Metro South Health

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Metro South Public Health Unit

Health Indicators Report:

Metro South Health

V1.0 Date: 25 November 2022

ICARE² values

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Queensland Government

Suggested citation:

Department of Health. *Health Indicators 2022: Metro South Health*. Brisbane 2022.

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Published by the State of Queensland (Metro South Health), November 2022

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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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Metro South Health at a glance

MSH population

- In 2020, estimated resident population: 1,205,022 people
- Represents 23% of the Queensland population
- By 2041, projected increase by 35%: 1,628,697 people
- Largest percentage increase in residents 80+ years
- By 2041, there will be over 100,000 residents 80+ years

Key MSH health stats

- 590,243 hospital separations per year for all causes
- 42,189 potentially preventable hospitalisations (PPH)
- 6,289 deaths per year from all causes
- 1,155 deaths per year classed as avoidable
- 5,998 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
- Sharp reduction in hospitalisation rates for respiratory conditions owing to pandemic control measures
- Hospitalisations for anxiety & depression fell while self-inflicted injury rose sharply, particularly in young people
- Participation in bowel and breast cancer screening fell
- Substantial increase in birth rate in 2021

Areas of health success for MSH

Hospitalisations

- Overall PPH rate lower than Queensland
- Hospitalisation rate for diabetes lower than Queensland

Deaths

- Avoidable mortality rate lower than Queensland
- Death rates for coronary heart disease (CHD) and stroke trending strongly downward
- Death rate for suicide lower than Queensland

Cancer

- Overall cancer incidence rate lower than Queensland
- Incidence rates of prostate, melanoma and colorectal cancers decreasing
- Lung cancer death rate in men decreasing strongly

Risk factors

- Adult smoking rates decreasing
- Smoking in pregnancy below 10%
- Adults less likely to drink at risky levels than Queensland

Specific health challenges for MSH

Hospitalisations

- Diabetes complications account for 30% of PPHs, with rate higher than Queensland
- Overall hospitalisation rate (for all causes) increasing
- Stroke hospitalisation rate higher than Queensland
- Female anxiety & depression hospitalisation rate higher than Queensland
- Diabetes, falls, road transport injuries, arthropathies, anxiety & depression and self-inflicted injury hospitalisation rates all increasing

Deaths

- CHD death rate higher than Queensland

Cancer

- Incidence rates for haematological, liver and pancreatic cancers increasing

Risk factors

- Cancer screening rates lower than Queensland
- Breast screening participation declining
- 40% of Indigenous mothers smoked during pregnancy
- Gestational diabetes prevalence tripled over the last 14 years to 17%
- Over half of adults (58%) are overweight or obese
- 1 in 4 children (5 – 17 years) are overweight or obese
- Key emerging issue – short and longer term health effects of e-cigarettes use, particularly in young people

Broad future challenges for MSH

Continuing to provide quality healthcare when:

- MSH population is rapidly ageing
- Hospitalisations are increasing, especially in conditions associated with ageing (e.g. diabetes, falls, arthropathies, COPD, mental health conditions)
- Many modifiable chronic disease risk factors remain high and likely will contribute to high hospitalisation rates
- Cancer screening rates are declining

Conditions presenting specific challenge:

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

Executive summary

Health Indicators 2022: Metro South Health describes the health status of the Metro South population and identifies important and emerging health issues. This report focuses 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.

Main findings

Demographics

As at 30 June 2020, Metro South Health (MSH) had an estimated resident population of 1,205,022 people, representing 23% of the Queensland population. Compared with Queensland as a whole, MSH had a larger proportion of younger adults (20 to 39 years of age) and a smaller proportion of older people (50 years and over). In 2020, Indigenous people represented an estimated 2.6% of the population in MSH, compared with 4.4% in the Queensland population.

It is projected that the overall population of MSH will increase by about 35% between 2020 and 2041, slightly below the projected state average increase of 38%. The largest percentage increase in MSH (164%) is expected in the 80 years and over age group. By 2041 it is projected that there will be over 100,000 MSH residents aged 80 and over. 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 590,000 hospital separations for all causes per year in MSH residents in the three years to 2020/21. MSH separation rates were significantly higher than Queensland rates for the categories of asthma, stroke, heart failure (females only), all mental health conditions (females only), anxiety & depression (females only) and self-inflected injury (young males only).

Hospital separation rates were significantly lower in MSH residents compared with Queensland for arthropathies and systemic connective tissue disorders, chronic obstructive pulmonary disease (COPD), influenza & pneumonia, coronary heart disease, heart failure (males only), diabetes and road transport injury (males only).

In MSH over the past ten years, hospital separations rates trended upwards for all causes and for the subcategories of diabetes, falls, road transport injuries, all mental health conditions and self-inflicted injury (especially among young people aged 15 to 24 years).

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 for the respiratory conditions asthma, chronic obstructive pulmonary disease (COPD) and influenza & pneumonia. The pandemic appears to have had no consistent or appreciable effect on separation rates

for diabetes or cardiovascular disease conditions (coronary heart disease, stroke, heart failure). Separation rates for anxiety & depression fell during the pandemic period while those for self-inflicted injury rose sharply, particularly in young people (15 to 24 years). 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.

Potentially preventable hospitalisations (PPH)

In 2020/21 there were just over 42,000 hospitalisations of MSH residents classified as 'potentially preventable'. The rates of all PPHs combined and the sub-categories of all acute and all chronic PPHs were significantly lower in MSH residents than in Queensland. However, the PPH rate for vaccine preventable diseases was significantly higher in MSH residents than in Queensland.

Overwhelmingly the condition with the highest rate of PPH in MSH residents was diabetes complications which represented almost one in three of all PPHs in MSH residents.

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 6,289 deaths from all causes per year in MSH residents in the three years to 2019. The death rate due to coronary heart disease was significantly higher in MSH residents compared with Queensland. However death rates due to heart failure (males only), road transport injury (males only), all mental health conditions (females only) and suicide (males only) were all significantly lower in MSH than in Queensland.

MSH mortality rates for coronary heart disease, stroke and diabetes in females all trended downwards while rates for road transport injury and all mental health conditions (combined) trended upwards.

In 2016-19 there was an average of 1,155 deaths per year which were classified as 'avoidable' among MSH residents. The age standardised avoidable mortality rate in MSH 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 MSH-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 5,998 new cases of cancer and 1,789 cancer deaths per year in MSH residents in 2015 to 2019. Over this period, the age standardised death rate for head & neck cancer was significantly lower in MSH residents than in Queensland. Death rates for all other major cancer types in MSH were similar to Queensland rates.

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

Lung cancer death rates among MSH males trended strongly downwards between 2002 and 2019 while rates in females were relatively steady.

In 2015 to 2019, age standardised rates of new cancer cases (incidence) were significantly lower in in MSH residents than in Queensland for all cancers combined, and separately for prostate, melanoma, and head & neck cancers. The incidence rate of endocrine cancer was significantly higher in MSH than in Queensland. Of the new cancers diagnosed in MSH residents in this period, the most common was prostate cancer (13% of all new cases), followed by female breast (13%), melanoma (13%), haematological (12%) and colorectal (11%) cancers.

MSH incidence rates of prostate, melanoma and colorectal cancers trended downwards between 2010 and 2019, while haematological, liver and pancreatic cancers all trended upwards.

Cancer screening

In 2019-20 the National Bowel Cancer Screening Program participation rate in MSH (37.5%) was lower than the Queensland rate (39%). Program participation rates increased with increasing age and were consistently higher in women than in men. Participation rates in both MSH and Queensland trended upwards between 2014-15 and 2018-19.

In 2019-20 the BreastScreen Queensland participation rate in MSH (51.0%) was lower than the Queensland rate (52.3%). Participation rates generally increased with increasing age but peaked in the 65 to 69 years group. Participation rates trended downwards between 2014-15 and 2019-20.

In 2018-20 the MSH cervical screening participation rate (55.8%) was comparable with the Queensland rate (55.5%). The screening program changed in 2018, with times series data not yet available. Prior to the program change participation rates were trending downwards in MSH, Queensland and nationally.

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 MSH 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 difficult to determine the exact scale of the impact of the pandemic on cervical screening because of the recent changes to the program.

Maternal and child health

In 2021 there were 15,643 births to 15,435 MSH mothers. The total life-time fertility rate per MSH female aged 15-49 years (1.68 births per woman) was significantly lower than the Queensland rate. Total life-time fertility rates fell consistently between 2007 and 2020 with a substantial increase recorded in 2021.

The overall median maternal age in MSH in 2021 was 31 years while the median MSH Indigenous maternal age was 26 years.

In 2020-21, 9% of pregnant women in MSH reported smoking cigarettes for all or part of their pregnancy (significantly lower than the Queensland prevalence of 12%). However, 40% of Indigenous MSH mothers smoked during pregnancy.

The prevalence of gestational diabetes more than tripled in MSH in the 14 years from 2007 (5%) to 2021 (17%). This substantial increase indicates a likely increase in related adverse pregnancy outcomes, especially if the trend is sustained over time.

The infant mortality rate (representing deaths in the first year of life) in MSH (4.2 deaths per 1,000 live births) was statistically similar to the Queensland rate in 2016 to 2020 (4.0 deaths per 1,000 births).

The perinatal mortality rate (representing stillbirths and deaths in the first 28 days of life) in MSH (10.6 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 MSH 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 58% of adult MSH residents were overweight or obese (self-reported data), 10% reported being daily smokers, and more than half (56%) reported doing sufficient physical exercise for health benefit. Over half (51%) reported having an adequate fruit intake while only 8% reported an adequate vegetable intake. Half (50%) of MSH adults reported being sunburnt in the last 12 months which was significantly lower than the prevalence in Queensland (53%).

In 2019 to 2020 one in four (25%) MSH children (5 to 17 years) were reported to be overweight or obese and less than half (45%) did sufficient physical activity for health benefit. The majority of children had an adequate fruit intake (69%) but only 3% ate sufficient vegetables. In 2018 to 2019, 42% of MSH children had been sunburnt in the last 12 months which was significantly lower than the Queensland prevalence (49%).

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 MSH.

Introduction

The aim of this report is to examine the health status of people living in the geographical area covered by Metro South Health (MSH) which is the major provider of public health services, and health education & research, in the Brisbane south-side regions of Logan, Redlands and Scenic Rim.

Metro South Health is one of 16 hospital and health services in Queensland and serves an estimated population of over 1.2 million people, representing 23 per cent of Queensland's population. MSH employs more than 13,500 full-time equivalent (FTE) staff and has annual operating revenues of $2.776 billion.

The health service's catchment spans 3,856 square kilometres and covers the area from the Brisbane River in the north to Redland City in the east, south to Logan City and the eastern portion of the Scenic Rim to the border of New South Wales.

Metro South Health is made up of five major hospitals in addition to a number of community health centres throughout the region.

Metro South Health hospitals

- Beaudesert Hospital
- Logan Hospital
- Princess Alexandra Hospital (PA)
- Queen Elizabeth II Jubilee Hospital (QEII)
- Redland Hospital

Major community health centres

- Beenleigh Community Health Centre
- Browns Plains Community health Centre
- Eight Mile Plains Community Health Centre
- Inala Community Health Centre
- Logan Central Community Health Centre
- Logan Central Community Mental Health Centre
- Logan Healthcare Centre, Meadowbrook
- Marie Rose Centre Dunwich
- Redland Health Service Centre, Cleveland
- Southern Queensland Centre of Excellence, Inala
- Woolloongabba Community Health Centre
- Wynnum-Manly Community Health Centre (Gundu Pa)

Specialty services

Metro South Health delivers a full suite of specialty services, including:

- acute medical
- acute surgical
- addiction and mental health
- acquired brain injury
- cancer services
- cardiology
- emergency medicine
- gastroenterology
- obstetrics and gynaecology
- older persons
- paediatrics
- palliative care
- rehabilitation
- renal
- spinal injury
- trauma
- transplantation

Health services delivered in the community include:

- Aboriginal and Torres Strait Islander Health
- community addiction and mental health services
- BreastScreen Queensland
- chronic disease management
- community rehabilitation
- hospital avoidance and substitution services
- maternity
- offender health
- oral health
- palliative care
- persistent pain
- refugee health
- residential aged care

Education and research

Metro South Health is committed to strong undergraduate and post-graduate teaching programs in medicine, nursing and allied health with linkages to the University of Queensland, Queensland University of Technology, Griffith University, and several other academic institutions.

Metro South Health is internationally recognised as a leader in biomedical and clinical research. Princess Alexandra Hospital is home to the Translational Research Institute (TRI) - a world class medical research facility housing over 700 researchers from four of the country's pinnacle institutions. The Hopkins Centre: Research for Rehabilitation and Resilience is a joint initiative of Griffith University, Metro South Health and the Motor Accident Insurance Commission.

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

Metro South Health (MSH) is situated in the south-east corner of Queensland, covering 3,856 square kilometres from the Brisbane River in the north to Redland City in the east, and through Logan City and Scenic Rim Regional Council to the border of New South Wales in the south-west. It encompasses the local government areas (LGAs) of Brisbane (south of the Brisbane River only), Logan, Redland and part of Scenic Rim, specifically the Statistical Area Level 2 (SA2) of Beaudesert (Figure 1).

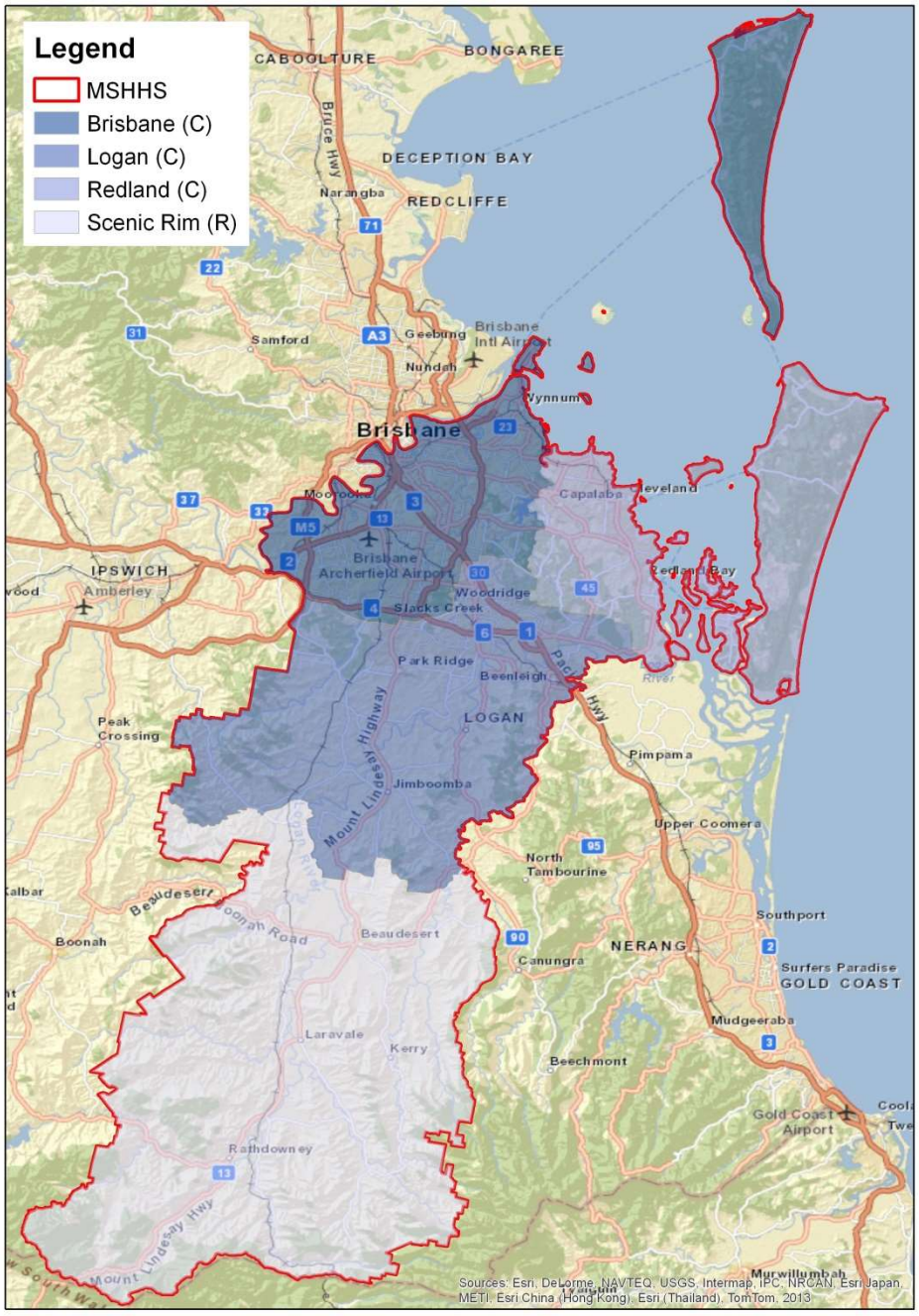


Figure 1: Map of Metro South Health showing local government areas within the MSH boundary

Demographics

The estimated resident population of MSH as at 30 June 2020 was 1,205,022 persons, representing 23% of the Queensland population. Compared with Queensland, MSH had a larger proportion of younger adults (20 to 44 years of age), and a smaller proportion of older persons (50 years and over) (Figure 2). Figure 3 shows a population pyramid for MSH, as at 30 June 2020.

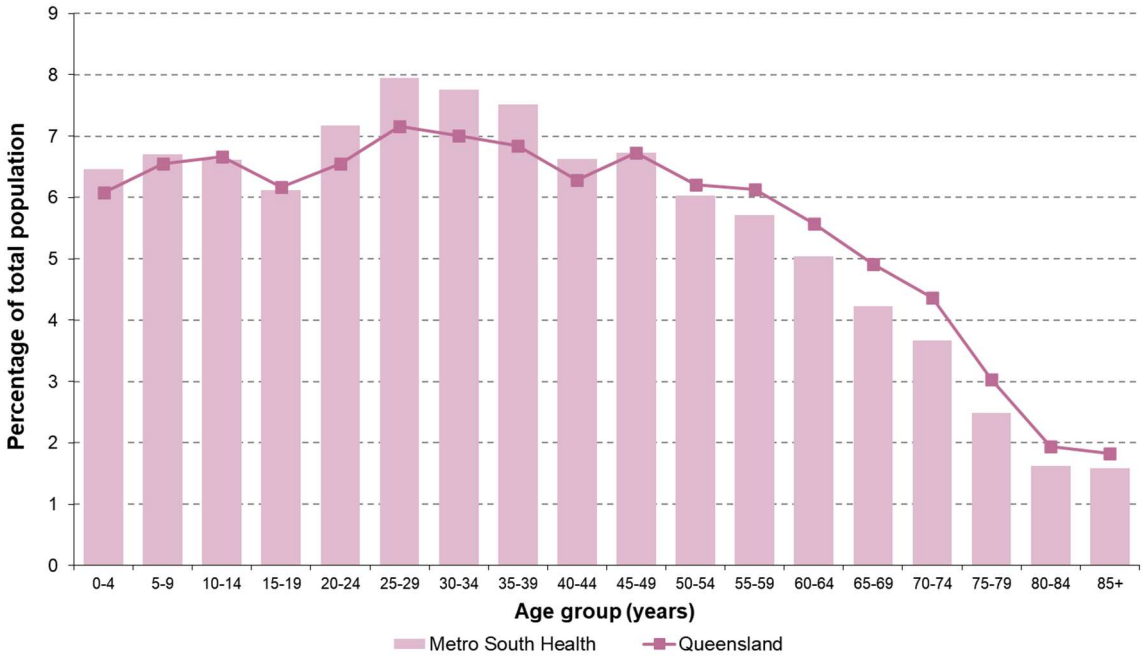


Figure 2: Percentage of total estimated population by age group, Metro South Health and Queensland, 30 June 2020

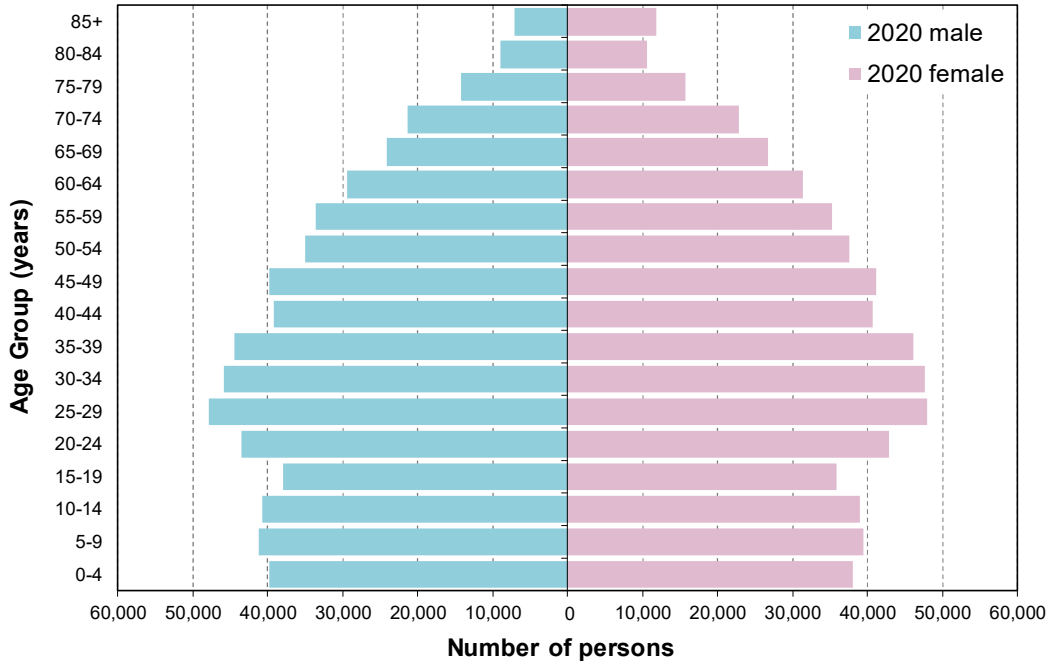


Figure 3: Estimated resident population by age group and sex, Metro South Health, 30 June 2020

Indigenous people represented an estimated 2.6% of the population of MSH, compared with 4.6% of the Queensland population in 2020. The Indigenous population of MSH 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 MSH (Figure 4). It is to be noted that Indigenous population estimates should be interpreted with caution as they are likely to be underestimates.

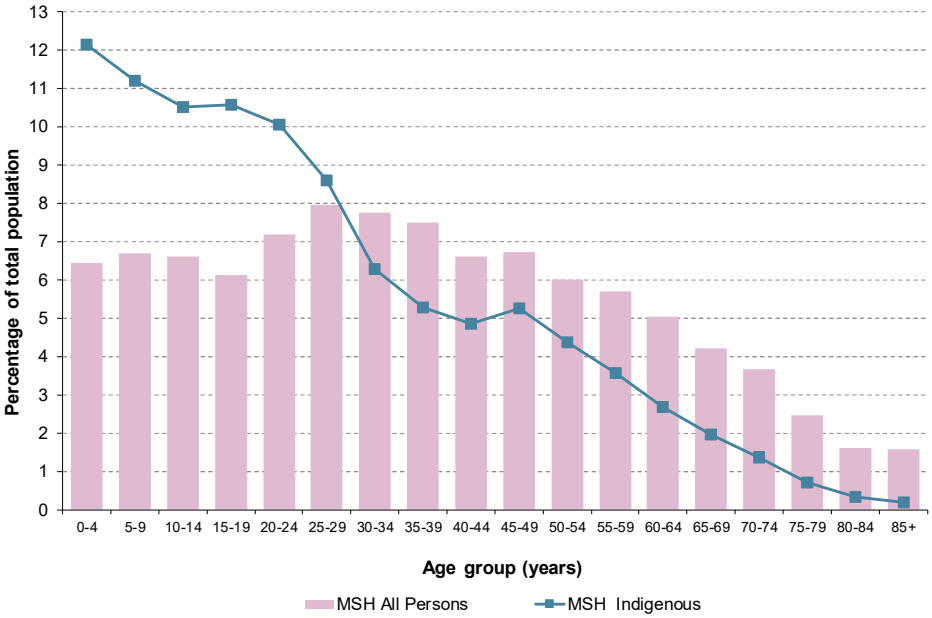


Figure 4: Percentage of estimated resident population by age group, Metro South Health all persons and Metro South Health Indigenous, 2020

Population projections

2020 to 2031

The most recent population projections (undertaken in 2018) estimate an increase in overall population of about 17% in MSH from 2020 to 2031 (Table 1). This compares with a projected increase of 20% across all of Queensland over the same period. In MSH 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 75,000 additional MSH residents aged 65 years and over compared with 2020 and over 60% of this increase will be in those over 75 years of age.

Table 1: Projected population count and percentage increase by age group, Metro South Health with Queensland comparison, 2020 to 2031

Age group (years)	Metro South Health population		Percentage increase	
	2020 (ERP)	2031 (proj.)	Metro South Health	Queensland
0 to 14	238,281	259,401	8.9	13.9
15 to 24	160,240	187,832	17.2	20.1
25 to 39	279,835	298,643	6.7	13.0
40 to 69	413,874	490,143	18.4	17.7
70 to 79	74,175	105,229	41.9	38.1
80+	38,617	67,662	75.2	74.5
Total	1,205,022	1,408,909	16.9	19.9

MSH is expected to experience lower population growth than Queensland in children under 15 years, younger adults 20 to 44 years and those 85 years and over (Figure 5).

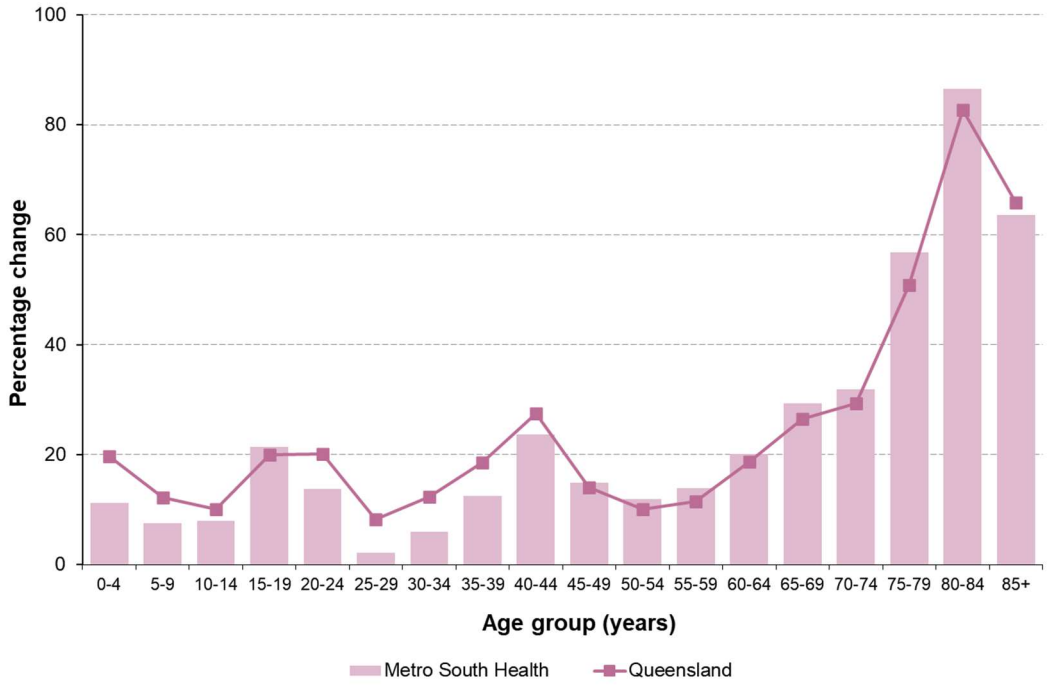


Figure 5: Projected percentage population changes by age group, Metro South Health and Queensland, 2020 to 2031

2020 to 2041

Taking a slightly longer-term perspective, it is projected that there will be a population increase of about 35% in MSH between 2020 and 2041. This compares with a projected increase across all of Queensland over the same period of 38%. By far the largest increases are projected to occur in the age groups over 80 years (Table 2; Figure 6).

Table 2: Projected population count and percentage increase, Metro South Health with Queensland comparison, 2020 to 2041

Age group (years)	Metro South Health population		Percentage increase	
	2020	2041	Metro South Health	Queensland
0 to 14	238,281	290,527	21.9	27.6
15 to 24	160,240	206,879	29.1	32.2
25 to 39	279,835	335,189	19.8	26.6
40 to 69	413,874	564,734	36.5	34.8
70 to 79	74,175	129,582	74.7	67.0
80+	38,617	101,786	163.6	158.0
Total	1,205,022	1,628,697	35.2	38.4

In MSH the number of residents aged over 85 years is predicted to increase by 180% by 2041 (Figure 6). This will result in approximately additional 34,000 residents in this age group within 20 years.

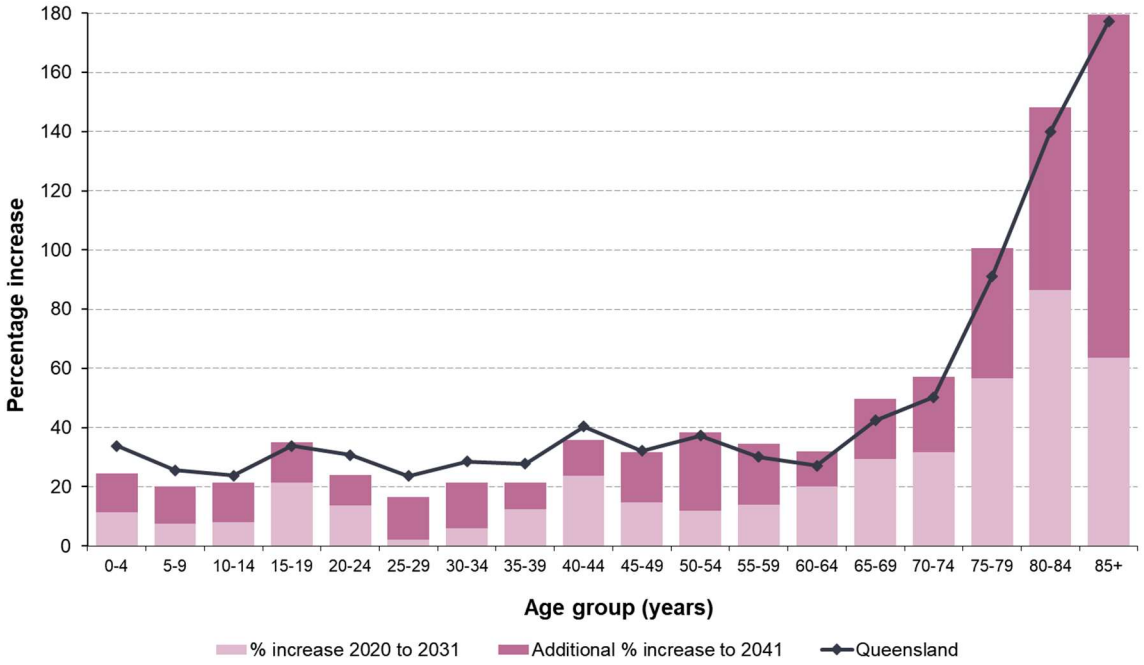


Figure 6: Projected percentage population changes by age group, Metro South Health and Queensland, 2020 to 2041

By 2041, it is projected that there will be over 307,000 MSH residents of 'retirement age' (65 years and over) which is an increase of about 144,000 from 2020. While in 2020 less than a quarter (24%) of those MSH residents aged 65 years and over were in the 80 years and over age group, by 2041 it is projected that this proportion will have increased to 33%. This equates to over 100,000 MSH residents being aged 80 years and over by 2041.

In 2020, 61% of MSH residents were in the 'working ages' of 20 to 64. By 2041 the balance between working and retirement ages will be undergoing a substantial change with a reduction in the percentage of 'working age' residents to 57% and an increase in the percentage of those in 'retirement age' to 19%. The population pyramid (Figure 7) illustrates the projected changes across age groups and by sex over this period.

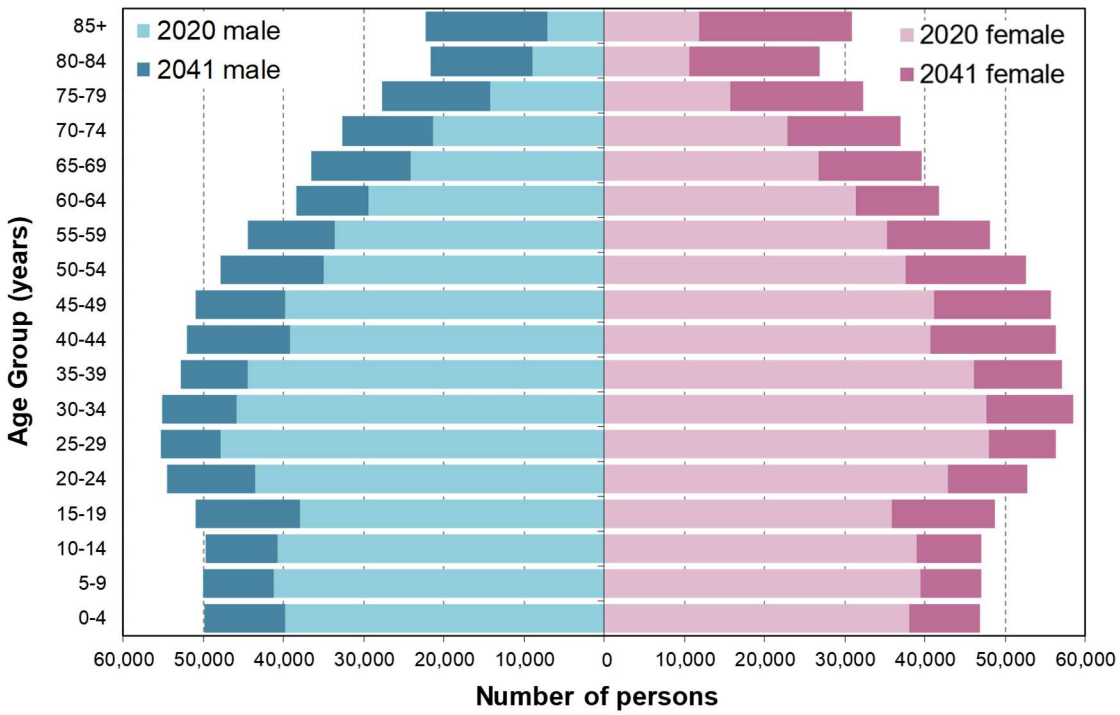


Figure 7: Estimated resident population by age group and sex, Metro South Health, as at 30 June 2020 and projection to 2041

Substantial ageing of the population will have major implications for the health and hospital system. It can be expected that MSH 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.

In the years 2016 to 2019, an average of 1,155 MSH resident deaths per year were classified as potentially avoidable. This represented 20% of all of the potentially avoidable deaths throughout Queensland over that period which is slightly less than the 23% which would have been expected on a purely population proportional basis.

The age standardised avoidable mortality rate in MSH (101 per 100,000 persons; [95% CI: 98 – 104]) 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 MSH residents and all Queenslanders, avoidable mortality rates for males were significantly higher than for females (Figure 8). In MSH, the avoidable mortality rate for males was 76% higher than the female rate while in Queensland the male rate was 87% higher than the female. Rates for MSH and Queensland females were statistically similar while rates for Queensland males were significantly higher than MSH 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 42,189 potentially preventable hospitalisations among MSH residents, representing 7% of all hospitalisations, with an age standardised rate of 3,393 PPHs per 100,000 persons.

The rate of potentially preventable hospitalisation was significantly lower in MSH than in Queensland for total PPHs, and the sub-categories of acute and chronic PPHs. However, the rate of vaccine preventable PPHs was significantly higher in MSH than in Queensland (Figure 9; Table 3).

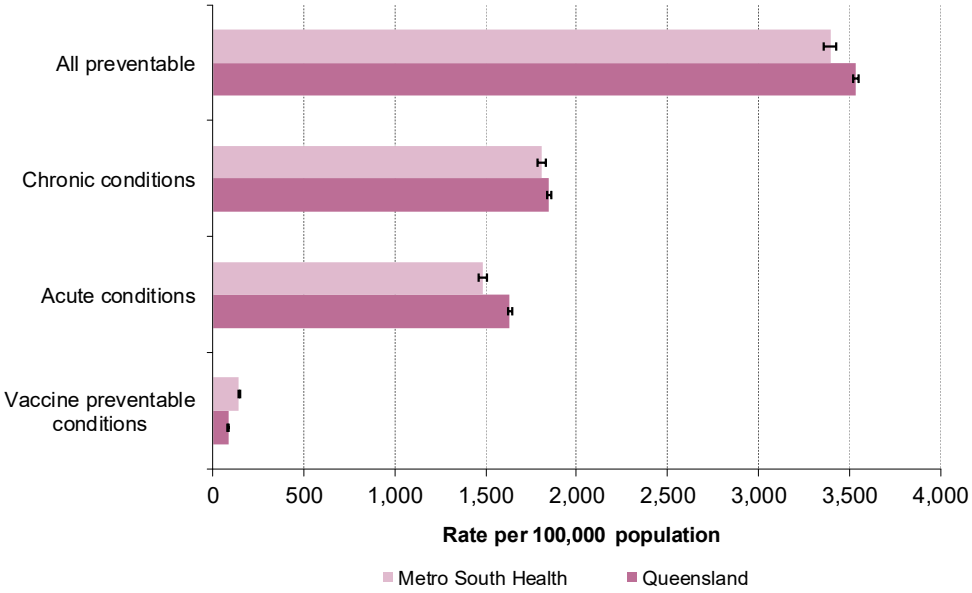


Figure 9: Potentially preventable hospitalisations by category, age standardised rates with 95% confidence intervals, Metro South Health and Queensland, 2020/21

There were over 22,700 PPHs for chronic conditions and over 18,000 for acute conditions among MSH residents in 2020/21 (Table 3). By comparison there were 1,829 PPHs for vaccine preventable conditions in this period which included 116 for influenza and pneumonia (Table 3; Table 4).

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

Category of PPH	Number of PPHs		Age standardised rate per 100,000 persons		Statistically significant difference
	MSH	QLD	MSH	QLD	MSH–QLD*
All preventable	42,189	202,759	3,393	3,538	↓
Chronic	22,760	111,645	1,805	1,850	↓
Acute	18,112	88,128	1,483	1,634	↓
Vaccine preventable	1,829	4,855	146	86.5	↑

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

PPHs by condition

Overwhelmingly the chronic condition with the highest rate of PPH in MSH residents (almost 1,000 PPHs per 100,000 persons) was diabetes complications which represented almost 30% of all PPHs in MSH residents. The chronic conditions congestive cardiac failure, COPD and iron deficiency anaemia had the next highest rates with each around 200 PPHs per 100,000 persons. Among acute conditions, the highest rate was for urinary tract infections followed by cellulitis and dental conditions (Table 4).

Table 4: Number and rate of potentially preventable hospitalisations by sub-category and condition, Metro South Health, 2020/21

Sub-category and condition	Number	Rate per 100,000 persons	% of total count
Vaccine Preventable	**1,829**	**145.7**	**4.3**
Other vaccine-preventable conditions	1,714	136.6	4.1
Influenza and pneumonia (vaccine preventable)	116	9.2	0.3
Chronic*	**22,760**	**1,804.7**	**53.9**
Diabetes complications	12,459	981.8	29.5
Congestive cardiac failure	2,885	225.2	6.8
COPD	2,372	186.5	5.6
Iron deficiency anaemia	2,154	175.1	5.1
Asthma	1,287	107.5	3.1
Angina	1,170	91.1	2.8
Hypertension	1,140	91.1	2.7
Bronchiectasis	572	45.9	1.4
Rheumatic heart disease	130	10.5	0.3
Nutritional deficiencies	69	5.6	0.2
Acute	**18,112**	**1,482.9**	**42.9**
Urinary tract infections	5,121	412.5	12.1
Cellulitis	3,911	317.7	9.3
Dental conditions	3,241	269.3	7.7
Ear, nose and throat infections	2,370	199.0	5.6
Convulsions and epilepsy	2,156	178.7	5.1
Gangrene	725	58.1	1.7
Perforated/bleeding ulcer	247	19.7	0.6
Pneumonia (not vaccine preventable)	58	4.6	0.1
Total preventable hospitalisations	**42,189**	**3,392.9**	**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 MSH than in Queensland for a range of conditions including: cellulitis, dental conditions, COPD, convulsions and epilepsy, iron deficiency anaemia and angina (Figure 10).

In comparison, PPH rates were significantly higher in MSH than Queensland for diabetes complications, hypertension and 'other vaccine preventable' conditions (that is, those other than influenza and pneumonia) (Figure 10).

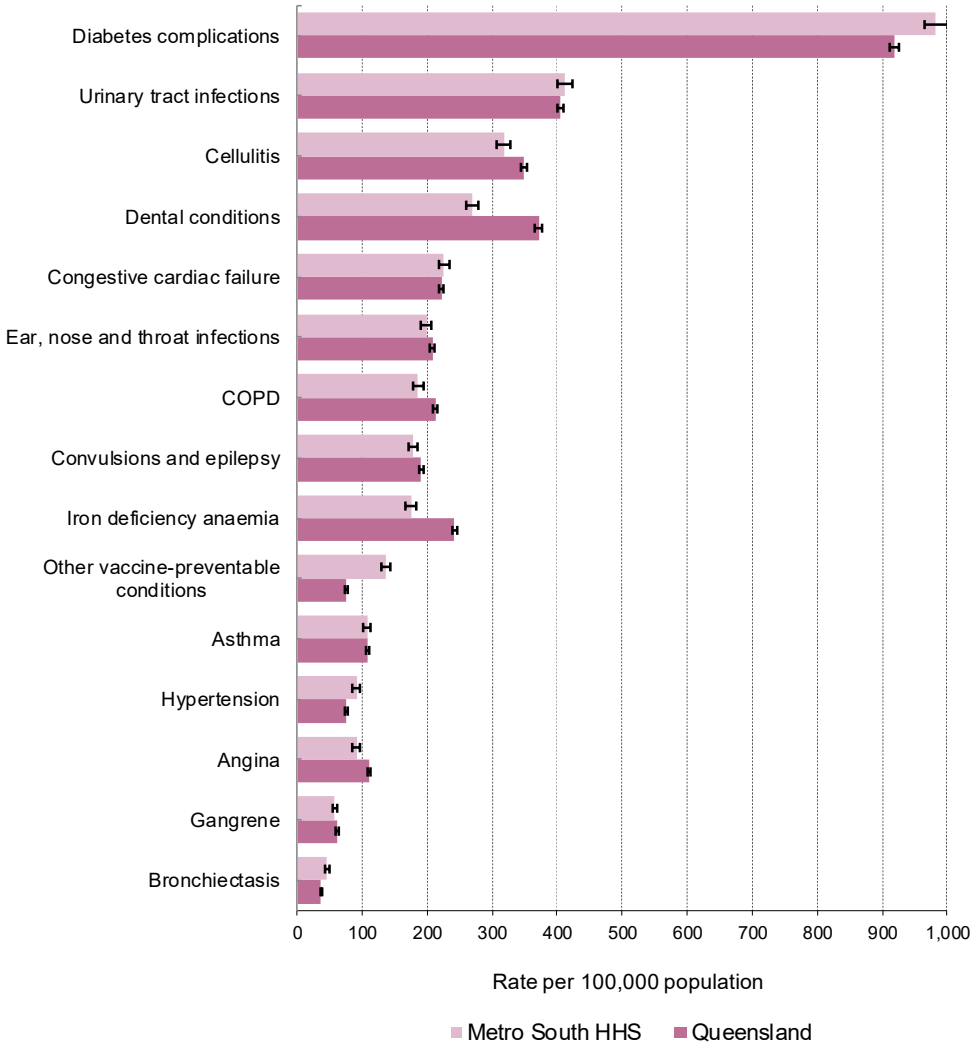


Figure 10: Potentially preventable hospitalisations, age standardised rates and 95% confidence intervals by condition, Metro South Health and Queensland, 2020/21

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

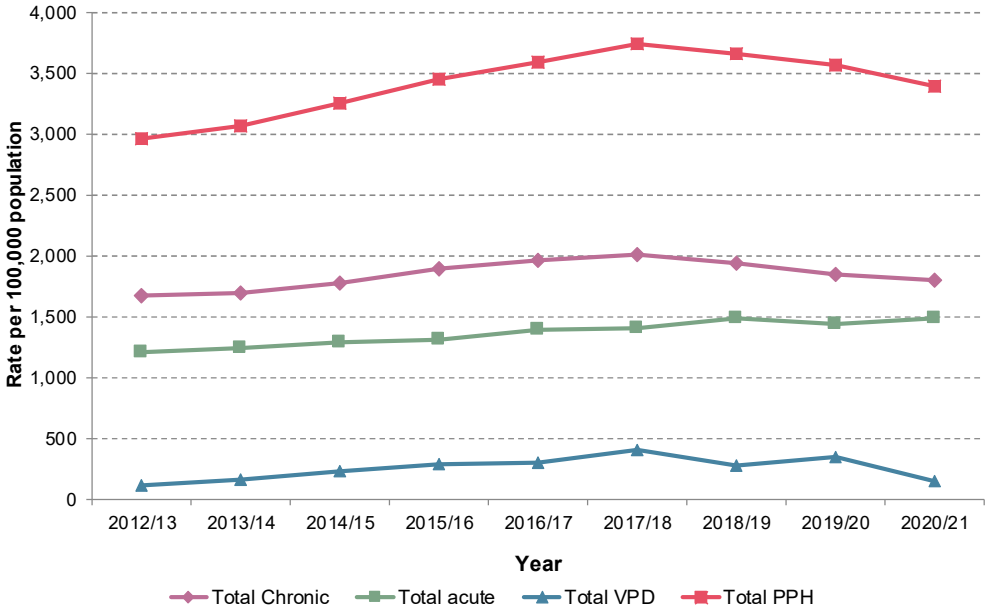


Figure 11: Age standardised rates of total potentially preventable hospitalisations and three sub-categories, 2012/13 to 2020/21, Metro South Health

Vaccine preventable PPHs also peaked in 2017/18 but 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 MSH 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 200 per 100,000 persons in 2019/20 to just nine per 100,000 persons in 2020/21 (Figure 12).

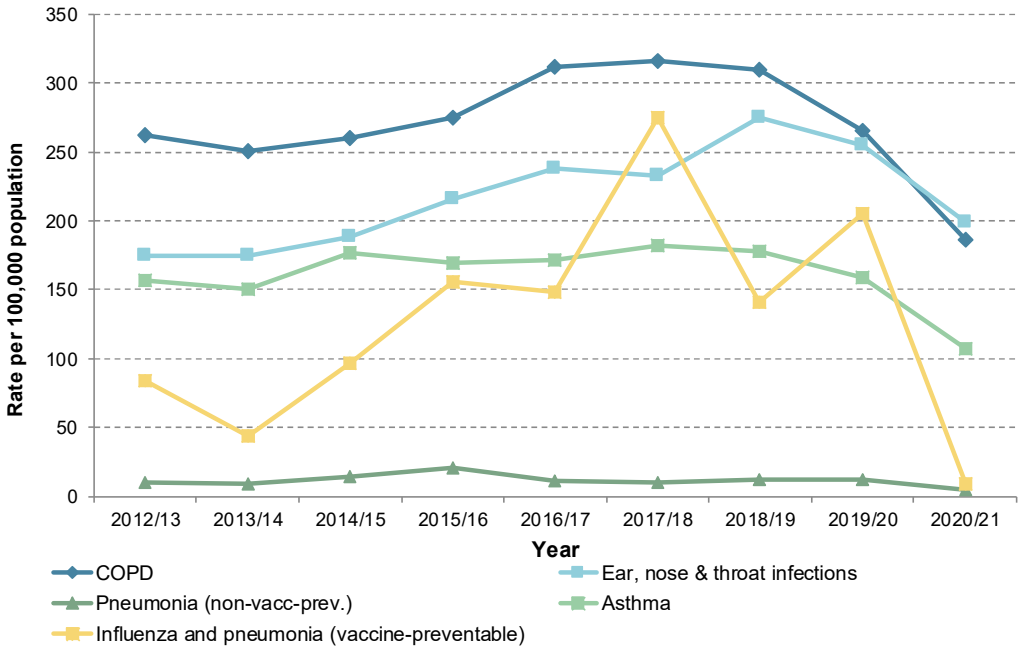


Figure 12: Age standardised rates of potentially preventable hospitalisations for selected conditions, 2012/13 to 2020/21, Metro South Health

Along with vaccine preventable influenza and 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, asthma and non-vaccine preventable pneumonia (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.

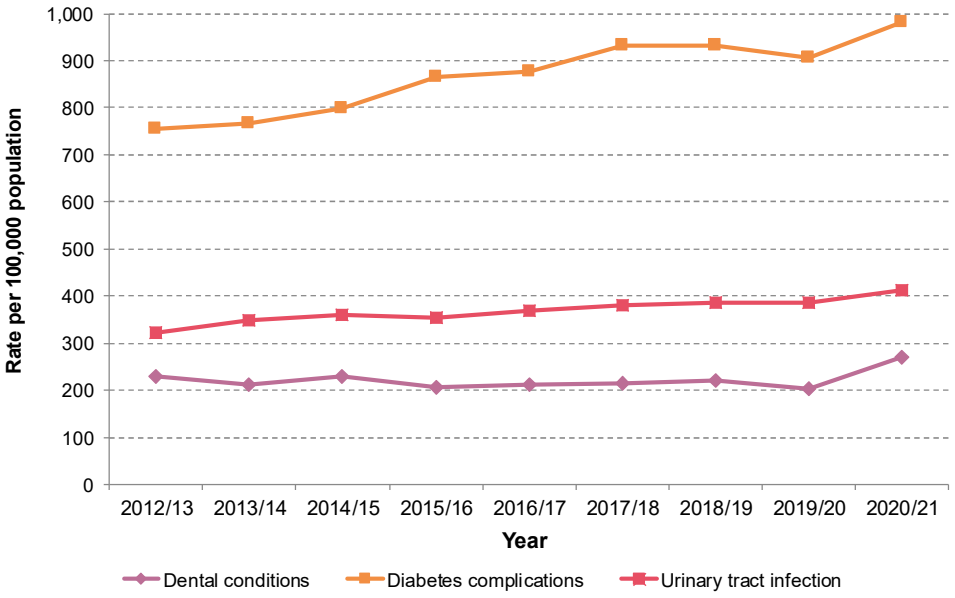


Figure 13: Age standardised rates of potentially preventable hospitalisations for selected conditions, 2012/13 to 2020/21, Metro South Health

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 (MSH; 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 MSH, this means 100 residents of MSH 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 MSH.

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 6,289 deaths per year from all causes among residents of MSH in the three years from 2017 to 2019. Between 2010-12 and 2017-19, mortality rates due to all causes of death declined for males and females in both MSH and Queensland. Males consistently had significantly higher mortality rates than females (Figure 14).

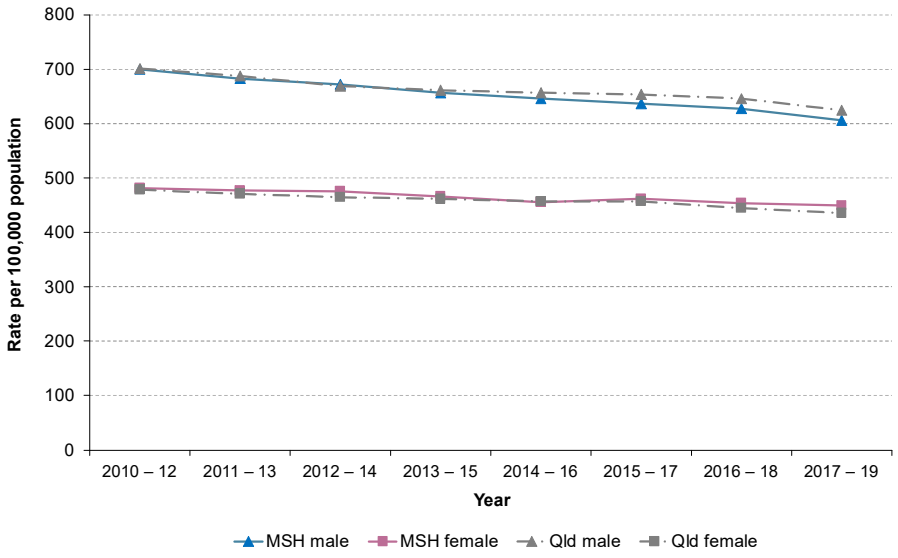


Figure 14: All causes age standardised mortality rates by sex, Metro South Health and Queensland, three-year moving averages 2010–12 to 2017–19

Indirect standardised mortality ratios indicate that the average mortality rate for all causes was significantly lower in MSH than in Queensland for males (4% lower) in the five years from 2015 to 2019 (Table 5). There was no significant difference between MSH and Queensland for females (Table 5).

Table 5: All causes standardised mortality ratios by sex, Metro South Health, 2015 to 2019

Region	Sex	Ratio (95% confidence interval)	Statistically significant difference MSH – QLD*
Metro South Health	Male	0.96 (0.95 – 0.98)	↓
	Female	1.02 (1.00 – 1.03)	—
	Persons	0.99 (0.98 – 1.00)	—

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

MSH 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.

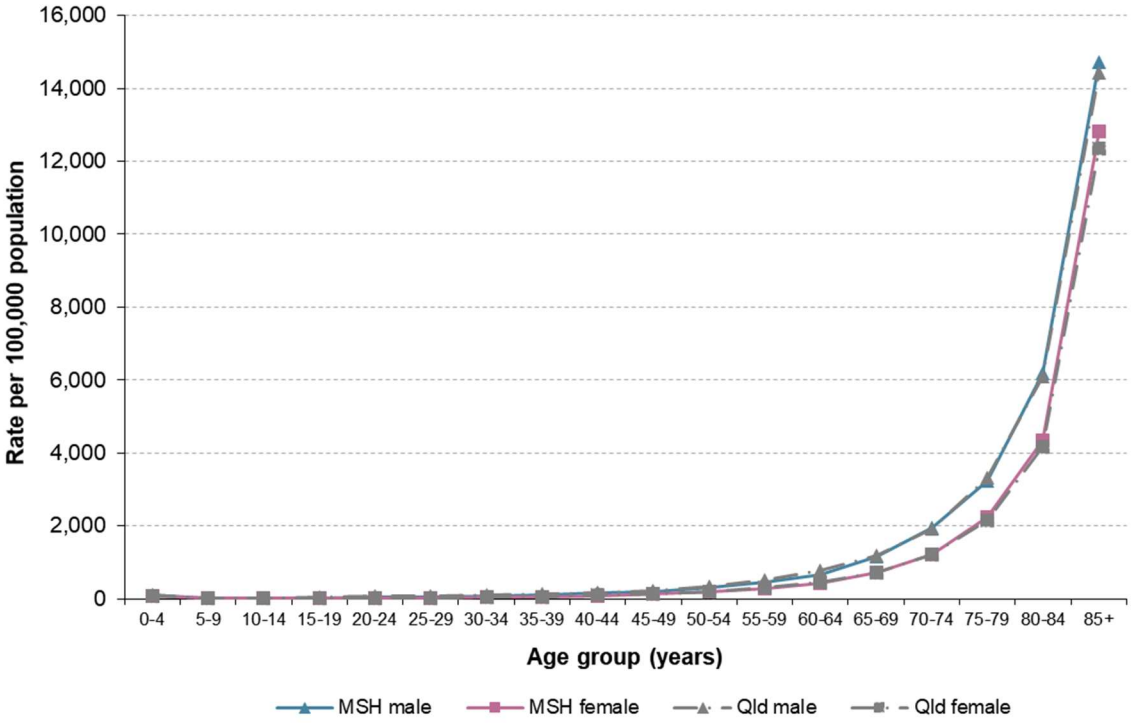


Figure 15: All causes age specific mortality rates by sex, Metro South Health and Queensland, 2013 to 2019

At the time of publication, deaths data for MSH was available up to 2019 only. As a result, the impact of the COVID-19 pandemic on mortality rates in MSH 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 MSH.

Hospital separations

On average there were 590,243 separations per year for all causes among MSH residents in the three years from 2018/19 to 2020/21. Age standardised separation rates due to all causes were consistently higher in MSH females than in males at all timepoints from 2011/12-13/14 to 2018/19-20/21 (Figure 16). This is largely due to women being admitted to hospital to give birth. Rates in both males and females trended upwards from 2011/12, with rates for MSH all persons increasing by 20% over this period.

From 2017/18-19/20 onwards there was a noticeable flattening of the upwards trend. 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.

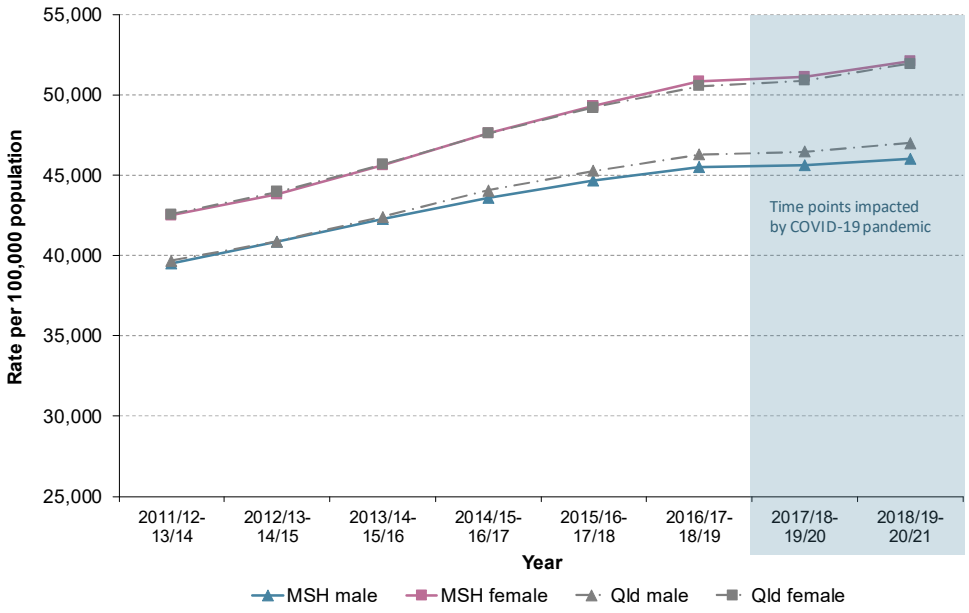


Figure 16: All causes age standardised hospital separation rates by sex, Metro South Health and Queensland, three-year moving averages 2011/12 to 2020/21

Indirect standardised separation ratios indicate that the average separation rate for all causes of hospitalisation was significantly lower in MSH than in Queensland for males (2% lower) and all persons (1% lower) in the period 2018/19 to 2020/21 (Table 6).

Table 6: All causes standardised separation ratios by sex, Metro South Health, 2018/19 to 2020/21

Region	Sex	Ratio (95% Confidence Interval)	Statistically significant difference MSH – QLD*
Metro South Health	Male	0.98 (0.98 – 0.98)	↓
	Female	1.00 (1.00 – 1.00)	—
	Persons	0.99 (0.99 – 0.99)	↓

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

In both Queensland and MSH, 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).

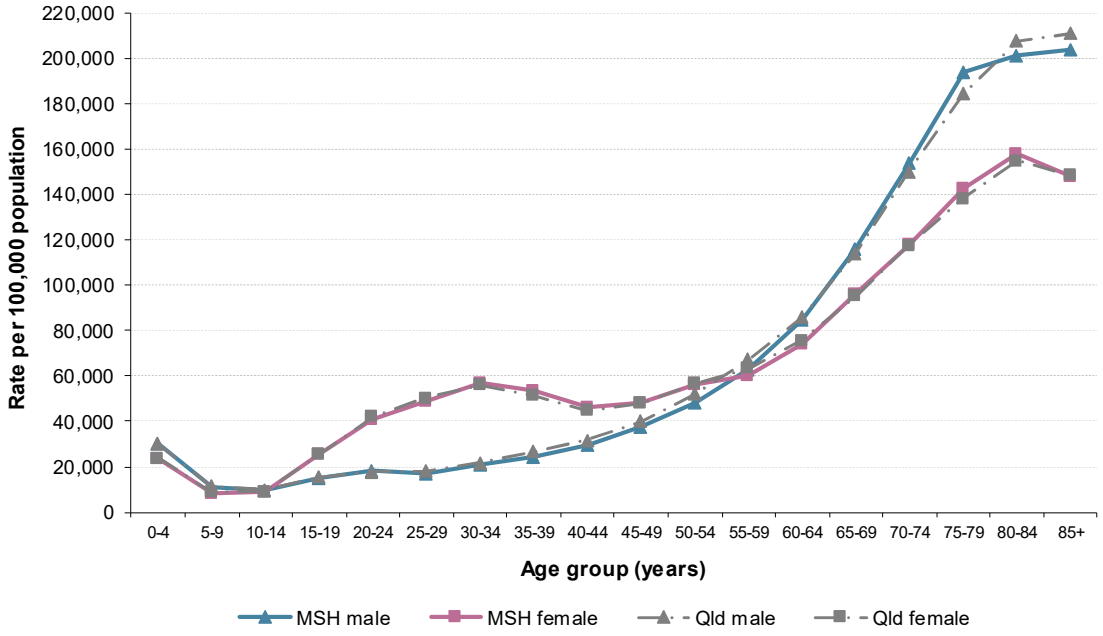


Figure 17: All causes age specific hospital separation rates by sex, Metro South Health and Queensland, 2018/19 to 2020/21

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 32 deaths per year from arthropathies and systemic connective tissue disorders among MSH residents in the three years from 2017 to 2019. Females accounted for two-thirds (66%) of these deaths. Indirect standardised mortality ratios indicate that the average mortality rates for arthropathies and systemic connective tissue disorders in all persons were statistically similar in MSH and Queensland in the five years from 2015 to 2019.

Hospital separations

For the three-year period 2018/19 to 2020/21, there was an average of 14,400 hospital separations per year for arthropathies and systemic connective tissue disorders among MSH residents. In past years[9] and up to the 2011/12–13/14 timepoint age standardised separation rates were consistently significantly higher in males than in females in both MSH and Queensland. However this pattern changed in more recent timepoints with MSH rates higher in females than males from 2015/16–17/18 onwards (Figure 18). 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.

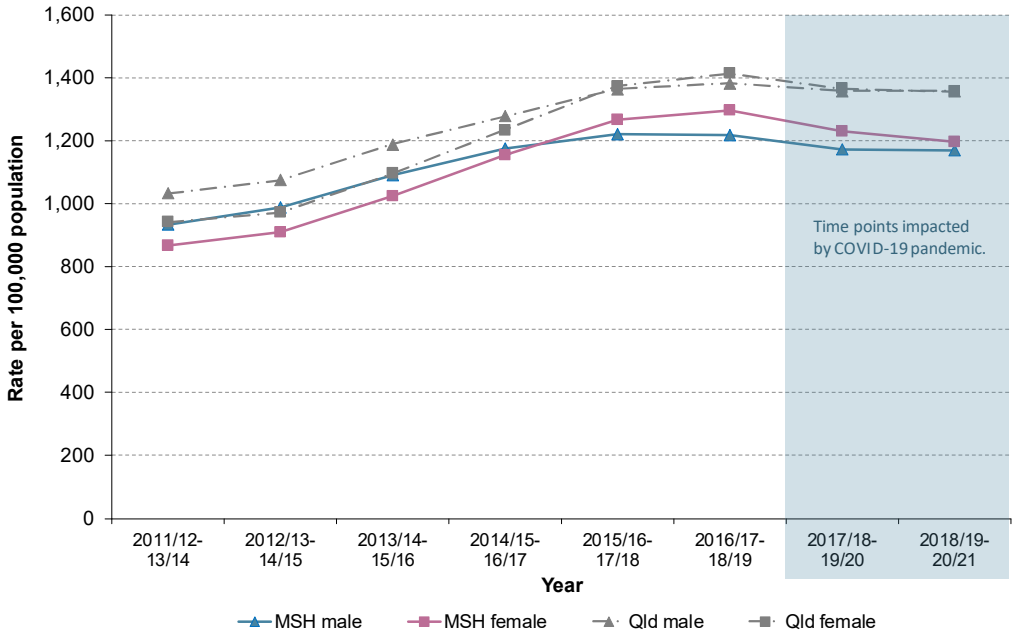


Figure 18: Arthropathies and systemic connective tissue disorders age standardised hospital separation rates by sex, Metro South Health and Queensland, three-year moving averages 2011/12 to 2020/21

Indirect standardised separation ratios indicate that the average separation rate for arthropathies and systemic connective tissue disorders was significantly lower in MSH than in Queensland for both males (14% lower) and females (13% lower) in the period 2018/19 to 2020/21 (Table 7).

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

Region	Sex	Ratio (95% Confidence Interval)	Statistically significant difference MSH – QLD*
Metro South Health	Male	0.86 (0.85 – 0.87)	↓
	Female	0.88 (0.86 – 0.89)	↓
	Persons	0.87 (0.86 – 0.88)	↓

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

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

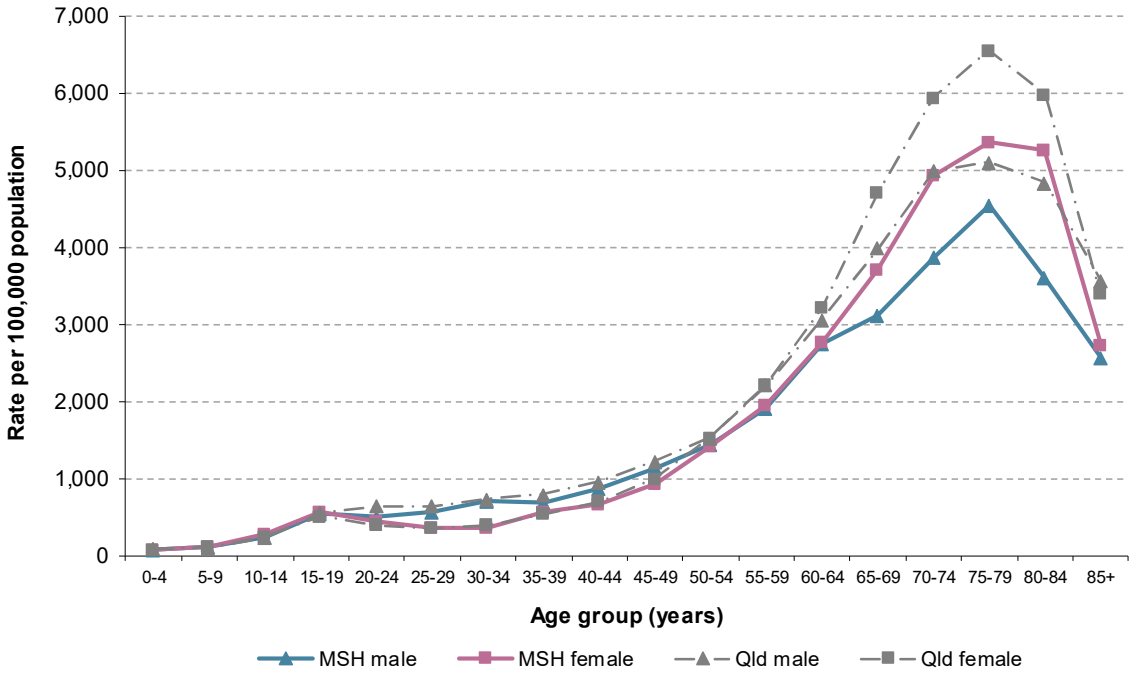


Figure 19: Arthropathies and systemic connective tissue disorders age specific hospital separation rate by sex, Metro South Health and Queensland, 2018/19 to 2020/21

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 14 deaths per year from asthma among MSH residents in the three years from 2017 to 2019. Females accounted for just under two-thirds (63%) of these deaths. Indirect standardised mortality

ratios indicate that the average mortality rates for asthma (all ages) were statistically no different in MSH than in Queensland for males and for females in the five years from 2015 to 2019.

Hospital separations

There was an average of 1,762 hospital separations per year for asthma among MSH residents in the three-year period 2018/19 to 2020/21. Approximately 48% 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 at all timepoints from 2011/12-13/14 to 2018/19-20/21. In MSH the same pattern was observed, with higher rates in females than males, however at some timepoints the difference was not statistically significant (Figure 20).

Separation rates in MSH males trended downwards over this period while rates in females decreased significantly only in 2018/19–20/21 (Figure 20). This sharp decrease in females and a similar decrease in males 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.

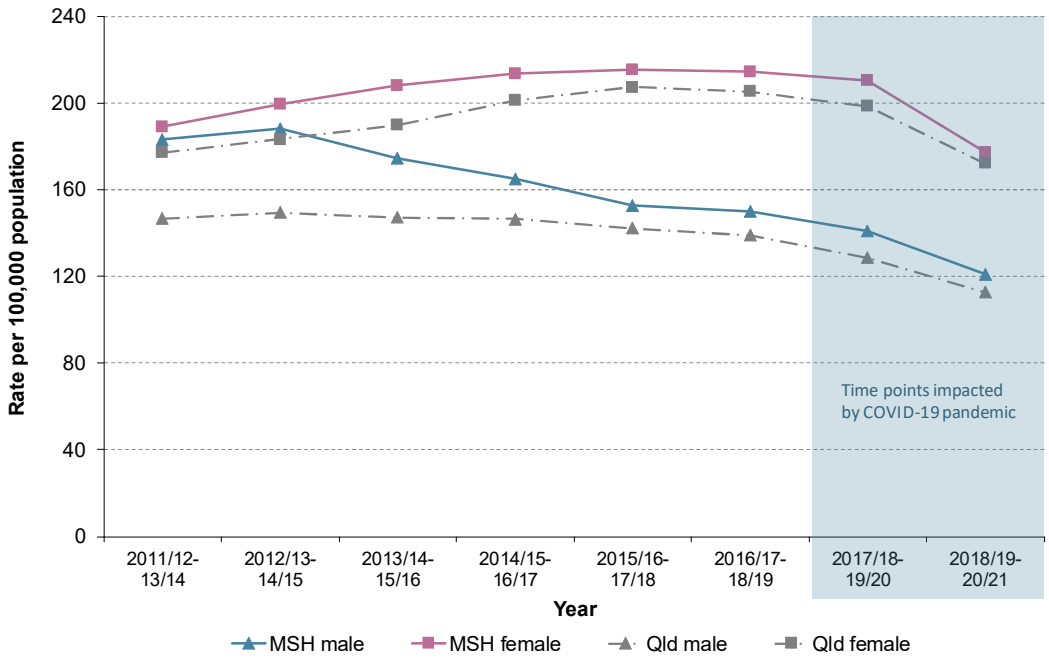


Figure 20: Asthma age standardised hospital separation rate by sex, Metro South Health and Queensland, three-year moving averages 2011/12 to 2020/21

Indirect standardised separation ratios indicate that the average separation rate for asthma was significantly higher in MSH than in Queensland for males (7% higher) and for all persons (4% higher) in 2018/19 to 2020/21 (Table 8). When only separations among people aged five to 34 years were considered, rates were significantly higher in MSH than in Queensland in both males (20% higher) and females (10% higher) (Table 8).

Table 8: Asthma standardised separation ratios by sex, Metro South Health, 2018/19 to 2020/21

Region	Age group	Sex	Ratio (95% Confidence Interval)	Statistically significant difference MSH – QLD*
Metro South Health	All ages	Male	1.07 (1.02 – 1.11)	↑
		Female	1.03 (0.99 – 1.07)	—
		Persons	1.04 (1.02 – 1.07)	↑
	Ages 5 to 34 years	Male	1.20 (1.14 – 1.27)	↑
		Female	1.10 (1.04 – 1.16)	↑
		Persons	1.15 (1.10 – 1.19)	↑

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

Age specific rates of hospital separation for asthma were highest among children, especially those aged five to nine years. Among MSH children aged five to nine years, separation rates in males were significantly higher than the corresponding female rates. This reflects a similar pattern of very high rates in young boys found throughout Queensland. In all age groups from 15 years upwards, rates were significantly higher in females. In adult females asthma separation rates were lowest between the ages of 20 and 34 years and then gradually increased with increasing age. In males rates were fairly consistently low between the ages of 15 and 64 years before increasing with increasing age (Figure 21).

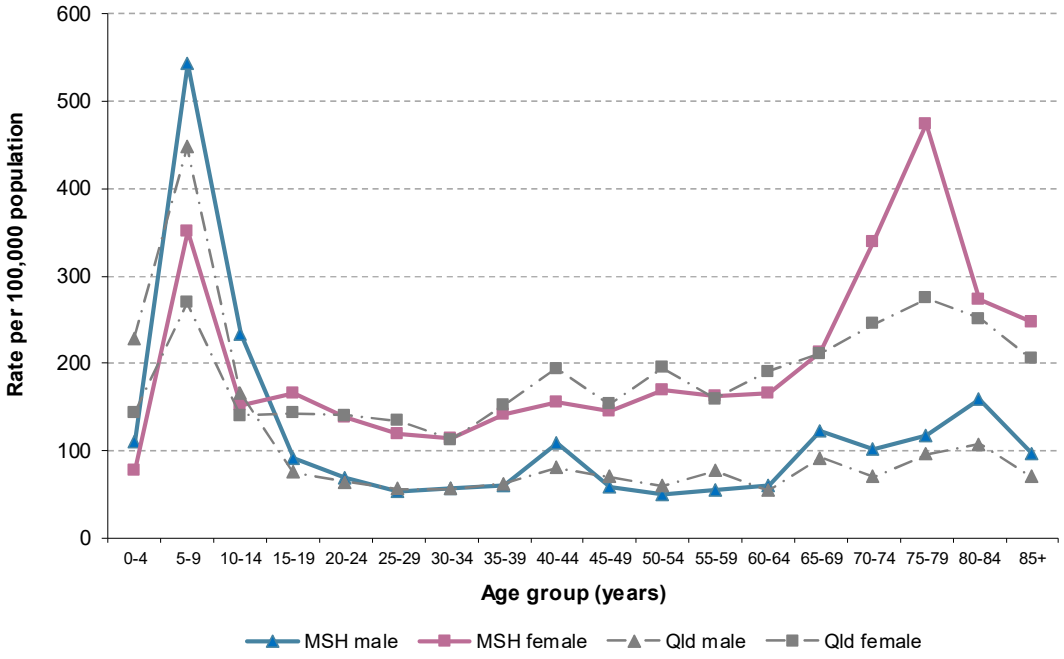


Figure 21: Asthma age specific hospital separation rate by sex, Metro South Health and Queensland, 2018/19 – 2020/21

Respiratory diseases: chronic obstructive pulmonary disease (COPD)

Mortality

On average there were 261 deaths per year from COPD among residents of MSH in the three-years from 2017 to 2019. Males accounted for 54% of these deaths.

Mortality rates for COPD in MSH were significantly higher in males than in females at all timepoints between 2010-12 and 2017-19 (Figure 22). Over this period, rates among MSH and Queensland females increased slightly while the rates among males decreased slightly.

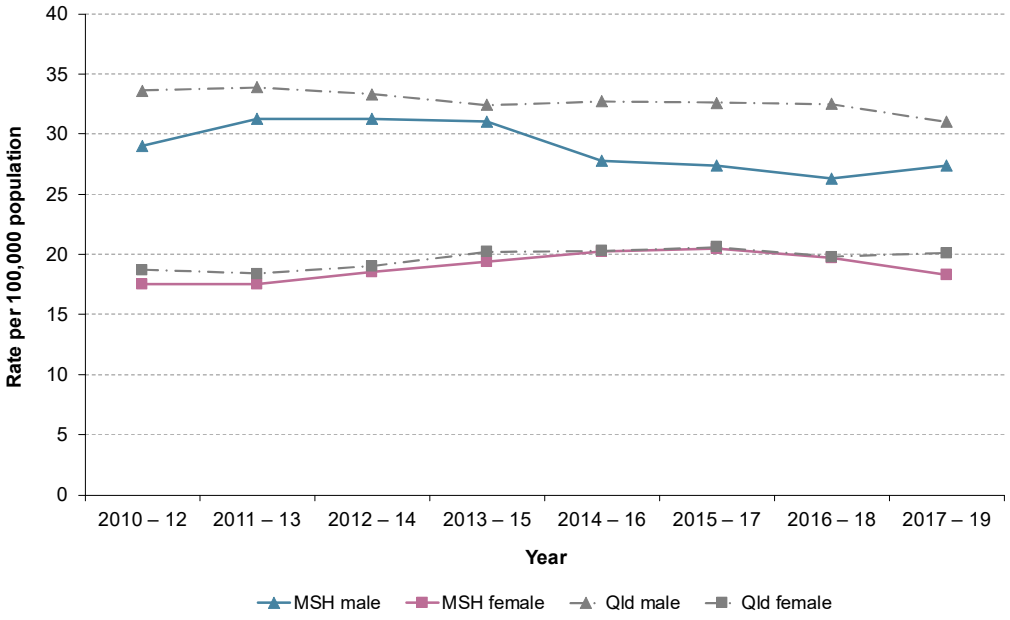


Figure 22: COPD age standardised mortality rate by sex, Metro South Health and Queensland, three-year moving averages 2010–12 to 2017–19

Indirect standardised mortality ratios indicate that the average mortality rate for COPD was significantly lower in MSH than in Queensland for males (16% lower) and all persons (12% lower) in the five years from 2015 to 2019 (Table 9).

Table 9: COPD standardised mortality ratios by sex, Metro South Health, 2015 to 2019

Region	Sex	Ratio (95% confidence interval)	Statistically significant difference MSH – QLD*
Metro South Health	Male	0.84 (0.78 – 0.91)	↓
	Female	0.93 (0.86 – 1.01)	—
	Persons	0.88 (0.83 – 0.93)	↓

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

Hospital separations

On average there were 3,079 hospital separations per year for COPD among residents of MSH in the three-years from 2018/19 to 2020/21. Age standardised separation rates were significantly higher in males than in females in both MSH and Queensland between at all timepoints from 2011/12-13/14 to 2018/19-20/21 (Figure 23). Over this period, rates in both males and females in MSH generally trended upwards until the timepoints impacted by the COVID-19 pandemic from 2019-20 onwards when 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.

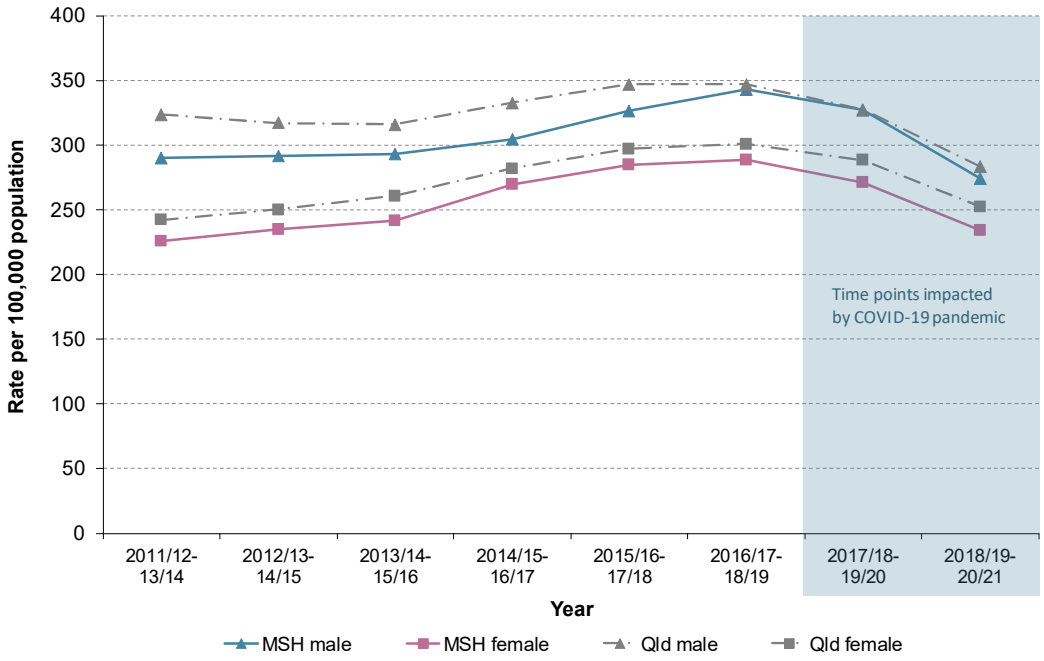


Figure 23: COPD age standardised hospital separation rate by sex, Metro South Health and Queensland, three-year moving averages 2011/12 to 2020/21

Indirect standardised separation ratios indicate that the average separation rate for COPD was significantly lower in MSH than in Queensland for both males (4% lower) and females (7% lower) in the three years from 2018/19 to 2020/21 (Table 10).

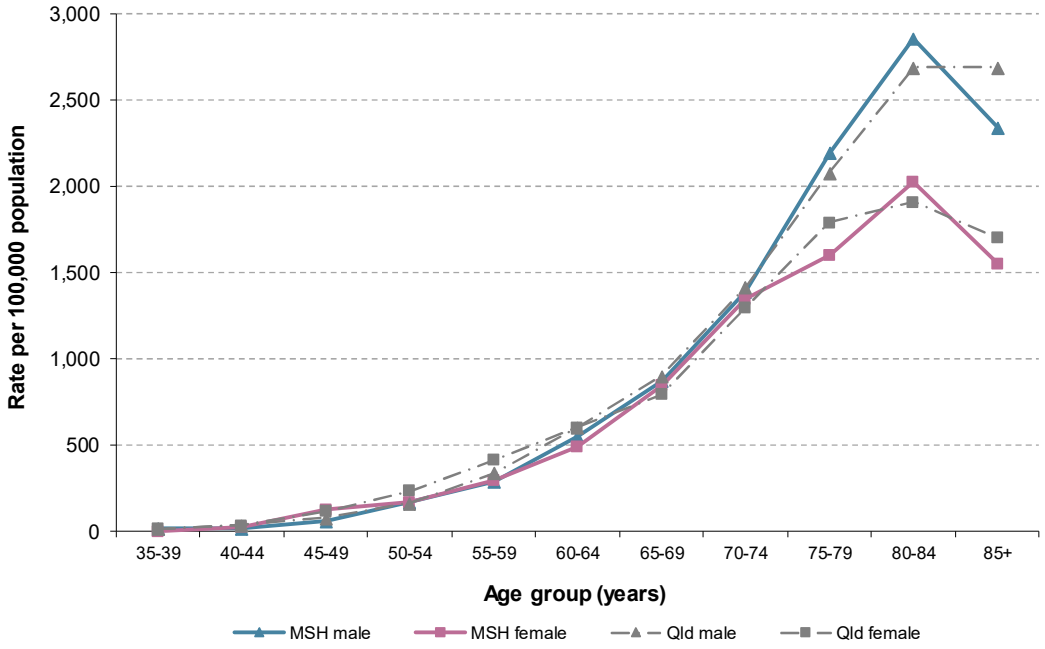
Table 10: COPD standardised separation ratios by sex, Metro South Health, 2018/19 to 2020/21

Region	Sex	Ratio (95% Confidence Interval)	Statistically significant difference MSH – QLD*
Metro South Health	Male	0.96 (0.94 – 0.99)	↓
	Female	0.93 (0.90 – 0.96)	↓
	Persons	0.95 (0.93 – 0.96)	↓

* ↑ MSH statistically significantly higher than Queensland; ↓ MSH statistically significantly lower than Queensland; — no statistically significant difference between MSH 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 males rose steeply from the age of about 60 years, peaking in the 80 to 84 years age group at over 2,700 separations per 100,000 persons. In comparison, rates for females also rose steeply

from the age of about 60 years, peaking at 80 to 84 years age groups at around 2,000 separations per 100,000 persons (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, Metro South Health and Queensland, 2018/19 to 2020/21*

Respiratory diseases: influenza and pneumonia

Mortality

There was an average of 120 deaths per year from influenza and pneumonia among residents of MSH in the three years from 2017 to 2019.

Mortality rates for influenza and pneumonia in Queensland were consistently higher in males than in females at all timepoints from 2010-12 to 2017-19 (Figure 25), however in Metro South this pattern reversed in 2016-18 and 2017-19 when rates were higher among females. Male and females rates in MSH were consistently statistically similar. Mortality rates increased slightly in the years onwards from 2014-16 (Figure 25). Queensland experienced very high counts of influenza notifications in 2017 and 2019[5] but there were no corresponding major peaks of deaths from influenza and pneumonia over this period. The clinical severity of the 2019 influenza season was much lower than in the 2017 and 2018 seasons (as determined by percentage of cases hospitalised)[5] and this variation in the severity of the three seasons from 2017 to 2019 may explain the modest increase in mortality illustrated in Figure 25.

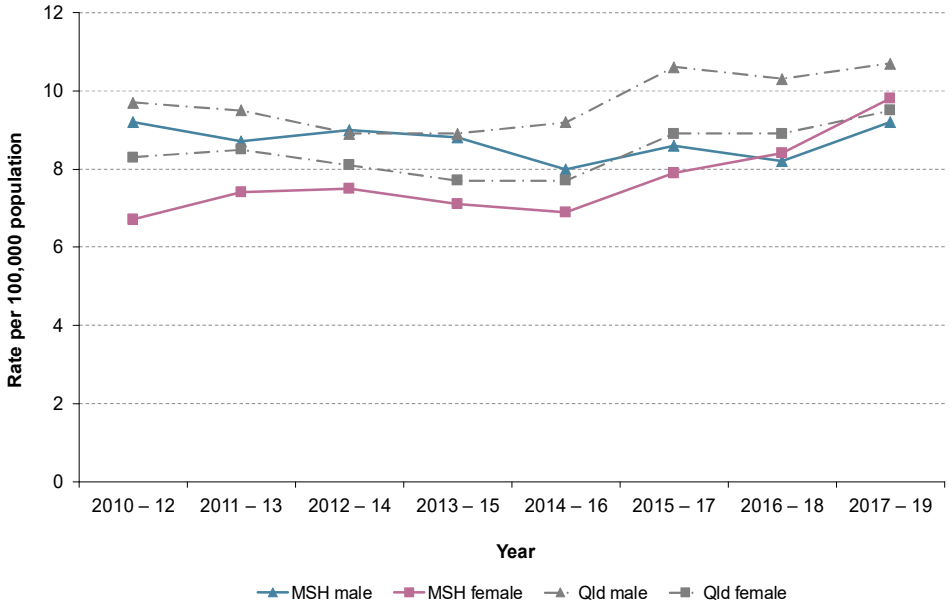


Figure 25: Influenza and pneumonia age standardised mortality rate by sex, Metro South Health and Queensland, three-year moving averages 2010–12 to 2017–19

Indirect standardised mortality ratios indicate that the average mortality rate for influenza and pneumonia was significantly lower in MSH than in Queensland for males (17% lower) in the five years from 2015 to 2019 (Table 11).

Table 11: Influenza and pneumonia standardised mortality ratios by sex, Metro South Health, 2015 to 2019

Region	Sex	Ratio (95% confidence interval)	Statistically significant difference MSH – QLD*
Metro South Health	Male	0.83 (0.72 – 0.95)	↓
	Female	0.99 (0.88 – 1.10)	—
	Persons	0.92 (0.84 – 1.00)	—

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

Hospital separations

On average there were 4,745 hospital separations per year for influenza and pneumonia among MSH residents in the three years from 2018/19 to 2020/21. Age standardised separation rates for influenza and pneumonia were consistently significantly higher for males than females in both MSH and Queensland at all timepoints from 2011/12-13/14 to 2018/19-20/21 (Figure 26).

Separation rates for both males and females in MSH and Queensland trended upwards over most of this period until steeply declining in 2018/19-20/21, the first timepoint at which a major COVID-19 pandemic impact would be expected (Figure 26). 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].

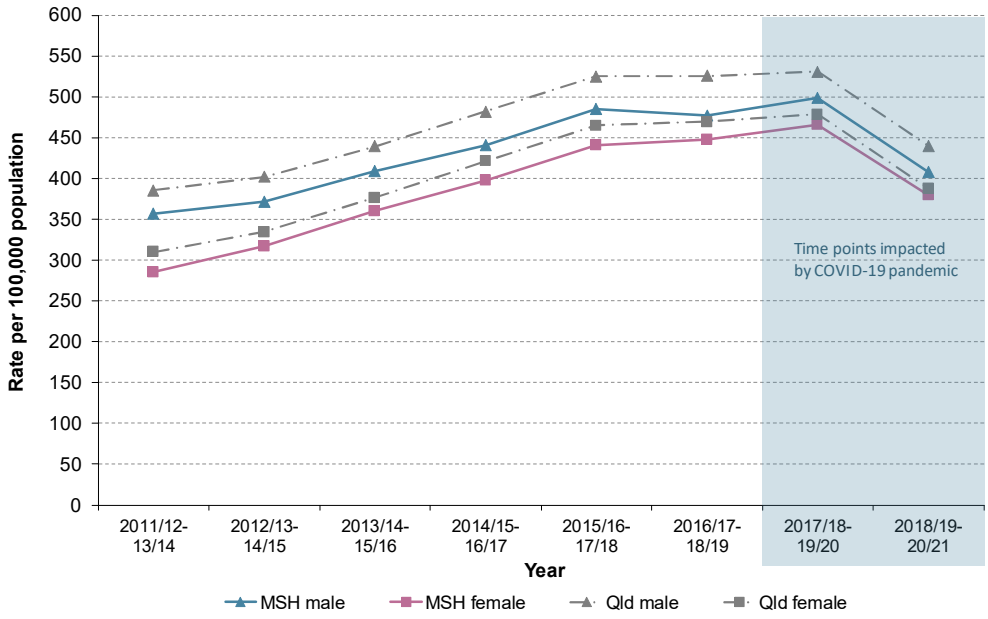


Figure 26: Influenza and pneumonia age standardised hospital separation rate by sex, Metro South Health and Queensland, three-year moving averages 2011/12 to 2020/21

Indirect standardised separation ratios indicate that the average separation rate for influenza and pneumonia was significantly lower in MSH than in Queensland for males (7% lower) and all persons (5% lower) in the period 2018/19 to 2020/21 (Table 12).

Table 12: Influenza and pneumonia standardised separation ratios by sex, Metro South Health, 2018/19 to 2020/21

Region	Sex	Ratio (95% Confidence Interval)	Statistically significant difference MSH – QLD*
Metro South Health	Male	0.93 (0.91 – 0.95)	↓
	Female	0.98 (0.96 – 1.00)	—
	Persons	0.95 (0.94 – 0.97)	↓

* ↑ MSH statistically significantly higher than Queensland; ↓ MSH statistically significantly lower than Queensland;
— no statistically significant difference between MSH 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 peak in the separation rate among children under five years of age (Figure 27).

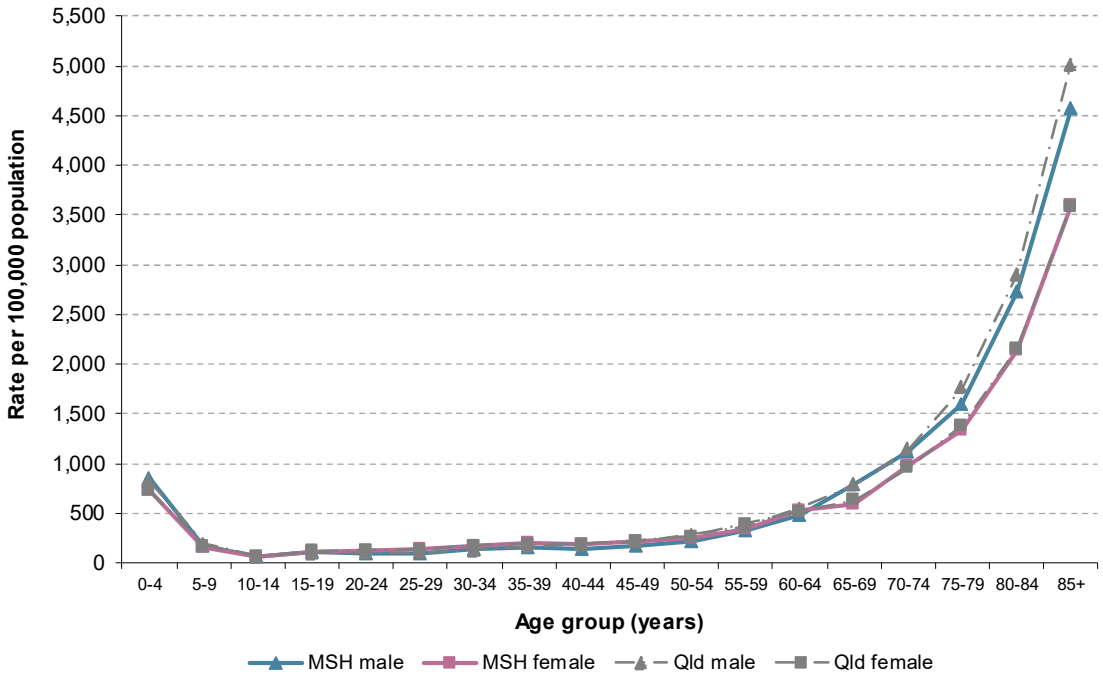


Figure 27: Influenza and pneumonia age specific hospital separation rate by sex, Metro South Health and Queensland, 2018/19 to 2020/21

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[11].

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[12].

Cardiovascular disease: coronary heart disease

Coronary heart disease, 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[11].

Mortality

There was an average of 830 deaths per year from CHD among MSH residents in the three years from 2017 to 2019. This represented 13% of all deaths of MSH residents in this period. By comparison, in 2010-12 CHD represented 17% of all MSH resident deaths.

Mortality rates for CHD were significantly higher in males than in females in all years between 2010-12 and 2017-19 in both MSH and Queensland (Figure 28). In both males and females, mortality rates trended downwards over this period, being significantly lower in MSH in 2017-19 than in 2013-15 and previous years (Figure 28).

Indirect standardised mortality ratios indicate that the average mortality rate for CHD was significantly higher in MSH than in Queensland for males (5% higher) and for females (17% higher) in the five years from 2015 to 2019 (Table 13).

Table 13: Coronary heart disease standardised mortality ratios by sex, Metro South Health, 2015 to 2019

Region	Sex	Ratio (95% confidence interval)	Statistically significant difference MSH – QLD*
Metro South Health	Male	1.05 (1.01 – 1.09)	↑
	Female	1.17 (1.12 – 1.23)	↑
	Persons	1.10 (1.07 – 1.13)	↑

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

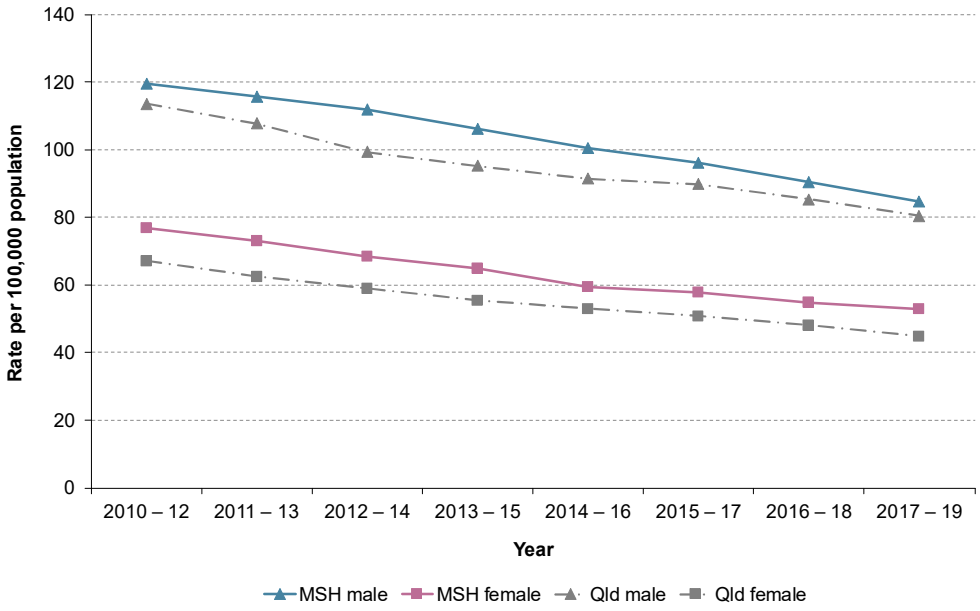


Figure 28: Coronary heart disease age standardised mortality rate by sex, Metro South Health and Queensland, three-year moving averages 2010–12 to 2017–19

Hospital separations

On average there were 6,457 hospital separations per year for CHD among residents of MSH in the three years from 2018/19 to 2020/21. Males accounted for 69% of these separations.

In both MSH 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, with rates among males being more than double the female rates during this time (Figure 29). In Queensland, CHD separation rates for both males and

females trended downwards between 2011/12-13/14 and 2018/19-20/21 (Figure 29), with the all persons rate decreasing by 13% over this period.

In MSH, separation rates in females decreased by 15% over this period. In contrast rates among MSH males did not show any consistent pattern (Figure 29). The COVID-19 pandemic did not appear to have a significant effect on CHD separation rates in Queensland or MSH. While rates did decrease in the timepoints impacted by the pandemic, this was largely in line with established trends.

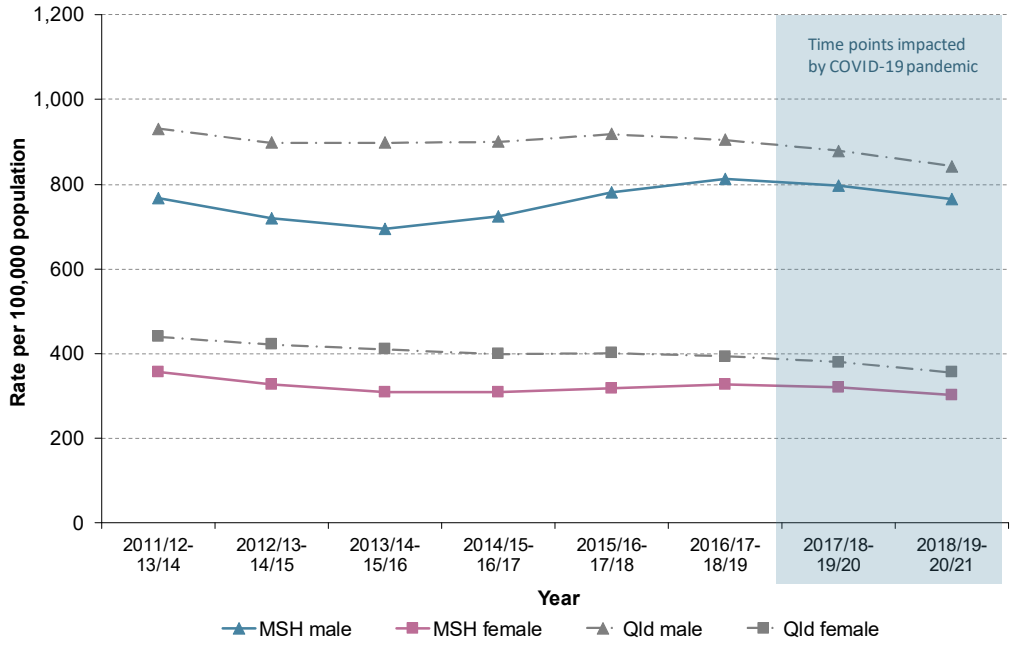


Figure 29: Coronary heart disease age standardised hospital separation rate by sex, Metro South Health and Queensland, three-year moving averages 2011/12 to 2020/21

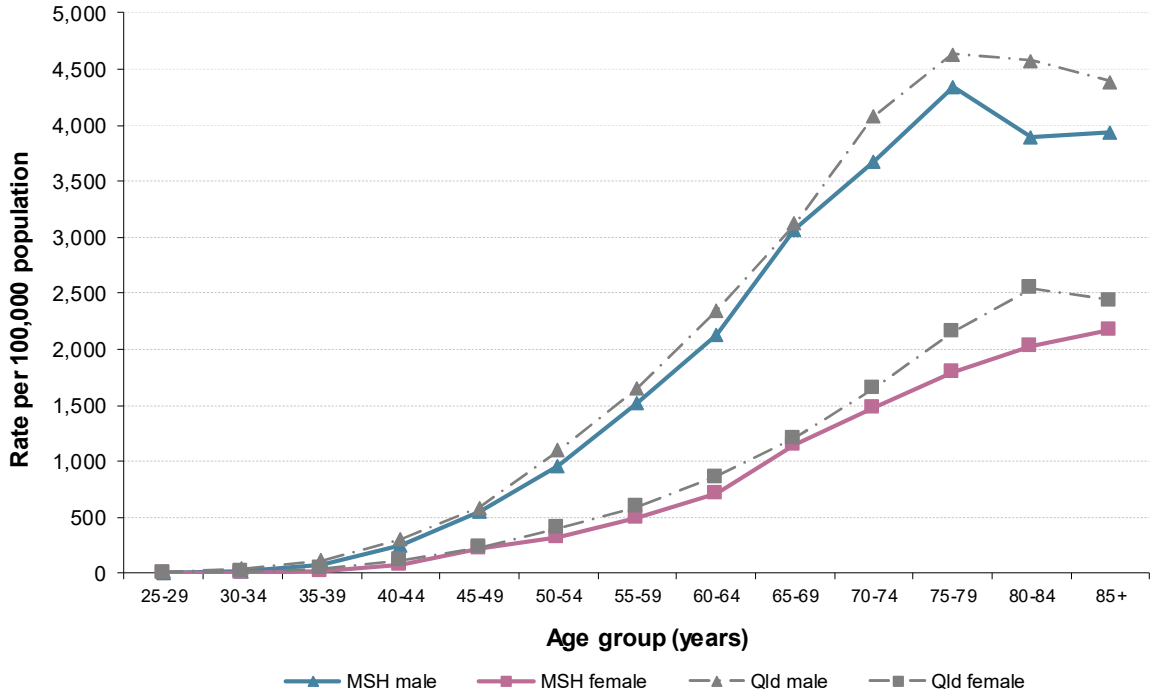
Indirect standardised separation ratios indicate that the average separation rate for CHD was significantly lower in MSH than in Queensland for both males (9% lower) and females (15% lower) in the years 2018/19 to 2020/21 (Table 14).

Table 14: Coronary heart disease standardised separation ratios by sex, Metro South Health, 2018/19 to 2020/21

Region	Sex	Ratio (95% Confidence Interval)	Statistically significant difference MSH – QLD*
Metro South Health	Male	0.91 (0.90 – 0.93)	↓
	Female	0.85 (0.83 – 0.87)	↓
	Persons	0.89 (0.87 – 0.90)	↓

* ↑ MSH statistically significantly higher than Queensland; ↓ MSH statistically significantly lower than Queensland; — no statistically significant difference between MSH 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 30).



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

Figure 30: Coronary heart disease age specific hospitalisation rate by sex, Metro South Health 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[11].

Mortality

There was an average of 402 deaths per year from stroke among MSH residents in the three years from 2017 to 2019. Females accounted for more than half (59%) of these deaths.

Age standardised mortality rates for stroke in MSH decreased steadily between 2010-12 and 2017-19 (Figure 31). In this period there was no significant difference in age standardised mortality rates for stroke between males and females in MSH or Queensland (Figure 31).

Indirect standardised mortality ratios indicate that the average mortality rates for stroke were statistically similar in MSH and Queensland for both males and females in the five years from 2015 to 2019.

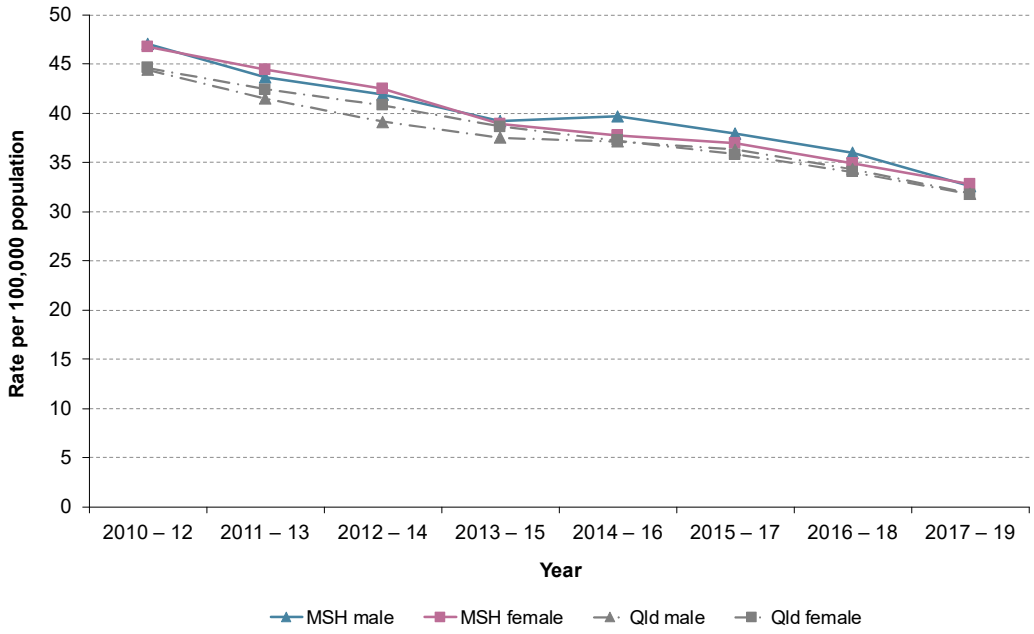


Figure 31: Stroke age standardised mortality rates by sex, Metro South Health and Queensland, three-year moving averages 2010–12 to 2017–19

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.

There was an average of 4,874 hospital separations per year for stroke among MSH 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 in all years between 2011/12 and 2020/21 in MSH and Queensland (Figure 32).

Prior to the coding change introduced from 1 July 2015, stroke hospital separation rates were steady in Queensland and trending slightly downwards in MSH[14]. Since the coding change, rates in Queensland males and females have trended very slightly downwards while MSH male rates have been relatively stable and MSH females rates have dropped significantly (Figure 32). The COVID-19 pandemic does not appear to have had any appreciable effect on stroke separation rates (Figure 32).

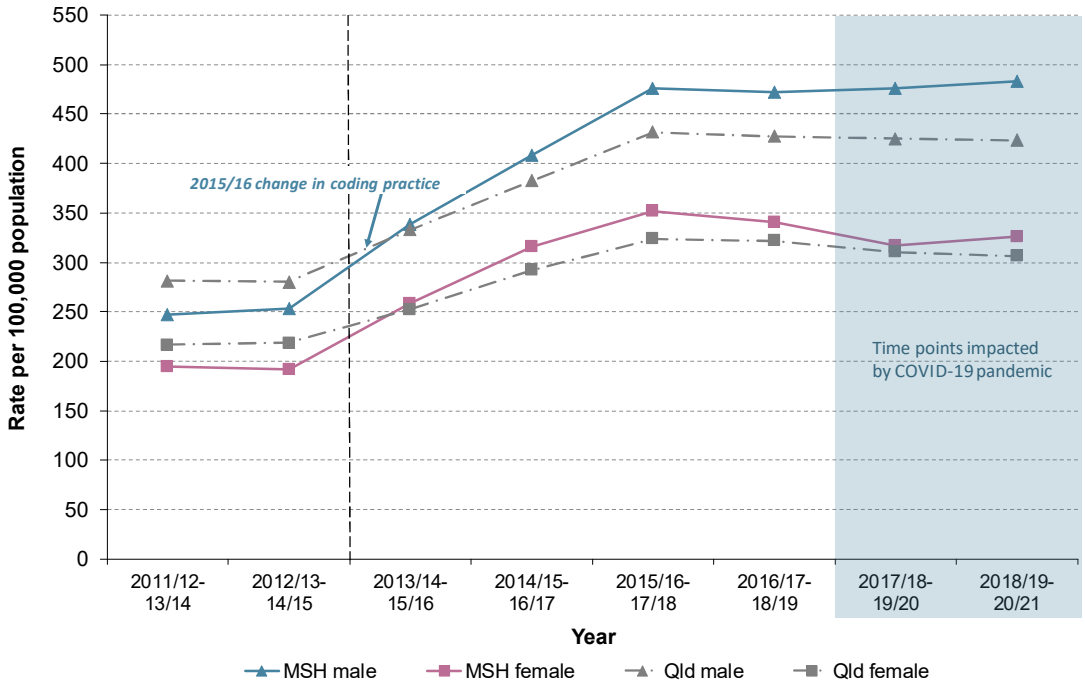


Figure 32: Stroke age standardised hospital separation rate by sex, Metro South Health and Queensland, three-year moving averages 2011/12 to 2020/21

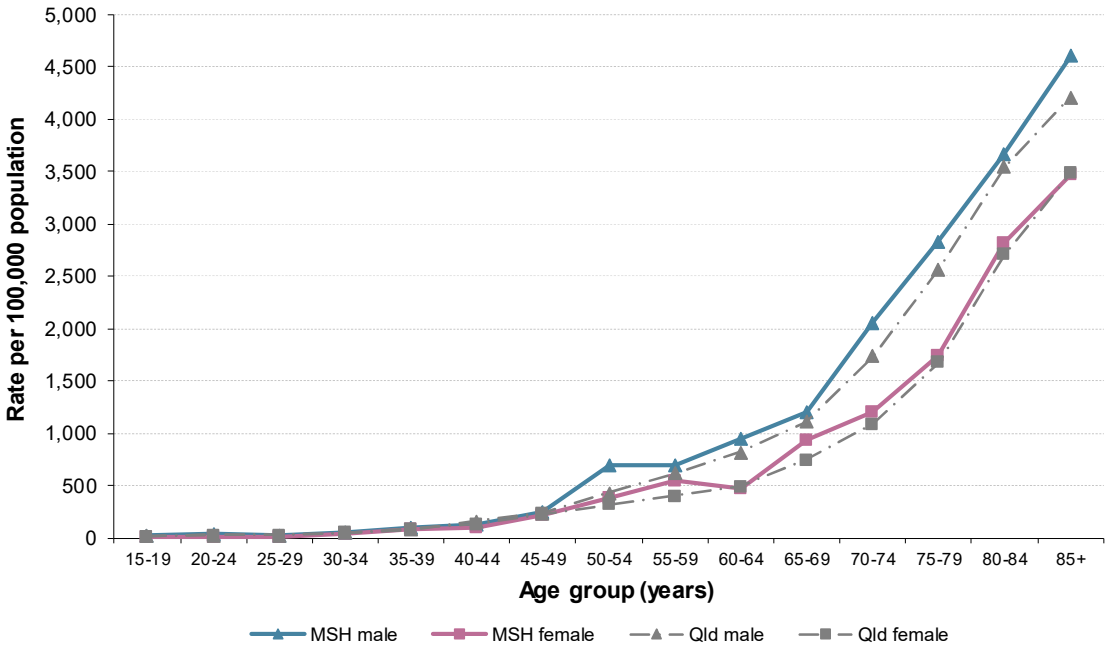
Indirect standardised separation ratios indicate that the average separation rate for stroke was significantly higher in MSH than in Queensland for both males (14% higher) and females (7% higher) between 2018/19 and 2020/21 (Table 15). This is a departure from the results prior to the coding change when MSH rates were consistently lower than Queensland rates.

Table 15: Stroke standardised separation ratios by sex, Metro South Health, 2018/19 to 2020/21

Region	Sex	Ratio (95% Confidence Interval)	Statistically significant difference MSH – QLD*
Metro South Health	Male	1.14 (1.12 – 1.17)	↑
	Female	1.07 (1.04 – 1.09)	↑
	Persons	1.10 (1.09 – 1.12)	↑

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

Patterns of age specific rates for stroke were similar in MSH and Queensland, 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 33).



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

Figure 33: Stroke age specific hospital separation rate by sex, Metro South Health 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[11]. 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[11].

Mortality

In the three years from 2017 to 2019, there was an average of 69 deaths per year from heart failure among MSH residents. Females accounted for almost two-thirds (64%) of these deaths. Age standardised rates in both MSH and Queensland trended downwards between 2010-12 and 2017-19, although in MSH females the trend was more variable, possibly owing to low case numbers.

Indirect standardised mortality ratios indicate that the average mortality rates for heart failure were statistically similar in MSH and Queensland for both males and females in the five years from 2015 to 2019.

Hospital separations

On average there were 2,718 hospital separations per year for heart failure among MSH residents in the three years from 2018/19 to 2020/21. In both MSH 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 34).

Separation rates for Queensland males and females increased by 4% and 8% respectively over this period (Figure 34). In comparison, rates among MSH females increased by 10% while MSH male rates decreased by 6% (Figure 34). The COVID-19 pandemic does not appear to have had any appreciable effect on separation rates for heart failure (Figure 34).

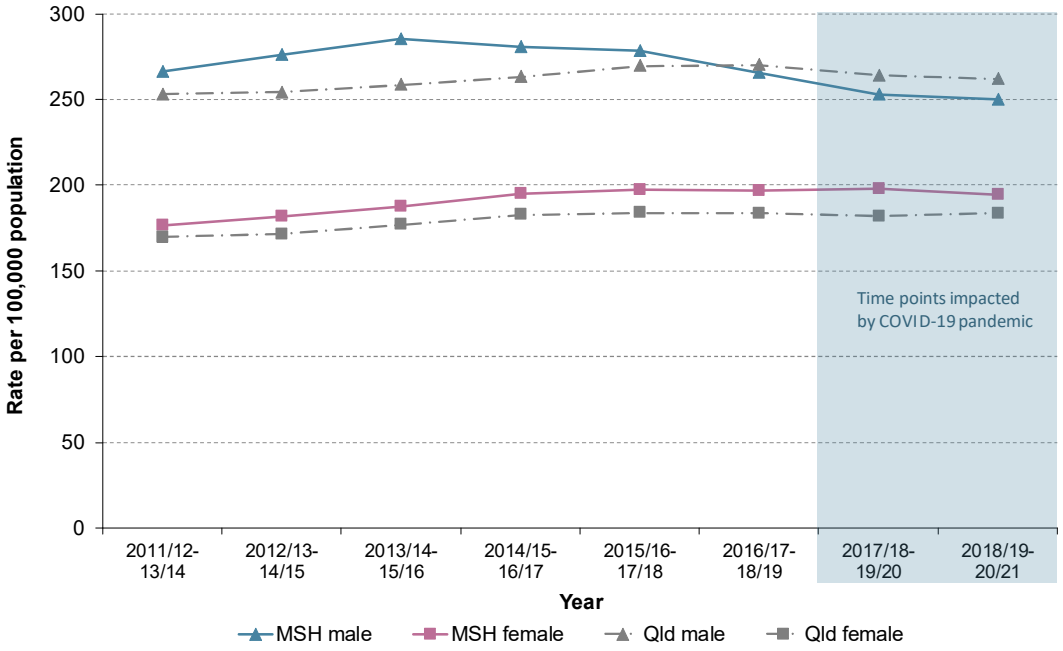


Figure 34: Heart failure age standardised hospital separation rate by sex, Metro South Health and Queensland, three-year moving averages 2011/12 to 2020/21

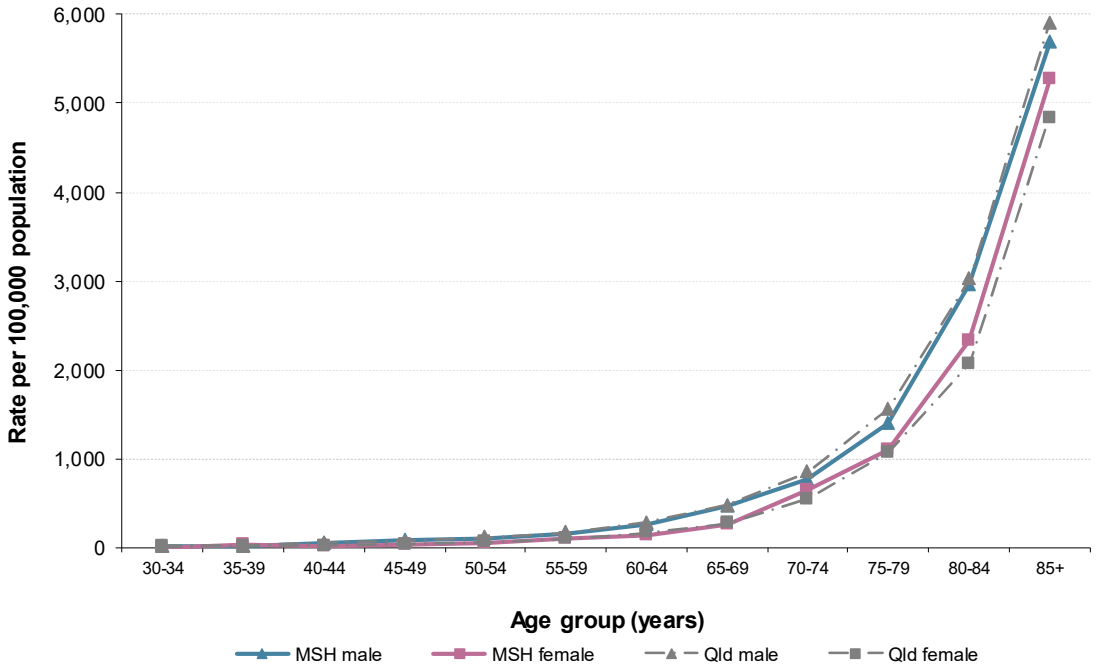
Indirect standardised separation ratios indicate that the average separation rate for heart failure was significantly higher in MSH than in Queensland for females (6% higher) but significantly lower than in Queensland for males (5% lower) in 2018/19 to 2020/21 (Table 16).

Table 16: Heart failure standardised separation ratios by sex, Metro South Health, 2018/19 to 2020/21

Region	Sex	Ratio (95% Confidence Interval)	Statistically significant difference MSH – QLD*
Metro South Health	Male	0.95 (0.92 – 0.98)	↓
	Female	1.06 (1.03 – 1.10)	↑
	Persons	1.00 (0.98 – 1.02)	–

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

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 70 years (Figure 35).



* rates not presented for age groups under 30 years because of low or zero counts

Figure 35: Heart failure age specific hospital separation rate by sex, Metro South Health 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 183 deaths per year from diabetes mellitus among residents of MSH in the three years from 2017 to 2019. Mortality rates appear to be trending downwards slightly in females in MSH and Queensland but this trend is not evident in males (Figure 36).

In both MSH and Queensland, mortality rates for diabetes were significantly higher in males than in females across at all timepoints from 2010-12 to 2017-19 (Figure 36).

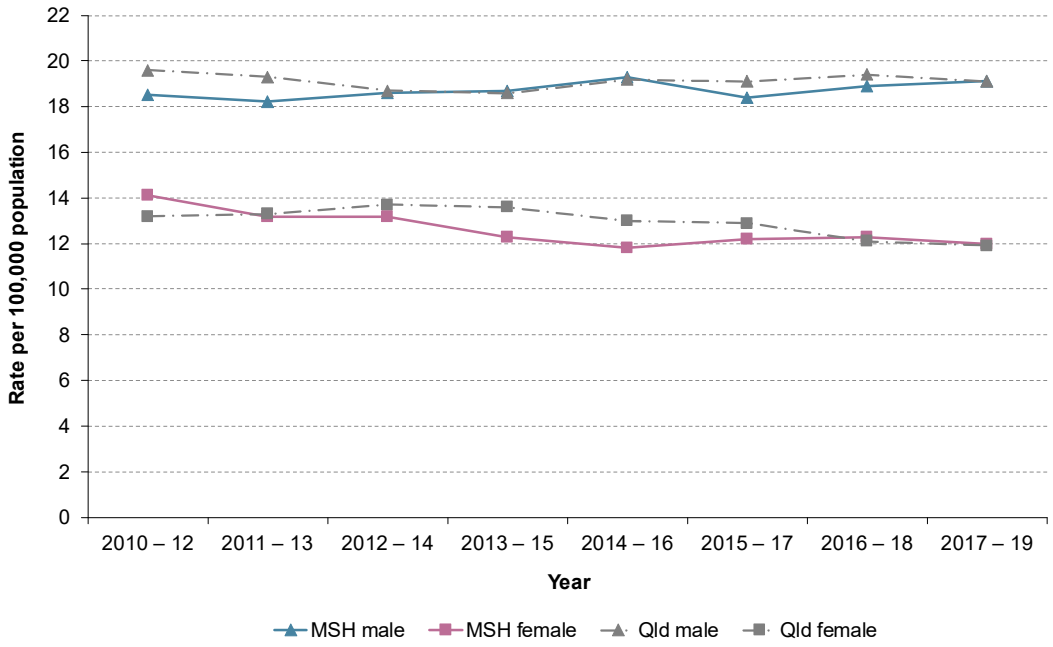


Figure 36: Diabetes mellitus age standardised mortality rate by sex, Metro South Health and Queensland, three-year moving averages 2010–12 to 2017–19

Indirect standardised mortality ratios indicate that the average mortality rates for diabetes were statistically similar in MSH and Queensland for both males and females in the five years from 2015 to 2019.

Hospital separations

There was an average of 2,534 hospital separations per year for diabetes mellitus among MSH residents in the three years from 2018/19 to 2020/21. In both MSH and Queensland, age standardised separation rates for males were significantly higher than rates for females in all years from 2011/12 to 2020/21 (Figure 37).

Between 2011/12-13/14 and 2018/19-20/21 hospital separation rates for diabetes in males and females in both MSH and Queensland trended strongly upwards (Figure 37) with MSH male rates increasing by 28% and females by 25%. The COVID-19 pandemic did not appear to have a significant effect on diabetes separation rates in Queensland or MSH. While rates did increase in the timepoints impacted by the pandemic, this was in line with established trends.

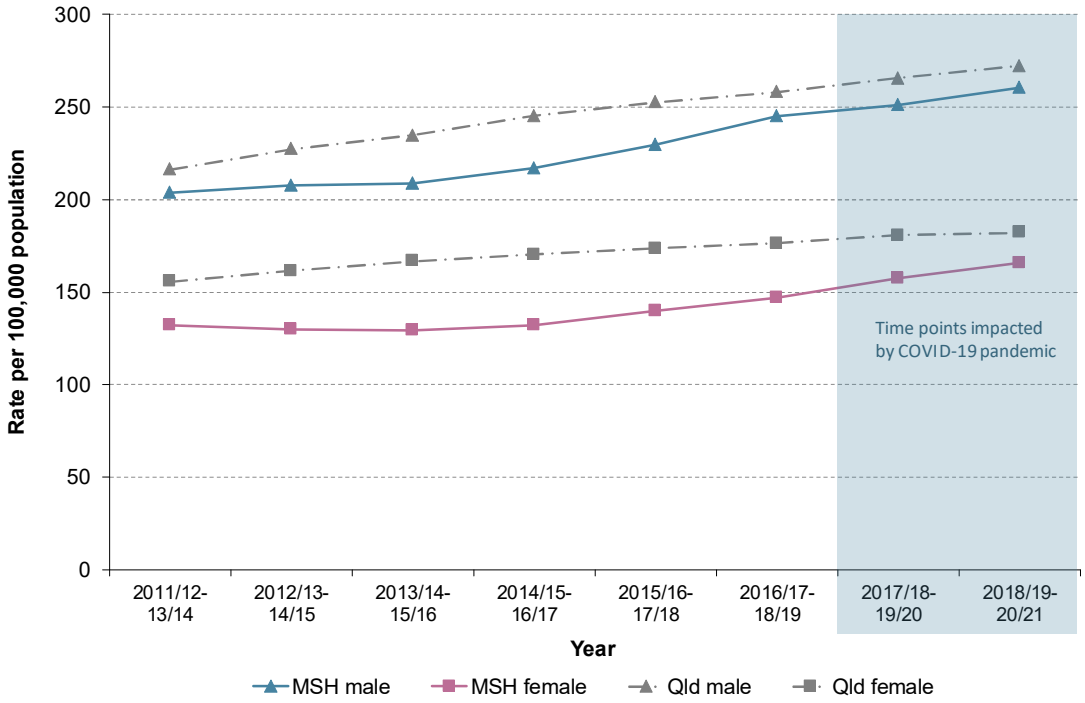


Figure 37: Diabetes mellitus age standardised hospital separation rate by sex, Metro South Health and Queensland, three-year moving averages 2011/12 to 2020/21

Indirect standardised separation ratios indicate that the average separation rate for diabetes was significantly lower in MSH than in Queensland for males (4% lower) and for females (9% lower) in the 2018/19 to 2020/21 period (Table 17).

Table 17: Diabetes mellitus standardised separation ratios by sex, Metro South Health, 2018/19 to 2020/21

Region	Sex	Ratio (95% Confidence Interval)	Statistically significant difference MSH – QLD*
Metro South Health	Male	0.96 (0.93 – 0.98)	↓
	Female	0.91 (0.88 – 0.95)	↓
	Persons	0.93 (0.91 – 0.96)	↓

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

Age specific hospital separation rates for diabetes were relatively low until the age of about 44 years after which they rose sharply with increasing age (Figure 38). Up to the age of 49 years, rates in males and females were broadly comparable, however from 50 years onwards rates in males increased at a greater rate than was seen in females with increasing age (Figure 38). This resulted in the rate in males aged 85 years and over being almost double the rate in females of the same age (Figure 38).

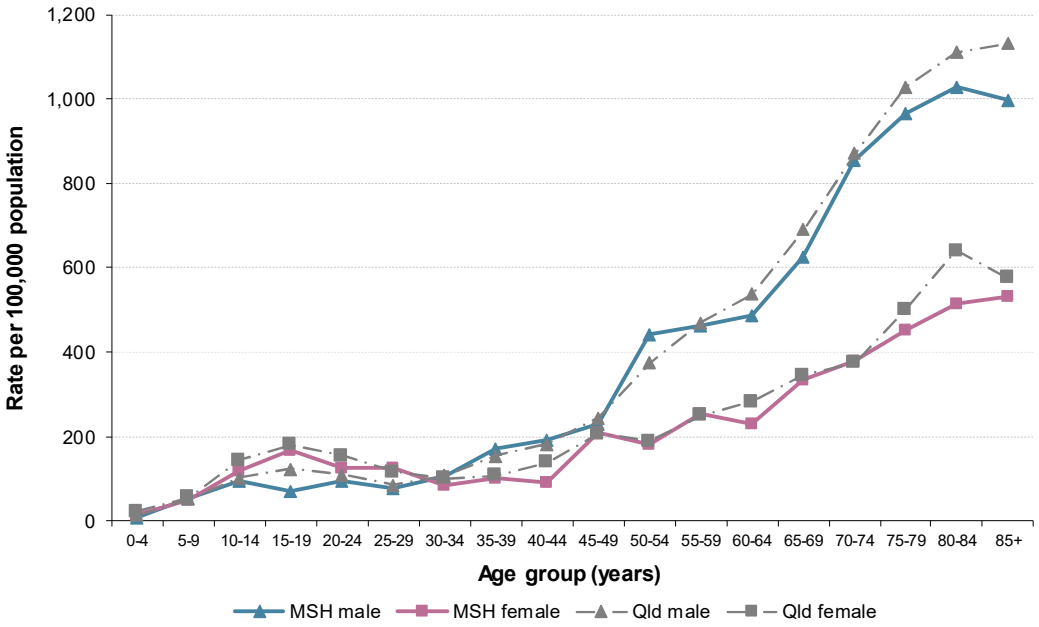


Figure 38: Diabetes mellitus age specific hospital separation rate by sex, Metro South Health and Queensland, 2018/19 to 2020/21

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

There was an average of 209 deaths per year from falls among MSH residents in the three years from 2017 to 2019. The vast majority of these deaths (94%) were in the 65 years and over age group.

In the 65 years and over age group mortality rates for falls were consistently higher in males than in females, although the differences were not statistically significant (Figure 39). Between 2010-12 and 2013-15 MSH mortality rates for falls in persons 65 years and older increased but after that time were relatively stable (Figure 39).

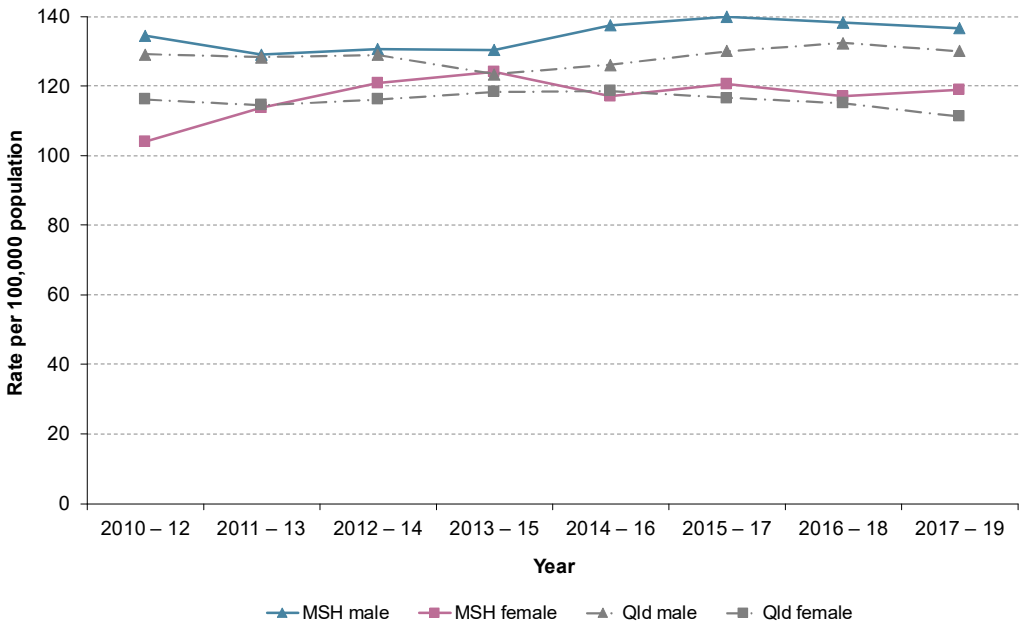


Figure 39: Falls in the 65+ years age group, age standardised mortality rate by sex, Metro South Health and Queensland, three-year moving averages 2010–12 to 2017–19

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

In the previous reporting period, 2007 to 2011, mortality ratios indicated that the average mortality rate for falls in females was significantly lower in MSH than in Queensland in both all ages (17% lower) and in the 65 years and over age group (16% lower)[9]. This change underlines the relatively recent significant increase in rates in MSH females in comparison with their Queensland counterparts.

Hospital separations

On average there were 13,335 hospital separations per year for falls among MSH residents in the three years from 2018/19 to 2020/21. Age standardised separation rates for females were consistently numerically higher than those among males at all timepoints from 2011/12-13/14 to 2018/19-20/21, with the difference being statistically significant from 2013/14-15/16 onwards (Figure 40).

In both MSH and Queensland falls separation rates in both sexes trended strongly upwards between 2011/12-13/14 and 2018/19-20/21 (Figure 40). In MSH rates among males and females increased by 42% and 53% respectively. The COVID-19 pandemic did not appear to have a significant effect on falls separation rates in Queensland or MSH. While rates did increase in the timepoints impacted by the pandemic, this was broadly in line with established trends (Figure 40).

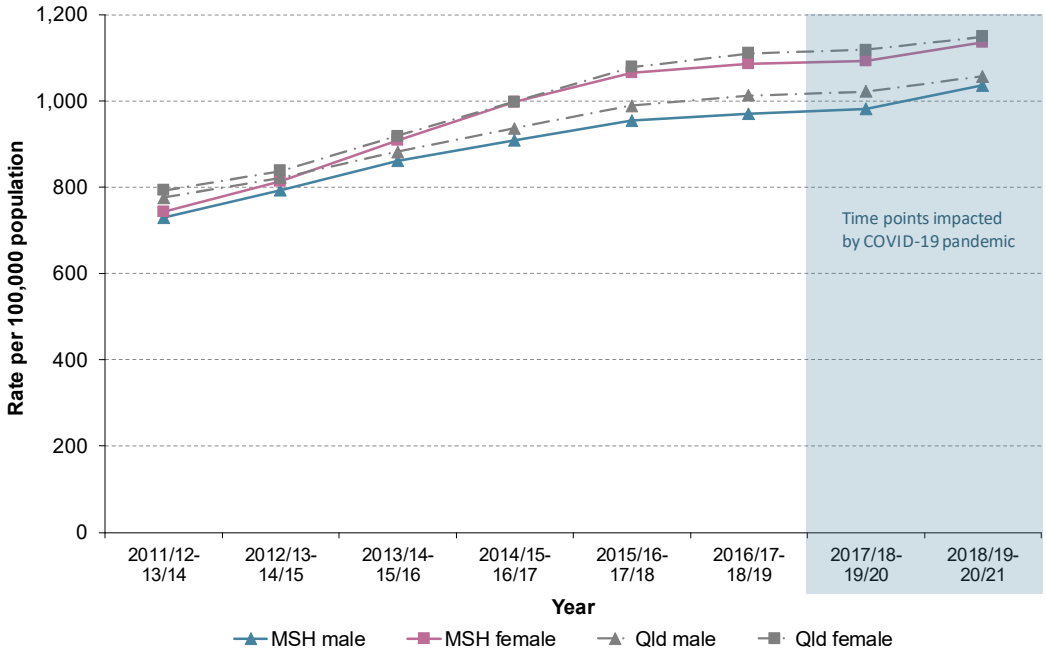


Figure 40: Falls age standardised hospital separation rate by sex, Metro South Health and Queensland, three-year moving averages 2011/12 to 2020/21

In the 65 years and over age group, there was an average of 7,549 hospital separations per year for falls in the three years from 2018/19 to 2020/21. In both MSH and Queensland, age standardised separation rates for females in this age group were consistently significantly higher than rates for males at all timepoints from 2011/12-13/14 to 2018/19-20/21 (Figure 41). Falls separation rates trended even more strongly upwards in this age group in both MSH and Queensland (Figure 41). Over this period rates in MSH males and females increased by 70% and 60% respectively.

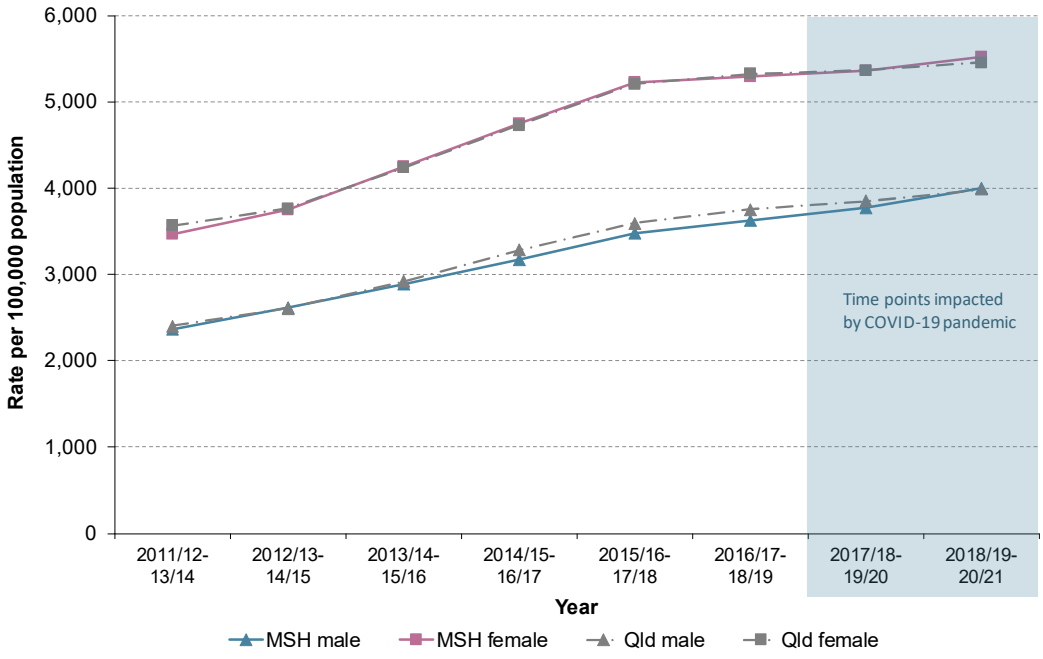


Figure 41: Falls in the 65+ years age group, age standardised hospital separation rate by sex, Metro South Health and Queensland, three-year moving averages 2011/12 to 2020/21

Indirect standardised separation ratios indicate that there was no difference in average separation rate for falls (all ages) or for falls in persons aged 65 years and over between MSH and Queensland for males or females in the period 2018/19 to 2020/21.

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 40 deaths per year from road transport injury among MSH residents in the three years from 2017 to 2019. Males accounted for 67% of these deaths and 23% were in persons aged 15 to 24 years.

Road transport injury mortality rates in MSH decreased between 2010-12 and 2017-19. Across all ages the rate dropped by 19% while in the high-risk age group 15 to 24 years, the decrease was similar at 20%. Years prior to the current reporting period have seen much greater proportional decreases[9,14]. The slowing of the decline suggests a natural floor rate may be approaching, and/or further health promotion activities in this area are needed to continue previous gains.

Indirect standardised mortality ratios indicate that the average mortality rate for road transport injury was significantly lower in MSH than in Queensland for males (33% lower) and for all persons (27% lower) in the five years from 2015 to 2019 (Table 18). When only deaths among those aged 15 to 24 years were considered, the average mortality rate for males was significantly lower in MSH than in Queensland (33% lower) but there was no significant difference between MSH and Queensland for mortality rates in females or all persons (Table 18).

Table 18: Road transport injury standardised mortality ratios by sex, Metro South Health, 2015 to 2019

Region	Age group	Sex	Ratio (95% confidence interval)	Statistically significant difference MSH – QLD*
Metro South Health	All ages	Male	0.67 (0.57 – 0.79)	↓
		Female	0.93 (0.71 – 1.19)	—
		Persons	0.73 (0.64 – 0.84)	↓
	15-24 years	Male	0.67 (0.45 – 0.95)	↓
		Female	1.31 (0.75 – 2.13)	—
		Persons	0.80 (0.59 – 1.07)	—

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

Hospital separations

On average there were 3,777 hospital separations per year for road transport injury among MSH residents in the three years from 2018/19 to 2020/21. Males accounted for almost two-thirds (61%) of these separations.

Age standardised separation rates were significantly higher for males than for females in MSH (by 1.6 to 1.8 times) and in Queensland across all timepoints from 2011/12-13/14 to 2018/19-20/21 (Figure 42). Over this period rates in both males and females in MSH and Queensland trended steadily upwards (Figure 42). The increase was most pronounced in MSH where male rates increased by 40% and female rates by 57% over this period. The COVID-19 pandemic did not appear to have a significant effect on road transport injury separation rates in Queensland or MSH. While rates did increase in the timepoints impacted by the pandemic, this was broadly in line with established trends (Figure 42) so cannot be attributed to the pandemic.

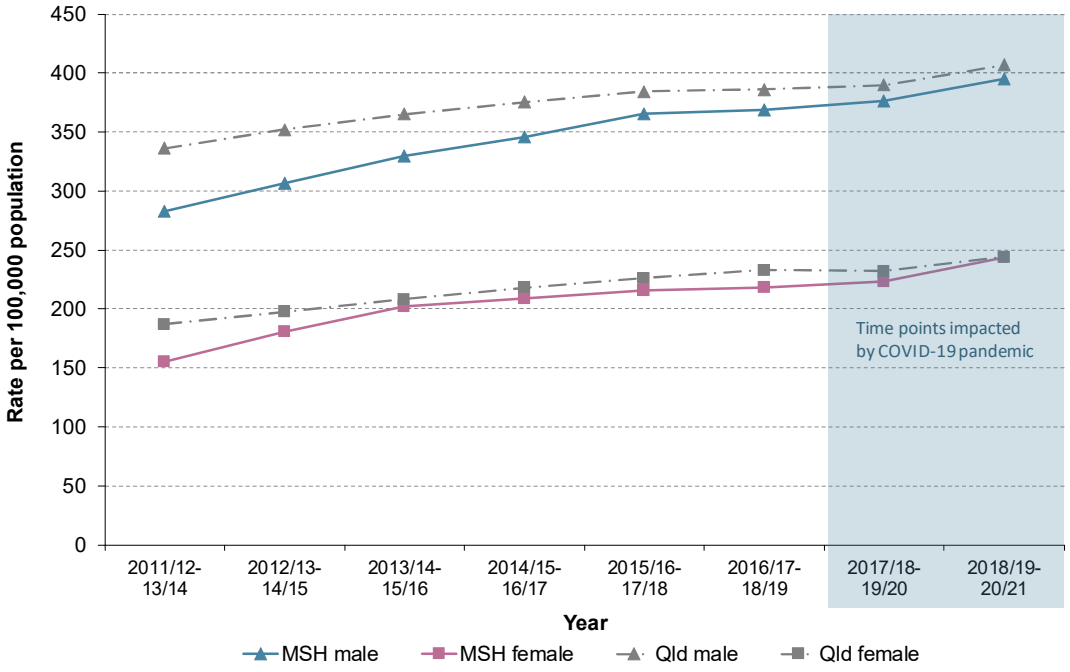


Figure 42: Road transport injury age standardised hospital separation rate by sex, Metro South Health and Queensland, three-year moving averages 2011/12 to 2020/21

In the 15 to 24 years age group, there was an average of 757 hospital separations per year for road transport injury in the three years from 2018/19 to 2020/21 in MSH. Males accounted for 60% of these separations.

In this younger age group, age standardised separations rates for males were significantly higher than for females in MSH (by 1.5 to 1.8 times) and in Queensland at all timepoints from 2011/12-13/14 to 2018/19-20/21 (Figure 43).

Over this period, rates in MSH and Queensland males and females trended upwards with the trend weakest in Queensland males (Figure 43). The MSH female rate increased by 69% and the Queensland female rate by 38% while the MSH male rate increased by 37% over this period. The COVID-19 pandemic did not appear to have a significant effect on road transport injury separation rates in MSH females. While female rates did increase in 2018/19-20/21, this was largely in line with established trends (Figure 43) so cannot be attributed to the pandemic. However the separation rate in MSH males increased strongly in 2018/19-20/21 to a level significantly higher than all other timepoints in the reported period (Figure 43). It is possible that the COVID-19 pandemic may have contributed to this significant rise.

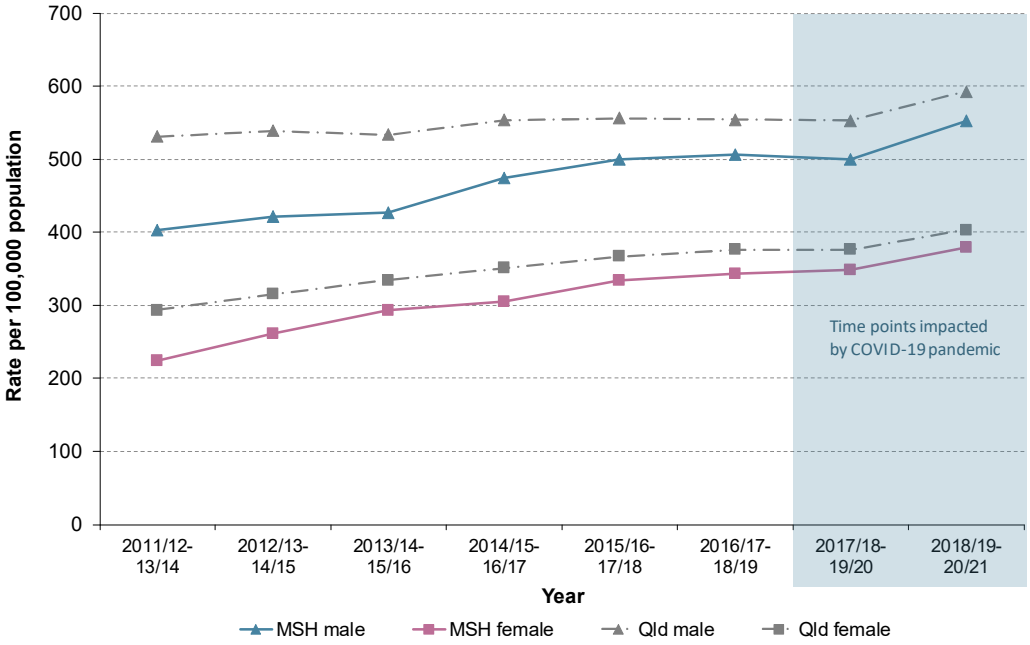


Figure 43: Road transport injury (15 to 24 years) age standardised hospital separation rate by sex, Metro South Health and Queensland, three-year moving averages 2011/12 to 2020/21

Indirect standardised separation ratios indicate that the average separation rate for road transport injury was significantly lower in MSH than in Queensland for males (3% lower) but not females between 2018/19 and 2020/21. When only young people in the high-risk age group 15 – 24 years were considered, the difference between MSH and Queensland was greater with the rate among MSH males 7% lower than their Queensland counterparts (Table 19).

Table 19: Road transport injury standardised separation ratios by sex, Metro South Health, 2018/19 to 2020/21

Region	Age group	Sex	Ratio (95% confidence interval)	Statistically significant difference MSH – QLD*
Metro South Health	All ages	Male	0.97 (0.95 – 0.99)	↓
		Female	1.00 (0.97 – 1.03)	—
		Persons	0.98 (0.96 – 1.00)	—
	15-24 years	Male	0.93 (0.88 – 0.98)	↓
		Female	0.95 (0.89 – 1.01)	—
		Persons	0.94 (0.90 – 0.98)	↓

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

Age specific rates of 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 44).

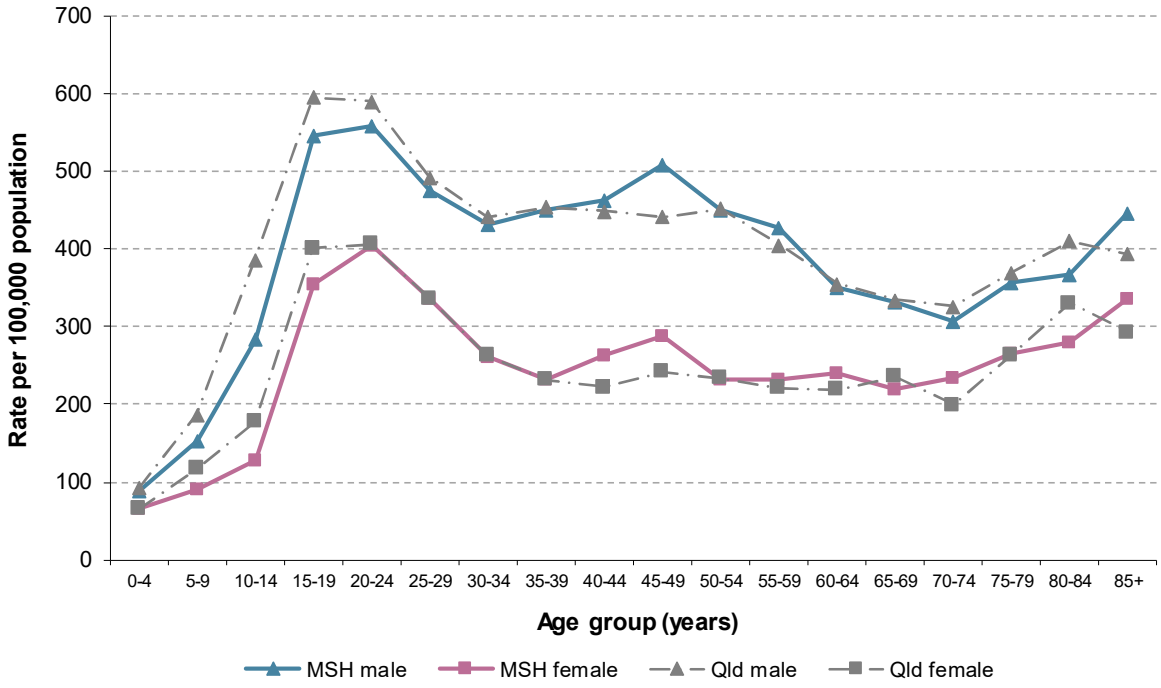


Figure 44: Road transport injury age specific hospital separation rate by sex, Metro South Health and Queensland, 2018/19 to 2020/21

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 persons 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

There was an average of 444 deaths per year from mental health conditions among MSH 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 MSH and Queensland increased markedly between 2010-12 and 2017-19 (Figure 45). MSH male mortality rates increased by 43% while for females there was a 32% increase. This translated to an overall 35% increase for all persons. Queensland experienced a smaller 24% all persons rate increase. Over this period there was no significant difference in age standardised mortality rates between males and females in MSH (Figure 45).

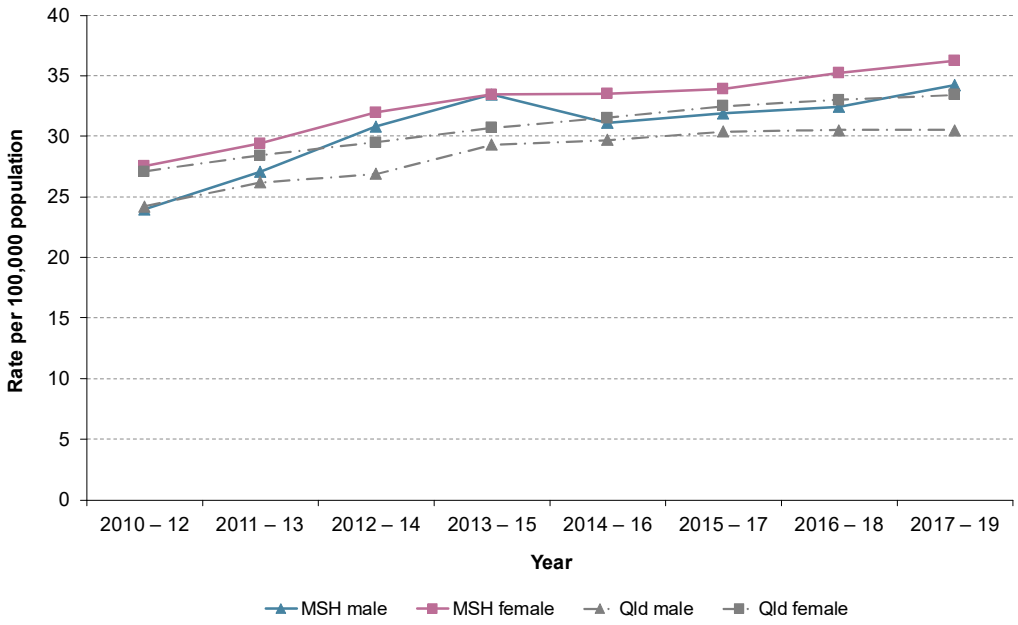


Figure 45: All mental health conditions age standardised mortality rates by sex, Metro South Health and Queensland, three-year moving averages 2010–12 to 2017–19

Indirect standardised mortality ratios indicate that the average mortality rate for all mental health conditions was significantly higher in MSH than in Queensland for females (7% higher) and for all persons (7% higher) in the five years from 2015 to 2019 (Table 20).

Table 20: All mental health conditions standardised mortality ratios by sex, Metro South Health, 2015 to 2019

Region	Sex	Ratio (95% confidence interval)	Statistically significant difference MSH – QLD*
Metro South Health	Male	1.06 (0.99 – 1.14)	—
	Female	1.07 (1.01 – 1.13)	↑
	Persons	1.07 (1.02 – 1.11)	↑

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

Hospital separations

There was an average of 15,677 hospital separations per year for mental health conditions (excluding ambulatory-equivalent) among MSH residents in the three years from 2018/19 to 2020/21. Age standardised separation rates were consistently significantly higher for females than for males in both MSH and Queensland at all timepoints from 2011/12-13/14 to 2018/19-20/21 (Figure 46).

Over this period both MSH and Queensland separation rates for males and females trended upwards (Figure 46). Rates in MSH males and females increased by 53% and 54% respectively over this period. Prior to the COVID-19 pandemic rates in both sexes had been increasing steeply, with rates at each timepoint significantly higher than the preceding point. However, for those timepoints impacted by the pandemic, the rate of increase slowed such that each timepoint was not significantly higher than the preceding one. It is plausible to suggest that persons with mental health conditions 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.

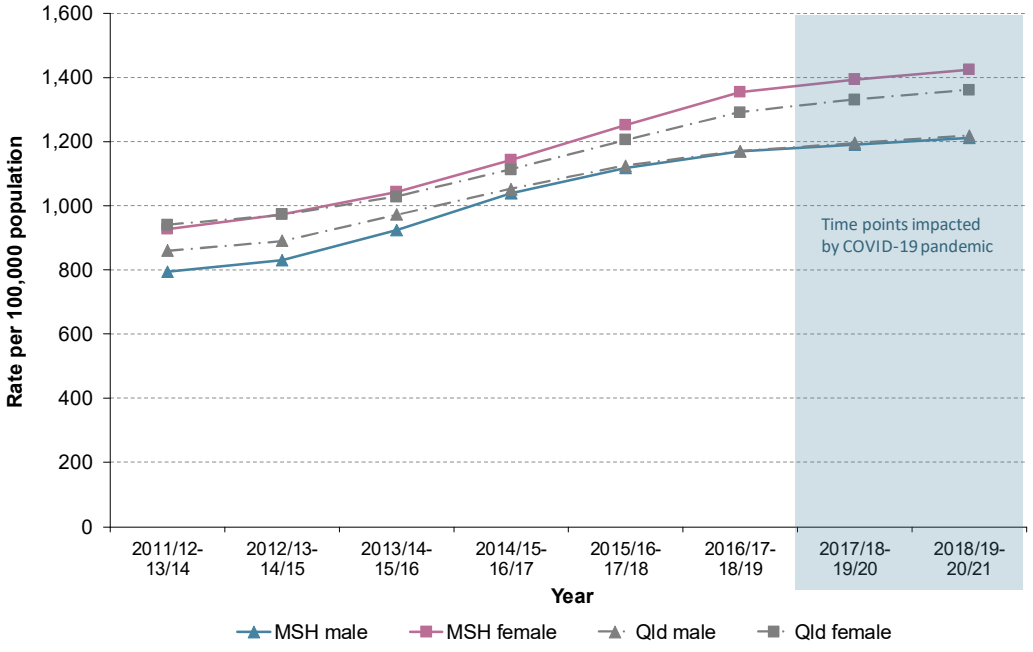


Figure 46: Mental health conditions age standardised hospital separation rate by sex, Metro South Health and Queensland, three-year moving averages 2011/12 to 2020/21

Indirect standardised separation ratios indicate that the average hospital separation rate for all mental health conditions was significantly higher in MSH than in Queensland for females (5% higher) and for all persons (3% higher) between 2018/19 and 2020/21 (Table 21).

Table 21: All mental health conditions standardised separation ratios by sex, Metro South Health, 2018/19 to 2020/21

Region	Sex	Ratio (95% confidence interval)	Statistically significant difference MSH – QLD*
Metro South Health	Male	1.00 (0.99 – 1.01)	—
	Female	1.05 (1.04 – 1.06)	↑
	Persons	1.03 (1.02 – 1.03)	↑

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

Age specific hospital separation rates for mental health conditions increased substantially between the age groups of 10 to 14 and 20 to 24 years. In females rates then remained relatively stable until 54 years after which they declined gradually until the age of 69 years. From 70 years onwards rates climbed steeply with increasing age. Among males, rates increased gradually from 15 to 54 years. In males over 74 years a steep increase with increasing age was recorded, similar to that observed in females (Figure 47).

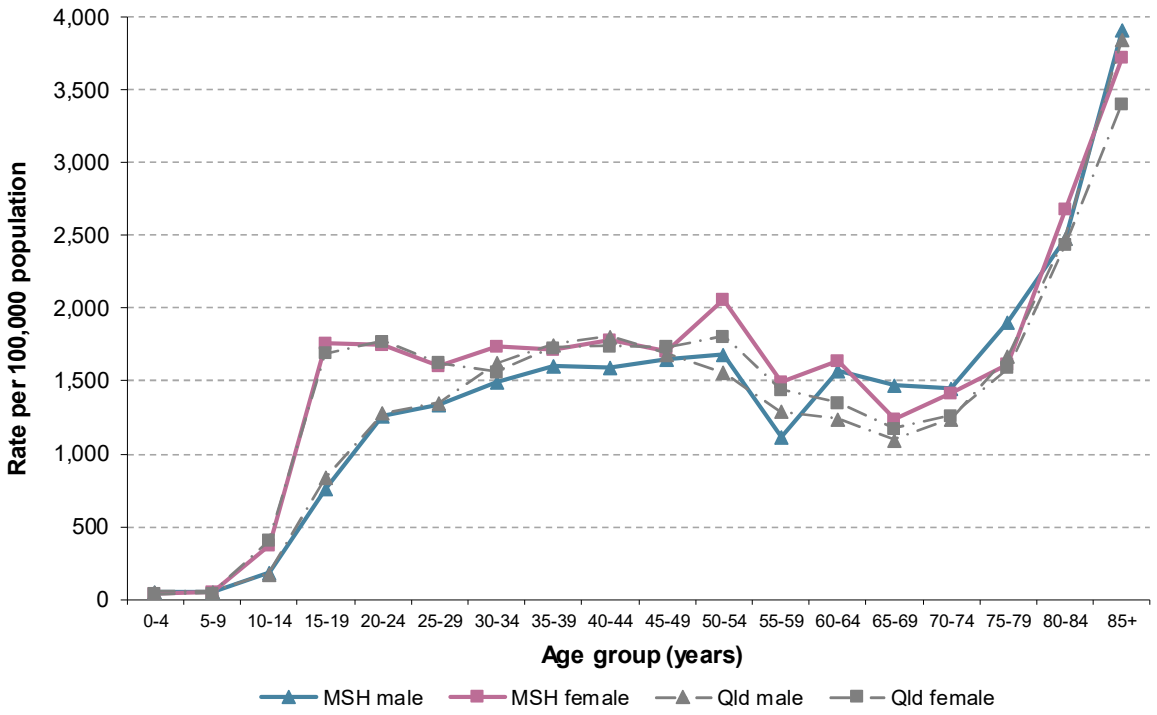


Figure 47: Mental health conditions age specific hospital separation rate by sex, Metro South Health and Queensland, 2018/19 to 2020/21

Mental health: anxiety and depression

Hospital separations

There was an average of 5,289 hospital separations per year for anxiety and depression (excluding ambulatory-equivalent) among MSH residents in the three-years from 2018/19 to 2020/21. Females accounted for 64% of these separations. Female age standardised separation rates were significantly higher than male rates in both MSH and Queensland across all timepoints from 2011/12-13/14 to 2018/19-20/21 (Figure 48).

Over this period MSH and Queensland separation rates for both males and females trended upwards (Figure 48). Rates in MSH males and females increased by 51% and 57% respectively over this time. Prior to the COVID-19 pandemic rates, in both sexes increased steeply, with rates at most timepoints significantly higher than the preceding point. However, for those timepoints impacted by the pandemic, separation rates fell for males, and for females the increase initially slowed and then fell. 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.

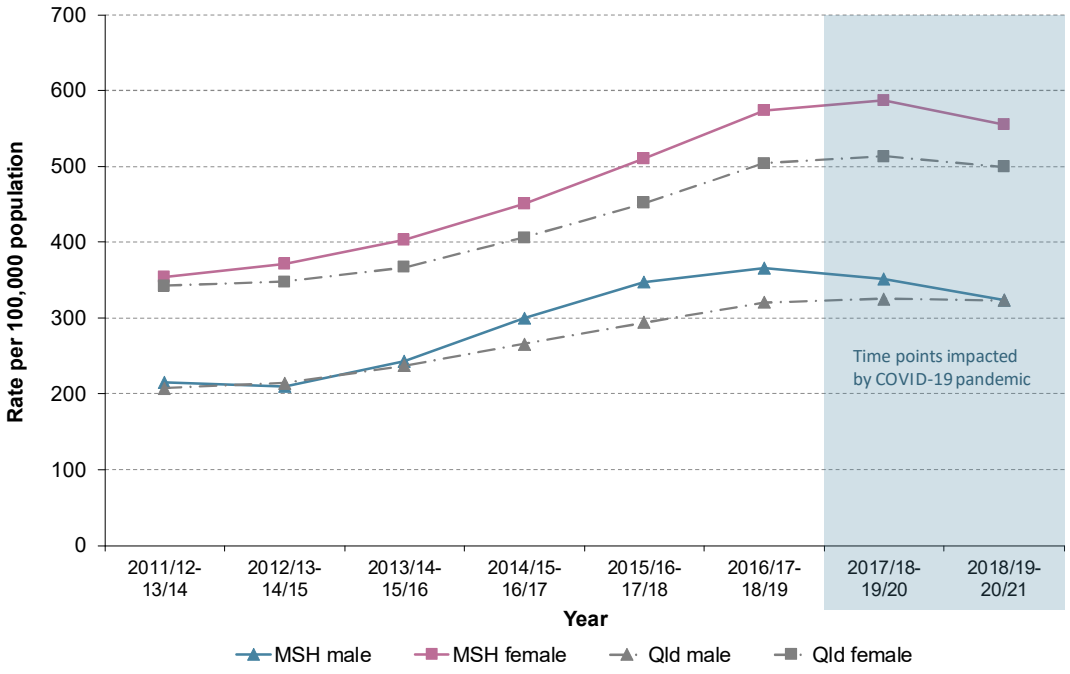


Figure 48: Anxiety and depression age standardised hospital separation rate by sex, Metro South Health and Queensland, three-year moving averages 2011/12 to 2020/21

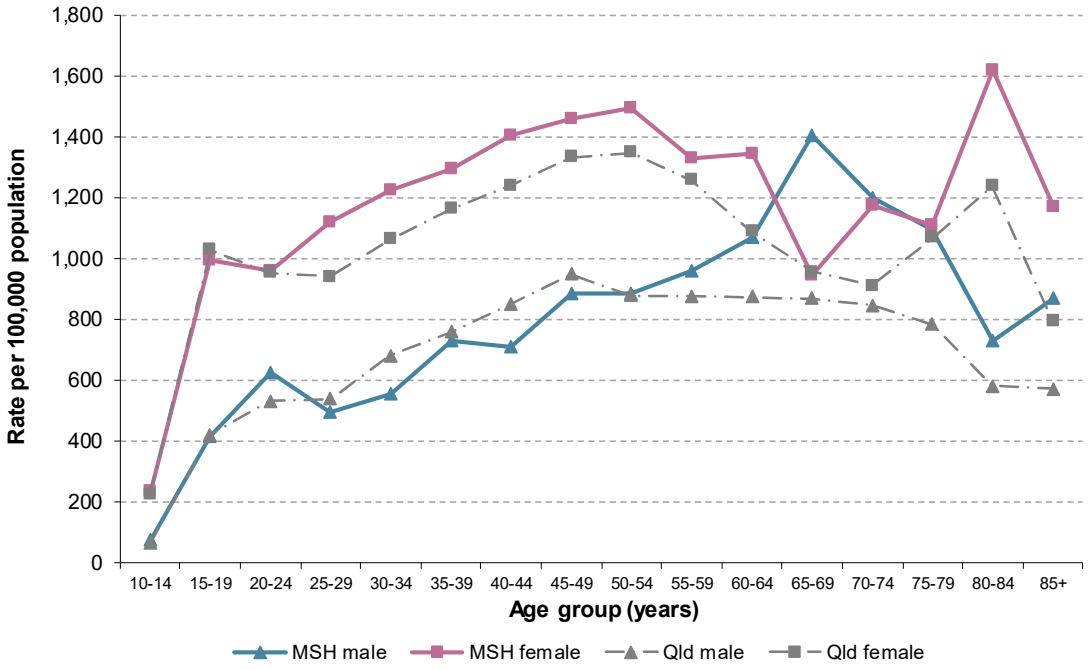
Indirect standardised separation ratios indicate that the average separation rate for anxiety and depression was significantly higher in MSH than in Queensland for females (12% higher) and for all persons (8% higher) between 2018/19 and 2020/21 (Table 22).

Table 22: Anxiety and depression standardised separation ratios by sex, Metro South Health and Queensland, 2018/19 to 2020/21

Region	Sex	Ratio (95% Confidence Interval)	Statistically significant difference MSH – QLD*
Metro South Health	Male	1.01 (0.99 – 1.04)	—
	Female	1.12 (1.10 – 1.14)	↑
	Persons	1.08 (1.06 – 1.10)	↑

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

Age specific hospital separation rates for anxiety and depression in MSH females increased sharply between the age groups of 10 to 14 and 15 to 19 years. They then increased more gradually with increasing age, peaking in the 50 to 54 years age group. There was then a sharp drop to a low point in the 65 to 69 years age group followed by further increases with a final peak at 80 to 84 years (Figure 49). Rates for males climbed more steadily with age with the highest rates in MSH found in those aged 65 to 69 years after which a decline was recorded (Figure 49).



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

Figure 49: Anxiety and depression age specific hospital separation rate by sex, Metro South Health and Queensland, 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

There was an average of 156 deaths per year from suicide among MSH residents in the three years from 2017 to 2019. Males accounted for almost three-quarters (72%) of these deaths. Suicide mortality rates among males were significantly higher than female rates in MSH, with male rates consistently around three times higher than female rates between 2010-12 and 2017-19 (Figure 50).

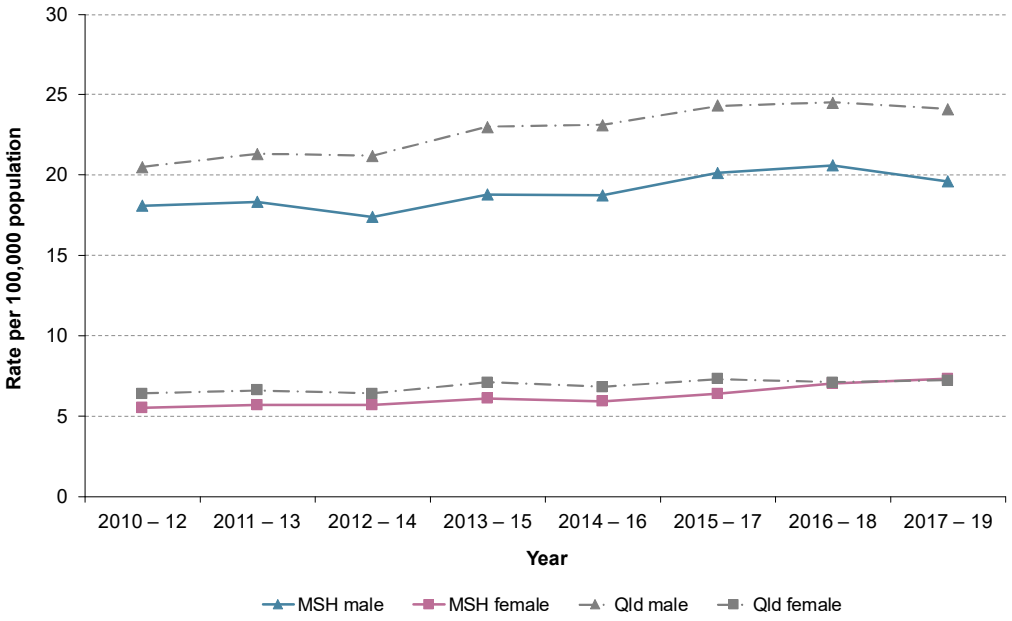


Figure 50: Suicide age standardised mortality rate by sex, Metro South Health and Queensland, three-year moving averages 2010-12 to 2017-19

Indirect standardised mortality ratios indicate that the average mortality rate for suicide was significantly lower in MSH than in Queensland for males (17% lower) and all persons (14% lower) in the five years from 2015 to 2019 (Table 23). When only deaths among those aged 15 to 24 years were considered, mortality ratios indicated no significant difference in rates between MSH and Queensland for the same period (Table 23).

Table 23: Suicide standardised mortality ratios by sex, Metro South Health, 2015 to 2019

Region	Age group	Sex	Ratio (95% confidence interval)	Statistically significant difference MSH – QLD*
Metro South Health	All ages	Male	0.83 (0.77 – 0.91)	↓
		Female	0.94 (0.81 – 1.08)	—
		Persons	0.86 (0.80 – 0.92)	↓
	15-24 years	Male	0.87 (0.70 – 1.07)	—
		Female	0.94 (0.66 – 1.31)	—
		Persons	0.89 (0.74 – 1.06)	—

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

Hospital separations

On average there were 2,659 hospital separations per year for self-inflicted injury (all ages) among MSH residents in the three-years from 2018/19 to 2020/21. Females accounted for almost two thirds (64%) of these separations. Female age standardised separation rates were significantly higher than male rates in both MSH and Queensland at all timepoints from 2011/12-13/14 to 2018/19-20/21 (Figure 51). Separation rates for MSH females were 1.7 to 1.9 times higher than the rates for males over these years.

Over this period MSH and Queensland self-inflicted injury separation rates for both males and females trended upwards (Figure 51). Rates in MSH males and females increased by 24% and 18% respectively over this period. The rate in MSH females increased significantly in 2018/19-20/21, the timepoint with the greatest COVID-19 pandemic impact to date. However the increase in males at that timepoint was not statistically significant.

There was an average of 975 hospital separations per year for self-inflicted injury in MSH 15 to 24 year olds in the three-years from 2018/19 to 2020/21, representing 37% of all separations for self-inflicted injury in this period. Females accounted for 69% of these separations and female age standardised separation rates were consistently two to three times higher than male rates (Figure 51).

Hospital separation rates for self-inflicted injury among young people (15 to 24 years) increased far more steeply between 2011/12-13/14 and 2018/19-20/21 than the all ages group (Figure 51). Rates for MSH males and females increased by 81% and 39% respectively

The age standardised hospital separation rate among all persons people aged 15 to 24 years was consistently more than double the rate in people of all ages in MSH over then entire reported period (Figure 51). The greater part of this difference was accounted for by females, with the separation rate for young MSH women being three times higher than the rate in women of all ages in 2018/19-20/21. Separation rates in young women, trended up more sharply over the reported period than did rates in all women (Figure 51).

In 2018/19-20/21, the timepoint with the greatest COVID-19 pandemic impact to date, the separation rate in young MSH females saw a 19% increase from the previous timepoint, with this spike being inconsistent with the previous trend. There was also an increase in the rate in young MSH males at this time of 17% although this was closer to previously established trends. These highly significant increases in hospitalisation for youth self-harm are consistent with anecdotal news reports throughout 2020-2021 regarding the social and mental health impact of the COVID-19 pandemic and pandemic response measures such as lockdowns and isolation.

The spikes in self-harm separations are concerning on their own. However, if they are considered in the light of the decrease in separation rates for anxiety & depression (Figure 48) these data may suggest that persons with mental health conditions such as anxiety & depression were less able to access hospital-based care over the pandemic period, resulting in higher rates of hospitalisation for self-harm episodes.

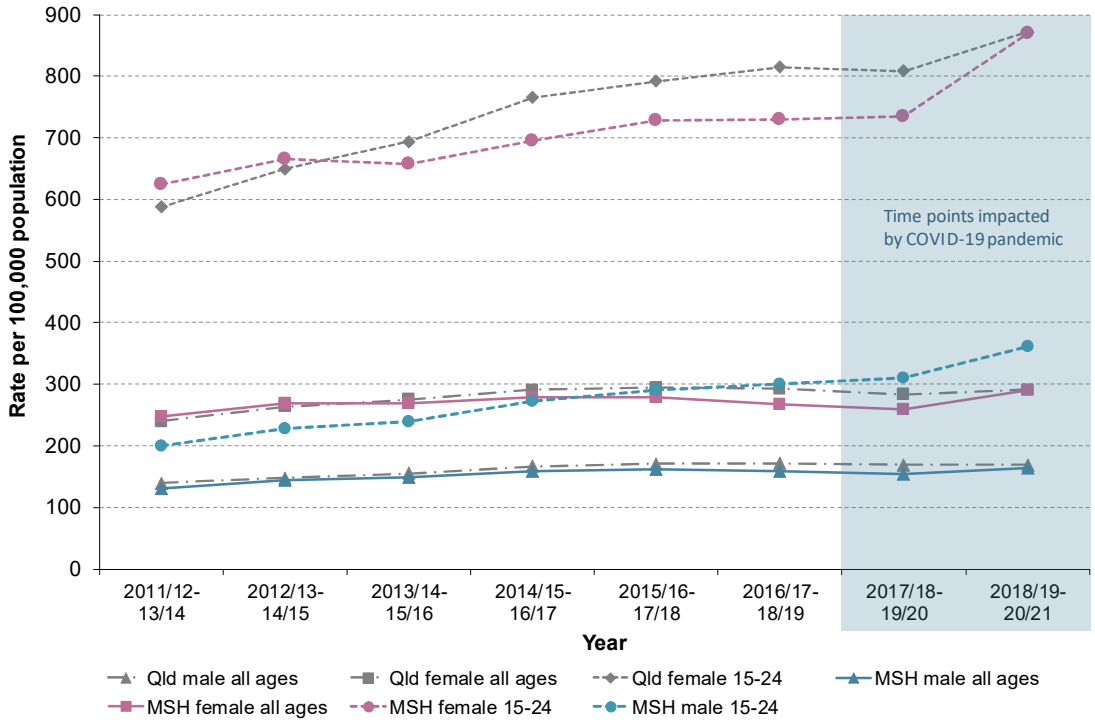


Figure 51: Self-inflicted injury age standardised hospital separation rate by sex and age group, Metro South Health and Queensland, three-year moving averages 2011/12 to 2020/21

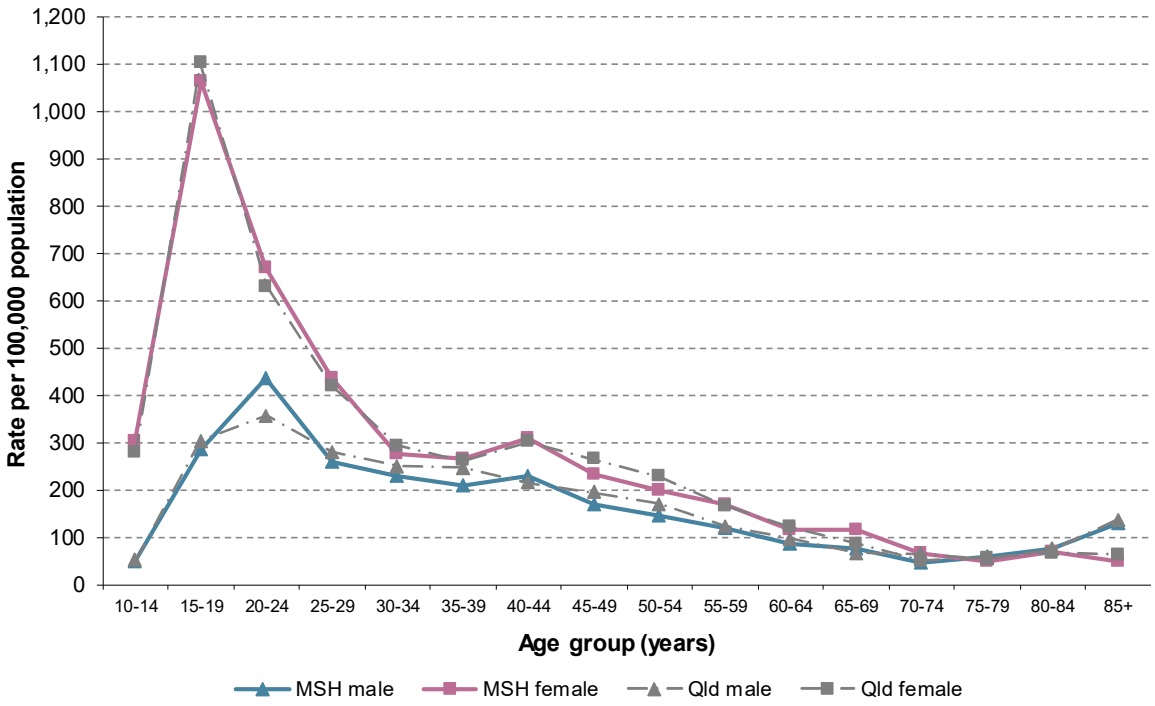
Indirect standardised separation ratios indicate that there was no difference in average separation rate for self-inflicted injury (all ages) between MSH and Queensland for males or females between 2018/19 and 2020/21.However when the younger, high-risk 15 to 24 years age group was considered, separation rates in MSH males were 11% higher than the equivalent Queensland rate (Table 24).

Table 24: Self-inflicted injury standardised separation ratios by sex, Metro South Health, 2018/19 to 2020/21

Region	Age group	Sex	Ratio (95% confidence interval)	Statistically significant difference MSH – QLD*
Metro South Health	All ages	Male	0.97 (0.94 – 1.01)	—
		Female	1.00 (0.97 – 1.03)	—
		Persons	0.99 (0.97 – 1.01)	—
	15-24 years	Male	1.11 (1.03 – 1.18)	↑
		Female	1.00 (0.96 – 1.05)	—
		Persons	1.03 (1.00 – 1.07)	—

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

Age specific hospital separation rates for self-inflicted injury among males increased through the teen years, peaking in the 20 to 24 years age group after which they declined steadily with increasing age (Figure 52). Among females, separation rates spiked in the 15 to 19 year age group to a rate more than double the peak rate in males. Female rates then dropped sharply by the 25 to 29 year age group and continued to decline with increasing age (Figure 52).



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

Figure 52: Self-inflicted injury age specific hospital separation rate by sex, Metro South Health and Queensland, 2018/19 to 2020/21*

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 1,789 deaths per year from all cancers among MSH residents in the years 2015 to 2019. Six types of cancer (lung, colorectal, hepatobiliary, haematological, prostate and female breast) together accounted for two thirds (66%) of all cancer deaths in MSH in the five years from 2015 to 2019 (Table 25). Lung cancer alone accounted for almost one in five (19%) cancer deaths in MSH in this period.

The age standardised mortality rate of head and neck cancer was significantly lower in MSH than in Queensland over this reporting period (Table 25). The mortality rates of all other major cancer types in MSH were statistically similar to the Queensland rates.

In 2015 to 2019, the average annual age standardised mortality rate for all cancers (combined) in MSH (155 new cases per 100,000 persons) was statistically similar to the Queensland rate (159 new cases per 100,000 persons) (Table 25). The current MSH mortality rate was significantly lower than the rate reported for 2011 to 2015 of 168 new cases per 100,000 persons[9].

Table 25: Mortality numbers and age standardised mortality rates by site of cancer, Metro South Health 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
	MSH	QLD	MSH	QLD	MSH–QLD*
Lung	1,734	9,147	30.3 (28.9 – 31.7)	32.0 (31.3 – 32.6)	—
Hepatobiliary	1,045	4,840	18.1 (17.0 – 19.2)	17.0 (16.5 – 17.4)	—
Colorectal	1,044	5,400	18.0 (16.9 – 19.1)	19.0 (18.5 – 19.5)	—
Haematological	925	4,752	16.2 (15.2 – 17.3)	16.8 (16.3 – 17.2)	—
Prostate	614	3,223	25.1 (23.1 – 27.1)	25.4 (24.5 – 26.3)	—
Breast (female)	583	2,824	18.7 (17.2 – 20.3)	19.2 (18.5 – 19.9)	—
Upper gastrointestinal	498	2,557	8.7 (8.0 – 9.5)	9.0 (8.7 – 9.4)	—
Urological	403	2,293	7.1 (6.4 – 7.8)	8.1 (7.8 – 8.4)	—
Gynaecological	439	1,971	14.2 (12.9 – 15.5)	13.3 (12.7 – 13.8)	—
Melanoma	305	1,604	5.2 (4.7 – 5.8)	5.7 (5.4 – 6.0)	—
CNS and Brain	319	1,421	5.6 (5.0 – 6.2)	5.2 (4.9 – 5.4)	—
Head and neck	221	1,300	3.8 (3.3 – 4.3)	4.5 (4.3 – 4.8)	🡻
Mesothelioma	149	690	2.6 (2.2 – 3.0)	2.4 (2.3 – 2.6)	—
Bone and soft tissue	110	471	1.9 (1.6 – 2.3)	1.7 (1.6 – 1.9)	—
Endocrine	44	191	Not calculated#	0.7 (0.6 – 0.8)	Not calculated#
Ophthalmic	16	100	Not calculated#	0.4 (0.3 – 0.4)	Not calculated#
Breast (male)	<5	22	Not calculated#	Not calculated#	Not calculated#
Other invasive cancers	494	2,487	8.4 (7.7 – 9.2)	8.6 (8.3 – 9.0)	—
TOTAL	8,947	45,293	155.4 (152.2 – 158.7)	159.4 (158.0 – 160.9)	—

* 🡹 MSH statistically significantly higher than Queensland; 🡻 MSH statistically significantly lower than Queensland;
— no statistically significant difference between MSH 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 5,998 new (incident) cases of cancer per year among MSH residents in the five-year period 2015 to 2019. The six most common types of newly diagnosed cancer in MSH (prostate, female breast, melanoma, haematological, colorectal and lung; Table 26) together accounted for 70% of all new cases.

For this period, the average annual age standardised incidence rate for all cancers (combined) in MSH (517 new cases per 100,000 persons) was significantly lower than the Queensland rate (545 new cases per 100,000 persons) (Table 26). The current MSH rate was almost the same as the rate reported for 2011 to 2015 of 516 new cases per 100,000 persons[9].

The incidence rates of prostate cancer and melanoma (two of the three most common newly diagnosed cancers in both MSH and Queensland) along with head and neck cancer were significantly lower in MSH than in Queensland in the current reported period (Table 26). The only major cancer with a significantly higher age standardised incidence rate in MSH compared with Queensland was endocrine cancer (Table 26).

Table 26: Newly diagnosed cancer cases (incidence) and age standardised incidence rates by site of cancer, Metro South Health 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
	MSH	QLD	MSH	QLD	MSH–QLD*
Prostate	3,942	22,142	139.8 (135.5 – 144.2)	156.5 (154.5 – 158.6)	↓
Breast (female only)	3,761	17,857	125.1 (121.1 – 129.1)	127.5 (125.6 – 129.4)	—
Melanoma	3,755	20,592	64.8 (62.8 – 66.9)	75.9 (74.9– 76.9)	↓
Haematological	3,475	17,191	60.3 (58.4 – 62.4)	62.0 (61.1 – 62.9)	—
Colorectal	3,254	16,475	56.5 (54.6 – 58.5)	59.2 (58.3 – 60.1)	—
Lung	2,675	13,675	46.5 (44.7 – 48.2)	47.9 (47.1 – 48.7)	—
Urological	1,680	8,508	29.1 (27.7 – 30.5)	30.9 (30.3 – 31.6)	—
Hepatobiliary	1,434	6,558	24.7 (23.4 – 26.0)	23.1 (22.5 – 23.6)	—
Gynaecological	1,279	6,043	42.4 (40.1 – 44.8)	43.1 (42.0 – 44.2)	—
Upper gastrointestinal	986	4,808	17.1 (16.1 – 18.2)	17.1 (16.6 – 17.5)	—
Endocrine	949	3,621	16.5 (15.5 – 17.6)	14.1 (13.6 – 14.6)	↑
Head and neck	939	5,173	16.0 (15.0 – 17.1)	18.5 (18.0 – 19.0)	↓
CNS and Brain	415	1,894	7.3 (6.6 – 8.0)	7.1 (6.8 – 7.4)	—
Bone and soft tissue	278	1,229	4.9 (4.4 – 5.5)	4.6 (4.4 – 4.9)	—
Mesothelioma	166	770	2.9 (2.5 – 3.4)	2.7 (2.5 – 2.9)	—
Ophthalmic	60	419	1.0 (0.8 – 1.3)	1.5 (1.4 – 1.7)	—
Breast (male only)	31	182	Not calculated#	1.3 (1.1 – 1.5)	Not calculated#
Other invasive cancers	910	4,785	15.6 (14.6 – 16.7)	16.9 (16.4 – 17.3)	—
TOTAL	29,989	151,922	517.0 (511.2 – 522.9)	545.3 (542.6 – 548.1)	↓

* ↑ MSH statistically significantly higher than Queensland; ↓ MSH statistically significantly lower than Queensland; — no statistically significant difference between MSH 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[29]. Mortality rates have decreased over time from 36 deaths per 100,000 males in 1985 to 25 deaths per 100,000 males in 2019[29]. This decline is expected to continue[27].

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 decreased to 147 per 100,000 in 2017[29].

Mortality

There was an average of 123 deaths per year from prostate cancer among MSH males in the five years from 2015 to 2019. This represented 6.9% of all cancer deaths in MSH in this period. There was no significant difference in age standardised prostate cancer mortality rate between MSH and Queensland in this period (Table 25, page 68).

Incidence

On average there were 788 new cases of prostate cancer per year among MSH males in the five years from 2015 to 2019. This represented 13% of all new cases of cancer in MSH over this period, making prostate cancer the most common newly diagnosed cancer in MSH.

In 2015 to 2019, the average annual prostate cancer age standardised incidence rate in MSH was 140 new cases per 100,000 males which was significantly lower than the Queensland rate of 157 new cases per 100,000 males (Table 26, page 69). The current MSH rate was also significantly lower than the rate reported for 2011 to 2015 of 146 new cases (95% CI: 142 – 151) per 100,000 males[9].

Between 2010 and 2019, annual age standardised rates of prostate cancer trended slightly downwards in both MSH and Queensland although both areas showed a rise between 2016 and 2019 (Figure 53).

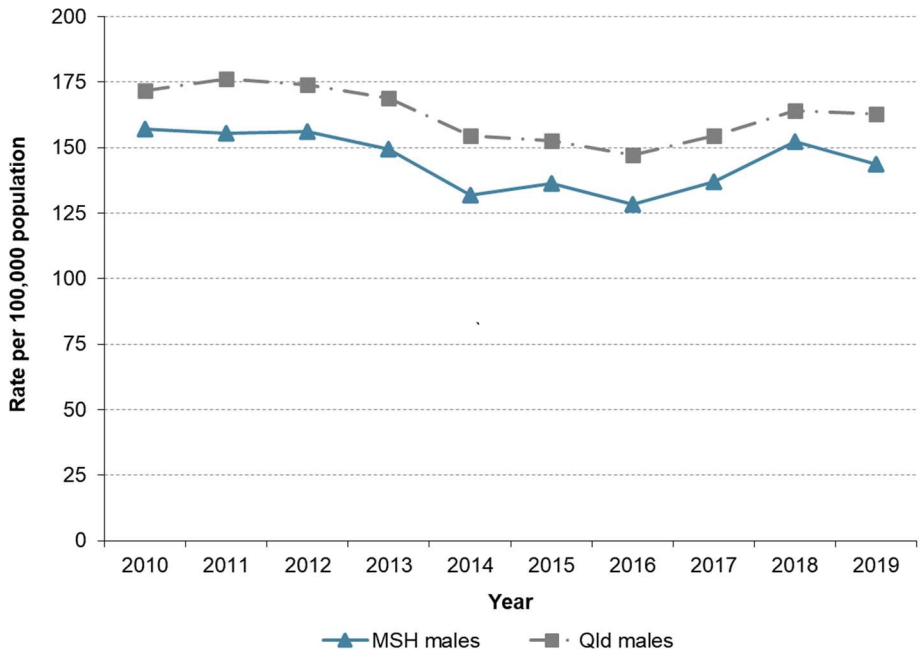
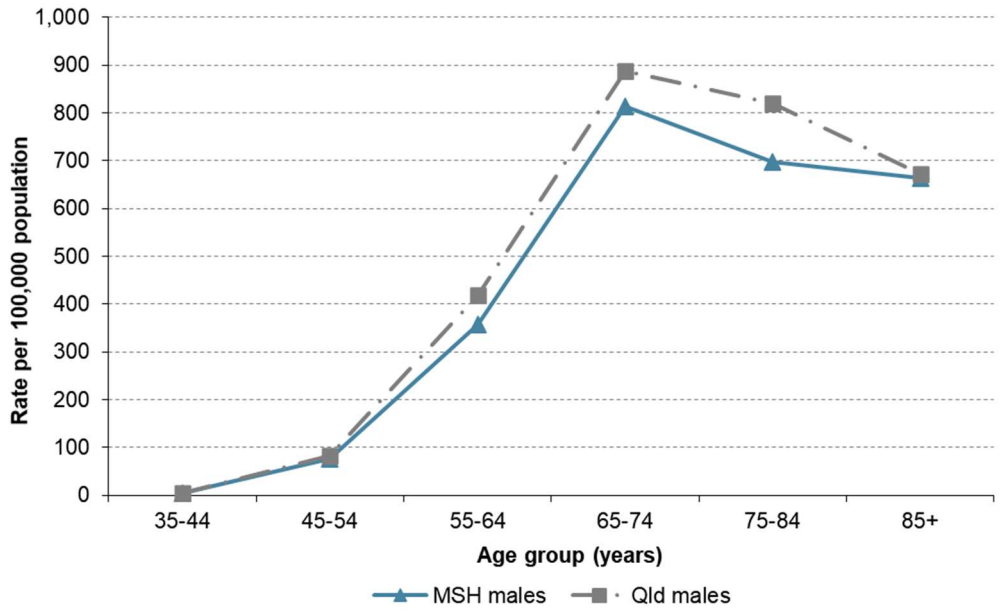


Figure 53: Prostate cancer age standardised incidence rates, Metro South Health and Queensland, 2010 to 2019

In the years 2015 to 2019, prostate cancer incidence rates were negligible in men under the age of 35 years. From the age of about 45 years rates increased sharply, peaking in the 65 to 74 years age group before declining somewhat in older age groups (Figure 54).



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

Figure 54: Prostate cancer age specific incidence rates, Metro South Health 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 cases 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 61 deaths per year from melanoma among MSH residents in the five years from 2015 to 2019. This represented 3.4% of all cancer deaths in MSH in this period. The age standardised melanoma mortality rate in MSH was statistically similar to the Queensland rate over this period (Table 25, page 68).

Incidence

On average there were 751 new cases of melanoma per year among MSH residents in the five years from 2015 to 2019. This represented almost 13% of all new cases of cancer in MSH in this period, making melanoma the third most common newly diagnosed cancer in MSH.

In 2015 to 2019, the average annual melanoma age standardised incidence rate in MSH was 65 new cases per 100,000 persons which was significantly lower than the Queensland rate of 76 new cases per 100,000 persons (Table 26, page 69). The current MSH rate was almost the same as the rate reported for 2011 to 2015 of 66 new cases per 100,000 males[9].

Between 2010 and 2019 annual melanoma incidence rates in MSH trended downwards from 70 to just over 60 new cases per 100,000 persons (Figure 55). This is in contrast to the whole of Australia[29] and Queensland (Figure 55) where rates increased over this period.

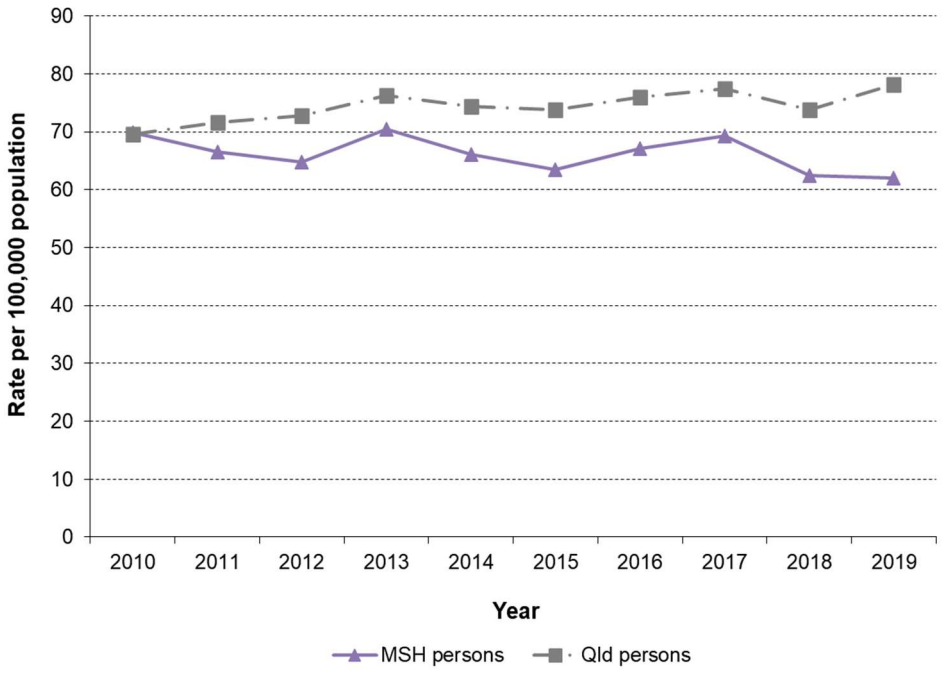
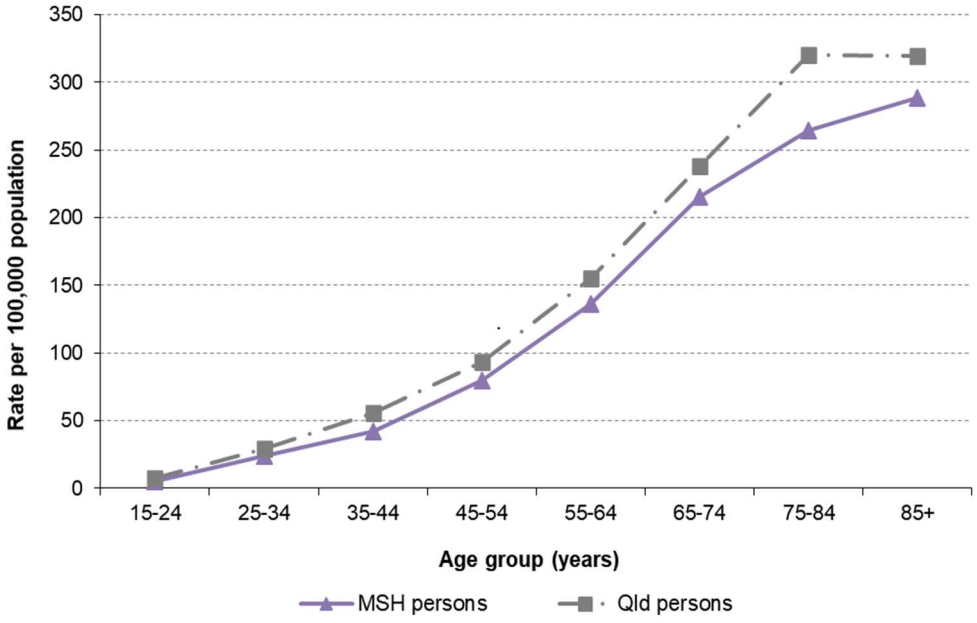


Figure 55: Melanoma age standardised incidence rates, Metro South Health and Queensland, 2010 to 2019

In the years 2015 to 2019, melanoma incidence rates were negligible in people under the age of 15 years, but then increased with increasing age, to a peak in the 85 years and over age group (Figure 56).



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

Figure 56: Melanoma age specific incidence rates, Metro South Health 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 117 deaths per year from breast cancer among MSH females in the five years from 2015 to 2019. This represented 6.5% of all cancer deaths in MSH in this period. The majority of these deaths (89%) were in the 50 years and over age group, with women aged 55 to 79 years accounting for over half (55%) of all breast cancer deaths. In this period there was an average of less than one death per year among MSH males.

There was no significant difference in average annual female breast cancer age-standardised mortality rate between MSH and Queensland over the years 2015 to 2019 combined (Table 25, page 68).

Incidence

On average there were 752 new cases of breast cancer per year among MSH women in the five-years from 2015 to 2019. This represented almost 13% of all new MSH cases of cancer in this period making breast the second most common newly diagnosed cancer in MSH. By comparison, on average over this period there were six new cases of breast cancer per year among MSH men.

In 2015 to 2019, the average annual female breast cancer age standardised incidence rate in MSH was 125 new cases per 100,000 females which was statistically similar to the Queensland rate (Table 26, page 68). The current MSH rate was very similar to the rate reported for 2011 to 2015 of 127 new cases (95% CI: 123 – 132) per 100,000 females[9].

Between 2010 and 2019 annual female breast cancer incidence rates in both MSH and Queensland were relatively steady with the rate in MSH consistently between 115 and 135 new cases per 100,000 persons (Figure 57).

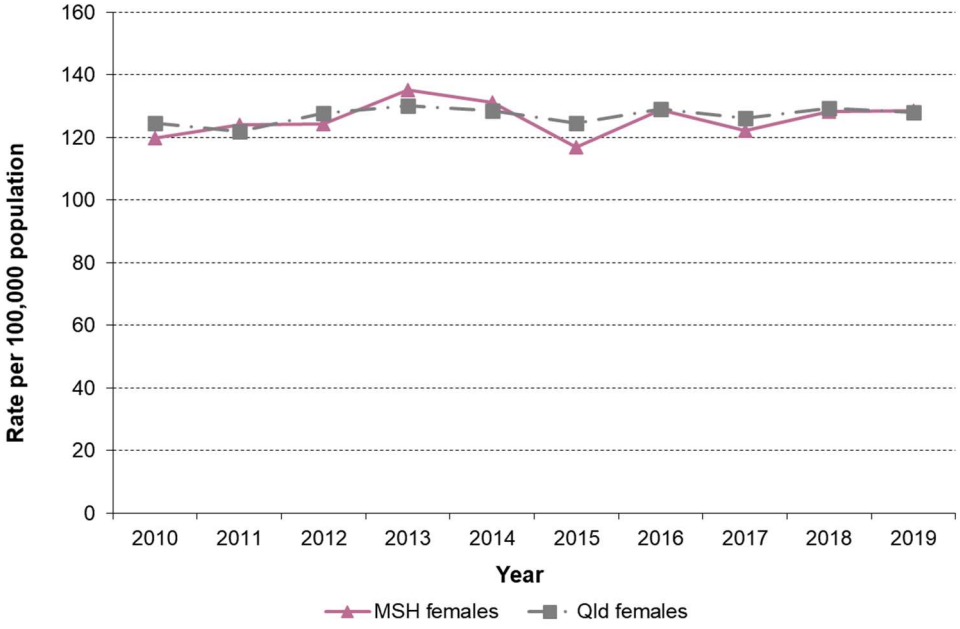
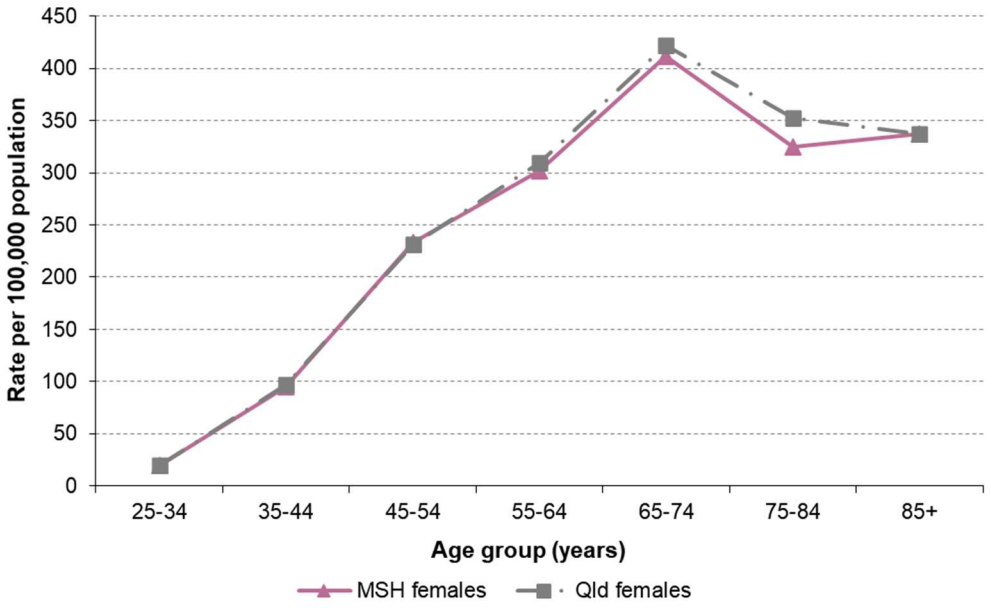


Figure 57: Breast cancer age standardised incidence rates, Metro South Health and Queensland, 2010 to 2019

In the years 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 58).



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

Figure 58: Breast cancer age specific incidence rates, Metro South Health 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 209 deaths per year from colorectal cancer among MSH residents in the five-years from 2015 to 2019. This represented 12% of all cancer deaths in MSH in this period. The MSH age standardised colorectal cancer mortality rate was statistically similar to the Queensland rate over this period (Table 25, page 68).

Incidence

On average there were 651 new cases of colorectal cancer per year among MSH residents in the five years from 2015 to 2019. This represented 11% of all new cases of cancer in MSH in this period.

In 2015 to 2019, the average annual colorectal cancer age standardised incidence rate in MSH was 57 new cases per 100,000 persons which was statistically similar to the Queensland rate (Table 26, page 68). The current MSH rate was almost the same as the rate reported for 2011 to 2015 of 58 new cases (95% CI: 56 – 60) per 100,000 persons[9].

Between 2010 and 2019 colorectal cancer incidence rates in both MSH and Queensland trended downwards from around 65 to around 55 new cases per 100,000 persons (Figure 59).

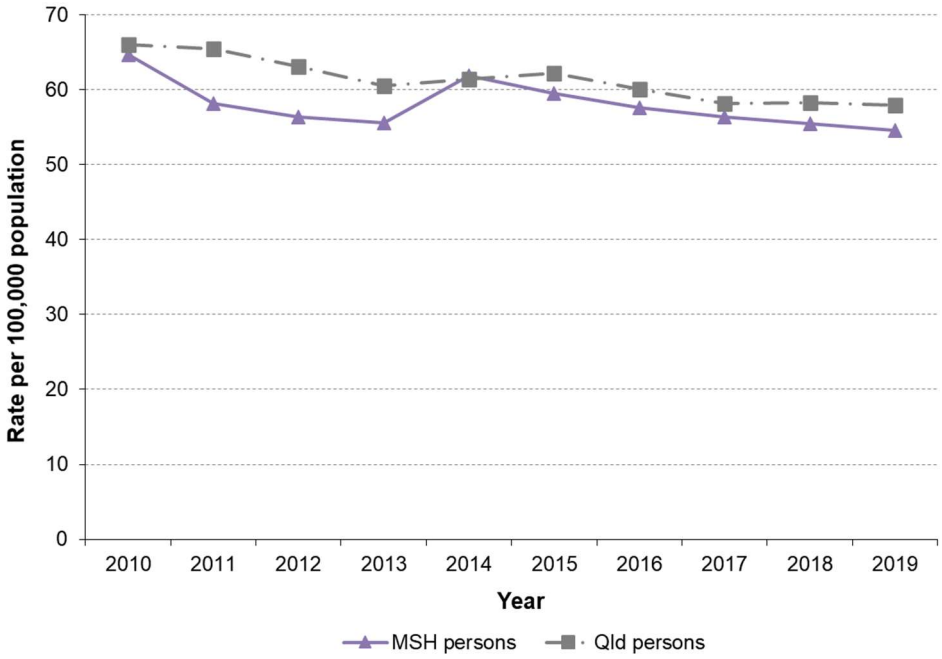
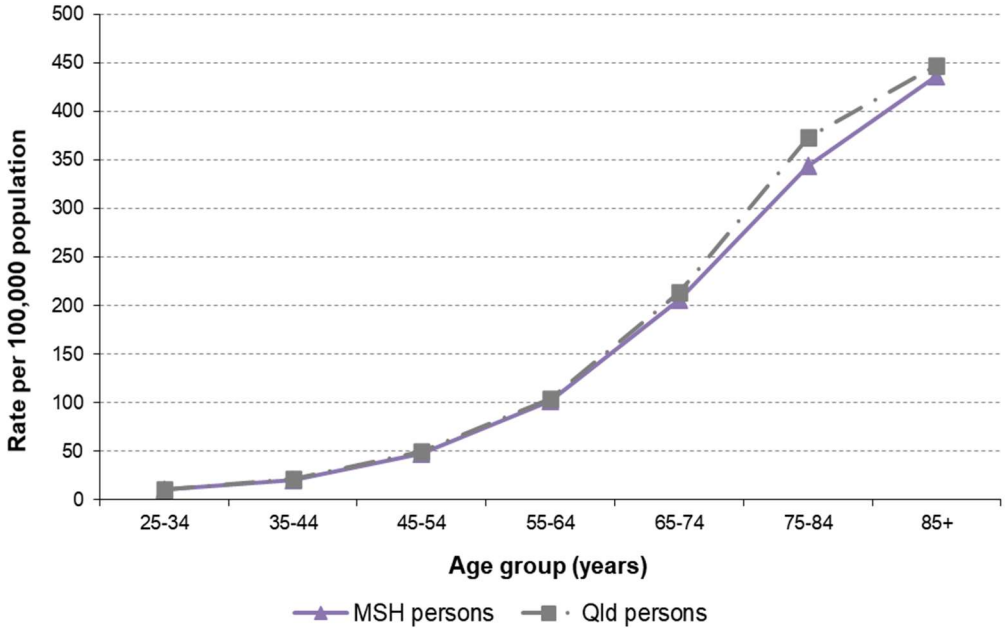


Figure 59: Colorectal cancer age standardised incidence rates, Metro South Health and Queensland, 2010 to 2019

In the years 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 60).



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

Figure 60: Colorectal cancer age specific incidence rates, Metro South Health 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 185 deaths per year from haematological cancer among MSH residents in the five years from 2015 to 2019. This represented just over 10% of all cancer deaths in MSH in this period.

The age standardised haematological cancer mortality rate in MSH was statistically similar to the Queensland rate over this period (Table 25, page 68).

Incidence

There was an average of 695 new cases per year of haematological cancer among MSH residents in the five years from 2015 to 2019. This represented almost 12% of all new cases of cancer in MSH in this period.

In 2015 to 2019, the average annual haematological cancer age standardised incidence rate in MSH was 60 new cases per 100,000 persons which was statistically similar to the Queensland rate (Table 26, page 68). The current MSH rate was significantly higher than the rate reported for 2011 to 2015 of 56 new cases (95% CI: 54 – 58) per 100,000 persons[9].

Between 2010 and 2019 haematological cancer rates in both MSH and Queensland trended slightly upwards from around 55 to around 60 new cases per 100,000 in 2017-2019 (Figure 61).

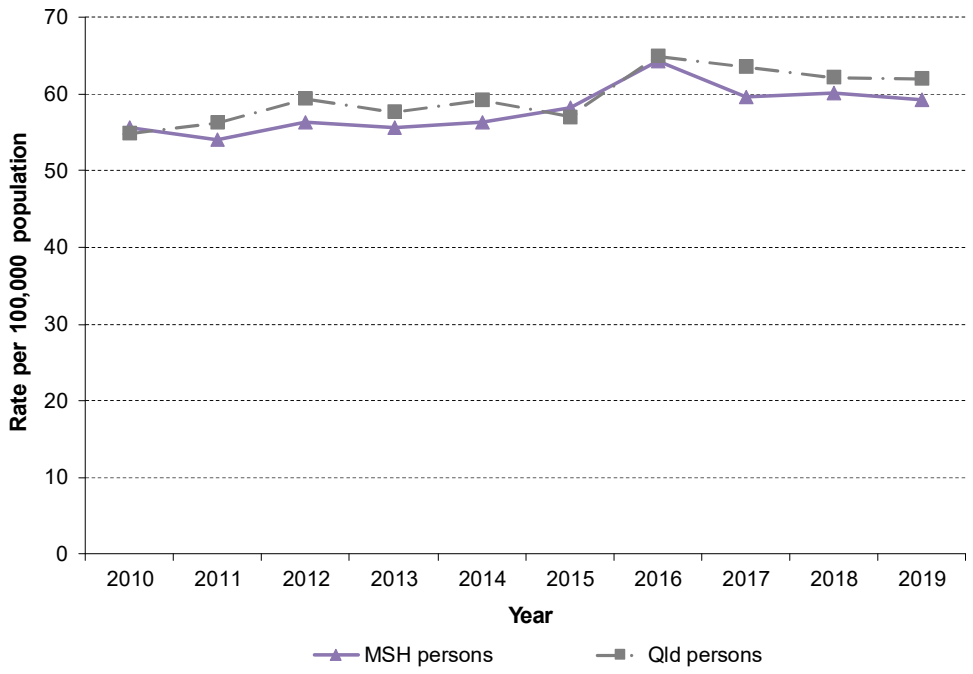


Figure 61: Haematological cancer age standardised incidence rates, Metro South Health and Queensland, 2010 to 2019

In the years 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 62).

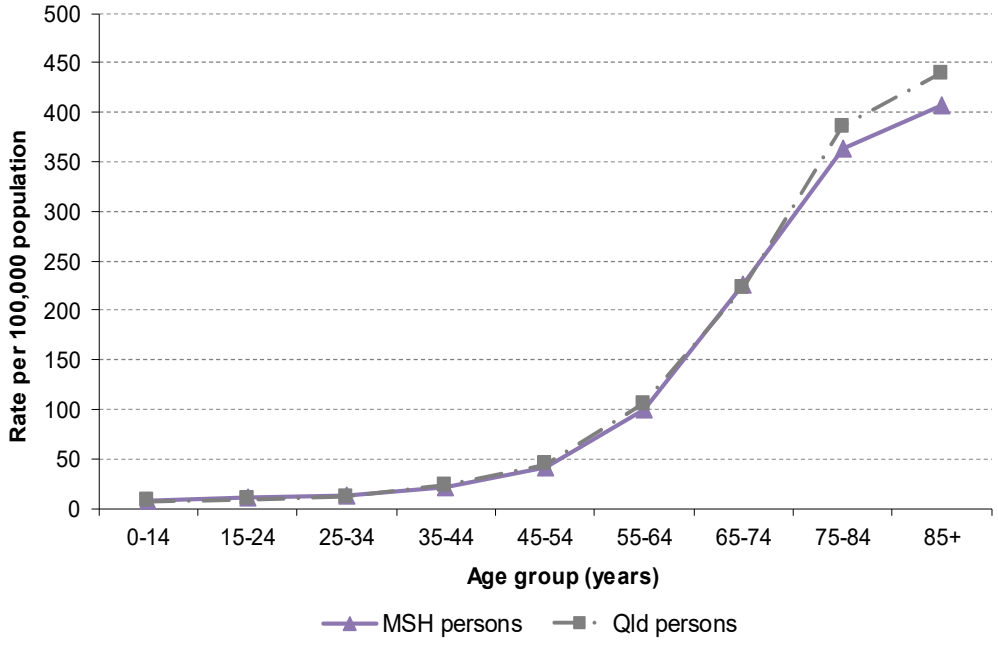


Figure 62: Haematological cancer age specific incidence rates, Metro South Health and Queensland, 2015 to 2019

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 347 deaths per year from lung cancer among MSH residents in the five years from 2015 to 2019. This represented 19% of all cancer deaths in MSH in this period, with males accounting for 57% of these deaths. The age standardised lung cancer mortality rate in MSH was statistically similar to the Queensland rate over this period (Table 25, page 67).

Between 2002 and 2019 lung cancer annual mortality rates in MSH fell in males from over 50 deaths per 100,000 males in 2002-2007 to 31 deaths per 100,000 persons in 2019. In contrast, over the same period mortality rates in females remained consistently between 20 and 30 deaths per 100,000 females (Figure 63).

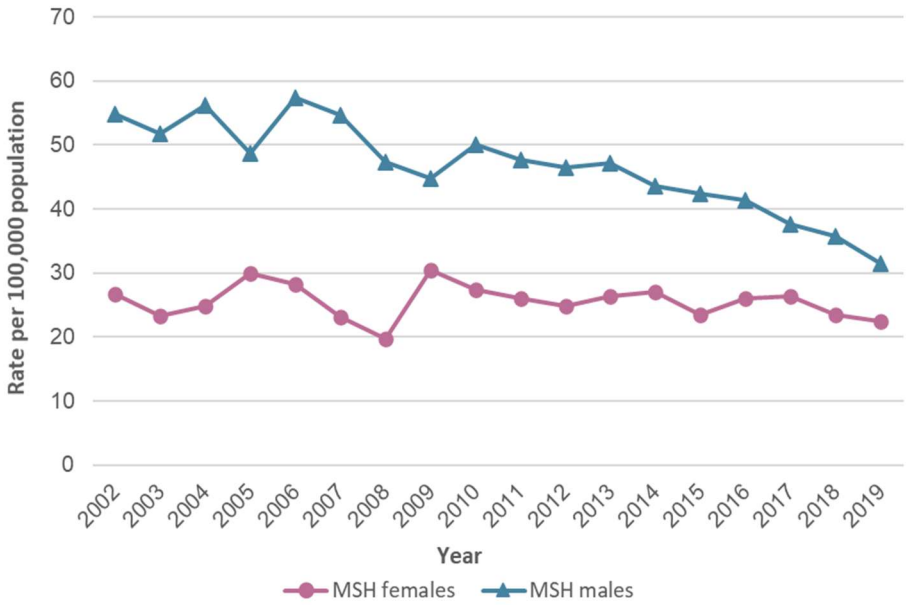


Figure 63: Lung cancer age standardised mortality rates by sex, Metro South Health, 2002 to 2019

Incidence

On average there were 535 new cases of lung cancer per year among MSH residents in the five years from 2015 to 2019. This represented 9% of all new cases of cancer in MSH in this five-year period.

In 2015 to 2019, the average annual lung cancer age standardised incidence rate in MSH of 47 new cases per 100,000 persons was statistically similar to the Queensland rate (Table 26, page 69). The MSH rate for the current period was statistically similar to the rate reported for 2011 to 2015 of 45 new cases (95% CI: 43 – 47) per 100,000 persons[9].

Between 2010 and 2019 lung cancer rates in both MSH and Queensland were relatively stable at around an average of 46 new cases per 100,000 persons (Figure 64).

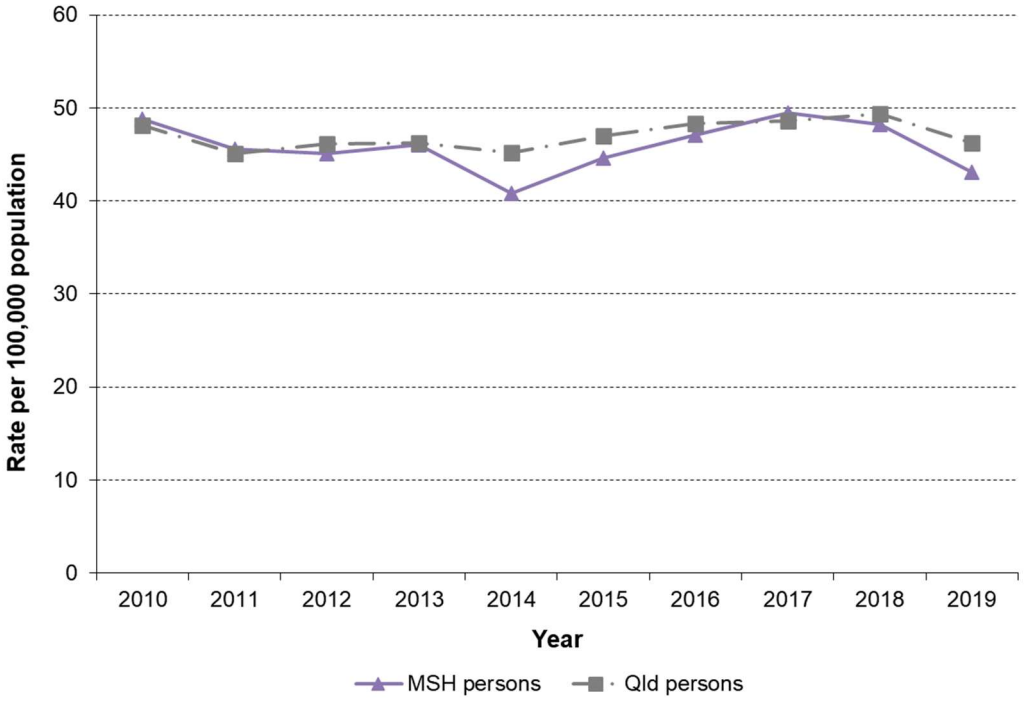
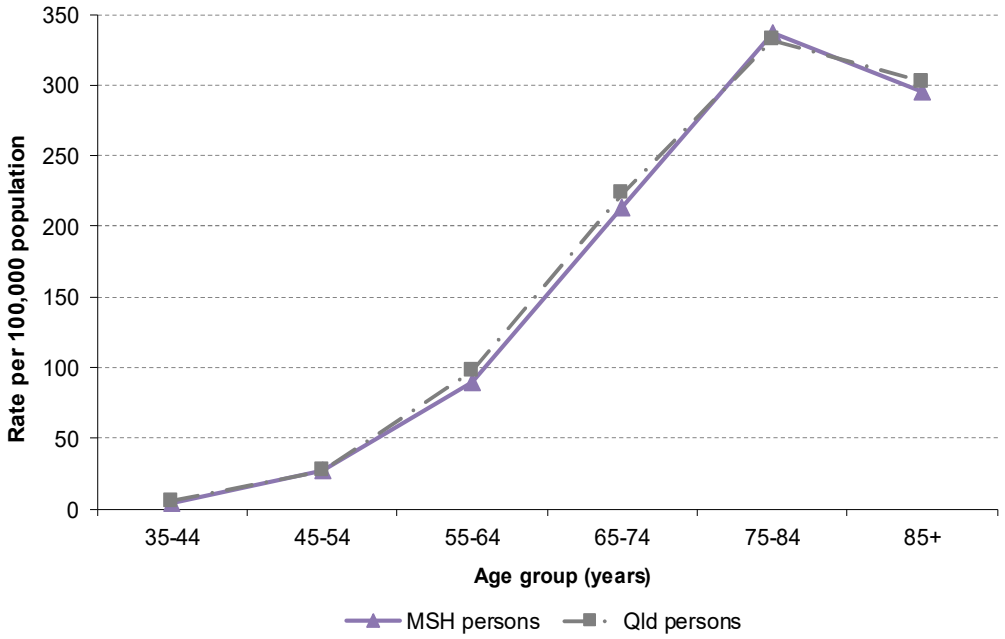


Figure 64: Lung cancer age standardised incidence rates, Metro South Health and Queensland, 2010 to 2019

In the years 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 before declining slightly in those aged 85 years and over (Figure 65).



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

Figure 65: Lung cancer age specific incidence rates, Metro South Health 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 61 deaths per year from liver cancer among MSH residents in the five years from 2015 to 2019. This represented 3.4% of all cancer deaths in MSH in this period.

The age standardised liver cancer mortality rate in MSH (5.2 deaths per 100,000 persons) was statistically similar to the Queensland rate (4.5 deaths per 100,000 persons) over this period.

Incidence

On average there were 98 new cases per year of liver cancer among MSH residents in the five years from 2015 to 2019. This represented 1.6% of all new cases of cancer in MSH in this period.

In 2015 to 2019, the average annual liver cancer age standardised incidence rate in MSH was 8.3 new cases (95% CI: 7.6 – 9.1) per 100,000 persons which was significantly higher than the Queensland rate of 7.1 new cases (95% CI: 6.8 – 7.4) per 100,000 persons. The MSH rate for the current period was significantly higher than the rate reported for 2011 to 2015 of 6.6 new cases (95% CI: 5.9 – 7.3) per 100,000 persons.

Between 2010 and 2019 liver cancer rates in both MSH and Queensland trended upwards from around six new cases in 2010 to over eight new cases per 100,000 in MSH in 2019 (Figure 66).

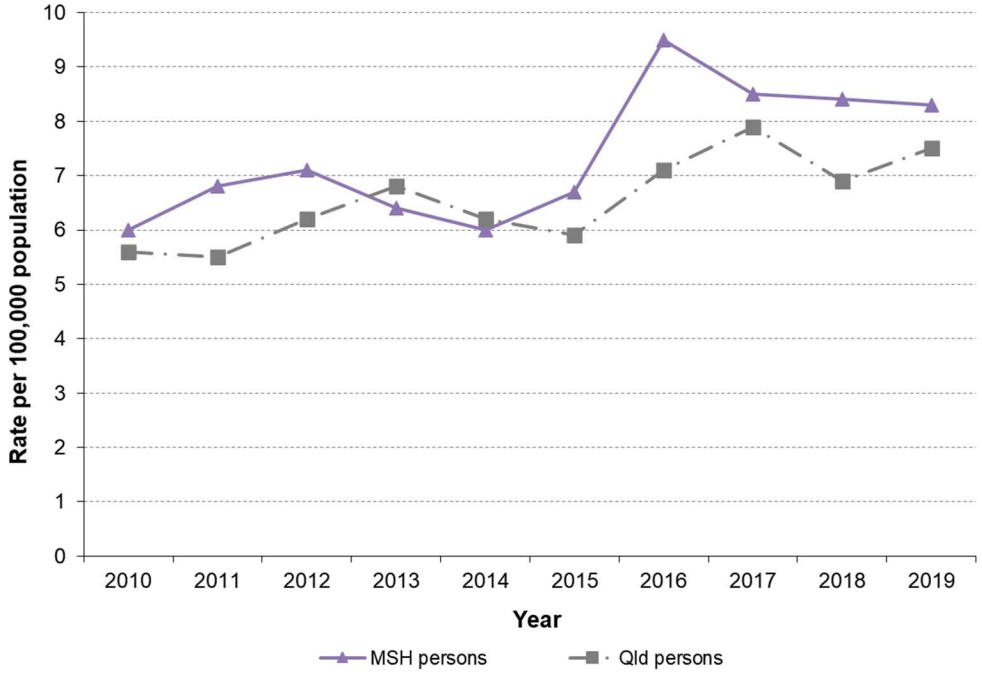
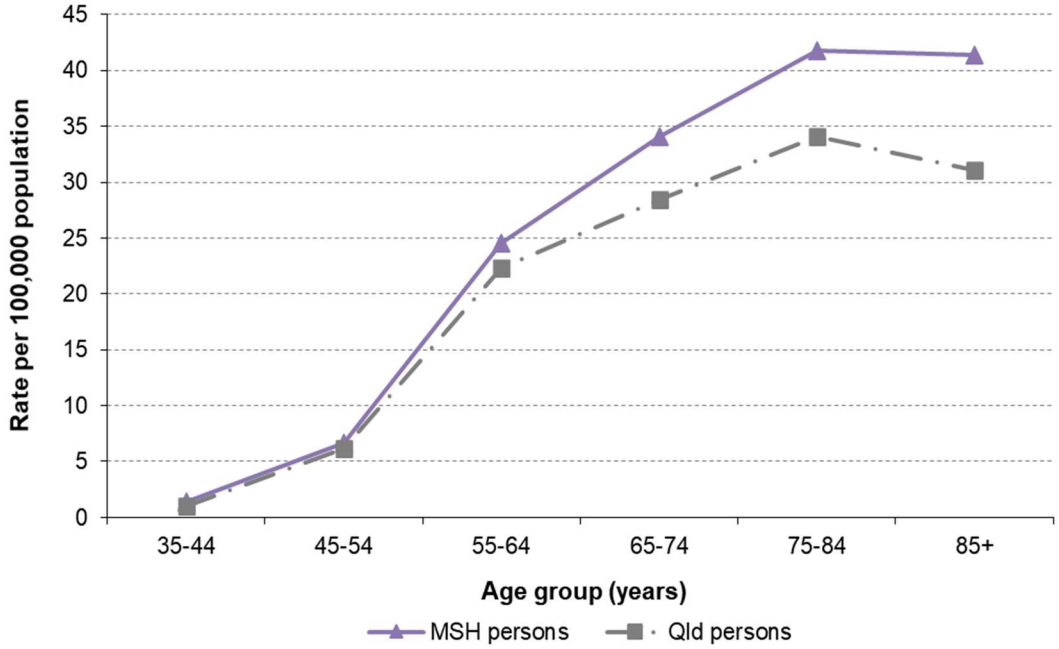


Figure 66: Liver cancer age standardised incidence rates, Metro South Health and Queensland, 2010 to 2019

In the years 2015 to 2019, liver cancer incidence rates were negligible in people under the age of 35 years. Rates increased with age, peaking in the 75 to 84 years group before declining slightly in people aged 85 years and over (Figure 67).



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

Figure 67: Liver cancer age specific incidence rates, Metro South Health and Queensland, 2015 to 2019

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 114 deaths per year from pancreatic cancer among MSH residents in the five years from 2015 to 2019. This represented over 6% of all cancer deaths in MSH in this period.

The age standardised pancreatic cancer mortality rate in MSH (10.0 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 145 new cases per year of pancreatic cancer among MSH residents in the five years from 2015 to 2019. This represented 2.4% of all new cases of cancer in MSH in this period.

In 2015 to 2019, the average annual pancreatic cancer age standardised incidence rate in MSH was 12.6 new cases (95% CI: 11.7 – 13.6) 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 current MSH rate was statistically similar to the rate reported for 2011 to 2015 of 11.8 new cases (95% CI: 10.9 – 12.8) per 100,000 persons.

Between 2010 and 2019 pancreatic cancer rates in both MSH and Queensland trended slightly upwards from around 11 new cases in 2010 to around 12 new cases per 100,000 in 2019 (Figure 68).

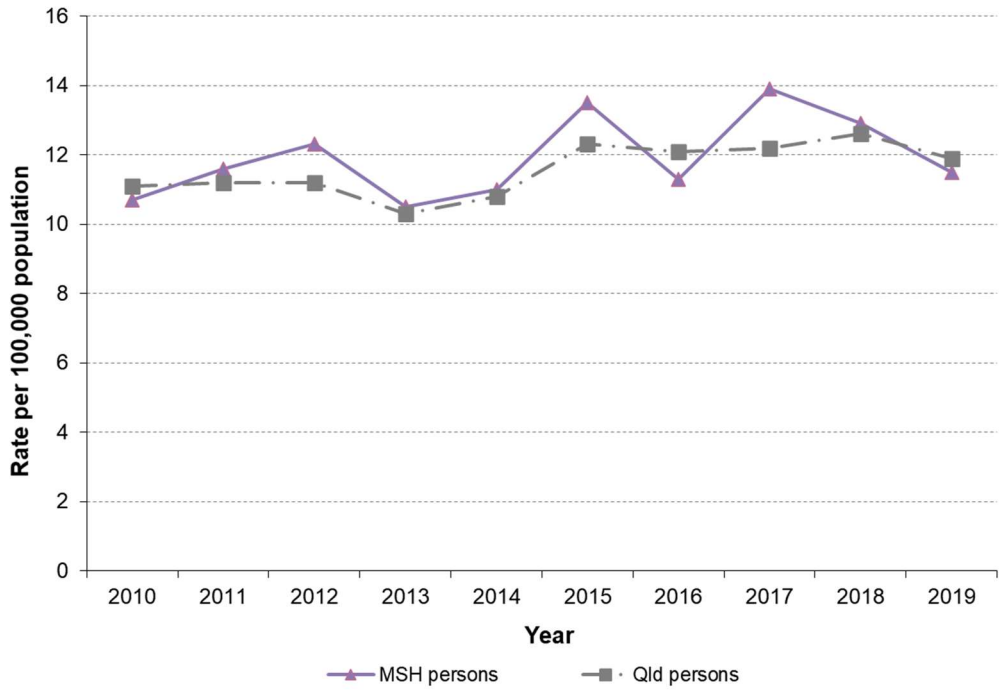
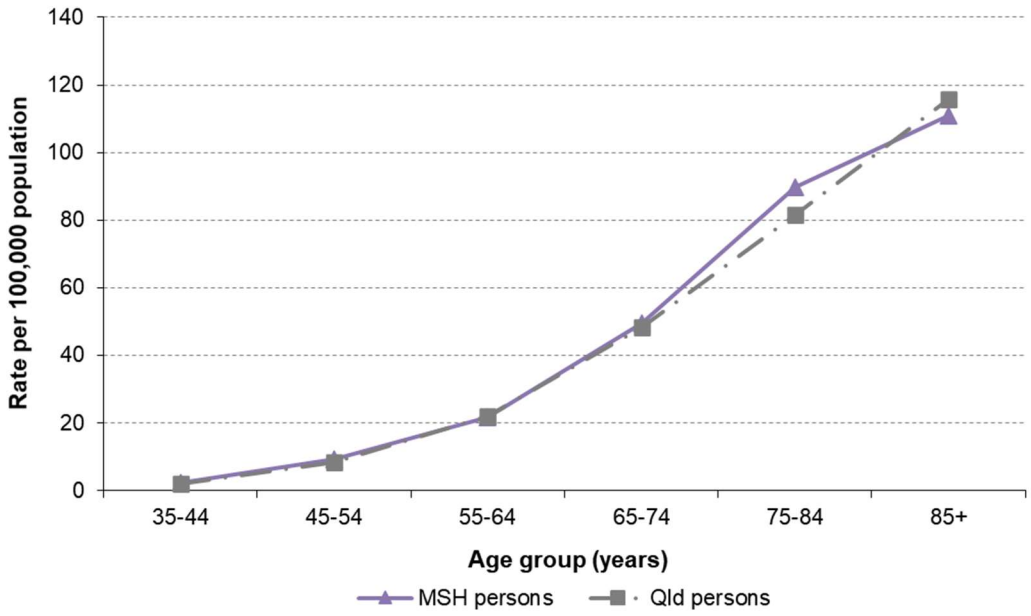


Figure 68: Pancreatic cancer age standardised incidence rates, Metro South Health and Queensland, 2010 to 2019

In the five years from 2015 to 2019, pancreatic cancer incidence rates were negligible in people under the age of 35 years. Rates then increased with age (Figure 69).



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

Figure 69: Pancreatic cancer age specific incidence rates, Metro South Health 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 26 deaths per year from kidney cancer among MSH residents in the five years from 2015 to 2019. This represented 1.5% of all cancer deaths in MSH in this period.

The age standardised kidney cancer mortality rate in MSH (2.3 deaths per 100,000 persons) was significantly lower than the Queensland rate (2.9 deaths per 100,000 persons) over this period.

Incidence

On average there were 157 new cases per year of kidney cancer among MSH residents in the five years from 2015 to 2019. This represented 2.6% of all new cases of cancer in MSH in this period.

In 2015 to 2019, the average annual kidney cancer age standardised incidence rate in MSH was 13.4 new cases (95% CI: 12.5 – 14.4) 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 current MSH rate was significantly higher than the rate reported for 2011 to 2015 of 14.1 new cases (95% CI: 13.1 – 15.1) per 100,000 persons.

Between 2010 and 2019 MSH kidney cancer incidence rates were relatively stable, varying around 14 new cases per 100,000 persons. In comparison, the rates in Queensland trended slightly upwards from around 12 to around 14 new cases per 100,000 by 2019 (Figure 70).

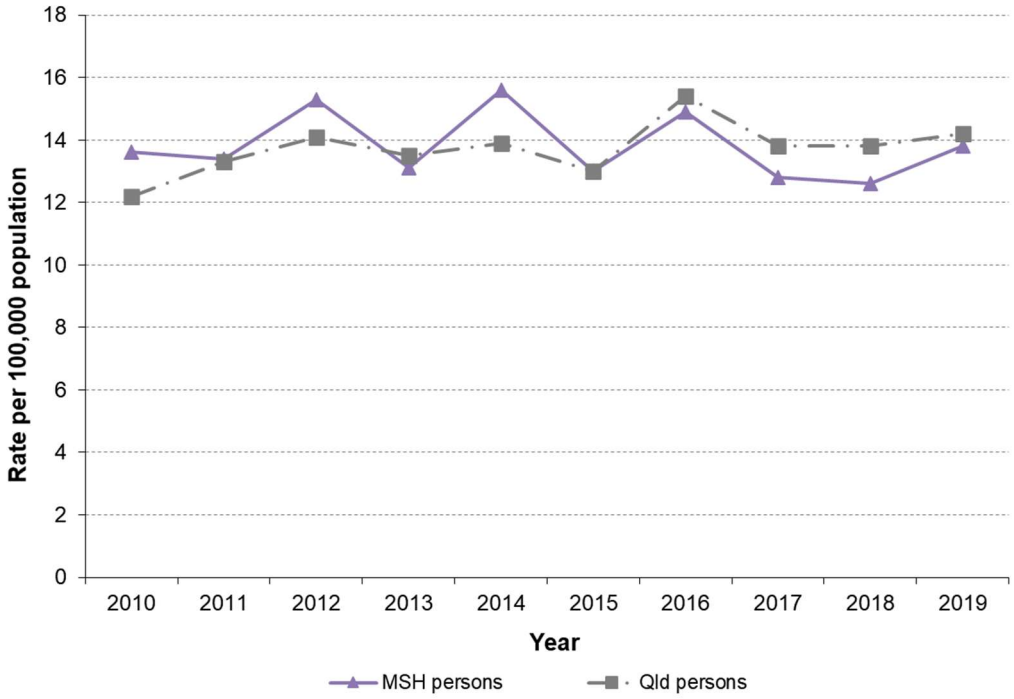
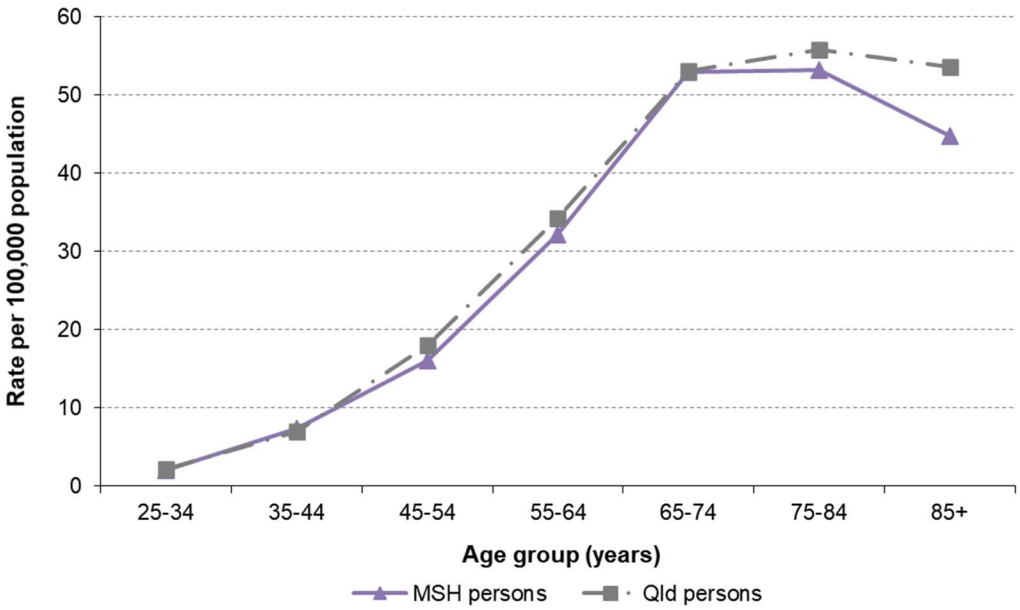


Figure 70: Kidney cancer age standardised incidence rates, Metro South Health and Queensland, 2010 to 2019

In the five years from 2015 to 2019, kidney cancer incidence rates were extremely low in people under the age of 25 years. Rates then increased with age, peaking in persons aged 65 to 84 years before declining in those aged 85 years and over (Figure 71).



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

Figure 71: Kidney cancer age specific incidence rates, Metro South Health 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 11 deaths per year from cervical cancer among MSH females in the five years from 2015 to 2019. Just under half (49%) of these deaths were women in the 50 to 69 years age group.

Incidence

On average there were 42 new cases of cervical cancer per year among MSH females in the five years from 2015 to 2019.

In 2015 to 2019, the average annual cervical cancer age standardised incidence rate in MSH was 7.8 new cases (95% CI: 6.8 – 8.8) per 100,000 females which was statistically similar to the Queensland rate of 8.6 new cases (95% CI: 8.1 – 9.1) per 100,000 females. The current MSH rate was statistically similar to the rate reported for 2011 to 2015 of 7.8 new cases (95% CI: 5.7 – 10.3) per 100,000 females[9].

In the five years from 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 relatively 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 MSH was 37.5%, lower than the Queensland rate of 39.0% and the Australian rate of 41.6%[42]. Data covering the age/sex breakdown for MSH 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 72. Queensland participation rates were higher for females than for males in all age groups (Figure 72) 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%).

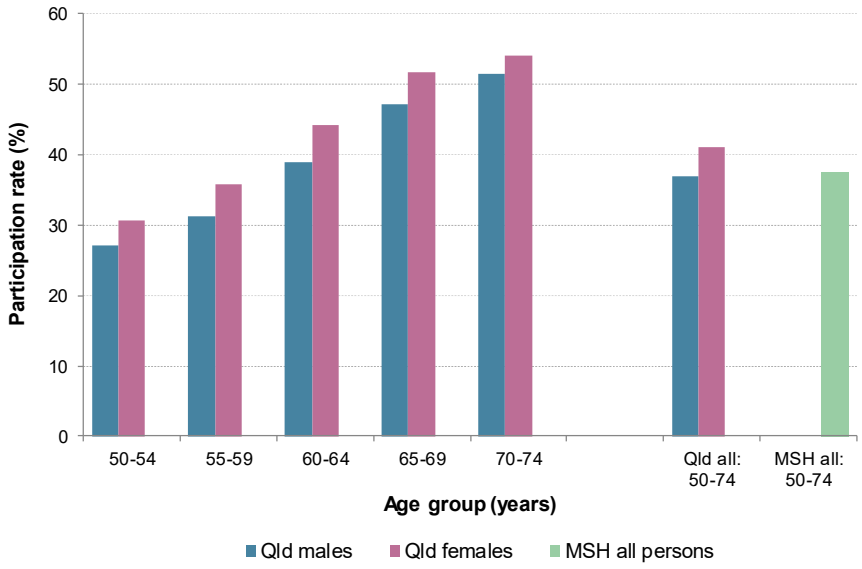


Figure 72: Crude participation rates in the National Bowel Cancer Screening Program by age and sex, Queensland, 2019-20 and Metro South Health all persons 50-74 years 2019-20

Between 2014-15 and 2019-20 NBCSP participation rates in MSH were consistently lower than the rates in Queensland (Figure 73). Rates in both MSH 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 MSH dropped sharply to the lowest level since 2014-15.

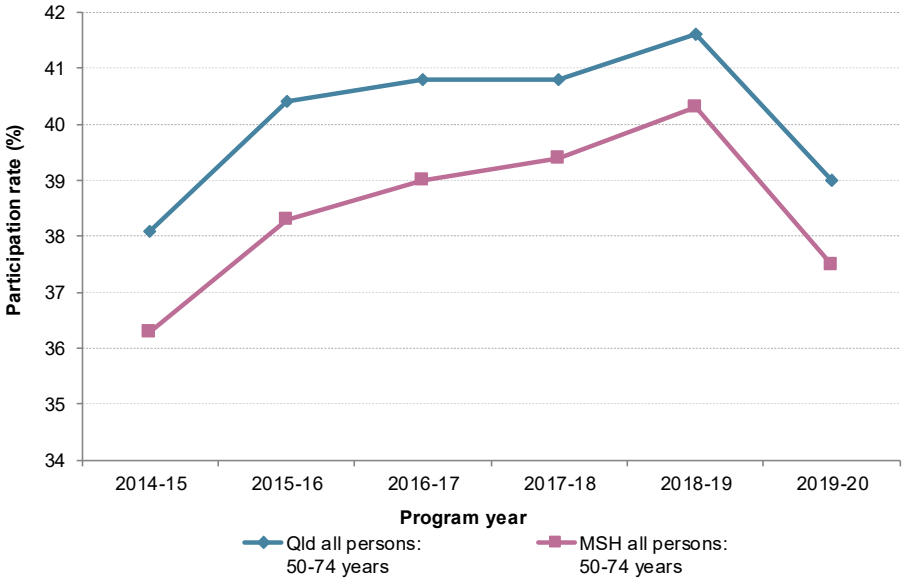


Figure 73: Crude all persons 50 to 74 years participation rates in the National Bowel Cancer Screening Program, Queensland and Metro South Health 2014-15 to 2019-20

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.

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 74). 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.

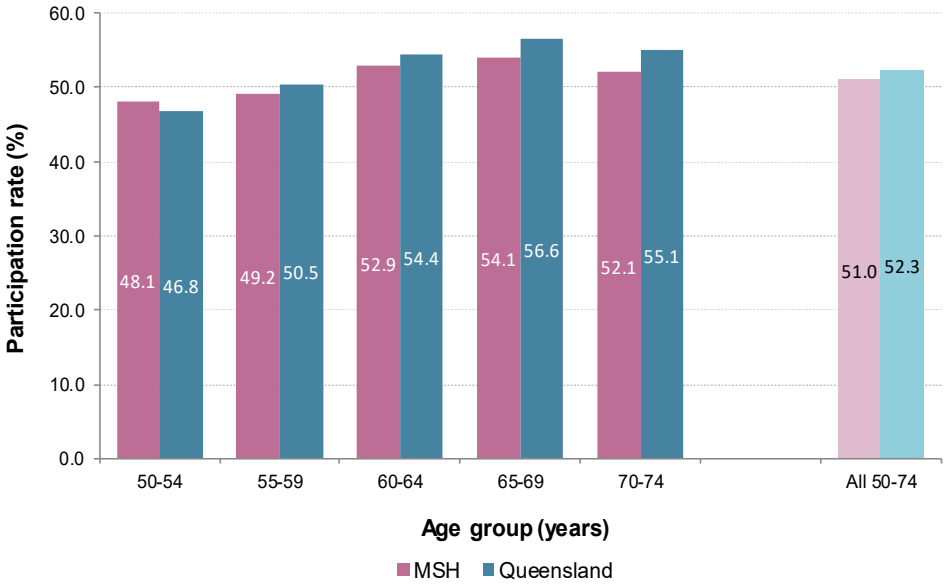


Figure 74: Crude participation rates in the BreastScreen Queensland screening program by age group, Metro South Health and Queensland, 2019-20

Between 2014-15 and 2019-20 BreastScreen Queensland participation rates in MSH were consistently lower than the rates in Queensland, ranging between 51% and 56% (Figure 75). Rates in both MSH and Queensland trended downwards over this period (Figure 75). The sharpest decrease was seen in 2019-20, the first year of the COVID-19 pandemic.

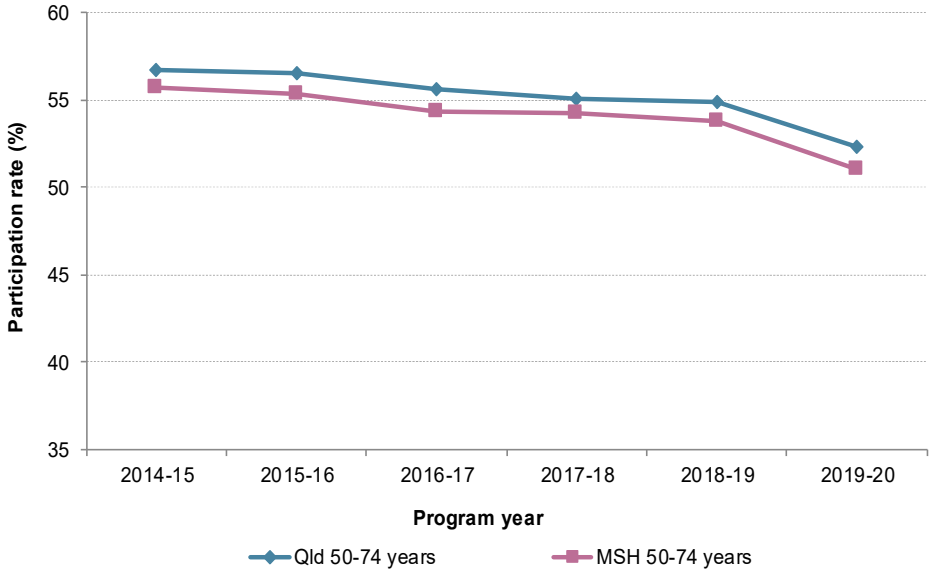


Figure 75: Crude participation rates in the BreastScreen Queensland screening program, all persons 50 to 74 years, Metro South Health and Queensland, 2014-15 to 2019-20

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].

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].

Historically, between 2005-06 and 2009-10 cervical screening participation rates in MSH were consistently higher than the Queensland rates[9]. However from at least 2013-14 to 2016-17, the MSH participation rate was slightly lower than the Queensland rate[45]. In 2018-20 the overall MSH participation rate was 55.8%. Rates in MSH were slightly higher than Queensland rates in all age groups except those 25 to 29 years (Figure 76).

In 2018-20 in both MSH and Queensland cervical screening program participation rates were highest in the 45 to 59 years age groups. In MSH the rate of participation was approximately 60% among this age bracket. MSH participation rates increased with age from 25 to 45 years and decreased with increasing age after 60 years, falling away to under 25% in those aged 70 to 74 years, the newest group recommended for screening (Figure 76).

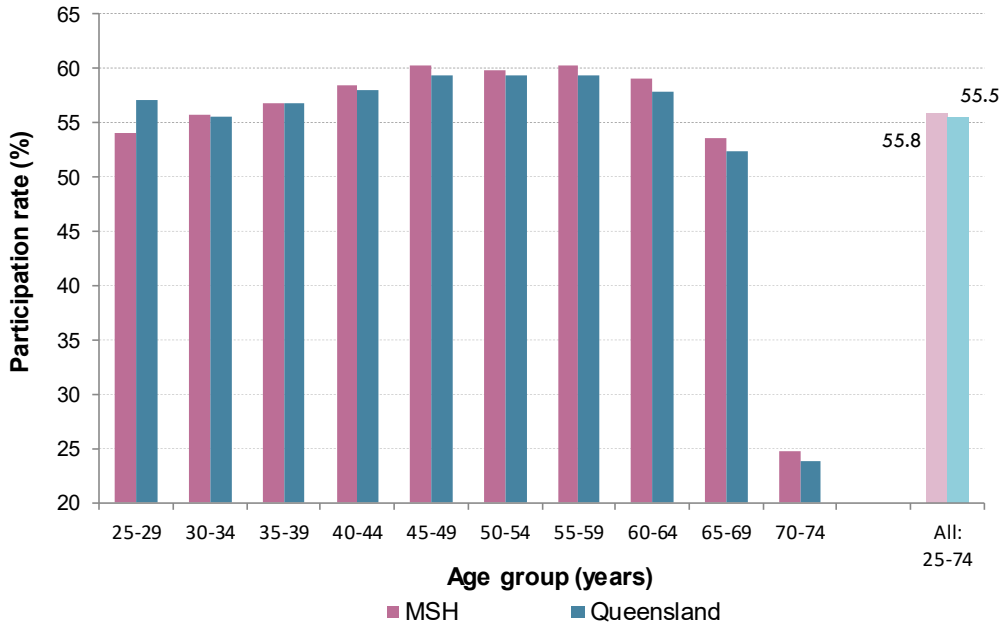


Figure 76: Crude participation rates in the National Cervical Screening Program by age group, Metro South Health and Queensland, 2018 to 2020

Prior to the change in the Queensland Cervical Screening Program in 2018, participation in the program had fallen in both Queensland and MSH, from a peak of around 60% in 2007-08 to rates of around 53% in 2015-16[9]. 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 15,643 births to 15,435 MSH mothers, including 15,496 live births and 147 stillbirths. This represented a crude birth rate in MSH of 51.1 live births per 1,000 women (15 to 49 years), marginally lower than the Queensland rate of 51.5 live births per 1,000 women. At each year between 2017 and 2020 the annual crude birth rate in MSH was approximately one percentage point higher than the Queensland rate, so 2021 represented a departure from this usual pattern.

In 2021, age-specific birth rates were significantly lower in MSH than in Queensland in the 15 to 29 years age groups, but were significantly higher than Queensland in the 35 to 44 years age groups. Age specific birth rates peaked in the 30-34 years age group for both MSH and Queensland mothers in 2021 (Figure 77).

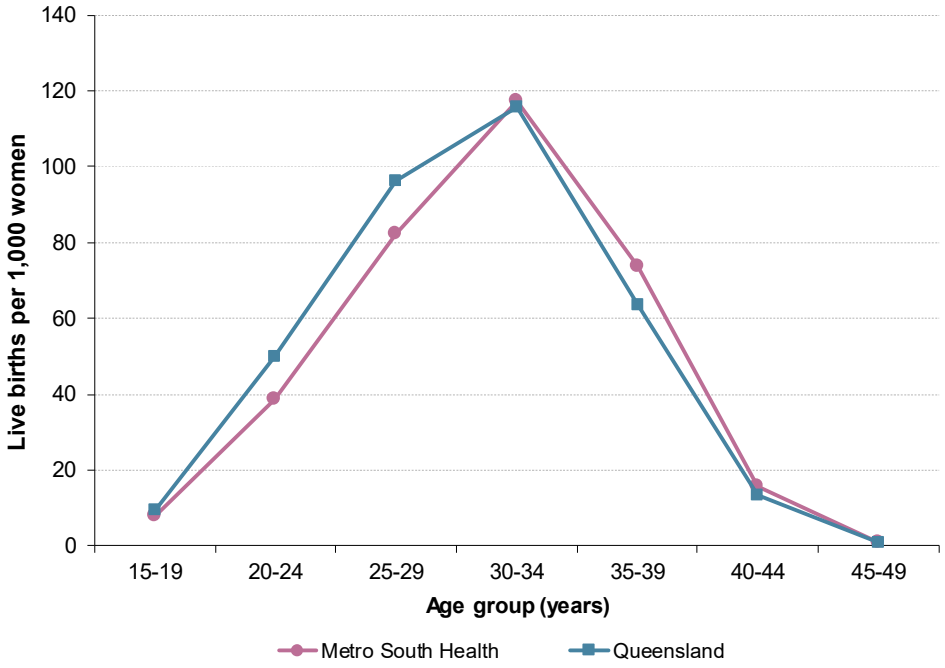


Figure 77: Age specific birth rates for Metro South Health and Queensland, 2021

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 MSH total life-time fertility rate was 1.68 children per female aged 15-49 years. This was significantly lower than the Queensland rate of 1.75 children (Table 27). There were no significant differences in life-time fertility rate between MSH and Queensland in 2017 to 2020 (Table 27).

Table 27: Total life-time fertility rate per female by year for Metro South Health and Queensland, 2017 to 2021

Year	Metro South Health Rate (95% CI)	Queensland Rate (95% CI)	Statistically significant difference MSH - QLD*
2017	1.71 (1.68 – 1.74)	1.72 (1.71 - 1.73)	—
2018	1.68 (1.65 – 1.70)	1.70 (1.69 – 1.71)	—
2019	1.65 (1.63 – 1.68)	1.67 (1.65 – 1.68)	—
2020	1.60 (1.58 – 1.63)	1.62 (1.61 - 1.64)	—
2021	1.68 (1.65 – 1.71)	1.75 (1.73 – 1.76)	↓

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

Total life-time fertility rates trended downwards in both MSH and Queensland between 2007 and 2020 before increasing significantly in 2021 (Figure 78). The sharp increase in 2021 is similar to that recorded between 2006 and 2007.

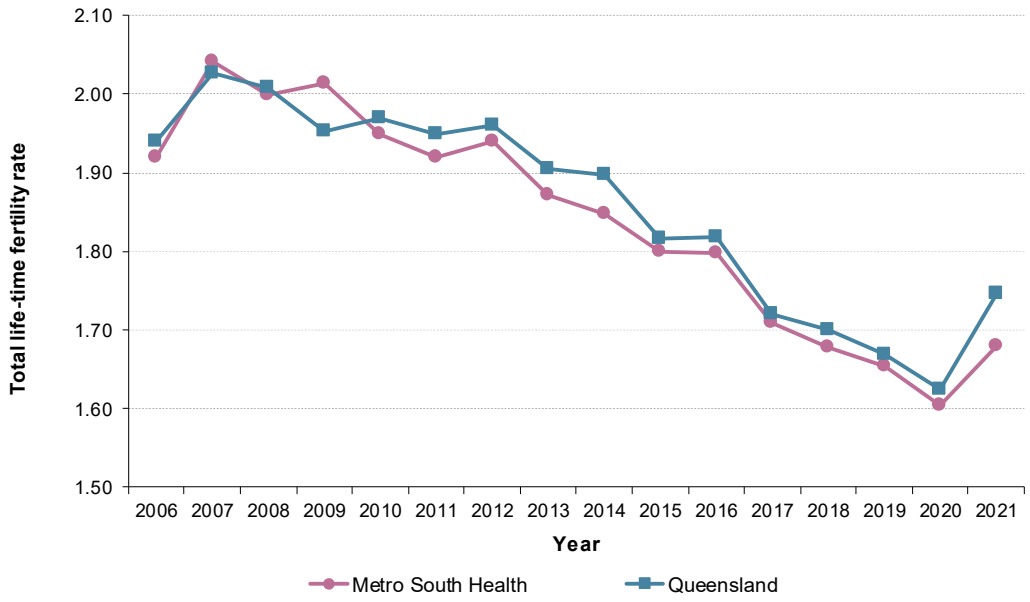


Figure 78: Total life-time fertility rates for Metro South Health and Queensland, 2006 to 2021

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 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 and consequently avoided the prolonged lockdowns experienced in some other states and therefore 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 MSH women who gave birth in 2021 was 31 years. This was higher than the median age of all Queensland mothers (30 years). Indigenous MSH mothers in 2021 had a median age of 26 years in 2021 which was the same as the median age for all Queensland Indigenous mothers.

The percentage of births to younger mothers (29 years of age and under) in MSH (40% of all births) was significantly lower than in Queensland (45% of all births) in the reporting period 2017 to 2021 (Table 28). Correspondingly, the proportion of births to MSH women aged in their 30s was significantly higher than in Queensland (Table 28).

Table 28: Number and proportion of total births by maternal age group, Metro South Health and Queensland, 2017 to 2021

Age group (years)	Metro South Health		Queensland		Relative Risk (95% CI)	Statistically significant difference MSH - QLD*
	Total births	% of total births	Total births	% of total births		
<20	1,734	2.3	8,620	2.9	0.8 (0.8 – 0.8)	↓
20-24	9,126	12.0	42,685	14.2	0.9 (0.8 – 0.9)	↓
25-29	19,763	26.1	84,478	28.0	0.9 (0.9 – 0.9)	↓
30-34	26,802	35.4	100,003	33.2	1.1 (1.1 – 1.1)	↑
35-39	15,253	20.1	54,087	17.9	1.1 (1.1 – 1.1)	↑
40-49	3,089	4.1	11,646	3.9	1.0 (1.0 – 1.1)	—
Total	75,767	100.0	301,519	100.0		

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

In MSH and all of Queensland between 2017 and 2021 the most common age for a woman to have a baby was 30 to 34 years. By comparison, for MSH Indigenous women, the most common age to have a baby was 20 to 24 years (Figure 79;Table 29).

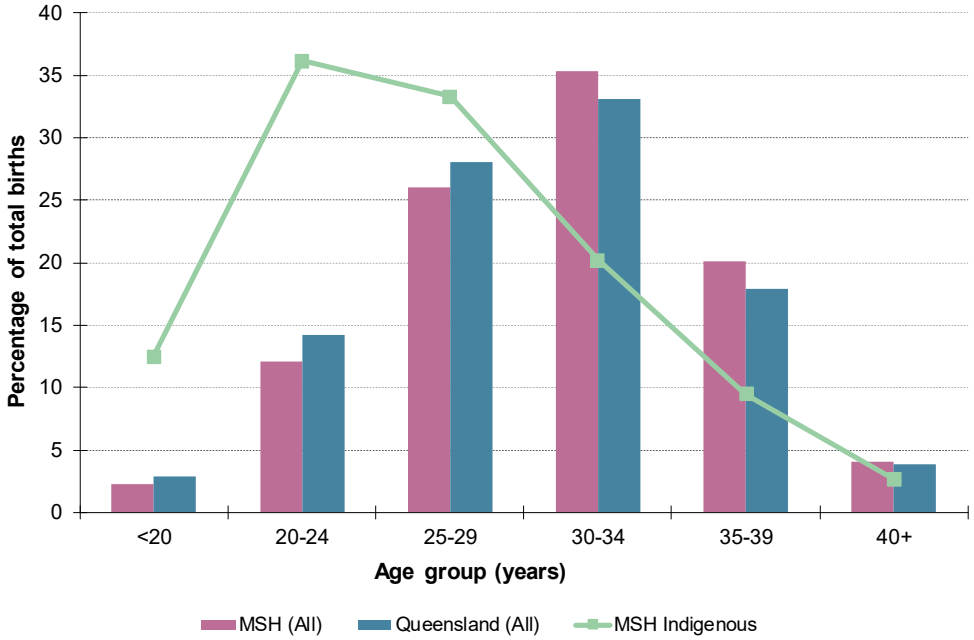


Figure 79: Percentage of total births by maternal age and Indigenous status, Metro South Health and Queensland, 2017 to 2021

Over the reporting period, almost three-quarters (72%) of all births to MSH Indigenous mothers were to women in age groups under 30 years. This was significantly higher than the percentage of births to women under 30 years of age in the general MSH population (40% of all births) over the same five-year period (Table 29).

Table 29: Number and proportion of total births by maternal age group and Indigenous status, MSH, 2017 to 2021

Age group (years)	MSH Indigenous		MSH (All)		Relative Risk (95% CI)	Statistically significant difference MSH - QLD*
	Total births	% of total births	Total births	% of total births		
<20	308	10.9	1,734	2.3	4.8 (4.3 – 5.4)	↑
20-24	890	31.6	9,126	12.0	2.6 (2.5 – 2.8)	↑
25-29	820	29.1	19,763	26.1	1.1 (1.1 – 1.2)	↑
30-34	498	17.7	26,802	35.4	0.5 (0.5 – 0.5)	↓
35-39	233	8.3	15,253	20.1	0.4 (0.4 – 0.5)	↓
40-49	65	2.3	3,089	4.1	0.6 (0.4 – 0.7)	↓
Total	2,814	100.0	75,767	100.0		

* ↑ MSH statistically significantly higher than Queensland; ↓ MSH statistically significantly lower than Queensland;
— no statistically significant difference between MSH 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 2020-2021, 9% of pregnant women in MSH 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 2020-2021, 40% of Indigenous MSH mothers reported smoking during pregnancy, significantly higher than the general prevalence of smoking in pregnancy in MSH. The pattern of high rates of smoking among pregnant Indigenous women was also seen throughout Queensland where the reported prevalence was 44% in 2020-21 (Figure 80).

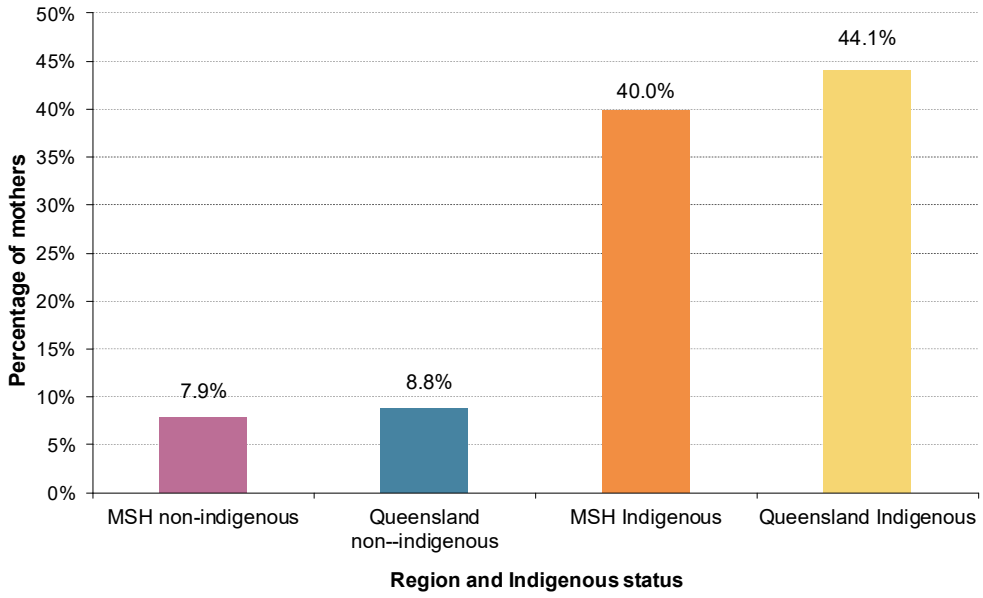


Figure 80: Percentage of mothers who reported smoking during pregnancy, Metro South Health and Queensland with Indigenous status, 2020-21

Between 2010-11 and 2015-16 reductions in rates of smoking in pregnancy were observed in both MSH and Queensland[9]. The rate for all mothers in MSH fell from 12% in 2010-11 to 9% in 2015-16 while in Queensland the rate fell from 17% to 12%[9]. However between 2015-16 and 2020-21 rates in both MSH and Queensland have plateaued at 9% and 12% respectively.

Among Indigenous mothers, the rates of smoking in pregnancy also fell between 2010-11 and 2015-16 in both MSH and Queensland[9]. In Queensland, the rate also plateaued after 2015-16 at around 43%. In MSH the rate continued to decrease to a low of 35% in 2018-19 but has since risen to 40% 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, 16% of MSH mothers had some form of diabetes in pregnancy including 15% with gestational diabetes and 1% with pre-existing diabetes. The proportion of mothers with gestational diabetes in MSH (15.0%) was significantly higher than the proportion in Queensland (13.9%). The proportion of MSH Indigenous mothers with gestational diabetes (11.8%) was significantly lower than the prevalence in all MSH mothers (15.0%).

The prevalence of gestational diabetes in all mothers more than tripled in MSH between 2007 (5.0%) and 2021 (17.3%) (Figure 81). This was a greater increase than that recorded in Queensland where the prevalence in 2021 was 2.9 times higher than in 2007 (Figure 81).

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.

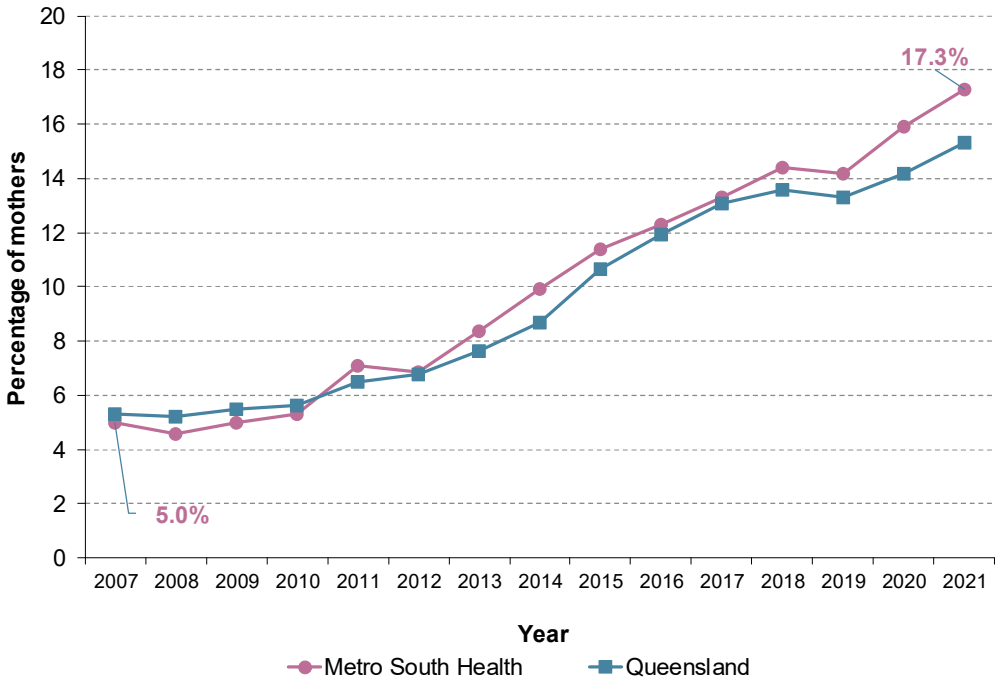


Figure 81: Percentage of mothers with gestational diabetes, Metro South Health and Queensland, 2007 to 2021

The numbers of MSH Indigenous mothers with gestational diabetes were too low for single year comparisons to be undertaken. However, between the five-year periods of 2007 to 2011 and 2017 to 2021 there was a

147% increase in Indigenous gestational diabetes in MSH which was higher than the 107% reported for Queensland Indigenous mothers over the same period (Table 30).

Table 30: Number and percentage of mothers with gestational diabetes by Indigenous status, Metro South Health and Queensland, 2017 to 2021 with comparison to 2012 to 2016 and 2007 to 2011

Region	Indigenous status	Mothers with gestational diabetes				Percentage increase in prevalence 2007-11 to 2017-21
		2017 – 2021		2012 – 2016	2007 – 2011	
		Number	%	%	%	
MSH	Indigenous	326	11.8	9.6	4.8	147%
	All persons	11,226	15.0	9.8	5.4	178%
Queensland	Indigenous	3,101	14.3	10.2	6.9	107%
	All persons	41,395	13.9	9.1	5.6	148%

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 (84%) born to MSH 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% of babies and high birth weight (4,000+g) for 9% of babies (Figure 82). The prevalence of high birth weight in MSH was significantly lower than in Queensland (10%) while there was no significant difference for low birth weight.

The prevalence of low birth weight among Indigenous babies (11%) in MSH was significantly higher than the prevalence among all MSH babies (7%). The prevalence of high birth weight among Indigenous babies in MSH (9%) was the same as the prevalence among all MSH babies.

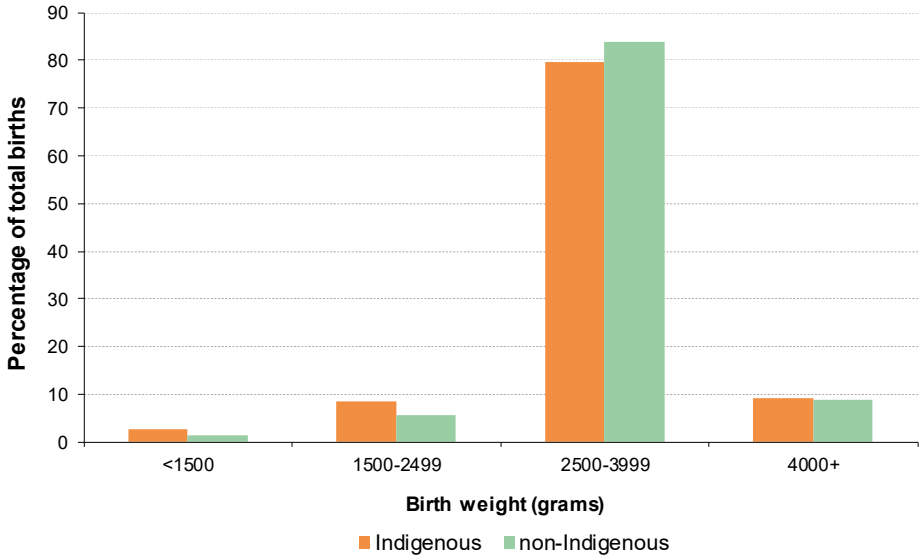


Figure 82: Percentage of total births by birth weight and Indigenous status, Metro South Health, 2017 to 2021

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 MSH, on average there were 63 infant deaths per year in the five years from 2016 to 2020 (including an average of five Indigenous infant deaths per year). The five-year infant mortality rate in MSH (4.2 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 small number of Indigenous infant deaths in the area, rates have not been calculated for MSH 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 160 perinatal deaths per year in MSH in the five years from 2017 to 2021.

In this period, the perinatal mortality rate in MSH (10.6 deaths per 1,000 births) was statistically similar to the Queensland rate (10.3 deaths per 1,000 births).

The perinatal mortality rate for Indigenous MSH infants (16.5 deaths per 1,000 live births) between 2017 and 2021 was significantly higher than the rate for non-Indigenous infants (10.4 deaths per 1,000 live births). However, it is important to note that the rate for Indigenous infants was based on very small numbers (an average of 9.2 deaths per year) and is therefore not very reliable. It is also important to note that the Queensland Indigenous perinatal mortality rate over the same period was 17.4 deaths per 1,000 live births, which was significantly higher than the Queensland non-Indigenous rate of 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 MSH mothers (96%) in 2017 to 2021 attended five or more antenatal visits over the course of their pregnancy, similar to all Queensland mothers (96%). Indigenous MSH mothers were significantly less likely (89%) to attend five or more antenatal visits than were non-Indigenous mothers (96%). The percentage of MSH Indigenous mothers attending five or more antenatal visits has consistently increased from 77% in 2007-2010[9] to 83% in 2012-2016[9] to 89% 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 4,966 MSH mothers with 5,186 births attributed to assisted conception between 2017 and 2021, including 5,129 live births and 57 stillbirths. The percentage of stillbirths was higher among births resulting from assisted conception (1.1%) than in those who conceived naturally (0.7%). In this period, MSH mothers who used assisted conception had a higher median age (35 years) than those who conceived naturally (30 years).

The proportion of mothers with births attributed to assisted conception was significantly higher in MSH (6.6%) than in Queensland (6.0%) in 2017 to 2021 (Table 31).

Table 31: Number and percentage of mothers birthing by assisted conception, Metro South Health, and Queensland, 2017 to 2021

Assisted Conception Status	Metro South Health		Queensland		Relative Risk (95% CI)	Statistically significant difference MSH - QLD*
	Total Mothers	% of Total Mothers	Total Mothers	% of Total Mothers		
Assisted	4,966	6.6	17,799	6.0	1.1 (1.1 – 1.1)	↑
Not assisted	69,735	93.4	279,340	94.0	1.0 (1.0 – 1.0)	—
Total	74,701	100.0	297,139	100.0		

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

The number of MSH mothers using assisted conception methods increased by 21% from 904 in 2017 to 1,095 in 2021. This represented an increase from 6.1% to 7.1% of all mothers.

In-vitro fertilisation (IVF) with over 3,500 mothers was the most frequently reported method of assisted conception in MSH in 2017 to 2021, representing over half of all births using assisted conception (Table 32). Other significant assisted conception methods included ovulation induction (1,044 mothers), embryo transfer (828 mothers), artificial insemination (459 mothers) and intracytoplasmic sperm injection (319 mothers).

Table 32: Percentage of total births attributed to assisted conception by method of assisted conception and year, Metro South Health, 2017 to 2021

Method*	2017	2018	2019	2020	2021	Total
In-vitro fertilisation (IVF)	55.0	60.3	58.1	56.5	49.7	55.6
Ovulation induction	20.6	15.9	16.4	13.4	16.0	16.3
Embryo transfer	9.1	9.7	11.0	15.6	17.4	12.9
Artificial insemination (AIH, AID)**	7.6	7.1	6.9	7.3	6.9	7.2
Intracytoplasmic sperm injection (ICSI)	4.1	3.9	4.6	3.9	7.7	5.0
Donor egg	3.2	2.9	2.7	3.0	1.9	2.7
Gamete intrafallopian transfer (GIFT)	0.3	0.1	0.2	0.2	0.2	0.2
Other unknown	0.0	0.2	0.1	0.1	0.1	0.1

* > 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 33: Summary of selected behavioural and health condition risk factors for chronic disease in adults (18+ years), Metro South Health and Queensland, 2019 to 2020 or 2018 to 2019 (as available)[54]

Risk factor	Population–weighted prevalence^		Statistically significant difference MSH - QLD*#
	MSH %	Queensland %	
Body mass index			
Underweight (BMI <18.5)	3.5	2.6	—
Healthy weight (BMI 18.5-<25)	39.0	37.4	—
Overweight (BMI 25-<30)	34.6	34.9	—
Obese (BMI 30+)	22.9	25.0	—
All overweight/obese (BMI 25+)	57.6	60.0	—
Smoking			
Daily smoking	10.0	10.8	—
e-cigarette (ever used)**	13.8	12.7	—
Sunburn			
Sunburnt in last 12 months	49.7	52.5	—
Alcohol consumption##			
Lifetime risk	17.9	21.6	🡻
Single occasion risk – at least monthly	26.5	30.0	—
Physical activity (18-75 years)			
Sufficient activity for health benefit	56.3	58.3	—
Fruit and vegetable consumption			
Sufficient fruit intake (2+ serves/day)**	51.0	52.1	—
Sufficient vege intake (5+ serves/day)**	7.7	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 MSH/Queensland

* 🡹 MSH statistically significantly higher than Queensland; 🡻 MSH statistically significantly lower than Queensland; — no statistically significant difference between MSH 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 33)[54] and children (Table 34)[54] 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.

Table 34: Summary of selected behavioural and health condition risk factors for chronic disease in children (5-17 years), Metro South Health and Queensland, 2019 to 2020 or 2018 to 19 (as available)[54]

Risk factor	Population–weighted prevalence^		Statistically significant difference MSH - QLD*#
	MSH %	Queensland %	
Body mass index^^			
Under-or healthy weight	75.0	74.4	—
Overweight	16.4	17.4	—
Obese	8.6	8.3	—
All overweight/obese	25.0	25.6	—
Sunburn			
Sunburnt in last 12 months**	42.0	49.2	🡻
Physical activity##			
Sufficient activity for health benefit	44.8	47.1	—
Fruit and vegetable consumption^^^			
Sufficient fruit intake	68.5	69.0	—
Sufficient vege intake	3.3	4.3	—

^ 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 5 to 17 year old residents of MSH/Queensland

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

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

^^ Specific BMI categories vary with age and sex of child

** Data from 2018 to 2019

Based upon 2014 physical activity guidelines for children which recommend 60 minutes or more of physical activity per day

^^^ Based upon 2013 Australian dietary guidelines which vary with age and sex of child

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 2019-2020, 58% of adult MSH residents were overweight or obese, which was not significantly different from the Queensland prevalence (60%) (Table 33). This is a much higher level of overweight and obesity than the 48% found via self-report in Queensland in 2001[17]. The prevalence of overweight and obesity in adults increased with age until leveling after 45 years at just over 70% in males and around 60% in females (Figure 83).

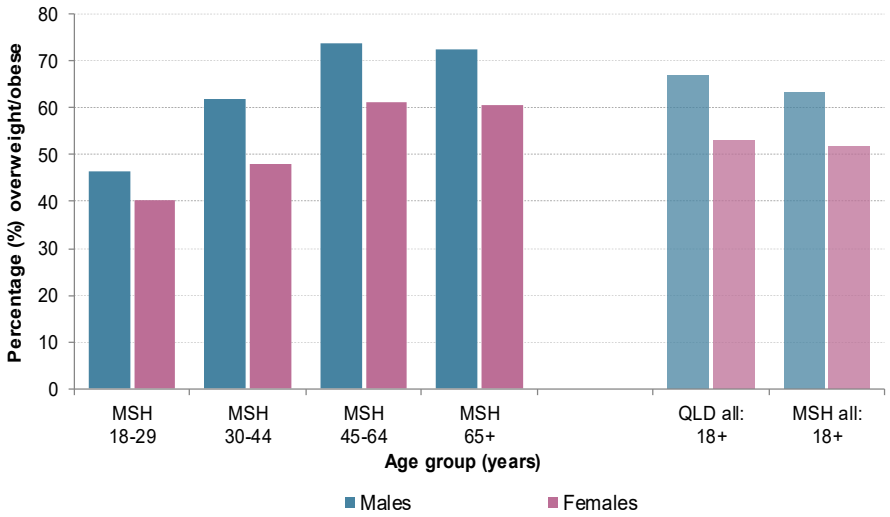


Figure 83: Percentage of overweight or obese adults (18+ years) by age and sex, Metro South Health, 2019 to 2020

The prevalence of adult overweight and obesity was linked with socio-economic status in both MSH and Queensland, with the highest rates found in the most disadvantaged areas and lowest rates in the most advantaged areas (Figure 84).

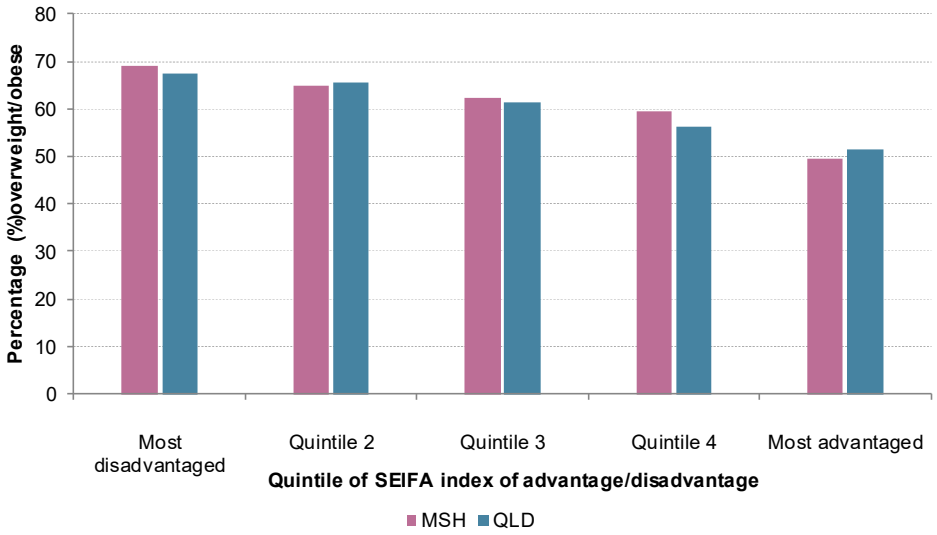


Figure 84: Percentage of overweight or obese adults (18+ years) by socioeconomic status (SEIFA), 2019 to 2020

In 2019-2020, one quarter (25%) of MSH children aged 5 to 17 years were overweight or obese, statistically similar to the Queensland prevalence (Table 34).

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 2019-2020, one in ten MSH adults smoked daily, representing a 12 percentage point reduction in prevalence since 2001. The decline in smoking rates in MSH over this period was similar to the Queensland decline. The 2019-2020, daily smoking rate in MSH (10%) was statistically similar to the rate in Queensland (11%) (Table 33).

Tobacco smoking was strongly linked with socio-economic status in both MSH and Queensland, with the highest rates found in the most disadvantaged areas and the lowest in the most advantaged areas (Figure 85).

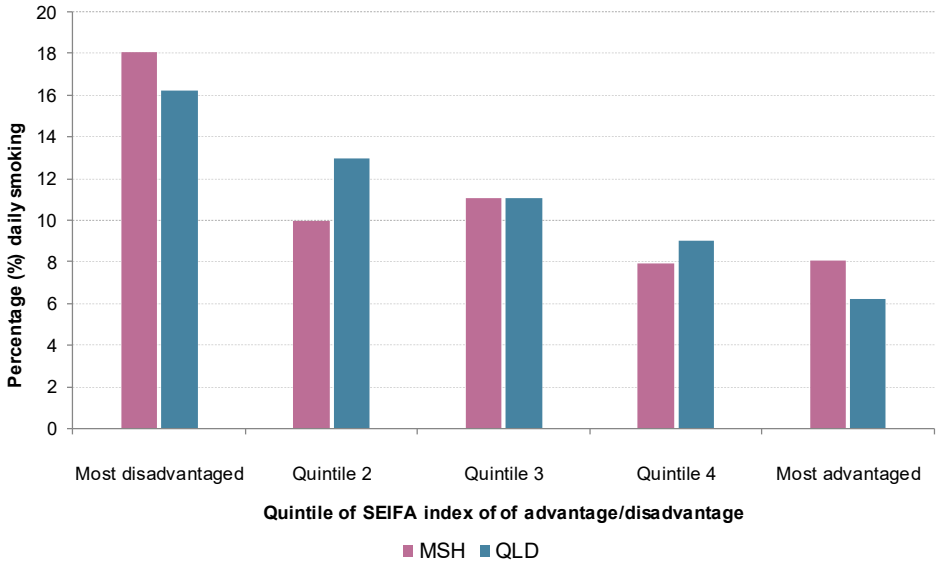


Figure 85: Percentage of adults who smoke tobacco daily, by socioeconomic status (SEIFA), Metro South Health and Queensland, 2019 to 2020

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].

In 2018-2019, 14% of adult MSH residents had used e-cigarettes on at least one occasion, which was statistically similar to the Queensland prevalence of use (13%) (Table 33). Usage was strongly linked with age group, peaking in those aged 18 to 24 years and generally declining with increasing age (Figure 86). 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.

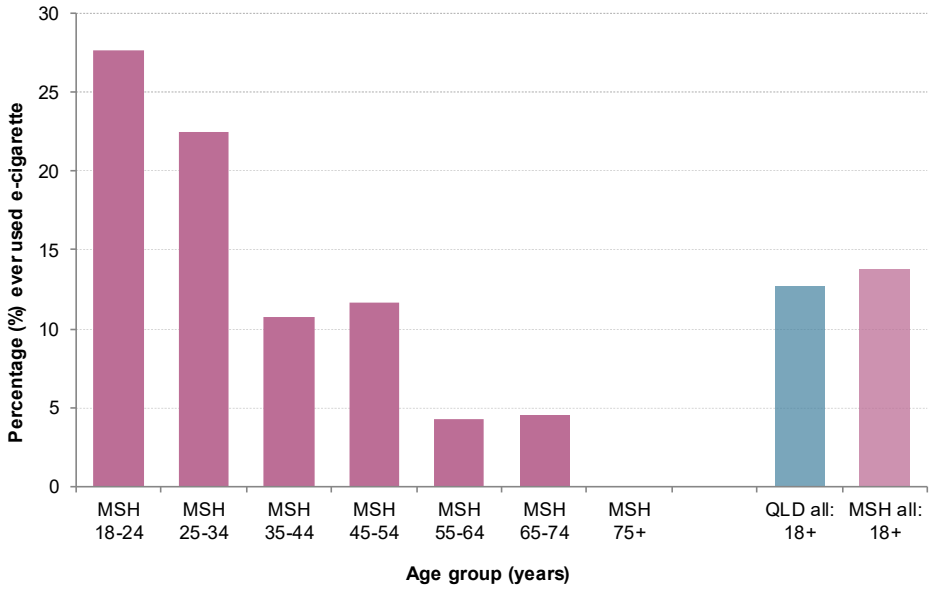


Figure 86: Percentage of adults who have ever used e-cigarettes, by age and sex, Metro South Health and Queensland, 2018 to 2019

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 MSH and Queensland adults meeting sufficient fruit or vegetable consumption guidelines (Table 33).

MSH children were more likely (69%) than their adult counterparts (51%) to consume sufficient fruit. However only 3% of MSH children in MSH reported sufficient consumption of vegetables, compared with 8% of MSH adults (Table 34).

Women were more likely than men to have sufficient daily fruit consumption. Fruit consumption was lowest in young adults and increased with age (Figure 87). MSH women (11.4%) were three times more likely than MSH men (3.8%) to report sufficient daily vegetable consumption.

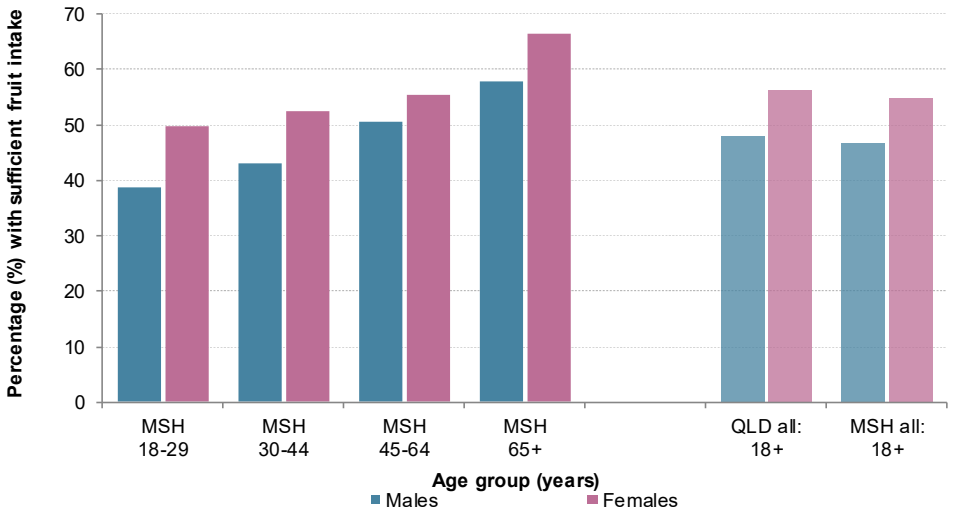


Figure 87: Percentage of adults (18+ years) with sufficient daily fruit consumption, by age and sex, Metro South Health and Queensland, 2019 to 2020

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, 56% of MSH adults undertook sufficient physical activity for health benefit which was statistically similar to the Queensland prevalence (58%) (Table 33). Sufficient physical activity generally decreased with age, with the prevalence higher in males than females in all age groups except those aged 65 to 75 years (Figure 88).

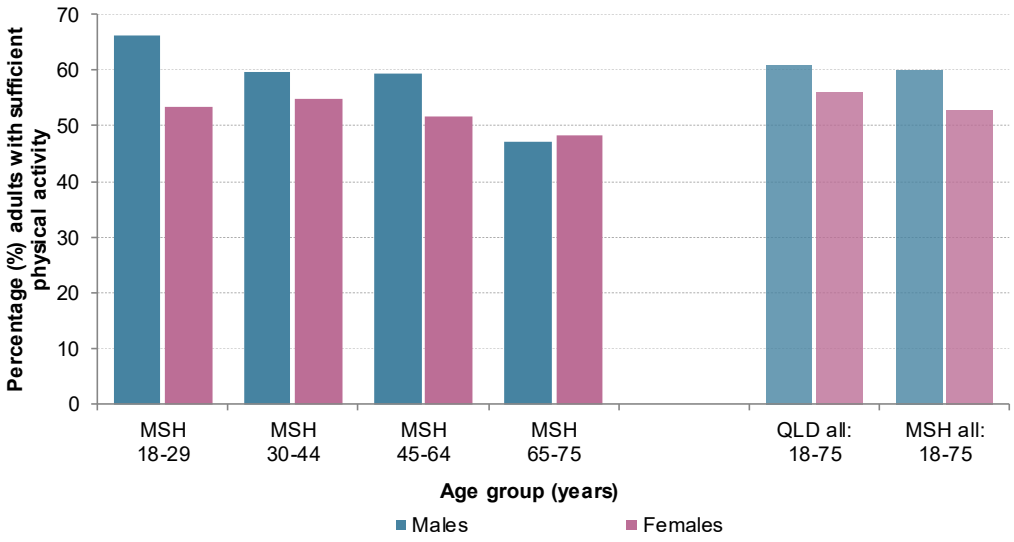


Figure 88: Percentage of adults (18-75 years) who undertook sufficient physical activity for health benefit in the last week, by age and sex, Metro South Health and Queensland, 2019 to 2020

Less than half (45%) of MSH children aged 5 to 17 years did sufficient physical activity for health benefit which was statistically similar to the Queensland prevalence (47%) (Table 34).

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, MSH adults (18%) were significantly less likely than Queensland adults (22%) to report alcohol consumption that was risky over their lifetime. They were also less likely to report single occasion alcohol consumption that was risky (at least monthly), but this difference was not statistically significant (Table 33).

Men were much more likely than women to report risky levels of alcohol consumption. Prevalence of lifetime risky consumption among males was equally high in all age groups under 65 years, while in women it was highest in those aged 18 to 29 years (Figure 89). Single-occasion risky drinking peaked in both sexes in the 18 to 29 years age group and then decreased with increasing age (data not shown).

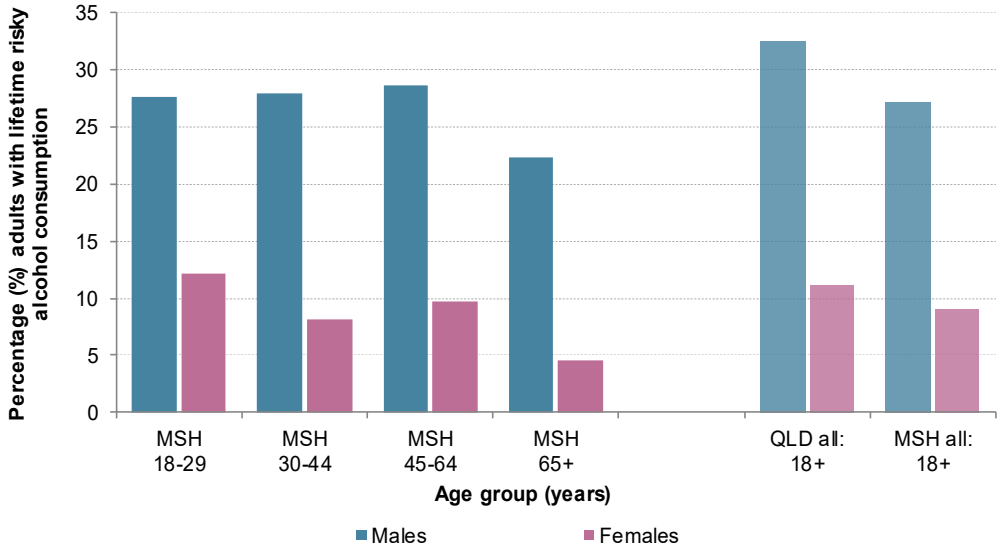


Figure 89: Percentage of adults (18+ years) with lifetime risky alcohol consumption, by age and sex, Metro South Health and Queensland, 2019 to 2020

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 MSH adults (50%) and Queensland adults (53%) (Table 33). However, MSH children (5 to 17 years) in 2018-2019 were significantly less likely than Queensland children to have been sunburnt in the past 12 months (42% vs 49%) (Table 34).

In children, boys were more likely that girls to have been sunburnt and older high school aged children were more likely to have been sunburnt than those of primary school age.

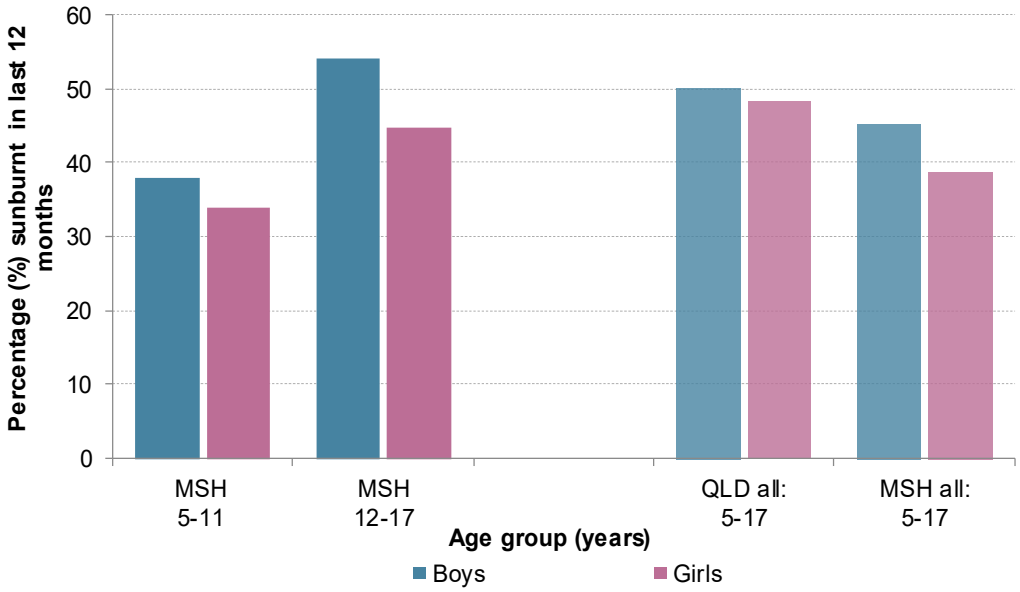


Figure 90: Percentage of children (5-17 years) sunburnt in the previous 12 months, by age and sex, Metro South Health and Queensland, 2018 to 2019

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

List of tables

References

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