NEEDS ASSESSMENT

Rural Health Outreach Fund

July 2017

rwav health professional solutions

Executive Summary

The Rural Health Outreach Fund (RHOF) provides funding to outreach health services to improve the health outcomes for people living in regional, rural and remote locations. These services are delivered by General Practitioners (GPs), medical specialists, nurses and allied health professionals within the four priority areas: maternal and paediatric health, mental health, chronic disease management support and eye health.

In Victoria, RHOF is administered by the Rural Workforce Agency Victoria (RWAV), and in the 2016-17 financial year, the program contracted 192 providers across 27 health disciplines to deliver 2584 occasions of service or visits across Victoria.

The examination of data at a local level presents an opportunity to adopt a place-based approach in administering this program to target areas of high need or health inequalities. The data presented in this report highlights the geographic variation of health outcomes, which may be linked to the mal-distribution of health service provision or interventions (e.g. an appropriate medical workforce).

To identify 'hotspots' or areas to target, this report examines rates or proportions of health outcomes that are persistently above the state or national average for a period of at least two years. This provides an indication of whether the prevalence of a specific health outcome is intermittent or by chance, or due to an ongoing or persistent issue in the community. Where longitudinal data is not available, the degree above or below the state or national rate was used to identify areas in need.

Despite the breadth of population health data available, this report has a strong focus on the rates of preventable hospital admissions as it suggests that many would have been avoided had there been appropriate and adequate community-based or primary health services in place. In accordance with previous research, the data collected and analysed for this report also suggests that low socio-economic status is associated with poorer health outcomes, and this is evident with the most socio-disadvantaged areas of rural Victoria appearing as hotspot areas consistently across the four RHOF priority areas (see **Table 1**).

A major limitation of this document is the lack of qualitative data or stakeholder consultation to substantiate or support the numerical data. However, we anticipate that this document becomes a starting point for discussion and consultation with local service providers, particularly in the context of limited regional health workforce data to truly understand the demand and supply issues. Specifically, this applies to the Primary Health Networks (PHN), as it presents an opportunity to collaborate and align resources in the commissioning of health services to adequately meet the health needs of the local population.

The table below provides an overview of the key findings and emerging recommendations:

A snapshot of rural Victoria	• 1.4 million Victorians currently reside in rural Victoria. The majority, 43%, reside within the Western Victoria PHN region. *Young Victorians* • There are a number of areas in rural Victoria that have a proportion of children (aged 0-14) well above the state average (18.3%): Maiden Gully – 26.04%, Strathfieldsaye – 25.7% and Ballarat (Alfredton/Buninyong/Smythes Creek - 23.03%. • By 2025, approximately 30% of the population in Strathfieldsaye, Seymour and Woodend will be children. The highest anticipated growth will occur in the Seymour Region (+10%), Ararat Region (+9.9%) and the Colac/Otway Region (+7.9%).

	Older Victorians • Over a 10 years period, rural Victoria is projected to experience a significant growth in its older population, which far surpasses the Victorian average. • By 2025, approximately 57% of the north Bendigo region is projected to be over 65 years of age, which is a growth of 40% since 2015. Another area with a high proportion of older Victorians, which is also projected significantly rise by 2025, is Maryborough (Vic.). *Socio-economic status (SES)* • Socioeconomic disadvantage has an association with poorer health. • 50% of the top 20 most socio-disadvantaged areas in rural Victoria were located within the Murray PHN region. • Priority places or 'hotspot' areas are more likely to be associated with low SES and as such, the most socio-disadvantaged areas consistently appear within the list of areas with the highest prevalence of health conditions.
Chronic disease management	**Key Findings:** • The prevalence of chronic disease is not uniformly distributed and is strongly linked, with greater effect, among socially disadvantaged people. • Aboriginal and Torres Strait Islander people, people living in areas of socioeconomic disadvantage and rural and remote areas experienced higher rates of hospitalisations compared to their counterparts. • Potentially preventable hospitalisitons (PPPH) are those that may have been prevented by timely and effective provision of non-hospital or primary health care. There were several areas within rural Victoria that experienced persistently high rates of PPH overall. These areas also contain towns and localities that have been categorised within the lowest SES regions of Victoria. • Of the providers that were contracted to deliver chronic disease management services in 2016-17, 48.6% of those were provided within the Western Victorian PHN region, followed by Murray (36.2%) and Gippsland (15.2%). However, the highest rates of PPH overall were in Gippsland PHN followed by Murray PHN. *Chronic respiratory disease* • The management of chronic obstructive pulmonary disease (COPD) in community-based health services appears to be an issue within the Murray PHN region with 91% demonstrating rates above the national average. Campaspe had rates double the national average. • Latrobe Valley and Bendigo had persistent rates of asthma and COPD PPHs above the national average from 2013-14 to 2015-16. • The area with the highest growth in COPD rates over the three year period was Campaspe (+40.4%), which is significant in comparison to the national growth of 8.1%. *Cardiovascular disease* • Cardiovascular disease appears to be a major concern for the Gippsland and Murray PHN region with areas experiencing persistent high rates from 2013-14 to 2015-16. Murray River – Swan Hill endured PPH rates consistently above the national rate for both angina and chronic heart failure. • Nationally, the rate of angina PPHs reduced by 20% while chronic heart failure (CHF) PPHs increased by 7.6% from 2013-14 to 2015-16. In comparison, the areas with the highest growth in admission rates for angina were Gippsland-East (+35.6%) and Wellington (+28.1%), and for CHF, Loddon – Elmore (+49.8%) and Wellington (+32.3%). *Diabetes complications* • In 2015-16, Baw Baw endured the highest rates of PPHs due to diabetes complications in rural Victoria, which was double the national rate.

- Hospital admissions due to gangrene are of a concern in the Murray PHN region. Shepparton had rates of gangrene PPHs, which were four times the national average.
- While the rate of PPHs from diabetes complication increased by 9.3% nationally from 2013-14 to 2015-16, Baw Baw, Campaspe and Upper Goulburn Valley had the highest growth in rural Victoria with an increase of 64.6%, 38.9% and 34.2% respectively.

Cellulitis

- In 2015-16, the highest rates of cellulitis PPHs occurred in Gippsland – East, Murray River – Swan Hill and Wellington.
- While the national rate of cellulitis PPHs increased by 6.3% between 2013-14 to 2015-16, Gippsland – East (+36.5%) and Heathcote – Castlemaine (+34.3%) experienced the highest growth rate of cellulitis PPHs across rural Victoria.

Kidney/urinary tract infections (UTI)

- Loddon – Elmore, Wellington and Bendigo had the highest rates of kidney/UTI hospital admissions in 2015-16, as well as higher than average rates in the previous two years.

Ear, nose and throat (ENT) infections

- Wangaratta – Benalla, Moira and Shepparton had rates of ENT PPHs well above the national rate.
- An examination of the rates across three consecutive years identified four areas with persistently high rates: Wellington, Shepparton, Murray Hill – Swan Hill and Grampians.
- While the national rate increased by 6.2% during this time period, the growth rate increased in Wangaratta-Benalla by 41.9%.

Musculoskeletal system disease

- Musculoskeletal system disease appears to be a prevailing problem across rural Victoria with 93% experiencing rates above the state average. However, the rates across rural Victoria were similar.

Cancer screening

- Cancer is one of the leading causes of death in Australia, accounting for about 3 of every 10 deaths registered in Australian in 2014.
- The incidence of premature death due to cancer was higher in rural Victorian in comparison to metropolitan Victoria. Between 2010-14, the areas with the highest rates of avoidable deaths caused by cancer in people aged 0-74 were Robinvale, Corio-Norlane and the Seymour Region.
- Local data on the prevalence of cancer could be sourced for the three national cancer screening programs: breast, bowel and cervical cancer. Although longitudinal data that could not be located, the following LGAs had positive screening results significantly above the Victorian rate:
    - *Bowel cancer:* East Gippsland Shire– Longford – Lock Sport / Yarram, Mitchell Shire – Seymour
    - *Cervical cancer:* Rural City of Swan Hill
    - *Breast cancer:* Buloke Shire

Recommendations:

- To address SA3s with high rates of PPHs, with particular focus in areas identified in the table below:

PPH condition	SA3 hotspots
PPH (total) and Chronic conditions	• Latrobe Valley • Loddon – Elmore • Murray River – Swan Hill

<table>
<tr><td></td><td>
<table>
<tr><td></td><td>• Campaspe
• Moira
• Shepparton
• Maryborough - Pyrenees</td></tr>
<tr><td>Chronic respiratory disease (asthma and COPD)</td><td>• Latrobe Valley
• Bendigo
• Loddon - Elmore
• Campaspe</td></tr>
<tr><td>Cardiovascular disease</td><td>• Murray River – Swan Hill
• Loddon – Elmore
• Wellington
• Gippsland – East</td></tr>
<tr><td>Diabetes complications (including gangrene)</td><td>• Moira
• Murray River - Swan Hill
• Geelong
• Baw Baw
• Campaspe
• Upper Goulburn Valley
• Shepparton</td></tr>
<tr><td>Cellulitis</td><td>• Gippsland – East
• Murray River- Swan Hill
• Wellington
• Heathcote - Castlemaine</td></tr>
<tr><td>Kidney/UTI</td><td>• Wellington
• Bendigo
• Loddon – Elmore</td></tr>
<tr><td>ENT infections</td><td>• Wangaratta - Benalla
• Wellington
• Shepparton
• Murray Hill – Swan Hill
• Grampians</td></tr>
</table>

To collaborate with rural PHNs to identify and prioritise local cancer workforce needs as they commission services to improve participation in the three national cancer screening programs, with particular attention to the following LGAs:

Buloke (S)
Swan Hill (RC)
Mitchell (S)
East Gippsland (S)
Greater Geelong (C)

</td></tr>
<tr><td>Mental health</td><td>Key Findings:

• Consistent with previous research, there is a correlation between disadvantaged rural Victorian areas and high/very high psychological distress.
• After arthritis, mental health problems was the most prevalent long-term condition affecting older rural populations. However, only 6.1% of the total providers supported under RHOF in 2016-17 provided mental health care.
• The rates of mental health-related hospitalisations provides an indication of the availability and quality of community-based programs or services.
• Significant high rates of high/very high psychological distress were detected within the Western Victorian PHN region but low rates of mental health-related hospitalisations. This may suggest the greater availability of primary health/community-based mental health services.</td></tr>
</table>

	• The Gippsland-East area had persistent and significantly high rates of hospitalisations above the national average in three categories: all mental health conditions, AoD use and intentional self-harm.
	• Wangaratta – Benalla had persistently high rates of hospital admissions for all mental health conditions and intentional self-harm. Other hotspots identified were:
	  ○ *All mental health conditions*: Bendigo, Murray River – Swan Hill
	  ○ *For AoD use*: Maryborough – Pyrenees
	  ○ *From intentional self-harm*: Wellington
	• 63% of rural Victoria had deaths from suicide and self-inflicted injuries above the national rate between 2010-14.
	• The Ararat Region had the highest incident of deaths from suicide and self-inflicted injuries, which was almost four times the Victorian average.
	
	Recommendations:
	
	• Given the prevalence of long-term mental health problems in inner/regional areas, active engagement should occur with the rural PHNs to identify how their commissioned services can be supported by an adequate mental health workforce.
	• To address high rates of mental health-related hospitalisations and suicide through mental health care and addiction recovery support, through targeted medical recruitment, for the following areas:
	  ○ Gippsland – East
	  ○ Wangaratta – Benalla
	  ○ Murray River – Swan Hill
	  ○ Maryborough – Pyrenees
	  ○ Wellington
	  ○ Grampians (Ararat)

Eye health	**Key Findings:**
	
	• There is limited data, on a population health level, on eye health needs both nationally and across the state. Despite this, ophthalmologists, as a health discipline, were one of the most contracted providers under RHOF in 2016-17.
	• The National Eye Health Survey (NEHS), published in 2016, was the first national survey that compared the prevalence of visual disorders nationally. In non-Aboriginal populations, there was no difference in the prevalence of visual impairment with age or remoteness.
	• Unlike the trend in other chronic disease conditions, local eye health data suggests that the need for eye health services did not appear to be linked with low socio-economic disadvantage. Data on cataract surgery hospitalisations indicates that some low SEIFA areas have been well-serviced with individuals gaining access to cataract surgery.
	• Although the rate of cataract surgery hospitalisations have improved across the state from 2013-14 to 2014-15, there were a number of areas in rural Victoria that were persistently below the national average, specifically Wangaratta – Benalla and Grampians.
	
	Recommendations:
	
	• To address SA3s with low rates of cataract surgery hospitalisations, with particular attention to the following areas:
	  ○ Wangaratta – Benalla
	  ○ Grampians
	  ○ Surf Coast – Bellarine Peninsula
	  ○ Mildura

Paediatric and maternity	**Key Findings:** • A third of all providers (34%, 88 providers) contracted under the RHOF program in 2016-17 provided maternity or paediatric services

	Maternity
	
	• Mildura had the highest number of births in 2010-15 but the highest rate of births per 1000 females (aged 15-44) occurred in Robinvale (117.6 births), which was an increase of approximately 30% over five years.
	• The largest growth in birth rates occurred in St Arnaud (44.3%), Longford-Loch Sport (37.2%) and Trafalgar (Vic.) (32.8%).
	
	Paediatrics
	
	• The proportion of children developmentally vulnerable was highest in Moe-Newborough/Morwell and Seymour
	
	Recommendations:
	
	• To address areas with the highest rates, or the largest growth rate, of births with the provision of maternity services, with particular attention to
	  ○ Robinvale
	  ○ St Arnaud
	  ○ Longford – Loch Sport
	  ○ Trafalgar
	• To address areas with high proportions of children assessed as developmentally vulnerable, particularly in the following areas:
	  ○ Latrobe Valley: Moe – Newborough/Morwell, Churchill
	  ○ Seymour
	  ○ Maryborough
	  ○ Benalla
	  ○ Wendouree – Miners Rest
	  ○ Newcomb-Moolap

Table 1: Hotspots within the most disadvantaged rural Victorian areas.

		SES		Chronic disease support management hotspot								Mental healht hotspot	Eye healht hotspot	Maternal & paediatric care hotspots		RHOF actiivty 2016-17	
PHN	SA2	SEIFA - State decile (2011)	SEIFA - Ranking within the State (2011)	PPH (total)/chornic conditions	Chronic respiratory disease	CVD	Diabetes complications	Cellulitis	Kidney/UTI	ENT	Cancer	Mental health	Eye health	Maternity	Early childhood development	RHOF Providers in 2016-17	Total RHOF providers in 2016-17
Western Victoria	**Corio - Norlane**	1	5				x				x						
Gippsland	**Morwell**	1	8	x	x										x		
Murray	**Upper Yarra Valley**	1	9				x										
Murray	**Robinvale**	1	17	x		x	x	x		x	x	x		x		Women's Health (1), psychiatry (1)	2
Western Victoria	**Maryborough (Vic.)**	1	22	x								x			x	Cardiology (1)	1
Gippsland	**Moe - Newborough**	1	24	x	x										x		
Murray	**Seymour**	1	26				x				x				x		
Murray	**California Gully - Eaglehawk**	1	29		x				x								
Murray	**Cobram**	1	30	x			x									General Physician (1), Geriatrics (1), psychiatry (2), paediatrics (1)	5
Murray	**Mooroopna**	1	33	x			x			x							
Western Victoria	**Wendouree - Miners Rest**	1	36												x		
Murray	**Mildura**	1	37										x			Cardiology (4), endocrinology (1), ENT (1), general physician (1), nephrology (1), ophthalmology (3), oncology (1), pain and palliative care (2), rheumatology (1), psychiatry (1)	16
Western Victoria	**Newcomb - Moolap**	1	38				x				x				x		
Gippsland	**Orbost**	1	39			x		x			x	x				Geriatrics (1), Nephrology (1), paediatrics (1)	3
Murray	**Red Cliffs**	1	40														
Murray	**Bendigo**	1	41		x				x							Paediatrics (1)	1
Western Victoria	**Ararat**	1	42							x		x	x			Cardiology (1), Ophthalmology (4)	5

Table of contents

List of Tables

List of Figures

Acronym list

ABS	Australian Bureau of Statistics
ACSQHC	Australian Commission on Safety and Quality in Health Care
AoD	Alcohol and other drugs
ASR	Age standardised rate
CHF	Chronic Heart Failure
COPD	Chronic obstructive pulmonary disease
ENT	Ear, nose and throat infections
ERP	Estimated Resident Population
GP	General Practitioner
LGA	Local Government Area
MSOAP	Medical Specialists Outreach Assistance Program
NBCSP	National Bowel Cancer Screening Program
NEHS	National Eye Health Survey
PHA	Population Health Area
PHN	Primary Health Network
PPH	Potentially preventable hospitalisation
RHOF	Rural Health Outreach Fund
RWAV	Rural Workforce Agency Victoria
SA2	Statistical Area Level 2
SA3	Statistical Area Level 3
SEIFA	Socio-Economic Indexes for Area
SES	socio-economic status

1. Introduction

Rural Workforce Agency Victoria (RWAV) is a non-government funded organisation that specializes in the recruitment, placement and support of General Practitioners (GPs), nurses and allied health professionals.

Established in 1998, RWAV was formed in response to the substantial general practice shortages in rural and remote areas. RWAV is an experienced administrator of health outreach programs, facilitating outreach services in Victoria for over a decade.

1.1. About this report

The purpose of this document is to articulate the health workforce needs, options and priorities based on the geographic variation of health outcomes.

Approximately 1.4 million Victorians live in regional or remote areas, equating to 23% of the state's population.[1] However, not all Victorian experience the same level of access to health services or health outcomes.

Our health is influenced by where we live. It is well-documented that Australians living in rural and remote areas experience poorer health outcomes and poorer access to health services in comparisons to their metropolitan counterparts due to a lack of necessary infrastructure and appropriate workforce.[2] However, this variation also occurs within regional and remote areas themselves.

According to the Australian Commission on Safety and Quality in Health Care (ACSQHC) (2017), variation can indicate that people are either missing out on care they require, or are not receiving adequate care. Moreover, it represents an opportunity for the health system to improve as it highlights:

- the inequity of health access and the need to deliver services more fairly; and
- inadequate system supports for appropriate care, and the need for training or financial incentives.[3]

This report demonstrates that geographic health inequalities exist across Victoria and as such, offers a targeted place-based approach in allocating resources or, more specifically, administering the Rural Health Outreach Fund (RHOF) program.

1.2. Program Overview: Rural Health Outreach Fund

The RHOF program was established to improve health outcomes for people living in regional, rural and remote locations by supporting the delivery of outreach health activities.

The objectives are to:

- provide both public and private outreach health services that address community needs;
- broaden the range and choice of health services available in regional, rural and remote locations; and
- remove the financial disincentives that create barriers to service provision.

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[1] Australian Bureau of Statistics. (2017). Regional Population Growth, Australia (cat. No. 3218.0). Retrieved from: http://www.abs.gov.au
[2] Thomas et al. (2014). What core primary health care services should be available to Australians living in rural and remote communities? *BMC Family Practice, 15*, 143.
[3] Australian Commission on Safety and Quality in Health Care. (2017). *The Australian Atlas of Healthcare Variation*. Sydney: ACSQHC. Retrieved from: http://www.safetyandquality.gov.au

Financial support is provided by RHOF to support travel, accommodation and service expenses for medical specialist and allied health teams providing outreach services for the following:

- Maternal and paediatric health
- Mental health
- Support for chronic disease management
- Eye health

As per the program guidelines, regional and rural locations in Victoria classified as ASGC-Remoteness Areas 2-4, are eligible for financial support under RHOF.

1.3. Other Government Initiatives

When interpreting these document, it is important to acknowledge the various other government initiatives (both state and national) that may also be involved in addressing the geographic variation in health outcomes across Victoria.

Specifically, there are two government initiatives that will need to be considered in actioning the findings and, subsequent, recommendations of this document.

Firstly, on 1 July 2015, the Commonwealth Government established 31 Primary Health Networks (PHNs) across the country to increase the efficiency and effectiveness of medical services for patients, particularly those at risk of poor outcomes. From 1 July 2016, PHNs moved from delivering health services directly to the community, to delivering health services through a commissioning approach.

Decisions on where to commission health services will be based on assessing needs and priorities, which includes the analysis of population health data, most of which is identical to the sources of data used to collate this document. This includes the commissioning of primary health services to address mental health and suicide, chronic disease, alcohol and other drugs (AoD), cancer screening and Aboriginal and Torres Strait Islander health.

Commissioned health services will need to be supported by an adequate workforce to improve the health priorities of the communities. As such, this report can provide an important basis for discussion with rural PHNs to collaborate and channel resources to address areas most in need.

Secondly, on a state level, the Victorian Department of Health and Human Services (DHHS) funded a number of telehealth specialist initiatives in 2016 to also address community need:

- Alfred Health will work in collaboration with partners at Mildura Base Hospital, Central Gippsland Health Service, Peninsula Health and Warrnambool Base Hospital to introduce telehealth for patients requiring burns, infectious disease, lung transplant, orthopaedics, gastroenterology, dialysis and HIV services.
- Austin Health will work in collaboration with Bendigo Health and Murray PHN to upscale the Victorian Respiratory Support Service and Victorian Spinal Cord Service
- Barwon Health will work towards scaling up telehealth access to specialist clinics in the Barwon region
- Bendigo Health Care Group will establish a telehealth community of practice, with an initial focus on paediatrics, respiratory medicine, endocrinology and genetics.
- Monash Health will collaborate with Latrobe Regional Hospital, Bass Coast Health, Bairnsdale Regional Health and Central Gippsland Health Service to increase telehealth consultations for paediatric specialist's clinics.

- Peter MacCallum Cancer Centre will initially provide specialist oncology outreach services within the Loddon-Mallee region (Bendigo Health and Mildura, with further opportunities to Swan Hill, Kerang and Kyneton).

1.4. Needs Assessment Methodology

To complete this report, a desktop review and analysis of data was undertaken between May – June 2017.

As per the program guidelines, only data related to areas located in ASGC-RA 2-5, with the exception of Geelong, has been considered. For this reason, results have been presented according to the three rural-based Victorian PHNs: Western Victoria PHN, Gippsland PHN and Murray PHN.

As this report suggests an allocation of resources that is aligned to geographic areas of variation, a consistent methodology was applied to alleviate bias.

While the Needs Assessment undertaken by each of the Victorian PHNs highlighted local community need and priorities based on a range of data sources, only data that was collected and measured consistently across the state was included. This limited the findings to publically-available data, and excluded information collected specifically by each individual PHN such as key findings from local consultations. GP throughput data collected by PHNs has also been excluded as it offers little utility in determining health outcomes or the availability of relevant health services.

That said, **Appendix 1** outlines the population health data collected to inform this report and identify the priority areas.

Age standardised rates (ASR) and proportions, rather than absolute numbers, have been used to enable areas across Victoria to be ranked comparatively and compared over time.

A snapshot of the RHOF activity in 2016-17 has also been included for each priority area to add further context and substantiate the recommendations emerging from this document.

Identifying priority or 'hotspot' areas

To identify areas of health inequality and poor health outcomes, this report has been determined by analysing data available at the lowest level of statistical geographic area, and benchmarked against either the Victorian or national average. By doing so, the extent of variation between areas could be effectively highlighted and as such, the emerging recommendations could be more specific in terms of locality.

The Grattan Institute defines hotspots as areas that warrant further financial investment because they experience sufficiently high and persistent rates of avoidable hospitalisations in comparison to the state-wide rate.[4] In this document, we refer to persistent hotspots as areas that have rates or proportions above the state or national average for a period of at least two years.

In addition, particularly where longitudinal data is not available, hotspots have also been selected if the rate or proportion is at least 50 per cent above the state or national average. Hotspot areas were also selected if there was significant growth or change over the examined time period.

[4] Duckett, S. & Griffiths, K. (2016). *Perils of place: identifying hotspots of health inequalities*. Melbourne: Grattan Institute.

Data limitations

The most predominate data limitation is the inconsistencies of aggregated data from different sources.

Where possible, data has been captured and analysed at the Statistical Level 2 (SA2). This is the lowest available level (or most granular) for which Estimated Resident Population (based on Census data) or other non-Census Australian Bureau of Statistics (ABS) data can be segmented. SA2 areas generally have a population ranging from 3,000 to 25,000 persons, with an average population of approximately 10,000 persons.[5] SA2 areas in rural and remote areas generally have smaller populations (and cover a larger geographical area) in comparison to SA2 areas in urban areas. For example, SA2 areas in urban areas are often defined by the Local Government Area (LGA) boundary however, a regional or rural LGA can comprise of multiple SA2 areas.

Definitions of the statistical geographic areas utilised in this report can be found in **Appendix 2**. Although the data utlised in this document were analysed at different statistical levels, the data has been geographically aligned in order to obtain some form of consistency.

Other limitations in this report include:

- Publically available data is for different time periods
- There is limited data available at a population health level for eye health
- Only quantitative data has been assessed

In the previous financial year (2016-17), qualitative anecdotal feedback was only captured during stakeholder meetings. This information has not been included in this report however, it provides an opportunity to collect this information in a systematic manner for successive Needs Assessments.

[5] Australian Bureau of Statistics. (2010). *Australian Statistical Geography Standard (ASGS): Volume 1 – Main Structure and Greater Capital City Statistical Areas, July 2011* (cat. No. 1270.0.55.001). Retrieved from http://www.abs.gov.au

Interpreting figures and tables:

Throughout this report, the graphs presented have been colour-coded according to the three Victorian rural PHNs:

Where rates of hospitalisations have been assessed, hotspot areas have been presented in a table to illustrate persistent rates above the national average (or, in the case of eye health, below the national average).

National average rate

		ASR of Total PPHs			ASR of Total chronic PPHs		
		2015-16	2014-15	2013-14	2015-16	2014-15	2013-14
National		**2643**	**2522**	**2437**	**1205**	**1146**	**1123**
Gippsland	Gippsland - East	3014	2911	2382	1442	1489	1046
Gippsland	Latrobe Valley	3408	2945	2688	1935	1465	1320
Gippsland	Wellington	3063	2675	2593	1317	1130	1084
Murray	Bendigo	2639	2638	2734	1307	1436	1403
Murray	Loddon - Elmore	2797	2705	2840	1551	1342	1455
Murray	Upper Goulburn Valley	2647	2360	2543	1296	1175	1282
Murray	Wangaratta - Benalla	2771	2501	2496	1298	1102	1254

Rate is above national rate

2. A snapshot of rural Victoria

Key Findings:

- 1.4 million Victorians currently reside in rural Victoria. The majority, 43%, reside within the Western Victoria PHN region.

Young Victorians

- There are a number of areas in rural Victoria that have a proportion of children (aged 0-14) well above the state average (18.3%): Maiden Gully – 26.04%, Strathfieldsaye – 25.7% and Ballarat (Alfredton/Buninyong/Smythes Creek - 23.03%.
- By 2025, approximately 30% of the population in Strathfieldsaye, Seymour and Woodend will be children. The highest anticipated growth will occur in the Seymour Region (+10%), Ararat Region (+9.9%) and the Colac/Otway Region (+7.9%).

Older Victorians

- Over a 10 years period, rural Victoria is projected to experience a significant growth in its older population, which far surpasses the Victorian average.
- By 2025, approximately 57% of the north Bendigo region is projected to be over 65 years of age, which is a growth of 40% since 2015. Another area with a high proportion of older Victorians, which is also projected significantly rise by 2025, is Maryborough (Vic.).

Socio-economic status (SES)

- Socioeconomic disadvantage has an association with poorer health.
- 50% of the top 20 most socio-disadvantaged areas in rural Victoria were located within the Murray PHN region.
- Priority places or 'hotspot' areas are more likely to be associated with low SES and as such, the most socio-disadvantaged areas consistently appear within the list of areas with the highest prevalence of health conditions.

Of the 1.4 million Victorians residing in rural Victoria, the majority (43%) were living within the Western Victorian PHN region, followed by Murray (38%) and Gippsland (19%). Understanding, and prioritising, the health needs of Victoria's rural population involves the consideration of the complex interplay between certain population groups, geographic locations and health conditions.

As the Australian Institute of Health and Welfare (2016) asserts:

> *'Health is not the same for everyone….health changes throughout lives and also differs within population groups.'*[6]

For example, the National Health Survey in 2015 discovered that people living outside the major cities were more likely to experience long-term health condition such as asthma, back problems, deafness, arthritis, diabetes and cardiovascular disease, which may be reflective of the older age profile of populations living in inner/outer regional and remote areas (see **Table 2**).

Given the priority areas of the RHOF program, this section will investigate two main age groups: older Victorians aged 65 years and over, and young Victorians under 14 years of age, who reside in rural Victoria. This section will also investigate the spread of geographic socio-disadvantage and medical workforce.

[6] Australian Institute of Health and Welfare. (2016). *Australia's health 2016: in brief*. Cat. No. AUS 201. Canberra: AIHW

Individuals that fall within these four categories are more likely to be impacted by the conditions within the RHOF priority areas and as such, are more likely to require access to health services and support.

Table 2: Prevalence of long-term conditions by remoteness

Disease type	Remoteness area		
	Major cities	Inner regional	Outer regional/Remote
Arthritis	14%	20%	18%
Back pain and problems	16%	18%	16%
Asthma	10%	12%	12%
COPD	2.4%	3.4%	2.7%
Blindness (partial and complete)	0.5%	0.9%	0.8%
Deafness	9.8%	15%	14%
Diabetes	4.7%	6.0%	6.7%
Cardiovascular disease (heart, stroke and vascular disease)	4.7%	6.7%	5.8%
Cancer	1.6%	1.7%	1.8%
Mental health problems	17%	19%	19%

(Adapted from the Australian Institute of Health and Welfare[7])

2.1 Young Victorians

In 2015, there were 263,615 children (aged 0-14) living in rural Victoria, with 43% residing in the Western Victoria PHN region (see **Figure 1**).

Figure 1: PHN proportion of children aged 0-14 years residing in rural Victoria

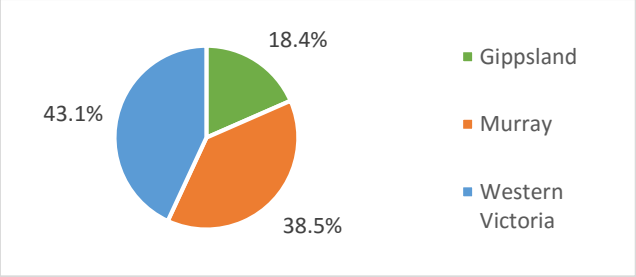
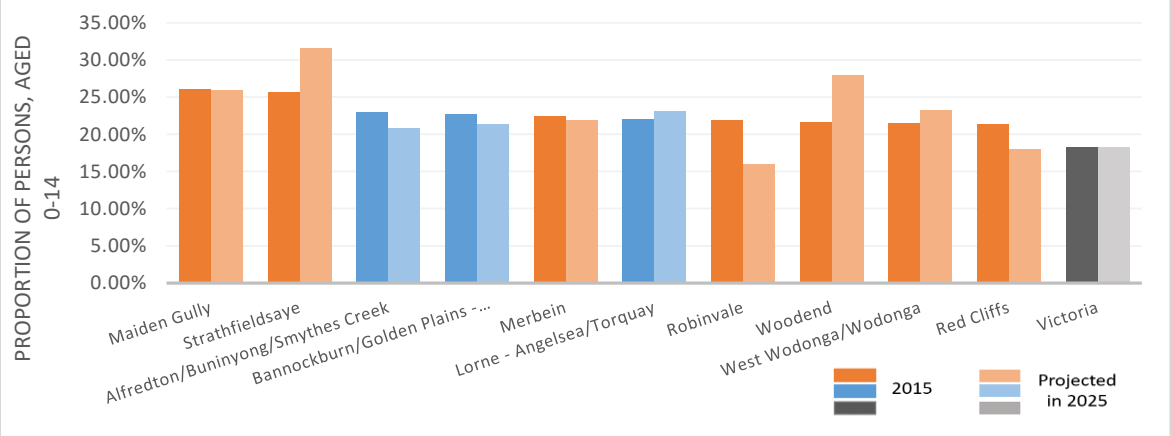


Figure 2 indicates the areas with the highest proportion of persons aged 0-14 years in 2015, which were all above the overall Victorian proportion of 18.3%.

Figure 2: PHAs with the highest proportion of persons aged 0-14 years in 2015 and their projected proportion in 2025.



[7] Australian Institute of Health and Welfare. *Health conditions and remoteness*. Retrieved 30 June 2017 from: http://www.aihw.gov.au/rural-health/health-conditions-and-remoteness/

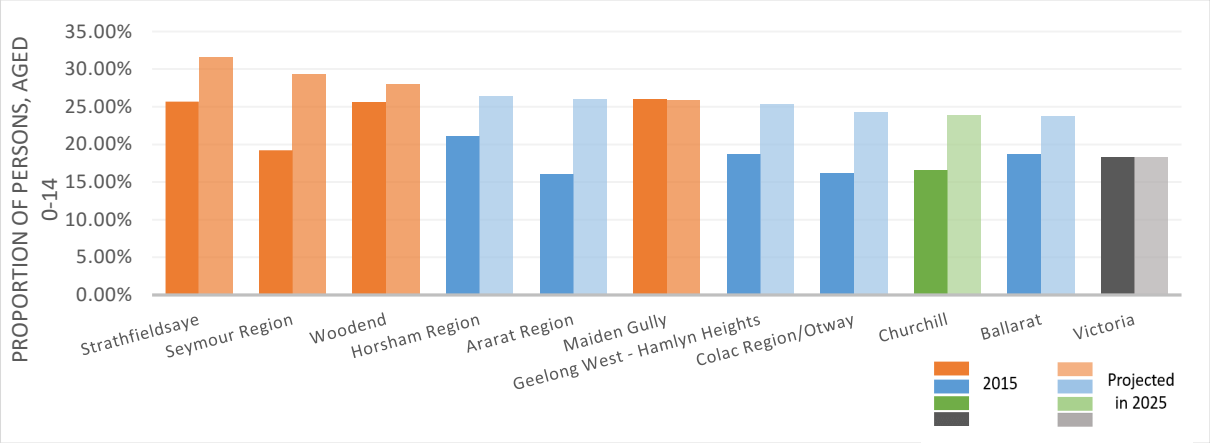
Similar to the Victorian proportion, **Table 3** indicates that, broadly, the proportion of children in each PHN region will remain relatively unchanged in 2025. However, for some specific areas, there will be significant growth or declines. For example, the proportion of children in Strathfieldsaye and Woodend is projected to increase by 5.9% and 6.3% respectively (see **Figure 3**). In comparison, the proportion will decrease in Robinvale (-5.9%) and Red Cliffs (-3.3%). The largest change in proportion will actually occur in the Bendigo-North (-12.2%), Seymour (+10.1%), Ararat (+9.9%) and Marybourgh (Vic.) (-9.1%) Region.

Table 3: Average projected change in population aged 0-14 years in PHN region

PHN	Average % of population aged 0-14 in 2015	Projected average % of population 0-14 in 2025	Change in %
Murray	18.7	17.9	-0.8
Gippsland	18.0	16.6	-1.4
Western Victoria	18.6	18.1	-0.5
Victoria	18.3	18.3	0.0

By 2025, approximately 30% of the population in Strathfieldsaye, Woodend and the Seymour Region will be children, which is well above the state average of 18.3%.

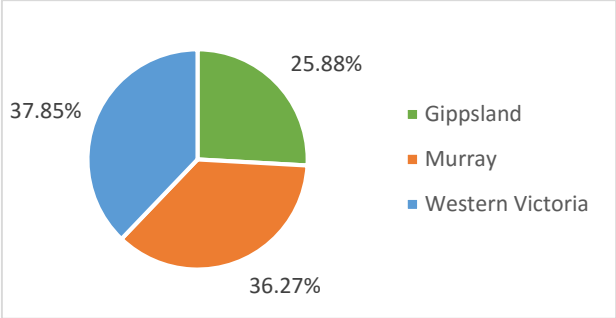
Figure 3: PHAs with the highest projected proportion of persons aged 0-14 years in 2025



2.2 Older Victorians

In 2015, 522,990 Victorians aged 65 years and over were living in rural areas, representing 8.8% of the total Victorian population. The proportion or spread of older Victorians living in rural areas, according to PHN region, is illustrated in **Figure 4**.

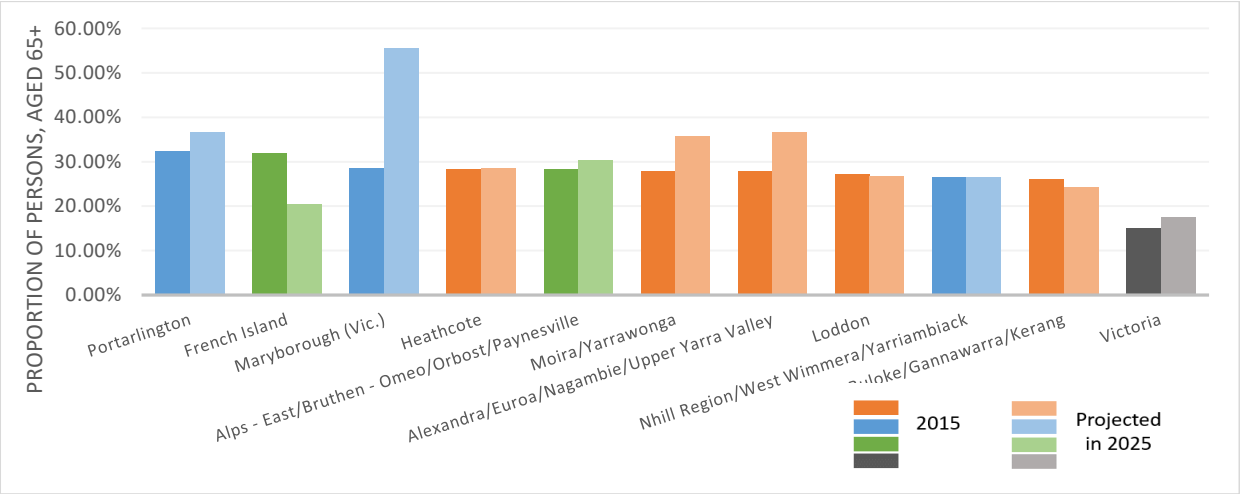
Figure 4: PHN proportion of adults aged 65 years and over residing in rural Victoria



The areas with the highest proportion of residents aged 65 years and over in 2015 is illustrated in **Figure 5**. In 2025, the overall proportion of Victorians aged 65 years and over is projected to increase from 15% in 2015 to 17.5%. Portarlington, French island, Maryborough (Vic.) and Heathcote all had a

proportion of residing population aged 65 years and over v double that of the Victorian average (15%). For Maryborough (Vic.), this proportion is projected to double in 2025 to 55.5%.

Figure 5: PHAs with the highest proportion of persons aged 65 years and over in 2015 and their projected proportion in 2025.



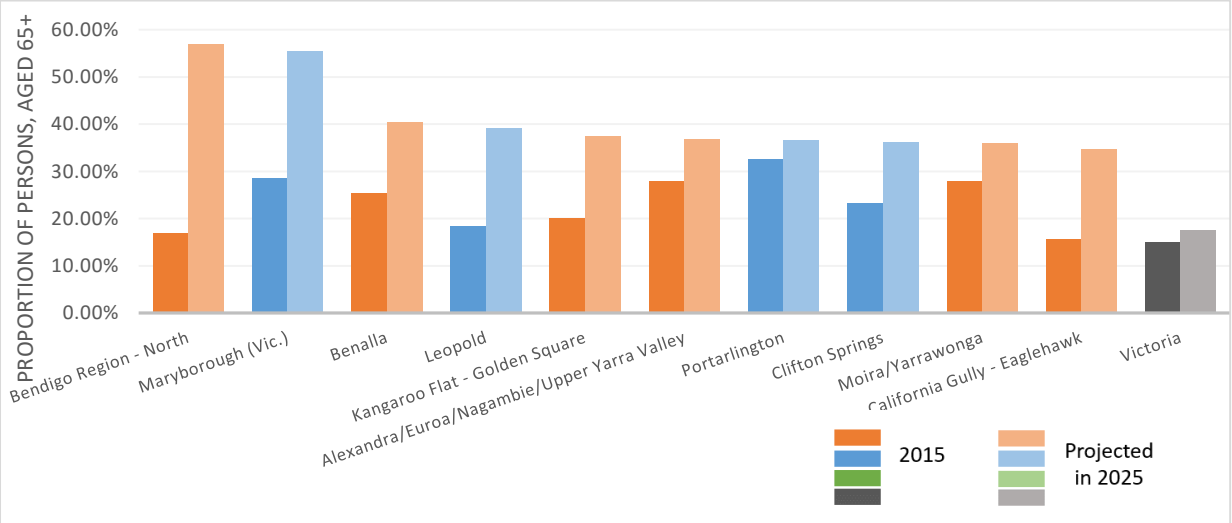
Over a 10 year period, rural Victoria is projected to experience a significant growth in the older population, which far surpasses the change in the Victorian average. **Table 4** demonstrates the projected change in older population according to PHN region, which is in contrast to the projected changes for the younger rural population.

Table 4: Average projected change in population aged over 65 years and over in PHN region

PHN	Average % of population aged 65+ in 2015	Projected average % of population aged 65+ in 2025	Change in %
Murray	20.2	25.9	5.7
Gippsland	22.1	26.3	4.2
Western Victoria	19.5	23.6	4.1
Victoria	15.0	17.5	2.5

Most notably, in 2025, approximately 57% of the north Bendigo region is projected to be over 65 years of age, which is a change of 39.9%. Other areas projected to experience significant growth are highlighted in **Figure 6**.

Figure 6: PHAs with the highest proportion of persons aged 65 years and over in 2025.



2.3. Socio-economic status (SES)

Socioeconomic disadvantage has an association with poorer health. People living within the lowest socioeconomic areas are likely to have higher rates of illness, disability and death than people living in high socioeconomic areas.[8]

Table 5 indicates the highest ranked areas (within ASGC-RA 2-5) of socio-disadvantage according to the SEIFA scale within Victoria. Priority places or 'hotspot' areas are more likely to be associated with low SES and as such, these areas consistently appear within the list of areas with the highest prevalence of health conditions in *Section 3* of this report. Fifty per cent of the top 20 most social disadvantaged areas in rural Victoria were located within the Murray region.

Table 5: Top 10 SA2 areas with the highest social disadvantage according to the SEIFA scale*.

No.	Rank within the State	SA2 area	SA3 area	LGA	PHN
1	5	Corio – Noriane	Geelong	Greater Geelong (C)	Western Victoria
2	8	Morwell	Latrobe Valley	Latrobe (C)	Gippsland
3	9	Upper Yarra Valley	Upper Goulburn Valley	Yarra Ranges (S)	Murray
4	17	Robinvale	Murray River – Swan Hill	Swan Hill (RC)	Murray
5	22	Maryborough (Vic.)	Maryborough - Pyrenees	Central Goldfields (S)	Western Victoria
6	24	Moe-Newborough	Latrobe Valley	Baw Baw (S)	Gippsland
7	26	Seymour	Upper Goulburn Valley	Mitchell (S)	Murray
8	29	California Gully – Eaglehawk	Bendigo	Greater Bendigo (C)	Murray
9	30	Cobram	Moira	Moira (S)	Murray
10	33	Mooroopna	Shepparton	Greater Shepparton (C)	Murray
11	36	Wendouree – Miners Rest	Ballarat	Ballarat (C)	Western Victoria
12	37	Mildura	Mildura	Mildura (RC)	Murray
13	38	Newcomb-Moolap	Geelong	Greater Geelong (C)	Western Victoria
14	39	Orbost	Gippsland – East	East Gippsland (S)	Gippsland
15	40	Red Cliffs	Mildura	MIldura (RC)	Murray
16	41	Bendigo	Bendigo	Greater Bendigo (C)	Murray
17	42	Ararat	Grampians	Ararat (RC)	Western Victoria
18	45	Avoca	Maryborough-Pyrenees	Ararat (RC)	Western Victoria
19	46	Kerang	Murray River – Swan Hill	Gannawarra (S)	Murray
20	47	Loddon	Loddon – Elmore	Loddon (S)	Murray

**The top 17 most disadvantaged SA2 areas were all ranked a SEIFA decile score of 1, which indicates it is an area within the lowest (most disadvantaged) 10% of the country*.

[8] Australian Institute of Health and Welfare. (2016). *Australia's health 2016: in brief*. Cat. No. AUS 201. Canberra: AIHW

2.4. Rural medical workforce

Australia's health workforce is large and diverse, covering many disciplines and ranging from highly qualified professions to support staff and volunteers.[9] Australia's health workforce is also mal-distributed, resulting in less accessible services in rural, remote and outer metropolitan regions.[10]

In recognition that some areas across Australia are better serviced by an adequate health workforce than others, the Australian Government has introduced various policies or incentives. One of these policies includes the district of workforce shortage (DWS) classification. Introduced in 2001, a DWS is a geographical area in which the local population has less access to Medicare-subsidised services in comparison to the national average. The areas are identified using the latest Medicare billing statistics, and updated on an annual basis to allow for changes to the composition and geographic distribution of the Australian medical workforce and the latest estimated resident population (ERP) provided by the ABS. Some doctors, such as overseas trained doctors or foreign graduates of Australian medical schools, are restricted from being eligible for a Medicare provider number unless they work in a DWS.[11]

As **Table 6** highlights, the vast majority of rural Victoria is considered an area of DWS, with the exception of the cities of Bendigo, Geelong and Ballarat. **Table 6** also includes a headcount of medical practitioners registered in 2015. This health workforce data may provide an indication of the capacity of rural practitioners to provide outreach services to nearby towns.

***Note: Local Health workforce data could only be sourced at an LGA level. As DWS areas are based on SA3 boundaries, the most dominate LGA, in terms of land area, has been used as a default. This only compromises areas Heathcote where the City of Greater Bendigo is not a DWS area for any medical specialty, but Heathcote is a DWS area for all conditions except psychiatry. DWS classification is not available for emergency medicine.*

[9] Australian Institute of Health and Welfare. (2016). *Australia's health 2016: in brief*. Cat. No. AUS 201. Canberra: AIHW

[10] Health Workforce Australia. (2012). *Health Workforce 2025 – Doctors, Nurses and Midwives – Volume 1*. Adelaide: HWA.

[11] Australian Government Department of Health. *DoctorConnect: Rural Classification Reform – Frequently Asked Questions*. Retrieved 21 July 2017 from: http://ww.doctorconnect.gov.au

Table 6: Number of registered medical practitioners (2015) according to 2017 District of Workforce Shortage (DWS) areas

		Health Workforce (No. of Medical Specialists)								
PHN	Local Government Area	Emergency medicine	Anaesthesia	Obstetrics and gynaecology	Ophthalmology	Cardiology	Psychiatry	GP	General surgery	Radiology
Gippsland	Bass Coast (S)	0	0	0	0	0	3	21	0	0
Gippsland	Baw Baw (S)	3	3	4	0	3	3	29	0	0
Gippsland	East Gippsland (S)	0	0	0	0	0	0	35	3	3
Gippsland	Latrobe (C)	0	10	5	0	3	9	46	9	8
Gippsland	South Gippsland (S)	0	0	0	0	0	0	25	3	0
Gippsland	Wellington (S)	0	0	4	0	0	0	35	4	3
Murray	Alpine (S)	0	0	0	0	3	0	10	0	0
Murray	Benalla (RC)	0	0	0	0	0	0	13	0	0
Murray	Buloke (S)	0	0	0	0	0	0	7	0	0
Murray	Campaspe (S)	0	0	0	0	0	3	29	3	3
Murray	Gannawarra (S)	0	3	0	0	0	0	5	0	0
Murray	Greater Bendigo (C)	10	25	10	3	6	15	84	9	7
Murray	Greater Shepparton (C)	0	10	7	3	0	7	49	7	6
Murray	Indigo (S)	0	0	0	0	0	0	7	0	0
Murray	Loddon (S)	0	0	0	0	0	0	3	0	0
Murray	Macedon Ranges (S)	0	3	0	0	0	3	40	0	0
Murray	Mansfield (S)	0	0	0	0	0	0	9	0	0
Murray	Mildura (RC)	4	7	3	0	0	7	37	6	3
Murray	Mitchell (S)	0	0	0	0	0	3	27	0	0
Murray	Moira (S)	0	0	0	0	0	0	18	0	0
Murray	Mount Alexander (S)	0	0	0	0	0	3	20	0	0
Murray	Murrindindi (S)	0	0	0	0	0	0	8	0	0
Murray	Strathbogie (S)	0	0	0	0	0	0	5	0	0
Murray	Swan Hill (RC)	0	0	3	0	0	0	12	3	0
Murray	Towong (S)	0	0	0	0	0	0	5	0	0
Murray	Wangaratta (RC)	0	7	5	0	0	3	26	3	3
Murray	Wodonga (RC)	0	0	5	0	3	0	37	3	3
Murray	Yarra Ranges (S)	0	0	0	0	0	3	116	0	3
Western Victoria	Ararat (RC)	0	0	0	0	0	0	7	0	0
Western Victoria	Ballarat (C)	15	28	10	3	8	11	88	15	17
Western Victoria	Central Goldfields (S)	0	0	0	0	0	0	8	0	0
Western Victoria	Colac-Otway (S)	0	0	3	0	0	0	13	0	0
Western Victoria	Corangamite (S)	0	0	0	0	0	0	10	0	0
Western Victoria	Glenelg (S)	0	3	0	0	0	0	14	0	0
Western Victoria	Golden Plains (S)	0	0	0	0	0	0	8	0	0
Western Victoria	Greater Geelong (C)	20	59	14	11	14	28	241	17	26
Western Victoria	Hepburn (S)	0	0	0	0	0	0	18	0	0
Western Victoria	Hindmarsh (S)	0	0	0	0	0	0	0	0	0
Western Victoria	Horsham (RC)	0	0	0	0	0	0	16	0	0
Western Victoria	Moorabool (S)	0	0	0	0	0	0	17	0	0
Western Victoria	Moyne (S)	0	0	0	0	0	0	4	0	0
Western Victoria	Northern Grampians (S)	0	0	0	0	0	0	10	3	0
Western Victoria	Queenscliffe (B)	0	0	0	0	0	3	7	0	0
Western Victoria	Pyrenees (S)	0	0	0	0	0	0	3	0	0
Western Victoria	Southern Grampians (S)	0	0	0	0	0	0	12	3	0
Western Victoria	Surf Coast (S)	0	0	0	0	0	0	26	0	0
Western Victoria	Warrnambool (C)	4	9	4	4	0	6	39	5	6
Western Victoria	West Wimmera (S)	0	0	0	0	0	0	0	0	0
Western Victoria	Yarriambiack (S)	0	0	0	0	0	0	4	0	0
	Total:	53	164	73	24	37	104	1218	93	88

District of Workforce Shortage (DWS) area in 2017

3. RHOF Priority Areas

3.1. Chronic Disease Management

Key Findings:

- The prevalence of chronic disease is not uniformly distributed and is strongly linked, with greater effect, among socially disadvantaged people.
- Aboriginal and Torres Strait Islander people, people living in areas of socioeconomic disadvantage and rural and remote areas experienced higher rates of hospitalisations compared to their counterparts.
- Potentially preventable hospitalisitons (PPPH) are those that may have been prevented by timely and effective provision of non-hospital or primary health care. There were several areas within rural Victoria that experienced persistently high rates of PPH overall. These areas also contain towns and localities that have been categorised within the lowest SES regions of Victoria.
- Of the providers that were contracted to deliver chronic disease management services in 2016-17, 48.6% of those were provided within the Western Victorian PHN region, followed by Murray (36.2%) and Gippsland (15.2%). However, the highest rates of PPH overall were in Gippsland PHN followed by Murray PHN.

Chronic respiratory disease

- The management of COPD in community-based health services appears to be an issue within the Murray PHN region with 91% demonstrating rates above the national average. Campaspe had rates double the national average.
- Latrobe Valley and Bendigo had persistent rates of asthma and COPD PPHs above the national average from 2013-14 to 2015-16.
- The area with the highest growth in COPD rates over the three year period was Campaspe (+40.4%), which is significant in comparison to the national growth of 8.1%.

Cardiovascular disease (CVD)

- CVD appears to be a major concern for the Gippsland and Murray PHN region with areas experiencing persistent high rates from 2013-14 to 2015-16. Murray River – Swan Hill endured PPH rates consistently above the national rate for both angina and chronic heart failure.
- Nationally, the rate of angina PPHs reduced by 20% while chronic heart failure (CHF) PPHs increased by 7.6% from 2013-14 to 2015-16. In comparison, the areas with the highest growth in admission rates for angina were Gippsland-East (+35.6%) and Wellington (+28.1%), and for CHF, Loddon – Elmore (+49.8%) and Wellington (+32.3%).

Diabetes complications

- In 2015-16, Baw Baw endured the highest rates of PPHs due to diabetes complications in rural Victoria, which was double the national rate.
- Hospital admissions due to gangrene are of a concern in the Murray PHN region. Shepparton had rates of gangrene PPHs, which were four times the national average.
- While the rate of PPHs from diabetes complication increased by 9.3% nationally between 2013-14 to 2015-16, Baw Baw, Campaspe and Upper Goulburn Valley had the highest growth in rural Victoria with an increase of 64.6%, 38.9% and 34.2% respectively.

Cellulitis

- In 2015-16, the highest rates of cellulitis PPHs occurred in Gippsland – East, Murray River – Swan Hill and Wellington.
- While the national rate of cellulitis PPHs increased by 6.3% between 2013-14 to 2015-16, Gippsland – East (+36.5%) and Heathcote – Castlemaine (+34.3%) experienced the highest growth rate of cellulitis PPHs across rural Victoria.

Kidney/urinary tract infections (UTI)

- Loddon – Elmore, Wellington and Bendigo had the highest rates of kidney/UTI hospital admissions in 2015-16, as well as higher than average rates in the previous two years.

Ear, nose and throat (ENT) infections

- Wangaratta – Benalla, Moira and Shepparton had rates of ENT PPHs well above the national rate.
- An examination of the rates across three consecutive years identified four areas with persistently high rates: Wellington, Shepparton, Murray Hill – Swan Hill and Grampians.
- While the national rate increased by 6.2% during this time period, the growth rate increased in Wangaratta-Benalla by 41.9%.

Musculoskeletal system disease

- Musculoskeletal system disease appears to be a prevailing problem across rural Victoria with 93% experiencing rates above the state average. The rates across rural Victoria were similar.

Cancer screening

- Cancer is one of the leading causes of death in Australia, accounting for about 3 of every 10 deaths registered in Australian in 2014.
- The incidence of premature death due to cancer was higher in rural Victorian in comparison to metropolitan Victoria. Between 2010-14, the areas with the highest rates of avoidable deaths caused by cancer in people aged 0-74 were Robinvale, Corio-Norlane and the Seymour Region.
- Local data on the prevalence of cancer could be sourced for the three national cancer screening programs: breast, bowel and cervical cancer. Although longitudinal data could not be located, the following LGAs had positive screening results significantly above the Victorian rate:
  - *Bowel cancer:* East Gippsland Shire– Longford – Lock Sport / Yarram, Mitchell Shire – Seymour
  - *Cervical cancer:* Rural City of Swan Hill
  - *Breast cancer:* Buloke Shire

Recommendations:

- To address SA3s with high rates of PPHs, with particular focus in areas identified in the table below:

PPH condition	SA3 hotspots
PPH (total) and Chronic conditions	• Latrobe Valley • Loddon – Elmore • Murray River – Swan Hill • Campaspe • Moira • Shepparton • Maryborough - Pyrenees

Chronic respiratory disease (asthma and COPD)	• Latrobe Valley • Bendigo • Loddon - Elmore • Campaspe
Cardiovascular disease	• Murray River – Swan Hill • Loddon – Elmore • Wellington • Gippsland – East
Diabetes complications (including gangrene)	• Moira • Murray River - Swan Hill • Geelong • Baw Baw • Campaspe • Upper Goulburn Valley • Shepparton
Cellulitis	• Gippsland – East • Murray River- Swan Hill • Wellington • Heathcote - Castlemaine
Kidney/UTI	• Wellington • Bendigo • Loddon – Elmore
ENT infections	• Wangaratta - Benalla • Wellington • Shepparton • Murray Hill – Swan Hill • Grampians

- To collaborate with rural PHNs to identify and prioritise local cancer workforce needs as they commission services to improve participation in the three national cancer screening programs, with particular attention to the following LGAs:
    - Buloke (S)
    - Swan Hill (RC)
    - Mitchell (S)
    - East Gippsland (S)
    - Greater Geelong (C)

Overview of 2016-17 activity

Table 7 highlights the health disciplines that provided chronic disease-related outreach services in 2016-17 and their proportion. The second highest number of all providers contracted, based on health discipline, in 2016-17 were dermatologists (37 providers, 14% of total), which includes 25 contracted to provide services within the Western Victorian PHN region.

Of the providers that were contracted to deliver chronic disease management services, 48.6% of those were provided within the Western Victorian PHN region, followed by Murray (36.2%) and Gippsland (15.2%).

Identifying need:

Chronic disease is a term for a group of diseases that have a prolonged course of illness with persistent effects. Chronic diseases are the leading causes of illness, disability and death in Australian, accounting for 90% of all deaths in 2011.[12]

The prevalence of chronic disease is not uniformly distributed.[13] For example, chronic diseases occur more often, and with greater effect, among socially disadvantaged people. The proportion of people living with multiple chronic diseases also increases with age, with 78% of people aged 65 years and over affected.[14]

Table 7: Chronic disease outreach services provided under RHOF in 2016-17 by specialty

Health discipline	% of total providers contracted in 2016-17
Anaesthetics	0.4%
Cardiology	4.2%
Dermatology	14.1%
Diabetes (gastroenterology)	2.7%
Dietician	0.4%
Ear, nose and throat (ENT)	1.2%
General practitioner or physician	9.2%
General surgery	9.9%
Geriatrics	1.9%
Nephrology	5.3%
Oncology	0.8%
Renal	0.4%
Respiratory	0.4%
Rheumatology	1.5%
Total:	**52.4%**

Potentially Preventable Hospitalisations (PPH):

The management of a chronic disease benefits from long-term, continuous and coordinated care.[15] However, for rural areas, this is challenged by high staff turnover and the use of medical locums.[16] As such, people living in rural and remote areas experienced higher rates of hospitalisation, together with people living in areas of socioeconomic disadvantage and Aboriginal and Torres Strait Islander Australians.[17]

According to ACSQHC (2017)[18]:

> *Suboptimal health care in the community can contribute to conditions worsening to the point where hospitalisation is necessary. For example, if diabetes is not well managed, patients risk developing diabetic foot disease. In the most severe cases, this can lead to hospitalisation and amputation of the affected toes, foot or lower leg.*

[12] Australian Institute of Health and Welfare. (2015). *Chronic disease*. Retrieved from: http://www.aihw.gov.au/chronic-diseases
[13] Australian Institute of Health & Welfare (2014). *Australia's health 2014*. Australia's health series no.14. Cat. No. AUS 178. Canberra: AIHW.
[14] Australian Institute of Health & Welfare (2014). *Australia's health 2014*. Australia's health series no.14. Cat. No. AUS 178. Canberra: AIHW.
[15] Hussey et al. (2014). Continuity and the Costs of Care for Chronic Disease. *JAMA Internal Medicine, 174*, 5.
[16] Humphreys et al. (2002). Workforce retention in rural and remote Australia: determining the factors that influence length of practice. *Medical Journal of Australia, 176*, 472 – 476.
[17] National Health Performance Authority. (2015). *Healthy Communities: Potentially preventable hospitalisations in 2013-14*. Sydney: NHPA. Retrieved from: http://www.myhealthycommunities.gov.au
[18] Australian Commission on Safety and Quality in Health Care. (2017). The Second Australian Atlas of Healthcare Variation. Sydney: ACSQHC. Retrieved from: http://atlas-acsqhc.opendata.arcgis.com/

PPHs (also known as ambulatory care sensitive conditions) are those that may have been prevented by timely and effective provision of non-hospital or primary health care. In public policy context, PPHs are often used as a proxy measure for the effectiveness of, and/or access to, primary care.[19] As such, PPHs is a key performance indicator (KPI) of PHNs as part of their remit to 'increase the efficiency and effectiveness of medical services for patients, particularly those at risk of poor health outcomes'.

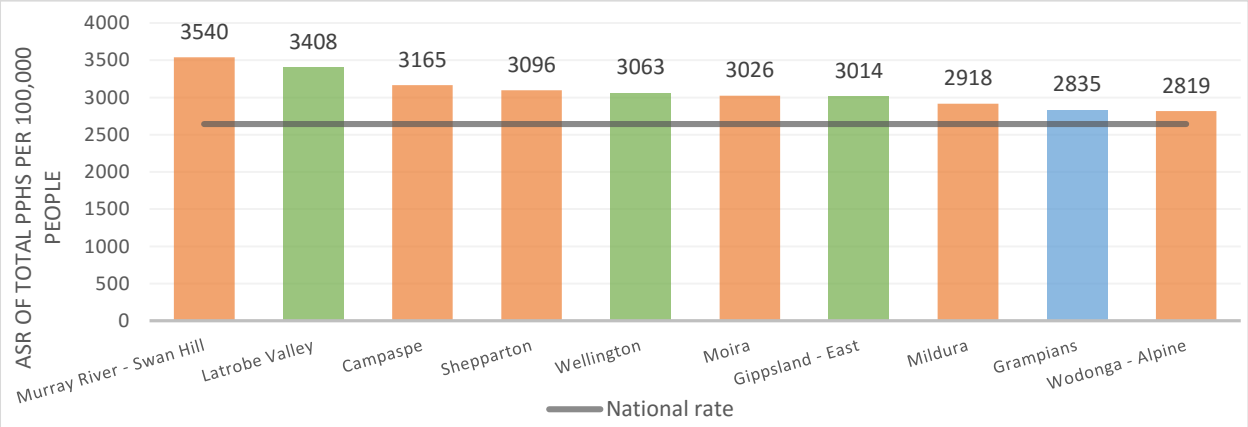
A PPH does not indicate that the patient did not need to be hospitalised at the time of presentation but rather the hospitalisation could have been avoided if appropriate and timely prevention or management was provided out of hospital.[20]

There are 22 conditions for which a hospitalisation is considered potentially preventable, which fall under three main categories:

- *Chronic conditions* – conditions that may be managed in a primary health setting to prevent exacerbation and requiring hospitalisation. Conditions include asthma, chronic obstructive pulmonary disease (COPD), diabetes, hypertension and chronic heart failure.
- *Acute conditions* – these conditions may not be preventable but their hospitalisation should not be necessary if adequate and timely access to primary health care was provided. Conditions include cellulitis, dental conditions, kidney/urinary tract infections (UTI) and perforated ulcers.
- *Vaccine-preventable* – conditions that are preventable with vaccination rather than the hospitalisation, such as pneumonia, influenza or measles. This PPH type is not explored further in this report.

In 2015-16, Gippsland PHN, overall, had the highest rate of PPHs with 2,913 per 100,000 people, followed by Murray (2,826) and Western Victoria (2,491). However, six of the 10 areas with the highest rate of PPHs, all above the national average, were located within the Murray PHN region (see **Figure 7**).

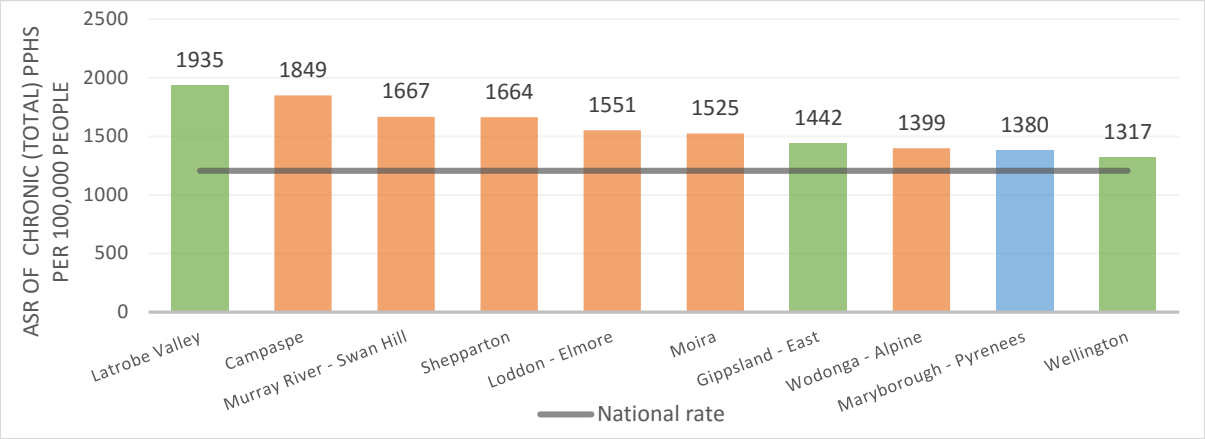
Figure 7: SA3 areas with highest ASR of PPHs (total) per 100,000 people in 2015-16



Similarly, in relation to avoidable hospital admissions for chronic conditions only, six of the 10 areas with the highest rate were located in the Murray PHN region. However, the highest rate of chronic PPHs was in Latrobe Valley, which is located within the Gippsland PHN region (see **Figure 8**).

[19] Duckett, S. & Griffiths, K. (2016). *Perils of place: identifying hotspots of health inequalities*. Melbourne: Grattan Institute.
[20] National Health Performance Authority. (2015). *Healthy Communities: Potentially preventable hospitalisations in 2013-14*. Sydney: NHPA. Retrieved from: http://www.myhealthycommunities.gov.au

Figure 8: SA3 areas with the highest number of chronic (total) PPHs in 2015-16.



The hotspot areas for all PPH, and all chronic PPHs, are highlighted in **Table 8**. There were seven areas that have persistently high rates over the three year period: Latrobe Valley, Loddon – Elmore, Murray River – Swan Hill, Campaspe, Moira, Shepparton and Maryborough – Pyrenees. These areas feature consistently in this section, which includes five specific PPH conditions that comprise approximately half (47%) of PPHs nationally: chronic obstructive pulmonary disease (COPD), chronic heart failure (CHF), diabetes complications, cellulitis and kidney/urinary tract infections (UTI).

Ear, nose and throat (ENT) and musculoskeletal conditions will also be examined in this section as conditions that require effective chronic disease management support.

Table 8: SA3 hotspot areas with persistently high rates of total PPHs and total chronic PPHs conditions between 2013-14 and 2015-16

PHN	SA3	ASR of Total PPHs			ASR of Total chronic PPHs		
		Total PPHs 2015-16	Total PPHs 2014-15	Total PPHs 2013-14	Chronic PPHs 2015-16	Chronic PPHs 2014-15	Chronic PPHs 2013-14
National		**2643**	**2522**	**2437**	**1205**	**1146**	**1123**
Gippsland	**Gippsland - East**	3014	2911	2382	1442	1489	1046
Gippsland	**Latrobe Valley**	3408	2945	2688	1935	1465	1320
Gippsland	**Wellington**	3063	2675	2593	1317	1130	1084
Murray	**Bendigo**	2639	2638	2734	1307	1436	1403
Murray	**Loddon - Elmore**	2797	2705	2840	1551	1342	1455
Murray	**Upper Goulburn Valley**	2647	2360	2543	1296	1175	1282
Murray	**Wangaratta - Benalla**	2771	2501	2496	1298	1102	1254
Murray	**Wodonga - Alpine**	2819	2331	2287	1399	1143	1088
Murray	**Mildura**	2918	2429	2519	1190	1000	1074
Murray	**Murray River - Swan Hill**	3540	3408	3420	1667	1745	1633
Murray	**Campaspe**	3165	2882	2711	1849	1507	1354
Murray	**Moira**	3026	2700	2909	1525	1400	1474
Murray	**Shepparton**	3096	2770	2667	1664	1469	1398
Western Victoria	**Maryborough - Pyrenees**	2717	2759	2460	1380	1363	1135
Western Victoria	**Geelong**	2724	2506	2450	1300	1219	1205
Western Victoria	**Grampians**	2835	2674	2678	1294	1144	1223

Chronic respiratory disease

Chronic respiratory disease affects the airways and others structures of the lung. This includes chronic obstructive pulmonary disease (COPD), which is an umbrella term for a number of lung disease that prevent proper breathing.[21] The common types of COPD are chronic asthma, chronic bronchitis and emphysema.[22] While GPs play a key role in the early intervention and management of COPD, a respiratory physician may also be involved to provide specialist care.[23]

Figure 9: SA3 areas with highest ASR of COPD PPHs per 100,000 people in 2015-16.

As illustrated in **Figure 9**, the management of COPD in the community-based health services appears to be an issue within the Murray PHN region with 91% of the region (10 out of 11 SA3s) demonstrating rates above the national rate. Specifically, the Campaspe area had the highest rate in Victoria, which was more than double the national rate (530 in comparison to 260 PPHs per 100,000 people).

When we look at asthma PPHs specifically (see **Figure 10**), there were six SA3s that were above the national rate of 133 PPHs per 100,000 people in 2015-16. Again, the highest rates were within the Murray PHN region in Loddon-Elmore and Bendigo with a rate of 228 and 197 PPHs per 100,000 people respectively.

Figure 10: SA3 areas with highest ASR of asthma PPHs per 100,000 people in 2015-16.

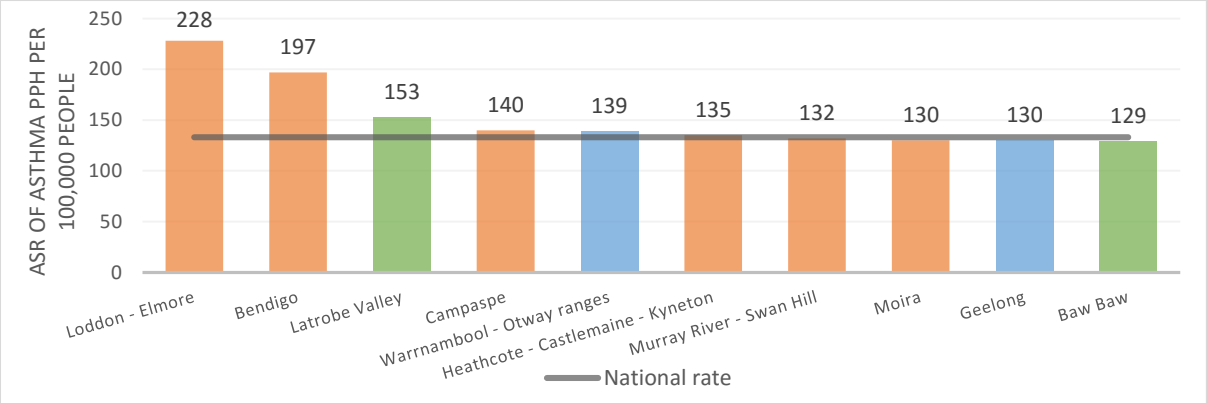


Table 9 indicate the areas that have had persistent high rates of respiratory-related hospital conditions over a three year period. Latrobe Valley and Bendigo had consistently high rates of PPHs for both COPD and asthma. However, the area with the highest growth in COPD rates over the three

[21] Australian Institute of Health and Welfare. (2017). *The burden of chronic respiratory conditions in Australia: a detailed analysis of the Australian Burden of Disease Study 2011.* Australian Burden of Disease Study series no. 14. BOD 15. Canberra: AIHW
[22] Better Health Channel. *Lung conditions – chronic obstructive pulmonary disease (COPD).* Retrieved from: http://www.betterhealth.vic.gov.au (last updated November 2013)
[23] Abramson et al. (2016). *COPD-X Concise Guide for Primary Care*. Lung Foundation Australia; Brisbane.

year period was Campaspe (+40.4%), which is significant in comparison to the national growth of 8.1%.

Table 9: SA3 hotspot areas with persistently high ASR of COPD and asthma PPHs between 2013-14 and 2015-16

		ASR of COPD PPHs per 100,000			ASR of Asthma PPHs per 100,000		
PHN	SA3	2015-16	2014-15	2013-14	2015-16	2014-15	2013-14
National		260	246	239	133	130	123
Gippsland	**Gippsland - East**	313	262	214	122	230	140
Gippsland	**Gippsland - South West**	288	254	278	122	101	88
Gippsland	**Latrobe Valley**	369	289	261	153	150	155
Gippsland	**Wellington**	273	320	320	122	110	100
Murray	**Bendigo**	277	257	303	197	266	225
Murray	**Heathcote - Castlemaine - Kyneton**	214	239	270	135	158	141
Murray	**Loddon - Elmore**	386	364	520	228	NP	167
Murray	**Upper Goulburn Valley**	301	315	398	106	80	141
Murray	**Wangaratta - Benalla**	278	242	275	128	139	157
Murray	**Wodonga - Alpine**	359	323	332	81	66	76
Murray	**Mildura**	324	274	293	99	123	110
Murray	**Murray River - Swan Hill**	327	430	401	132	103	157
Murray	**Campaspe**	530	314	316	140	101	96
Murray	**Moira**	393	381	320	130	131	91
Murray	**Shepparton**	344	321	331	84	98	109
Western Victoria	**Creswick - Daylesford - Ballan**	259	258	249	124	112	78
Western Victoria	**Maryborough - Pyrenees**	316	327	286	NP	77	94
Western Victoria	**Barwon - West**	181	247	253	102	NP	104
Western Victoria	**Geelong**	285	252	242	130	139	135
Western Victoria	**Grampians**	315	261	266	107	101	122
Western Victoria	**Warrnambool - Otway Ranges**	268	266	251	139	116	111

Cardiovascular disease

Cardiovascular disease (CVD) refers to a group of diseases or conditions involving the heart and blood vessels within the cardiovascular or circulatory system. The most common types of CVD are coronary heart disease, stroke and heart failure.[24]

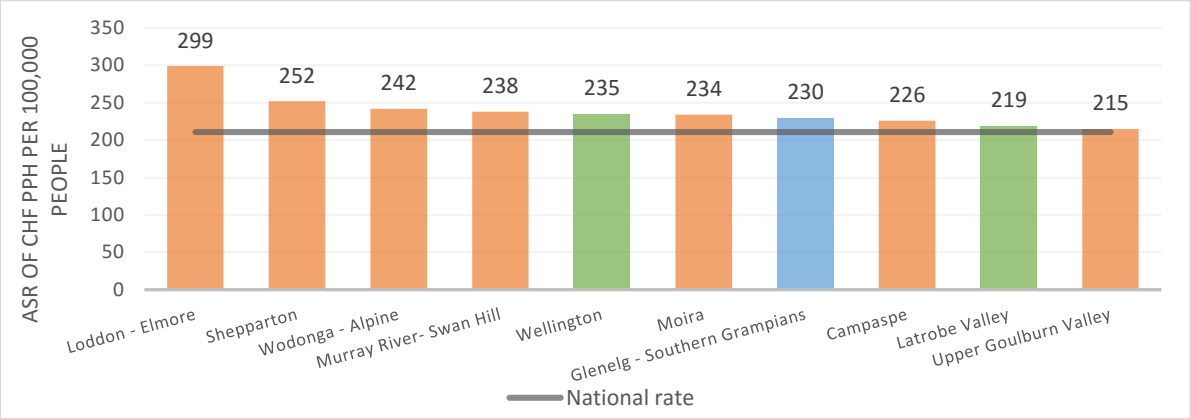
CHF, also known as congestive cardiac failure, is a chronic condition where the heart is weakened and is unable to sufficiently pump blood to the body. The major causes of CHF are hypertension and coronary heart disease.[25] Specialist care is provided by Cardiologists.

In 2015-16, Loddon-Elmore had the highest rate of CHF PPHs in rural Victoria (see **Figure 11**) with 299 PPHs per 100,000 people, compared to the national rate of 211. In fact, seven of the top 10 SA3s with the highest rate of CHF PPHs were from the Murray PHN region.

[24] Australian Institute of Health and Welfare. (2011). *Cardiovascular disease: Australian facts 2011*. Cardiovascular disease series. Cat. no. CVD 53. Canberra: AIHW

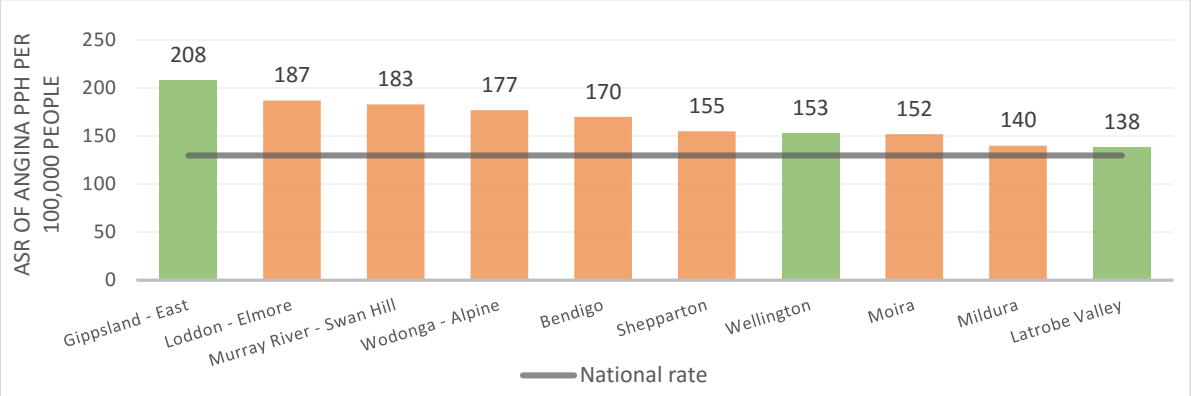
[25] Better Health Channel. *Congestive heart failure (CHF).* Retrieved from: https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/congestive-heart-failure-chf (last updated December 2016)

Figure 11: SA3 areas with highest ASR of CHF PPHs per 100,000 people in 2015-16.



Angina is another type of CVD caused by coronary heart disease, which is a pain or discomfort that occurs when there is insufficient blood and oxygen to the heart.[26] In 2015-16, the rates of hospital admission due to angina was highest in Gippsland-East with 208 PPHs compared to the national average of 130 PPHs per 100,000 people (see **Figure 12**)

Figure 12: SA3 areas with highest ASR of angina PPHs per 100,000 people in 2015-16.



The hotspot areas identified in **Table 10** indicate that CVD is a concern in the Gippsland and Murray PHN region. Murray River – Swan Hill was the only area that experienced persistently high rates for both angina and CHF over the three years. Between 2013-14 to 2015-15, the areas with the highest growth in admission rates for angina were Gippsland-East (+35.6%) and Wellington (+28.1%), and for CHF, Loddon – Elmore (+49.8%) and Wellington (+32.3%). Nationally, the rate of angina PPHs reduced by 20% while the CHF PPHs increased by 7.6%.

Table 10: SA3 hotspot areas with persistently high ASR of angina and CHF PPHs between 2013-14 and 2015-16

		ASR of Angina PPHs per 100,000			ASR of CHF PPHs per 100,000		
PHN	**SA3**	2015-16	2014-15	2013-14	2015-16	2014-15	2013-14
National		**130**	**139**	**156**	**211**	**198**	**195**
Gippsland	**Gippsland - East**	208	215	134	212	203	175
Gippsland	**Gippsland - South West**	134	173	197	180	159	153
Gippsland	**Latrobe Valley**	138	125	140	219	265	282
Gippsland	**Wellington**	153	151	110	235	201	159

[26] Heart Foundation. *Angina*. Retrieved 18 July 2017 from: https://www.heartfoundation.org.au/your-heart/heart-conditions/angina

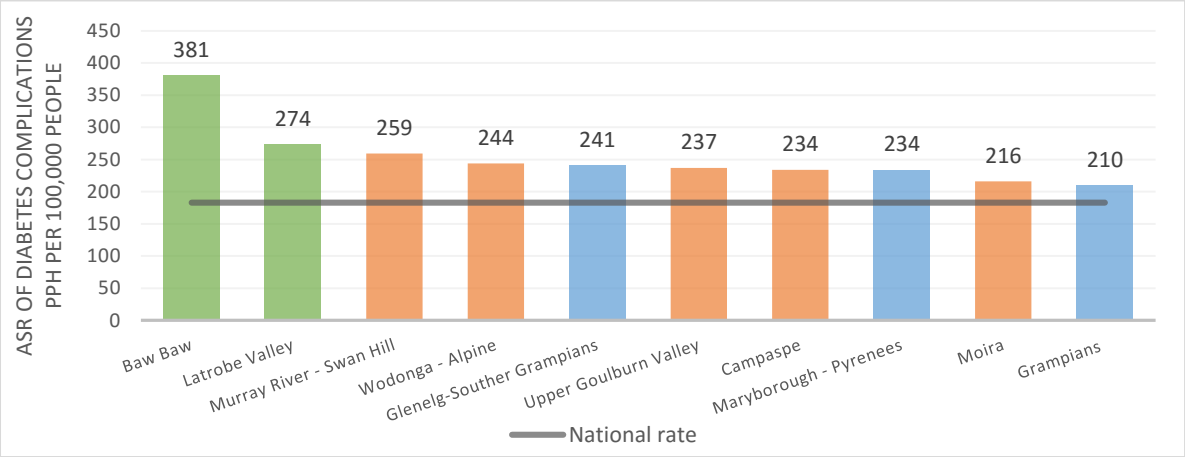
Murray	**Bendigo**	170	162	171	201	204	246
Murray	**Loddon - Elmore**	187	155	147	299	248	150
Murray	**Upper Goulburn Valley**	90	97	78	215	187	214
Murray	**Wangaratta - Benalla**	132	118	110	181	199	197
Murray	**Wodonga - Alpine**	177	149	154	242	196	181
Murray	**Murray River - Swan Hill**	183	194	246	238	240	236
Murray	**Campaspe**	123	128	163	226	273	225
Murray	**Moira**	152	89	147	234	199	241
Murray	**Shepparton**	155	149	188	252	204	187

Diabetes complications

Diabetes occurs when the level of glucose (sugar) in the blood are too high, which is caused by an impairment of the body's ability to produce or respond to insulin (a hormone produced by the pancreas to control blood glucose levels).[27] Persistent high blood glucose levels can lead to serious complications requiring hospitalisation due to kidney damage, nerve damage, visual problems or heart disease. As such, effective management of diabetes requires a multi-disciplinary approach involving various health practitioners, including GPs, medical specialists (e.g. endocrinologists, ophthalmologists, cardiologists, nephrologists) and allied health professionals (e.g. diabetes educators, dieticians, pharmacists, podiatrists).[28]

In 2015-16, Baw Baw endured the highest rates of PPHs related to diabetes complications in Victoria, which was more than double the national rate (381 compared to 166 PPHs per 100,000 people) (see **Figure 13**).

Figure 13: SA3 areas with highest ASR of diabetes complication PPHs per 100,000 people in 2015-16.

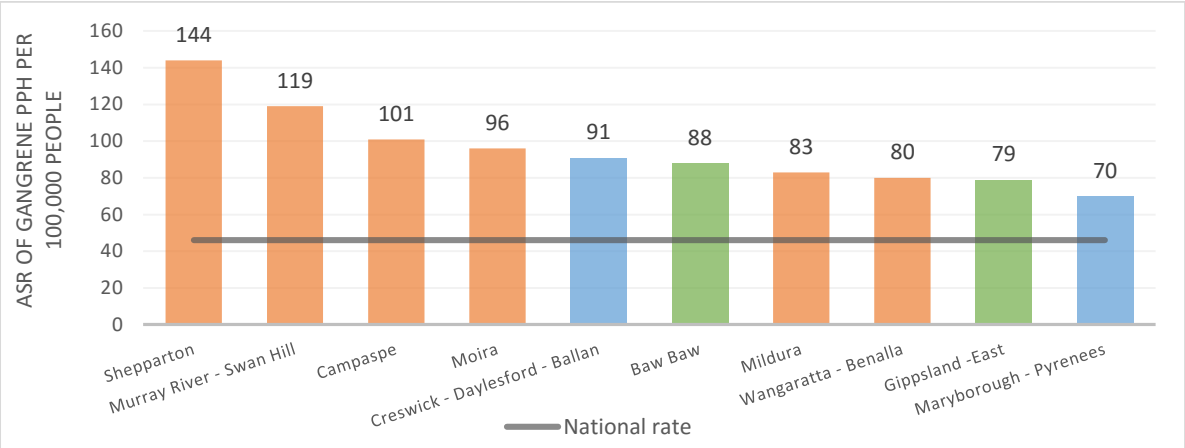


One of the complications of diabetes includes gangrene, which is the death of body tissue due to the lack of blood flow or a serious bacterial infection. The treatment for gangrene includes surgery to remove the dead tissue (including amputation) and antibiotics.[29] A number of areas featured in **Figure 13** also appear in **Figure 14**, which highlights the areas with the highest rates of gangrene hospital admissions. The top four SA3s were all located within the Murray PHN region, with

[27] Australian Institute of Health and Welfare. *Diabetes*. Retrieved from: http://www.aihw.gov.au/diabetes (last updated December 2016)
[28] Australian Institute of Health & Welfare. 2004. *Diabetes management and the allied health workforce: An overview of workforce mapping techniques and data related issues.* Retrieved from: http://www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=6012954Lac6225
[29] Mayo Clinic. *Gangrene*. Retrieved 18 July 2017 from: http://www.mayoclinic.org/diseases-conditions/gangrene/home/ovc-20336984

Shepparton experiencing a rate more than three times the national average (144 compared to 46 PPHs per 100,000 people).

Figure 14: SA3 areas with highest ASR of gangrene PPHs per 100,000 people in 2015-16.



When PPH rates are examined over a three year period for gangrene and diabetes complications, Murray River – Swan Hill, Geelong and Moira were areas that had rates that were consistently above the national average (see **Table 11**).While the rate of PPHs from diabetes complication increased by 9.3% nationally between 2013-14 to 2015-16, Baw Baw, Campaspe and Upper Goulburn Valley had the highest growth in rural Victoria with an increase of 64.6%, 38.9% and 34.2% respectively.

Table 11: SA3 hotspot areas with persistently high ASR of diabetes complications and gangrene PPHs between 2013-14 and 2015-16

		ASR of diabetes complications PPHs per 100,000			ASR of gangrene PPHs per 100,000		
PHN	SA3	2015-16	2014-15	2013-14	2015-16	2014-15	2013-14
National		**183**	**174**	**166**	**46**	**42**	**37**
Gippsland	**Baw Baw**	381	167	135	88	65	55
Gippsland	**Gippsland - East**	158	222	184	79	85	63
Gippsland	**Gippsland - South West**	191	198	160	64	51	46
Gippsland	**Latrobe Valley**	274	235	207	61	48	37
Gippsland	**Wellington**	193	142	200	46	42	44
Murray	**Bendigo**	179	250	235	45	39	25
Murray	**Loddon - Elmore**	190	245	295	NP	NP	NP
Murray	**Upper Goulburn Valley**	237	208	156	68	79	69
Murray	**Wangaratta - Benalla**	203	132	257	80	33	43
Murray	**Wodonga - Alpine**	244	183	170	59	42	41
Murray	**Mildura**	189	152	129	83	60	41
Murray	**Murray River - Swan Hill**	259	260	184	119	54	118
Murray	**Campaspe**	234	217	143	101	79	65
Murray	**Moira**	216	263	300	96	100	130
Murray	**Shepparton**	183	191	164	144	113	93
Western Victoria	**Ballarat**	154	191	180	42	55	35
Western Victoria	**Creswick - Daylesford - Ballan**	170	91	137	91	85	89
Western Victoria	**Maryborough - Pyrenees**	234	254	200	70	75	NP

Western Victoria	**Barwon - West**	179	391	191	NP	NP	NP
Western Victoria	**Geelong**	198	217	206	56	50	44
Western Victoria	**Grampians**	210	194	200	48	42	28
Western Victoria	**Glenelg - Southern Grampians**	241	185	182	NP	NP	NP

Cellulitis

Cellulitis is a bacterial infection of the skin, which can affect almost any part of the body. Prior to the development of antibiotics, cellulitis was fatal.[30] Cellulitis can be diagnosed and managed by GPs and dermatologists.

At an ASR of 287, the Gippsland PHN region broadly had the highest rate of PPHs related to cellulitis of all Victorian PHNs, with high rates identified in the areas of Gippsland-East, Wellington, Latrobe Valley and Gippsland – South West (see **Figure 15**). The top three areas in 2015-16 (Gippsland –East, Murray River – Swan Hill and Wellington) all had persistent high rates above the national average in the last three years (see **Table 12**). At 36.5%, Gippsland- East also experienced the highest growth rate across rural Victoria, followed by Heathcote-Castlemaine with 34.3%, in comparison to the national growth rate of 6.3% nationally between 2013-14 to 2015-16.

Figure 15: SA3 areas with highest ASR of cellulitis PPHs per 100,000 people in 2014-15.

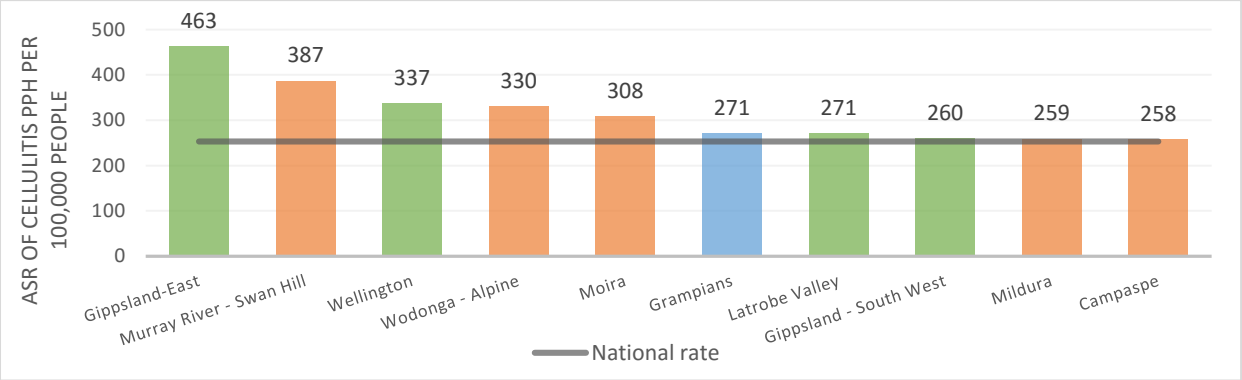


Table 12: SA3 hotspot areas with persistently high ASR of cellulitis PPHs between 2013-14 and 2015-16

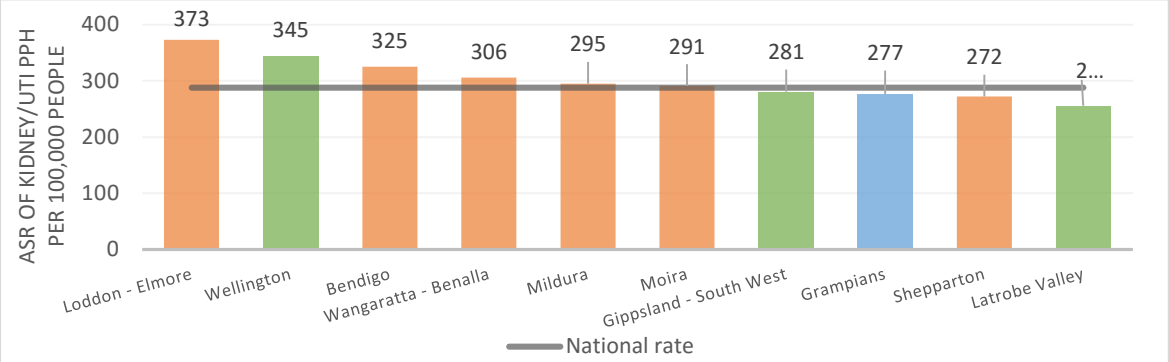
		ASR of cellulitis PPHs per 100,000		
PHN	**SA3**	2015-16	2014-15	2013-14
National		**253**	**237**	**237**
Gippsland	**Gippsland - East**	463	331	294
Gippsland	**Latrobe Valley**	271	302	265
Gippsland	**Wellington**	337	258	267
Murray	**Wangaratta - Benalla**	237	246	247
Murray	**Wodonga - Alpine**	330	207	244
Murray	**Murray River - Swan Hill**	387	271	314
Murray	**Campaspe**	258	276	295
Murray	**Moira**	308	284	323
Western Victoria	**Grampians**	271	276	216

[30] Better Health Channel. *Cellulitis*. Retrieved from: https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/cellulitis (last updated April 2015).

Kidney/Urinary Tract Infection

A PPH related to the kidney/UTI results from an infection, usually bacterial, that can lead to severe kidney damage if left untreated. Medical practitioners, such as GPs, renal physicians (urologists and nephrologists), can be involved in the prevention and management of kidney/urinary problems.

Figure 16: SA3 areas with highest ASR of kidney/UTI PPHs per 100,000 people in 2015-16.



As **Figure 16** highlights, there were six rural Victorian areas that were above the national rate (288 PPHs per 100,000 people) in 2015-16. Five of these areas were located within the Murray PHN region. The three areas with the highest rates of kidney/UTI hospital admissions in 2015-16 also had higher than average rates in the previous two years (see **Table 13**).

Table 13: SA3 hotspot areas with persistently high ASR of kidney/UTI PPHs between 2013-14 and 2015-16

		ASR of Kidney/UTI PPHs per 100,000 people		
PHN	**SA3**	2015-16	2014-15	2013-14
National		**288**	**285**	**279**
Gippsland	**Wellington**	345	288	227
Murray	**Bendigo**	325	305	296
Murray	**Loddon - Elmore**	373	296	342
Murray	**Moira**	291	265	280

Ear, nose and throat infections

ENT conditions and infections can be acute or chronic. Common ENT infections include tonsillitis and pharyngitis.

If primary health care is not provided in a timely or adequate manner, it can result in hospitalisation. **Figure 17** highlights the areas in rural Victoria with highest rates of avoidable hospitalisation due to an ENT infection in 2015-16. There were three areas that were well above the national rate of 178 hospitalisations per 100,000 people: Wangaratta - Benalla (246), Moira (224) and Shepparton (220).

However, when the rates are compared across three consecutive years, there were four areas that had persistent high rates. These areas are Wellington, Shepparton, Murray Hill – Swan Hill and Grampians (see **Table 14**). While the national rate increased by 6.2% during this time period, the growth rate increased in Wangaratta-Benalla by 41.9%.

Figure 17: SA3s with the highest ASR of ENT infections per 100,000 people in 2015-16

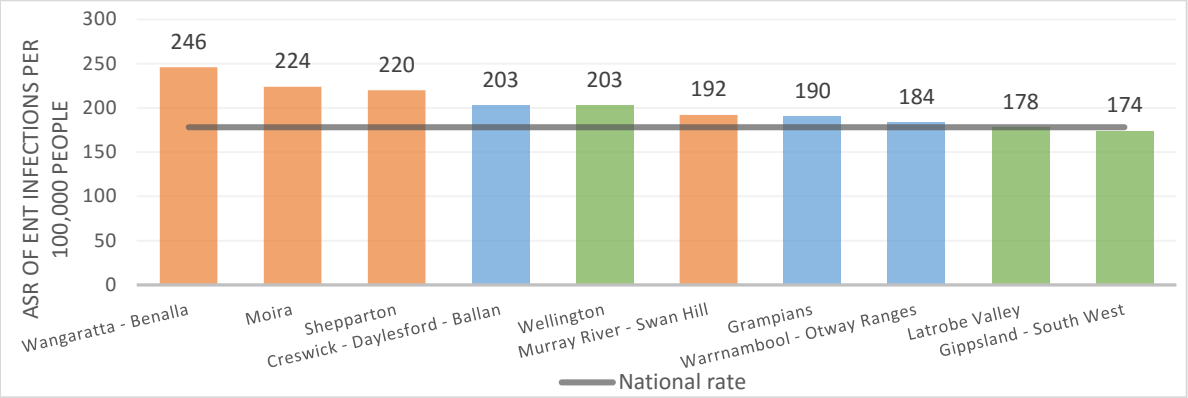


Table 14: SA3 hotspot areas with persistently high ASR of ENT infection PPHs between 2013-14 and 2015-16

PHN	SA3	ASR of ENT infections PPHs per 100,000 people		
		2015-16	2014-15	2013-14
National		**178**	**173**	**167**
Gippsland	**Wellington**	203	214	219
Murray	**Wangaratta - Benalla**	246	208	143
Murray	**Murray River - Swan Hill**	192	231	225
Murray	**Shepparton**	220	216	184
Western Victoria	**Creswick - Daylesford - Ballan**	203	161	171
Western Victoria	**Geelong**	154	180	187
Western Victoria	**Grampians**	190	223	233
Western Victoria	**Warrnambool - Otway Ranges**	184	176	151

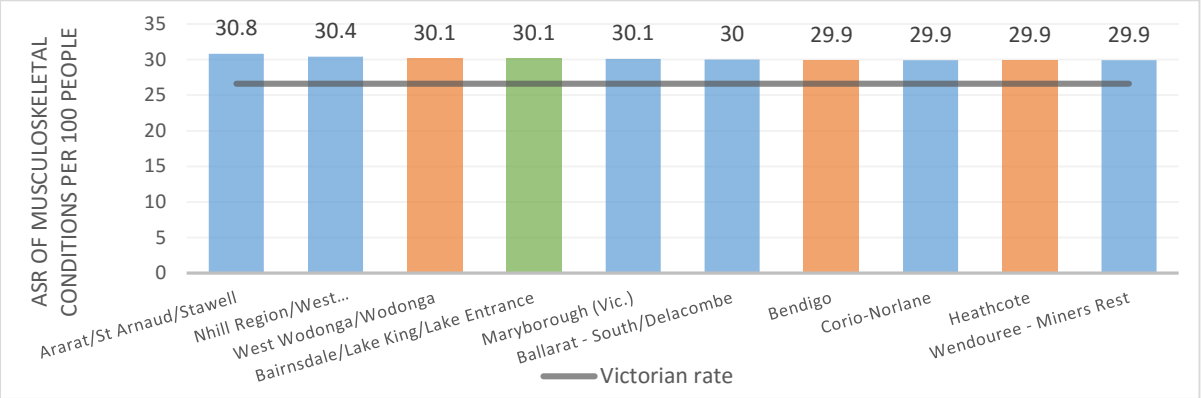
Musculoskeletal disease

Musculoskeletal conditions involve bones, muscles and their attachments (e.g. ligaments and joints). Predominately managed in the primary health care settings, they are the most common chronic conditions in Australia.[31] The most common musculoskeletal conditions include back pain/problems, osteoarthritis, rheumatoid arthritis, rheumatoid arthritis, juvenile arthritis and gout. When musculoskeletal conditions exacerbate, they may be referred by a GP to see a Musculoskeletal Physician or Rheumatologists (specialists in arthritis and other autoimmune diseases).[32]

As these conditions are primarily managed in primary care, population health data on a national level is limited. However, **Figure 18** presents the top 10 areas with highest rate of diagnosed musculoskeletal disease that had lasted, or was expected to last more than six months. Ninety-three per cent of rural Victoria had rates above the state average. The highest rate was experienced in Ararat/St Arnaud/Stawell with 31 per 100 people diagnosed with a chronic musculoskeletal condition.

[31] Australian Institute of Health and Welfare. *Arthritis, osteoporosis and other musculoskeletal conditions*. Retrieved from: http://www.aihw.gov.au/arthritis-and-musculoskeletal-conditions/ (last updated December 2016)
[32] Australian Rheumatology Association. *What is a Rheumatologist*? Retrieved from: https://rheumatology.org.au/patients/what-is-a-rheumatologist.asp

Figure 18: PHAs with the highest ASR of musculoskeletal system diseases per 100 people in 2011-12



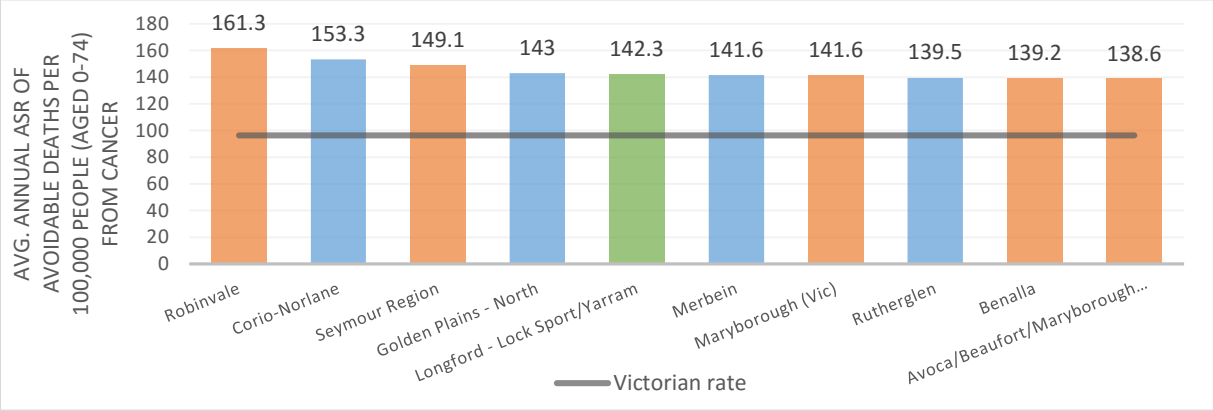
Cancer screening

Cancer is a term used to describe a disease where abnormal cells divide without control and invade nearby tissue. Cancer is one of the leading causes of death in Australia, accounting for about 3 of every 10 deaths registered in Australia in 2014.[33] It is also the leading cause of premature death. The incidence and mortality rate of cancer is also higher in areas of high disadvantage and regional areas.[34]

Examination of the incidence rates of positive cancer detection and cancer-related deaths may indicate a need for medical specialties such as palliative or pain medicine, oncology or radiology.[35]

The incidence of premature death due to cancer was higher in rural Victoria in comparison to metropolitan Victoria. Seventy-eight per cent of the areas within the Western Victorian and Murray PHN region were above the Victorian rate, in comparison to the Gippsland PHN region with 68%. The top three areas with the highest rates of avoidable deaths caused by cancer in people aged between 0-74 years were Robinvale, Corio-Norlane and the Seymour Region (**Figure 19).**

Figure 19: PHAs with highest average annual ASR of avoidable deaths from cancer per 100,000 people aged between 0-74 during 2010-14



While some cancers can be cured or controlled with medical treatment, others are diagnosed too late for medical treatment to be effective.[36] Cancer screening aims to detect early, potentially curable, disease in people who have no symptoms. There are three national cancer screening

[33] Australian Institute of Health and Welfare & Australasian Association of Cancer Registries. (2017). *Cancer in Australia: In brief 2017*. Cancer series no. 102. Cat. No. CAN 101. Canberra: AIHW.
[34] Australian Institute of Health and Welfare & Australasian Association of Cancer Registries. (2017). *Cancer in Australia: In brief 2017*. Cancer series no. 102. Cat. No. CAN 101. Canberra: AIHW.
[35] Cancer Council Australia. *Find a specialist*. Retrieved from: http://www.cancer.org.au/about-cancer/find-a-specialist.html (last updated Marcy 2017).
[36] Cancer Council Australia. *About cancer*. Retrieved from: http://www.cancer.org.au/about-cancer (last updated March 2016)

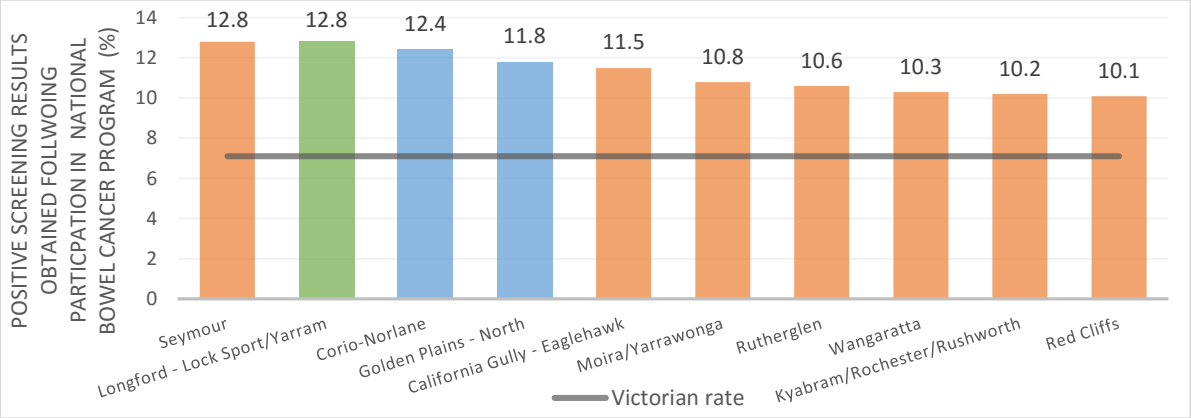
programs in Australia: breast, bowel and cervical cancer. Local participation in these programs is one of the national performance indicators for PHNs.

Bowel cancer detection

Bowel cancer is the second most commonly diagnosed cancer in Australia for both men and women. The risk of bowel cancer increases after 50 years of age. As such, the National Bowel Cancer Screening Program (NBCSP) offers free bowel cancer detection kits for eligible people between the ages of 50-74 years.

Of those that participated in the NBCSP, the proportion of positive screening results was highest in Seymour, Longford - Lock Sport/Yarram and Corio-Norlane (see **Figure 20**).

Figure 20: PHAs with the highest per cent of positive screening results of those who participated in the NBCSP (2012-13)

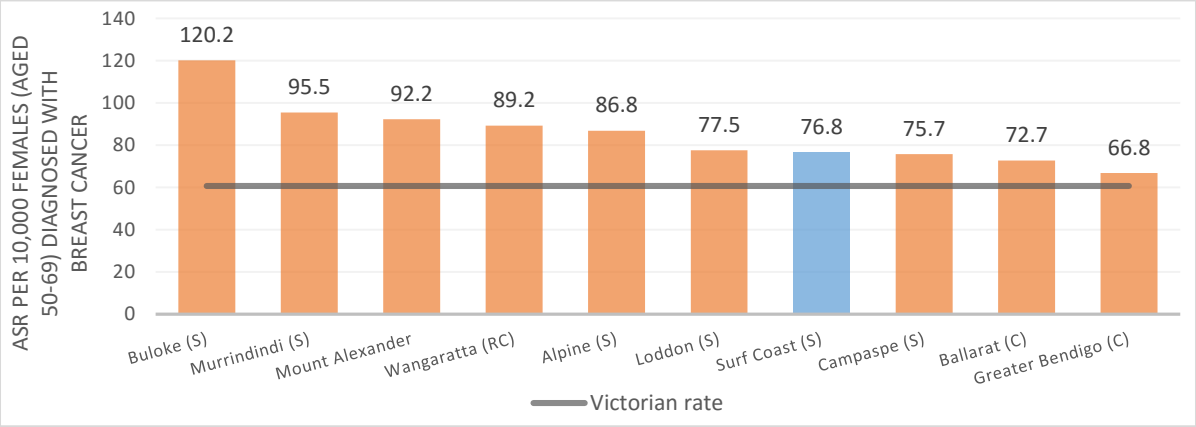


Breast cancer detection

Breast cancer is the most common cancer in Australian women with one in nine women developing breast cancer by the age of 85 years. Breast screening is the most effective method for detecting breast cancer at its earliest stages. BreastScreen Victoria currently provides screening in approximately 40 centres across Victoria, with eight located in regional areas.

As **Figure 21** illustrates, high rates of breast cancer were detected within the Murray PHN region with nine out of the 10 top LGAs located within this rural part of Victoria. Buloke Shire Council experienced rates almost double the state average.

Figure 21: LGAS with the highest ASR per 10,000 females (aged 50-69) diagnosed with cancer following a breast screening test over a 24 month period (2010-11)

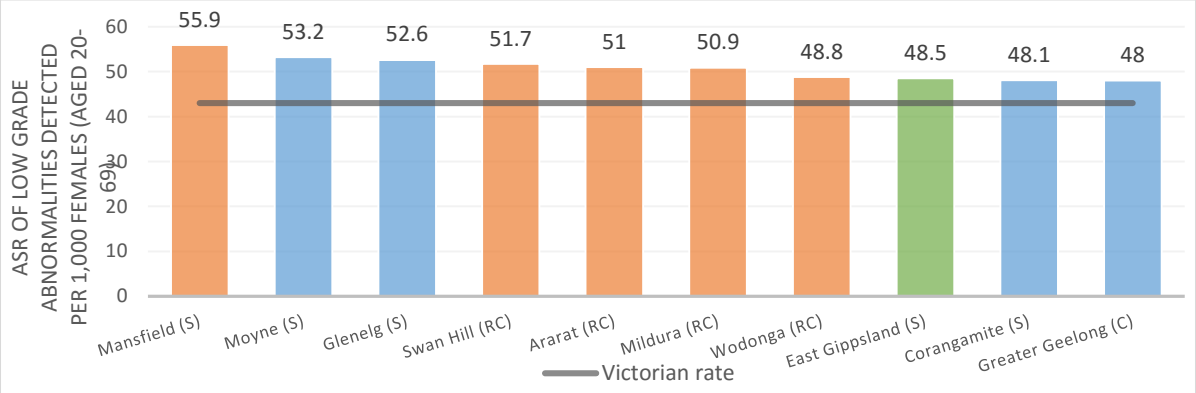


Cervical cancer detection

Under the current national cervical cancer screening program, Pap tests are offered every two years to women between the ages of 18 and 70. Abnormalities detected in a Pap test can be classified as either low or high grade.

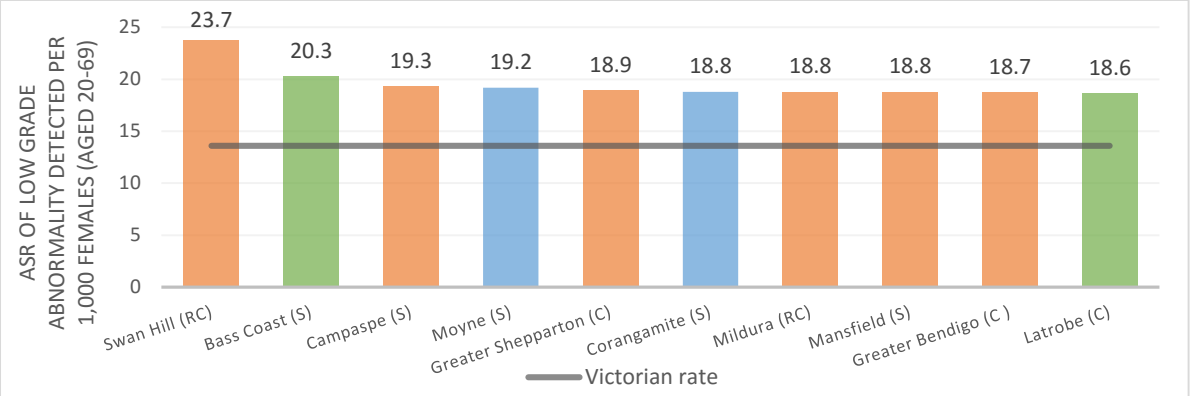
Low grade abnormalities are linked to the human papilloma virus (HPV) and usually disappear over time. However, persistent HPV increases the risk of cervical cancer.[37] **Figure 22** illustrates the incidence of low grade abnormalities detected in females over a 24 month period. Sixty-one per cent of LGAs in rural Victoria were higher than the Victorian rate. The incidence rate was highest in the LGAs of Mansfield, Moyne and Glenelg.

Figure 22: LGAS with the highest incidence of low grade abnormality detected following a cervical screening test in rural Victoria (2011-12)



High grade abnormalities detected in a Pap screen refer to more serious changes to the cells in the cervix and, if left untreated, have a greater chance in developing into cervical cancer.[38] In 2011-12, 70% of rural Victoria had incidence rates higher than the Victorian rate. As **Figure 22** demonstrates, the highest rate occurred in the LGAs of Swan Hill and Bass Coast.

Figure 22: LGAS with the highest incidence of low grade abnormality detected following a cervical screening test in rural Victoria (2011-12)



[37] Better Health Channel. *Pap tests*. Retrieved from: http://www.betterhealth.vic.gov.au/health/coniditonsandtreatment/pap-tests (last updated April 2016)
[38] Better Health Channel. *Pap tests*. Retrieved from: http://www.betterhealth.vic.gov.au/health/coniditonsandtreatment/pap-tests (last updated April 2016)

3.2. Mental Health

Key Findings:

- Consistent with previous research, there is a correlation between disadvantaged rural Victorian areas and high/very high psychological distress.
- After arthritis, mental health problems was the most prevalent long-term condition affecting older rural populations. However, only 6.1% of the total providers supported under RHOF in 2016-17 provided mental health care.
- The rates of mental health-related hospitalisations provides an indication of the availability and quality of community-based programs or services.
- Significant high rates of high/very high psychological distress were detected within the Western Victorian PHN region but low rates of mental health-related hospitalisations. This may suggest the greater availability of primary health/community-based mental health services.
- The Gippsland-East area had persistent and significantly high rates of hospitalisations above the national average in three categories: all mental health conditions, AoD use and intentional self-harm.
- Wangaratta – Benalla had persistently high rates of hospital admissions for all mental health conditions and intentional self-harm. Other hotspots identified were:
    - *All mental health conditions*: Bendigo, Murray River – Swan Hill
    - *For AoD use*: Maryborough – Pyrenees
    - *From intentional self-harm*: Wellington
- 63% of rural Victoria had deaths from suicide and self-inflicted injuries above the national rate between 2010-14.
- The Ararat Region had the highest incident of deaths from suicide and self-inflicted injuries, which was almost four times the Victorian average.

Recommendations:

- Given the prevalence of long-term mental health problems in inner/regional areas, active engagement should occur with the rural PHNs to identify how their commissioned services can be supported by an adequate mental health workforce.
- To address high rates of mental health-related hospitalisations and suicide through mental health care and addiction recovery support, through targeted medical recruitment, for the following areas:
    - Gippsland – East
    - Wangaratta – Benalla
    - Murray River – Swan Hill
    - Maryborough – Pyrenees
    - Wellington
    - Grampians (Ararat)

Overview of 2016-17 activity

Of the 192 providers contracted in 2016-17, 6.1% provided mental health outreach services as a psychiatrist or psychologist.

Most of the mental health outreach services (63%, 10 providers) were provided within the Murray PHN region in Numurkah, Cobram, Mildura, Robinvale, Swan Hill and Bright. Three mental health providers serviced the Gippsland PHN region in Bairnsdale, Leongatha and Sale. The remaining three providers provided outreach services in Hamilton, Hawkesdale and Stawell.

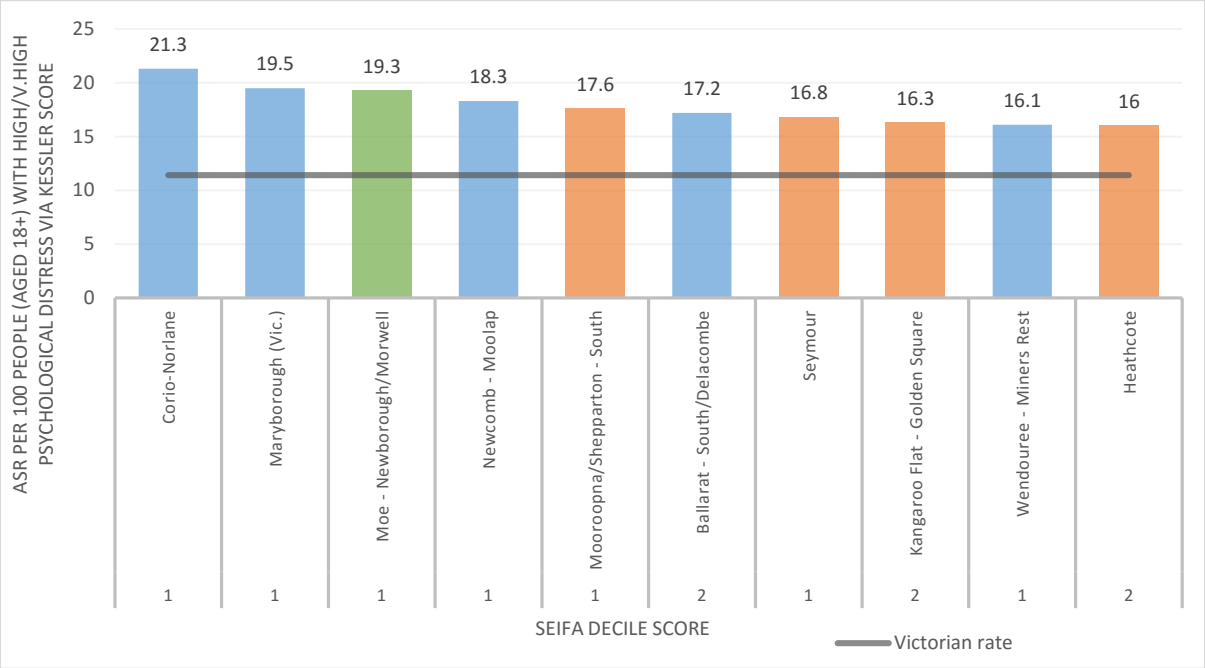
Identifying need:

Approximately 45% Australians aged 16-85 will experience a common mental health disorder such as depression, anxiety or a substance use disorder in their lifetime. Moreover, Australian adults living in low socioeconomic areas are 1.4 times more likely to live with mental or behavioral problems than adults living in high socioeconomic areas.[39]

Community-based mental health services can be provided by GPs, psychiatrists, psychologists and other allied health professionals (e.g. social workers, mental health nurses and occupational therapists).

Of the areas in rural Victoria that were classified as most disadvantaged (SEIFA decile score 1-2), 81% had rates of high or very high psychological distress (using Kessler scale) above the state ASR of 11.4 per 100 people aged 18 years and over in 2014-15. Significantly higher rates were detected in Corio-Norlane (21.3), Maryborough (19.5) and Moe-Newborough/Morwell (19.3) (see **Figure 23**). The top 10 PHA areas with the highest rates of psychological distress were within SA2s classified as either 1 or 2 on the SEIFA scale.

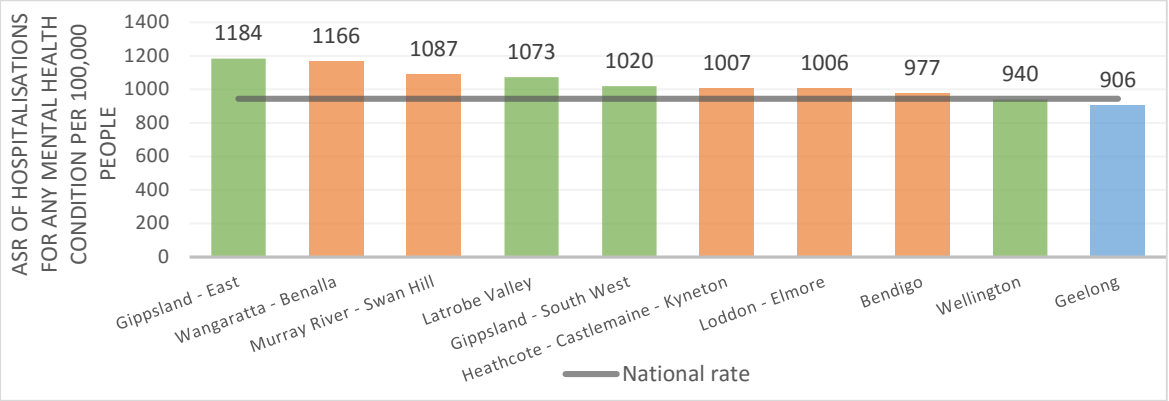
Figure 23: SA2s with the highest incidence of high/very high psychological distress in rural Victoria (2014-15)



Although a number of areas within Western Victoria PHN appear in **Figure 23**, this is different to the areas that appear in **Figure 24**, which illustrates the areas with the highest rate of overnight hospitalisations for any mental health condition in rural Victoria. This, perhaps, may be explained by the provision or availability of community-based mental health services within that region. In contrast, high rates of hospitalisation were identified in various areas within the Murray and Gippsland PHN boundaries.

[39] Australian Institute of Health and Welfare. (2016). *Australia's health 2016: in brief*. Cat. No. AUS 201. Canberra: AIHW

Figure 24: SA3s with the highest incidence of hospitalisations for any mental health condition (2014-15)

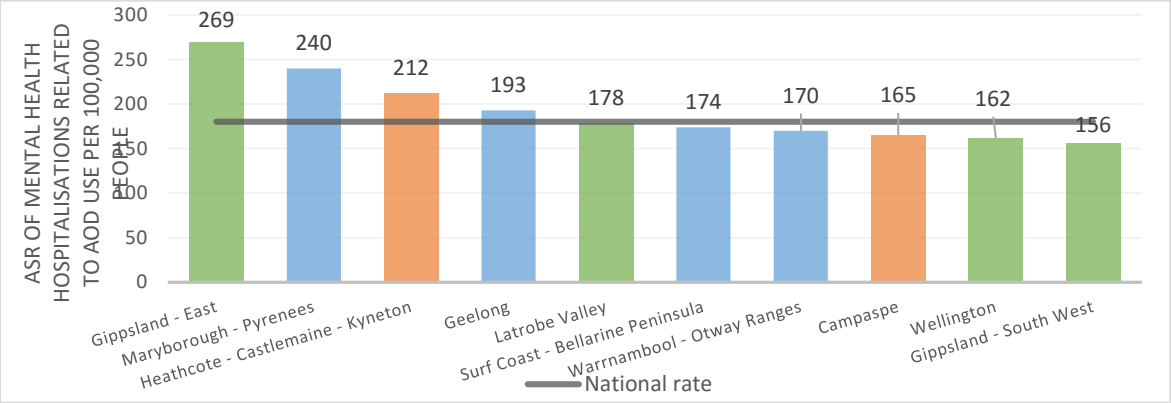


Alcohol and Drug Use

Mental health and behavioural disorders due to alcohol and other drugs (AoD) use is one of the two most common mental health conditions requiring overnight treatment in hospital in 2014-15.[40]

There were four areas in rural Victoria that were above the national rate of 180 hospitalisations per 100,000 people. Most notably, the rates were highest in the East Gippsland and Maryborough-Pyrenees area (see **Figure 25**).

Figure 25: SA3s with the highest incidence of mental health hospitalisations related to AoD use (2014-15)



Suicide and intentional self-harm

Figure 26 demonstrates the areas in rural Victoria that had the highest number of hospital admissions due to injury or poisoning by intentional self-harm. Six areas in rural Victoria were above the national rate of 150 hospitalisations per 100,000 people, the highest rate experienced in Wangaratta-Benalla (207) and Gippsland-East (203).

Sixty-three per cent of rural Victoria had deaths from suicide and self-inflicted injuries above the Victorian rate. The Ararat Region had the highest incident of deaths from suicide and self-inflicted injuries, which was almost four times the Victorian average (see **Figure 27**).

[40] Australian Institute of health and Welfare. (2016). *Healthy Communities: Hospitalisations for mental health conditions and intentional self-harm in 2013-14.* Cat. No. HSE 177. Canberra: AIHW

Figure 26: SA3s with the highest incidence of hospitalisations related to intentional self-harm (2014-15)

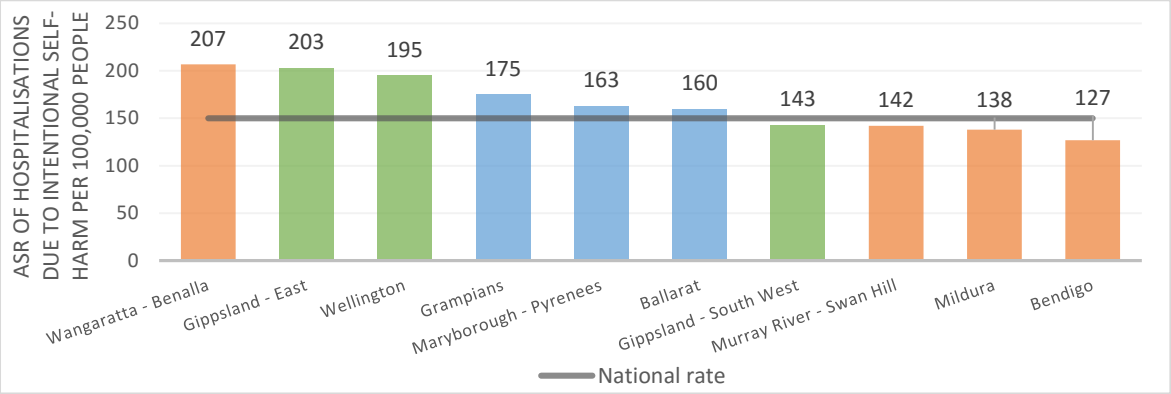
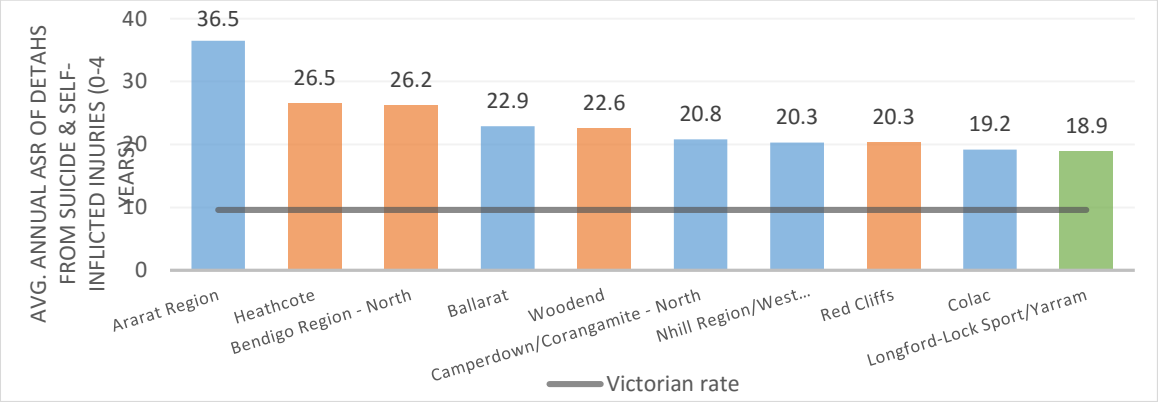


Figure 27: PHAs with the highest incidence of deaths from suicide and self-inflicted injures (0-74 years) between 2010-14



Examining mental health-related hospitalisations rates over a two year period may provide an indication of whether the prevalence of mental health is intermittent or by chance, or due to an ongoing or persistent issue in the community. This is presented in **Table 15**. Gippsland East, Bendigo, Wangaratta – Benalla and Murray River – Swan Hill all had rates of hospitalisations for all mental health conditions above the national average in two consecutive years. The persistent high rates of AoD related mental health admissions were apparent in Maryborough – Pyrenees and Gippsland – East. The persistent high number of hospitalisations from intentional self-harm in Wellington indicates the need for psychological support in this areas as well.

Table 15: SA3 hotspot areas with persistently high ASR of mental health-related hospitalisations in 2013-14 and 2015-16

		ASR of mental health hospitalisations per 100,000 people					
		For any mental health condition		For AoD use		From intentional self-harm	
PHN	SA3	2014-15	2013-14	2014-15	2013-14	2014-15	2013-14
National		944	911	180	168	161	150
Gippsland	Gippsland - East	1184	1031	269	197	203	128
Gippsland	Wellington	940	1005	162	144	195	200
Murray	Bendigo	977	1001	137	94	127	139
Murray	Wangaratta - Benalla	1166	1028	154	116	207	154
Murray	Murray River - Swan Hill	1087	1230	139	157	142	155
Western Victoria	Maryborough - Pyrenees	833	944	240	258	163	NP

3.3. Eye Health

Key Findings:

- There is limited data, on a population health level, on eye health needs both nationally and across the state. Despite this, ophthalmologists, as a health discipline, were one of the most contracted providers under RHOF in 2016-17.
- The National Eye Health Survey (NEHS), published in 2016, was the first national survey that compared the prevalence of visual disorders nationally. In non-Aboriginal populations, there was no difference in the prevalence of visual impairment with age or remoteness.
- Unlike the trend in other chronic disease conditions, local eye health data suggests that the need for eye health services did not appear to be linked with low socio-economic disadvantage. Data on cataract surgery hospitalisations indicates that some low SEIFA areas have been well-serviced with individuals gaining access to cataract surgery.
- Although the rate of cataract surgery hospitalisations have improved across the state from 2013-14 to 2014-15, there were a number of areas in rural Victoria that were persistently below the national average, specifically Wangaratta – Benalla and Grampians.

Recommendations:

- To address SA3s with low rates of cataract surgery hospitalisations, with particular attention to the following areas:
    - Wangaratta – Benalla
    - Grampians
    - Surf Coast – Bellarine Peninsula
    - Mildura

Overview of 2016-17 activity

In 2016-17, 7.6% of the total RHOF providers were Ophthalmologists. More than half of the Ophthalmologists contracted were positioned within the Murray PHN region, specifically Mildura (three providers), Swan Hill (two providers) and Echuca (two providers). Ararat, with four providers, had the most number of ophthalmologists providing outreach services.

Identifying need:

Nationally, eye health conditions are common. They can be present at birth or develop over time due to ageing. The five most common eye health conditions in Australia are cataracts, glaucoma, diabetic retinopathy, macular degeneration and uncorrected refractive error.[41] The eye health workforce includes ophthalmologists, optometrists, orthoptists, optical dispensers and optical mechanics.

Despite the high number of eye health providers funded under the RHOF program in 2016-17, there is very limited evidence, from a population health level, on eye health needs. Unlike the other RHOF priority areas, this limits the ability to identify geographic variation at a granular level.

The National Eye Health Survey, published in 2016, was the first national survey that compared the prevalence of visual impairment and blindness in Indigenous Australians aged 40 years and over, and non-Indigenous Australians aged 50 years and over by gender, age and geographic location. While the prevalence of visual impairment increased markedly with age for Indigenous Australians, there was no significant difference for non-Indigenous Australians (4.42% for 50-59 year old non-

[41] Australian Institute of Health and Welfare. *Eye health*. Retrieved on 29 June 2017 from: http://www.aihw.gov.au/eye-health/

Indigenous Australians and 4.37% for 60-69 year old non-Indigenous Australians). There was also no significant variance between regions of different remoteness.

Other research indicates that eye health care needs is influenced by:

- an ageing population – 85% of all visual impairments affect those aged 50 years and over;
- the prevalence of diabetes, which leads to diabetic eye disease; and
- the increase in risk factors for diabetes (e.g. obesity).

The Australian Atlas of Variation provides insight into the variation of surgical interventions, such as cataract surgery, and suggests that there are areas in Australia that experience inequity of access. The data, which includes hospitalisations in both private and public hospitals, indicates that, unlike the data presented throughout this report, there was no clear pattern according to low SES. In general, rates tended to be higher in inner/outer regional regionals than major cities and remote areas.

Figure 28 highlights the top and bottom five areas in rural Victoria of hospitalisations for cataract surgery for every 100,000 people aged 40 years and over. The extent to which they are above or under the national rate of 2,138 hospitalisations provides an indication of the level of access to ophthalmology services. While Gippsland-East (3015) appeared well-serviced by having the highest rate of cataract surgery hospitalisations in across Victoria, Wangaratta-Benalla (1698) had the lowest rate after Melbourne City (1549). The five areas that had the lowest rates of hospitalisations due to cataract surgery in 2014-15, also had low rates in 2013-14 (see **Table 16**). Despite the significant improvement in cataract surgery admission rates over the two year period, Grampians (+67.5%) and Wangaratta – Benalla (+43.5%) consistently appeared to be the most under-serviced areas in rural Victoria. Surf Coast – Bellarine Peninsula and Mildura experienced the lowest growth in improvement with an increase of 25.3% and 29.1% respectively. The rate of cataract surgery admissions increased by 32.8% nationally.

Figure 28: Top and bottom five SA3 areas in rural Victoria of cataract hospitalisations per 100,000 people aged 40 years and over in 2014-15

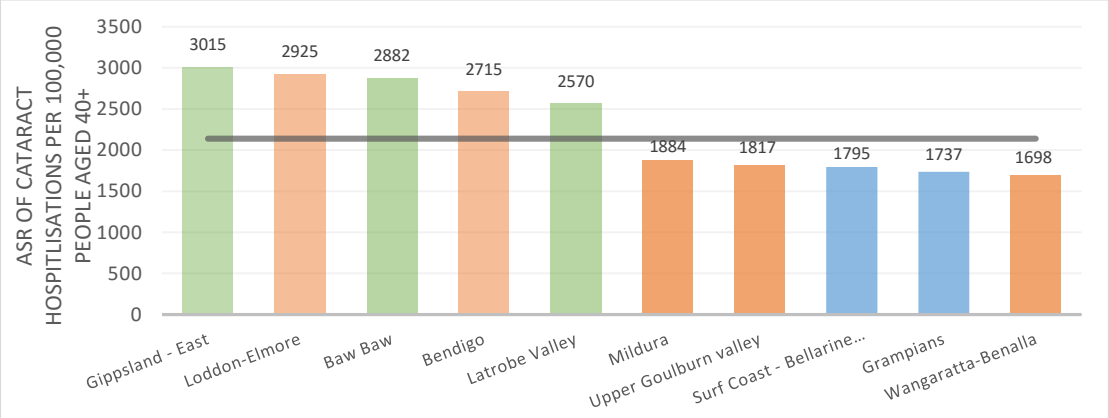


Table 16: SA3 hotspot areas with persistently low ASR of cataract surgery hospitalisations in 2013-14 and 2015-16

		ASR of hospitalisations for cataract surgery per 100,000 people aged 40 years and over	
PHN	**SA3**	2014-15	2013-14
National		**2138**	**1436**
Gippsland	**Gippsland - South West**	2020	1119

Gippsland	**Wellington**	2096	743
Murray	**Upper Goulburn Valley**	1817	1036
Murray	**Wangaratta - Benalla**	1698	959
Murray	**Mildura**	1884	1335
Western Victoria	**Ballarat**	1986	846
Western Victoria	**Creswick - Daylesford - Ballan**	2082	1007
Western Victoria	**Maryborough - Pyrenees**	1973	882
Western Victoria	**Barwon - West**	1905	990
Western Victoria	**Geelong**	1885	1316
Western Victoria	**Surf Coast - Bellarine Peninsula**	1795	1341
Western Victoria	**Grampians**	1737	564

3.4. Maternity and Paediatrics

Key Findings:

- A third of all providers (34%, 88 providers) contracted under the RHOF program in 2016-17 provided maternity or paediatric services

Maternity

- Mildura had the highest number of births in 2010-15 but the highest rate of births per 1000 females (aged 15-44) occurred in Robinvale (117.6 births), which was an increase of approximately 30% over five years.
- The largest growth in birth rates occurred in St Arnaud (44.3%), Longford-Loch Sport (37.2%) and Trafalgar (Vic.) (32.8%).

Paediatrics

- The proportion of children developmentally vulnerable was highest in Moe-Newborough/Morwell and Seymour

Recommendations:

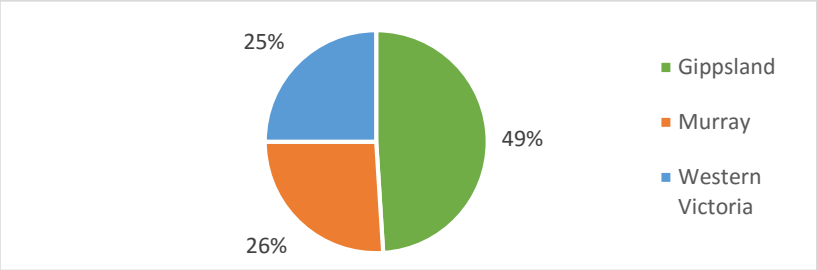
- To address areas with the highest rates or the largest growth rate of births with the provision of maternity services, with particular attention to
  - Robinvale
  - St Arnaud
  - Longford – Loch Sport
  - Trafalgar
- To address areas with high proportions of children assessed as developmentally vulnerable, particularly in the following areas:
  - Latrobe Valley: Moe – Newborough/Morwell, Churchill
  - Seymour
  - Maryborough
  - Benalla
  - Wendouree – Miners Rest
  - Newcomb-Moolap

Overview of 2016-17 activity

Almost a third of all providers (34%, 88 providers) contracted under the RHOF program in 2016-17 provided maternity or paediatric services.

In 2016-17, there were 53 providers contracted to deliver paediatric services under the RHOF program. The highest number of providers of any discipline contracted, paediatricians comprised 20% of all those contracted under RHOF. More than 50% of contracted paediatricians provided services within the Gippsland PHN region (see **Figure 29**), with the majority positioned in Bairnsdale (8), Sale (6) and Traralgon (5).

Figures 29: Distribution of paediatricians contracted under RHOF in 2016-17



Maternity services were provided by 28 obstetric and gynaecology providers in 2016-17. Seven midwives and nurse coordinators were also recruited. The majority (57%) were positioned within the Murray PHN region, with two providers each positioned in Kerang, Swan Hill and Robinvale, followed equally by Western Victoria and Gippsland with 21%.

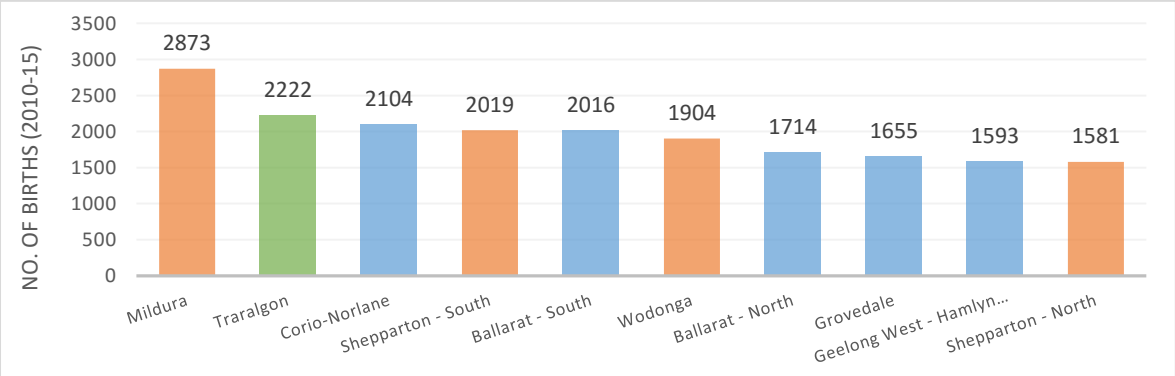
Identifying need:

Maternity

The examination of the birth and fertility rates across rural Victoria may provide an indication of the need for a medical workforce with skills in obstretrics and gynaecology.

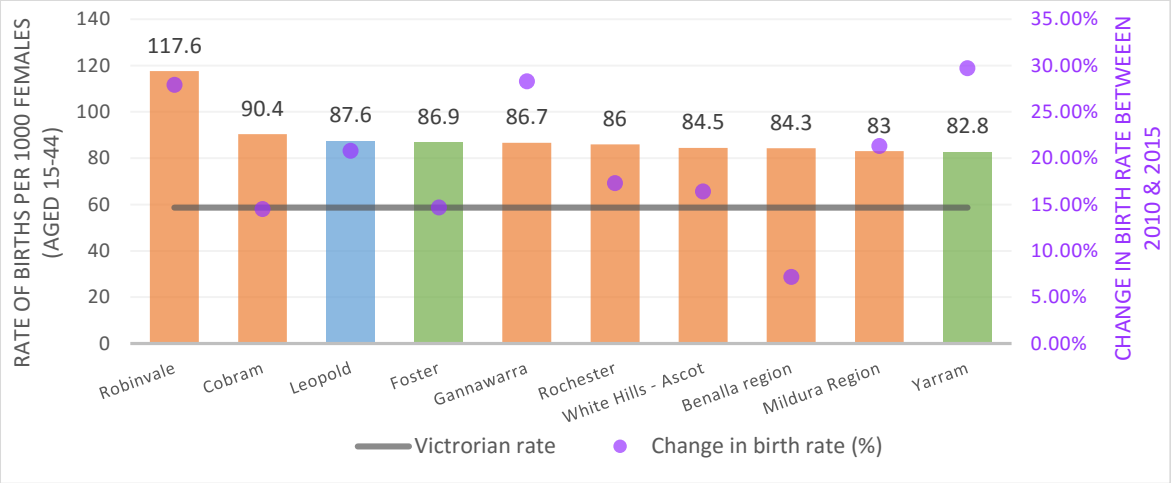
In 2010-15, the Western Victoria PHN region overall had the highest number of births, accounting for 42% of the total births in rural Victoria. More specifically, the highest number of births occurred in Mildura (see **Figure 30**). The lowest number of births was recorded in Queenscliff (147), Moira (151), Longford – Loch Sport (164) and West Wimmera (168).

Figure 30: SA2s with the highest number of births recorded in 2010-15.



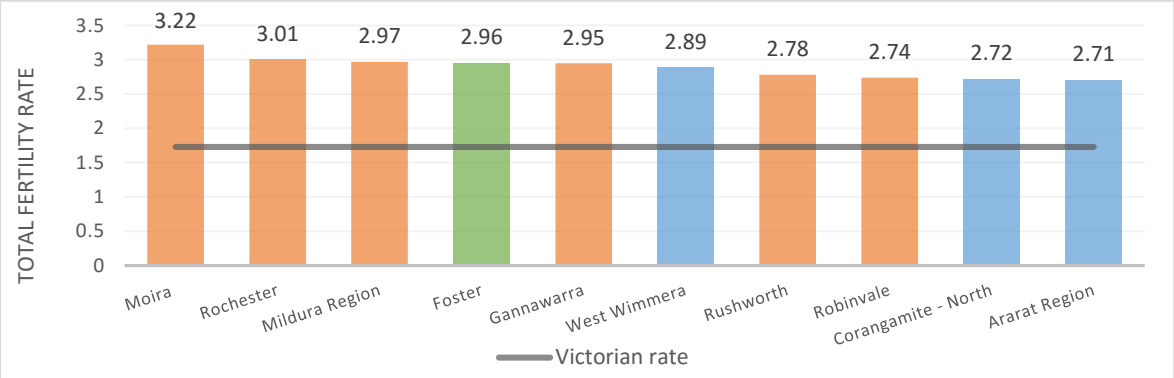
Based on ABS data of women aged 15-44 and the number of births, the rate of births per 1000 women could be calculated. Robinvale had the highest rate at 1117.6 births per 1000 females, which is an approximately 30% increase over a five year period (see **Figure 31**). The most significant growth in birth rates occurred in St Arnaud (44.3%), Longford-Loch Sport (37.2%) and Trafalgar (Vic.) (32.8%). In comparison, there were several areas in Victoria that had a significant decrease in birth rates, such as Queenscliff (-130%), Heathcote (-45.8%), Beaufort (-43.3%) and Otway (-41.3%).

Figure 31: SA2s with the highest rate of births per 1000 females (aged 15-44 years) in 2015 and corresponding change (%) since 2010.



The fertility rate refers to the average number of children a women could expect to bear during her reproductive lifetime. In 2015, 95% of rural Victoria had a fertility rate more than the Victorian rate of 1.73 children and as **Figure 32** illustrates, the highest fertility rates were recorded in Moira and Rochester.

Figure 32: SA2s with the highest fertility rate (2015)



Paediatric

Assessing community need for paediatric care has been determined by the proportion of children in the local population, the projected growth by 2025, and the level of childhood development vulnerability.

As *Section 2* highlighted, the proportion of children (aged 0-14) in each PHN region is relatively similar however, there are a number of localities, particularly within the Murray and Western Victoria PHN, where the proportion of children were well above the state average (18.3%). This includes localities within the Bendigo (Maiden Gully – 26.04%; Strathfieldsaye – 25.7%) and Ballarat (Alfredton/Buninyong/Smythes Creek - 23.03%). By 2025, although the proportion of children will remain relatively unchanged in the PHN region broadly, highest anticipated growth is projected in the Seymour Region (+10%), Ararat Region (+9.9%) and the Colac/Otway Region (+7.9%). Approximately thirty per cent of the population in Strathfieldsaye, Seymour and Woodend will be children.

The Australian Early Development Census (AEDC) is a population based measure that is used to measure the development of children in Australia by the time they commence school. The AEDC examines five domains of early childhood development: physical health and wellbeing, social

competence, emotional maturity, language and cognitive skills, and communication skills and general knowledge. Examining the variation of the results geographical variation may provide an indication of the need for specific health services (e.g. Paediatrician).

There were a number of areas in rural Victoria that were well above the Victorian average in regards to the per cent of children that were developmentally vulnerable in both one or more, or two or more domains. This is highlighted in **Table 17**. Moe – Newborough/Morwell had the highest proportion of developmentally vulnerable children.

Table 17: PHAs with a high proportion of children with development issues

PHN	Area	% of children developmentally vulnerable in one or more domain	% of children developmentally vulnerable in two or more domains
Victoria		19.9%	9.9%
Gippsland	**Moe – Newborough/Morwell**	41.0%	28.8%
Murray	**Seymour**	37.0%	24.1%
Western Victoria	**Maryborough (Vic.)**	29.9%	23.4%
Gippsland	**Churchill**	35.7%	22.7%
Murray	**Benalla**	36.6%	22.1%
Western Victoria	**Wendouree – Miners Rest**	31.6%	21.2%
Western Victoria	**Newcomb – Moolap**	35.7%	21.1%

Appendix 1

Overview of data indicators and sources

Priority Area	Data indicator	Time period	Statistical Area Assessed	Data Source
Population Demographics	Estimated resident population (ERP)	2015	SA2	Australian Bureau of Statistics. (2016*). Estimated Resident Population, 2015*. Cat. No. 3235
	Proportion of ERP aged between 0-14 years	2015	PHA	Public Health Information Development Unit (PHIDU). (2017). *Social Health Atlas of Australia: Population Health Areas.*
	Projected proportion of ERP aged between 0-14 in 2025	Projected 2025	PHA	
	Proportion of ERP aged 65 years and over	2015	PHA	
	Projected proportion of ERP aged 65 years and over in 2025	Projected 2025	PHA	
	Socio-Economic Indexes for Areas (SEIFA) decile score	2011	SA2	Australian Bureau of Statistics. (2011). *Census of Population and Housing: Socio-Economic Indexes for Areas (SEIFA) Australia.* Cat. No. 2033.0.55.001.
	SEIFA rank within Victoria	2011	SA2	
	Total number of births	2010-15	SA2	Australian Bureau of Statistics. (2016). *Births*. Cat.no. 3301.0.
Potentially Preventable Hospitalisations (PPH)	ASR of all PPHs per 100,000 people.	2013-14, 2014-15 & 2015-16	SA3	National Health Performance Authority. (2017). *Healthy Communities: Potentially preventable hospitalisations in 2015-16*. NHPA: Sydney
	ASR of all chronic PPHs conditions per 100,000 people			
	ASR of PPHs related to chronic heart failure (CHF) per 100,000 people			
	ASR of PPHs related to angina per 100,000 people			
	ASR of PPHs related to chronic obstructive pulmonary disease (COPD) per 100,000 people			
	ASR of PPHs related to diabetes complications per 100,000 people			
	ASR of PPHs related to gangrene per 100,000 people			
	ASR of PPHs related to cellulitis per 100,000 people			
	ASR of PPHs related to ENT per 100,000 people			
	ASR of PPHs related to kidney/urinary tract infections (UTI) per 100,000 people			

Musculoskeletal disease	ASR per 100 people with a musculoskeletal system disease	2011-12	PHA	Public Health Information Development Unit (PHIDU). (2017). *Social Health Atlas of Australia: Population Health Areas.*
Cancer	Average annual ASR per 100,000 people for avoidable deaths from cancer for persons aged 0 to 74.	2010-14	PHA	Public Health Information Development Unit (PHIDU). (2017). *Social Health Atlas of Australia: Population Health Areas.*
	ASR of low grade abnormality detected during cervical cancer screening per 1,000 females aged 20-69.	2011-12	LGA	Public Health Information Development Unit (PHIDU). (2017). *Social Health Atlas of Australia: Local Government Areas.*
	ASR of high grade abnormality detected during cervical cancer screening per 1,000 females aged 20-69.	2011-12	LGA	
	Per cent of the population that obtained a positive screening result following participation in the National Bowel Cancer Screening Program	2012-13	PHA	Public Health Information Development Unit (PHIDU). (2017). *Social Health Atlas of Australia: Population Health Areas.*
	ASR per 10,000 females aged 50-59 diagnosed with cancer following a breast screening test.	2010-11	LGA	Public Health Information Development Unit (PHIDU). (2017). *Social Health Atlas of Australia: Local Government Areas.*
Mental health and suicide	ASR per 100 people aged 18 years and over with high or very high psychological distress using the Kessler 10 scale.	2014-15	PHA	Public Health Information Development Unit (PHIDU). (2017). *Social Health Atlas of Australia: Population Health Areas.*
	ASR per 100,000 people of overnight hospitalisations due to any mental health conditions	2014-15 & 2013-14	SA3	National Health Performance Authority. (2017). Healthy communities: *Hospitalisations for mental health conditions and intentional self-harm in 2014-15.* Sydney: NHPA National Health Performance Authority. (2016). Healthy communities: *Hospitalisations for mental health conditions and intentional self-harm in 2013-14.* Sydney: NHPA
	ASR per 100,000 people of overnight hospitalisations due to drug and alcohol use		SA3	
	ASR per 100,000 people of overnight hospitalisations due to intentional self-harm		SA3	
	Average annual ASR per 100,000 people aged 0-74 of deaths from suicide and self-inflicted injuries	2010-14	PHA	Public Health Information Development Unit (PHIDU). (2017). *Social Health Atlas of Australia: Population Health Areas.*
Eye health	ASR per 100,000 people aged 40 years and above of hospitalisations for cataract surgery	2014-15 & 2013-14	SA3	Australian Commission on safety and Quality in Health Care. (2017). *The Second Australian Atlas of Healthcare Variation.* Sydney: ACSQHC

				Australian Commission on safety and Quality in Health Care. (2015). *The First Australian Atlas of Healthcare Variation.* Sydney: ACSQHC
Maternity and Paediatrics	Fertility rate: the average number of children that a female would expect to bear during her reproductive lifetime.	2012-14	LGA	Australian Bureau of Statistics. (2016). *Births*. Cat.no. 3301.0.
	Rate of births per 1,000 females aged between 15-44	2015	SA2	Calculated from data retrieved from Australian Bureaus of Statistics: *Births*, Australia, 2015 and *Estimated Resident Population*, 2015
	Change in birth rate (births per 1,000 females aged between 15-44) between 2010 and 2015	2010 vs. 2015	SA2	Calculated from data retrieved from Australian Bureaus of Statistics: *Births*, Australia, 2015 and *Estimated Resident Population*, 2015
	Per cent of children developmentally vulnerable in one or more domain (based on the Australian Early Development Census).	2011-13	PHA	Public Health Information Development Unit (PHIDU). (2017). *Social Health Atlas of Australia: Population Health Areas*.
	Per cent of children developmentally vulnerable in two or more domains.	2011-13	PHA	

Appendix 2

Definitions of statistical geographical areas used for this report

Geographic structure	Definition
Primary Health Network (PHN)	On 1 July 2015, the Commonwealth Government established 31 PHNs across Australia. The geographical boundaries of each PHN can be found at: http://health.gov.au/internet/main/publishing.nsf/content/PHN-Home
Statistical Area Level 3 (SA3)[42]	The SA3 provides a standardized regional breakup of Australia. The SA3 provides a framework for the analysis of ABS data by clustering groups of SA2s that have similar regional characteristics. SA3s generally have populations between 30,000 to 130,000 persons.
Local Government Area (LGA)[43]	LGAs are an Australian Bureau of Statistic (ABS) approximation of officially gazetted LGAs as defined by each State and Territory local government department. The LGA status types used in Victoria area: Cities (C), Rural Cities (RC), Boroughs (B) and Shires (S)
Population Health Area (PHA)	Constructed by the Public Health Information Development Unit (PHIDU) , Torrens University Australia to determine the Social Health Atlases of Australia and Aboriginal and Torres Strait Islander Social Health Atlas, the PHA comprises of a combination of whole SA2s and multiple (aggregates of) SA2s.
Statistical Area Level 2 (SA2)[44]	The SA2 is the lowest level for which Estimated Resident Population (ERP), Health and Vitals, and other non-Census data are generally available. SA2s broadly have a population range of 3,000 to 25,000 persons, with an average population of about 10,000 persons.

[42] Australian Bureau of Statistics. (2010). *Australian Statistical Geography Standard (ASGS): Volume 1 – Main Structure and Greater Capital City Statistical Areas, July 2011* (cat. No. 1270.0.55.001). Retrieved from http://www.abs.gov.au

[43] Australian Bureau of Statistics. (2016). Australian Statistical Geography Standard (ASGS): Volume 3 – Non ABS Structures, July 2016 (cat. No. 1270.0.55.003). Retrieved from: http://www.abs.gov.au

[44] Australian Bureau of Statistics. (2010). *Australian Statistical Geography Standard (ASGS): Volume 1 – Main Structure and Greater Capital City Statistical Areas, July 2011* (cat. No. 1270.0.55.001). Retrieved from http://www.abs.gov.au