA (160 deaths per 100,000 persons) was not significantly different from the Queensland rate (159 deaths per 100,000 persons) in 2015 to 2019 (Table 22). The mortality rates of all groupings of cancer by site were statistically similar in Redland LGA and Queensland in this period (Table 22).

The all cancer Redland LGA mortality rate for 2015 to 2019 was not significantly different from the rate reported for 2011 to 2015 of 168 deaths per 100,000 persons[11].

Table 22: Mortality numbers and age standardised mortality rates by site of cancer, Redland LGA and Queensland, 2015 to 2019

Site	Number of deaths, 2015-2019		Average annual age standardised rate per 100,000 persons (95% confidence interval)		Statistically significant difference
	Redland LGA	QLD	Redland LGA	QLD	LGA –QLD*
Lung	320	9,147	30.8 (27.5 – 34.3)	32.0 (31.3 – 32.6)	—
Colorectal	198	5,400	18.8 (16.3 – 21.5)	19.0 (18.5 – 19.5)	—
Hepatobiliary	177	4,840	16.6 (14.3 – 19.2)	17.0 (16.5 – 17.4)	—
Haematological	164	4,752	15.8 (13.5 – 18.3)	16.8 (16.3 – 17.2)	—
Prostate	135	3,223	28.7 (24.1 – 33.7)	25.4 (24.5 – 26.3)	—
Breast (female)	116	2,824	21.4 (17.7 – 25.5)	19.2 (18.5 – 19.9)	—
Urological	84	2,293	8.3 (6.6 – 10.1)	8.1 (7.8 – 8.4)	—
Upper gastrointestinal	78	2,557	7.3 (5.8 – 9.0)	9.0 (8.7 – 9.4)	—
Gynaecological	69	1,971	12.7 (9.9 – 15.9)	13.3 (12.7 – 13.8)	—
CNS and Brain	68	1,421	6.9 (5.3 – 8.6)	5.2 (4.9 – 5.4)	—
Melanoma	64	1,604	6.3 (4.8 – 7.9)	5.7 (5.4 – 6.0)	—
Head and neck	45	1,300	Not calculated#	4.5 (4.3 – 4.8)	Not calculated#
Mesothelioma	25	690	Not calculated#	2.4 (2.3 – 2.6)	Not calculated#
Bone and soft tissue	23	471	Not calculated#	1.7 (1.6 – 1.9)	Not calculated#
Endocrine	11	191	Not calculated#	0.7 (0.6 – 0.8)	Not calculated#
Ophthalmic	<5	100	Not calculated#	0.4 (0.3 – 0.4)	Not calculated#
Breast (male)	<5	22	Not calculated#	Not calculated#	Not calculated#
Other invasive cancers	81	2,487	7.5 (6.0 – 9.2)	8.6 (8.3 – 9.0)	—
-TOTAL	1,660	45,293	160.2 (152.6 – 168.0)	159.4 (158.0 – 160.9)	—

* ↑ Redland LGA statistically significantly higher than Queensland; ↓ Redland LGA statistically significantly lower than Queensland; — no statistically significant difference between Redland LGA and Queensland

I# Rate not calculated because total number of deaths, 2015 to 2019, less than 50

Source: Queensland Health. Oncology Analysis System (OASys). Queensland Cancer Control Analysis Team

Incidence

On average there were 1,085 new (incident) cases of cancer per year among Redland LGA residents in the five years from 2015 to 2019. The six most common types of newly diagnosed cancer in Redland (melanoma, prostate, female breast, colorectal, haematological and lung; (Table 23) together accounted for 71% of all new cases.

For this period, the average annual age standardised incidence rate for all cancers (combined) in Redland LGA (547 new cases per 100,000 persons) was not significantly different from the Queensland rate (545 new cases per 100,000 persons) (Table 23). The current Redland LGA incidence rate was not significantly different from the rate reported for 2011 to 2015 of 539 new cases per 100,000 persons[11].

The incidence rate of melanoma (the most common newly diagnosed cancer in Redland LGA) was significantly higher in Redland LGA than in Queensland in 2015 to 2019 (Table 23). The incidence rates of all other cancer groupings by site were statistically similar in Redland LGA and Queensland in this period (Table 23).

Table 23: Newly diagnosed cancer cases (incidence) and age standardised incidence rates by site of cancer, Redland LGA and Queensland, 2015 to 2019

Site	Number of new cases, 2015-2019		Average annual age standardised rate per 100,000 persons (95% confidence interval)		Statistically significant difference LGA–QLD*
	Redland LGA	QLD	Redland LGA	QLD	
Melanoma	827	20,592	86.4 (80.6 – 92.4)	75.9 (74.9– 76.9)	↑
Prostate	728	22,142	144.0 (133.7 – 154.6)	156.5 (154.5 – 158.6)	—
Breast (female only)	632	17,857	127.4 (117.6 – 137.5)	127.5 (125.6 – 129.4)	—
Colorectal	599	16,475	60.6 (55.8 – 65.5)	59.2 (58.3 – 60.1)	—
Haematological	588	17,191	58.6 (53.9 – 63.4)	62.0 (61.1 – 62.9)	—
Lung	477	13,675	45.9 (41.9 – 50.2)	47.9 (47.1 – 48.7)	—
Urological	301	8,508	30.8 (27.4 – 34.4)	30.9 (30.3 – 31.6)	—
Hepatobiliary	249	6,558	23.9 (21.0 – 27.0)	23.1 (22.5 – 23.6)	—
Gynaecological	203	6,043	39.4 (34.2 – 45.0)	43.1 (42.0 – 44.2)	—
Head and neck	178	5,173	17.6 (15.1 – 20.3)	18.5 (18.0 – 19.0)	—
Upper gastrointestinal	166	4,808	16.2 (13.8 – 18.8)	17.1 (16.6 – 17.5)	—
Endocrine	125	3,621	15.2 (12.7 – 18.0)	14.1 (13.6 – 14.6)	—
CNS and Brain	78	1,894	8.7 (6.9 – 10.7)	7.1 (6.8 – 7.4)	—
Bone and soft tissue	51	1,229	5.4 (4.0 – 7.0)	4.6 (4.4 – 4.9)	—
Mesothelioma	29	770	Not calculated#	2.7 (2.5 – 2.9)	Not calculated#
Ophthalmic	13	419	Not calculated#	1.5 (1.4 – 1.7)	Not calculated#
Breast (male only)	7	182	Not calculated#	1.3 (1.1 – 1.5)	Not calculated#
Other invasive cancers	176	4,785	17.0 (14.6 – 19.6)	16.9 (16.4 – 17.3)	—
TOTAL	5,427	151,922	546.6 (532.2 – 561.3)	545.3 (542.6 – 548.1)	—

* ↑ Redland LGA statistically significantly higher than Queensland; ↓ Redland LGA statistically significantly lower than Queensland; — no statistically significant difference between Redland LGA and Queensland

\# Rate not calculated because total number of new cases, 2015 to 2019, less than 50

Source: Queensland Health. Oncology Analysis System (OASys). Queensland Cancer Control Analysis Team

Prostate cancer

Prostate cancer is the result of abnormal cell growth in the prostate, a gland in the male reproductive system. It can be a slow growing cancer, and the majority of men with low grade prostate cancer live for many years without symptoms. However high grade prostate cancer can spread quickly and can be life threatening[26].

Prostate cancer is the most commonly diagnosed cancer in Australia (excluding non-melanoma skin cancers)[27,28]. One in five men in Queensland are at risk of developing prostate cancer by the age of 85. The risk increases with age, with at least 83% of Australian cases diagnosed in men aged of 60 years and over[26,28].

In Australia in 2019, there were 3,582 deaths caused by prostate cancer[27]. Mortality rates have decreased over time from 36 deaths per 100,000 males in 1985 to 25 deaths per 100,000 males in 2019[27]. This decline is expected to continue[27].

In 2017, over 20,600 new cases of prostate cancer were diagnosed in Australia[29]. The Australian age standardised incidence of prostate cancer increased from 80 new cases per 100,000 males in 1982 to 198 per 100,000 in 2009, largely due to increases in the numbers of men presenting for testing[27,29]. Since peaking in 2009, rates have decreased to 147 per 100,000 in 20178[29].

Mortality

On average there were 27 deaths per year from prostate cancer among Redland LGA males in the five years from 2015 to 2019. This represented 8.1% of all cancer deaths in Redland LGA in this period. There was no significant difference in age standardised prostate cancer mortality rate between Redland LGA and Queensland in this period (Table 22, page 65).

Incidence

On average there were 146 new cases of prostate cancer per year among Redland LGA males in the five years from 2015 to 2019. This represented 13% of all new cases of cancer in Redland LGA over this period, making prostate cancer the second most common newly diagnosed cancer in Redland LGA.

In 2015 to 2019, the average annual prostate cancer age standardised incidence rate in Redland LGA was 144 new cases per 100,000 males which was statistically similar to the Queensland rate of 157 new cases per 100,000 males (Table 23, page 66). The Redland LGA rate for the current period was very similar to the rate in 2011 to 2015 of 147 new cases (95% CI: 136 – 159) per 100,000 males[11].

Between 2010 and 2019, annual age standardised rates of prostate cancer trended slightly downwards in both Redland LGA and Queensland although both areas showed a rise between 2015 and 2019 (Figure 51).

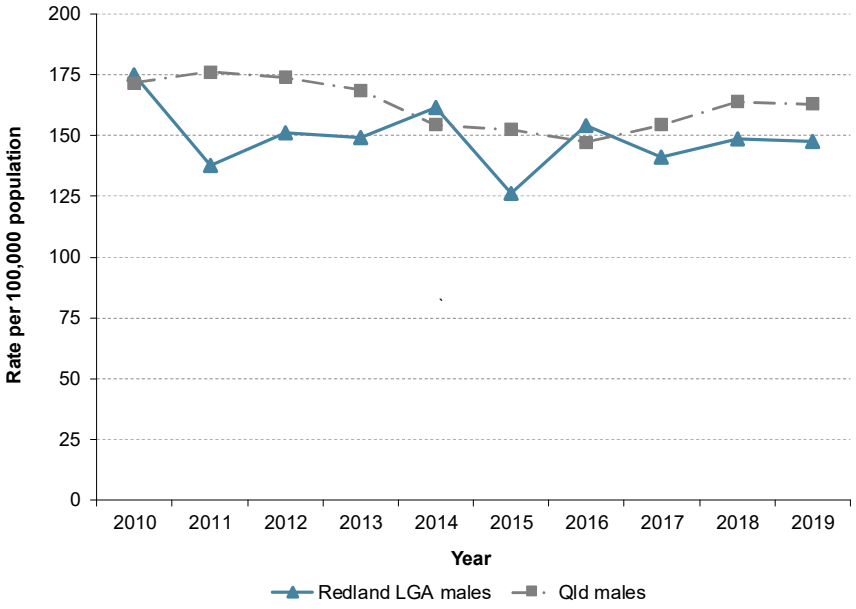
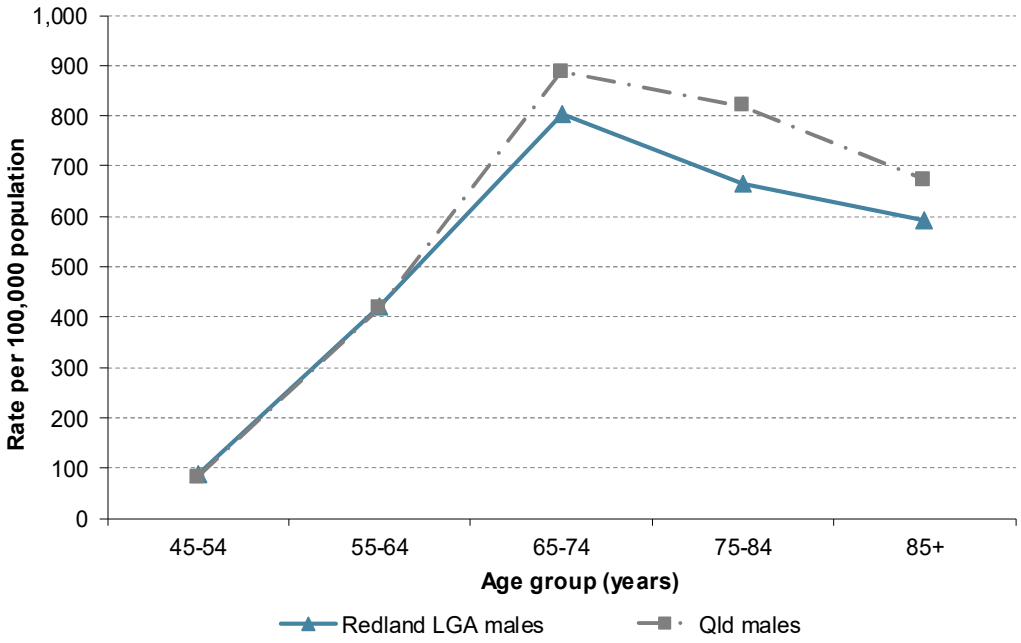


Figure 51: Prostate cancer age standardised incidence rates, Redland LGA and Queensland, 2010 to 2019

In 2015 to 2019, prostate cancer incidence rates were nil to negligible in men under the age of 45 years. From the age of about 45 years rates increased sharply. In both Queensland and Redland LGA rates peaked in the 65 to 74 years age group before declining somewhat in older age groups (Figure 52).



* rates not presented for age groups less than 45 years because of low or zero counts

Figure 52: Prostate cancer age specific incidence rates, Redland LGA and Queensland, 2015 to 2019*

Melanoma

Melanoma arises in cells in the skin called melanocytes. Melanocytes produce melanin that gives colour to the skin. Skin cancer (both melanoma and non-melanoma skin cancers) accounts for the largest number of cancers diagnosed in Australia every year[30]. Queensland has the highest age standardised mortality rates for melanoma in Australia[30].

In Australia in 2019, there were 1,405 deaths caused by melanoma[29]. After remaining relatively consistent for the 30 years to 2015, Australian melanoma mortality rates dropped slightly in 2016 to 2019[29].

The Australian age standardised incidence rate for melanoma doubled between 1952 and 2017 to 54 per 100,000 persons[29]. Australian rates increased in all age groups except those aged less than 40 years. Incidence rates in persons aged 20 to 39 years peaked in the late 1980s and in the late 1990s in persons aged under 20 years[29].

Mortality

On average there were 13 deaths per year from melanoma among Redland LGA residents in the five years from 2015 to 2019. This represented 4.0% of all cancer deaths in Redland LGA in this period. The age standardised melanoma mortality rate in Redland LGA was statistically similar to the Queensland rate over this period (Table 22, page 65).

Incidence

On average there were 165 new cases of melanoma per year among Redland LGA residents in the five years from 2015 to 2019. This represented 15% of all new cases of cancer in Redland LGA in this period, making melanoma the most common newly diagnosed cancer in Redland LGA.

In 2015 to 2019, the average annual melanoma age standardised incidence rate in Redland LGA was 86 new cases per 100,000 persons which was significantly higher than the Queensland rate of 76 new cases per 100,000 persons (Table 23, page 66). The Redland LGA rate for this period was statistically similar to the rate in 2011 to 2015 of 83 new cases (95% CI: 77 – 89) per 100,000 males[11].

Between 2010 and 2019 annual melanoma incidence rates in Redland LGA did not show a consistent ten-year trend. However between 2012 and 2019 they increased from a minimum of around 78 to a ten-year peak of 96 new cases per 100,000 persons (Figure 53). This increase since 2012 is consistent with the whole of Australia[29] and Queensland (Figure 53) where rates increased over this ten-year period.

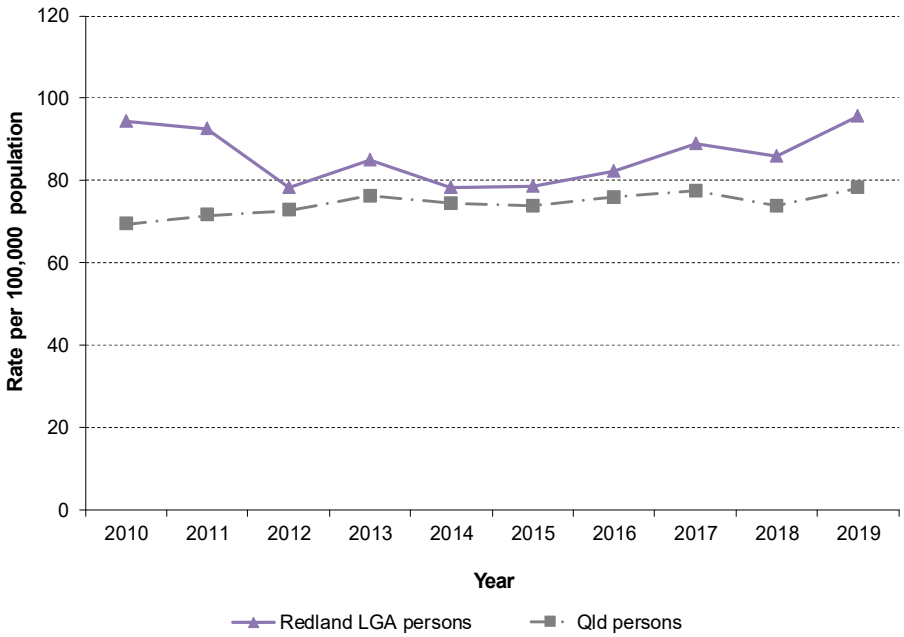
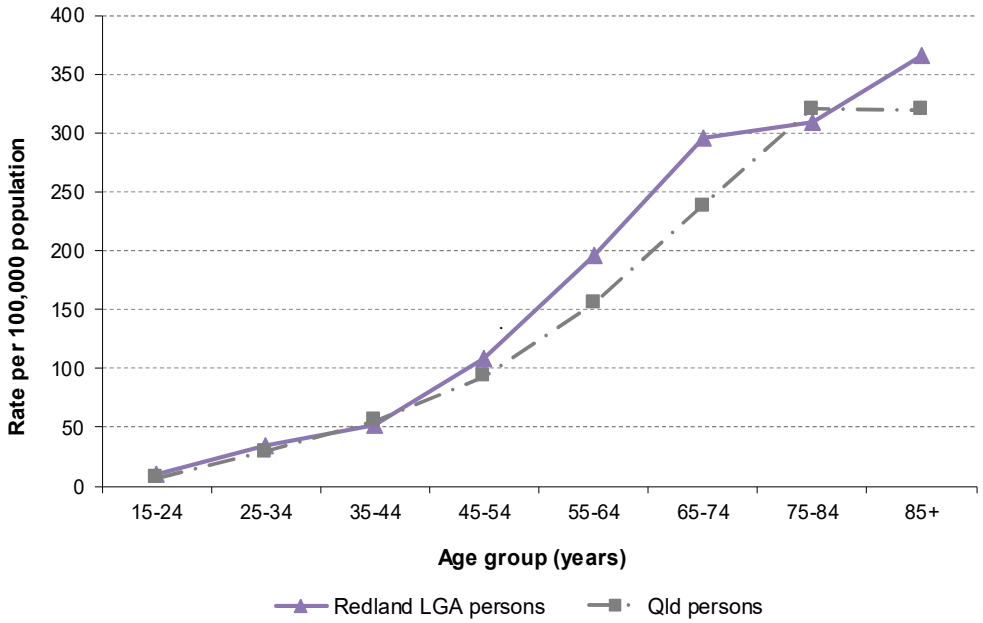


Figure 53: Melanoma age standardised incidence rates, Redland LGA and Queensland, 2010 to 2019

In 2015 to 2019, melanoma incidence rates were negligible in people under the age of 15 years, but then increased with increasing age (Figure 54). In Queensland the rate remained consistently high in persons aged 65 years and over, while in Redland LGA rates peaked in persons 85 years and over (Figure 54).



* rates not presented for ages under 15 years because of low counts

Figure 54: Melanoma age specific incidence rates, Redland LGA and Queensland, 2015 – 2019*

Breast cancer

Breast cancer is a major cause of illness and death for Australian women. Although much less common, males can also develop the disease[31]. Not all breast cancer is invasive, and these benign tumours are not life-threatening. However when abnormal cells in the breast tissue multiply and form invasive tumours, these tumours can spread to other parts of the body through the lymphatic or vascular systems and if not treated the cancer may be fatal[31].

In Australia in 2019, there were 3,243 deaths from breast cancer (31 males and 3,212 females)[29]. In females the age standardised mortality rate was 20 per 100,000 females[29]. While counts of deaths have increased, mortality rates for breast cancer in Australia have steadily declined since the mid-1990s[29].

Between 1982 and 2018 age standardised breast cancer incidence rates in Australia increased from 81 to 125 new cases per 100,000 females[29]. The increase in incidence rate was due in part to the introduction of the national breast cancer screening program[31]. Age specific incidence rates increased with increasing age, reaching a peak in the 65 to 74 years age group[31], with the Australian rate in that age group reaching 411 new cases per 100,000 females in 2018.

Mortality

On average there were 23 deaths per year from breast cancer among Redland LGA females in the five years from 2015 to 2019. This represented 7.0% of all cancer deaths in Redland LGA in this period. The majority of these deaths (84%) were in the 55 years and over age group. Women aged 55 to 79 years accounted for half of all breast cancer deaths while those aged 80 years and over represented 34% of the deaths. In this period there was an average of less than one death per year among Redland LGA males.

There was no significant difference in average annual female breast cancer age-standardised mortality rate between Redland LGA and Queensland over the years 2015 to 2019 combined (Table 22, page 65).

Incidence

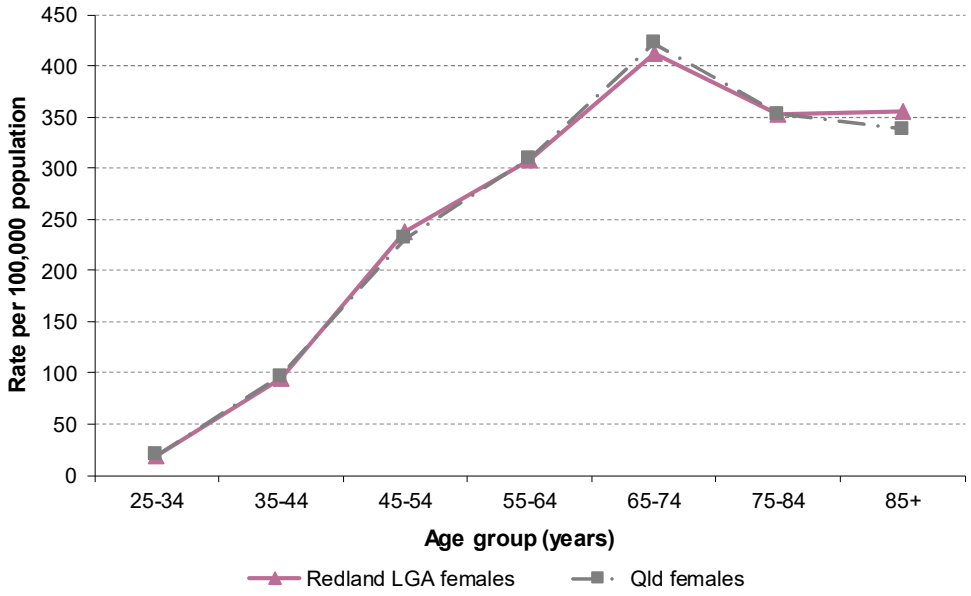
On average there were 126 new cases of breast cancer per year among Redland LGA women in the five years from 2015 to 2019. This represented almost 12% of all new cases of cancer in Redland LGA in this period making breast the third most common newly diagnosed cancer in Redland LGA. By comparison, on average over this period there were fewer than two new cases of breast cancer per year among Redland LGA men.

In 2015 to 2019, the average annual female breast cancer age standardised incidence rate in Redland LGA was 127 new cases per 100,000 females which was almost the same as the Queensland rate (Table 23, page 66). The Redland LGA rate for this period was the same as the rate in 2011 to 2015 of 127 new cases (95% CI: 117 – 138) per 100,000 females[11].

Between 2010 and 2019 annual female breast cancer incidence rates in Queensland were relatively steady with the rate averaging 127 new cases per 100,000 persons (Figure 55). However in Redland LGA rates rose from 116 new cases per 100,000 persons in 2010 to just under 130 new cases per 100,000 persons in 2018 and 2019 (Figure 55).

Figure 55: Breast cancer age standardised incidence rates, Redland LGA and Queensland, 2010 to 2019

In 2015 to 2019, breast cancer incidence rates were negligible in women under the age of 25 years. Incidence rates increased with increasing age, but declined in women aged 75 years and over (Figure 56).



*rates not presented for age groups under 25 years because of low or zero counts

Figure 56: Breast cancer age specific incidence rates, Redland LGA and Queensland, 2015 to 2019*

Colorectal cancer

Colorectal (bowel) cancer begins in the mucosa or inner lining of the colon or rectum. It usually develops from a small benign growth called an adenoma (polyp). Polyps usually remain benign but some can become malignant and spread to other parts of the body[32]. Bowel cancer is the third most common cancer in Australia and is most common in people over 50 years but can occur at any age[32].

In Australia in 2019, there were 5,255 deaths caused by colorectal cancer[29]. Age standardised mortality rates for colorectal cancer peaked at 33 deaths per 100,000 persons in 1985 and since that time have halved to 16.5 deaths per 100,000 in 2019[29].

The number of new cases of colorectal cancer in Australia per year has doubled from almost 7,000 cases in 1982 to over 15,200 cases in 2017. Between 1982 and 2007 the age standardised incidence rate for colorectal cancer showed no consistent trend, varying between 58 and 66 new cases per 100,000 persons[29]. However between 2007 and 2017 the rate fell from 66 to 53 new cases per 100,000 persons[29].

Mortality

On average there were 40 deaths per year from colorectal cancer among Redland LGA residents in the five years from 2015 to 2019. This represented 12% of all cancer deaths in Redland LGA in this period. The Redland LGA age standardised colorectal cancer mortality rate was statistically similar to the Queensland rate over this period (Table 22, page 65).

Incidence

On average there were 120 new cases of colorectal cancer per year among Redland LGA residents in 2015 to 2019. This represented 11% of all new cases of cancer in Redland LGA in this period.

In 2015 to 2019, the average annual colorectal cancer age standardised incidence rate in Redland LGA was 61 new cases per 100,000 persons which was statistically similar to the Queensland rate (Table 23, page 66). The Redland LGA rate for this period was very similar to the rate in 2011 to 2015 of 62 new cases (95% CI: 57 – 68) per 100,000 persons[11].

Between 2010 and 2019 colorectal cancer incidence rates in Redland LGA trended downwards from 74 to around 60 new cases per 100,000 persons in 2017 to 2019 (Figure 57). Queensland rates also declined over this period from 66 to 58 new cases per 100,000 persons (Figure 57).

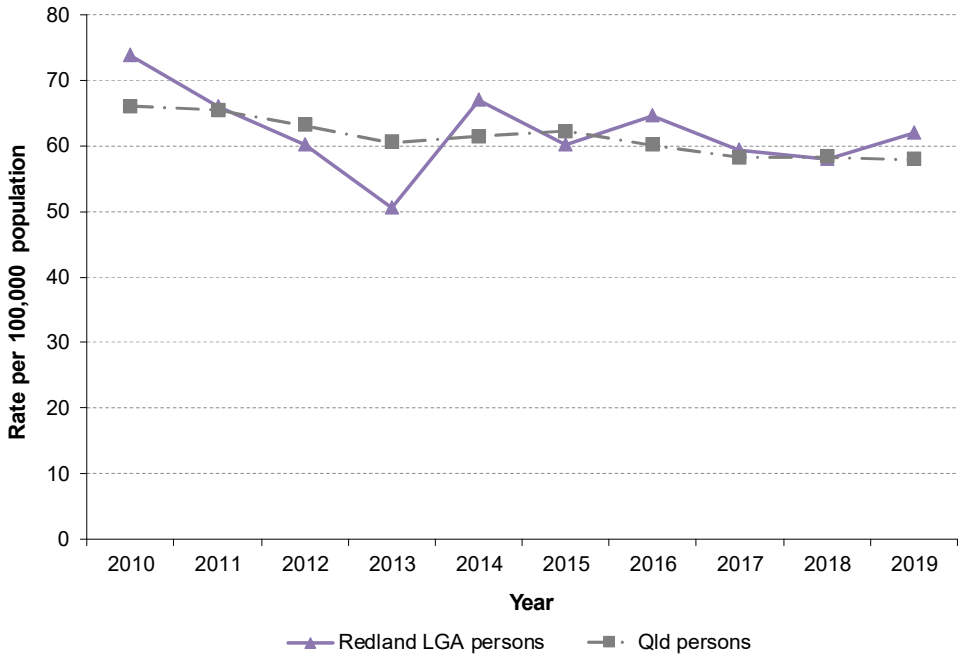
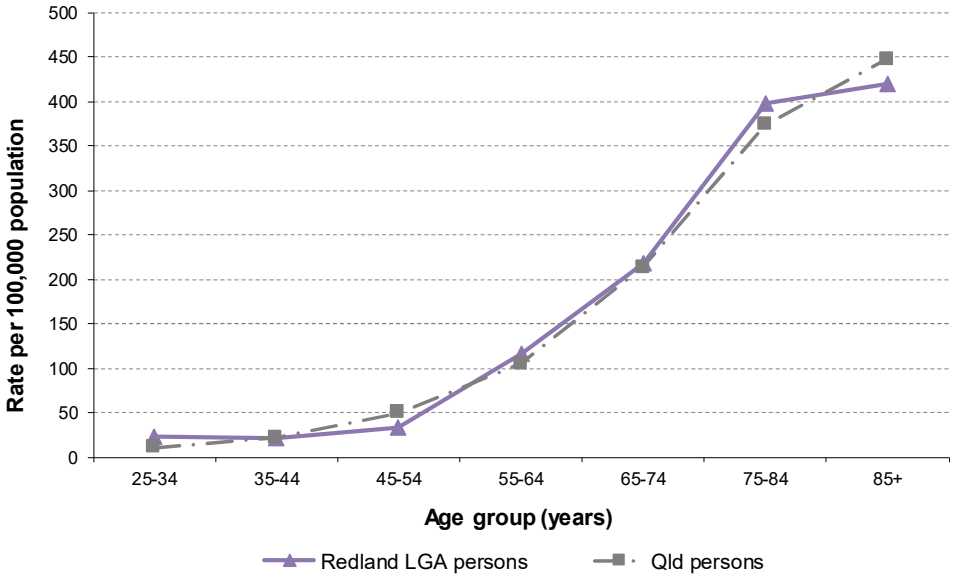


Figure 57: Colorectal cancer age standardised incidence rates, Redland LGA and Queensland, 2010 to 2019

In 2015 to 2019, colorectal cancer incidence rates were negligible in people under the age of 25 years. Rates then increased with increasing age, to a peak in the 85 years and over age group (Figure 58).



* rates not presented for ages under 25 years because of low or zero counts

Figure 58: Colorectal cancer age specific incidence rates, Redland LGA and Queensland, 2015 to 2019*

Haematological cancer

Haematological cancers – the main ones being lymphoma, leukaemia and myeloma – are cancers arising from abnormal blood, bone marrow or lymph node cells[33]. Unlike most other forms of cancer, cancers of the blood do not form a solid tumour. Lymphomas affect the lymphatic system, leukaemias are cancers of the white blood cells which begin in the bone marrow and myeloma is a cancer that develops from plasma cells[33]. Lymphomas are the most common form of haematological cancer in Australia with around 90% being non-Hodgkin lymphomas[34].

In Australia in 2019 there were 1,605 deaths caused by non-Hodgkin lymphoma[29] and 75 deaths caused by Hodgkin lymphoma[29]. Australian age standardised mortality rates for non-Hodgkin lymphoma decreased from a peak of 8.9 per 100,000 persons in 1997 to 5.1 per 100,000 in 2019[29].

In 2017, 5,317 Australians were diagnosed with lymphoma (5,619 cases of non-Hodgkin lymphoma and 698 cases of Hodgkin lymphoma)[29]. Between 1984 and 2017 the age standardised incidence rate of non-Hodgkin lymphoma increased from 13 to 20 per 100,000 persons [29].

In Australia in 2019 there were 1,933 deaths due to all types of leukaemia[29]. The type responsible for the highest number (1,086 deaths) was acute myeloid leukaemia[29]. Australian age standardised mortality rates for leukaemia trended downwards from a peak of 8.3 deaths per 100,000 persons in 1980 to 6.1 per 100,000 in 2019[29].

In 2017, the majority of new leukaemia cases in Australia were chronic lymphocytic leukaemia (2,068 cases) and acute myeloid leukaemia (963 cases)[29]. Between 1982 and 2017 the age standardised incidence rate for leukaemia trended upwards from 12 to 16 cases per 100,000 persons[29].

In 2019 1,018 deaths were recorded from multiple myeloma in Australia[29]. Multiple myeloma age standardised mortality rates increased from 1.9 deaths per 100,000 persons in 1972 to a peak of 3.8 deaths per 100,000 in 1994. Between 1994 and 2019 rates trended generally downwards, reaching 3.2 deaths per 100,000 in 2019[29]. The Australian age standardised incidence rate for multiple myeloma increased from 4.7 per 100,000 persons in 1982 to 6.8 per 100,000 in 2017[29].

Mortality

On average there were 33 deaths per year from haematological cancer among Redland LGA residents in the five years from 2015 to 2019. This represented almost 10% of all cancer deaths in Redland LGA in this period.

The age standardised haematological cancer mortality rate in Redland LGA was statistically similar to the Queensland rate over this period (Table 22, page 65).

Incidence

There was an average of 118 new cases per year of haematological cancer among Redland LGA residents in 2015 to 2019. This represented almost 11% of all new cases of cancer in Redland LGA in this period.

In 2015 to 2019, the average annual haematological cancer age standardised incidence rate in Redland LGA was 59 new cases per 100,000 persons which was statistically similar to the Queensland rate (Table 23, page 66). The Redland LGA rate for this period was very similar to the rate in 2011 to 2015 of 58 new cases (95% CI: 53 – 63) per 100,000 persons[11].

Between 2010 and 2019 haematological cancer rates in both Redland LGA and Queensland trended upwards. In Redland LGA the increase was from 52 to 62 new cases per 100,000 persons over this period (Figure 59).

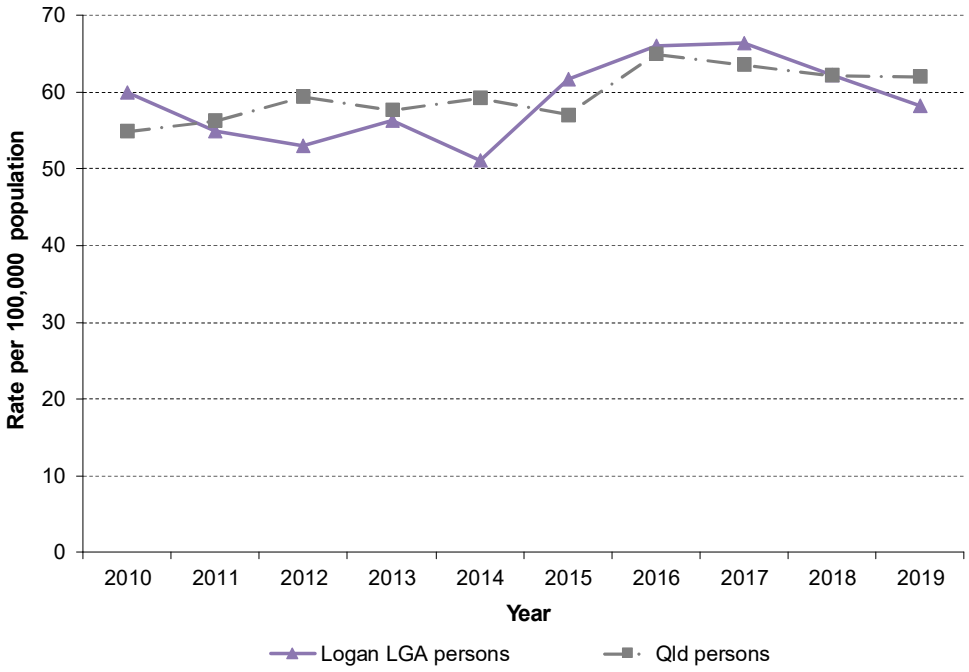


Figure 59: Haematological cancer age standardised incidence rates, Redland LGA and Queensland, 2010 to 2019

In 2015 to 2019, haematological cancer incidence rates were low for people under the age of 45 years. Rates then increased with age, with the sharpest rises occurring between the ages of approximately 64 and 84 years (Figure 60).

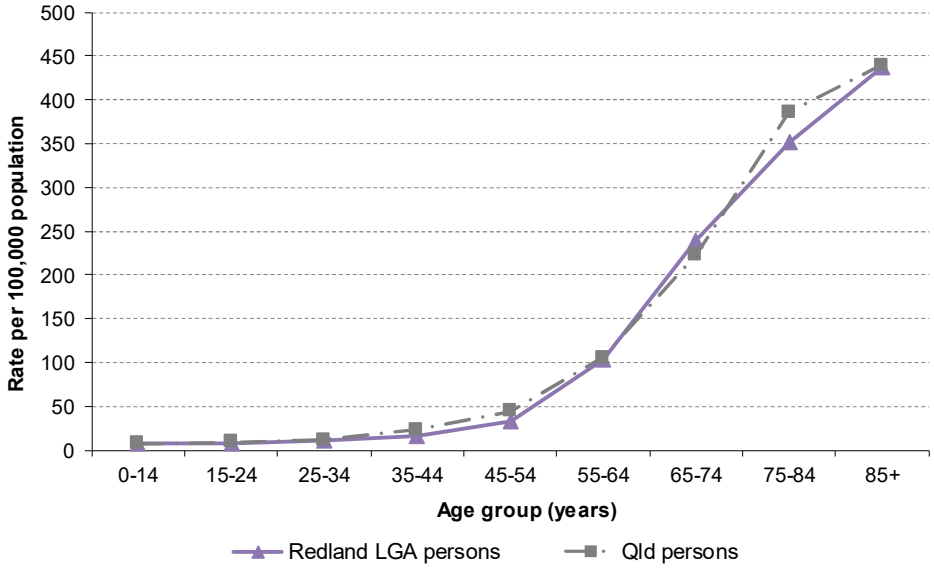


Figure 60: Haematological cancer age specific incidence rates, Redland LGA and Queensland, 2015 to 2019

Lung cancer

Lung cancer is a malignant tumour starting in the tissues of one or both lungs and is the leading cause of cancer death in Australia. The prognosis for those diagnosed with lung cancer is poor and has improved only

marginally over the past three decades. Tobacco smoking is a major cause of lung cancer, and tobacco control is essential for effective lung cancer prevention[35].

In Australia in 2019, there were 8,739 deaths from lung cancer and it accounted for more deaths than any other cancer[29]. Age standardised lung cancer mortality rates decreased from a peak in 1989 of 43 deaths per 100,000 persons to the most recently available rate of 28 deaths per 100,000 in 2019 [29].

Between 1982 and 2017, the age standardised incidence rate of lung cancer among Australian males decreased by 39% from 85 to 52 cases per 100,000 persons[29]. However, over the same period the age standardised incidence rate among females increased by 100% from 18 to 36 cases per 100,000 persons[29]. The difference in pattern between the sexes reflects historical differences in smoking behaviour[35].The occurrence of lung cancer is strongly related to age, with the majority of new cancers (83% in 2017) diagnosed in people aged 60 years and older [29,35].

Mortality

On average there were 64 deaths per year from lung cancer among Redland LGA residents in the five years from 2015 to 2019. This represented 19% of all cancer deaths in Redland LGA in this period, with males accounting for 53% of the deaths. The age standardised lung cancer mortality rate in Redland LGA was statistically similar to the Queensland rate over this period (Table 22, page 65).

Between 2002 and 2019 lung cancer annual mortality rates in Redland LGA trended downwards in males from a peak of over 60 deaths per 100,000 males in 2007 to 32 deaths per 100,000 males in 2019. Annual mortality rates in females were almost always lower than male rates however they did not show any appreciable downward trend over this period, averaging 25 deaths per 100,000 persons overall (Figure 61).

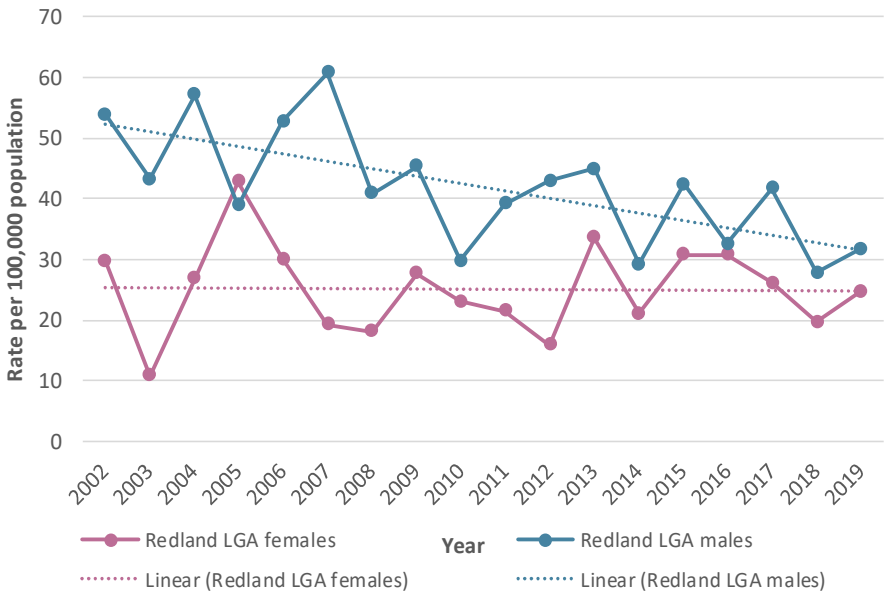


Figure 61: Lung cancer age standardised mortality rates by sex, Redland LGA, 2002 to 2019, with trendlines

Incidence

On average there were 95 new cases of lung cancer per year among Redland LGA residents in the five years from 2015 to 2019. This represented almost 9% of all new cases of cancer in Redland LGA in this period.

In 2015 to 2019, the average annual lung cancer age standardised incidence rate in Redland LGA was 46 new cases per 100,000 persons which was statistically similar to the Queensland rate (Table 23, page 66). The Redland LGA rate for this period was statistically similar to the rate in 2011 to 2015 of 44 new cases (95% CI: 40 – 48) per 100,000 persons[11].

Between 2010 to 2019 lung cancer rates in Queensland were relatively stable at an average of around 47 new cases per 100,000 persons per year (Figure 62). In contrast, in Redland LGA rates increased from a low of 39 new cases per 100,000 persons in 2013 and 2014 to a peak of 50 new cases per 100,000 persons in 2017 (Figure 62).

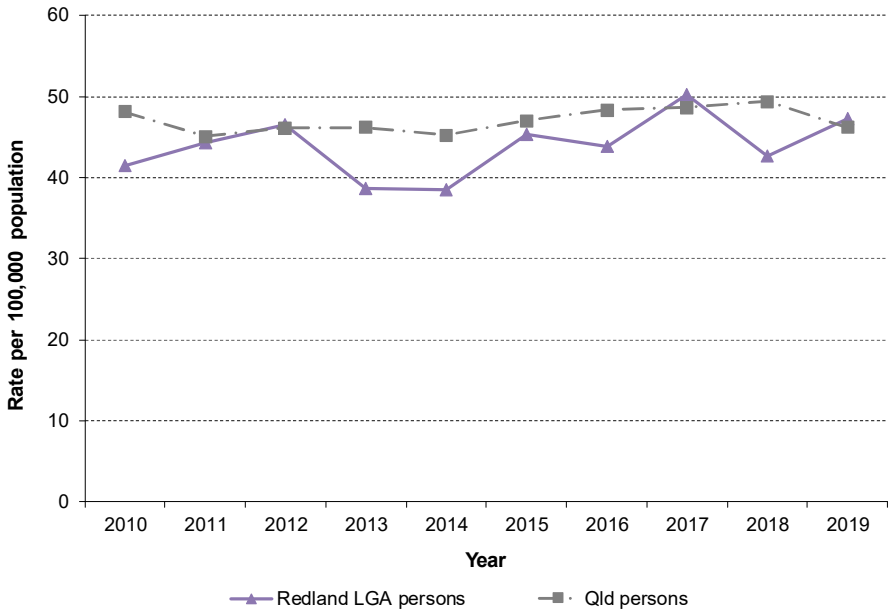
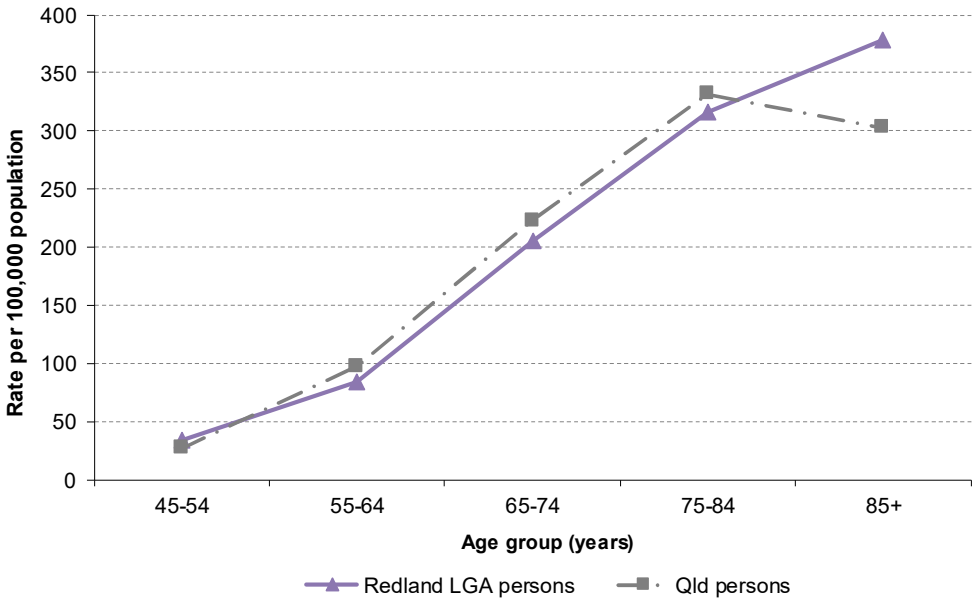


Figure 62: Lung cancer age standardised incidence rates, Redland LGA and Queensland, 2010 to 2019

In 2015 to 2019, lung cancer incidence rates were negligible in persons under the age of 35 years. Rates then increased steadily with increasing age, peaking in the 75 to 84 years age group in Queensland and the 85 years and over group in Redland LGA (Figure 63).



* rates not presented for age groups under 45 years because of low or zero counts

Figure 63: Lung cancer age specific incidence rates, Redland LGA and Queensland, 2015 to 2019*

Hepatobiliary cancers: liver cancer

The most common cancers of the hepatobiliary system are liver and pancreatic cancer. Primary liver cancer is a malignant tumour that starts in the liver and it is almost three times more common in men than in women in Australia[36]. The rate of primary liver cancer in Australia has doubled since 1999, possibly due to increasing rates of obesity, type 2 diabetes, hepatitis B and C infections and an ageing population[36].

In Australia in 2019 there were 2,187 deaths caused by liver cancer[29]. Australian age standardised mortality rates increased from 1.4 per 100,000 persons in 1972 to 7.1 per 100,000 in 2019[29].

Between 1982 and 2017 the annual number of new cases of liver cancer in Australia increased almost ten-fold from 228 cases in 1982 to 2,174 in 2017[29]. Over this period the age standardised incidence rate for liver cancer increased from 1.8 to 7.6 new cases per 100,000 persons[29].

Mortality

On average there were ten deaths per year from liver cancer among Redland LGA residents in the five years from 2015 to 2019. This represented 3.0% of all cancer deaths in Redland LGA in this period.

The total number of deaths in 2015 to 2019 was too small (<50) for an accurate annual average age standardised liver cancer mortality rate to be calculated for Redland LGA for this period.

Incidence

On average there were 17 new cases of liver cancer per year among Redland LGA residents in the five years from 2015 to 2019. This represented 1.5% of all new cases of cancer in Redland LGA in this period.

In 2015 to 2019, the average annual liver cancer age standardised incidence rate in Redland LGA was 8.0 new cases (95% CI: 6.4 – 9.8) per 100,000 persons which was statistically similar to the Queensland rate of 7.1 new cases (95% CI: 6.8 – 7.4) per 100,000 persons. The Redland LGA rate for this period was not significantly different from the rate in 2011 to 2015 of 6.4 new cases (95% CI: 4.9 – 8.2) per 100,000 persons.

In Queensland between 2010 and 2019 liver cancer rates trended upwards from around 5.5 to 7.5 new cases per 100,000 persons respectively. The number of new cases per year in Redland LGA was too small for accurate annual age standardised rates to be calculated.

In 2015 to 2019, Redland LGA liver cancer age specific incidence rates were negligible in people under the age of 45 years. Incidence rates increased with increasing age, peaking in the 75 to 84 years group in both Redland LGA and Queensland. It is important to note, that numbers in each age group in Redland LGA were small making interpretation difficult.

Hepatobiliary cancers: pancreatic cancer

Pancreatic cancer is caused by the uncontrolled growth of abnormal cells within the pancreas, a small gland located between the stomach and the spine which produces hormones such as insulin and digestive enzymes[37]. In its early stages, pancreatic cancer rarely causes obvious symptoms, with symptoms often not occurring until the cancer has spread or is large enough to affect nearby organs[37]. The causes of pancreatic cancer are not known but risk factors include tobacco smoking, obesity, ageing, high alcohol consumption and long-term diabetes or pancreatitis[37].

In Australia in 2019 there were 3,182 deaths due to pancreatic cancer[29]. Between 1971 and 2019 the number of Australian deaths to pancreatic cancer increased but age standardised mortality rates were very stable at between 9.1 and 10.5 deaths per 100,000 persons[29].

Between 1982 and 2002 the Australian annual age standardised incidence rate for pancreatic cancer remained consistently between 9.6 and 10.3 new cases per 100,000 persons[29]. However after 2002 the rate trended upwards, reaching 12.5 cases per 100,000 persons in 2017[29].

Mortality

On average there were 21 deaths per year from pancreatic cancer among Redland LGA residents in the five years from 2015 to 2019. This represented 6.2% of all cancer deaths in Redland LGA in this period.

The 2015 to 2019 annual average age standardised pancreatic cancer mortality rate in Redland LGA (9.8 deaths per 100,000 persons) was statistically similar to the Queensland rate (9.7 deaths per 100,000 persons) over this period.

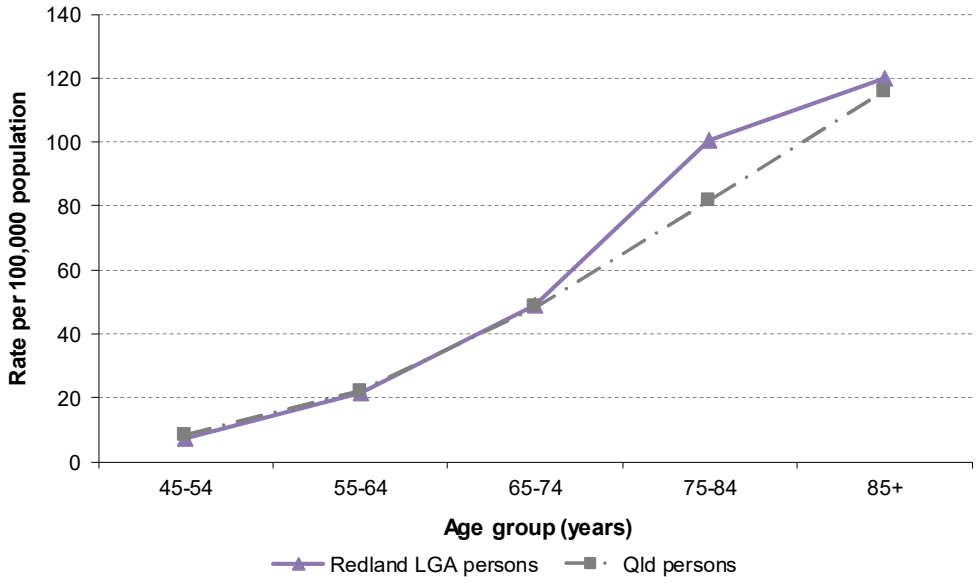
Incidence

On average there were 26 new cases per year of pancreatic cancer among Redland LGA residents in the five years from 2015 to 2019. This represented 2.4% of all new cases of cancer in Redland LGA in this period.

In 2015 to 2019, the average annual pancreatic cancer age standardised incidence rate in Redland LGA was 12.6 new cases (95% CI: 10.5 – 14.8) per 100,000 persons which was statistically similar to the Queensland rate of 12.2 new cases (95% CI: 11.8 – 12.6) per 100,000 persons. The Redland LGA rate for this period was statistically similar to the rate in 2011 to 2015 of 12.2 new cases (95% CI: 10.1 – 14.6) per 100,000 persons.

In Queensland between 2010 and 2019 pancreatic cancer rates trended upwards slightly from around 11 to 12 new cases per 100,000 persons respectively. The number of new cases per year in Redland LGA was too small for accurate annual age standardised rates to be calculated.

In 2015 to 2019, pancreatic cancer incidence rates were negligible in people under the age of 45 years. Rates then increased with increasing age (Figure 64).



* rates not presented for age groups under 45 years because of low or zero counts

Figure 64: Pancreatic cancer age specific incidence rates, Redland LGA and Queensland, 2015 to 2019

Kidney cancer

The most common type of kidney cancer is renal cell carcinoma which accounts for about 90% of all cases. Usually only one kidney is affected. Kidney cancer is twice as common in men as in women, with most cases occurring in people over the age of 50[38]. Most cases have no symptoms and many are diagnosed when seeking treatment for an unrelated condition[38]. The causes of kidney cancer are unknown but risk factors include tobacco smoking, obesity, high blood pressure, kidney failure and family history[38].

In Australia in 2019 there were 944 deaths due to kidney cancer[29]. Australian annual age standardised mortality rates for kidney cancer peaked in 1991 at 4.7 deaths per 100,000 persons and since then have fallen to 3.0 deaths per 100,000 persons in 2019[29].

Between 1982 and 2017 the Australian annual age standardised incidence rate for kidney cancer increased from 6.2 to 13.2 cases per 100,000 persons[29].

Mortality

On average there were 6.4 deaths per year from kidney cancer among Redland LGA residents in the five years from 2015 to 2019. This represented 1.9% of all cancer deaths in Redland LGA in this period.

The total number of Redland LGA deaths in 2015 to 2019 was too small (<50) for an accurate annual average age standardised kidney cancer mortality rate to be calculated for this period.

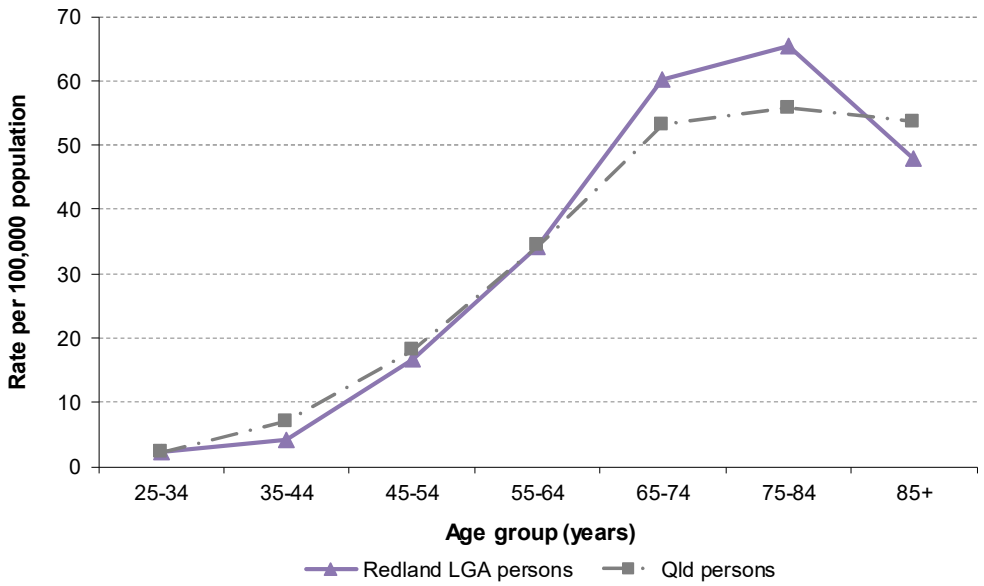
Incidence

On average there were 29 new cases per year of kidney cancer among Redland LGA residents in the five years from 2015 to 2019. This represented 2.7% of all new cases of cancer in Redland LGA in this period.

In 2015 to 2019, the average annual kidney cancer age standardised incidence rate in Redland LGA was 14.4 new cases (95% CI: 12.2 – 16.8) per 100,000 persons which was statistically similar to the Queensland rate of 14.1 new cases (95% CI: 13.6 – 14.5) per 100,000 persons. The Redland LGA rate for this period was not significantly different from the rate in 2011 to 2015 of 12.9 new cases (95% CI: 10.7 – 15.4) per 100,000 persons.

In Queensland between 2010 and 2019 kidney cancer rates trended upwards from approximately 12 to 14 new cases per 100,000 persons. The number of new cases per year in Redland LGA was too small for accurate annual age standardised rates to be calculated.

In 2015 to 2019, kidney cancer incidence rates were extremely low in people under the age of 35 years. Rates then increased with age, peaking in Redland LGA in persons aged 75 to 84 years and over, while in Queensland rates remained relatively stable in persons aged 65 years and over (* rates not presented for age groups under 25 years because of low or zero counts
Figure *65*).



* rates not presented for age groups under 25 years because of low or zero counts

Figure 65: Kidney cancer age specific incidence rates, Redland LGA and Queensland, 2015 to 2019

Cervical cancer

Cervical cancer is a growth of abnormal cells in the lining of the uterine cervix. Usually cervical cancer takes many years to develop and is preceded by abnormal changes in cervical cells[39]. The primary cause of cervical cancer is the human papillomavirus (HPV) with the primary prevention in Australia through vaccination against HPV via the National HPV Vaccination Program to prevent women being infected with cancer-causing HPV types[40]. Secondary prevention is through cervical screening through the National Cervical Screening Program (NCSP) to detect and treat abnormalities while they are in the precancerous stage[40].

Worldwide, cervical cancer is the fourth most common cancer affecting women[40]. However, the disease burden of cervical cancer is not evenly distributed across nations, as it accounts for less than 2% of all female cancers in Austlalia[40]. Diagnoses of cervical cancer in Australia have significantly reduced since the NCSP was introduced in the 1990s. The introduction of the national HPV vaccination program in 2007 and improvements to the screening program in 2017 are expected to further reduce cervical cancer rates[39].

In Australia in 2019, there were 229 cervical cancer deaths[29]. Age standardised mortality rates have decreased over time from 6.8 deaths per 100,000 females in 1971 to 1.6 deaths per 100,000 in 2019[29].

Between 1982 and 2002 Australian age standardised cervical cancer incidence rates halved from 14 to seven new cases per 100,000 females[29]. Between 2002 and 2017 incidence rates remained extremely stable at seven new cases per 100,000 females[29].

Mortality

On average there were fewer than five deaths per year from cervical cancer among Redland LGA females in the five years from 2015 to 2019. The majority (67%) of these deaths were women aged 50 to 69. In Redland LGA only 8% of deaths were women aged 30 to 49 years. The total number of cervical cancer deaths from

2015 to 2019 was too small (<50) for an accurate annual average age standardised mortality rate to be calculated for Redland LGA for this period.

Incidence

On average there were six new cases of cervical cancer per year among Redland LGA females in the five years from 2015 to 2019. The total number of new cases of cervical cancer was too small (<50) for an accurate annual average age standardised incidence rate to be calculated for Redland LGA for this period.

In Queensland between 2010 and 2019 cervical cancer rates trended upwards from approximately 8.0 to 9.4 new cases per 100,000 persons respectively. The number of new cases per year in Redland LGA was too small for accurate annual age standardised rates to be calculated.

In 2015 to 2019, cervical cancer age specific incidence rates were negligible in women under the age of 25 years. Incidence rates were highest in the age group 25 to 54 years and then generally decreased with increasing age. It is important to note however, that numbers in each age group were very small making interpretation difficult.

Cancer screening

The health burden of some cancers can be reduced by the implementation of organised, population based screening programs. Such programs involve the systematic use of a test to identify individuals who are not showing any symptoms of the disease. Screening programs are based on the understanding that the earlier most cancers, or their precursors, are detected, the greater the likelihood of a better outcome for the individual concerned[21]. Currently in Australia colorectal, breast and cervical cancers have met the criteria for approved population based screening programs.

Colorectal cancer screening

The National Bowel Cancer Screening Program (NBCSP) commenced in Queensland in 2006, providing free bowel screening to people turning 55 and 65 years. Those turning 50 and 60 years were included from July 2008 and 2013 respectively. Program expansion to implement biennial screening for those aged 50 to 74 years commenced in January 2015[41]. It has been found that NBCSP invitees (and participants) who had been diagnosed with bowel cancer had a lower risk of dying from the disease and were more likely to have less advanced bowel cancers when diagnosed than non-invitees[41]. These findings show that the national program is meeting its goal of reducing bowel cancer morbidity and mortality.

In 2019-20 the overall NBCSP participation rate in Redland LGA was 41.2% which was higher than the Queensland rate of 39% but marginally lower than the Australian rate of 41.6%[42]. Data covering the age/sex breakdown for Redland LGA for the period since the program expansion in 2015 are not available, however these data have been published for Queensland[42] and are presented in Figure 66. Queensland participation rates were higher for females than for males in all age groups (Figure 66) and participation rates increased with increasing age in both sexes. The Queensland participation rate among persons aged 70 to 74 years (53%) was considerably higher than the rate among persons aged 50-54 years (29%).

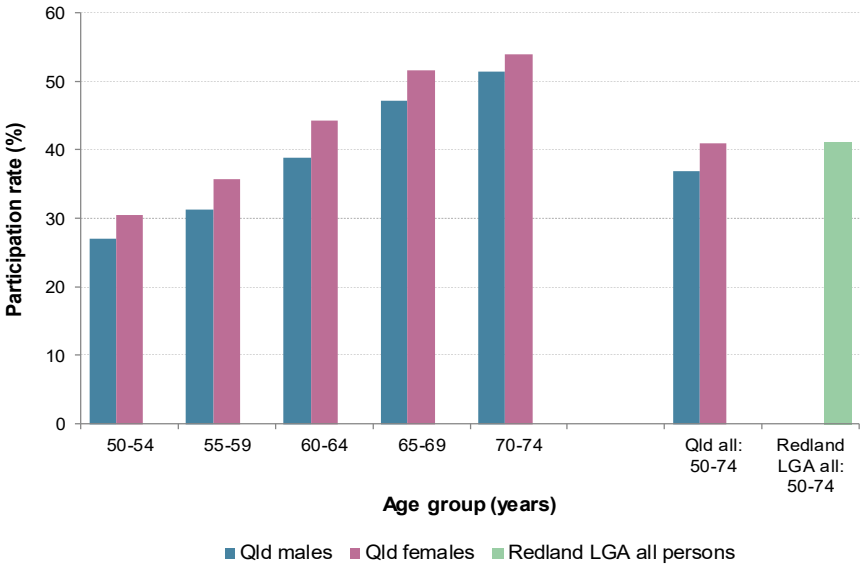


Figure 66: Crude participation rates in the National Bowel Cancer Screening Program by age and sex, Queensland, 2015-16 and all Redland LGA 50-74 years 2019-20

Between 2014-15 and 2019-20 NBCSP participation rates in Redland LGA were consistently higher than rates in Queensland (Figure 67). Rates in both Redland LGA and Queensland increased gradually from 2014-15 to a peak in 2018-19. In 2019-20, the first timepoint impacted by the COVID-19 pandemic, rates in Redland LGA dropped sharply to the lowest level since 2015-16.

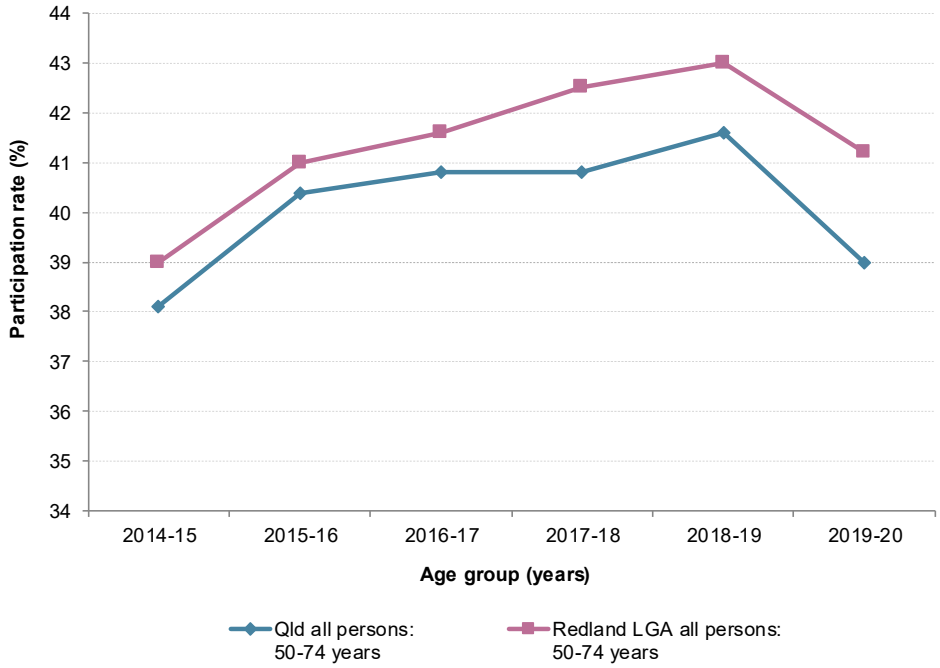


Figure 67: Crude all persons 50 to 74 years participation rates in the National Bowel Cancer Screening Program, Queensland and Redland LGA 2014-15 to 2019-20

The COVID-19 pandemic affected people's access to and use of health services such as cancer screening programs[43]. The impact varied both between and within states and across the different screening programs. In 2020 on an Australia-wide basis, no clear patterns directly correlating with the COVID-19 pandemic were evident in the data although the number of test kits returned did rise around the time that restrictions first started to ease[43]. In Queensland the number of kits returned was lowest in comparison with previous years in March, April and August of 2020[43] which were months with generally higher levels of restrictions.

Breast cancer screening

The BreastScreen Queensland Program currently recommends women aged 50 to 74 years be screened every two years[44]. Prior to July 2013, the target age group range for this service was women aged 50 to 69 years with data for the current target group available from 2014-15 onwards. Women aged 40 to 49 years and 75 years and over are also able to access free BreastScreen Queensland services but are not actively targeted[44] and are not included in the data presented in this report.

At the time of publication of this report, breast cancer screening participation data were not published specifically for local government areas such as Redland however some data are published at the Statistical

Area 3 (SA3) level. As a result some of the data presented in this section of the report are for Queensland and the Metro South Health area (MSH). MSH comprises the Logan and Redland LGAs in their entirety plus part of the Scenic Rim LGA and the section of the Brisbane LGA south of the Brisbane River. For time series purposes an approximation to Redland LGA has been created comprising the SA3s of Cleveland – Stradbroke and Capalaba. This equates to the entire Redland LGA plus the SA2 of Belmont – Gumdale.

In 2019-20 within the targeted age group of 50 to 74 years, participation in the BreastScreen Queensland program increased with increasing age, peaking in the 65 to 69 years group at 54% in MSH and 57% in Queensland (Figure 68). MSH participation rates were lower than the equivalent Queensland rates in all age groups except those aged 50 to 54 years – the youngest section of the cohort.

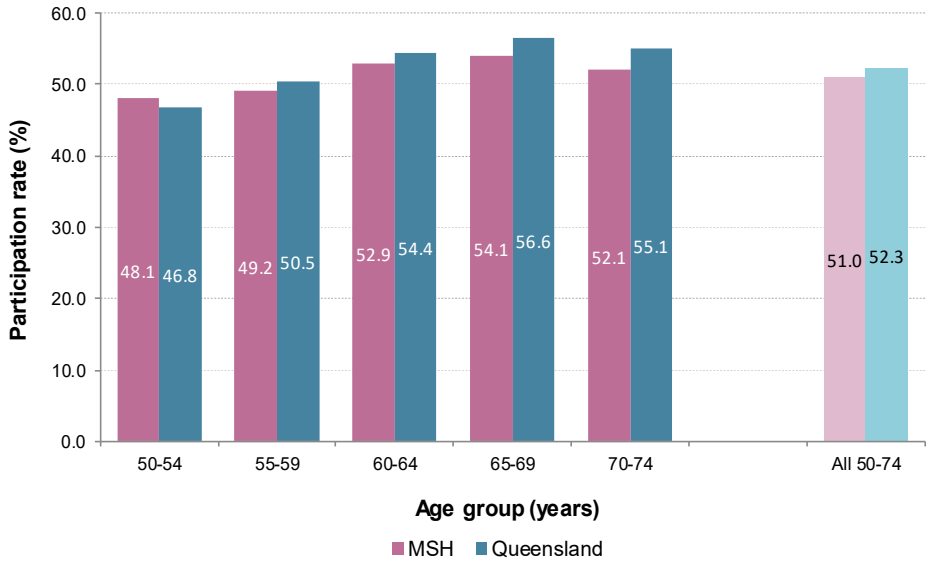
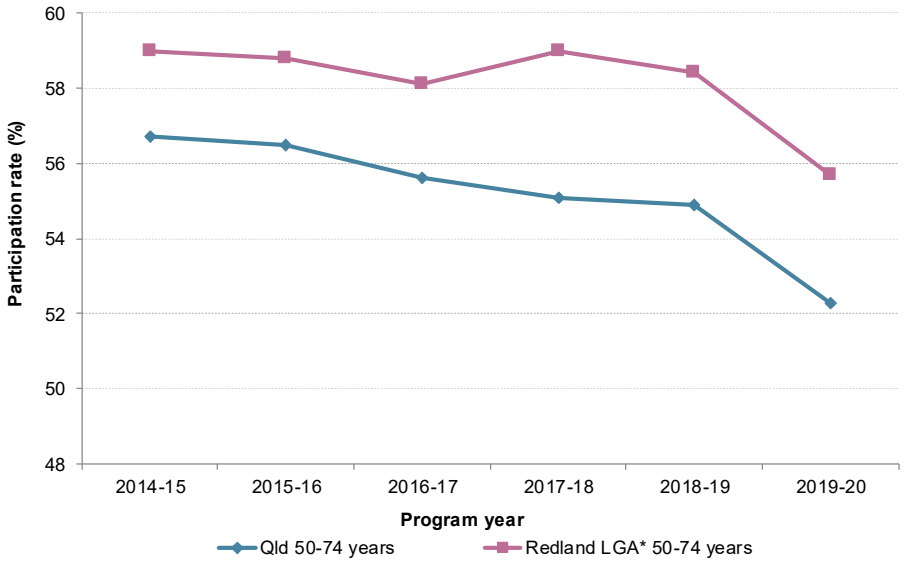


Figure 68: Crude participation rates in the BreastScreen Queensland screening program by age group, Metro South Health and Queensland, 2019-20

Between 2014-15 and 2019-20 BreastScreen Queensland participation rates in the area approximated to Redland LGA were consistently higher than the rates in Queensland, ranging between 56% and 59% (Figure 69). Rates in Queensland trended downwards over this period (Figure 69) while participation in Redland LGA (approximation) was stable. In 2019-20, the first year of the COVID-19 pandemic both Queensland and Redland LGA (approximation) experienced a sharp decrease in participation (Figure 69).

The number of screening mammograms performed through BreastScreen Australia significantly declined in March 2020 as the COVID-19 pandemic worsened and restrictions were put in place from 25 March which included a suspension of all BreastScreen services[43]. As restrictions were eased and the suspension lifted, the number of screening mammograms increased through May and June. In July to September Queensland conducted more mammograms than were conducted during the same period in 2018[43]. Younger women were found to be slower to return to screening after the restrictions were lifted[43].



* An approximation for Redland LGA comprising Redland LGA plus the Statistical Area 2 (SA2) of Belmont-Gumdale

Figure 69: Crude participation rates in the BreastScreen Queensland screening program, all persons 50 to 74 years, Redland LGA* and Queensland, 2014-15 to 2019-20

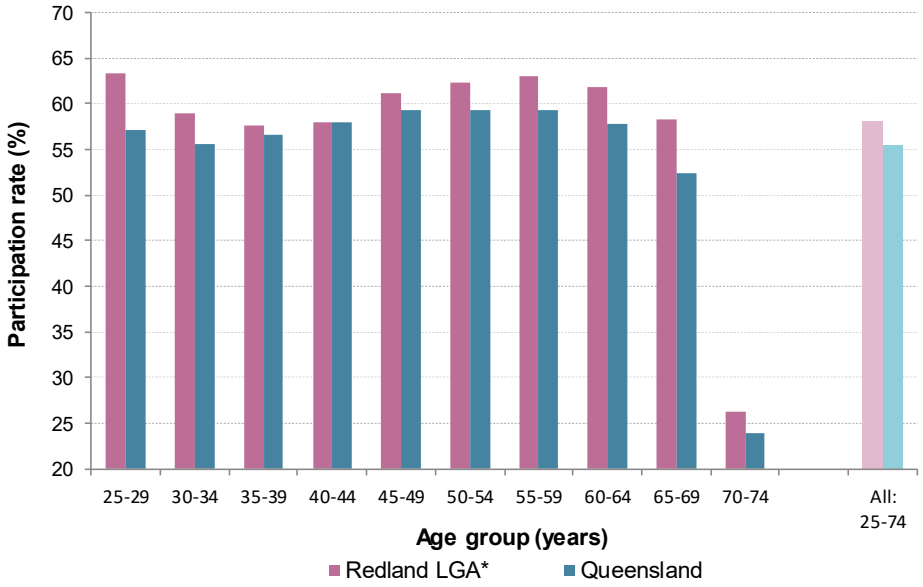
Cervical cancer screening

On 1 December 2017 a five-yearly cervical screening test (human papillomavirus [HPV] test) was introduced to replace the previously recommended two-yearly Pap test[45]. The new test is more accurate than the Pap test and is conducted every five rather than every two years[45]. The age at which screening starts was also increased from 20 to 25 years. No data are yet available about participation in the new screening program[45].

Prior to December 2017, the Queensland Cervical Screening Program recommended women aged 20 to 69 years be screened every two years. Cervical cancer is one of the most preventable cancers with just over 90% cancers occurring in women who have either never been screened or who are lapsed screening program participants[45].

At the time of publication of this report, cervical cancer screening participation data were not published specifically for local government areas such as Redland however some data are published at the Statistical Area 3 (SA3) level. For age group breakdown purposes an approximation to Redland LGA has been created comprising the SA3s of Cleveland – Stradbroke and Capalaba. This equates to the entire Redland LGA plus the SA2 of Belmont – Gumdale.

In 2018-20 in Redland LGA cervical screening program participation rates were highest in the 25 to 29 and 50 to 59 years age groups at between 62% and 64%. Redland LGA participation rates decreased with increasing age after 60 years, falling away to 26% in those aged 70 to 74 years, the group only recently recommended for screening (Figure 70).



* An approximation for Redland LGA comprising the LGA plus the SA2 area of Belmont-Gumdale

Figure 70: Crude participation rates in the National Cervical Screening Program by age group, Redland LGA* and Queensland, 2018 to 2020

Prior to the change in the Queensland Cervical Screening Program in 2018, participation in the program had fallen in Queensland from a peak of around 60% in 2007-08 to around 53% in 2015-16[11]. This decline was consistent with national findings that participation was showing a downward trend[45].

It is not possible to present time series data for the current cervical screening program because its relatively recent introduction precludes the calculation of multiple timepoints of data.

Cervical screening tests are usually conducted by a general practitioner. While GP services did continue during the COVID-19 pandemic, there was an increased use of telehealth consultations and cervical screening tests require in-person consultations[43]. It is difficult to determine the exact scale of the impact the pandemic had on cervical screening because the number of tests conducted was expected to be lower in 2020 than in 2019 due to the change from two- to five-yearly tests. Most people on a regular screening program were due for their first test of the new program in 2018 or 2019, two years after their last Pap test. Screening in 2020 mainly comprised women overdue for their first test of the new program plus those newly-screening. This makes it inappropriate to directly compare 2020 data to 2019 data[43].

Maternal and child health

Birth and fertility rates

In 2021 there were 1,736 births to 1,714 Redland LGA mothers, including 1,722 live births and 14 stillbirths. This represented a crude birth rate in Redland LGA of 51.8 live births per 1,000 women (15 to 49 years), which was marginally higher than the Queensland rate of 51.5 live births per 1,000 women. The crude birth rate in Redland LGA was statistically similar to the Queensland rate in each of the years from 2017 to 2021.

In 2021, age-specific birth rates were significantly higher in Redland LGA than in Queensland in the 25 to 34 years age groups. In all other age groups there were no significant differences between Redland LGA and Queensland. Age specific birth rates peaked in the 30 to 34 years age group for both Redland LGA and Queensland mothers in 2021 (Figure 71).

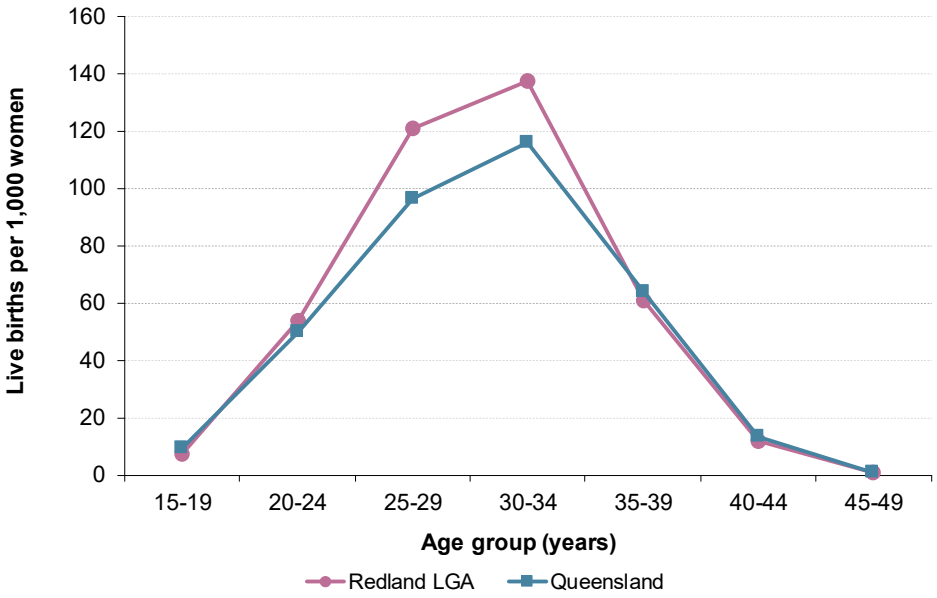


Figure 71: Age specific birth rates for Redland LGA and Queensland, 2021

Total life-time fertility refers to the total number of children an average woman can be expected to have over the course of her life-time. In 2021, the Redland LGA total life-time fertility rate was 1.96 children per female aged 15 to 49 years. This was significantly higher than the Queensland rate of 1.75 children (Table 24). In 2017 and 2018 the Redland LGA rate was also higher than Queensland but in 2019 and 2020 there were no significant differences (Table 24).

Table 24: Total life-time fertility rate per female by year for Redland LGA and Queensland, 2017 to 2021

Year	Redland LGA Rate (95% CI)	Queensland Rate (95% CI)	Statistically significant difference LGA - QLD*
2017	1.83 (1.74 – 1.92)	1.72 (1.71 - 1.73)	↑
2018	1.81 (1.72 – 1.89)	1.70 (1.69 – 1.71)	↑
2019	1.77 (1.68 – 1.85)	1.67 (1.65 – 1.68)	—
2020	1.71 (1.62 – 1.79)	1.62 (1.61 - 1.64)	—
2021	1.96 (1.87 – 2.05)	1.75 (1.73 – 1.76)	↑

* ↑ LGA statistically significantly higher than Queensland; ↓ LGA statistically significantly lower than Queensland; — no statistically significant difference between LGA and Queensland

Total life-time fertility rates trended downwards in both Redland LGA and Queensland between 2007 and 2020 before increasing significantly in 2021 (Figure 72). The sharp increase in 2021 is somewhat similar to that recorded between 2006 and 2007, although in Redland LGA the 2021 increase was extremely steep.

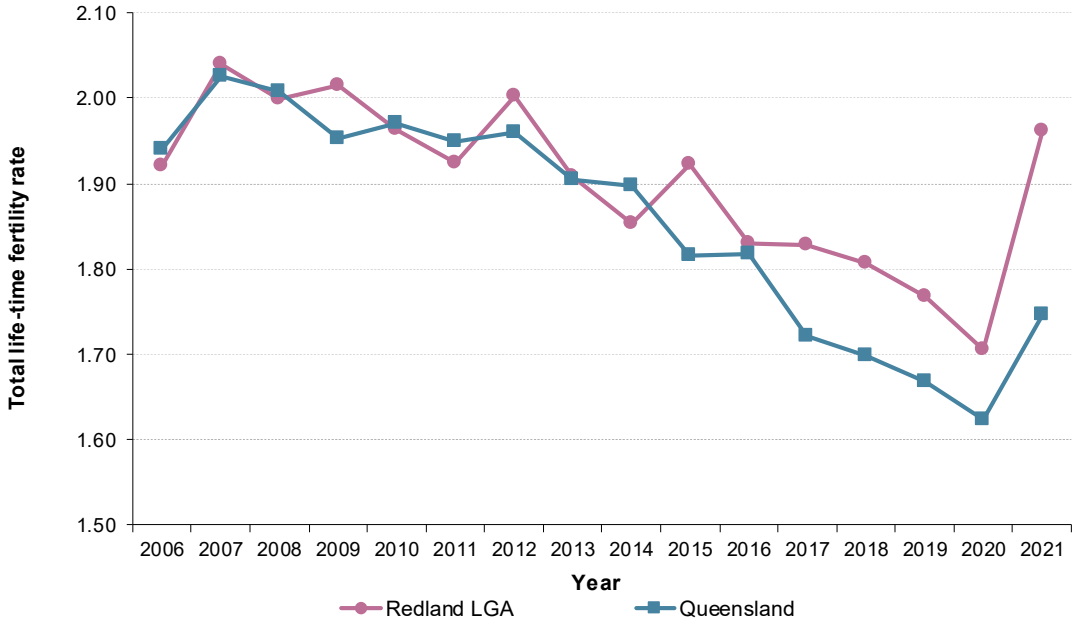


Figure 72: Total life-time fertility rates for Redland LGA and Queensland, 2006 to 2021

The increase in fertility rate recorded in 2021, during the COVID-19 pandemic was somewhat unexpected. The results of the Families in Australia Survey[46], conducted in late 2020, indicated that for around one in five women under 40, COVID-19 had impacted on their intentions of having children. The most commonly reported impacts included delaying the timing of trying to conceive, delayed access to IVF treatment and planning to have fewer children. The key reasons given for delaying or not having children were related to financial concerns, job insecurity and pandemic-related health risks. The survey found a small proportion of women did report that the pandemic brought forward their plans of having children.

The increase in birth rate seen in Queensland may be at least partly due to the lower impact of COVID-19 on the general population in 2020/2021 compared with many other states. Queensland was able to stay almost COVID-19-free through these two years, avoiding the prolonged lockdowns experienced in some other states and consequently avoided some of the more extreme financial, social and health impacts.

Maternal age

Maternal age is an important risk factor for both obstetric and perinatal outcomes. Younger and older mothers are at greater risk of adverse outcomes for both the mother and baby, including a greater risk of giving birth to a baby that is pre-term and/or of low birth weight. Babies of older mothers are more likely to be born with a chromosomal disorder and babies of teenage mothers have an increased risk of pre-term birth, low birthweight and associated complications[47,48].

The median maternal age of Redland LGA women who gave birth in 2021 was 30 years. This was the same as the median age of all Queensland mothers. Indigenous mothers from Redland LGA had a median age of 27 years which was higher than the median age of 26 years for all Queensland Indigenous mothers.

The percentage of births to young mothers (24 years and under) in Redland LGA was significantly lower than in Queensland in 2017 to 2021 (Table 25). There was no significant difference between Redland LGA and Queensland in the percentage of births to women in age groups 25 years and older (Table 25).

Table 25: Number and proportion of total births by maternal age group, Redland LGA and Queensland, 2017 to 2021

Age group (years)	Redland LGA		Queensland		Relative Risk (95% CI)	Statistically significant difference LGA - QLD*
	Total births	% of total births	Total births	% of total births		
<20	159	1.9	8,620	2.9	0.7 (0.6 – 0.8)	🡻
20-24	976	11.9	42,685	14.2	0.8 (0.8 – 0.9)	🡻
25-29	2,444	29.8	84,478	28.0	1.1 (1.0 – 1.0)	—
30-34	2,860	34.9	100,003	33.2	1.1 (1.0 – 1.1)	—
35-39	1,475	18.0	54,087	17.9	1.0 (1.0 – 1.1)	—
40-49	285	3.5	11,646	3.9	0.9 (0.8 – 1.0)	—
Total	8,199	100.0	301,519	100.0		

* 🡹 LGA statistically significantly higher than Queensland; 🡻 LGA statistically significantly lower than Queensland;
— no statistically significant difference between LGA and Queensland

In Redland LGA and all of Queensland in 2017 to 2021 the most common age for a woman to have a baby was 30 to 34 years. By comparison, for Redland LGA Indigenous women, the most common age to have a baby was 25to 29 years (Figure 73).

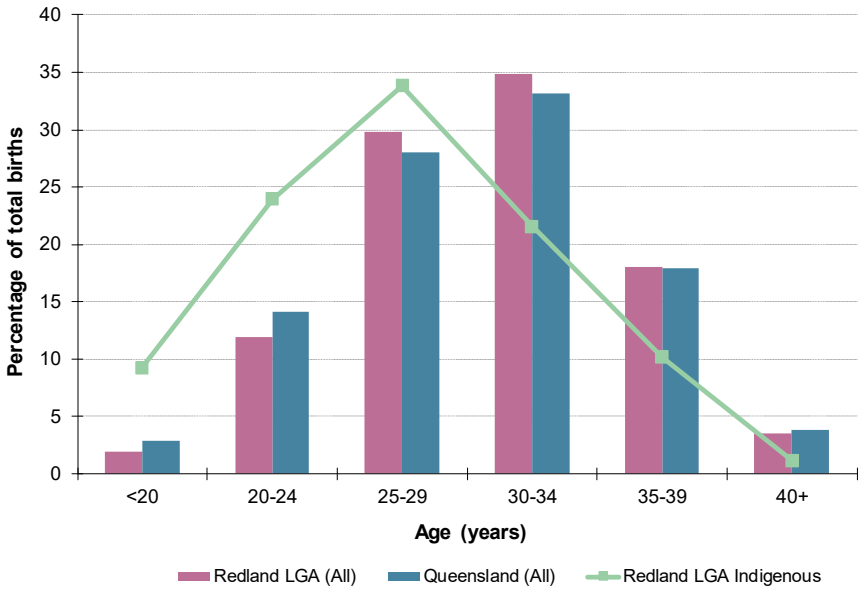


Figure 73: Percentage of total births by maternal age and Indigenous status, Redland LGA and Queensland, 2017 to 2021

In 2017 to 2021, one third (33%) of all births to Redland LGA Indigenous mothers were to women under 25 years of age. This was significantly higher than the percentage of births to women under 25 years of age in the overall Redland LGA population (14% of all births) over the same five-year period (Table 26).

Table 26: Number and proportion of total births by maternal age group and Indigenous status, Redland LGA, 2017 to 2021

Age group (years)	Redland LGA Indigenous		Redland LGA (All)		Relative Risk (95% CI)	Statistically significant difference LGA - QLD*
	Total births	% of total births	Total births	% of total births		
<20	31	9.3	159	1.9	4.8 (3.3 – 6.9)	↑
20-24	80	24.0	976	11.9	2.0 (1.6 – 2.5)	↑
25-29	113	33.8	2,444	29.8	1.1 (1.0 – 1.3)	—
30-34	72	21.6	2,860	34.9	0.6 (0.5 – 0.8)	↓
35-39	38	11.4	1,475	18.0	0.5 (0.4 – 0.7)	↓
40-49	Nil	-	285	3.5	-	-
Total	334	100.0	8,199	100.0		

* ↑ LGA statistically significantly higher than Queensland; ↓ LGA statistically significantly lower than Queensland;
— no statistically significant difference between LGA and Queensland

Maternal smoking

Smoking by mothers during pregnancy has been linked with poorer birth outcomes for both mother and baby including an increased risk of pre-term birth, low birth weight, foetal or neonatal death, ectopic pregnancy, placental complications, birth defects, lung function abnormalities and respiratory problems[47,48]. The effects of smoking during pregnancy can persist into infancy and childhood with associations found with sudden infant death syndrome (SIDS), childhood cancers, high blood pressure, obesity, asthma, lowered cognitive development and psychological problems[47,48]. Stopping smoking during pregnancy is associated with

improved health outcomes for infants and quitting within the first 20 weeks of pregnancy may result in birthweight similar to infants of non-smoking mothers[47,48].

In 2020-21, 9% of pregnant women in Redland LGA reported smoking cigarettes for all or part of their pregnancy. This was significantly lower than all of Queensland where 12% of pregnant women smoked.

In contrast over the same period, 30% of Indigenous mothers in Redland LGA reported smoking during pregnancy, significantly higher than the general prevalence of smoking in pregnancy in Redland LGA. The pattern of high rates of smoking among pregnant Indigenous women was also seen throughout Queensland where the reported prevalence was 44% in 2010-21 (Figure 74).

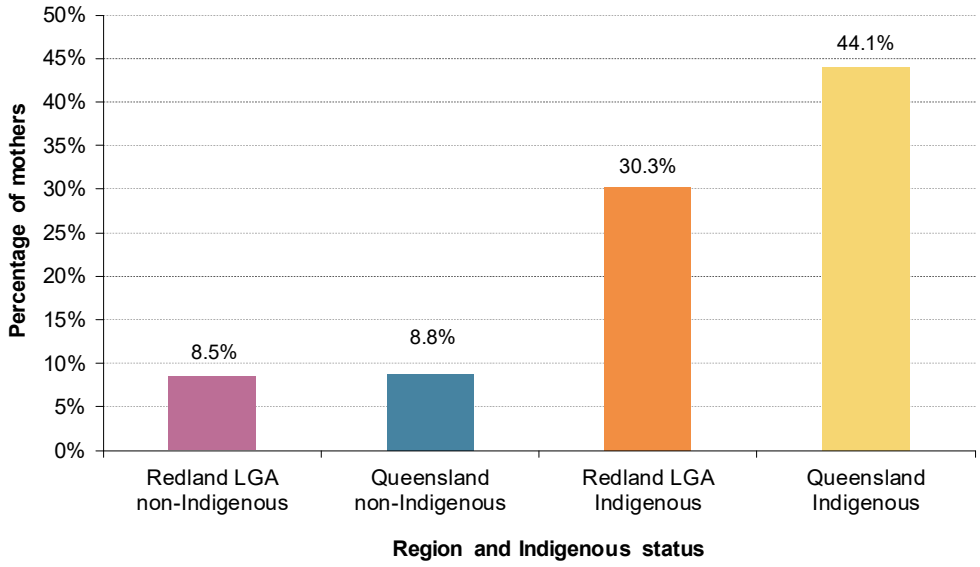


Figure 74: Percentage of mothers who reported smoking during pregnancy, Redland LGA and Queensland with Indigenous status, 2020-21

Between 2010-11 and 2017-18 reductions in rates of smoking in pregnancy were observed in both Redland LGA and Queensland[11]. The rate for all mothers in Redland LGA fell from 15% in 2010-11 to 11% in 2015-16 while in Queensland the rate fell from 17% to 12%[11]. However between 2017-18 and 2020-21 rates in Queensland have plateaued at 16%. In Redland LGA rates plateaued at 11% until 2019 and since then have fallen to 9%.

Among Indigenous mothers, the rates of smoking in pregnancy also fell between 2010-11 and 2015-16 in both Redland LGA and Queensland[11]. In Queensland the rate also plateaued after 2015-16 at around 43%. However in Redland LGA the rate has been more volatile, peaking at 36% in 2018-19 then falling to 30% in 2020-21.

Diabetes in pregnancy

Mothers with pre-existing and gestational diabetes mellitus are at an increased risk of adverse outcomes during pregnancy[49]. Mothers with diabetes and their babies are at increased risk of miscarriage, pre-term birth, pre-term induced labour, caesarean section, hypertension, longer length of stay in hospital, high birth weight, low Apgar score, high level resuscitation and admission to special care[49]. Adverse outcomes are more frequently reported among Indigenous than non-Indigenous mothers and babies[49].

In the five years from 2017 to 2021, 15.5% of mothers in Redland LGA had some form of diabetes in pregnancy including 14.7% with gestational diabetes and 0.8% with pre-existing diabetes. The proportion of mothers with gestational diabetes in Redland LGA (14.7%) was not significantly different from the proportion in Queensland (13.9%). The proportion of Redland LGA Indigenous mothers with gestational diabetes (11.6%) was also not significantly different from the prevalence in all Redland LGA mothers (14.7%).

The prevalence of gestational diabetes increased substantially between 2007 and 2021 in both Redland LGA and Queensland (Figure 75). In Redland LGA there was a 9.2 percentage point increase in prevalence over this period while in Queensland the increase was 10.0 percentage points. These increases represent an overall 161% increase in Redland LGA and 189% increase in Queensland since 2007.

Such substantial increases in prevalence of gestational diabetes indicate likely increased prevalence for many adverse pregnancy outcomes, especially if the trend towards increased diabetes prevalence remains sustained over time.

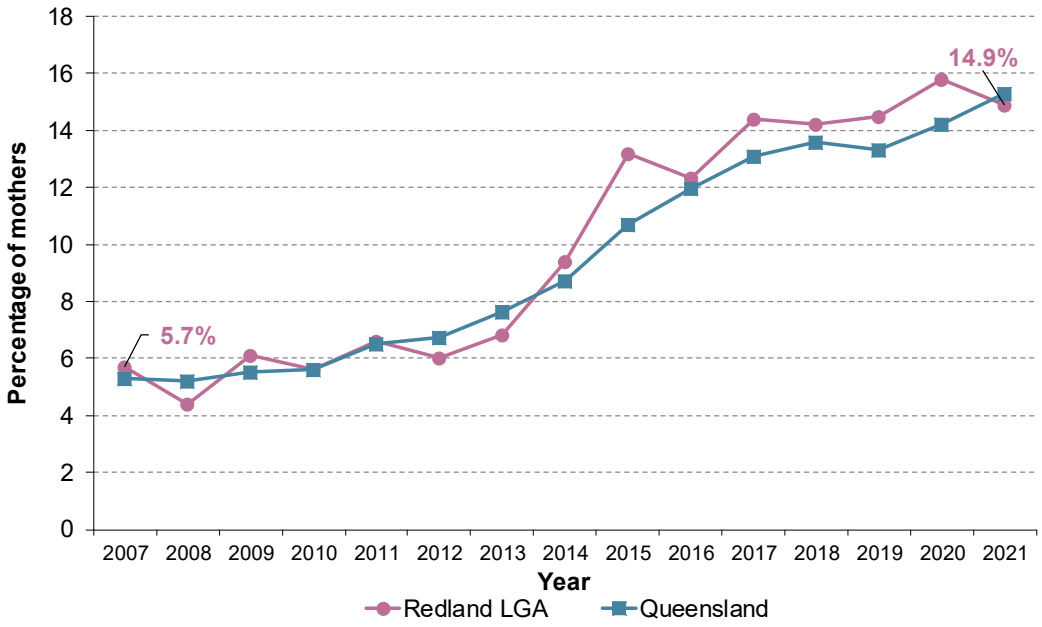


Figure 75: Percentage of mothers with gestational diabetes, Redland LGA and Queensland, 2007 to 2021

The numbers of Redland LGA Indigenous mothers with gestational diabetes were too low for single year comparisons to be undertaken. However, between the five-year periods 2012 to 2016 and 2017 to 2021 the prevalence of Indigenous gestational diabetes in Redland LGA decreased by 0.4 percentage points

while in Queensland Indigenous mothers, the prevalence increased by 4.1 percentage points (data not shown).

Birth weight

Low birth weight is a key indicator of a baby's immediate health and an important determinant of their future health. Babies with low birth weight are at greater risk of illness or death in infancy[47]. Long-term health effects can include poor cognitive development and an increased risk of developing chronic diseases such as diabetes and cardiovascular disease later in life[47]. Children born with very low birthweight are particularly at high risk of developmental difficulties and poor cognitive and motor skills[47]. There is a wide range of risk factors for low birth weight including pre-term birth, maternal age of under 16 or over 40 years, multiple pregnancy, chronic maternal conditions, exposure to indoor air pollution, maternal smoking and drug use and inadequate maternal nutrition[47].

High birthweight is also a matter of concern with evidence indicating higher birth weight was associated with increased likelihood of obesity among children aged nine to 11 years[47].

The majority of babies (83%) born to Redland LGA mothers in 2017 to 2021 were in the normal birth weight range (2,500-3,999g). Low birth weight (<2,500g) was recorded for 7% and high birth weight (4,000+g) for 10% of babies (Figure 76). The prevalence of low and high birth weight in Redland LGA was not significantly different from the prevalence in all of Queensland.

The prevalence of low birth weight among Indigenous babies (11%) in Redland LGA was significantly higher than the prevalence among all Redland LGA babies (7%). The prevalence of high birth weight among Indigenous babies in Redland LGA (8%) was statistically similar to the prevalence among all Redland LGA babies (10%).

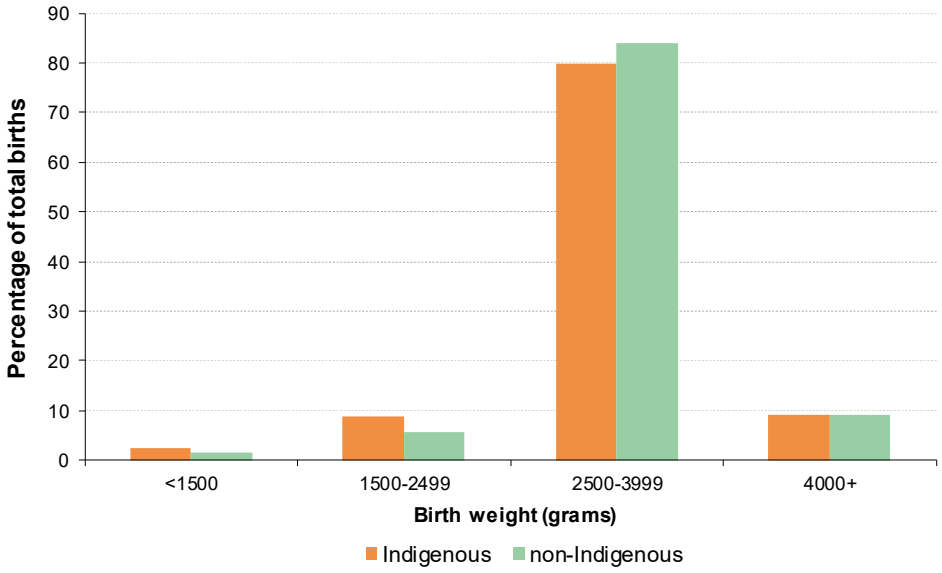


Figure 76: Percentage birth weight by Indigenous status, Redland LGA, 2017 to 2021

Infant mortality

Infant mortality rate is considered to be an important indicator of the general health and well-being of a population and provides insight into the effectiveness of the maternal and perinatal health system[47]. It is defined as the number of deaths in infants (less than one year of age) per 1,000 live births. In Queensland infant mortality rates have historically been higher for Indigenous infants compared with non-Indigenous infants[2,47].

In Redland LGA, on average there were 5.6 infant deaths per year in the five years from 2016 to 2020 (including an average of fewer than five Indigenous infant deaths per year). The overall infant mortality rate in Redland LGA (3.5 deaths per 1,000 live births) was statistically similar to the Queensland rate (4.0 deaths per 1,000 live births) over this period. Owing to the very small number of Indigenous infant deaths in the area, rates have not been calculated for Redland LGA Indigenous infants.

In 2018 the Queensland Indigenous infant mortality rate of 5.6 deaths per 1,000 live births was 51% higher than the non-Indigenous rate of 3.7 deaths per 1,000 live births[2]. The Queensland Indigenous infant mortality rate declined between 2011 and 2018 from 8.4 to 5.6 deaths per 1,000 live births. The non-Indigenous infant mortality rate also decreased over this period from 4.7 to 3.7 deaths per 1,000 live births[2].

Perinatal mortality

Perinatal mortality rate refers to stillbirths or deaths in the first 28 days of life. On average there were 13 perinatal deaths per year in Redland LGA in the five years from 2017 to 2021.

In this period, the perinatal mortality rate in Redland LGA (8.1 deaths per 1,000 births) was statistically similar to the Queensland rate (10.3 deaths per 1,000 births).

In Redland LGA the number of Indigenous perinatal deaths was too small for a reliable mortality rate to be calculated for 2017 to 2021. It is important to note that the 2017 to 2021 Queensland Indigenous perinatal mortality rate (17.4 deaths per 1,000 live births) was significantly higher than the Queensland non-Indigenous rate (9.7 deaths per 1,000 live births) for the same period.

Antenatal visits

Access to antenatal care is associated with positive health outcomes for mothers and babies. Queensland Health aims to improve the rate of attendance at antenatal visits by Indigenous mothers, closing the gap between Indigenous and non-Indigenous mothers. The key performance indicator in Queensland for Indigenous mothers is attendance at five or more antenatal visits[50].

Based on mothers who gave birth at 32 weeks gestation or later, the majority of Redland LGA mothers (97%) in 2017 to 2021 attended five or more antenatal visits over the course of their pregnancy, similar to all Queensland mothers (96%). Indigenous mothers from Redland LGA were less likely (91%) to attend five or more antenatal visits than were non-Indigenous mothers (97%) but this difference was not statistically

significant. The percentage of Redland LGA Indigenous mothers attending five or more antenatal visits has consistently increased from 82% in 2007-2010[11] to 86% in 2012-2016[11] to 91% in the current period.

Assisted conception

Assisted reproductive treatment includes artificial insemination and the use of assisted reproductive technologies. Assisted reproductive technologies involve the handling of eggs (human oocytes) and sperm or embryo to facilitate pregnancy[51]. There was a 48% increase in the use of these technologies in Australia and New Zealand in the five years from 2005 to 2009. However, from 2009 to 2010 there was a 13% decrease in the number of treatment cycles performed in Australia which coincided with a change in government funding for fertility treatment[51].

Fertility treatment can increase the risk of multiple births and therefore increase the risk of pregnancy and birthing complications, pre-term delivery and low birth weight. There have been fewer multiple gestation pregnancies in recent years due to a reduction in the number of embryo transfers during treatment[51].

There were 581 Redland LGA mothers with 610 births attributed to assisted conception in 2017 to 2021, including fewer than five stillbirths. The percentage of stillbirths was slightly higher among births resulting from assisted conception (0.7%) than in those who conceived naturally (0.6%). In this period, Redland LGA mothers who used assisted conception had a higher median age (34 years) than those who conceived naturally (30 years).

The proportion of mothers with births attributed to assisted conception was significantly higher in Redland LGA (7.2%) than in Queensland (6.0%) in 2017 to 2021 (Table 27).

Table 27: Number and percentage of mothers birthing by assisted conception, Redland LGA, and Queensland, 2017 to 2021

Assisted Conception Status	Redland LGA		Queensland		Relative Risk (95% CI)	Statistically significant difference LGA - QLD*
	Total Mothers	% of Total Mothers	Total Mothers	% of Total Mothers		
Assisted	581	7.2	17,799	6.0	1.2 (1.1 – 1.3)	↑
Not assisted	7,498	92.8	279,340	94.0	1.0 (1.0 – 1.0)	—
Total	8,079	100.0	297,139	100.0		

* ↑ LGA statistically significantly higher than Queensland; ↓ LGA statistically significantly lower than Queensland; — no statistically significant difference between LGA and Queensland

The number of Redland LGA mothers using assisted conception methods increased by 45% from 96 in 2017 to 139 in 2021. This represented an increase from 6.0% to 8.1% of all mothers.

In-vitro fertilisation (IVF) was the most frequently reported method of assisted conception (414 mothers) in Redland LGA in 2017 to 2021 and represented 55% of all births using assisted conception (Table 28). Other significant assisted conception methods included ovulation induction (133 mothers), embryo transfer (73 mothers) and artificial insemination (50 mothers).

Table 28: Percentage of total births attributed to assisted conception by method of assisted conception and year, Redland LGA, 2017 to 2021

Method*	2017	2018	2019	2020	2021	Total
In-vitro fertilisation (IVF)	44.5	55.9	60.7	55.5	58.0	55.4
Ovulation induction	27.7	13.7	15.2	18.5	16.5	17.8
Embryo transfer	6.7	11.8	9.0	11.0	9.7	9.8
Artificial insemination (AIH, AID)**	9.2	4.3	6.2	7.5	6.8	6.7
Intracytoplasmic sperm injection (ICSI)	5.9	8.7	4.8	4.8	5.1	5.9
Donor egg	4.2	4.3	4.1	2.1	4.0	3.7
Gamete intrafallopian transfer (GIFT)	1.7	0	0	0.7	0	0.4
Other unknown	0	1.2	0	0	0	0.3

* > one method per mother can be recorded
** AIH – Artificial insemination by husband; AID – Artificial insemination by donor

Chronic disease risk factors

Chronic diseases continue to be a leading contributor to disease burden across Queensland. It is estimated that 38% of the disease burden is due to modifiable risk factors and could have been avoided or reduced[52]. Behavioural risk factors such as tobacco use, overweight and obesity, physical inactivity, poor nutrition and risky alcohol consumption explain a substantial proportion of the total chronic disease burden in the population[21,52]. For example, more than two thirds of the burden of diabetes in Queensland can be attributed to the combined effect of high body mass and physical activity[21] and lung cancer is primarily caused by tobacco smoking, which also contributes to the development of a number of other cancers.

Understanding the risk factors for chronic disease and risk factor prevalence in the community is vital to interpreting chronic disease profiles and trends of these same communities[21,52]. Furthermore, monitoring health is fundamental to providing evidence-based services and strategies aimed at improving health status, now and in the future[53].

Table 29: Summary of selected behavioural and health condition risk factors for chronic disease in adults (18+ years), Redland LGA and Queensland, 2019 to 2020 or 2018 to 2019 (as available)[53]

Risk factor	Population–weighted prevalence^		Statistically significant difference LGA - QLD*#
	Redland LGA %	Queensland %	
Body mass index			
Underweight (BMI <18.5)	3.0	2.6	—
Healthy weight (BMI 18.5-<25)	36.2	37.4	—
Overweight (BMI 25-<30)	34.9	34.9	—
Obese (BMI 30+)	25.9	25.0	—
All overweight/obese (BMI 25+)	60.8	60.0	—
Smoking			
Daily smoking	7.7	10.8	—
Sunburn			
Sunburnt in last 12 months	53.9	52.5	—
Alcohol consumption##			
Lifetime risk	19.6	21.6	—
Single occasion risk – at least monthly	25.3	30.0	—
Physical activity (18-75 years)			
Sufficient activity for health benefit	51.8	58.3	🡻
Fruit and vegetable consumption			
Sufficient fruit intake (2+ serves/day)**	54.4	52.1	—
Sufficient vege intake (5+ serves/day)**	8.4	8.4	—

^ Survey data were weighted to adjust for differences between the demographic characteristics of the population and of the sample. Weighted results are considered to be an accurate representation of the demographic profile of the adult residents of LGA/Queensland

* 🡹 LGA statistically significantly higher than Queensland; 🡻 LGA statistically significantly lower than Queensland; — no statistically significant difference between LGA and Queensland

\# Based upon comparison of age standardised prevalence, not population weighted prevalence

** Data from 2018 to 2019

2009 Australian guidelines to reduce health risks from drinking alcohol

Queensland Health undertakes regular population surveys of adults (Table 29)[54] and children to determine the self-reported prevalence of a variety of behavioural and chronic disease risk factors at the state and lower geographical levels. This self-reported data is presented in this section of this report. At time of publication, data for children was not available at the LGA level.

Overweight and obesity

Unhealthy weight gain is recognised as a significant public health issue, with rates of obesity in the population increasing over several decades. The pathway to overweight and obesity is complex. The combination of multiple interactions involving genetics, diet, physical activity, social and physical environments, other health conditions and social determinants make overweight and obesity a significant public health challenge[2].

The health implications of being overweight or obese include increased risk for a range of disease groups including endocrine disorders, kidney and urinary diseases, cardiovascular diseases, musculoskeletal conditions and various cancers[52]. In 2018, overweight and obesity were estimated to account for 8.4% of the total burden of disease in Australia[52].

In 2019 to 2020, 61% of adult Redland LGA residents were overweight or obese, which statistically similar to the Queensland prevalence (60%) (Table 29). This is a slightly lower level of overweight and obesity than the 64% self-reported in Redland LGA in 2009 to 2010[54]. The prevalence of overweight and obesity in Redland LGA adults increased with age until dropping slightly in the 65 years and over age group (Figure 77).

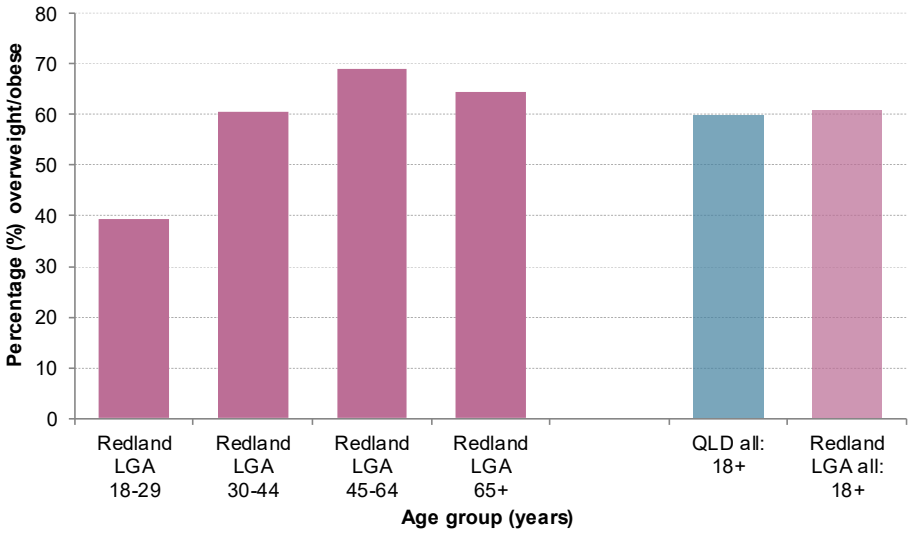


Figure 77: Percentage of overweight or obese adults (18+ years) by age, Redland LGA, 2019 to 2020

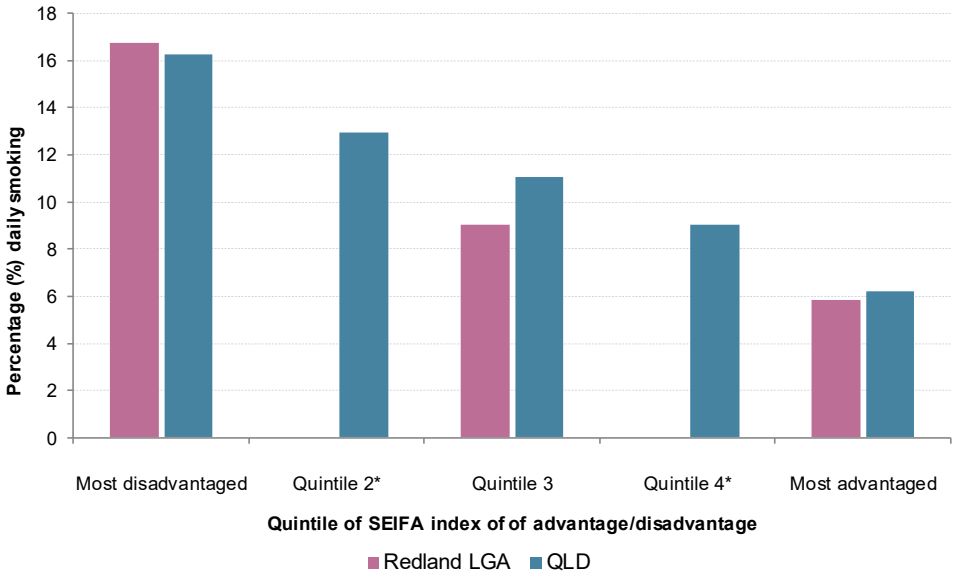
Smoking

Tobacco smoking remains the leading cause of preventable disease and death in Queensland, despite a significant reduction in smoking rates being recorded in recent decades[2]. Smoking increases the risk of various disease groups including respiratory diseases, various cancers, cardiovascular diseases, infectious

diseases, type 2 diabetes, gastrointestinal disorders, hearing and vision disorders, musculoskeletal conditions and neurological conditions[52]. In 2018, tobacco smoking was estimated to account for 8.6% of the total burden of disease in Australia[52].

In 2019 to 2020, 8% of Redland LGA adults smoked daily, which was statistically similar to the rate in Queensland (11%) (Table 29). Redland LGA recorded a four percentage point reduction in prevalence of daily smoking in the ten years between 2009-2010 and 2019-2020. Queensland experienced a five percentage point reduction over this period.

Tobacco smoking was strongly linked with socio-economic status in both Redland LGA and Queensland, with the highest rates found in the most disadvantaged areas and lowest rates in the most advantaged areas (Figure 78).



* Insufficient data for calculation of reliable estimate for quintiles 2 and 4 for Redland LGA

Figure 78: Percentage of adults who smoke tobacco daily, by socioeconomic status (SEIFA), Redland LGA and Queensland, 2019 to 2020

The use of electronic cigarettes (e-cigarettes or vapes) which heat liquid into a fine vapour that users inhale[2] is emerging as a key health issue[55]. E-cigarettes are designed to deliver chemicals via aerosol vapour directly to the lungs. The liquid solution used in them usually contains propylene glycol, glycerol and flavourings and may contain nicotine[55]. The short and long term health effects of e-cigarettes are currently being researched, and they have not been proven safe to use. In addition, studies are increasingly showing that e-cigarettes emit harmful, possibly carcinogenic substances[55].

No data are available on e-cigarette use in Redland LGA specifically, however in 2018-2019, 14% of adult MSH residents reported having used e-cigarettes on at least one occasion which was statistically similar to the Queensland prevalence of use (13%). Usage was strongly linked with age group, peaking in those aged 18 to 24 years and generally declining with increasing age (Figure 79). In 2017, 16% of Queensland

secondary school students aged 12 to 17 years reported having ever used e-cigarettes[56]. No data are available to address usage in younger children.

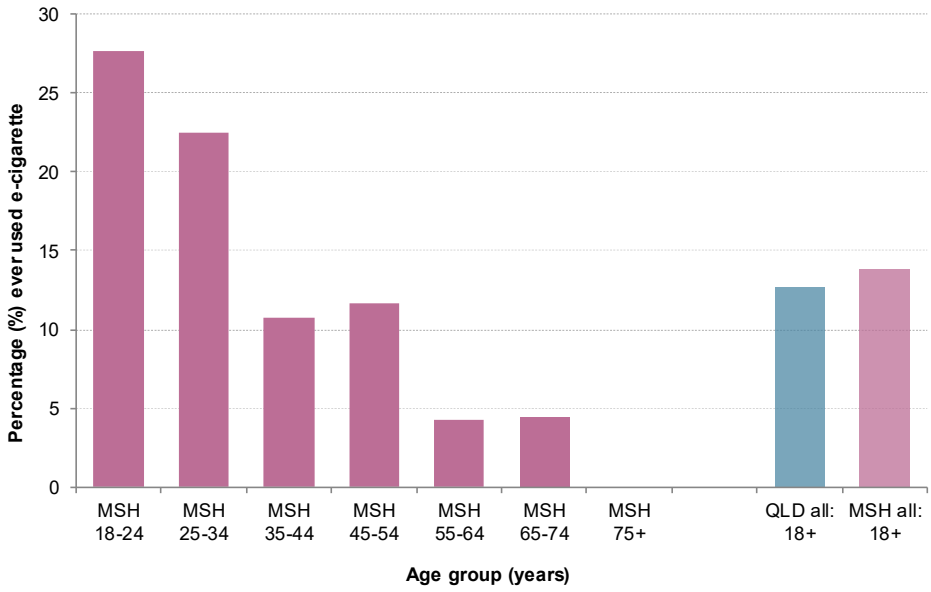


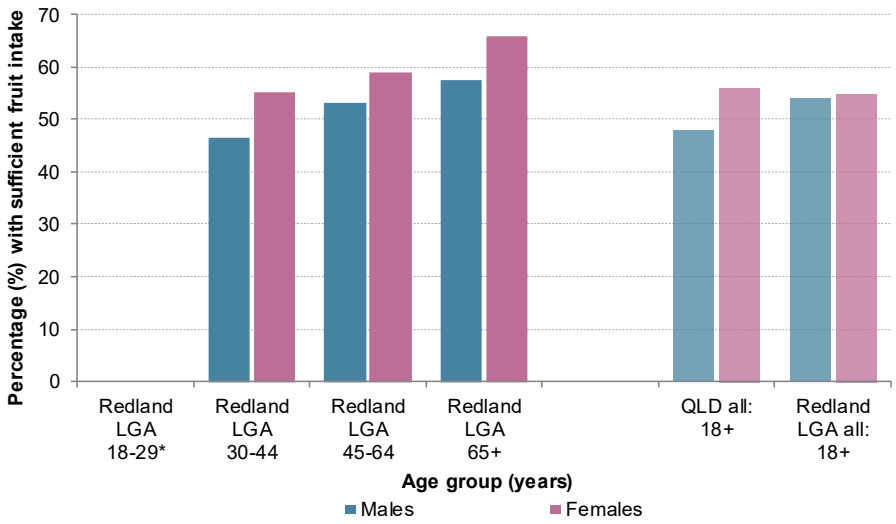
Figure 79: Percentage of adults who have ever used e-cigarettes, by age and sex, Metro South Health and Queensland, 2018 to 2019

Nutrition

Healthy eating is a challenge. While poor health cannot be attributed to a single food or nutrient, in 2018, the Australian Institute of Health and Welfare (AIHW) estimated dietary risks account for 5.4% of the total disease burden in Australia[52]. The health implications of poor diet include increased risk for disease groups, including cardiovascular diseases, type 2 diabetes and bowel and other cancers[52]. Eating a wide variety of nutritious foods from the five food groups daily (vegetables, fruit, grain, lean meat, and dairy) is recommended to promote overall health and wellbeing, reduce the risk of diet related disease, and protect against future chronic conditions[2,57]. This report focuses solely on fruit and vegetable consumption.

In 2018-19 there was no significant difference in the percentage of Redland LGA and Queensland adults who reported adequate fruit or vegetable consumption for health benefit (Table 29).

Redland LGA women (12%) were more than two times more likely than men (5%) to have sufficient daily vegetable consumption. Fruit consumption increased with increasing age (Figure 80).



* Insufficient data for calculation of reliable estimate for males and females aged 18 to 29 years for Redland LGA

Figure 80: Percentage of adults (18+ years) with sufficient daily fruit consumption, by age and sex, Redland LGA and Queensland, 2018 to 2019

Physical activity

Regular physical activity provides many benefits to both physical and mental health. It can help prevent heart disease, stroke, diabetes, hypertension, breast and colon cancer, overweight and obesity and improve mental health, quality of life and wellbeing[2]. The health impacts of physical inactivity include coronary heart disease, dementia, type 2 diabetes, bowel cancer, stroke, breast cancer and uterine cancer. In 2018, physical inactivity was estimated to account for 2.5% of the total burden of disease in Australia[52].

In 2019-2020, 52% of Redland LGA adults reported undertaking sufficient physical activity for health benefit which was significantly lower than the Queensland prevalence (58%) (Table 29). Sufficient physical activity in Redland LGA increased with age until dropping in the 65 to 75 years age group (Figure 81).

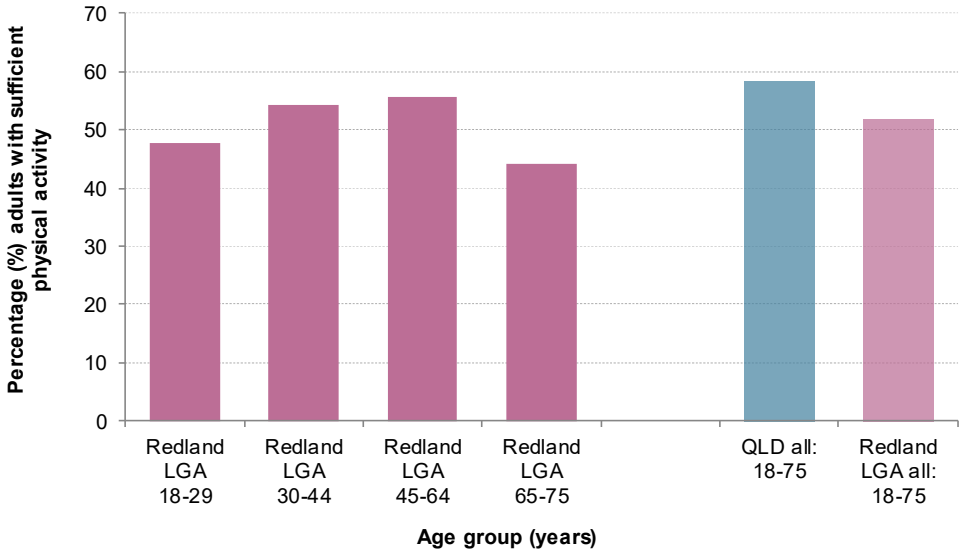


Figure 81: Percentage of adults (18-75 years) who undertook sufficient physical activity for health benefit in the last week, by age, Redland LGA and Queensland, 2019 to 2020

Alcohol consumption

The National Health and Medical Research Council (NHMRC) recently reviewed the health effects of alcohol consumption in Australia[58]. The review found increased evidence of relationships between alcohol consumption and the risk of cancers including breast, liver, pancreatic, colorectal, oesophageal, mouth and throat cancers[58]. Evidence of any protective effects of low-level alcohol consumption weakened[58].

The health impacts of alcohol consumption include multiple injury types (predominantly road traffic, suicide and self-inflicted injuries), chronic liver disease, liver cancer, seven other cancers and coronary heart disease[52]. In 2018, alcohol consumption was estimated to account for 4.5% of the total burden of disease in Australia[52].

In 2019-2020, Redland LGA adults (25%) were statistically similarly likely as Queensland adults (30%) to report single occasion alcohol consumption that was risky (at least monthly). They were also similarly likely to report alcohol consumption that was risky over the lifetime (Table 29).

In 2019-2020, Redland LGA men (24%) were not significantly more likely than women (16%) to report lifetime risky levels of alcohol consumption. Similarly single-occasion risky drinking was not statistically significantly different between males (28%) and females (23%) in Redland LGA.

Sun safety

Sun exposure is a risk factor for future skin cancer[2].Differences in ultraviolet exposure (chronic or intermittent) and age at which melanoma occurs both influence disease development[2]. Sunburn frequency, especially in childhood, increases the risk of melanoma[2]. In 2018, high sun exposure was estimated to account for 0.7% of the total burden of disease in Australia[52].

In 2019-2020, there was no significant difference in the prevalence of being sunburnt in the previous 12 months between Redland LGA adults (54%) and Queensland adults (53%) (Table 29). Sunburn prevalence peaked in the 18 to 44 years age groups at over 70% and then decreased with increasing age, falling to below 20% in adults over 65 years.

Definitions

Age specific rate: A rate reported for a specific age group. Age specific rates are calculated by dividing the number of events (e.g. deaths) occurring in a specific age group by the corresponding population in the same age group.

Age standardisation: A method used to convert the age structures of different populations to the same 'standard' structure. If there are more older people in a Hospital and Health Service area compared with the Queensland average, then we would expect the crude rates of many diseases associated with ageing to be higher in that Hospital and Health Service. Standardisation allows comparison of disease rates between populations by removing the influence of age.

Avoidable deaths: According to the Australian Bureau of Statistics, 1370.0 - Measures of Australia's Progress 2010, a potentially avoidable death is one that theoretically could have been avoided, given our current understanding of the cause of the death, and assuming the adoption of available disease prevention initiatives (such as screening for early detection) and the use of available health care (surgery, chemotherapy etc). Conversely, an example of an unavoidable death is one from dementia, where no substantial gains are currently available through primary, secondary or tertiary prevention with current medical knowledge.

Confidence intervals: Usually expressed as 95% CI, this means we can be 95% confident that the true value of interest lies within the confidence intervals given. We do not usually know what the true value is as we can only estimate it from observations taken from samples. For example, if the mortality rate is 3.1 per 100,000 (95% CI: 2.9-3.2), we can be 95% confident that the true rate will be between 2.9 and 3.2, and our best estimate is 3.1 per 100,000.

Crude rates: A crude rate is the number of events (deaths, hospitalisations, newly diagnosed cancer cases) from a specific cause over a specified period of time (usually per year) divided by the total population. For example, a crude hospital separation rate is defined as the number of persons who completed an episode of hospital care within a specified time divided by the total population.

Crude birth rate: The crude birth rate is the number of live births registered during the calendar year per 1,000 of the estimated resident population (ERP) of women aged 15 to 49 years, as at 30th June of that year.

Estimated resident populations (ERPs): These are the official estimates of the Australian population, which link people to a place of usual residence within Australia. The Australian Bureau of Statistics defines 'usual residence' as the place where each person has lived or intends to live for six months or more from the reference date for data collection.

Hospital separations: These are episodes of hospital care which can be a total hospital stay (from admission to discharge, transfer or death) or a portion of a hospital stay ending in a change of status (for example, when a patient moves from acute care to rehabilitation). Therefore, there may be more than one episode of care within the one hospital stay, in which case separate episodes of care are counted.

Incidence: A measure of the risk of developing a disease or condition within a specified period of time. Incidence refers to new cases of disease occurring within a specified time period divided by the population at risk. For example, if a population initially contains 100,000 non-diseased persons and 1,000 get the disease in a year, the incidence rate is 1,000 per 100,000 in that year (1%).

Infant mortality rate: The number of deaths in children younger than one year of age in any calendar year per 1,000 live births in the same year.

Perinatal mortality: The number of deaths in babies who die in the perinatal period, expressed as a rate per 1,000 live births. The perinatal period includes the period from birth to the 28th day of life.

Prevalence: Prevalence is the proportion of a population that has a disease or condition at a given point in time. It is usually expressed as a percentage where the number of events is the numerator and the population at risk is the denominator. Therefore if 10,000 people have diabetes in a total population at risk of 100,000, then the prevalence of diabetes in that population at that time is 1 in 10, or 10%.

P value: By convention, a P value of 0.05 or less is usually considered ‘statistically significant’. That is, if the P value is less than 0.05, there is a less than one in 20 chance that the observed difference would have arisen by chance alone. When comparing rates between a Hospital and Health Service area and Queensland, if the P value is <0.01, this is often referred to ‘highly significant’ because the probability that the observed difference is due to chance alone is less than one in 100.

Relative risk: The ratio of the probability of an event occurring (death, disease) among those exposed to a risk factor compared to those not exposed. It is calculated by dividing the incidence rate in the exposed group by the incidence rate in the non-exposed group. A relative risk of 1.0 means there is no difference in risk between the two groups.

Standardised mortality or separation ratio (SMR or SSR): The SMR or SSR gives a measure of the excess or reduction in mortality/separations in the HHS compared to Queensland. The SMR or SSR is the ratio of the observed number of events (deaths, hospitalisations) in a population (e.g. MSH) to the expected number of events in the standard population (Queensland). Ratios between an area and Queensland are reported as indicating a statistically significant difference if the 95% confidence interval does not include 1.00. For example, if the SMR is 1.22 (95%CI: 1.10 – 1.30) then the ratio indicates that the average mortality or separation rate in the area is 22% higher than in Queensland and that the difference was statistically significant because the 95% CI does not include 1.00.

Statistical significance: A statistical test that provides us with information on whether an observed difference or association is unlikely to be due to chance alone (See P value). If it is unlikely to be due to chance alone it is deemed to be 'statistically significant'. However, it is important to note that statistical significance does not necessarily mean that an observed effect or difference is 'real', because by chance alone one in 20 'significant' findings will be spurious (where P=0.05). Also 'statistical significance' does not necessarily mean clinically significant. It is the size of the effect that determines the clinical or public health importance, not the presence of statistical significance alone.

Total fertility rate: The total fertility rate (TFR) refers to the average number of children that would be born per woman if all women lived to the end of their childbearing years and bore children according to the relevant age specific fertility rate at each year of their age. This is a more direct measure of the level of fertility than the crude birth rate, since it refers to births per woman.

List of figures

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