FINAL REPORT

NORTH WESTERN MELBOURNE PRIMARY HEALTH NETWORK

AFTER HOURS PRIMARY HEALTH CARE: GAP ANALYSIS AND RECOMMENDATIONS

December 2018

IMPACT CO.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. INTRODUCTION

Background

On 1 July 2015, 31 Primary Health Networks (PHN), including the North Western Melbourne Primary Health Network (NWMPHN), were established to do the following:

- Increase the efficiency and effectiveness of medical service for consumers, particularly those at risk of poor health outcomes; and
- Improve the coordination of care to ensure consumers receive the right care in the right place, at the right time.

Achieving these objectives involves working with frontline services within the primary health system and collaborating with Local Hospital Networks to ensure better integration between primary and acute services. This is particularly important to ensure the effectiveness and accessibility of after-hours (**AH**) health services.

The Commonwealth Government provides specific funding to PHNs to support, coordinate and plan AH health services, which can be tailored to address the specific and diverse needs of their local communities. The purpose of the funding is two-fold: first, to address gaps in AH service provision for at risk populations; and, second, to improve service integration.

Impact Co. was engaged by NWMPHN to provide it with a richer understanding of the current state of AH primary health care (**AHPHC**) in, and in close proximity to, the NWMPHN catchment. In doing so, Impact Co. was specifically tasked with considering the key areas of community need and service gaps, particularly for priority populations, with the purpose of identifying broad level service recommendations that can inform the future commissioning efforts of NWMPHN.

Purpose of the document

This Final Report presents an overview of the key areas of community need and service gaps across the NWMPHN catchment. In line with the scope of the engagement, this report focuses principally on priority populations in the NWMPHN catchment, with the purpose of identifying broad service level recommendations to guide NWMPHN as it commissions AH services from 2018-19 and beyond.

Approach

To undertake the AH Gap Analysis and Recommendations project, 10 key Sprints were adopted (see **Figure 1**).

Each Sprint is further described in the table below:

Sprint 1	**Project establishment** Following a Project Kick-off meeting between NWMPHN and Impact Co., a detailed project plan was developed and confirmed the following: (i) members of the Project Working Group, (ii) project governance, (iii) project methodology, (iv) project milestones, (v) approach to, and targets for, consultations, and (vi) project logistics.
Sprint 2	**Rapid literature review** A rapid literature review was undertaken to understand the key drivers of health care presentations during the AH period. The insights were used to guide the quantitative and qualitative data collection and analysis conducted in Sprints 4-6. The key insights of the literature review are featured in *Section 2* of this report.
Sprint 3	**Review of NWMPHN's strategic and operating context** This Sprint reviewed the key documents that articulate the NWMPHN's strategic and operational direction relating to AH care.

Sprint 4

Quantitative analysis

This Sprint involved the calculation of a Composite Index Score based on three main components (or sub-indices):

Component 1 - AH Need: The sourcing of data (publicly available and PHN-available sources) relevant to AH service needs and utilisation within the NWMPHN region. The data was collated into a database of population health and service use organised by geography, priority population groups and service focus areas.

Component 2 – Unmet AH demand: This involves the analysis of data from the Victorian Emergency Minimum Dataset (VEMD), Ambulance Victoria and the *My Healthy Communities* website as variables to measure unmet AH demand.

Component 3 – AH service availability: Using data extracted from the National Health Service Directory (NHSD) and medical deputising services, this sub-index determines the level of AH service availability in each region.

The three sub-indices have been combined to calculate a Composite Index Score to rank all LGAs in the NWMPHN region. The highest scores reflect the areas with the greatest need and poorest service availability.

The variables or data indicators that have been selected for inclusion in the Composite Index Score are outlined In *Section 3* of this report. Each variable is ranked in order to demonstrate the extent of the variation across the LGAs. As indicated by the Table below, as an example, the LGA with the highest measure of a variable is indicated in red, reflecting the greatest need.

Rank	LGA	Estimated resident population
1	Wyndham (C)	228,088
2	Hume (C)	207,830
3	Brimbank (C)	205,741
4	Moreland (C)	172,091
5	Darebin (C)	155,022
6	Melbourne (C)	148,039
7	Melton (C)	141,749
8	Moonee Valley (C)	122,968
9	Hobsons Bay (C)	93,392
10	Yarra (C)	93,380
11	Maribyrnong (C)	87,355
12	Macedon Ranges (S)	47,512
13	Moorabool (S)	32,658

The data described above has also been used to create detailed LGA profiles (*Section 5*). Each profile draws attention to the AH needs and the current AH service availability in each LGA.

Further detail on how the Composite Index Score is calculated is set out in *Section 4* of this report. All data presented in this report is to one decimal point.

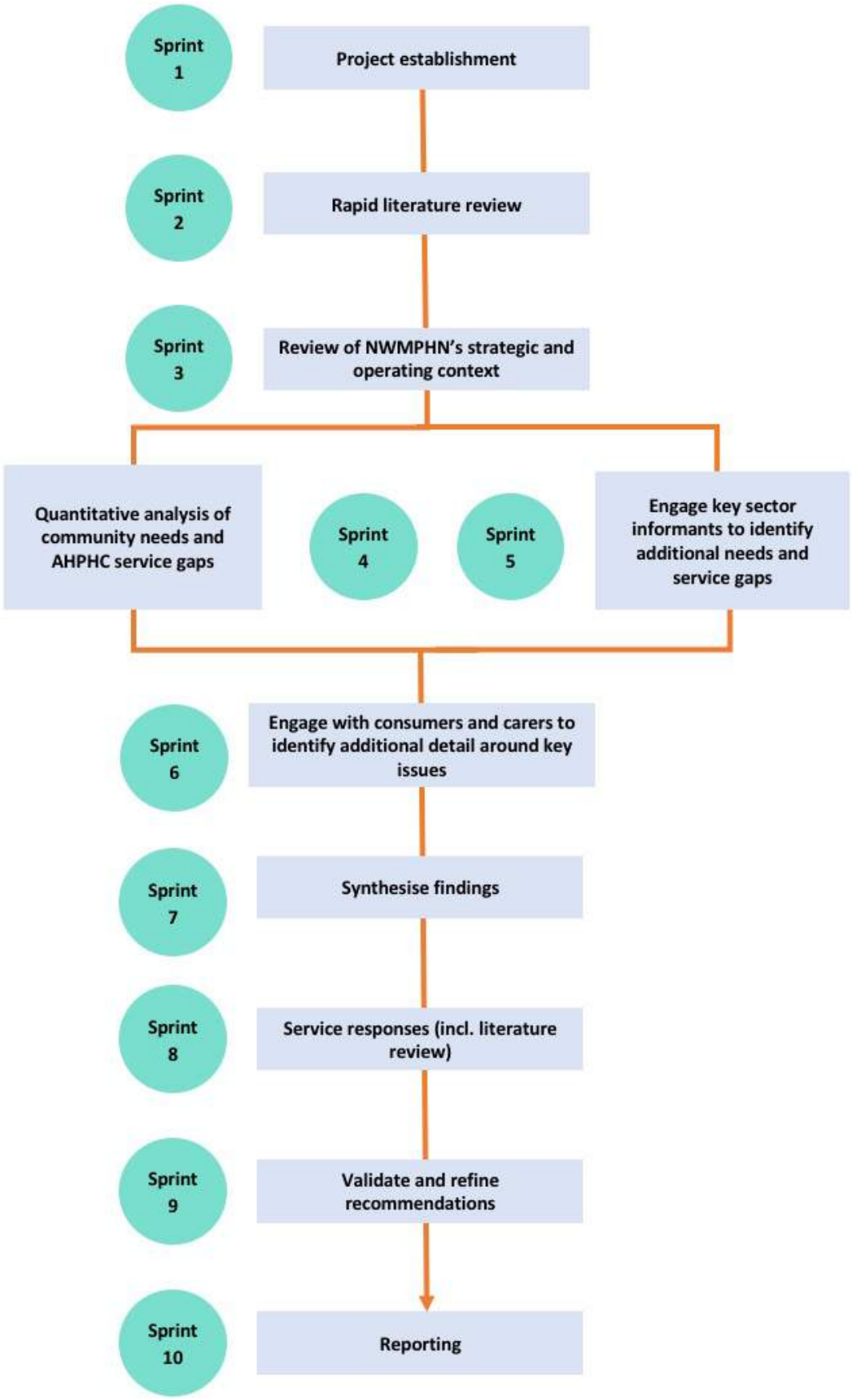
Sprint 5

Engage key sector informants to identify additional needs and service gaps

Interviews were conducted with key sector informants. The purpose of this was two-fold: first, to uncover issues that the quantitative analysis did not reveal. Second, to validate and develop a more detailed understanding of the insights gained in Sprint 4.

	The Impact Co. team engaged with 13 key informants or providers of services across the catchment. The list of key personnel involved can be found in **Appendix C.** The interview guide used in each consultation can be found in **Appendix D.**
Sprint 6	**Engage with consumers and carers to identify additional detail around key issues** Findings from Sprints 4 and 5 were used to identify in-need population cohorts (including consumers and carers) that could be engaged in this Sprint via focus groups to develop a more detailed understanding of the challenges associated with accessing the AH primary health system. This includes identifying insights into the drivers for their health-seeking behaviours. The Impact Co. team engaged with 80 consumers across nine focus groups. The list of groups involved can be found in **Appendix C**. The interview guide used in each focus group can be found in **Appendix D.**
Sprint 7	**Synthesise findings** This Sprint consolidates the findings from the previous Sprints. Regional maps, charts and tables have been used to visually represent the data collected in Sprint 4 in a user-friendly manner.
Sprint 8	**Service response (including literature review)** To supplement the insights identified in Sprint 7, a further literature review of Australian and international literature was undertaken to identify potential innovative service responses to the issues identified in the preceding sprints. Leveraging the findings from the literature review, recommendations for a commissioning framework were developed to assist NWMPHN with its future commissioning strategy relating to AH primary care services in its catchment.
Sprint 9	**Validate and refine recommendations** The recommendations developed in Sprint 8 were validated and tested with three relevant stakeholders. This includes a GP, a CEO of a community health service and an Executive Director of a metropolitan hospital within the catchment. The purpose of this Sprint was to: • Ensure the efficacy of the recommendations identified; and • Identify unforeseen implementation challenges for the recommendations.
Sprint 10	**Reporting** A final report (this document) is submitted to NWMPHN, which consolidates the outputs from Sprints 2-9.

Figure 1: Impact Co.'s approach to the AH Gap Analysis



2. THE CONTEXTUAL ENVIRONMENT FOR AH CARE

WHAT DRIVES THE DEMAND FOR AFTER-HOURS HEALTH SERVICES: A REVIEW OF THE LITERATURE

A health care system that is able to provide the right care, at the right place, and at the right time is crucial to reducing health inequity and improving health outcomes. When people fall ill, their choice of which service to access for care or advice is influenced by a range of factors. These include (but are certainly not limited to) service type and accessibility, location, time of day, attitudinal factors, the health literacy of the person seeking the service and a variety of socio-economic factors.

Like most other Western countries, there has been a rise in the number of visits to Australian emergency departments (EDs) in recent years, particularly for presentations considered non-urgent, inappropriate, low urgency or 'primary care type' that could be managed in general practice. As Gill and Sheridan (2016) argue, "*EDs are popular because they work - for consumers*" (p.269).

This literature review explored the reasons for the rising number of ED presentations over recent years. In doing so, this review considers if certain population cohorts are more likely to seek care at an ED, as opposed to other alternatives, such as those available within the primary health care system.

This literature review has been written in the context of identifying opportunities to divert non-urgent presentations to EDs to more appropriate (primary) health services during the AH period.

Background

Overcrowding or increased use of EDs is an issue as it causes increased cost and demand on ED staff, risks to the quality of care, patient dissatisfaction, and delays in care due to longer waiting times (Butun & Hemingway, 2018). This overcrowding has been attributed, at least in part, to patients who present with a general practice-type condition caused by the decreased availability of general practitioners (GP) during the AH period (Nagree et al., 2013).

The AH period is defined as the hours between:

- 6pm to 8am Monday to Friday
- 12pm Saturday to 6am on Monday
- All hours on public holidays

In Australia, the method used to determine whether a presentation can be managed in general practice is via the Australasian Triage Scale (ATS). The ATS is used to prioritise care within EDs by allocating all presenting patients a category from 1 to 5. Category 1 patients are considered as the highest priority in terms of urgency, while category 5 patients are the least urgent (ACEM, 2018). The Australian Institute of Health and Welfare (2014) defines ATS categories 4 and 5 as those that can be managed by general practice. In addition, a GP-type presentation is one that:

- did not arrive by ambulance;
- was for a new episode of care; and
- did not result in admission.

In 2016-17, there were approximately 7.8 million presentations to ED nationally, averaging more than 21,000 a day. Of this number, 50% were triaged as non-urgent (Category 5) and semi-urgent (Category 4), and 31% of all ED presentations occurred during the AH period (AIHW, 2017a). In Victoria, the number of presentations to ED is projected to increase by 2.7% per annum between 2012-13 to 2026-27, which is an overall increase of 44.2% (Austin Health, 2016). It is anticipated that this growth will coincide with a rise in non-urgent and AH presentations. As such, reforming primary care service delivery, particularly in relation to the AH period, has been part of the Commonwealth Government's agenda in recent years.

Redirecting patients to more appropriate care also makes economic sense. An analysis conducted by Deloitte Access Economics (2016) explored different cost pathways for seeking different AH primary care. While seeking care at an AH clinic costs $93, a visit to ED arriving by ambulance costs $1,351. If self-presenting to ED, the cost reduced to $368 (which remains substantially more than the cost of a visit to an AH general practice clinic. On the basis of these costs, the report estimated savings for EDs in the order of $724 million over four years if after hours services at a general practice were utilised for primary care type ED presentations.

Why are people attending ED for non-urgent care?

There are various reasons for why there is a growing number of consumers who bring themselves or their children to ED rather than a GP or other alternatives for potential primary care issues. There is also evidence (e.g. Masso et al, 2007) that these reasons differ from those perceived by clinicians.

These reasons are detailed below.

Perceived seriousness

The need for immediate attention and a perceived urgency or seriousness of condition appeared to be the primary reason why patients opt to attend ED. This perceived seriousness attributes to a belief that the condition requires the resources that can be offered by a hospital, or that it is too complex or difficult to be effectively controlled or managed by a GP (Coster et al., 2017).

A Tasmanian study surveyed almost 500 patients to understand their rationale for presenting to ED with non-urgent conditions. The most commonly selected reason for attending ED was a belief that further investigation (e.g. radiology or pathology) would be required. This was followed by the belief the issue was clearly an emergency (Unwin et al, 2016). These findings are consistent with Siminski et al's study (2005), which found that 85% of patients surveyed at an ED believed that their conditions were urgent or too complex to be treated elsewhere.

Capacity of primary care

For children, in particular, there is substantial evidence indicating that parents or guardians attend ED due to the perceived, or actual, limited capacity of GP.

For example, one study observed that parents bypassed their GP and attend ED as they predicted they will be referred (Berry et al., 2008). A further study found that two thirds of parents surveyed had considered or, in fact, took their child to a GP prior to presenting at a paediatric ED, and a quarter were unable to access a GP (Williams et al, 2009). Similar results were found in a Melbourne study, where two thirds of the parents who contacted their GP were instructed to go to the ED for their lower urgency condition (Freed et al., 2016). This suggests, perhaps, the deficiency of primary care to treat cases deemed to be non-urgent by the ED.

Another study by Gafforini et al. (2016) investigated injuries, which account for a significant proportion of paediatric lower urgency presentations to ED. The study assessed the preferences and experiences of treatment of parents who attended an ED at one of four Melbourne hospitals with their child who was triaged with a lower urgency condition. As a result of the research conducted, this study drew the following conclusions:

- Few parents of injured children attempted to see a GP prior to attending the ED
- Injured children were more likely to be referred to ED by a GP (compared to an ill child), and
- Parents who presented to ED were more likely to have greater trust in ED doctors compared to a GP.

Advantages of accessing care at an ED

Many argue that because publicly funded EDs are free and can provide on-demand care for most conditions (Gill & Sheridan, 2016), it is not surprising that there is a growing demand for ED services, particularly for the management of non-urgent conditions. Families have also indicated the convenience of the ED (open 24 hours a day, 7 days a week), expertise with children, dissatisfaction with the primary care provider, quality of care and increased resources as some of the reasons for choosing to seek care at an ED (Berry et all, 2008).

Further, the inability of parents to take time of work was another reason for choosing to access care at an ED. In making this observation, parents acknowledged that they choose to attend EDs with their children because they were not able to get an appointment from a primary care service before work and because of the unavailability of other services (Butun & Hemingway, 2018).

What is not a significant factor?

Cost

While there is a perception amongst clinicians that cost (i.e. no cost to attend an ED) is a predominate factor for primary care type patients present to ED, there is evidence to suggest that introducing a fee or gap payment will have a minimal impact on diverting consumers (Masso et al., 2007). Moreover, in the research explored for this literature review, cost did not appear to be a significant factor amongst people when deciding where to seek treatment (e.g. Unwin et al., 2016).

For example, one study (Bingham et al, 2015) surveyed parents or guardians of children presenting to ED with low urgency conditions. This study found that the introduction of a co-payment to general practice or ED is unlikely to affect health service use. The study also found that a $7 co-payment to ED would not influence the decision to attend for 90% of parents/guardians who participated. Of the remaining 10% of people surveyed, 7% of parents/guardians noted that they would be more likely to attend general practice, and 3% would take care of the problem at home.

The above noted results are consistent with those from the 2016 Survey of Health Care in which less than 1% of people surveyed indicated that the cost of seeing a GP or other health professional was the reason behind their most recent visit to ED (ABS, 2017a).

Are there specific population cohorts that are more likely to present to ED?

Paediatrics and adolescents

Recent research suggested that the greatest impact to primary care type presentations to ED could be made if children and young adults are encouraged to visit general practice. Of all population cohorts investigated for this literature review, the research on paediatric primary care type ED attendances are recent and extensive, highlighting the magnitude of the issue.

An analysis of the Victorian emergency minimum dataset (VEMD) identified that the age group with the highest proportion of primary care type visits to the ED between 2002-2013 was the 0-4 year age group. This group was followed by those aged 20-24 years old, with the proportion of people attending the ED decreasing with the increase in patient age (Freed et al, 2015).

The degree of paediatric presentations in ED is also an international issue. For example, one American study has observed that non-urgent conditions to a paediatric ED accounted for 58% to 82% of visits (Berry et al, 2008). This has been reinforced with a local study in which one Melbourne hospital projected that paediatric ED presentations (aged 0-14 years) would increase at a higher rate than for adults (aged 15+ years) over the next decade (Austin Health, 2016).

Several studies argued that parents bring their children to ED inappropriately due to poor service design rather than their health behaviours (e.g. Hendry et al., 2005). When parents or guardians notice that their children are ill, their goal is to bring their children immediately to what is available and is most capable of helping their children – and this instinct or motive is difficult to change. As such, they are unlikely to agree that their visit to ED was inappropriate (Wong et al., 2015).

In contrast to paediatrics, the research available on adolescents and young adults was limited. In exploring the reasons contributing to the rising number of young adults and adolescents attending ED over the past decade in NSW, one study (Jenkins & Katz, 2015) associated this with risky behaviours, mental health issues, interpersonal violence and chronic illness. Anonymity and privacy, opening times, transport and lack of awareness of other service options were identified as barriers for adolescents and young adults in accessing alternative care options to ED (Jenkins & Katz, 2015).

Older people

An ageing population has a major effect on health care delivery, utilisation and cost. In 2016-17, people aged 65 years and over accounted for 21% of all ED presentations in Australia. The representation of older people in EDs surpasses their representation within the general population (of 15% (AIHW, 2018a). That said, the research indicated that this population cohort is not using the ED unnecessarily; rather they are simply in need of more urgent health care.

While evidence suggested that younger adults are more likely to be associated with non-urgent ED use than older adults (Uscher-Pines et al., 2013), older adults are more likely to utilise emergency services, stay in ED for a longer period, be admitted and to have repeat ED visits (Aminzadeh & Dalziel, 2002). As such, when compared to their younger counterparts, older people presenting to ED are more likely to use the ED for valid reasons (Salvi et al., 2007).

People experiencing, or at risk of, homelessness

Homeless adults visit EDs approximately four times more frequently than the general population and are among the highest repeat visitors (Pearson et al., 2007). In one Australian study, 41% of the repeated ED presentations were by people who were homeless (Dent et al., 2003). Another study, which undertook a retrospective review of ED presentations over a 24-month period, discovered that the odds of re-presentation increased threefold for consumers that were homeless when compared to those living in stable housing (Moore et al., 2007). In an American study that interviewed just over 2500 homeless or marginally housed consumers, more than half reported that the ED was their only source of health care. This suggested that the services and convenience offered by ED encouraged greater use (Kushel et al., 2002).

The literature highlighted that those that attend ED frequently are from vulnerable groups with complex care needs, suffering a higher incidence of mental illness and injuries, and experiencing greater disadvantage compared to infrequent ED users (Moore et al., 2007). While frequent ED attendees may increase demand on acute services, the complexity and time required to provide effective treatment to these people may be beyond the scope of general practice, and therefore considered to be reasonable to be provided by ED (Moore et al, 2007).

Aboriginal and Torres Strait Islander

From 2014-15 to 2015-16, in Victoria 59% of ED presentations for Aboriginal and Torres Strait Islander patients occurred in the after-hours period. Of this number, 55% were classified as either semi-urgent or non-urgent (triage Category 4 or 5); this percentage was slightly higher than the proportion for non-Indigenous patients (52%) (AIHW, 2017b).

A review of Australian literature indicated that Aboriginal and Torres Strait Islander peoples attend EDs twice the rate of non-Indigenous people (Thomas & Anderson, 2006). This is also consistent with a recent study, although conducted at a remote ED in Katherine, Northern Territory, that identified a strong connection between frequent attendance at ED (for reasons excluding chronic health conditions) and each of Aboriginal status and homelessness (Quilty et al., 2016).

Despite this information, the research was inconclusive as to whether Aboriginal and Torres Strait Islander people use ED for primary care type presentations at a higher rate than non-Indigenous people (e.g. Thomas et al., 2008).

Culturally and Linguistically Diverse (CALD) groups, refugees and asylum seekers

There is international research suggesting that consumers from non-English speaking backgrounds are more likely to seek care at an ED inappropriately. However, similar evidence is not available in the Australian context (Mahmoud et al, 2015).

Only one study (Mahmoud et al., 2015) was identified that explored the subjective reasons why immigrants to Australia (non-English speaking background (NESB) and English-speaking background not born in Australia (ESB-NBA)) attended EDs. The study found that NESB patients triaged as Categories 3-5 were less likely to consider contacting a GP before attending the ED. This was because they either did not have a regular GP or due to a belief that it would take a long time to obtain an appointment with their GP. The same study also found that newly arrived immigrants to Australia were less likely to consider contacting a GP due to limited knowledge of the health system and services available.

Research specific to the ED attendance of refugees or asylum seekers in Australia could not be located.

People with a disability

There was limited research on the nature of ED presentations by consumers with a disability. Of the literature available, consumers with an intellectual or developmental disability was explored. Similar research conducted could not be identified within the Australian context.

The available research suggested that patients with a developmental disability were more likely to present to ED, including during the AH period, when compared to the general population (Lunsky et al., 2012). This prevalence of presentations to ED then increased further for patients with a developmental disability that had been diagnosed with a serious mental illness.

Research on this topic also identified that patients with a disability that had access to some form of primary care were more likely to visit the ED when compared to those who did not., This reflects the fact that people with development delay may have multiple physical and psychological needs and need to access various health services concurrently. However, an earlier study found that the ratio of semi-urgent and non-urgent presentations compared to the more urgent categories was similar across consumers with and without an intellectual development disability (Lunsky et al., 2011).

Given the inconsistency in the research identified, and the fact that there is no research that relates to Australia specifically, further research is required to understand the health seeking behaviours of people with a disability in the AH period.

LGBTIQ consumers

To date, Victorian hospitals do not systematically capture whether a consumer identifies as lesbian, gay, bisexual, transgender, intersex or queer (LGBTIQ). There is also limited research documented in

Australia that can be used to describe the nature of ED presentations by consumers that identify as LGBTIQ.

The limited research outside of Australia does suggest, however, that consumers that have transgender or gender nonconforming experiences tend to avoid EDs or have negative experiences when they do interact with the ED. This is because of the lack of provider sensitivity towards this patient population (Chisholm-Straker et al., 2017; Scheck, 2015). This is similar to a Canadian study that assessed the ED visits of approximately 400 transgender patients and found that more than half had negative experience, and 21% were likely to avoid the ED due to fear of discrimination (Bauer et al., 2014).

Regional and rural communities

Australians living in rural and regional remote communities generally experience poorer health outcomes when compared to their metropolitan counterparts (AIHW, 2008). This is reflected in the frequency of ED presentations amongst people living in these communities.

Findings from the Patient Experiences in Australia 2016-17 survey indicate that people living in outer regional, remote or very remote regions were approximately twice as likely to report that they presented to an ED because a GP was not available when required (29% compared to 17% of those living in major cities) (ABS, 2017b). People living in inner regional areas were 1.5 times more likely to present to ED than metropolitan residents (National Health Performance Authority, 2016). In terms of what proportion of these presentations are low urgency or could be treated by a GP, one Tasmanian study (Allen et al., 2015) found that this ranged from 15% to 69% in a rural hospital ED. Using four different methodologies, the study found that GP-type presentations were higher in rural ED compared to urban ED settings.

Other than the lack of access to a GP, there were no other significant factors that contributed to the ED presentation of consumers living in rural/regional areas for non-urgent conditions that could be identified in the literature.

Are there specific clinical or demographic variables that are associated with non-urgent ED presentations?

Demographic variables

It is widely published in Australian that certain demographic factors are associated with poor health outcomes but the extent to which they influence the likelihood of ED presentations is unclear.

For example, it is generally accepted that socioeconomically disadvantaged groups experience a poorer health status due to their increased likelihood of engaging in behaviours that are consistent with their high-risk factor profile (e.g. Turnell et al., 2006). Low income and education were also found to be predictors of poor health outcomes (Shea et al., 2016). Many articles (e.g. Lee, 2000 and Greiner et al., 1996) also suggest that self-reported or assessed health, which is often a proxy for the actual health status of an consumer, were predicative of poor health outcomes and functional decline. In general, the higher a person's income, education and level and self-reported health, the healthier they tend to be. However, this association between these demographic factors and frequency of ED presentations could not be found in the limited evidence available.

Of the demographic factors assessed in literature, age was the only factor found to have an association with non-urgent ED use. In one systematic review by Uscher-Pines et al. (2013), younger age groups were found to have an increased likelihood of visiting the ED for non-urgent reasons compared to older adults. The review also could not find any association with race, gender or income. This is consistent with a recent Australian study by Dinh et al. (2016), which found that the strongest predictors of low acuity ED presentations were those under the age of 40. In terms of education, one Brazilian study (Carrett et al., 2007) found that only older adults (> 50 years) and higher levels of education had a slight association with

higher inappropriate ED use. Weak associations were also found between socio-economic disadvantage (lower SEIFA score) and presentations to ED for non-urgent care (e.g. Williams et al., 2009 and Dinh et al., 2016).

Clinical variables

In relation to clinical conditions, nationally, the most common presentation to ED was for injury, poisoning and certain other consequences of external causes in 2016-17, followed by symptoms, signs and abnormal clinical and laboratory findings (AIHW, 2017a). For Category 4 and Category 5 presentations in 2016-17, major and minor single site injuries accounted for the largest proportion (21.9% and 9.8% respectively), followed by illness of the digestive system (9.6%) (AIHW, 2017a).

While injuries constitute the large proportion of ED presentations, there is evidence to indicate the association, or lack of association, between non-urgent ED presentations and certain clinical variables or conditions.

This is as follows:

Mental health

Mental health is a crucial component of good general health. People with a mental and behavioural condition are almost twice as likely than those without a mental health and behavioural condition to have diabetes, three times as likely to report chronic obstructive pulmonary disease, and twice as likely to report osteoporosis (ABS, 2015). As such, various studies suggest that mental health is linked to high health care utilisation.

Articles, such as Behr & Diaz (2016), indicate that frequent utilisation of the ED has been associated with patients with cognitive impairments, psychiatric conditions, psychological distress and depression. Suicidality and deliberate self-harm are also contributors to increased ED attendance (Behr & Diaz, 2016). According to Ballard et al. (2017), many children and adolescents present to ED for treatment of their suicidal thoughts or after a suicide attempt, and parents report suicide risk factors such as depression, anxiety, aggression, and alcohol or drug abuse.

In 2016-17, 3.6% of all presentations to Australian EDs were mental health-related. Of this number, 31.8% were classified as a Category 4 or Category 5 presentation (AIHW, 2017a). It is unclear, on a national level, what proportion of mental health-related presentations occurred during the AH period.

With regards to primary health services, excluding back pain, one Australian study by Knox & Britt (2004) found an association between anxiety and depression, and a greater patient demand for general practice services in comparison to all other health problems. Similarly, a British study by Little et al. (2001) identified higher than average attendance rates in health consultations among adults with depression and anxiety.

Chronic conditions

While consumers with multiple chronic conditions have been found to be frequent attendees in general practice (e.g. Gill et al., 1999), this association has not been found in attending ED.

In exploring the relationship between inappropriate attendance at ED by adults and local general practices, one British study by Martin et al. (2002) found no association with chronic physical illness. Similar results were found in a Brazilian study (Carret et al., 2007) where inappropriate use of the ED was connected with those who self-reported an absence of chronic diseases. This pattern is consistent with the evidence on ED presentations by older adults given they are an age group that is more susceptible to chronic and comorbid diseases, which often requires more immediate attention and complex care.

Palliative care

Consumers seek care from an ED for relief of pain and other burdensome symptoms. However, increasingly, these consumers are older and more medically complex (Grudzen et al., 2011). Due to the large gaps that exist in the delivery of palliative care services in the outpatient settings, the ED is perceived as the only place that can provide needed interventions to manage pain crises or other symptoms, particularly outside of business hours (Grudzen et al., 2011). However, there is research to suggest that most of these presentations could have been avoided if they were managed in another manner (e.g. GP) or setting (e.g. admission to a hospice).

For example, in one Canadian retrospective study of palliative care patients who attended ED over a six-month period, it found that 63% of presentations occurred outside business hours, 51.5% were deemed potentially avoidable and one third were referred by an on-call GP (Wallace et al., 2012). This is consistent with another Canadian study (Barbera et al., 2010) that also found that many ED presentations made by patients with cancer near the end-of-life may have been unnecessary.

What other AH service options are available and are they making an impact on EDs?

There are a number of AH care options that exist; however, access and availability vary considerably across Victoria. Besides the ED, available options include practice-based services, medical deputising services (e.g. home visits), and telephone triage and advice services (e.g. AH GP helpline, Healthdirect Australia and private health insurance services). There is conflicting research as to whether these alternatives are making an impact on the rate of non-urgent presentations in ED.

An analysis (McKenzie et al., 2016) of calls to the 'after hours GP helpline' over a two-year period (2011-13) found that the service was well utilised by parents of young children, women, those who identified as Aboriginal and Torres Strait Islander, and those living in remote areas and less socio-advantaged areas. However, as a proportion, older people and rural residents appeared to be low users of the service.

In contrast, another study that surveyed parents or guardians of children with low urgency conditions that attended four hospitals in metropolitan Melbourne reported that few attempted to contact an after-hours GP service or nurse telephone triage service prior to presenting to ED (Freed et al., 2016). Another paper of the same survey found that of the 7% of participants that received a home visiting GP, half of the parents were advised to go to the ED, and more than a quarter went to ED as they were still worried about their child's condition (Allen et al., 2016).

Just as the AIHW (2017a) noticed an increase in the number of ED presentations between 2011-12 and 2015-16, so too has the number of claims for all after hours Medicare Benefits Schedule (MBS) item numbers, which are utilised by after hour medical deputising service (MDS) providers (de Graaff et al., 2017). While after hour MDSs were introduced as mechanisms to support general practice during the after hours, it is questionable whether they are alleviating any demand on EDs despite their growth in recent years.

THE ROLE OF PHNS IN COMMISSIONING AFTER HOURS PRIMARY HEALTH CARE

The 2014 review of the state of AHPHC in Australia confirmed the role of after-hours primary health care as '*a central tenant of a high quality health care system*' (Jackson, 2014). In particular, the review noted that the AHPHC system had an important role in delivering positive health outcomes for the community:

> *When people become ill outside normal business hours, they often need to access after-hours health care services or advice...Primary health care is often the first port of call in meeting after hours health care needs across the country and in doing so reducing health inequity, lowering rates of avoidable hospitalization and improving health outcomes*
>
> (Jackson, 2014)

The review recommended the distribution of funding to PHNs to take a positive role in improving AH service integration and innovation, with a focus on addressing gaps in service provision, particularly for vulnerable groups.

Following the establishment of PHNs in July 2015, the Commonwealth Government provided funding to PHNs to work with local key stakeholders to improve access that are tailored to the specific needs of their community. In essence, the remit of the PHN AH program is to:

- Increase the efficiency and effectiveness of AH primary health care for patients, particularly those with limited access; and
- Improve access the AH primary health care through effective planning, coordination and support for population-based AH primary health care.

To ensure investments are needs-based, locally-appropriate, patient-centred and demonstrate value for money, each PHN operates within a commissioning environment. The regional commissioning of services enables strategic and targeted actions to address the specific needs of the catchment, including the diverse needs of population sub-groups to support health equity.

With respect to NWMPHN, the organisation has made, and continues to make, significant investments in developing an effective and efficient AHPHC system by commissioning high quality, innovative and locally relevant solutions as guided by their Needs Assessment.

Key findings:

- Besides GP unavailability, there are other reasons to explain why there is a growing number of GP-type presentations in ED. These include, perceived seriousness or urgency of conditions and the services/feature offered by ED. These themes were consistent across the general population.
- The attendance of children in EDs for low urgency conditions has been extensively explored in research, which reflects the magnitude of the presentations made by this population cohort in Australian EDs.
- There is sufficient research to suggest that Aboriginal and Torres Strait Islander people, people experiencing homelessness and older adults tend to have more frequent interactions with EDs. However, the proportion of these interactions that were non-urgent and could be effectively managed in primary care is unclear and therefore requires further research.
- There was limited local evidence to describe the nature of ED attendances by people with a disability, people who identify themselves as LGBTIQ, and consumers with a CALD, refugee or asylum seeker background. It would therefore be useful to undertake further research in relation to these cohorts to be able to draw a more definitive conclusion.
- Age was the only demographic factor found to have an association with non-urgent presentations. However, socioeconomic disadvantage, low income and education levels, and poor self-reported health are predictors of poor health outcomes. Mental health was the only clinical variable associated with high ED and general practice utilisation.
- Although well utilised, it is not clear whether alternative after hour services are having an impact in reducing the demand on EDs.

Implications:

- Based on the key findings described above, the Composite Index Score includes the following variables as data indicators: age (with an emphasis on young children and older adults), humanitarian settlers, homeless population, CALD consumers, socio-economic disadvantage, psychological distress, chronic illness and self-reported health status.
- Population cohorts that have limited evidence and quantitative data to describe the nature of their attendance in ED (e.g. LGBTIQ populations) have formed the basis of the qualitative interviews (Sprint 5 and 6).

3. DETERMINING GAPS IN AH PRIMARY CARE IN NWMPHN

WHAT IS DRIVING AFTER HOURS NEEDS IN THE NWMPHN CATCHMENT? (AH NEED INDEX)

Guided by the key findings of the literature review, this section identifies the key demographic factors informing the need for AHPHC services. It is these factors that have been used to inform the calculation of the Composite Index Score, which is detailed in *Section 4.*

Although it is understood anecdotally that the NWMPHN region is home to many people who identify themselves as lesbian, gay, bisexual, transgender, intersex or queer (LGBTIQ), publicly available data could not be found to describe their location across the catchment. Therefore, unfortunately, this cohort is not represented in the Composite Index Score.

Population size and growth

The NWMPHN catchment covers 3,212 km^2 and stretches from Richmond in the inner eastern suburbs, past Bacchus Marsh in the west, from coastal Cocoroc in the south-west, to Lancefield and beyond in the north. In 2016, an estimated 1,707,375 individuals resided in the region[1].

The NWMPHN catchment is diverse in its geographic, culture and socio-economic status. It crosses 12 metropolitan and one regional Local Government Areas (LGAs): Melbourne, Yarra, Maribyrnong, Darebin, Hobsons Bay, Moonee Valley, Moreland, Hume, Brimbank, Melton, Wyndham, Macedon Ranges and Moorabool. As **Table 1** and **Figure 2** highlight, Wyndham, Hume, and Brimbank and are the most populated LGAs in the catchment.

Table 1: Estimated resident population in each NWMPHN LGA in order of highest total number (PHIDU, 2016)

Rank	LGA	Estimated resident population
1	Wyndham (C)	228,088
2	Hume (C)	207,830
3	Brimbank (C)	205,741
4	Moreland (C)	172,091
5	Darebin (C)	155,022
6	Melbourne (C)	148,039
7	Melton (C)	141,749
8	Moonee Valley (C)	122,968
9	Hobsons Bay (C)	93,392
10	Yarra (C)	93,380
11	Maribyrnong (C)	87,355
12	Macedon Ranges (S)	47,512
13	Moorabool (S)	32,658

Table 2: Anticipated projected growth of LGA population by 2031 ranked in order of highest change (%) (Victoria in Future 2016)

Rank	LGA	Projected population growth by 2031
1	Melton (C)	92.5%
2	Melbourne (C)	69.3%
3	Wyndham (C)	63.9%
4	Maribyrnong (C)	52.5%
5	Hume (C)	46.8%
6	Moorabool (S)	43.6%
7	Yarra (C)	31.8%
8	Moreland (C)	26.5%
9	Darebin (C)	25.2%
10	Macedon Ranges (S)	24.9%
11	Moonee Valley (C)	20.2%
12	Hobsons Bay (C)	17.0%
13	Brimbank (C)	13.0%

By 2031, the NWMPHN population is forecast to increase to 2,398,742, representing a growth of 40%. Wyndham will continue to be the most populated LGA in the catchment, followed by Hume and Melton (see **Figure 3**). However, as **Table 2** highlights, Melton is anticipated to have the highest population growth in the 15 years between 2016 and 2031 with a 92.5% increase, followed by Melbourne with 69.3% and Wyndham with 64.0%. Brimbank is forecasted to have the slowest rate of growth with 13.0% increase.

[1] Demographic data. http://www.health.gov.au/internet/main/publishing.nsf/Content/PHN-Demographic_Data

Figure 2: Estimated Resident Population of each NWMPHN LGA (2016)

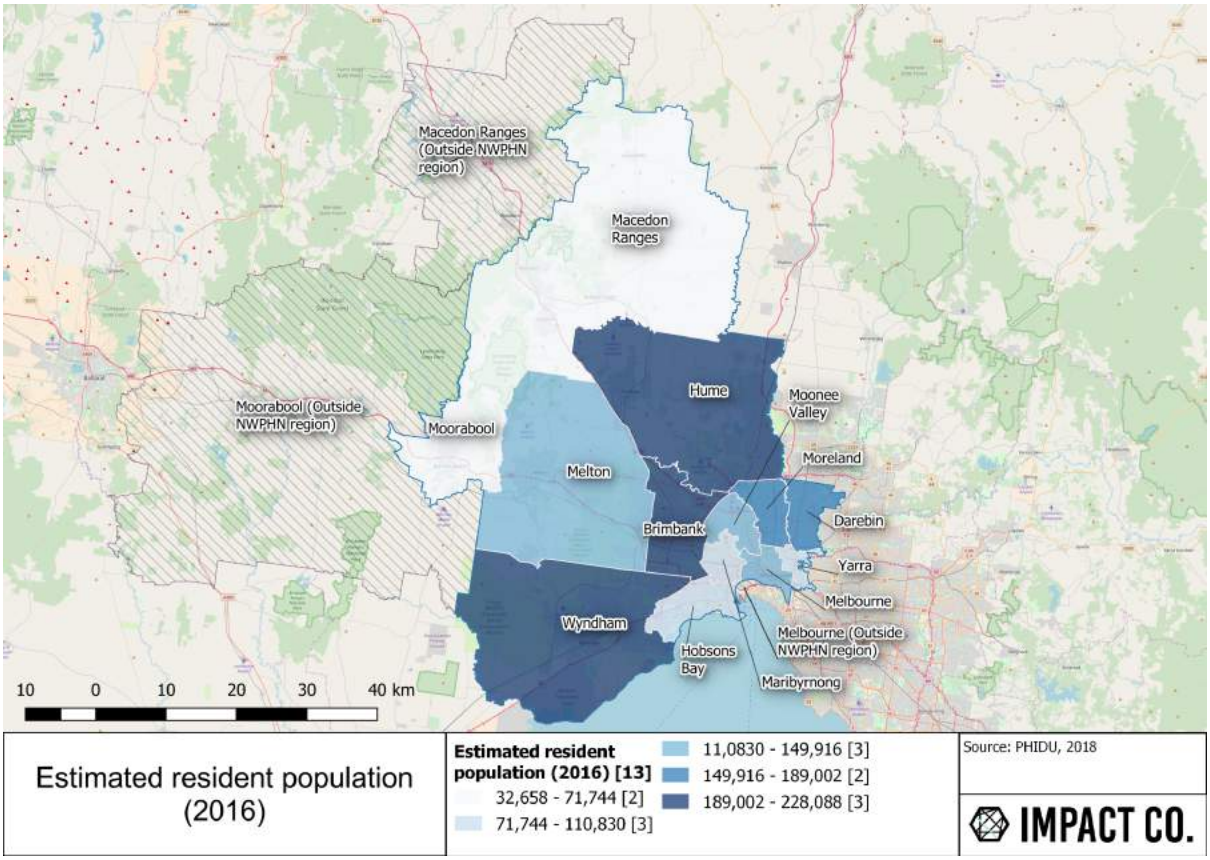
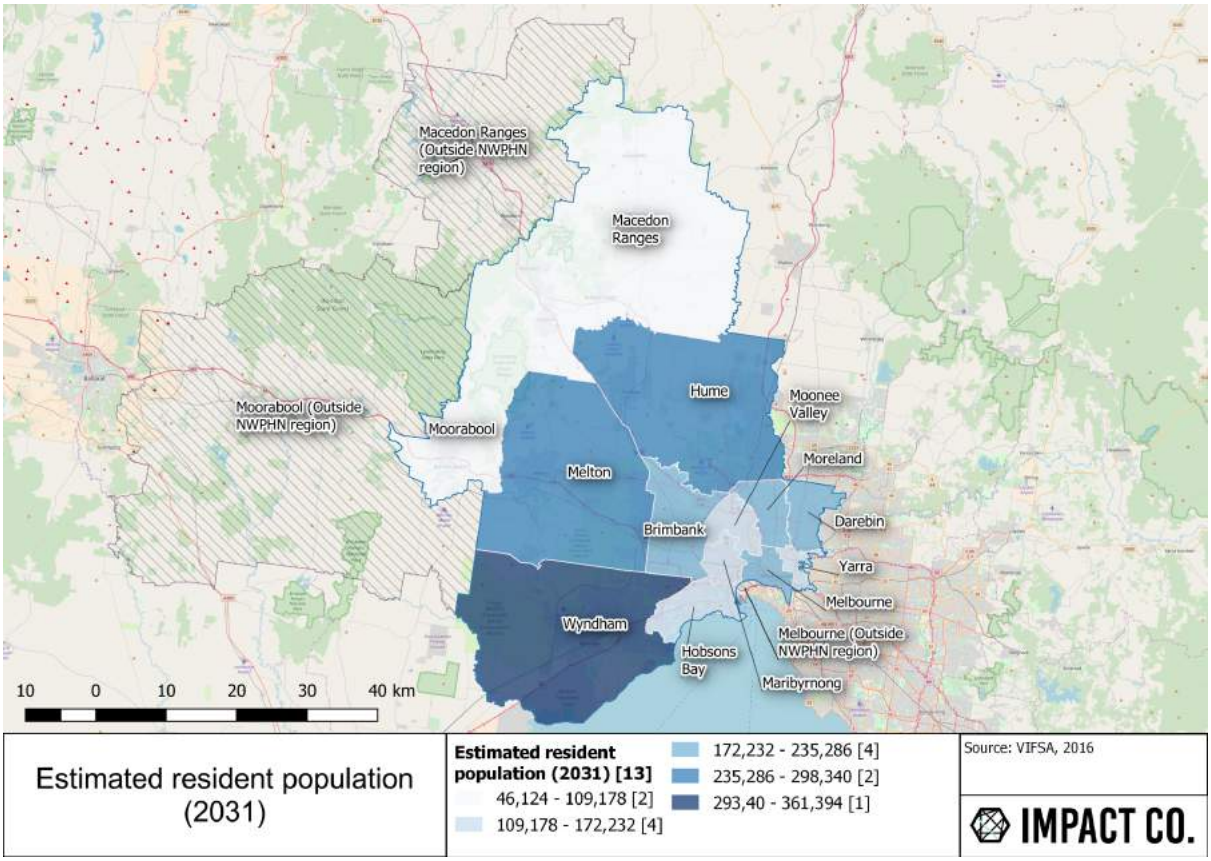


Figure 3: Population growth forecast to 2031 according to LGA



Children and youth

An estimated 119,450 children between the ages of 0-4 live in the LGAs within the NWMPHN catchment, representing 7% of the region's total population[2].

The proportion of children aged 0-4 years varied across the catchment, ranging from 10.1% in Wyndham to 3.4% in Melbourne (see **Table 3** and **Figure 4**).

Table 3: Proportion of the population aged 0-4 years in order of highest proportion by LGA (PHIDU, 2016)

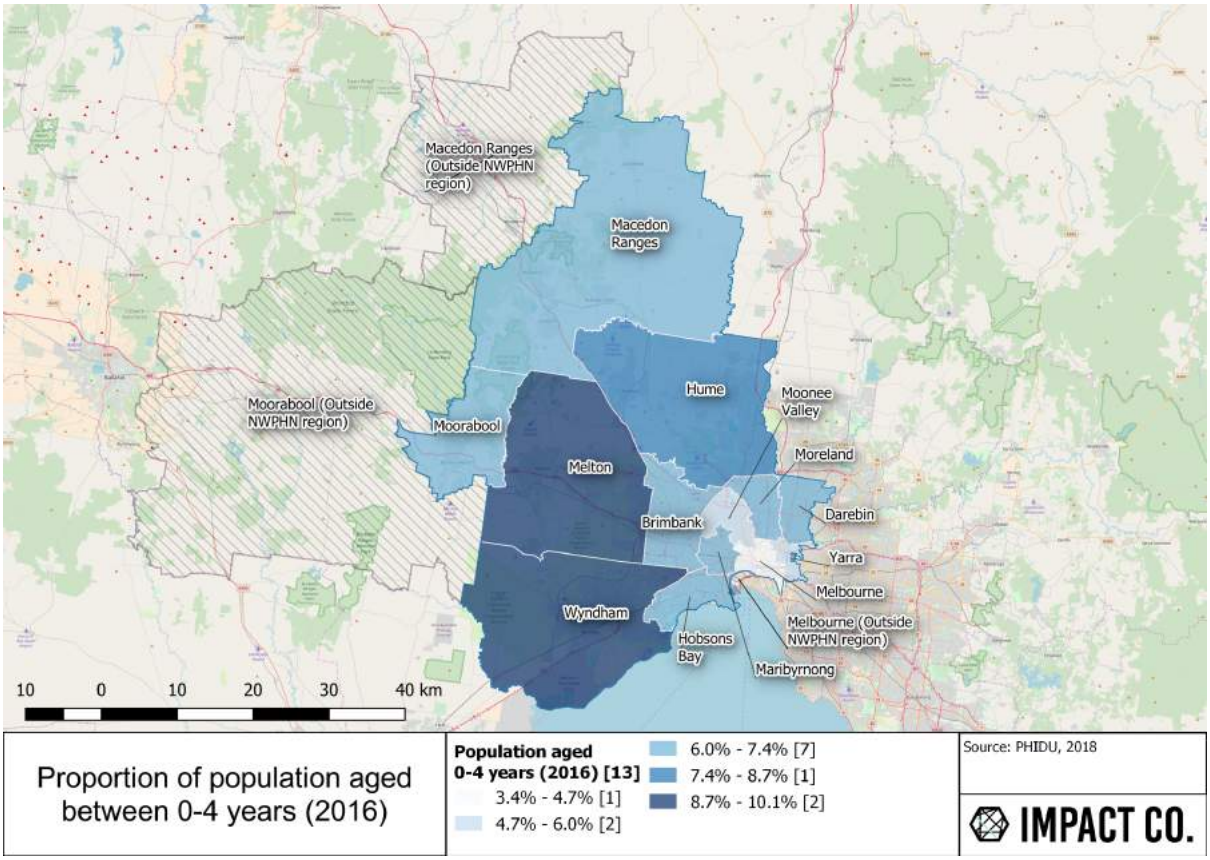
Rank	LGA	Proportion of population aged 0-4 years
1	Wyndham (C)	10.1%
2	Melton (C)	8.7%
3	Hume (C)	8.1%
4	Hobsons Bay (C)	7.1%
5	Maribyrnong (C)	7.0%
6	Brimbank (C)	6.8%
7	Moorabool (S)	6.7%
8	Macedon Ranges (S)	6.7%
9	Moreland (C)	6.5%
10	Darebin (C)	6.2%
11	Moonee Valley (C)	5.9%
12	Yarra (C)	4.8%
13	Melbourne (C)	3.4%

By 2031, the number of children aged 0-4 is expected to increase to approximately 151,173. Although this represents a growth of 27%, the proportion of 0-4 year olds within the region's overall population will decline slightly to 6.3% during this time.

Despite this, some LGAs are projected to experience significant growth in the number of young children in this time period (see **Table 4**). For example, Melton and Melbourne are projected to increase by 77% and 70.7%, respectively. In contrast, Brimbank is forecast to have the least amount of growth in the number of children aged 0-4 with 2.3%, followed by Hobsons Bay with 5.2%.

As demonstrated in **Figure *5***, Wyndham and Hume will have the highest number of children aged 0-4 in the region.

Figure 4: Proportion of population aged 0-4 years according to LGA

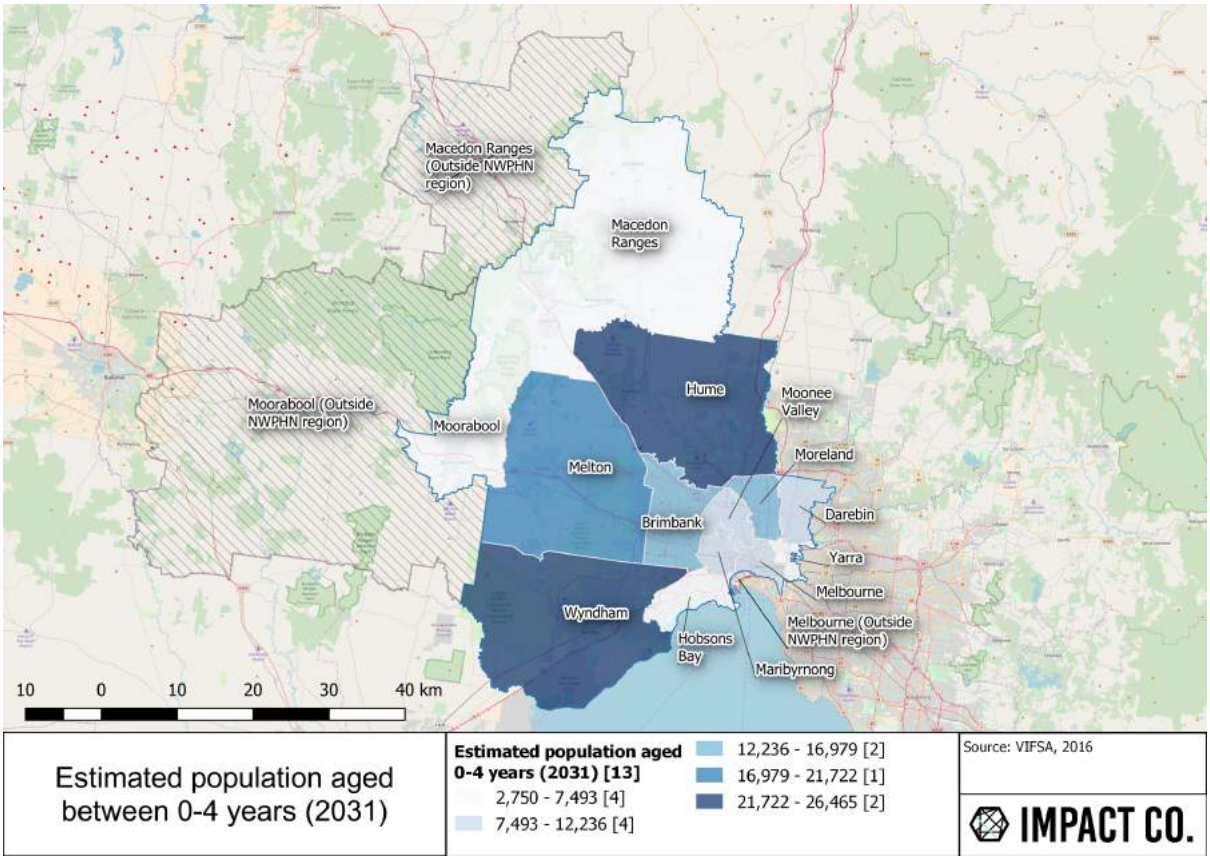


[2] PHIDU, 2016

Table 4: Projected change in the proportion of the population aged 0-4 years from 2016 to 2031 in order of highest proportion by LGA (VIFSA, 2016)

Rank	LGA	Projected population growth by 2031
1	Melton (C)	77.0%
2	Melbourne (C)	70.7%
3	Hume (C)	34.2%
4	Moorabool (S)	33.5%
5	Maribyrnong (C)	30.8%
6	Moreland (C)	24.6%
7	Darebin (C)	19.2%
8	Macedon Ranges (S)	18.7%
9	Yarra (C)	18.3%
10	Moonee Valley (C)	16.9%
11	Wyndham (C)	14.1%
12	Hobsons Bay (C)	5.2%
13	Brimbank (C)	2.3%

Figure 5: Estimated resident population aged 0-4 years in 2031



Adults aged 65 years and over

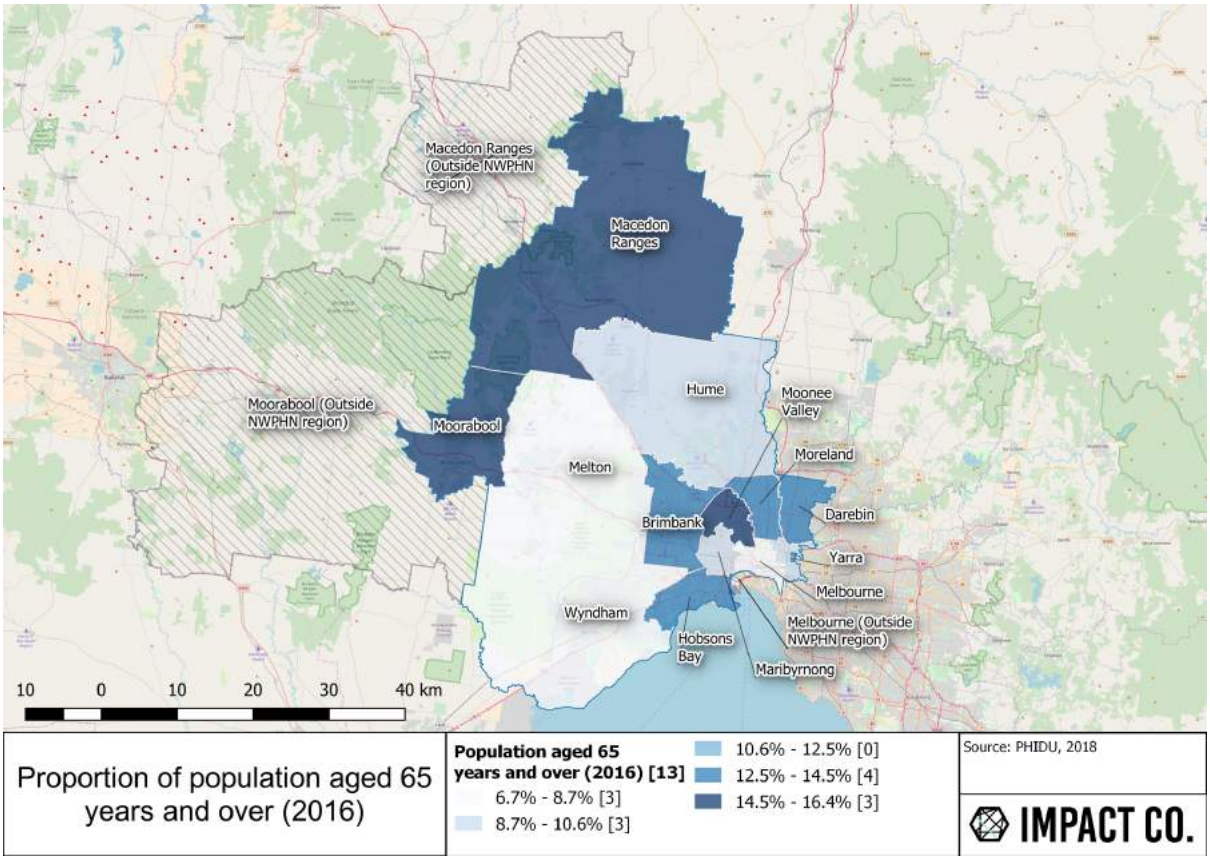
In 2016, there were 189,567 older adults (aged 65 years and over) residing in the NWMPHN region, representing 11% of the total population[3].

The proportion of older adults differs slightly across the LGAs. As outlined in **Table 5**, Macedon Ranges had the highest proportion of older adults with 16.4% followed by Moonee Valley with 15.6% and Moorabool with 15.1%. In contrast, Wyndham and Melbourne had the lowest proportion of older adults with 7.4% and 6.7% respectively. This is also visually represented in **Figure *6*** .

Table 5: Proportion of the population aged 65 years and over in order of highest proportion by LGA (PHIDU, 2016)

Rank	LGA	Proportion of population aged 65 years and over
1	Macedon Ranges (S)	16.4%
2	Moonee Valley (C)	15.6%
3	Moorabool (S)	15.1%
4	Hobsons Bay (C)	14.4%
5	Darebin (C)	13.9%
6	Moreland (C)	13.4%
7	Brimbank (C)	13.2%
8	Yarra (C)	10.4%
9	Hume (C)	10.1%
10	Maribyrnong (C)	9.6%
11	Melton (C)	8.2%
12	Wyndham (C)	7.4%
13	Melbourne (C)	6.7%

Figure 6: Proportion of the population aged 65 years and over



Within a 15-year period, the number of older adults is forecast to grow to 347,654, increasing the proportion of the total population to 15% in 2031.

[3] PHIDU, 2016

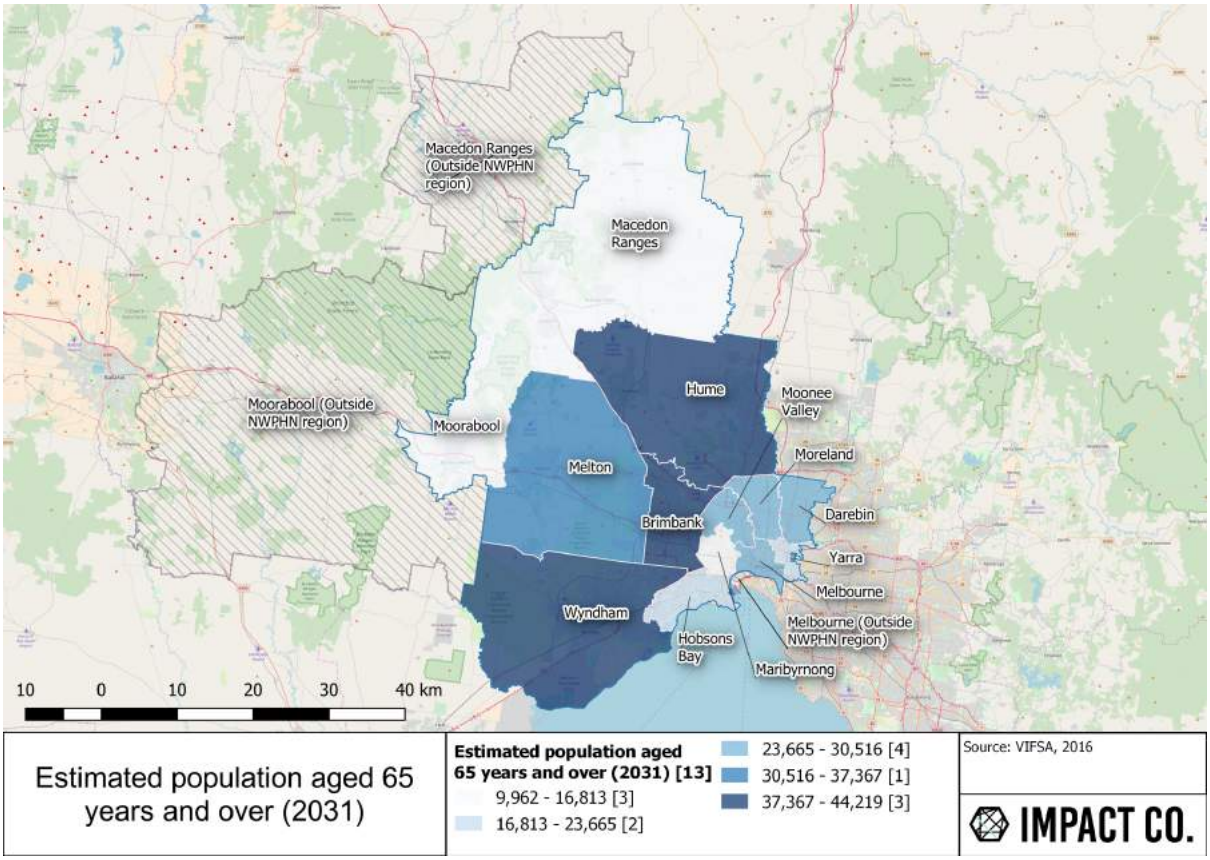
Some LGAs are projected to experience significant growth in the number of older adults. As **Table 6** indicates, the number of older adults in Wyndham is forecast to grow by 189.4% by 2031, which is an annual growth rate of 13%. Melbourne will experience the second fastest growth in older adults at 140.1%. The lowest population growth is expected to occur in Moreland (23.3%) and Darebin (32.6%).

In terms of actual numbers, Wyndham, Brimbank and Hume will have the highest population of adults aged 65 years and over in the NWMPHN catchment by 2031. This is reflected in **Figure 7**.

Table 6: Projected change in the proportion of the population aged 65 years and over from 2016 to 2031 in order of highest proportion by LGA (VIFSA, 2016)

Rank	LGA	Projected population growth by 2031
1	Wyndham (C)	189.4%
2	Melbourne (C)	140.1%
3	Melton (C)	125.3%
4	Hume (C)	115.2%
5	Moorabool (S)	102.8%
6	Maribyrnong (C)	94.4%
7	Macedon Ranges (S)	78.5%
8	Yarra (C)	72.7%
9	Brimbank (C)	51.9%
10	Hobsons Bay (C)	51.8%
11	Moonee Valley (C)	36.3%
12	Darebin (C)	32.6%
13	Moreland (C)	23.3%

Figure 7: Estimated resident population aged 65 years and over in 2031



Aboriginal and Torres Strait Islander peoples

Approximately 10,138 people identified as being of Aboriginal or Torres Strait Islander descent reside in the region[4].

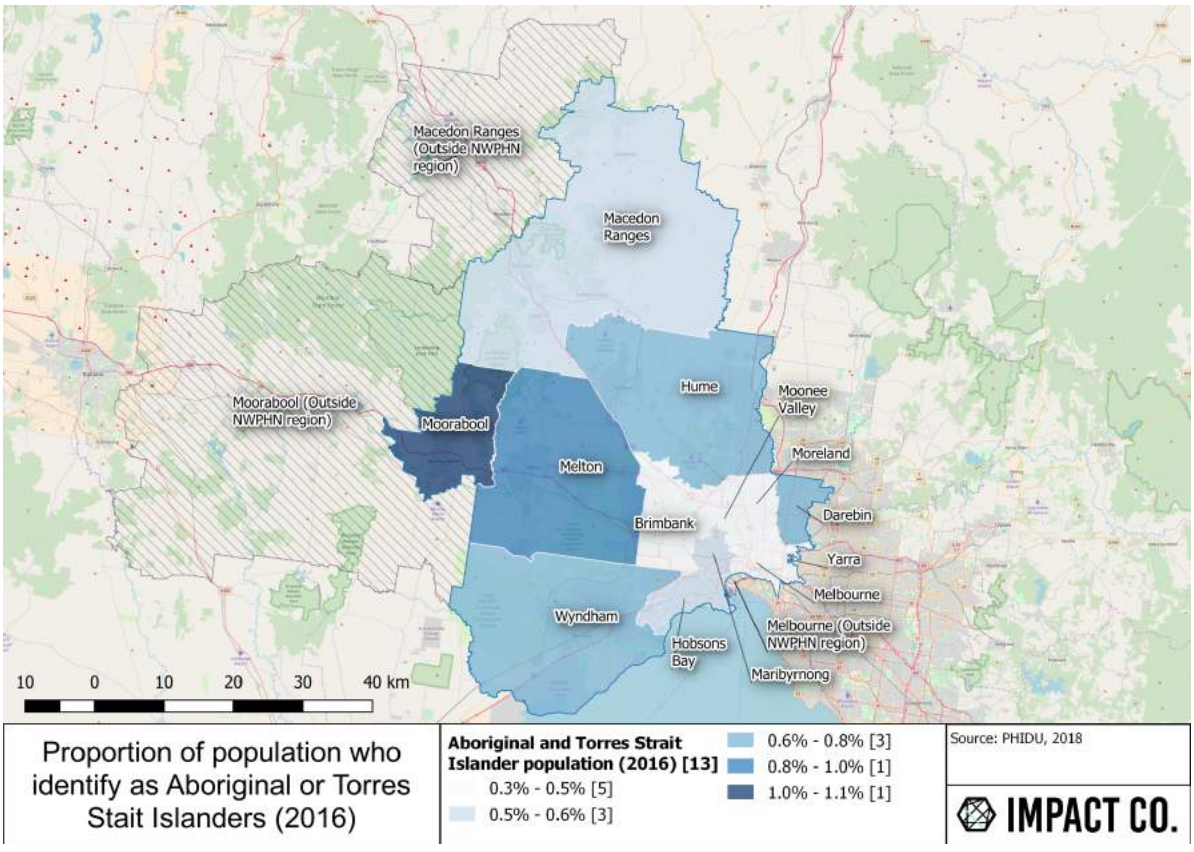
Of the total Aboriginal and Torres Strait Islander population living in the region, the majority resided in Wyndham (17.1%), Hume (14.4%) and Melton (12.7%). In contrast, Yarra (3.8%), Macedon Ranges (3.65) and Moorabool (2.9%) had the lowest population proportions.

However, as **Table 7** and **Figure *8*** indicate, Moorabool had the highest proportion of residents who identified as being of Aboriginal or Torres Strait Islander descent with 1.1%. Melbourne had the lowest proportion with 0.3%.

Table 7: Proportion of all residents who identify as Aboriginal and/or Torres Strait Islander by LGA ranked according to highest proportion (PHIDU, 2016)

Rank	LGA	Proportion of residents who identify as Aboriginal and/or Torres Strait Islander
1	Moorabool (S)	1.1%
2	Melton (C)	0.9%
3	Wyndham (C)	0.8%
4	Darebin (C)	0.8%
5	Hume (C)	0.7%
6	Macedon Ranges (S)	0.6%
7	Hobsons Bay (C)	0.5%
8	Maribyrnong (C)	0.5%
9	Moreland (C)	0.5%
10	Yarra (C)	0.4%
11	Brimbank (C)	0.4%
12	Moonee Valley (C)	0.4%
13	Melbourne (C)	0.3%

Figure 8: Proportion of the population who identify as Aboriginal and/or Torres Strait Islander



[4] PHIDU, 2016

Socio-economic disadvantage

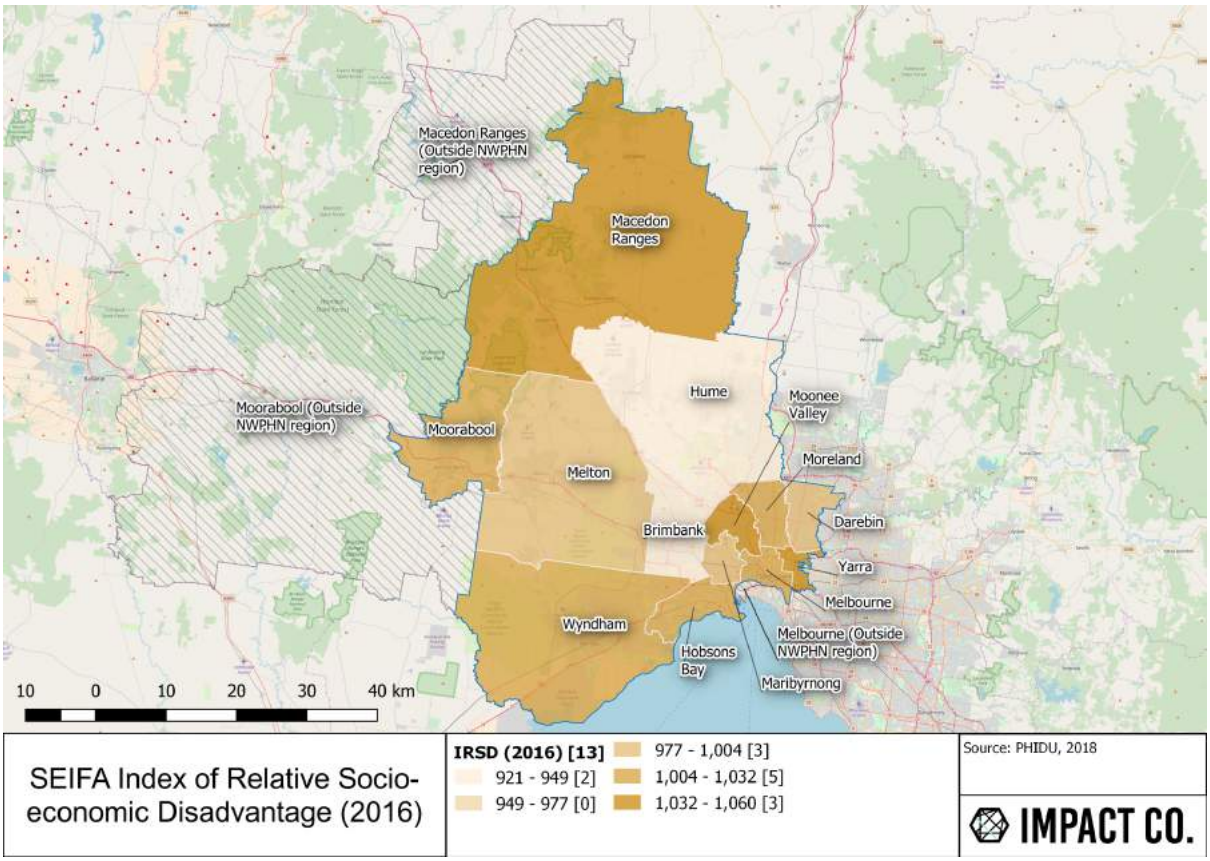
The Socio-economic Indexes for Areas (SEIFA) ranks areas across Australia according to a number of different Census variables, including: income, education levels, employment, and housing conditions. The Index of Relative Socio-economic Disadvantage (IRSD) is a general socio-economic index that summarises a range of information about the economic and social conditions of people and households within an area. A low score indicates relative greater disadvantage and high scores indicate relative lack of disadvantage.

Table 8: IRSD scores for each LGA ranked in order of most to least disadvantaged (PHIDU, 2016)

Rank	LGA	IRSD score
1	Brimbank (C)	921
2	Hume (C)	947
3	Melton (C)	994
4	Maribyrnong (C)	995
5	Darebin (C)	1004
6	Wyndham (C)	1009
7	Melbourne (C)	1010
8	Moorabool (S)	1010
9	Moreland (C)	1014
10	Hobsons Bay (C)	1015
11	Moonee Valley (C)	1035
12	Yarra (C)	1035
13	Macedon Ranges (S)	1060

Figure 9 illustrates the variation of IRSD across the LGAs in the catchment and suggests that the outer suburban areas of Brimbank and Hume experienced greater levels of disadvantage. On the other side of the spectrum, Moonee Valley, Yarra and Macedon Ranges experienced the least disadvantage. The 13 LGAs are ranked in order of most to least disadvantaged by IRSD in Table 8.

Figure 9: Map of IRSD by LGA



Cultural diversity

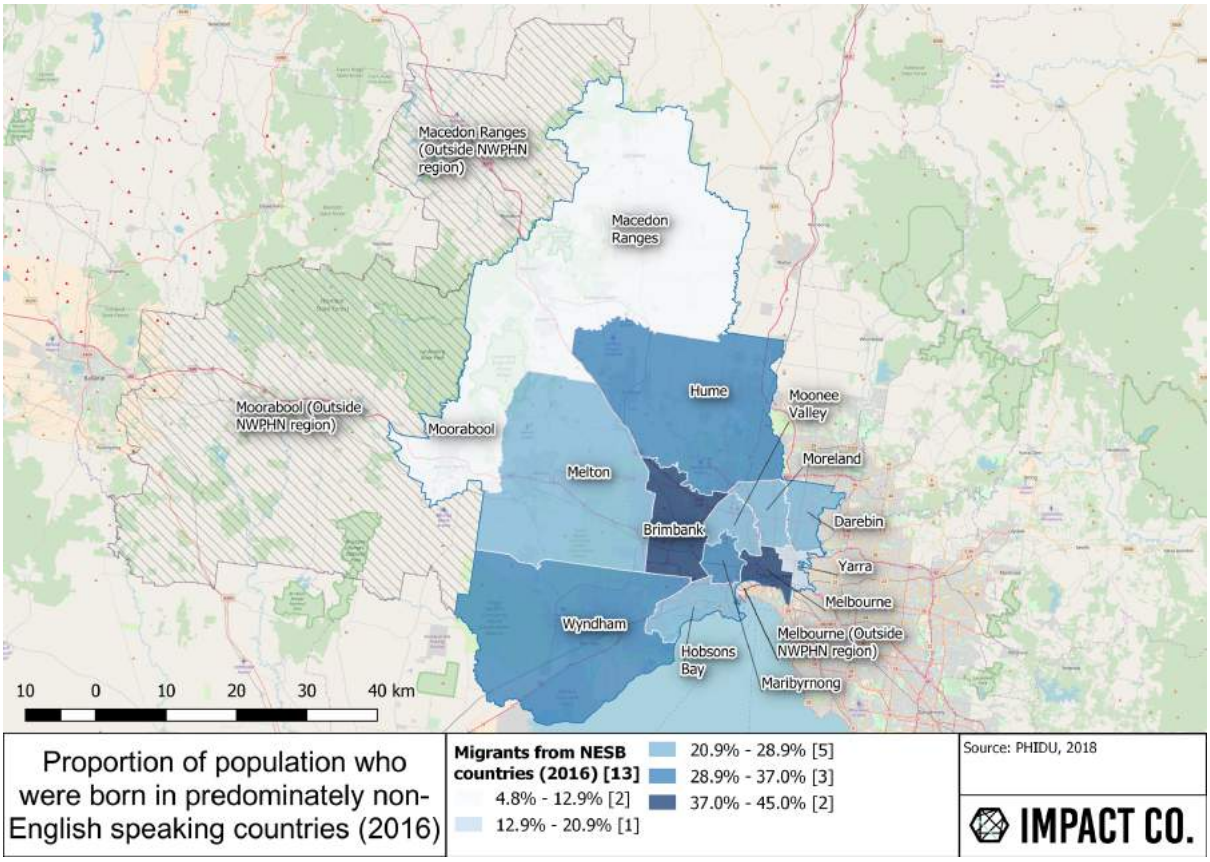
The NWMPHN population is rich in its cultural diversity, with approximately 44% of residents born in a country other than Australia[5].

Melbourne, with 45%, had the highest proportion of its population born in a predominately non-English speaking country. This was followed by Brimbank, with 42.2%, and Maribyrnong with 32.5% (see **Table 9**). The shires of Moorabool and Macedon Ranges had the lowest proportion of the population born in a non-English speaking country, with 4.8% and 5.5% respectively. This is also illustrated in **Figure 10.**

Table 9: Proportion of population born in a predominately non-English speaking country ranked in order of the LGAs with the highest proportion (PHIDU, 2016)

Rank	LGA	Proportion of the population
1	Melbourne (C)	45.0%
2	Brimbank (C)	42.2%
3	Maribyrnong (C)	32.5%
4	Wyndham (C)	32.3%
5	Hume (C)	30.0%
6	Moreland (C)	27.1%
7	Darebin (C)	26.8%
8	Melton (C)	23.6%
9	Moonee Valley (C)	22.0%
10	Hobsons Bay (C)	21.6%
11	Yarra (C)	17.5%
12	Moorabool (S)	5.5%
13	Macedon Ranges (S)	4.8%

Figure 10: Proportion of population who were born in predominately non-English speaking countries



[5] Demographic data. http://www.health.gov.au/internet/main/publishing.nsf/Content/PHN-Demographic_Data

English language proficiency

Poor English proficiency can be a barrier to an individual's ability to access appropriate health services.

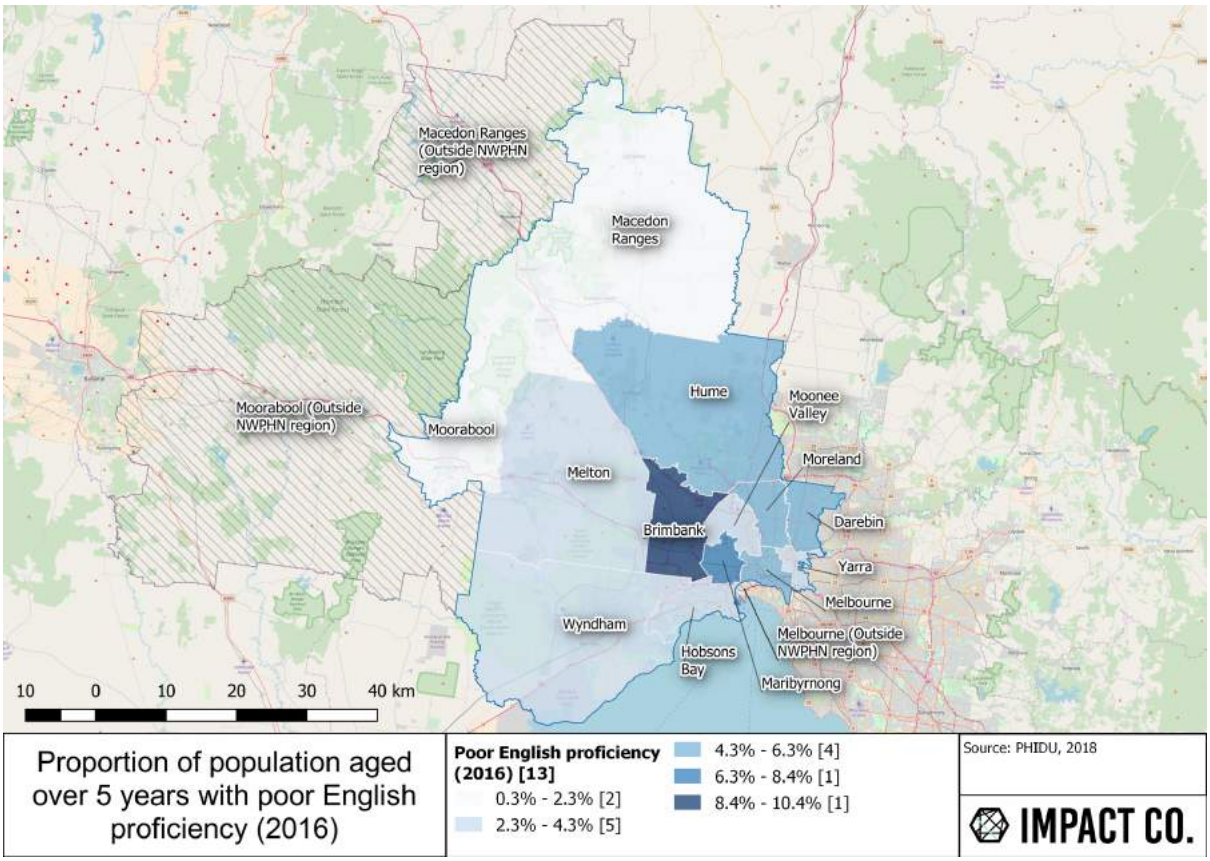
Although Melbourne had the highest proportion of foreign-born residents, **Error! Reference source not found.** suggests that they have better English language skills than their peers in other LGAs. Brimbank, Maribyrnong, Hume and Darebin all have larger proportions of people with poor English language proficiency compared to Melbourne.

The LGAs with the lowest proportion of the population with poor English proficiency mirrors the results of the LGAs with the lowest proportion of the population born in non-English speaking countries. 0.3% of the population in the shires of Macedon Ranges and Moorabool had poor English proficiency. This is also illustrated in **Figure 11.**

Table 10: Proportion of people (aged 5 years and over) born overseas with poor English proficiency (PHIDU, 2016)

Rank	LGA	Proportion of the population
1	Brimbank (C)	10.4%
2	Maribyrnong (C)	7.2%
3	Hume (C)	5.8%
4	Darebin (C)	5.7%
5	Melbourne (C)	5.5%
6	Moreland (C)	4.8%
7	Yarra (C)	4.0%
8	Moonee Valley (C)	3.6%
9	Hobsons Bay (C)	3.6%
10	Wyndham (C)	3.5%
11	Melton (C)	2.6%
12	Macedon Ranges (S)	0.3%
13	Moorabool (S)	0.3%

Figure 11: Proportion of population aged over 5 years with poor English proficiency.



Humanitarian settlers

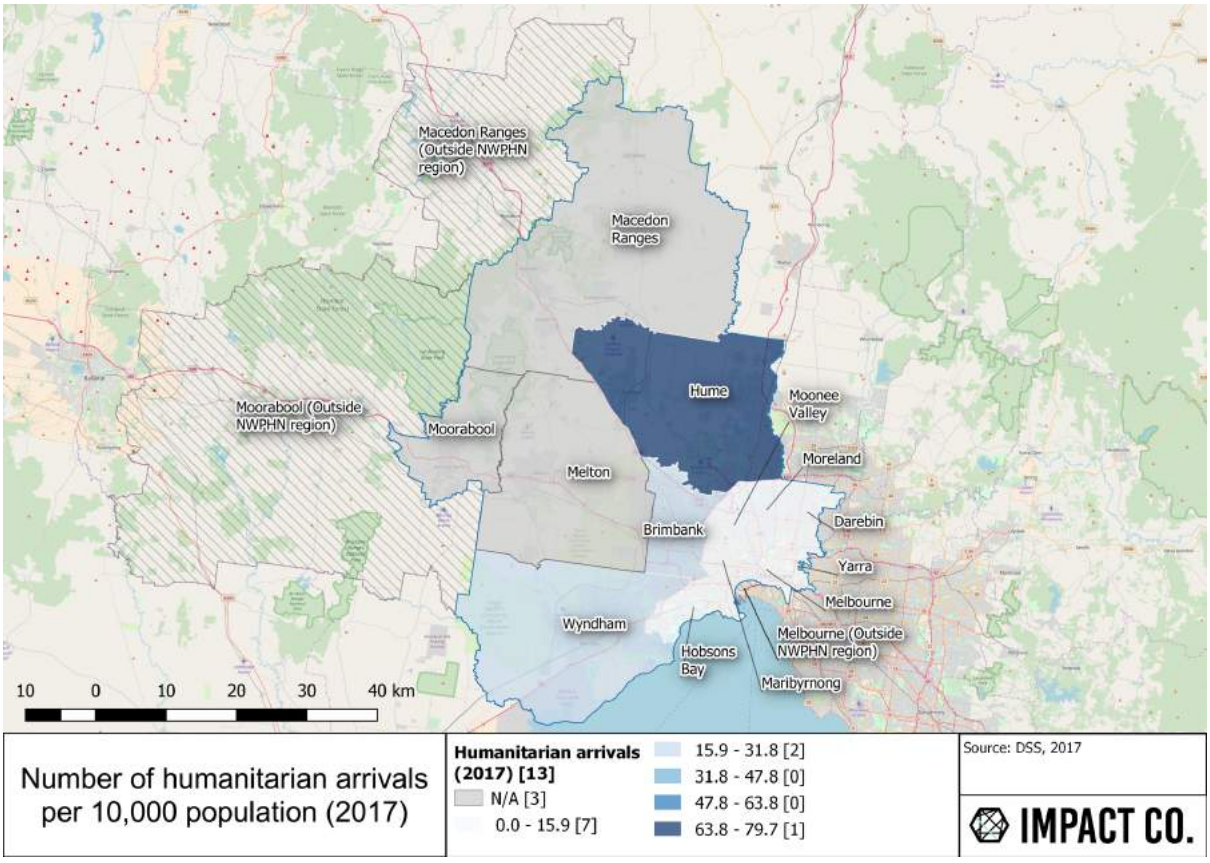
Between 1 January – 31 December 2017, 16,757 humanitarian entrants settled in Australia. More than half of these humanitarian arrivals were born in Iraq, Syria, Afghanistan, Myanmar or Iraq. In this same time period, 3,202 humanitarian entrants settled within the NWMPHN catchment.

As **Table 11** highlights, more than half (55.7%) of the total humanitarian entrants settled in Hume. In contrast, there were no humanitarian settlers in Melton, Moorabool and Macedon Ranges. The rate of humanitarian arrivals per 10,000 population is demonstrated in **Figure 12**.

Table 11: Proportion of total humanitarian settlers in the NWMPHN by LGA from 1 Jan – 31 Dec 2017 in order of highest proportion (Department of Social Services, 2018)

Rank	LGA	Proportion of total humanitarian settlers
1	Hume (C)	55.7%
2	Wyndham (C)	12.3%
3	Brimbank (C)	12.2%
4	Moreland (C)	5.3%
5	Darebin (C)	4.0%
6	Maribyrnong (C)	3.6%
7	Hobsons Bay (C)	2.4%
8	Melbourne (C)	2.1%
9	Moonee Valley (C)	2.0%
10	Yarra (C)	0.3%
11	Melton (C)	0.0%
12	Moorabool (S)	0.0%
13	Macedon Ranges (S)	0.0%

Figure 12: Number of humanitarian arrivals per 10,000 population



The proportion of residents born in one of the top five countries contributing to humanitarian settlement in Australia was also investigated (see **Table 12**). Hume, at 6.4%, had the largest proportion of residents from the top five countries of birth, followed by Brimbank (1.6%) and Wyndham (1.3%). Low populations were found in the shires of Moorabool and Macedon Ranges.

Table 12: Proportion of residents born in one of the top 5 countries of birth of humanitarian settlers to Australia (Census, 2016)

Rank	LGA	Proportion of residents
1	Hume (C)	6.4%
2	Brimbank (C)	1.6%
3	Wyndham (C)	1.3%
4	Moreland (C)	1.1%
5	Maribyrnong (C)	0.9%
6	Darebin (C)	0.8%
7	Melton (C)	0.6%
8	Moonee Valley (C)	0.6%
9	Melbourne (C)	0.6%
10	Hobsons Bay (C)	0.6%
11	Yarra (C)	0.3%
12	Macedon Ranges (S)	0.0%
13	Moorabool (S)	0.0%

People experiencing, or at risk of, homelessness

According to the 2016 Census, an estimated 9,337 individuals were homeless in the region. This represents a 20.3% increase since the previous 2011 Census.

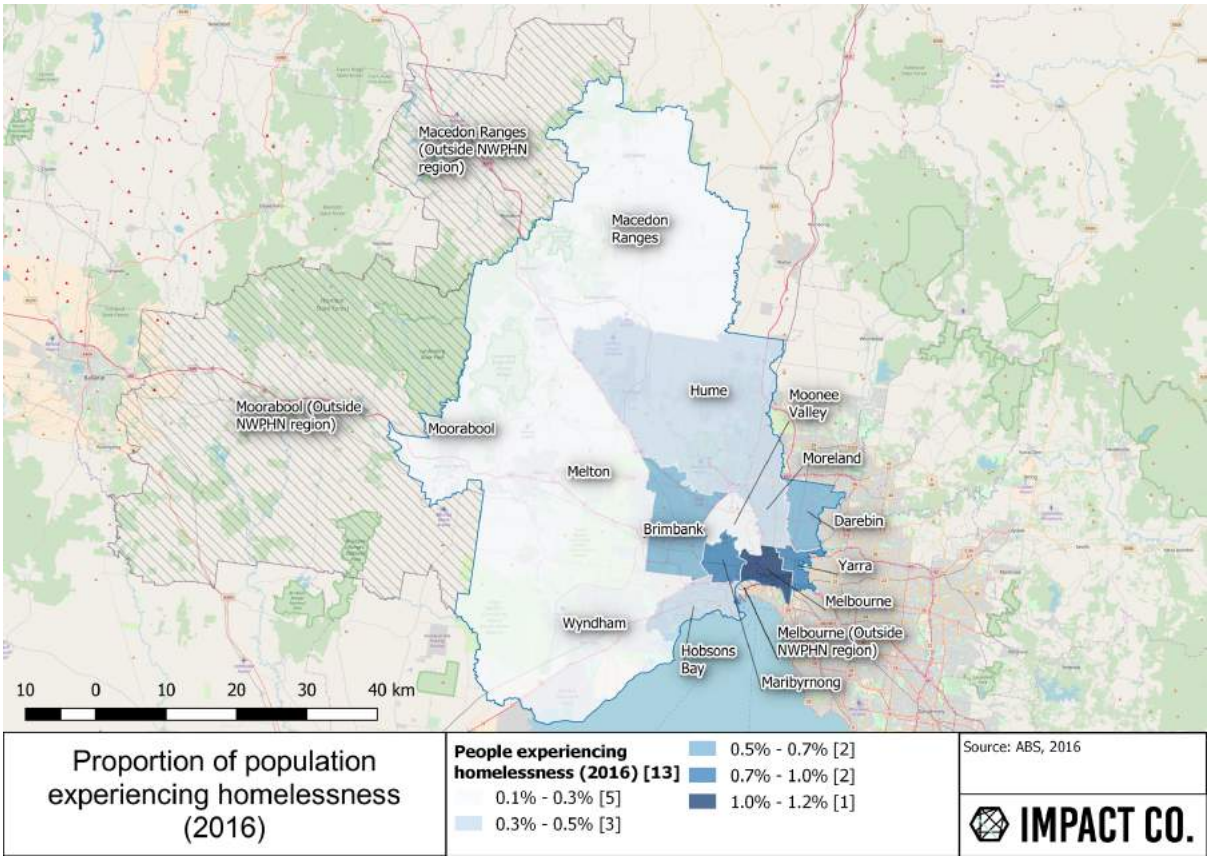
As **Table 13** indicates, Melbourne had the highest proportion of homelessness with 18.5%, followed by Brimbank (15.8%) and Darebin (10.4%). The shires of Macedon and Moorabool had the lowest proportion of the population who were homeless. This is also illustrated in **Figure *13***.

In comparison to the 2011 Census, the population who were homeless in Melbourne increased by 86.3%. Significant growth was also found in Wyndham (76.3%) and Hobsons Bay (54%).

Table 13: Proportion of total homeless population in the NWMPHN by LGA in order of highest proportion (ABS, 2016)

Rank	LGA	Proportion of total population who were homeless
1	Melbourne (C)	18.5%
2	Brimbank (C)	15.8%
3	Darebin (C)	10.4%
4	Hume (C)	9.8%
5	Yarra (C)	9.0%
6	Moreland (C)	8.3%
7	Wyndham (C)	7.8%
8	Maribyrnong (C)	7.6%
9	Moonee Valley (C)	4.3%
10	Melton (C)	3.6%
11	Hobsons Bay (C)	3.6%
12	Moorabool (S)	0.7%
13	Macedon Ranges (S)	0.6%

Figure 13: Proportion of population experiencing homelessness



People who report high psychological distress

The literature review in *Section 2* suggests that mental health has an association with poor health outcomes.

Based on the Kessler 10 (K10) scale, the age-standardised rate (**ASR**) per 100 people who reported high or very high psychological distress in the catchment was 13.6, which is higher than the Victorian average rate of 12.5[6].

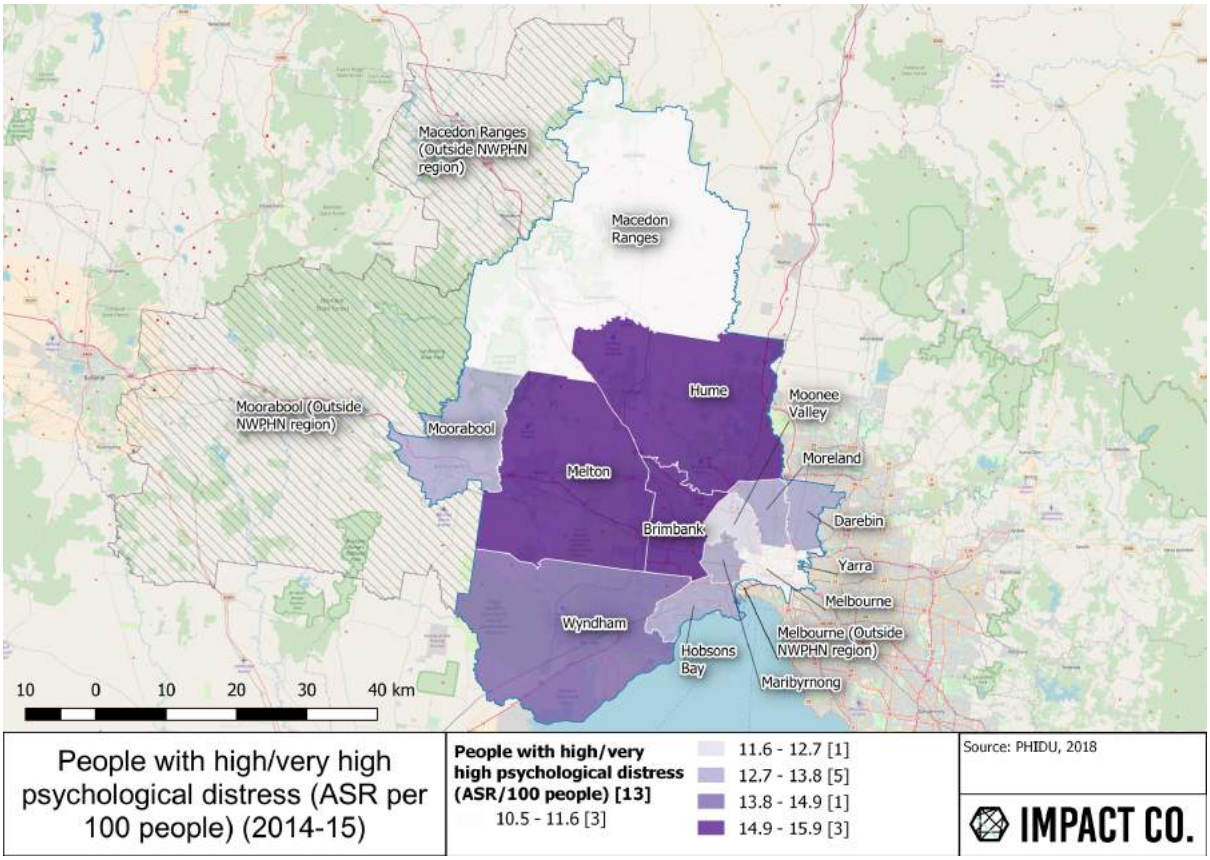
There is also geographic variation in the rate of high psychological distress across the catchment. As shown in **Table 14** and **Figure 14**, nine out of the 13 LGAs within the catchment had rates higher than the Victorian average. The rate of high psychological distress was highest in Brimbank with 15.9, followed closely by Melton (15.5) and Hume (14.8). The rate was lowest in Macedon Ranges (10.5) and Melbourne (10.8).

Table 14: ASR per 100 people aged 18 years and over with high or very high psychological distress (based on Kessler 10 scale) ranked in order of highest rate by LGA (PHIDU, 2014-15)

Rank	LGA	ASR per 100 people aged 18 years and over
1	Brimbank (C)	15.9
2	Melton (C)	15.5
3	Hume (C)	15.3
4	Wyndham (C)	14.8
5	Darebin (C)	13.4
6	Moreland (C)	13.2
7	Maribyrnong (C)	13.2
8	Moorabool (S)	13.1
9	Hobsons Bay (C)	12.7
10	Moonee Valley (C)	11.6
11	Melbourne (C)	10.8
12	Yarra (C)	10.7
13	Macedon Ranges (S)	10.5

[6] PHIDU, 2014-15

Figure 14: ASR per 100 people (aged 18 years and over) with high/very high psychological distress



Self-reported health

Self-reported health status is generally used as a proxy measure for actual health status. An individual's experience of illness and disability can be gauged by how they rate their own health.

Across Victoria, the ASR per 100 people aged 15 years and over who reported fair or poor self-assessed health was 15.6. The rate is higher in the NWMPHN region at 17.7[7].

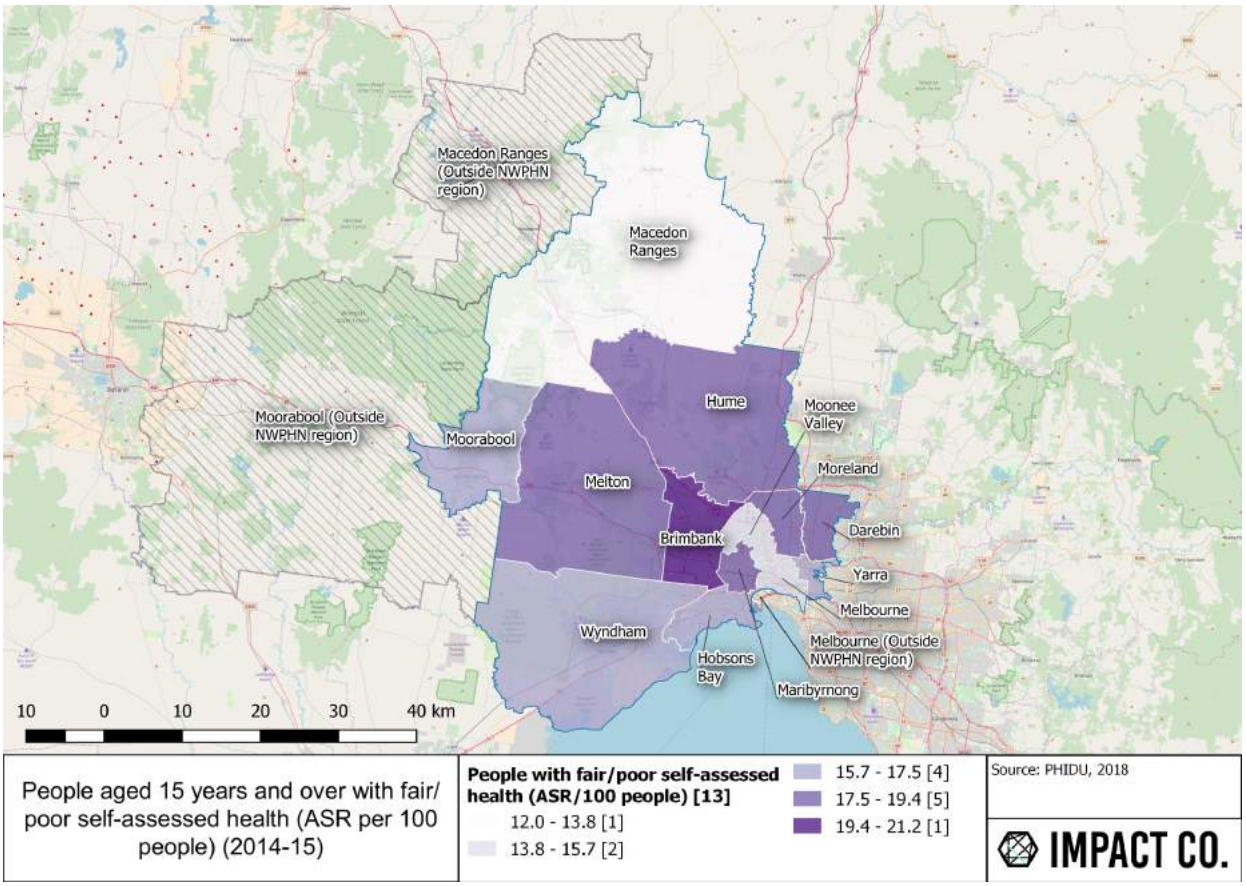
As **Table 15** and **Figure 15** indicates, 10 LGAs had rates of fair/poor self-assessed health higher than the Victorian average. Brimbank had the highest rate at 21.2 per 100 people, followed by Darebin (19.3) and Hume (19.2). Residents in Macedon Ranges had the lowest rate of fair/poor self-reported health at 12.0.

Table 15: ASR per 100 people aged 15 years and over with fair or poor self-assessed health ranked in order of highest rate by LGA (PHIDU, 2014-15)

Rank	LGA	ASR per 100 people aged 15 years and over
1	Brimbank (C)	21.2
2	Darebin (C)	19.3
3	Hume (C)	19.2
4	Maribyrnong (C)	18.9
5	Moreland (C)	18.6
6	Melton (C)	17.6
7	Hobsons Bay (C)	17.0
8	Moorabool (S)	16.6
9	Wyndham (C)	16.1
10	Yarra (C)	16.0
11	Moonee Valley (C)	14.7
12	Melbourne (C)	14.7
13	Macedon Ranges (S)	12.0

[7] PHIDU, 2014-15

Figure 15: ASR per 100 people aged 15 years and over with fair or poor self-assessed health



Multiple chronic conditions

An ageing population and an increased life expectancy has a combined impact on the growing number of individuals experiencing multiple chronic illnesses. According to the AIHW, almost 40% of Australians aged 45 years and over have two or more chronic illnesses.[8]

Table 16 highlights the proportion of adults aged 18 years and over in each LGA with three or more chronic illnesses. Melton had the highest proportion, at 10.2%, of adults with multiple chronic illnesses, followed by Wyndham (8.8%). In contrast, Hobsons Bay and Yarra had the lowest proportion at 5.0% and 4.3% respectively.

Table 16: Proportion of adults aged 18 years and over with three or more chronic illnesses ranked in order of highest LGA (Victorian Population Health Survey, 2014)

Rank	LGA	Proportion of adults aged 18 years and over
1	Melton (C)	10.2
2	Wyndham (C)	8.8
3	Brimbank (C)	7.9
4	Moorabool (S)	7.9
5	Macedon Ranges (S)	6.9
6	Maribyrnong (C)	6.8
7	Melbourne (C)	6.3
8	Darebin (C)	6.1
9	Moonee Valley (C)	6.1
10	Moreland (C)	5.4
11	Hume (C)	5.3
12	Hobsons Bay (C)	5.0
13	Yarra (C)	4.3

[8] AIHW. (2015). *Chronic conditions and disability 2015*.

MEASURING UNMET AH SERVICE DEMAND IN NWMPHN (UNMET DEMAND INDEX)

Calculating unmet demand for AHPHC services in the catchment is the second component (or sub-index) of the Composite Index Score. To measure unmet AH primary care demand in the region, the rate of category 4 and 5 (**Cat 4/5**) ED attendances in the AH period, the number of non-emergency ambulance calls outs per LGA, and the rate of potentially preventable hospitalisations (PPH) were considered. This is detailed further below.

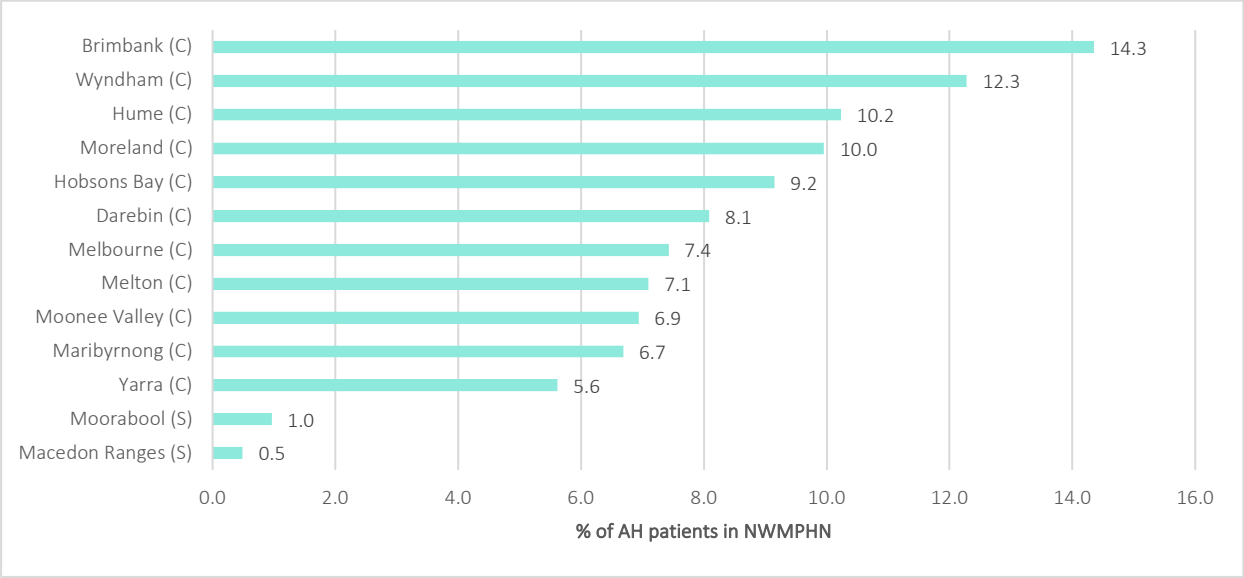
AH service use: ED attendances

The following section presents findings from the Victorian Emergency Minimum Dataset (**VEMD**) according to presentations made by residents of the NWMPHN catchment between 2014-16.

Category 4 and 5 presentations

Between 2014-2016, 262,587 residents from the catchment attended the ED during the AH period for a health problem that was triaged as a Cat 4/5 presentation. Brimbank, at 14.3%, accounted for the highest proportion of residents attending ED during the AH period over the two year period (see **Figure 16**), while Macedon Ranges had the lowest proportion at 0.5%.

Figure 16: Proportion of AH ED attendances in NWMPHN by LGA (2014-16)

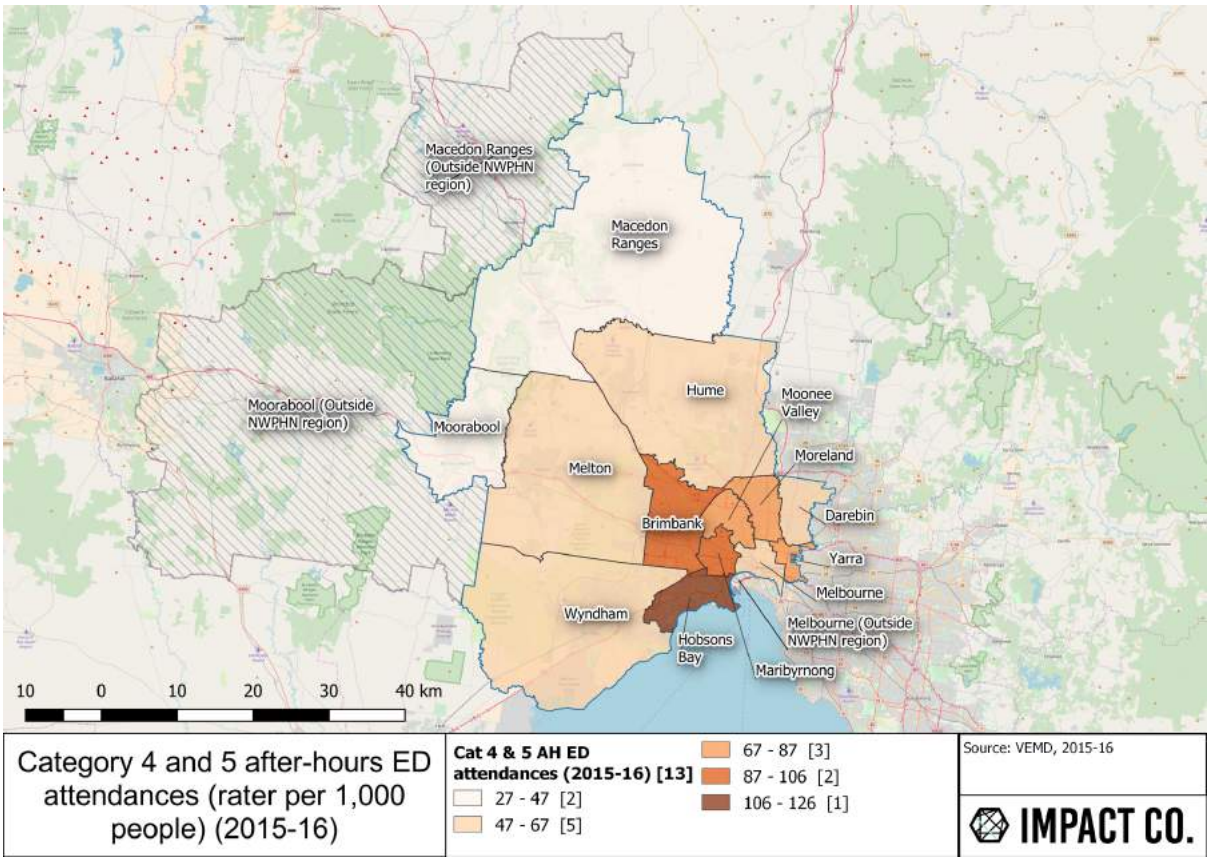


However, as **Table 17** outlines, when the number of Cat 4/5 ED presentations in the AH period in 2015-16 is assessed according to the rate per 1000 population, Hobsons Bay had the highest rate at 126, followed by Maribyrnong (100.4) and Brimbank (91.8). In comparison, the shires of Moorabool and Macedon Ranges had the lowest rate of residents presenting to ED in the AH period at 28.5 and 27.3 respectively. This is also illustrated in **Figure 17**.

Table 17: Rate of category 4 and 5 ED attendances per 1,000 population ranked according to highest LGA (VEMD)

Rank	LGA	Category 4/5 presentations per 1,000 population
1	Hobsons Bay (C)	126.0
2	Maribyrnong (C)	100.4
3	Brimbank (C)	91.8
4	Yarra (C)	82.8
5	Moonee Valley (C)	77.8
6	Moreland (C)	68.6
7	Melbourne (C)	65.5
8	Darebin (C)	60.8
9	Melton (C)	58.6
10	Hume (C)	57.6
11	Wyndham (C)	56.3
12	Moorabool (S)	28.5
13	Macedon Ranges (S)	27.3

Figure 17: Rate of category 4 and 5 ED presentations in the AH period per 1,000 population



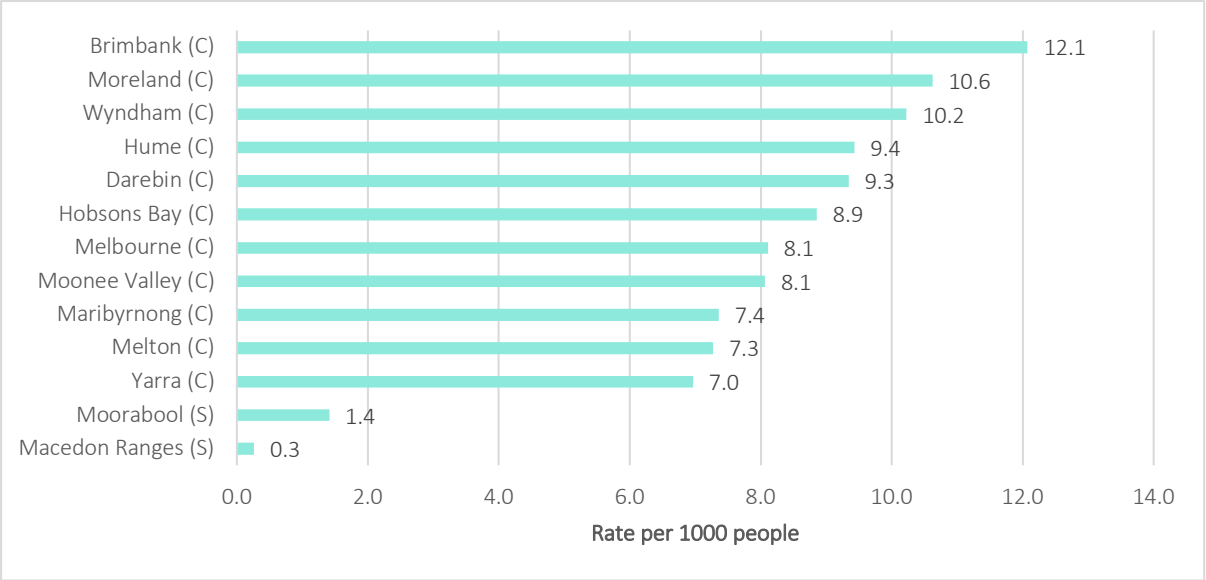
Mental health ED presentations

Between 2014-2016, 2,269 residents from the catchment attended the ED during the AH period for a mental-health related problem that was triaged as a Cat 4/5 presentation. Brimbank, at 12.1%, accounted for the highest proportion of residents attending ED during the AH period over the two-year period for mental health-related problems (see **Figure 18**), while Macedon Ranges had the lowest proportion at 0.3%.

However, as **Table 18** outlines, when the number of Cat 4/5 ED presentations in the AH period is assessed according to the rate per 1,000 population, Maribyrnong had the highest rate at 1.2, followed by Hobsons Bay (1.1) and Yarra (0.8). In comparison, the Macedon Ranges and Wyndham had the lowest rate of residents presenting to ED in the AH period at 0.1 and 0.4 respectively.

The rank order of LGAs presented in **Table 18** is heavily influenced by the overall rate of Cat 4/5 ED attendances (i.e. a larger volume of attendances makes it more likely that some of those attendances will be mental health-related). The proportion of all Cat 4/5 AH ED attendances that were mental-health related is a more accurate indicator of higher levels of inappropriate ED use for mental health-related conditions (see **Table 19**). This proportion tends not to be influenced by population size (like data in **Figure 17**), or the high number Cat 4/5 ED attendances in the AH period (like data in **Table 18**).

Figure 18: Proportion of all MH-related AH ED attendances in NWMPHN by LGA (2014-16)



The results presented in **Table 19** indicate that the majority of the catchment has a similar level of AH ED use for non-urgent mental health-related issues. The highest ranked LGA, Moorabool Shire however, has a proportion 1.8 times greater than the next highest ranked LGA. This indicates that inappropriate ED use for mental-health related conditions is a greater issue in Moorabool than the rest of the catchment.

Table 18: Rate of mental health related Cat 4/5 ED attendances per 1,000 population ranked according to highest LGA (VEMD), 2015-16

Rank	LGA	MH-related category 4/5 presentations per 1,000 population
1	Maribyrnong (C)	1.2
2	Hobsons Bay (C)	1.1
3	Yarra (C)	0.8
4	Moonee Valley (C)	0.8
5	Melbourne (C)	0.7
6	Moreland (C)	0.7
7	Brimbank (C)	0.6
8	Melton (C)	0.6
9	Moorabool (S)	0.6
10	Darebin (C)	0.6
11	Hume (C)	0.5
12	Wyndham (C)	0.4
13	Macedon Ranges (S)	0.1

Table 19: Mental health-related Cat 4/5 ED attendances as a proportion of all Cat 4/5 ED attendances ranked according to highest LGA (VEMD), 2015-16

Rank	LGA	%MH-related category 4/5 presentations
1	Moorabool (S)	2.0
2	Maribyrnong (C)	1.2
3	Melbourne (C)	1.1
4	Moonee Valley (C)	1.0
5	Moreland (C)	1.0
6	Melton (C)	1.0
7	Yarra (C)	1.0
8	Darebin (C)	0.9
9	Hobsons Bay (C)	0.9
10	Hume (C)	0.9
11	Wyndham (C)	0.8
12	Brimbank (C)	0.7
13	Macedon Ranges (S)	0.5

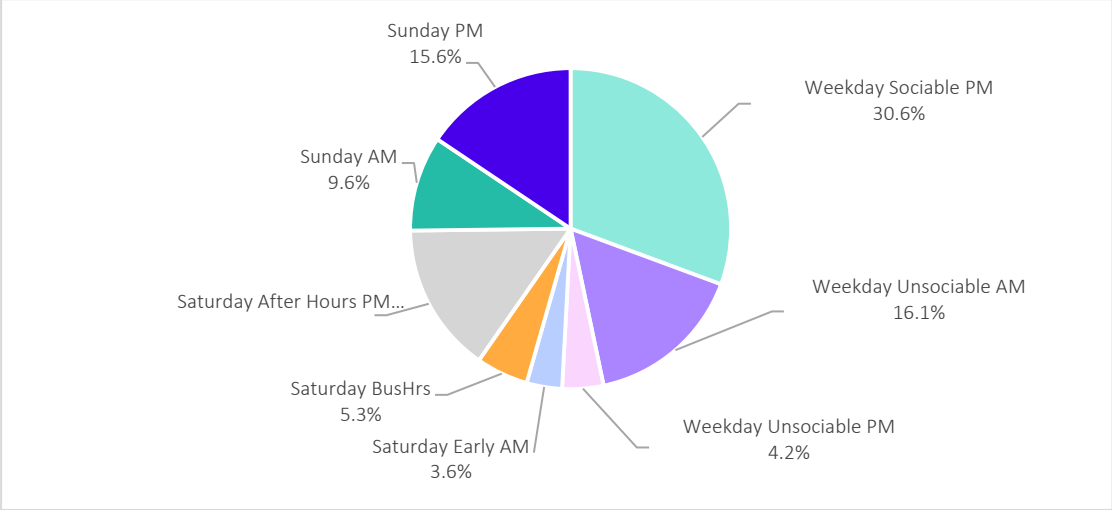
Time of day

The AH period can be further categorised according to the sociable or unsociable hours of the weeknight and time during the weekends.

According to **Figure 18**, the majority (30.6%) of AH attendances in ED occurred during the weekday sociable PM, followed by the weekday unsociable AM.

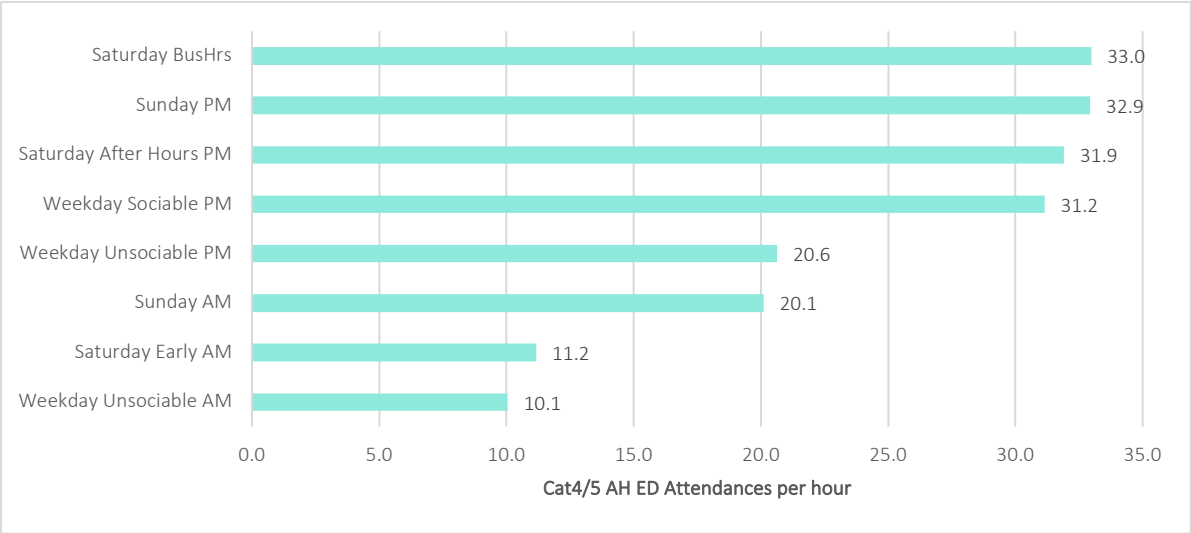
Saturday Early AM	00:01 to 07:59
Saturday Business Hours	08:00 to 11:59
Saturday PM	12:00 to 23:59
Sunday AM	00:01 to 11:59
Sunday PM	12:00 to 23:59
Weekday unsociable AM	00:01 to 07:59
Weekday sociable PM	18:00 to 22:59
Weekday unsociable PM	23:00 to 23:59

Figure 19: All Cat 4/5 ED attendances by NWMPHN residents according to time of presentation during AH period (2014-16)



However, when the rate of Cat 4/5 AH attendances is assessed according to the rate per hour, Saturday Business Hours had the highest with 33 attendances per hour, followed closely by Sunday PM with 32.9 attendances per hour (see **Figure 20**).

Figure 20: Rate of category 4 or 5 ED attendances per hour in the AH period, 2014-16

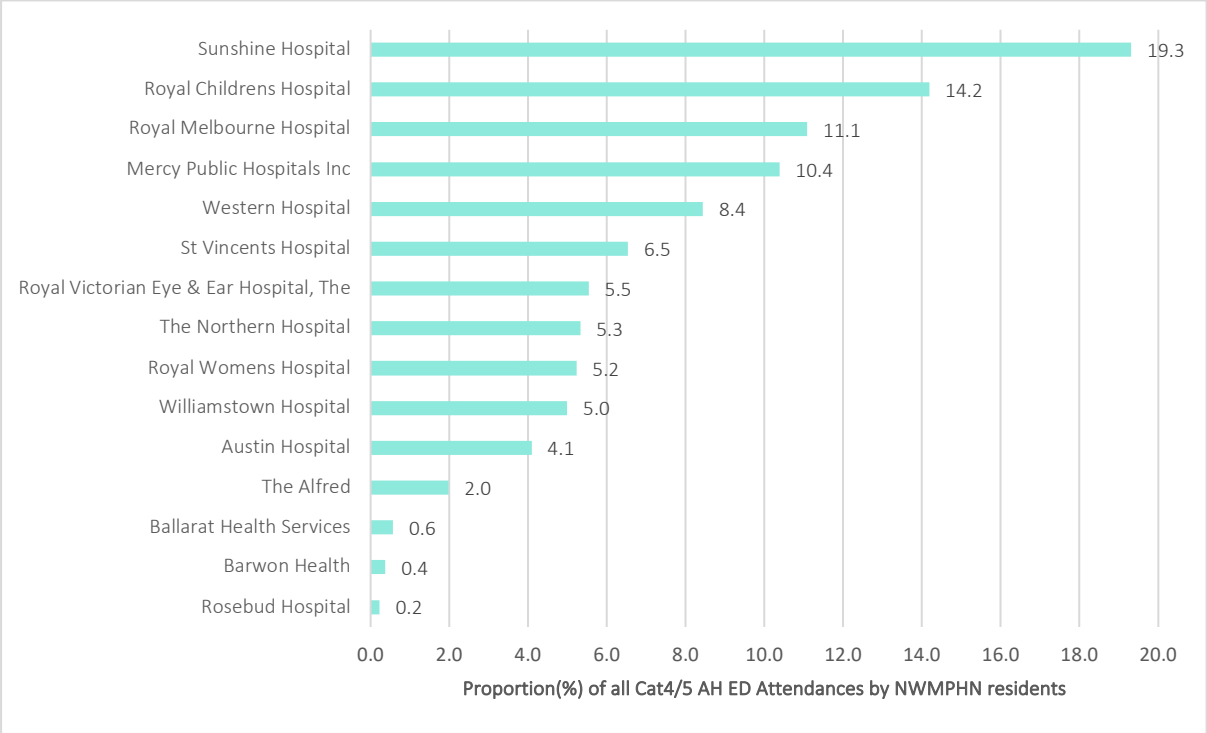


Service location

Sunshine Hospital, with 19.3%, had the greatest number of patients from NWMPHN who attended ED with a category 4 or 5 presentation. The Royal Children's Hospital (14.2%), Royal Melbourne Hospital (11.1%) and Mercy Hospital (10.4%) were also in the top five hospitals where NWMPHN residents presented. As

Figure 21 highlights, a number of residents travelled outside the catchment for care to Austin Hospital, The Alfred, Ballarat Health Service, Baron Health and Rosebud Hospital.

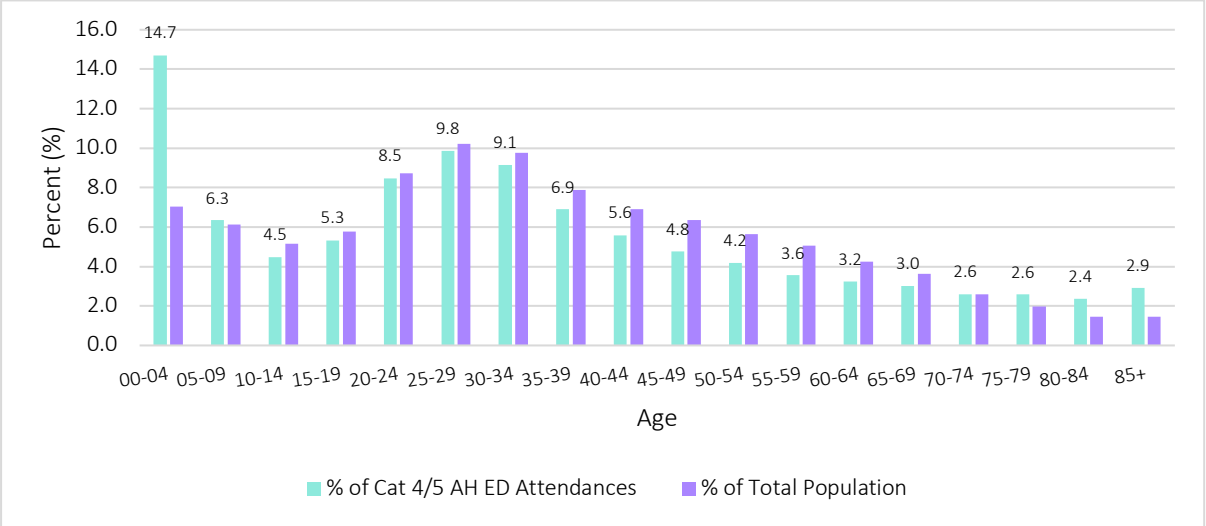
Figure 21: Top 15 hospitals where NWMPHN residents accessed EDs during the AH period



Patient age

Of all age groups presenting with triage category 4 or 5 presentations in the AH period, the most frequent are children aged 0-4 years (14.7%) and young adults aged 20-34 years (27.4%). **Figure 22** compares the age distribution of category 4 or 5 AH ED attendances with that of the general population. This comparison highlights the striking over-representation of 0-4 year old children among AH ED attendances and, to a lesser extent, that of older adults age 75 years and older. For Yarra and Melbourne, young people aged 20-35 years comprised the greatest proportion of Cat 4/5 AH attendances (37% and 44% respectively), which is consistent with the population demographics of these LGAs. However, a similar trend of over-representation of the very young and very old exists as well.

Figure 22: Proportion of AH category 4 and 5 ED presentations by NWMPHN residents according to age group



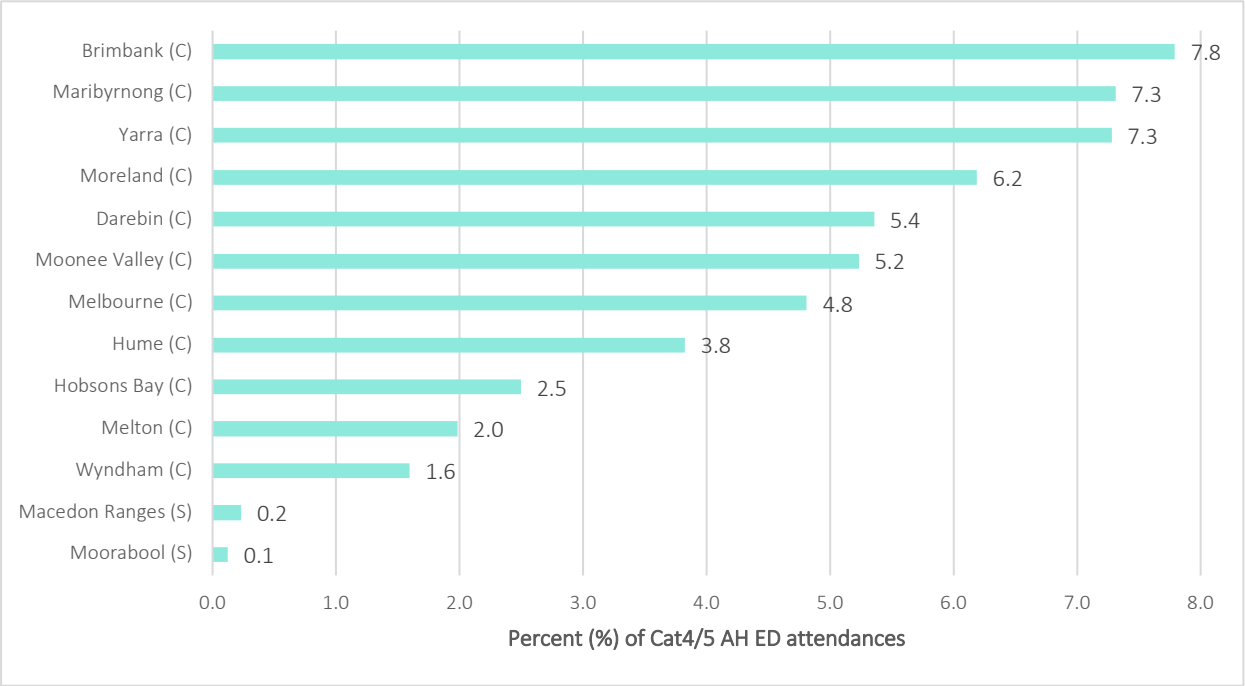
Interpreter use

From 2014-16, 12,546 Cat 4/5 ED presentations in the AH period by NWMPHN residents required an interpreter.

Figure 23 shows the proportion of NWMPHN patients who requested an interpreter according to each LGA. Brimbank and Maribyrnong had the largest proportion of patients requiring an interpreter, which is reflective of the proportion of the population with low English proficiency (see Error! Reference source not found.). Interestingly, Yarra, which has the third largest proportion of interpreter use, does not have a large culturally and linguistically diverse population or population with poor English proficiency.

Of the ED attendances that required an interpreter, 125 different preferred languages were reported. The 10 most preferred languages are outlined in Table 20. However, the preferred language is not necessarily the language that was used with an interpreter. At 15.3%, Vietnamese was the most often preferred language of people requesting an interpreter, followed by Italian (13.6%) and Greek (13.4%).

Figure 23: Proportion of AH category 4 and 5 ED presentations by NWMPHN residents that required an interpreter by LGA



Type of usual accommodation

The VEMD also collects data on the usual place of residence of the presenting patient. During the assessed period, the majority of category 4 and 5 patients (93.1%) lived in private residences. A small proportion lived in residential aged care facilities (1.2%), and 1.3% lived in shelters or public places (homeless). This is outlined in Table 21.

Table 20: Top 10 most common languages requiring an interpreter by NWMPHN patients attending ED for category 4 and 5 presentations during the AH period

	FY14/15		FY15/16		Total	
Language	Freq.	Perc (%)	Freq.	Perc (%)	Freq.	Perc (%)
Vietnamese	923	14.92	992	15.60	1,915	15.26
Italian	879	14.21	830	13.05	1,709	13.62
Greek	840	13.58	843	13.25	1,683	13.41
Arabic	609	9.85	532	8.36	1,141	9.09
Mandarin	366	5.92	389	6.12	755	6.02
Turkish	316	5.11	272	4.28	588	4.69
Cantonese	227	3.67	270	4.24	497	3.96
Macedonian	229	3.70	214	3.36	443	3.53
Croatian	150	2.43	140	2.20	290	2.31
Persian	142	2.30	142	2.23	284	2.26

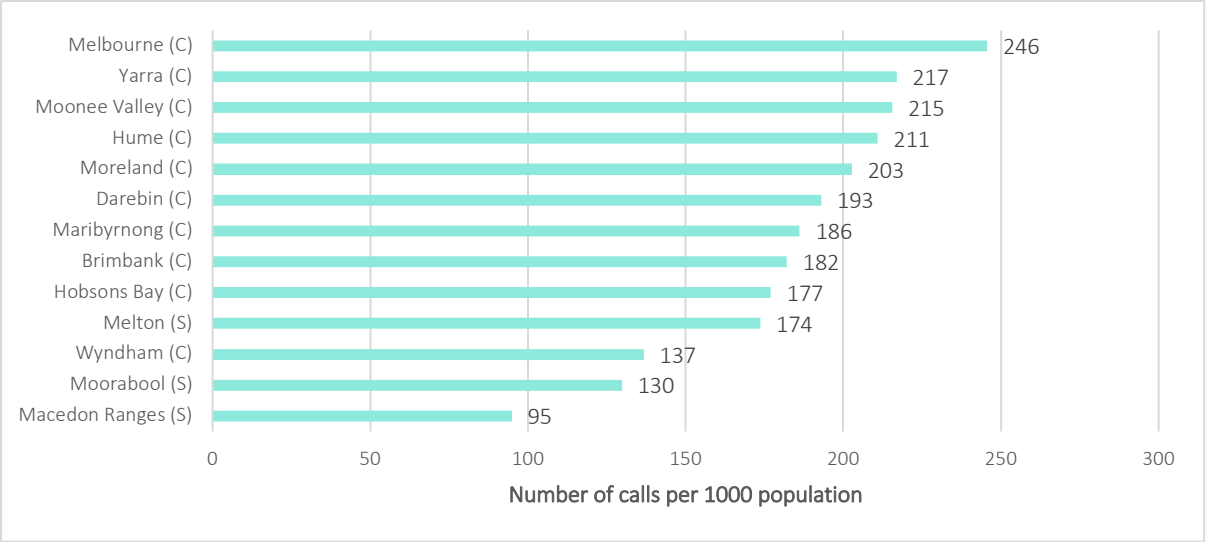
Table 21: Reported type of usual accommodation of NWMPHN patients presenting with a category 4 or 5 ED presentation during the AH period

	2014-16	
Type of usual accommodation	Freq.	Perc (%)
Boarding/rooming house/hostel	581	0.22
Community-based supported accommodation	567	0.22
Homeless Persons Shelter	97	0.04
Other Accomm NEC	236	0.09
Other Hospital Setting	20	0.01
Prison/Remand/Youth Training Centre	110	0.04
Private Residence - alone	9,438	3.59
Private Residence - with other(s)	234,097	89.15
Psychiatric Hospital	27	0.01
Public Place (Homeless)	271	0.10
Residential Aged Care Facility	3,106	1.18
Shelter/Refuge Other Than Homeless Shelter	77	0.03
Unknown	13,960	5.32
Total	262,587	100.00

AH service use: Ambulance call outs

Between 2015-18, 326,546 ambulance calls were made within the catchment. Melbourne had the highest rate of ambulance calls with 246 calls made per 1000 population, compared to Macedon Ranges with the lowest rate at 95 calls per 1000 population (see **Figure 24**).

Figure 24: Rate of ambulance calls by LGA, 2015-18



Non-emergency ambulance calls

All ambulance calls are categorised into a Final Priority code, with 0 being the highest priority and 9 being the lowest. Priority 4-9 code incidents are considered non-emergency incidents that don't require an ambulance response. Instead, following a secondary triage, are referred to an alternative service provider such as a GP or registered nurse.

Of the total number of ambulance calls outs, 5.0% were considered non-emergency or primary care type incidents. **Table 22** illustrates the rate of total primary care type calls per 1000 population for each LGA. Darebin had the highest rate of non-emergency calls at 15.8, followed by Moreland (11.2) and Hume (10.6). This is also illustrated in **Figure 25.**

When non-emergency calls are assessed as a proportion of total ambulance calls, Darebin, at 8.2%, has the greatest number (see **Figure 24**).

Table 22: Rate of non-emergency ambulance calls per 1,000 population ranked in order of highest rate by LGA, 2015-18

Rank	LGA	Non-emergency ambulance calls per 1000 population
1	Darebin (C)	15.8
2	Moreland (C)	11.2
3	Hume (C)	10.6
4	Brimbank (C)	9.6
5	Maribyrnong (C)	9.5
6	Hobsons Bay (C)	9.3
7	Melton (C)	9.1
8	Moonee Valley (C)	8.8
9	Yarra (C)	8.5
10	Melbourne (C)	8
11	Wyndham (C)	6.3
12	Macedon Ranges (S)	5.4
13	Moorabool (S)	3.3

Figure 25: Rate of non-emergency calls per 1,000 population

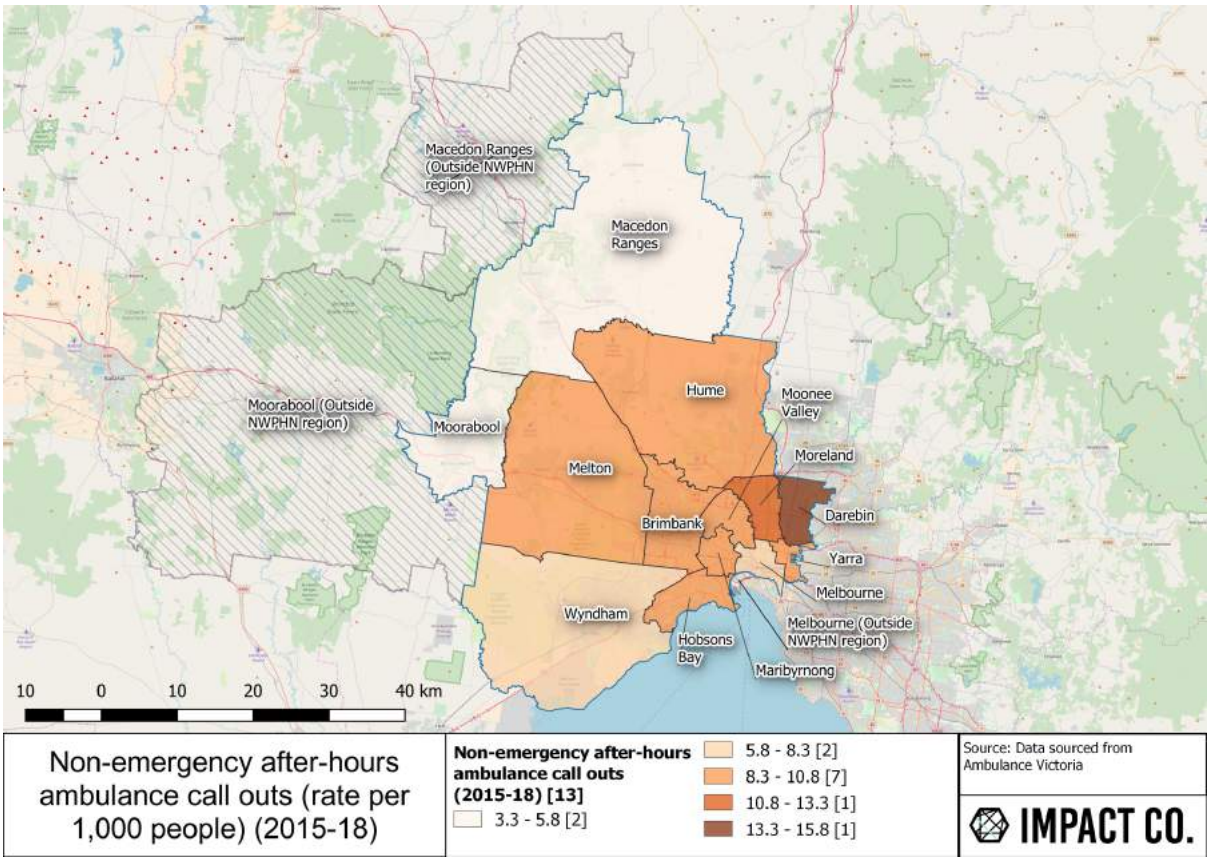
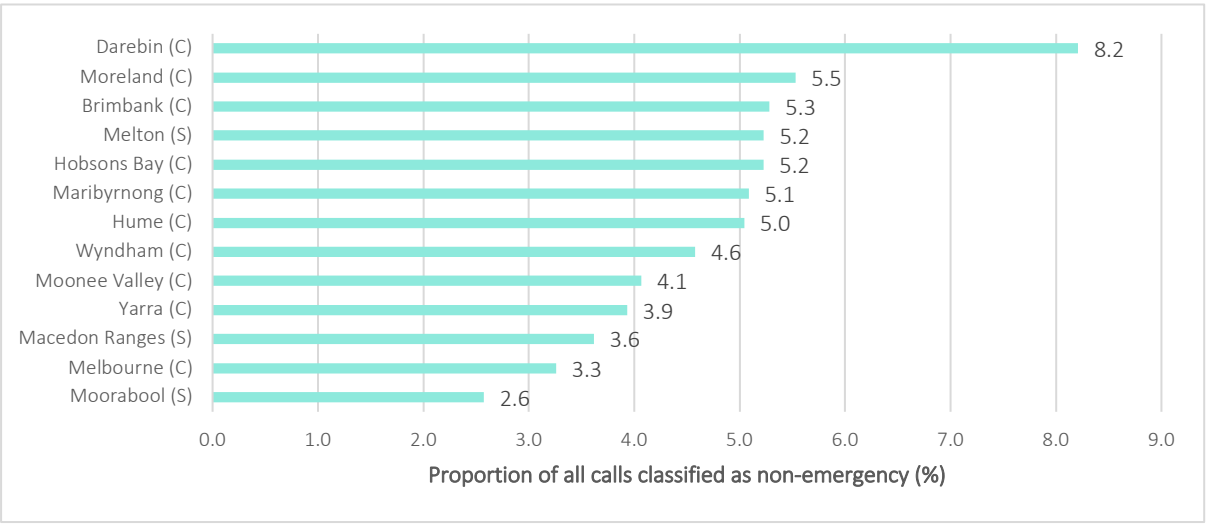


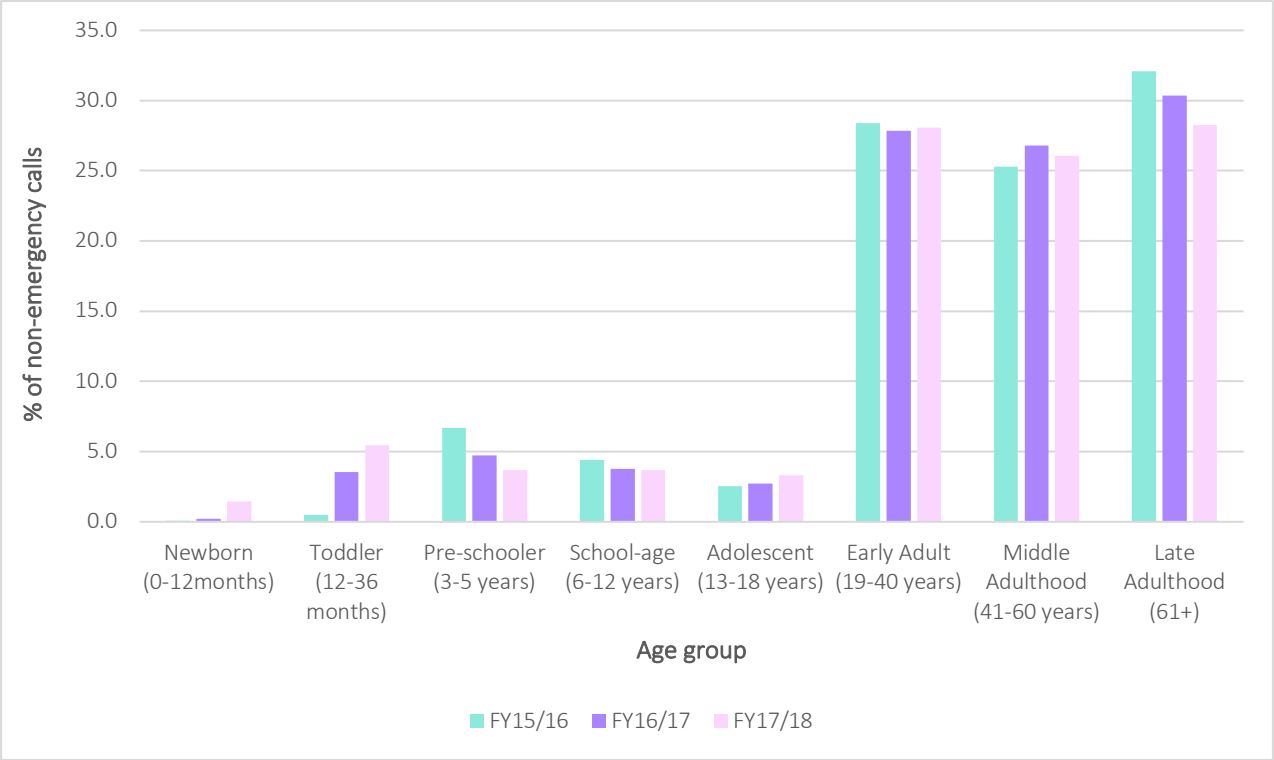
Figure 26: Non-emergency call outs as a proportion of all ambulance call outs by LGA, 2015-18



Non-emergency call outs by age group

Figure 27 highlights that the largest proportion of non-emergency ambulance calls are made by individuals aged 61 years and over, followed closely young adults aged between 19-40 years. These proportions are relatively consistent across the three financial years.

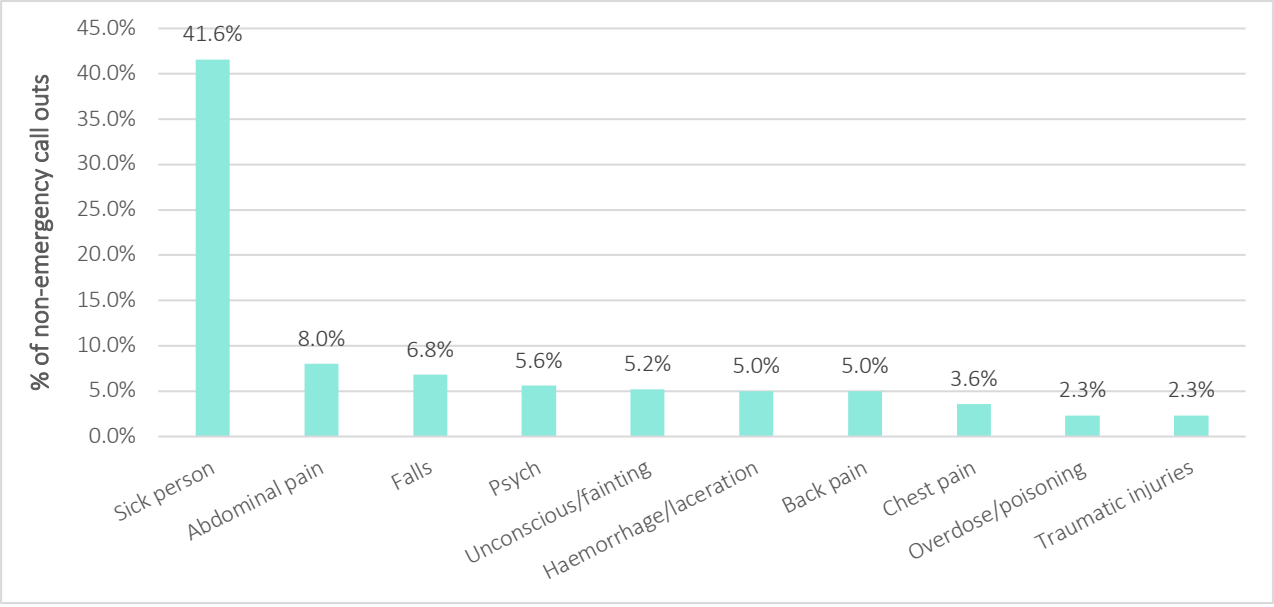
Figure 27: Proportion of non-emergency calls out by age group and fiscal year



Non-emergency call outs by health problem

Although most non-emergency calls (41.6%) were related, broadly, to a 'sick person', abdominal pain (8.0%) and falls (6.8%) were common health problems (see **Figure 28**).

Figure 28: Top 10 health problems of non-emergency call outs



Potentially preventable hospitalisations

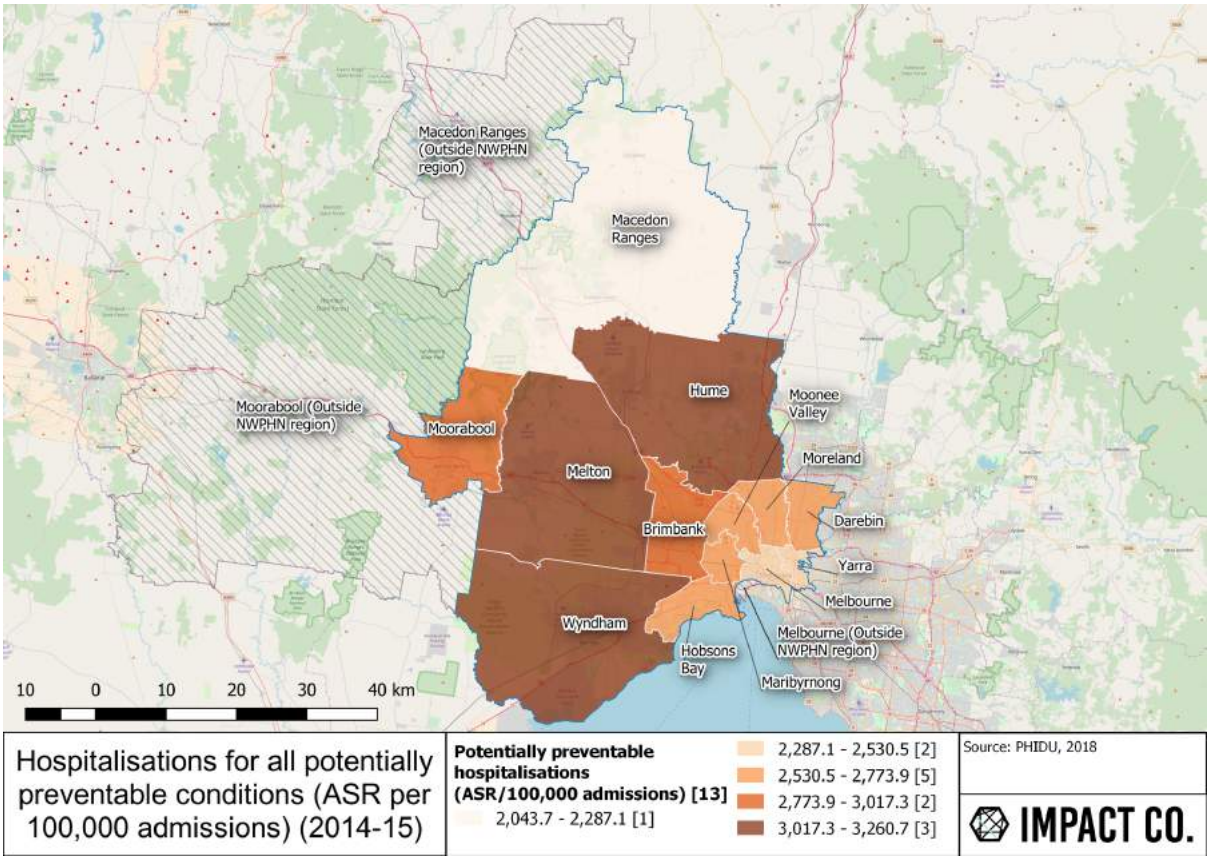
A potentially preventable hospitalisation (**PPH**) refers to a hospitalisation that could have been prevented had there been timely and appropriate provision of primary or community-based health care.

The rate of PPHs per 100,000 population for all hospitals in the catchment was 2,812.7 in 2014-15, which is above the Victorian average of 2,731.0. The highest rate of PPHs occurred in Hume with 3,260.7 per 100,000 population, followed by Wyndham (3,190) and Melton (3,116.7). The lowest recorded rate occurred in Macedon Ranges at 2043.7. This is highlighted in **Table 23** and **Figure 29**.

Table 23: Rate of PPHs (all hospitals) per 100,000 population ranked in order of highest rate by LGA, 2014-15 (PHIDU)

Rank	LGA	Non-emergency ambulance calls per 1000 population
1	Hume (C)	3260.7
2	Wyndham (C)	3190
3	Melton (C)	3116.7
4	Brimbank (C)	2894.5
5	Moorabool (S)	2829.4
6	Darebin (C)	2773.9
7	Moreland (C)	2703.2
8	Maribyrnong (C)	2681.4
9	Hobsons Bay (C)	2548.1
10	Moonee Valley (C)	2548
11	Yarra (C)	2521.8
12	Melbourne (C)	2394.6
13	Macedon Ranges (S)	2043.7

Figure 29: Rate of PPHs (per hospital) per 100,000 population



AFTER HOUR PRIMARY HEALTH SERVICE AVAILABILITY (AH SERVICE AVAILABILITY INDEX)

The third component of the composite index score is calculated on the AH service availability in the catchment. Using data from the National Health Service Directory (**NHSD**), the number of primary health services has been determined for each LGA, including the number of hours each service is open during the AH period.

The analysis utilised the NHSD's Primary Service Type designation to assign all services to one of 25 service categories (see **Appendix A**).

This analysis is limited to the services that have uploaded their operating hours to the NHSD. For services that have not indicated their operating hours, the assumption was made that it did not provide services during the AH period.

This is explored further below.

Table 24: Rate of primary care services per 10,000 population ranked in order of highest rate

Rank	LGA	No. of AH services	No. of AH services per 10,000 population
1	Melbourne (C)	436	29.5
2	Yarra (C)	255	27.3
3	Moonee Valley (C)	283	23.0
4	Maribyrnong (C)	177	20.3
5	Moreland (C)	297	17.3
6	Darebin (C)	248	16.0
7	Hobsons Bay (C)	126	13.5
8	Wyndham (C)	247	10.8
9	Brimbank (C)	221	10.7
10	Macedon Ranges (S)	48	10.1
11	Hume (C)	179	8.6
12	Melton (C)	121	8.5
13	Moorabool (S)	21	6.4

All primary health services

To date, there are currently 2,659 primary health services reported to be open during the AH period across the catchment. This number excludes hospitals and all dental services.

Melbourne had the greatest number of primary health services open in the AH period per 10,000 population in the catchment at 29.5, followed by Yarra (27.3). The lowest number of primary health services open in the AH period per 10,000 population was in Moorabool and Melton, with 6.4 and 8.5, respectively. This is highlighted in **Table 24.**

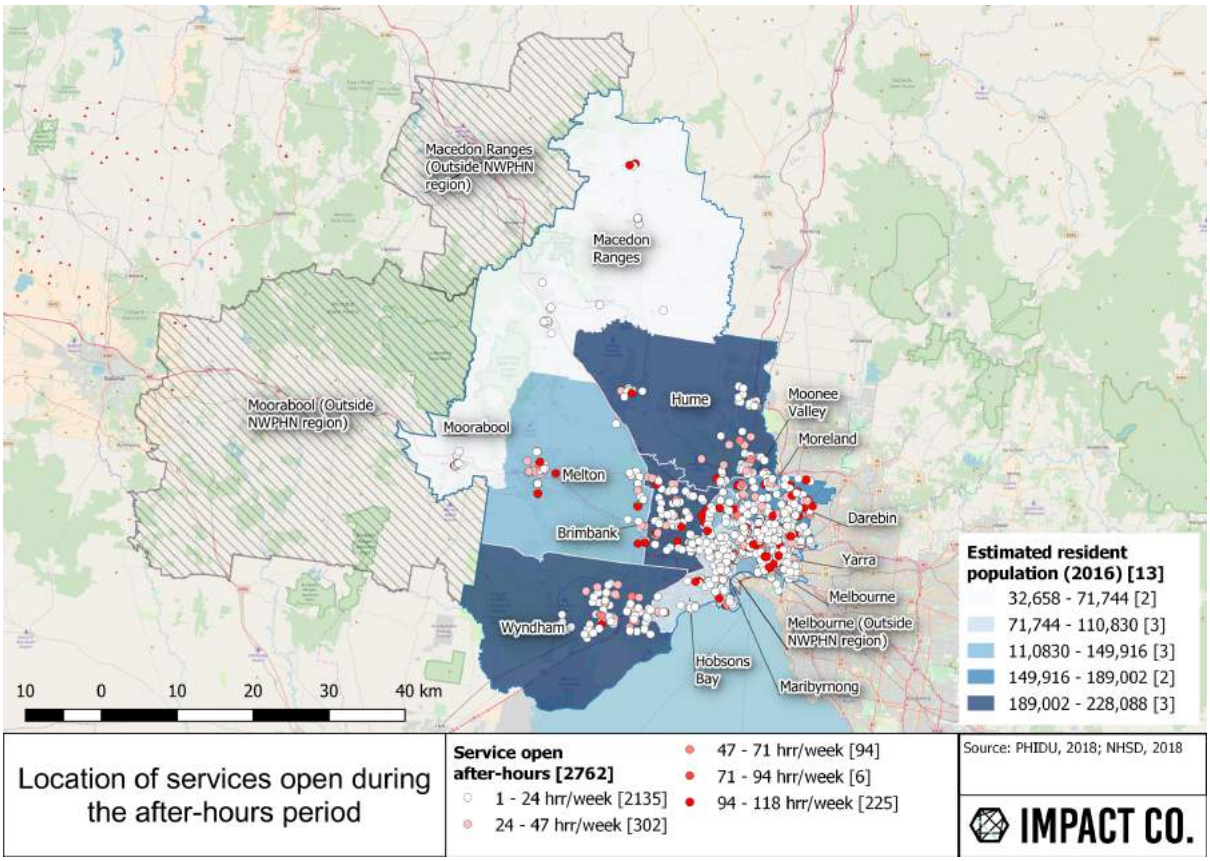
The number of weekly opening hours available during the AH period for each service was also investigated and adjusted for population size. This analysis excluded any service likely to operate 24 hours a day but are not usually available to the general public such as hospitals, residential aged care facilities and mental health in-patient treatment centres.

As **Table 25** demonstrates, the top four LGAs are identical to **Table 24** with Melbourne, Yarra, Moonee Valley and Maribyrnong having the highest rate of service hours available in the AH period per week per 10,000 population. In contrast, different results were obtained for the LGAs with the lowest rate of service opening hours. In this instance, Hume and Brimbank had the lowest rates with 165.9 and 181.8 respectively.

Table 25: Rate of AH primary care service hours per week per 10,000 population ranked in order of highest rate

Rank	LGA	No. of service hours per week in AH period	No. of AH service hours per week per 10,000 population
1	Melbourne (C)	10403.7	702.8
2	Yarra (C)	4636.5	496.6
3	Maribyrnong (C)	41.39.8	473.9
4	Moonee Valley(C)	4699.8	382.2
5	Darebin (C)	4837.3	312.0
6	Moreland (C)	4749.2	276.0
7	Wyndham (C)	5131.8	225.0
8	Hobsons Bay (C)	1990.4	213.1
9	Melton (C)	2762.6	194.9
10	Macedon Ranges (S)	912.5	192.1
11	Moorabool (S)	627.2	192.0
12	Brimbank (C)	3740.5	181.8
13	Hume (C)	3447.3	165.9

Figure 30: Location of all primary health services open during the AH period



General practices

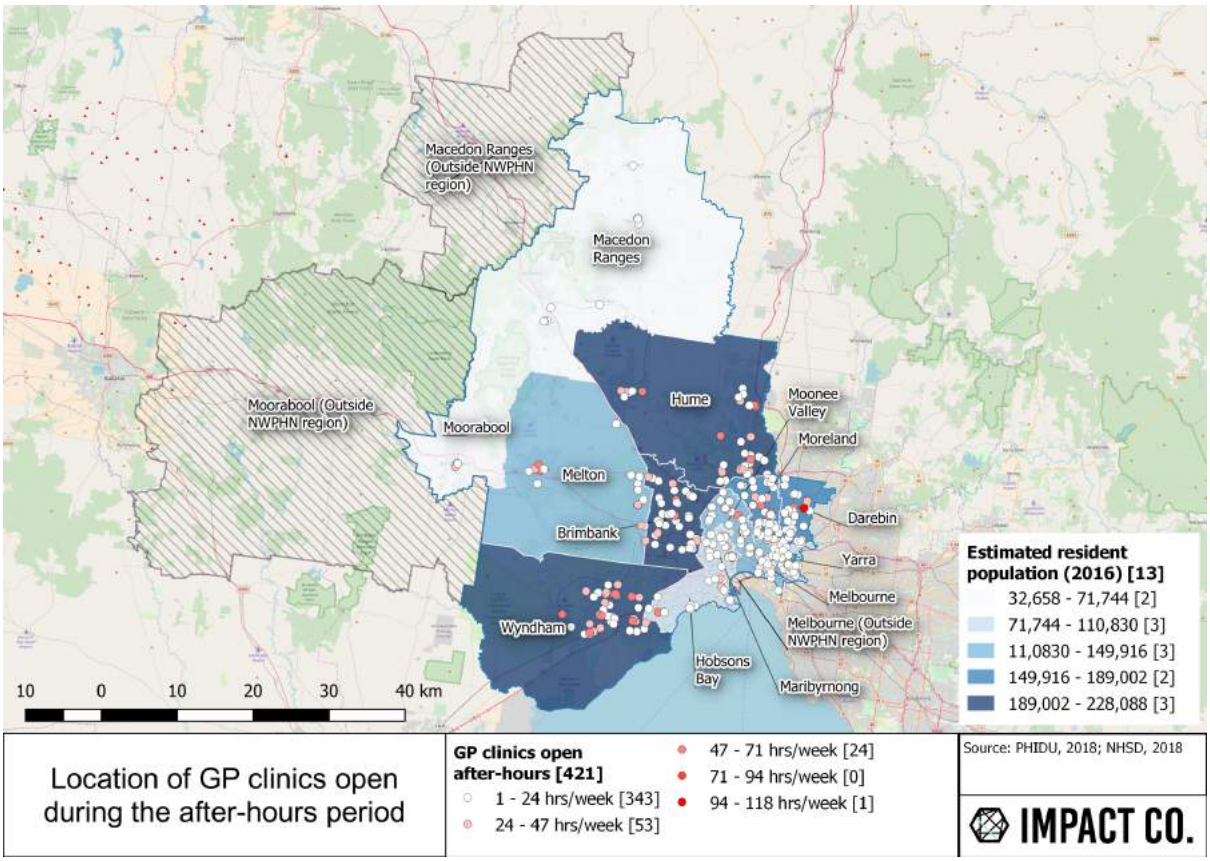
There are currently 421 general practices that are open during the AH period across the catchment (see **Figure 31**).

Maribyrnong, with 32 general practices, had the highest rate of general practices open during the AH period with 3.7 per 10,000 population. The lowest rate was found in Macedon Ranges (1.9), Melton (1.6) and Moorabool (1.2). This is highlighted in **Table *26***.

Table 26: Rate of general practices open in the AH period per 10,000 population ranked in order of highest rate

Rank	LGA	No. of services open in AH period	No. of AH services per 10,000 population
1	Maribyrnong (C)	32	3.7
2	Yarra (C)	29	3.1
3	Brimbank (C)	59	2.9
4	Moonee Valley(C)	35	2.8
5	Moreland (C)	46	2.7
6	Darebin (C)	38	2.5
7	Melbourne (C)	35	2.4
8	Wyndham (C)	51	2.2
9	Hobsons Bay (C)	19	2.0
10	Hume (S)	42	2.0
11	Macedon Ranges (S)	9	1.9
12	Melton (C)	22	1.6
13	Moorabool (S)	4	1.2

Figure 31: Location of general practices open during the AH period



When the number of general practice service hours in the AH period are adjusted for population size (see Table *27*), Wyndham had the highest rate with 58.4 opening hours per week per 10,000 population. Hume and Maribyrnong had also high rates at 41.2 and 40.3 respectively. The lowest rate was found in Melbourne with 14.9 service hours per 10,000 population.

Table 27: Rate of general practice service hours per week per 10,000 population ranked in order of highest rate

Rank	LGA	No. of service hours available in AH period	No. of AH service hours per week per 10,000 population
1	Wyndham (C)	1332.5	58.4
2	Hume (C)	857.1	41.2
3	Maribyrnong (C)	351.7	40.3
4	Brimbank(C)	791.9	37.0
5	Darebin (C)	474.4	30.6
6	Melton (C)	423.9	29.9
7	Moreland (C)	490.5	28.5
8	Moonee Valley (C)	348.3	28.3
9	Moorabool (S)	83.5	25.6
10	Hobsons Bay (C)	214.4	23.0
11	Macedon Ranges (S)	99.5	20.9
12	Yarra (C)	195	20.9
13	Melbourne (C)	220.1	14.9

Pharmacies

According to the NHSD, there are 338 pharmacies open during the AH period in the catchment.

Melbourne, at 45, had the greatest number of pharmacies open compared to Moorabool that only had three. Melbourne continues to be the top ranked when adjusted for population size with a rate of 3 pharmacies open per 10,000 population. Similarly, Moorabool continues to the be lowest ranked with 0.9 pharmacies open. As **Table 28** highlights, Melton and Wyndham also have low rates of pharmacies open during the AH period with similar rates of 1.1 per 10,000 population.

When the service opening hours are adjusted for population size (see **Table *29***), Moonee Valley has the highest rate of pharmacy service hours available during the AH period at 60.1 per 10,000 population. The LGAs with the lowest rate were Macedon Ranges and Moorabool with 23.8 and 14.4, respectively. **Figure 32** demonstrates the location of pharmacies that are open during the AH period, including the service hours available.

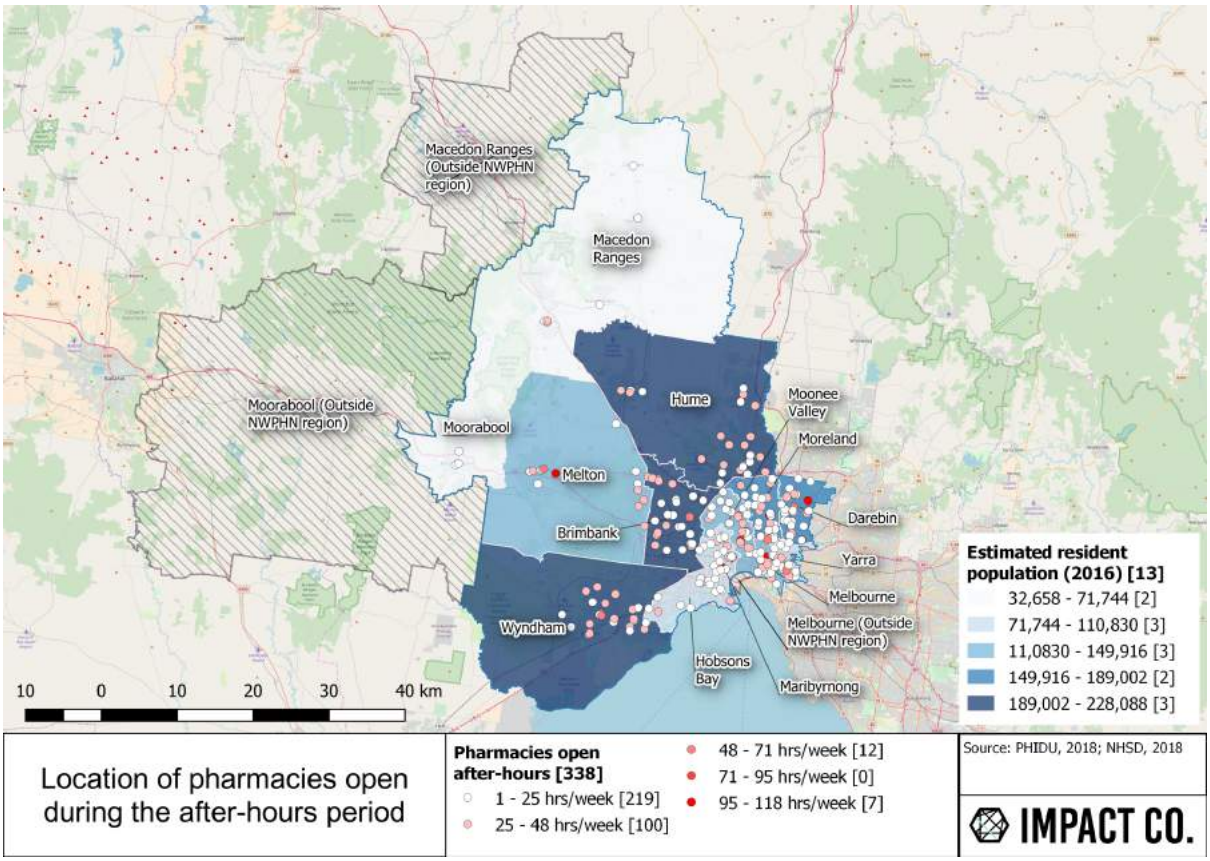
Table 28: Rate of pharmacies open in the AH period per 10,000 population ranked in order of highest rate

Rank	LGA	No. of services open in AH period	No. of AH service available per 10,000 population
1	Melbourne (C)	45	3.0
2	Maribyrnong (C)	26	3.0
3	Moonee Valley (C)	35	2.8
4	Darebin(C)	36	2.3
5	Yarra (C)	21	2.2
6	Moreland (C)	37	2.2
7	Brimbank (C)	40	1.9
8	Hobsons Bay (C)	17	1.8
9	Macedon Ranges (S)	7	1.5
10	Hume (C)	30	1.4
11	Wyndham (C)	26	1.1
12	Melton (C)	15	1.1
13	Moorabool (S)	3	0.9

Table 29: Rate of pharmacy service hours per week per 10,000 population ranked in order of highest rate

Rank	LGA	No. of service hours available per week in AH period	No. of AH service hours per week per 10,000 population
1	Moonee Valley (C)	738.6	60.1
2	Melbourne (C)	855.6	57.8
3	Maribyrnong (C)	465.9	53.3
4	Moreland (C)	901.7	52.4
5	Yarra (C)	455	48.7
6	Darebin (C)	738.4	47.6
7	Brimbank (C)	859	41.8
8	Hume (C)	854.3	41.1
9	Wyndham (C)	734	32.2
10	Melton (C)	430.9	30.4
11	Hobsons Bay (C)	247.5	26.5
12	Macedon Ranges (S)	113	23.8
13	Moorabool (S)	47	14.4

Figure 32: Location of pharmacies open in the AH period



Mental health services

There are currently 1,366 mental health services open during the AH period. This includes a combination of in-patient, community and non-clinical mental health services. For this analysis, clinical in-patient mental health services have been excluded as they are predominately operated within the acute sector.

Clinical community mental health services

Of the 554 available services in the AH period, Melbourne has the greatest number of clinical mental health services in community-based settings, with 152 providers and the highest rate of 10.3 services per 10,000 population (see **Table *30***).

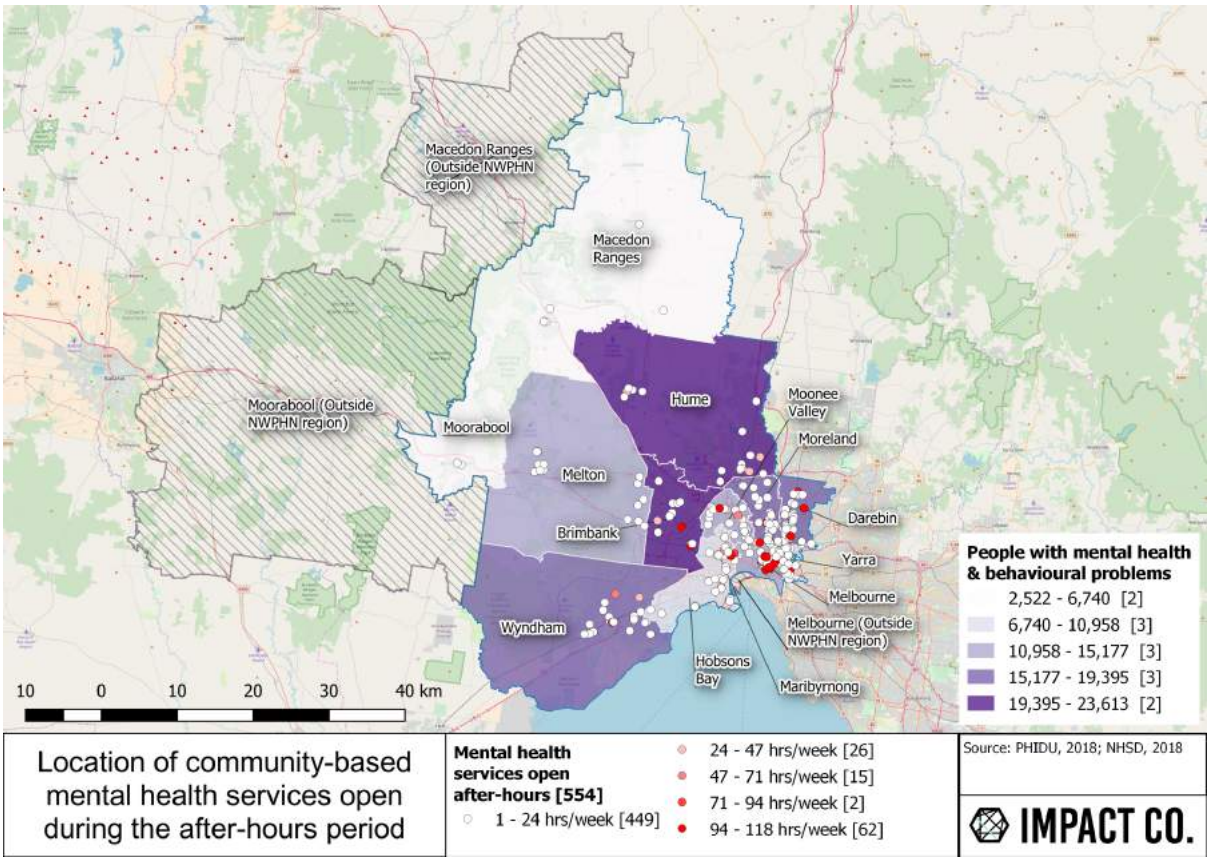
In comparison, Moorabool had the lowest number, with 2 services open during the AH period and the lowest rate of 0.6 services per 10,000 population.

Figure 33 shows the location of community-based clinical mental health services during the AH period, including the number of service hours available, against the number of people with mental health and behavioural problems.

Table 30: Rate of community clinical mental health services open in the AH period per 10,000 population ranked in order of highest rate

Rank	LGA	No. of services open in AH period	No. of AH service available per 10,000 population
1	Melbourne (C)	152	10.3
2	Yarra (C)	56	6.0
3	Maribyrnong (C)	36	4.1
4	Moonee Valley (C)	47	3.8
5	Darebin (C)	58	3.7
6	Hobsons Bay (C)	32	3.4
7	Moreland (C)	50	2.9
8	Wyndham (C)	46	2.0
9	Melton (C)	23	1.6
10	Macedon Ranges (S)	7	1.5
11	Brimbank (C)	25	1.2
12	Hume (C)	20	1.0
13	Moorabool (S)	2	0.6

Figure 33: Location of community-based mental health services during the AH period



In terms of service hours during the AH period, Melbourne had, by far, the highest rate with 352.9 hours per 10,000 population. In contrast, the LGAs with the lowest rate were Macedon Ranges with 9.9 and Moorabool with 7.7. This is demonstrated in **Table 31**.

Table 31: Rate of community clinical mental health service hours per week per 10,000 population ranked in order of highest rate

Rank	LGA	No. of service hours available in AH period	No. of AH service hours available per 10,000 population
1	Melbourne (C)	5224.0	352.9
2	Maribyrnong (C)	1528.1	174.9
3	Yarra (C)	865.7	92.7
4	Moonee Valley (C)	884.3	71.9
5	Darebin (C)	796.7	51.4
6	Brimbank (C)	969.2	47.1
7	Hobsons Bay (C)	415.0	44.4
8	Wyndham (C)	934.0	41
9	Moreland (C)	483.9	28.1
10	Melton (C)	178.5	12.6
11	Hume (C)	222.9	10.7
12	Macedon Ranges (S)	47	9.9
13	Moorabool (S)	25	7.7

Non-clinical mental health services

There are currently 17 non-clinical mental health services open in the AH period within the catchment. Maribyrnong had the highest rate with 0.5 services open per 10,000 population. As **Table 32** indicates, there are six LGAs that have no service available during the AH period.

Maribyrnong continues to be the top ranked LGA when analysed against the number of service opening hours per week per 10,000 population with 29.1 (see **Table *33***). This is followed by Yarra with 12.6.

Figure 34 shows the location of non-clinical mental health services open during the AH period, including the number of service hours available.

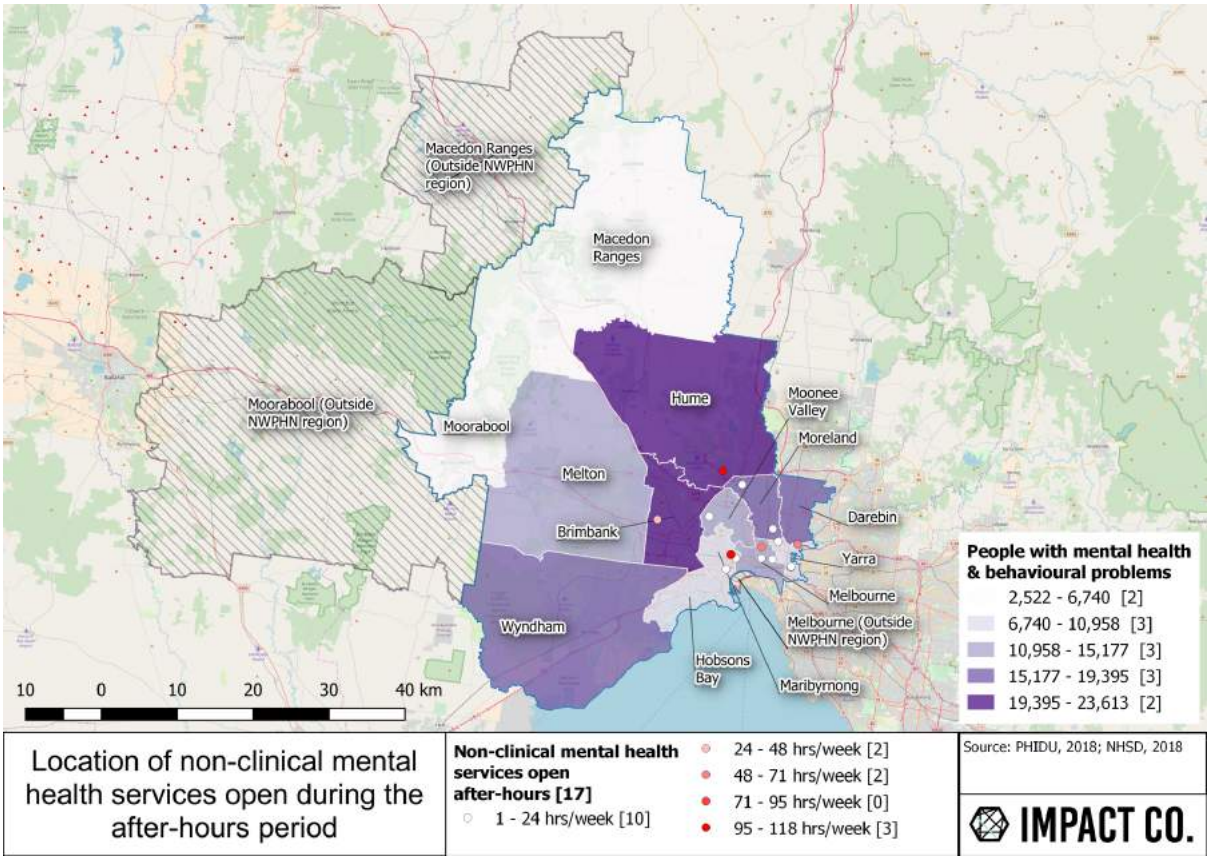
Table 32: Rate of non-clinical mental health services open in the AH period per 10,000 population ranked in order of highest rate

Rank	LGA	No. of services open in AH period	No. of AH service available per 10,000 population
1	Maribyrnong (C)	4	0.5
2	Yarra (C)	4	0.4
3	Melbourne (C)	4	0.3
4	Moreland (C)	2	0.1
5	Moonee Valley (C)	1	0.1
6	Brimbank (C)	1	0.0
7	Hume (C)	1	0.0
8	Darebin (C)	0	0.0
8	Hobsons Bay (C)	0	0.0
8	Macedon Ranges (S)	0	0.0
8	Melton (C)	0	0.0
8	Moorabool (S)	0	0.0
8	Wyndham (C)	0	0.0

Table 33: Rate of non-clinical mental health service hours per week per 10,000 population ranked in order of highest rate

Rank	LGA	No. of service hours per week in AH period	No. of AH service hours per week per 10,000 population
1	Maribyrnong (C)	254.3	29.1
2	Yarra (C)	118.0	12.6
3	Melbourne (C)	95.9	6.5
4	Hume (C)	117.9	5.7
5	Brimbank (C)	31	1.5
6	Moreland (C)	12	0.7
7	Moonee Valley (C)	1	0.1
8	Darebin (C)	0	0.0
8	Hobsons Bay (C)	0	0.0
8	Macedon ranges (S)	0	0.0
8	Melton (C)	0	0.0
8	Moorabool (S)	0	0.0
8	Wyndham (C)	0	0.0

Figure 34: Location of non-clinical mental health services open during the AH period



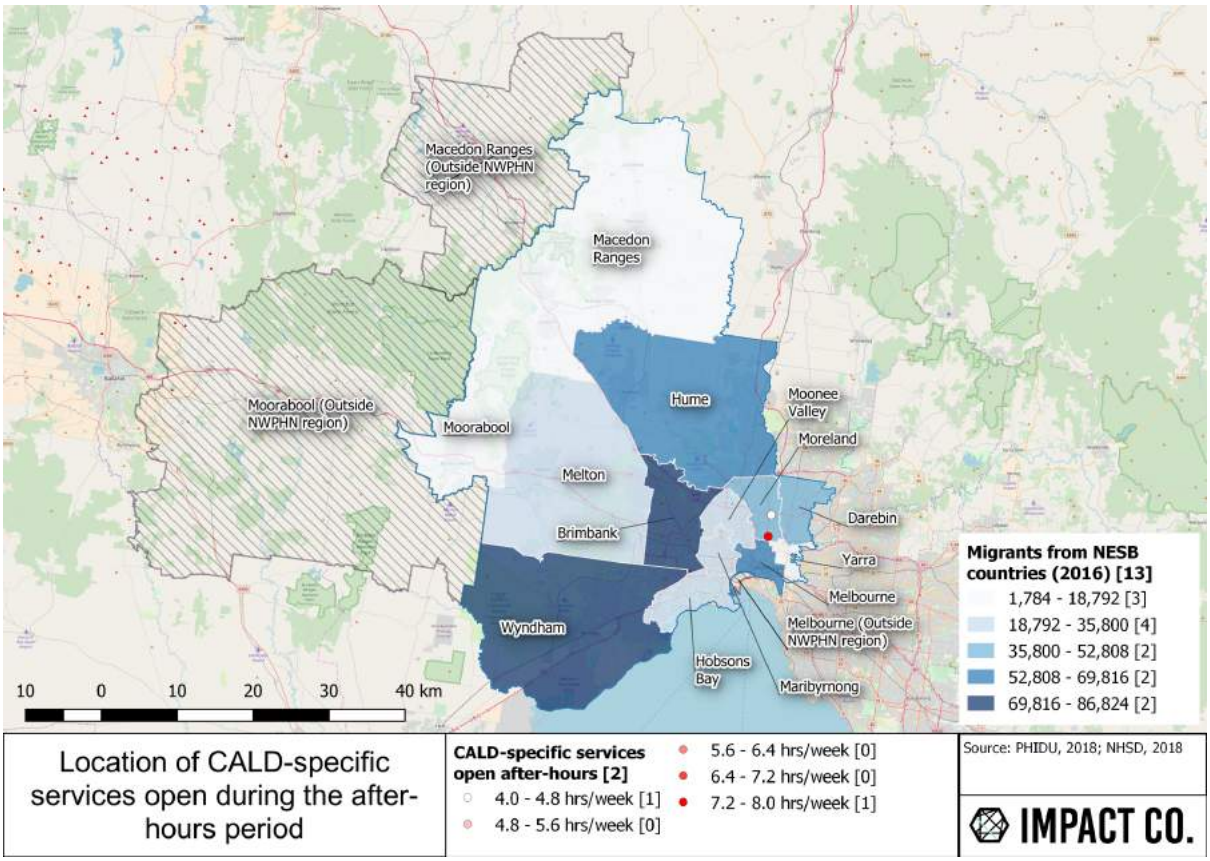
Culturally and linguistically diverse services

Only 33 providers in the catchment indicated that their primary service was to provide culturally and linguistically diverse (CALD) services. Of this number, only two providers were open in the AH period, both being situated in Moreland (see **Table *34*** and **Figure 35**).

Table 34: Rate of CALD services by AH availability and opening hours per 10,000 population ranked in order of highest rated LGA

Rank	LGA	No. of services available in AH period	No. of AH service available per 10,000 population	No. of service hours available in AH period	No. of AH service hours available per 10,000 population
1	Moreland (C)	2	0.1	12	0.7
2	Yarra (C)	0	0	0	0
2	Melbourne (C)	0	0	0	0
2	Hume (C)	0	0	0	0
2	Brimbank (C)	0	0	0	0
2	Moreland (C)	0	0	0	0
2	Moonee Valley (C)	0	0	0	0
2	Darebin (C)	0	0	0	0
2	Hobsons Bay (C)	0	0	0	0
2	Macedon ranges (S)	0	0	0	0
2	Melton (C)	0	0	0	0
2	Moorabool (S)	0	0	0	0
2	Wyndham (C)	0	0	0	0

Figure 35: Location of CALD-specific services open during the AH period



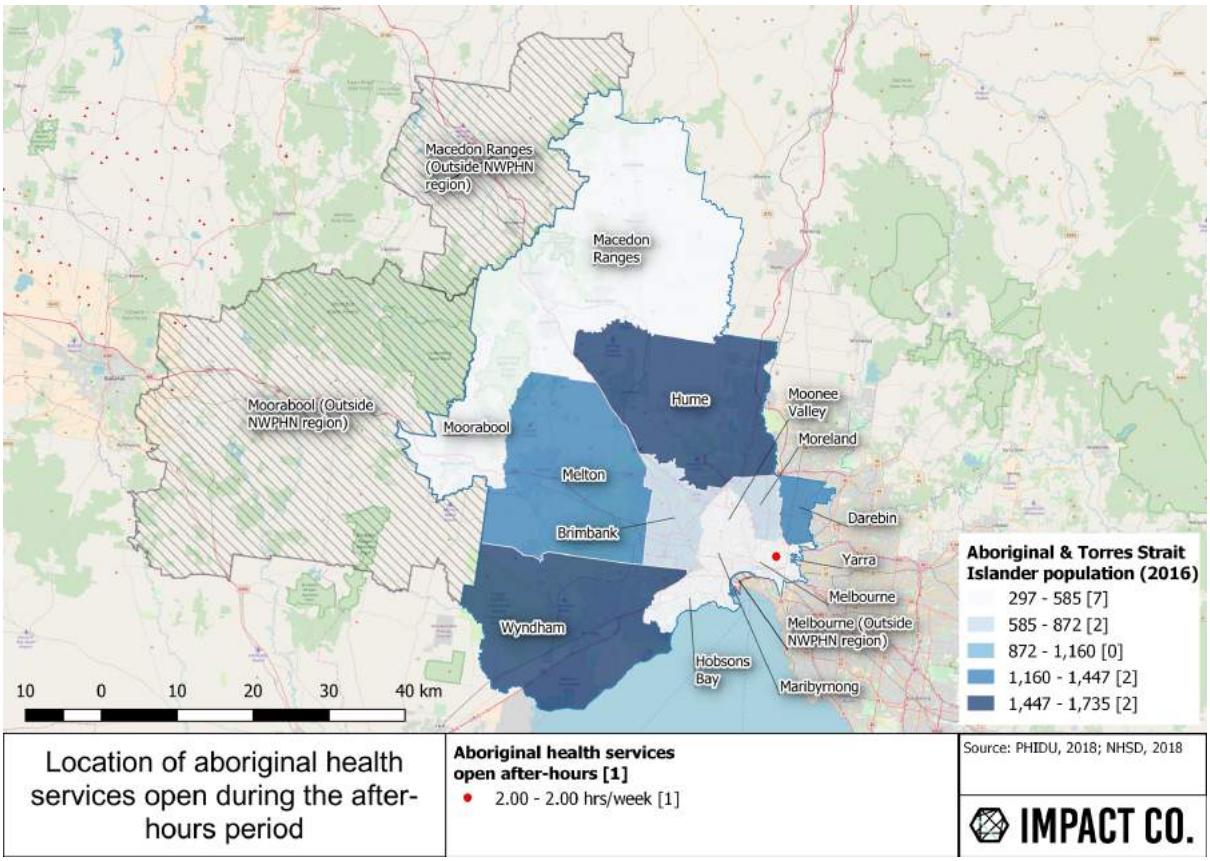
Aboriginal and Torres Strait Islander services

Nine providers in the catchment indicated that their primary service was to provide services for the Aboriginal and Torres Strait Islander communities. Of this number, only one service, located in Yarra, was open during the AH period (see **Table 35** and **Figure 36**).

Table 35: Rate of CALD services by AH availability and opening hours per ERP of Aboriginal people ranked in order of highest rated LGA

Rank	LGA	No. of services available in AH period	No. of AH service available per Aboriginal population	No. of service hours available in AH period	No. of AH service hours available per Aboriginal population
1	Yarra (C)	1	0.3	2	0.5
2	Moreland (C)	0	0	0	0
2	Melbourne (C)	0	0	0	0
2	Hume (C)	0	0	0	0
2	Brimbank (C)	0	0	0	0
2	Moreland (C)	0	0	0	0
2	Moonee Valley (C)	0	0	0	0
2	Darebin (C)	0	0	0	0
2	Hobsons Bay (C)	0	0	0	0
2	Macedon ranges (S)	0	0	0	0
2	Melton (C)	0	0	0	0
2	Moorabool (S)	0	0	0	0
2	Wyndham (C)	0	0	0	0

Figure 36: Location of Aboriginal services open during the AH period



Alcohol and other Drug (AoD) services

There are 181 providers in the catchment that provide AoD services. Of this number, 15 provide services during the AH period.

As **Table 36** highlights, the majority of AoD services are located in Yarra, which also has the highest rate per 10,000 population. In contrast, Hobsons Bay, Hume and Macedon Ranges did not have any services open.

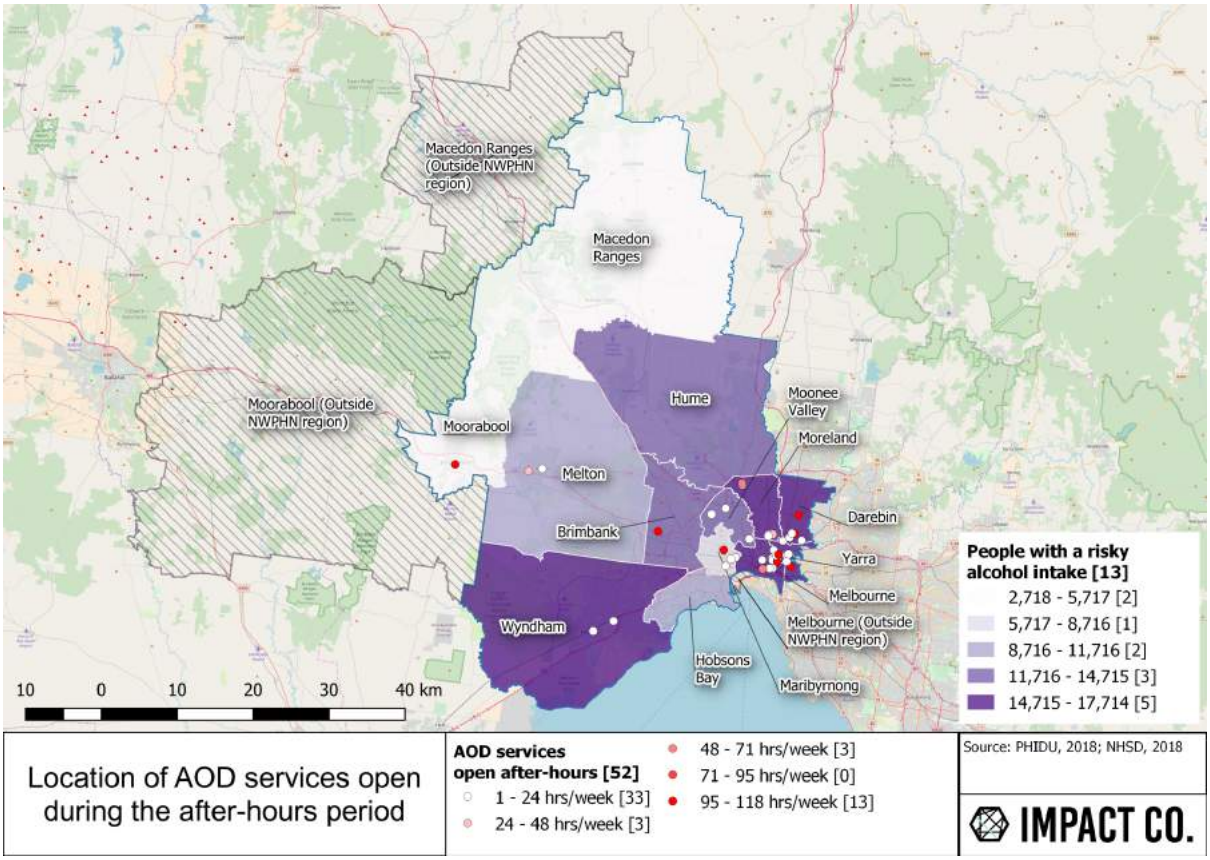
For service opening hours (see **Table *37***), Yarra continues to be the LGA with the highest rate of service opening hours in the AH period with 80.7 per 10,000 population. This is followed by Moorabool with 72.2.

Figure 37 shows the location of AoD services open during the AH period, including the number of service hours available.

Table 36: Rate of AoD services open in the AH period per 10,000 population ranked in order of highest rated LGA

Rank	LGA	No. of services open in AH period	No. of AH service available per 10,000 population
1	Yarra (C)	15	1.6
2	Maribyrnong (C)	6	0.7
3	Melbourne (C)	10	0.7
4	Moorabool (S)	2	0.6
5	Moreland (C)	6	0.4
6	Darebin (C)	5	0.3
7	Moonee Valley (C)	3	0.2
8	Melton (C)	2	0.1
9	Wyndham (C)	2	0.1
10	Brimbank (C)	1	0.1
11	Hobsons Bay (C)	0	0.0
11	Hume (C)	0	0.0
11	Macedon Ranges (S)	0	0.0

Figure 37: Location of AoD services open during the AH period



AH service use: Locum doctor

There are currently four locum doctor or medical deputising service (MDS) providers servicing different parts of the catchment. For this analysis, data was only supplied by two MDS providers: National Home Doctor Service (**NHDS**) (trading as 13SICK) and the Australian Locum Medical Service (ALMS) (trading as DoctorDoctor (**DrDr**)). However, not all LGAs, or suburbs within the LGAs, in the catchment are serviced by the MDS providers. NHDS, which is the predominate provider of the catchment, doesn't cover all areas of Darebin, Hume, Melbourne, Melton and Yarra (see **Table *38*).** Both NHDS and ALMS do not cover the shires of Macedon Ranges and Moorabool.

Table 37: Rate of AoD service hours per week per 10,000 population ranked in order of highest rated LGA

Rank	LGA	No. of service hours per week in AH period	No. of AH service hours per week per 10,000 population
1	Yarra (C)	753.8	80.7
2	Moorabool (S)	235.8	72.2
3	Melbourne (C)	324.6	21.9
4	Maribyrnong (C)	155.9	17.8
5	Darebin (C)	259.8	16.8
6	Moreland (C)	103	6.0
7	Brimbank (C)	117.9	5.7
8	Melton (C)	60.5	4.3
9	Moonee Valley (C)	30	2.4
10	Wyndham (C)	22	1.0
11	Hobsons Bay (C)	0	0.0
11	Hume (C)	0	0.0
11	Macedon Ranges (S	0	0.0

In 2017-18, 145,847 locums service calls were made within the catchment. The number of locum doctor calls according to each LGA is demonstrated in **Figure 38**. Moreland, at 17.3%, accounted for the largest proportion of locum doctor calls, followed by Wyndham (11.9%) and Darebin (11%). When the number of calls is assessed according to 1000 population, Maribyrnong and Moonee Valley also have high rates of service use compared to other LGAs (see **Figure 39** and **Figure 40**).

Table 38: Proportion of area covered by NHDS ranked in order of LGA with least coverage

Rank	LGA	% of area covered by MDS
1	Moorabool (S)	0%
2	Macedon Ranges (S)	6%
3	Melbourne (C)	81%
4	Yarra (C)	86%
5	Hume (C)	88%
6	Darebin (C)	89%
7	Melton (C)	90%
8	Brimbank (C)	100%
8	Hobsons Bay (C)	100%
8	Maribyrnong (C)	100%
8	Moonee Valley (C)	100%
8	Moreland (C)	100%
8	Wyndham (C)	100%

Figure 38: Number of locum doctor calls per LGA, 2017-18

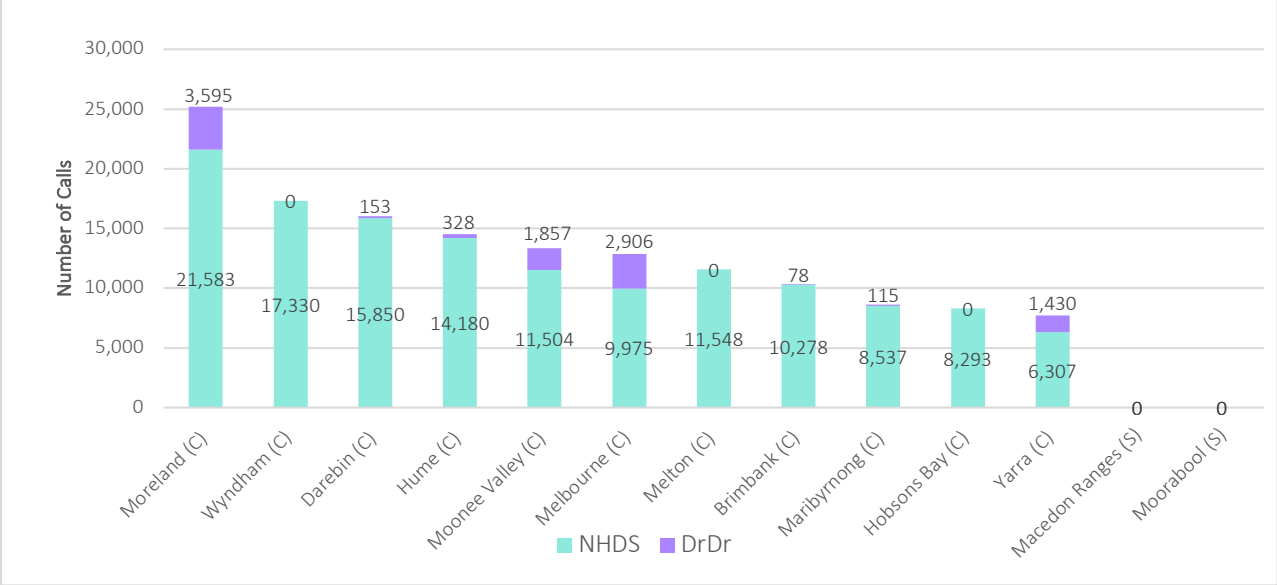


Figure 39: Number of locum doctor (NHDS) calls per 1000 population by LGA, 2017-18

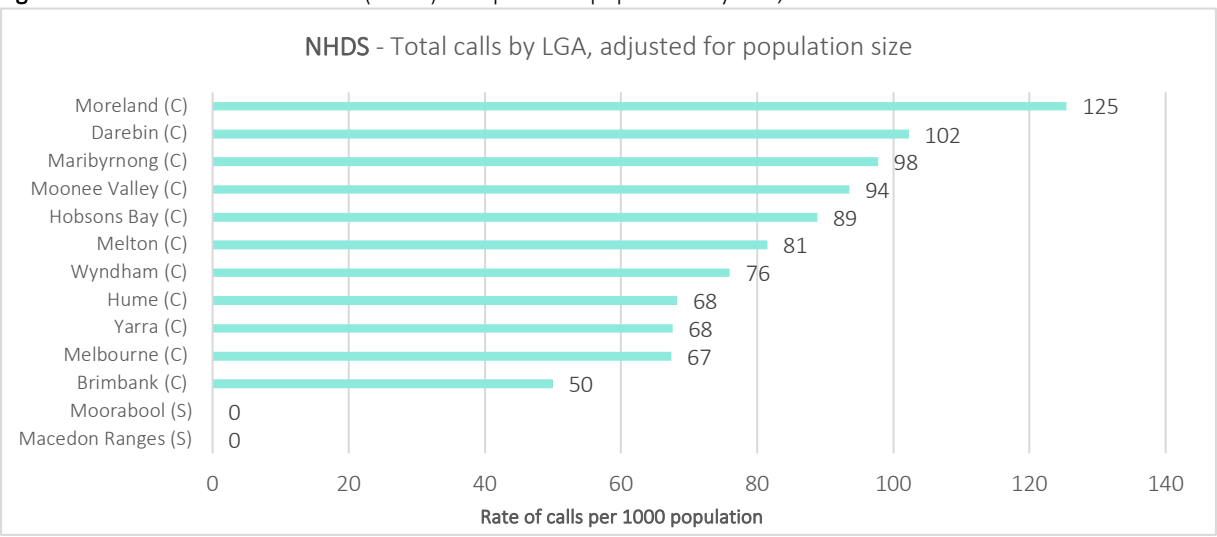
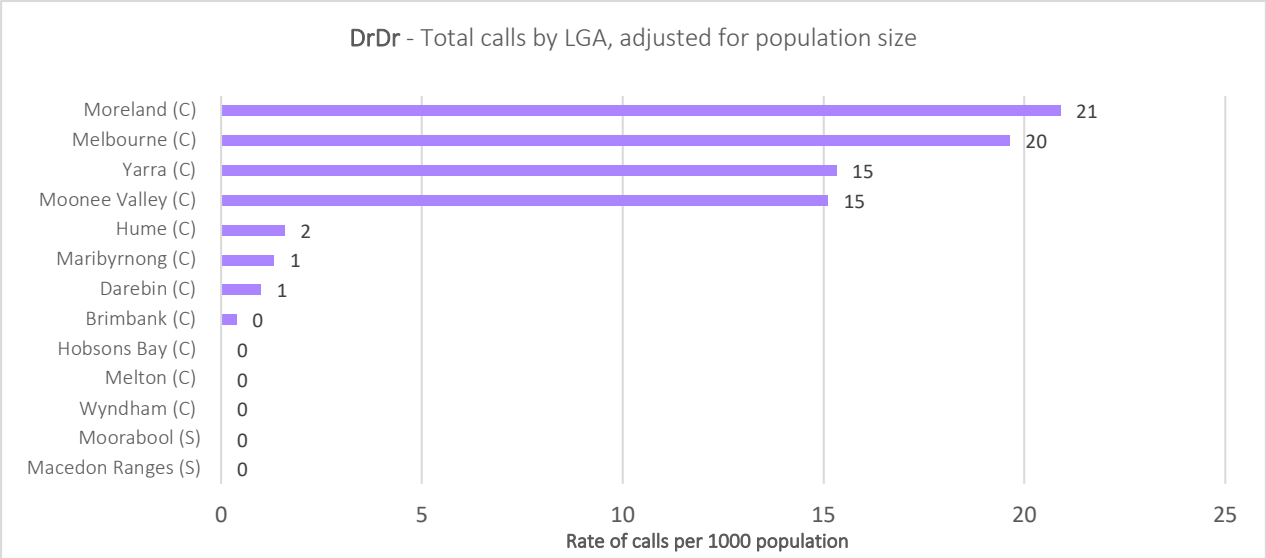


Figure 40: Number of locum doctor (DrDr) calls per 1000 population by LGA, 2017-18



Use by age group and referral type

The age distribution of locum doctor calls to NHDS and DrDr is shown in **Figure 41.** The trend is similar even though the two organisations provided services to a vastly different number of clients in different areas of the catchment. Due to its larger patient volume, the age distribution of NHDS calls was compared to that of the general NWMPHN population (see **Figure 42**). The trend is similar to the age groups that most frequently attend ED for a category 4 or 5 presentation during the AH period, with the exception of a much larger spike in services for older people. **Figure 43** suggests that this spike may be attributed to the proportion of calls made by residential aged care facilities, which account for approximately a quarter of service use.

Figure 41: Proportion of locum doctor calls by age group, 2017-18

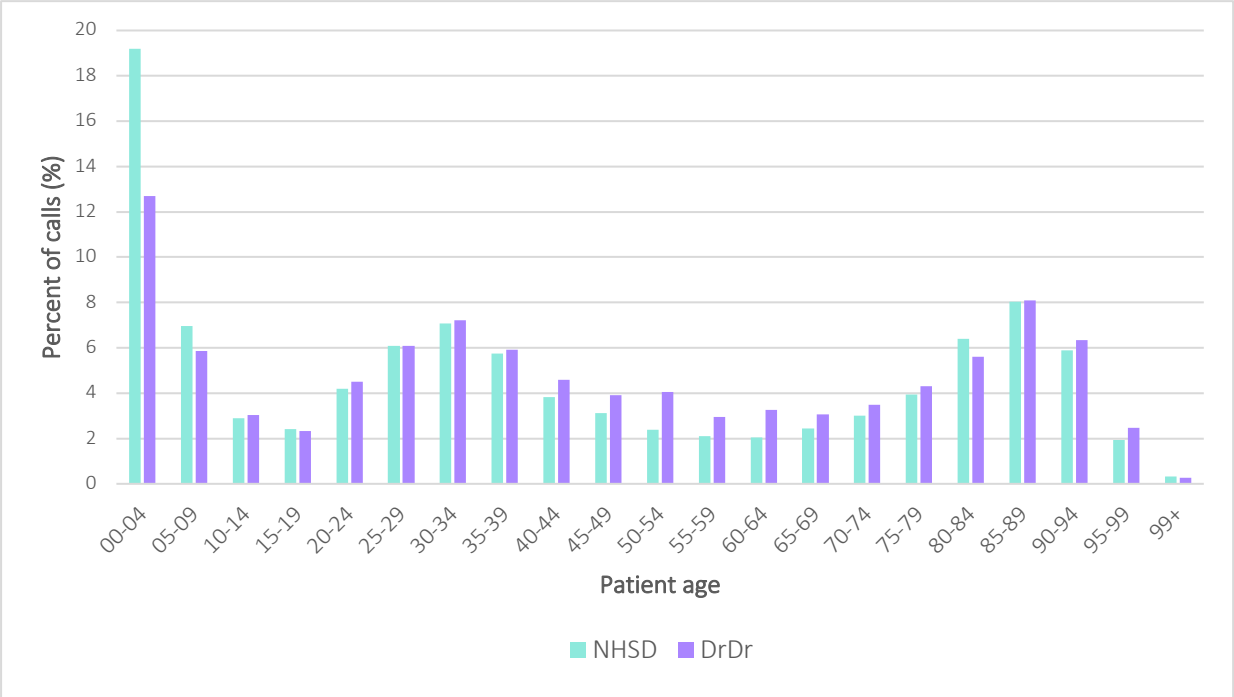


Figure 42: Age distribution of NHDS calls (FY17-18) compared to the general population

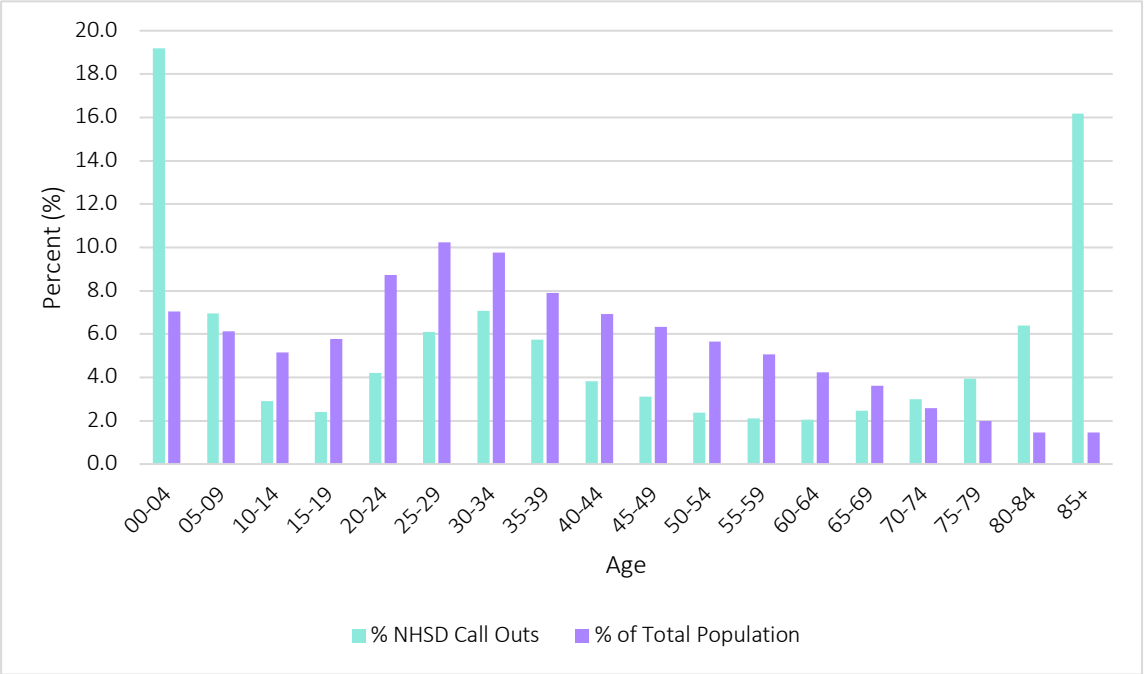
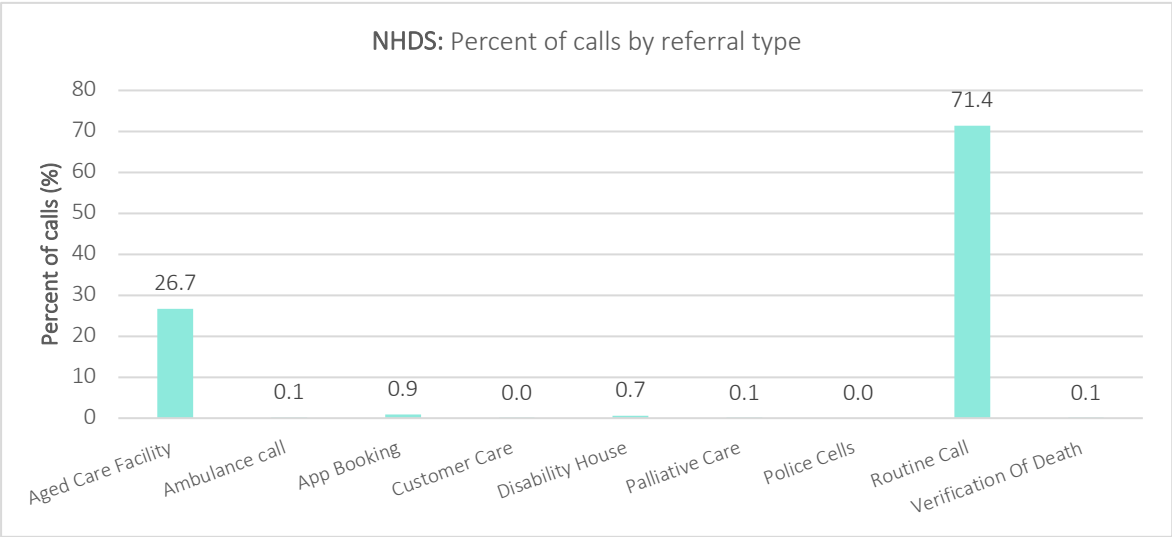
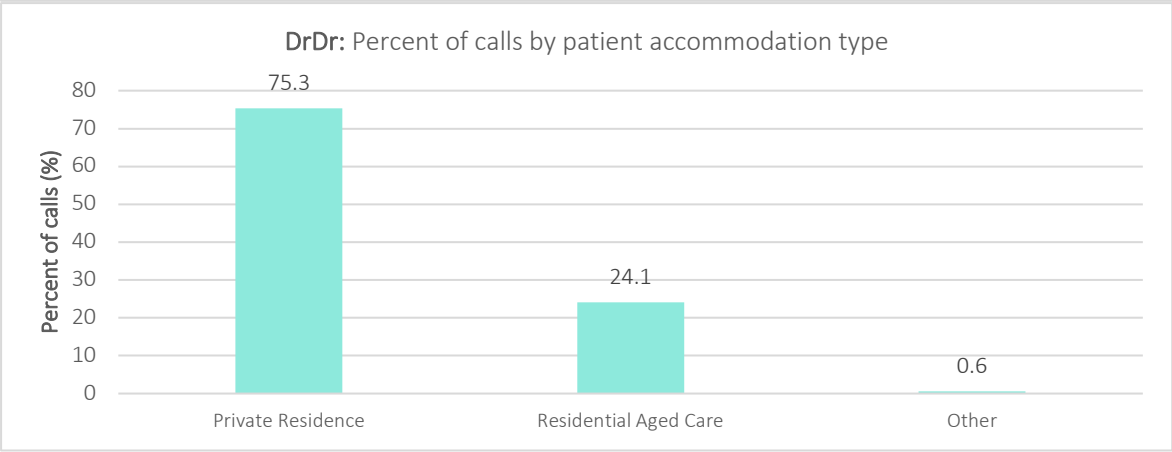


Figure 43: Proportion of locum doctor calls by referral (NHDS) or accommodation type (DrDr), 2017-18





4. COMPOSITE INDEX SCORE RESULTS

DEVELOPING A COMPOSITE INDEX SCORE OF AH PRIMARY HEALTH CARE NEEDS

A multi-factorial, or composite, index score was developed to better understand, and quantify, the AH primary health care needs of residents of the NWMPHN catchment. This Composite Index Score quantifies the relative need for AH primary care services across the catchment, allowing LGAs to be ranked in order from most to least need as well as the proportion of need.

As described in the previous section, the Composite Index Score is comprised of three sub-indices:

1. AH Need Index
2. Unmet AH Demand Index
3. AH Service Availability Index

Using the data and rankings applied in *Section 3*, this section provides more detail on how the Composite Index Score was derived, and also sets out the results.

After-hours (AH) Need Index

Step 1: Identify demographic drivers of after-hours primary care need

The AH Need Index was developed based on demographic drivers of need for AH primary care. The demographic drivers included in the index were selected based on the results of the literature review (*Section 2*), a local-level analysis of AH ED attendance data and because a specific population cohort was a priority focus area of NWMPHN. The demographic drivers were measured using publicly available data sources as presented in **Table 39.**

A full description of indicators, related calculations and sources can be found in **Appendix B.**

Table 39: AH NEED INDEX - demographic drivers and related indicators

Demographic Driver	Indicator(s)	Source
Population size	2016 Estimated resident population	PHIDU; Census2016
0-4 year old population	Proportion of 2016 resident population aged 0-4 years	PHIDU; Census2016
65+ year old population	Proportion of 2016 resident population aged 65 years and older	PHIDU; Census2016
Population growth	Projected percent annual overall population growth Projected percent annual 0-4 year old population growth Projected percent annual 65+ year old population growth	Victoria in Future 2016
Homeless population	Proportion of 2016 resident population who were homeless	PHIDU; Census2016
Refugee population	Proportion of all humanitarian settlers who were settled in the NWMPHN region in 2017	DSS
	Proportion of 2016 resident LGA population born in one of the top 5 countries contributing to humanitarian settlement in Australia.	DSS; Statistical Data for Victorian Communities
Aboriginal and Torres Strait Islander population	Proportion of 2016 resident population who identified as Aboriginal or Torres Strait Islander	PHIDU; Census2016
CALD population	Proportion of 2016 resident population born in predominantly non-English speaking countries	PHIDU; Census2016
	Proportion of 2016 resident population with poor English proficiency	PHIDU; Census2016
Socio-economic disadvantage	SEIFA Index of Relative Socio-Economic Disadvantage Score (IRSD)	PHIDU; Census2016
Population living with mental illness	Age standardised rate per 100 people, aged 18 years and over, with high or very high psychological distress based on K10 scale	PHIDU; Census2016
Population in poor health	ASR per 100 people aged 15 years and over with fair or poor self-assessed health	PHIDU; Census2016
Population living with complex chronic conditions	Proportion of 2014 population living with 3 or more chronic diseases	Victorian Population Health Survey 2014

Step 2: Standardisation of indicators

The indicators identified in **Table 39** exist in various formats i.e. proportion, absolute number and composite score. As such, each indicator must be standardised in order to be compared and combined into a single index score. Standardisation was achieved by dividing each LGA-specific indicator value by the sum of all 13 LGA indicator values.

Table 40 demonstrates this process using two indicators – proportion of the population aged 0-4 and IRSD. It is not possible to add these two indicators in their original format as the IRSD value is much larger than the proportions of 0-4 year olds. Leaving the values in its original format will mean that the differences among 0-4 year old populations by LGA will be insignificant in the final composite score.

Standardising the indicator in this manner results in a score between 0 and 1 that can then be combined into a composite score and, at the same time, maintain the relative difference between LGAs, as visible by the rankings and colouring in **Table 40**.

Step 3: Weighting of AH Need Indicators

It is easy to accept that varying demographic characteristics will not equally influence a population's need for AH primary health care services. This methodology acknowledges that some population demographics will have more influence over a population's need for services than others. However, estimating the relative difference in influence between demographic drivers is not an easy, nor straightforward, task. Literature on this general subject is limited and literature relating to the northwestern Melbourne region is non-existent.

The rationale for employing weightings in this methodology is based on the results of the literature review in *Section 2*. Demographic drivers that have been found to influence ED attendance or poor health outcomes were given an additional 0.50 weighting. These indicators were: age (0-4 years and 65+ years), IRSD, high/very psychological distress and self-reported health.

Table 40: Examples of method employed to standardise indicators

LGA	Rank 0-4yr	Aged 0-4 years (%)	Calculations	0-4yr Score	Rank 0-4yr Score
Brimbank (C)	6	6.84	6.84/88	0.0777	6
Darebin (C)	10	6.19	6.19/88	0.0703	10
Hobsons Bay (C)	4	7.09	7.09/88	0.0806	4
Hume (C)	3	8.12	8.12/88	0.0922	3
Macedon Ranges (S)	8	6.67	6.67/88	0.0758	8
Maribyrnong (C)	5	7.03	7.03/88	0.0799	5
Melbourne (C)	13	3.36	3.36/88	0.0382	13
Melton (C)	2	8.75	8.75/88	0.0994	2
Moonee Valley (C)	11	5.90	5.90/88	0.0670	11
Moorabool (S)	7	6.72	6.72/88	0.0763	7
Moreland (C)	9	6.49	6.49/88	0.0737	9
Wyndham (C)	1	10.07	10.07/88	0.1145	1
Yarra (C)	12	4.78	4.78/88	0.0543	12
Total		88.00		1.00	

LGA	Rank IRSD	IRSD	Calculations	IRSD Score	Rank IRSD Score
Brimbank (C)	13	921	921/13049	0.0706	13
Darebin (C)	9	1004	1004/13049	0.0769	9
Hobsons Bay (C)	4	1015	1015/13049	0.0778	4
Hume (C)	12	947	947/13049	0.0726	12
Macedon Ranges (S)	1	1060	1060/13049	0.0812	1
Maribyrnong (C)	10	995	995/13049	0.0763	10
Melbourne (C)	6	1010	1010/13049	0.0774	6
Melton (C)	11	994	994/13049	0.0762	11
Moonee Valley (C)	2	1035	1035/13049	0.0793	2
Moorabool (S)	6	1010	1010/13049	0.0774	6
Moreland (C)	5	1014	1014/13049	0.0777	5
Wyndham (C)	8	1009	1009/13049	0.0773	8
Yarra (C)	2	1035	1035/13049	0.0793	2
Total		13049.0		1.00	

Step 4: Calculating AH Need Index

The last step in generating the AH Need Index involved summing all standardised AH need scores and dividing by the total number of indicators, which resulted in an average AH Need Index for each LGA (see **Table 41**). LGAs were ranked based on the AH Need Index and the index value was expressed as a percentage for easier comprehension. The calculations required to express the index score as a percentage do not change the relative differences nor ranking of the LGAs.

Table 41: AH Need Index scores

Rank	LGA	AH Need Index	AH Need Index
1	Hume (C)	0.098	9.84
2	Brimbank (C)	0.090	8.99
3	Wyndham (C)	0.087	8.74
4	Melton (C)	0.086	8.58
5	Maribyrnong (C)	0.079	7.93
6	Darebin (C)	0.079	7.89
7	Melbourne (C)	0.077	7.74
8	Moreland (C)	0.074	7.42
9	Moorabool (S)	0.071	7.13
10	Hobsons Bay (C)	0.067	6.71
11	Moonee Valley (C)	0.066	6.58
12	Yarra (C)	0.065	6.47
13	Macedon Ranges (S)	0.060	5.98

Interpretation of % AH Need

The results indicate that the City of Hume has the highest AH primary health needs in the catchment, accounting for an estimated 9.84% of all need. This value is only marginally higher than the next three ranked LGAs of Brimbank (8.99%), Wyndham (8.74%) and Melton (8.58%). Overall, there is minimal variation in relative AH primary health needs across the catchment with the first ranked LGA (Hume) having a score only 1.7 times greater than the last ranked LGA (Macedon Ranges).

Unmet AH Demand Index

Step 1: Identify indicators of unmet demand

To our knowledge, there is no standardised method for quantifying a population's unmet demand for AH primary health care services.

To calculate this sub-index, indicators were selected that could demonstrate that consumers' need for primary health services in the AH period was met by acute-care services rather than within the community. Indicators were selected for this index based on the literature review (*Section 2*) and were limited by what data sources were timely, accurate or publicly accessible. For example, the length of a service's waitlist is a strong indicator of unmet demand for services however, gaining access to this level of information across all geographies and health sectors is not currently feasible. Indicators that were accessible and included in the Unmet Demand Index are listed in **Table 42**.

Table 42: Indicators of unmet demand for after-hours primary health services

Unmet Demand	Indicator	Source
Non-urgent ED attendances	Rate per 1000 population for all Cat 4/5 emergency department attendances occurring in the after-hours period	VEMD 2015-16
Mental health-related non-urgent ED attendances	After-hours triage Cat 4/5 mental-health related ED attendances as a proportion of all after-hours ED attendances	VEMD 2015-16
Potentially preventable hospitalisations	Age standardised rate per 100,000 admissions (all hospitals) for all potentially preventable conditions	PHIDU 2014-15
Non-urgent ambulance call outs	Non-urgent ambulance call outs made in the after-hours period as a proportion of all ambulance call outs	Ambulance Victoria, 2015-18

Step 2: Standardisation of indicators

All indicators were standardised using the methods described in AH Need Index Step 2 (see page 65).

Step 3: Calculating Unmet AH Demand Index

Calculating the Unmet AH Demand Index involved summing all standardised indicator scores and dividing by the total number of indicators, which resulted in an average Unmet AH Demand Index for each LGA. As **Table 43** demonstrates, the LGAs are ranked in order of most unmet AH demand, and the index value is expressed as a percentage for easier comprehension. The calculations required to express the index score as a percentage do not change the relative differences nor ranking of the LGAs.

Table 43: Unmet AH Demand Index scores

Rank	LGA	Unmet Demand Index	% Unmet Demand
1	Hobsons Bay (C)	0.091	9.14
2	Maribyrnong (C)	0.090	9.00
3	Darebin (C)	0.087	8.72
4	Brimbank (C)	0.081	8.08
5	Moreland (C)	0.080	7.99
6	Melton (C)	0.079	7.89
7	Moorabool (S)	0.078	7.80
8	Hume (C)	0.076	7.63
9	Moonee Valley (C)	0.076	7.57
10	Yarra (C)	0.075	7.53
11	Wyndham (C)	0.071	7.13
12	Melbourne (C)	0.070	6.95
13	Macedon Ranges (S)	0.046	4.56

Interpretation of % Unmet Demand

The results indicate that Hobsons Bay has the highest unmet demand for AH primary care services in the catchment, accounting for an estimated 9.14% of all unmet demand. This value is only marginally higher than the next two LGA – Maribyrnong (9.00%) and Darebin (8.72%). Overall, there is moderate variation in the relative unmet demand for AH primary health services across the catchment with the first ranked LGA (Hobsons Bay) having a score twice as great as the last ranked LGA (Macedon Ranges).

After-hours Service Availability Index

Step 1: Identify indicators of service availability

Generating the AH Service Availability Index first involved determining the relative amount of primary care services available in the AH periods by LGA. The majority of indicators (or data) used to calculate this score were extracted from the National Health Services Directory (NHSD) database. As such, one limitation of our analysis is that its accuracy is dependent on the accuracy, and currency, of information stored in the NHSD. Locum doctor service coverage (namely the National Home Doctor Service) was also used to calculate this index score and, again, is limited by the accuracy (and currency) of the data provided by NHDS.

The NHSD database contains a wealth of information relating to each service site listed, including geographic location, opening hours, service sector, primary service type, and relevance to specific cohorts. This allowed for a detailed analysis of service availability across the catchment. From this, two main types of indicators were included in the analysis:

1) the number of service locations open in the AH period; and
2) the number of weekly service hours available in the AH period.

A total of 18 service availability indicators were selected for inclusion into the index analysis. They included indicators specific for various health services (e.g. general practices, pharmacies, mental health services) and population cohorts (e.g. CALD-specific) that were chosen based on their alignment with NWMPHN's priorities and funding remit. A full list of indicators, rationale for inclusion and associated calculations is presented in **Appendix B**.

Step 2: Standardisation of indicators

All indicators were standardised using the methods described in AH Need Index Step 2 (see page 65).

Step 3: Calculating Service Availability Index

Calculating the AH Service Availability Index score involved summing all standardised indicator scores and dividing by the total number of indicators, which resulted in an average Service Availability Index score for each LGA. **Table 44** ranks the LGAs from lowest to highest AH service availability with the index value, expressed as a percentage for easier comprehension. The calculations required to express the index score as a percentage do not change the relative differences nor ranking of the LGAs.

Table 44: AH Service Availability Index scores

Rank	LGA	Service Availability Index	% Service Availability
1	Macedon Ranges (S)	0.022	2.25
2	Melton (C)	0.030	2.97
3	Hobsons Bay (C)	0.037	3.68
4	Hume (C)	0.038	3.82
5	Wyndham (C)	0.039	3.95
6	Brimbank (C)	0.042	4.15
7	Moorabool (S)	0.042	4.18
8	Darebin (C)	0.052	5.21
9	Moonee Valley (C)	0.062	6.21
10	Melbourne (C)	0.113	11.28
11	Maribyrnong (C)	0.120	12.02
12	Moreland (C)	0.166	16.56
13	Yarra (C)	0.237	23.73

Interpretation of % Service Availability

The results indicate that Macedon Ranges has the lowest number of available AH services in the catchment, accounting for an estimated 2.25% of the relative availability of AH services. It is important to note that this value is a relative score and is not an accurate estimation of the proportion of all services available in the AH. This is because the services that the NWMPHN has more influence over, or interest in, have been more heavily weighted in this analysis. For example, dental, allied health and accommodation services have been excluded in this analysis.

Overall, there is very high variation in relative service availability for AH primary health services across the catchment, with the first ranked LGA (Macedon Ranges) having a score 10.6 times less than the last ranked LGA (Yarra). Having vastly different service availability across the catchment is not, in itself, a negative finding if, for example, the need for services is equally varied. However, the findings presented in the previous two indices (see **Table 41** and **Table 43**) indicates that this is not likely the case in the NWMPHN catchment.

Calculating the Composite Index Score

The final step in generating the Composite Index Score involves combining the above-mentioned indices into one composite value. To do so, the following equation was employed:

$$Composite\ Index\ Score\ = \frac{AH\ Need\ Index\ +\ Unmet\ Demand\ Index}{Service\ Availability\ Index}$$

The LGA with the highest score is assumed to have a combination of the greatest need and unmet demand, with the poorest AH service availability. This approach to calculating the Composite Index Score reveals the extent of variation between LGAs, providing an indication of the extent to which each LGA should be prioritised when the NWMPHN engages in future AH service commissioning.

Interpretation of the Composite Index Score

Table 45 presents the Composite Index Scores and related sub-indices. The results of the Composite Index Score indicate that residents of Melton have the greatest overall need for AH primary health services in the catchment, followed (relatively) closely by Macedon Ranges and Hume.

Table 45: LGA Ranking by Composite Index Score

Rank	LGA	AH Need Index	Unmet Demand Index	Service Availability Index	COMPOSITE INDEX	% COMPOSITE INDEX
1	Melton (C)	0.086	0.079	0.030	5.537	13.67
2	Macedon Ranges (S)	0.060	0.046	0.022	4.694	11.59
3	Hume (C)	0.098	0.076	0.038	4.573	11.29
4	Hobsons Bay (C)	0.067	0.091	0.037	4.307	10.63
5	Brimbank (C)	0.090	0.081	0.042	4.111	10.15
6	Wyndham (C)	0.087	0.071	0.039	4.023	9.93
7	Moorabool (S)	0.071	0.078	0.042	3.568	8.81
8	Darebin (C)	0.079	0.087	0.052	3.190	7.87
9	Moonee Valley (C)	0.066	0.076	0.062	2.279	5.62
10	Maribyrnong (C)	0.079	0.090	0.120	1.409	3.48
11	Melbourne (C)	0.077	0.070	0.113	1.302	3.21
12	Moreland (C)	0.074	0.080	0.166	0.931	2.30
13	Yarra (C)	0.065	0.075	0.237	0.590	1.46

A closer examination of the top three ranked LGAs tells three very different stories:

1. Melton

   Melton has a moderate to high demographic drivers of AH need and ranks fourth in the catchment in this regard. Unmet demand for AH primary health services is relatively average while this LGA has the second lowest Service Availability Index in the catchment. Melton's first place ranking, in terms of overall need, is a result of its relatively high need for services combined with relatively few services available.

2. Macedon Ranges

   Macedon Ranges has the lowest indicators of AH need for primary health services in the catchment. This is largely due to the shire's small population and lack of population diversity relative to its neighbouring LGAs. It also has the lowest indicators of unmet AH demand for services. The main driver influencing Macedon Ranges' second place ranking is the dearth of AH services available to this population. While this population's levels of need are low in comparison to other LGAs, some need does exist, and residents are generally required to travel to its neighbouring LGAs to access the services they require.

3. Hume

   The City of Hume has the highest AH Need Index in the catchment, a moderate level of unmet AH demand and has the fourth lowest service availability index in the catchment. Although Hume has high indicators of inherent need for services, the moderate level of service availability is what pulls Hume down from the first-place ranking.

Overall, there is high variation in the Composite Index Scores across the catchment with the highest ranked LGA (Melton) having an estimated 9.4 times more need for AH primary health services than the lowest ranked LGA (Yarra). This variation is an indication that services are inequitably distributed throughout the catchment. If service availability was well matched to levels of need for services, one could expect the variation in composite index values to be minimal across the catchment.

5. CONSUMER AND PROVIDER EXPERIENCE OF AH HEALTH SERVICES

WHAT DO CONSUMERS AND PROVIDERS THINK ABOUT THE PROVISION OF AFTER-HOURS CARE IN THE REGION?

This section highlights the key themes emerging from the key informant interviews and focus groups conducted with consumers and carers.

Following the completion of the quantitative analysis, which is detailed in the previous sections of this report, a targeted approach was used to engage certain population cohorts where there is limited understanding of these cohorts, particularly with respect to the nature of their attendance to ED or interactions with the primary health system. For the most part, these cohorts represented people from more vulnerable and marginalised sections of the community. For this reason, although young children (aged 0-4 years) constitute a large proportion of low urgency ED presentations, focus groups were not conducted with this cohort due to the considerable amount of evidence available to describe the nature and rationale behind their presentations to ED.

To understand the key challenges of providing effective AH primary health services across the catchment, consultations were conducted with 13 key informants and 80 consumers across nine focus groups.

Appendix C outlines the key informants and groups that participated in the qualitative consultations.

How do priority populations in the region access after hour services?

The focus groups provided deep insights into how and why the region's most vulnerable population groups access health services during the AH period, including their preferences for and expectations of health providers. Four vignettes are provided in this section that summarise the stories and experiences of four of the key priority population groups with respect to accessing AH services in the NWMPHN catchment.

Hong* arrived in Australia from Vietnam more than 30 years ago. Her English is fairly limited so she relies on her three children to help her navigate and access services. Hong continues to see the same GP since she arrived in Melbourne. She feels confident and comfortable with her GP because they speak Vietnamese. She always acts on her GP's advice. This is the case even if she continues to have persistent health issues, as she is reluctant to seek a second opinion. If she has any urgent health issues during the AH period, she will first call one of her children who will decide for her if she can wait to see her GP when they are next available or if an ambulance is needed.

Hong wants to be less reliant on her children but is fearful of going into a nursing home. She wants more information on how she can access both support and health services so that she can remain independent.

Alex* has identified as queer from a young age. Having a GP that you can trust and treats you with respect is very important to Alex. This means that Alex travels two hours by public transport to see his GP, who sees patients in a queer-friendly practice. This makes Alex feel comfortable, welcomed and not judged.

Alex sees a GP and a psychologist to manage mental health issues. If a mental health crisis situation was to occur, Alex would not consider attending the ED. This is based on previous experiences where Alex felt dismissed, stigmatised and not listened to by ED staff. On one occasion, after feeling that they weren't prepared to help, Alex walked out of the ED.

Alex believes that all staff working in the health system should be trained about queer or trans issues so that others won't have to experience the same unpleasant experiences Alex had.

Charlie* is over 65 years of age and migrated to Australia from Malta more than 40 years ago. He currently lives within the local government area of Brimbank.

Charlie has a great relationship with his GP and considers him like family. He sees his GP regularly to monitor his chronic illnesses. He likes seeing this GP because he feels that he can have a proper conversation with him.

Charlie knows there are more than four GP clinics that are open late near his house, which he can access if he needs to. However, his preference is to go to ED when his usual doctor isn't available because that's what his GP advises him to do. He has used the home visiting doctor service in the past. However, from his experience, it can take up to two hours for these doctors to arrange, so you may as well go and wait at the hospital!

Tracey* is currently living in short-term emergency housing. She found herself homeless after escaping a violent relationship with her ex-partner.

From her perspective, accessing any form of support services is 10 times harder for Tracey. This is because a number of services aren't able to help because she doesn't have ID. She also needs to make sure there is enough security when she accesses services and that her information is safe because of the violent situation she escaped. She finds it difficult to find health staff that don't judge and interrogate her.

If she needed help during the AH period, she would go to the hospital, provided she was able to get there herself. She knows there are nurses at her housing accommodation. However, Tracey refuses to see the nurses because she finds they have no experience in interacting with the homeless community.

Understanding the key challenges to access AH primary health services

This section describes the challenges and themes associated with appropriate access to after hour services in the NWMPHN catchment. As the informant interviews and focus groups were conducted, it became apparent that the key themes across the two categories were consistent. As such, this section presents a set of consolidated themes, which apply equally to the two groups of consumers consulted.

The key themes are outlined below:

1. The health system is not set up to support consumers through their health journey

Providers and consumers acknowledge the lack of integration and collaboration amongst health providers

While several health providers spoke about the lack of communication between services, many consumers also expressed their frustration in having to repeat their medical history or share information with various health providers, including providers within the same health service. The My Health Record was highlighted by consumers as a solution to connecting the health system, as long as their confidentiality wasn't compromised.

The most apparent disconnect between services was between general practice and hospitals. Many consumers recalled instances where their GP or specialist had not been informed of their interactions with the acute sector. From a provider's point of view, one hospital reported a tendency of ED staff to refer patients to the hospital's own outpatient clinic instead of their patient's usual GP for care. While it could be assumed that such referrals were made because of their ease, the provider instead noted a general distrust of primary health care amongst ED staff. This distrust was borne out of the fact that primary care providers were seen as being unable to effectively manage the health needs of their clients, and therefore resorted to ED to manage what they otherwise couldn't.

Consumers also spoke about how the lack of integration was creating unnecessary duplication of health services, such as blood and other pathology tests. For example, the focus group with consumers experiencing mental health issues highlighted instances where there was a reluctance from psychiatrists to consult with other health providers about their patient's care. The result of this was that the services that a client received were inconsistent at best, or counter to supporting better health outcomes at worst.

> *"My GP was away for three weeks…they said, 'this* [other] *doctor will treat you, he knows exactly your problems'. When I went to see him, he had no idea…I just walked out…you explain your history that many times, it's like a broken record."*
>
> **Consumer (CALD)**

> *"You go to your GP to get a blood test and if you have to go to the hospital, they do another blood test. They say, 'we don't like those blood tests from that company….we have to do our own tests'."*
>
> **Consumer (CALD)**

Providers are open to trialing innovative service models that could contribute to a more integrate service response for consumers

Across the board, key informants from service providers expressed a willingness to be involved in piloting new approaches that were designed to deliver a more integrated, connected and holistic response for consumers across the care continuum. In expressing this point, key informants suggested that for such pilots to be effective they must challenge the very fabric of the primary care system – from the largely disaggregated structures to the funding models to the hierarchy amongst care clinicians – as this is the only way to develop a truly effective, integrated and collaborative response for consumers.

To this end, one general practice described their participation in a pilot with a metropolitan hospital, which had reduced hospital admissions in their practice by 13%. It was noted that this equated to savings of approximately $270,000 per annum.

The pilot, which is still in operation, involves a hospital nurse to be based at their practice one day a week, focusing on building the knowledge of consumers following discharge from hospital. The nurse also assists consumers with attending their appointments and is available to answer any questions they may have. It was noted that the reason that this pilot has proven to be so impactful because it regulates appointments and consumer contacts, which prevents uncertainties. The focal point of the pilot is an action plan for symptoms that is developed by the nurse in partnership with the consumer. This ensure that the plan is well understood by the consumer and the nurse uses motivational interviewing to touch-base with the client on various occasions to make sure they are on track with the plan.

2. Consumers want a personalised health experience

A trusting and mutually respectful relationship with a GP / health worker is the most important factor for consumers.

The factors that all consumers noted was the key element driving whether a GP or health service was considered to be 'good' was whether that GP or health service:

- Can be trusted
- Demonstrates genuine empathy
- Seeks to build a mutually respectful relationship with the consumers.

> *"It's like a hairdresser, if you're happy with them, you follow them"*
>
> **Consumer (older adults)**

When asked the reasons why they continue to see the same health provider, consumers indicated that it was their awareness of their medical history, their bedside manners and their honesty or transparency. Others reported that their health provider, such as their GP, was very comprehensive and thorough, and took the necessary time to address their health issues or concerns.

> *"I see my GP…I'm now a 20-30 minute drive away but I still see her because she's really good…she knows my history, all of my history and she's always willing to admit when she doesn't know something. She's willing to learn, especially in regards to my queer stuff, like, she admits that she's not that experienced but she wants to learn. She wants to learn and be better about it"*
>
> **Consumer (young adult identifying as LGBTIQ)**

Many older adults reported seeing the same GP or health service for over 30 years. This indicates that once a consumer develops a relationship with a particular GP or health professional, they tend to follow them, even if they move locations. This was similar for the Vietnamese community with low English proficiency, who also reported seeing the same Vietnamese GP for a number of decades.

People who identified as LGBTIQ or from a CALD background reported travelling up to half-an-hour by car or two hours by public transport to see their GP. The reason for this was that consumers prioritised the need to feel safe, be welcomed and comfortable when choosing and remaining with a health provider.

> *"You always have to fill out the forms when you are going somewhere new and anywhere that has, like, a section to write pronouns or gender identity or preferred name, always makes me feel a lot more comfortable or safe because that's something I don't have to have a conversation about later"*
>
> **Consumer (young adult identifying as LGBTIQ)**

> *"I was wanting a stable GP…so I guess it's just that I feel listened to, I feel the clinic is queer friendly so I know I can go there and say anything to her and she's probably heard it all before. She's empathetic, absolutely, and overtime she has gotten to know me and my daughter and our issues. I continue to go there because of that"*
>
> **Consumer (adult identifying as LGBTIQ)**

The Aboriginal Elders engaged spoke highly of their GPs in enabling them to access support programs such as the Close the Gap Pharmaceutical Benefits Scheme. They reported having more satisfaction with their GP than any other part of the health system, as they felt they were listened to, respected and the GP was proactive about their care. This aligns with the views offered by other, non-Aboriginal consumers noted above.

> *"I never ever get the same care as I get from my local clinic, my local doctor…she gives you the time. She'll send you to have a scan or an x-ray rather than wipe off* [your problems] *with a tablet. I've had experiences somewhere else where you've just been pushed through…I've had great experiences with her and I would never leave her because her service to me is just brilliant"*
>
> **Consumer (Aboriginal Elder)**

Empathy is a necessary requirement for health practitioners to engage with their patients effectively

When consumers were asked to describe some of the unpleasant experiences, they have had when engaging with various aspects of the health system, the majority discussed incidents where the health professional demonstrated a lack of empathy. Such instances were most prevalent amongst the region's most vulnerable population groups, including those that were homeless or sleeping rough, identified as being from the LGBTIQ community or having a serious and / or complex mental health issue.

> *"We don't want sympathy, we want empathy"*
>
> **Consumer (person experiencing homelessness)**

The homeless consumers engaged spoke about various experiences with the health system where they felt judged. They described interactions where health staff became less attentive or empathetic as soon as they found they were living on the streets; this was a sentiment that was echoed by homeless service providers. They also described a difficulty in building trust with health professionals who displayed a lack of skills and experience in interacting with the

> *"I found a particular provider to be extremely generic and text book…wasn't engaging. They ask the standard questions and then they run out…I wasn't comfortable with dealing with him any further because I didn't think he would be interested'"*
>
> **Consumer (person experiencing homelessness)**

homeless community. To this end, one consumer reported that because of this lack of empathy and understanding, he had been banned from 10 hospitals in metropolitan Melbourne.

> *"Your 9-5 GP doesn't want to see a young person where behaviour is a concern or* [there is] *untreated mental health, or significant drug use, or someone who is sleeping rough and smelly…it's really those basic things that put young people at a disadvantage"*
>
> **Health provider (homelessness services)**

> *"When you're homeless and you're carrying your life on your back, you're already down. You don't need to be kicked by a service and sometimes they do that…when you're down, you think 'oh my God, where do I go from here?'"*
>
> **Consumer (person experiencing homelessness)**

For the LGBTIQ community, many described interactions where they felt their concerns were dismissed by health professionals. This type of behaviour manifested in health professionals failing (or choosing not) to call the consumer by their preferred name and a demonstrated lack of respect for the transgender or queer community. For young adults from the LGBTIQ community in particular, many spoke about a hesitancy to attend services that were not regarded as 'queer friendly'.

> *"There are times when I feel that I'm not heard, so the times that I am heard, my concerns are heard. They aren't just talking over the top or dismissed as not important…I think there's a lot of health professionals out there that may be knowledgeable, but they may not be necessarily personable and they don't have the skills that can help them to hear"*
>
> **Consumer (adult identifying as LGBTIQ)**

> *"More extensive training [is required] for a variety of different things like mental health and LGBTIQ [issues], working with people of different colours, physical disabilities, diversity and stuff like that for all across the board so that if you're not an expert, you at least have a basic knowledge….not telling people that their experiences aren't valid "*
>
> **Consumer (young adult identifying as LGBTIQ)**

A discussion with Aboriginal Elders highlighted a perceived lack of respect and compassion for the elderly population, particularly those living within residential aged care facilities. The group noted there was not enough staff with adequate training and qualifications to provide sufficient care to residents, particularly during the AH period.

> *"I find with the elderly, they're treated terribly…I don't' want to go to a home…there's no respect when you get old…our people are just pushed aside, it's just not right. For the last years of their life…this is the time when you want to be looked after and treated with compassion"*
>
> **Consumer (Aboriginal Elder)**

For CALD groups, seeing the same GP was important to them, so much so that they described a lack of confidence in seeing another doctor. Many described previous experiences where the GP failed to listen and understand why they were presenting to the health service. A number of consumers with low English proficiency described a lack of tendency by health professionals to adequately explain or clarify why certain medical tests where necessary. In these instances, they could not recall any effort made by the health service to involve a translator to explain the purpose for conducting certain medical tests in further detail.

> *"When they do blood tests too many times...if you ask the nurse, so that you will know why they are doing that…one time the nurse said, 'if you don't take it, I'll send you home'…he wasn't happy with the way the nurse explained it…it wasn't nice"*
>
> **Consumer (CALD adult with low English proficiency translated by interpreter)**

> *"There should be an interpreter if it's needed because where are you going to end up? What are you going to do? There's no conversation. It's very important to have a conversation, particularly if it's for medical reasons...they should ask you, 'do you speak English?', it's either yes or no. They can then put you to a Maltese or a Greek, whatever it is"*
>
> **Consumer (CALD)**

The cohort experiencing complex mental health issues discussed the stigma and stereotype associated with being categorised or labelled as an consumer with mental illness. Consumers spoke about previous interactions with the health system where they felt their needs weren't being considered or listened to, and, as such, emphasised the importance of health professionals being compassionate and empathetic.

> *"just to respect us…there is this common thinking that because we have mental health, we are stupid people, but we are far from that and that's what we are proving. We are not respected enough, and we're definitely not empathised [with]…they label us all too often"*
>
> **Consumer (person experiencing complex mental health issues)**

Confidentiality and security of medical information is important, particularly for vulnerable communities

For all consumers, knowing that your health information remains private and secure was an important factor when receiving health services or, for some, choosing where to receive health care.

This was particularly pertinent for people experiencing homelessness. For example, at a drop-in center to access a GP, consumers highlighted their discomfort at disclosing the nature or reason for their presentation to the receptionist, which was required for the service to prioritise patients in terms of urgency.

> *"Being homeless, you're forced into a situation…The problem is with confidentiality and exposure of information. You want people that value your privacy and some people don't, and that just gives you less confidence with individuals, less confidence with the service and so on…I've been in situations like that"*
>
> **Consumer (person experiencing homelessness)**

These consumers also indicated their anxiety in providing ID before they can access health services. For those escaping violent situations, knowing that their health and general information is secure and confidential, and that they feel comfortable and are able to build a rapport with the service was a crucial component when accessing care. This particular cohort also reported that they would only attend a health service where they felt safe and there was sufficient security in place.

Young adults who identified as LGBTIQ also expressed how important confidentiality was in building trust and rapport with health professionals, although acknowledged their legal obligation to inform their parents or guardians when necessary.

> *"My psychologist…she doesn't tell my parents unless it's important that she does…the only thing she would tell my parents are the things that she's legally required to…"*
>
> *"My GP is totally honest about what's going in and what he's doing and also, I know that if I say something to him, he see my entire family, I know that he won't say something to my mum if I don't want him to…I know there's trust"*
>
> **Consumers (young adult identifying as LGBTIQ)**

3. Alternative AH service options don't accommodate for some of the region's most vulnerable population groups

From the perspectives of most focus group consumers, particularly those who were most vulnerable, there were only two plausible options for seeking care during the AH period: the GP or at an ED. While many consumers were not aware of available alternative AH services, the majority of those who were aware recounted unsatisfactory experiences.

Older adults

For older adults, the hospital was considered a 'last resort' and was only an option if you *"were about to die"*. Their first point of call for any issue, irrespective of whether it occurred during the AH period, was their GP. This meant that older consumers would generally wait to see their GP at their next availability (rather than frequenting a hospital). That said, this group was well aware of the AH options that were available in the community and could recall satisfactory experiences with locum services and Nurse on Call. They were also aware when their GP was open during the AH period.

Homeless cohort

Within the homeless community, there was general awareness of 'concierges' (also known as outreach workers) and onsite nurses in emergency housing in the AH period. Despite knowledge of these services, homeless people were reluctant to access them due to their apparent lack of skills and knowledge to interact effectively with this cohort. Many spoke about the hospital being the only option to seek care during the AH period. However, as mentioned earlier, this group encountered a lack of empathy from ED staff. The homeless cohort also described a hesitancy to go to a hospital or a health service to receive care in fear that their belongings will be go missing or thrown away.

As a result of these challenges, there was a tendency to only present to the hospital when *"it is too late"*. This was consistent with the perspectives of one provider who provided homelessness services for youths aged 12-25 years. While the provider was able to treat the immediate needs of the client during business hours, they noted the limitations outside this period for young homeless people with complex needs. The provider explained that when a client presents for care in the AH period, they are generally experiencing significant trauma and requiring urgent care. For this reason, due to the limitations of existing primary health services, the ambulatory and emergency sector is involved.

> *"I don't know if it's right or not, but I've always been told that St Vincent's is the hobo hospital…the generic feel is that if you go to the others, you're just going to be told to go to St Vincent's…no one's been turned away"*
>
> **Consumer (Person experiencing homelessness)**

> *"There is a nurse at the emergency housing I'm at, but I refuse to see her…because they're hopeless. They have no experience whatsoever…They don't know how to talk to people that are homeless – absolutely none – they have no idea. No people skills"*
>
> **Consumer (Person experiencing homelessness)**

LGBTIQ community

Consumers identifying as LGBTIQ preferred to wait till their GP was open if they had health issues occurring during the AH period. Further, these consumers would generally only access the ED if their condition was very severe.

> *"the idea of phoning someone that I don't know or who I don't have a connection with is quite difficult for me and anxiety-provoking"*
>
> **Consumer (Adult identifying as LGBTIQ)**

Of those who had previous interactions with ED, there appeared to be a disparity between the care received in a paediatric vs. an adult service. Paediatric services appeared to be more considerate of the holistic needs of the consumer compared to the experiences at an adult ED where they felt dismissed, rushed and made to believe that they did not need to be there. The concept of accessing other mainstream AH services, where an existing relationship or connection didn't exist, was not a feasible option for some consumers from this cohort.

CALD groups

The CALD groups were either unaware or had unpleasant experiences with alternative AH services. Consumers with low English proficiency reported that they would initially contact a family member should they require urgent health care. It was this family member, often one of their children, who would decide whether their parent would attend ED or wait to see the GP.

For this reason, this cohort was very interested in receiving further information about other service options that was available during the AH period so that they could be less dependent on their family. For CALD consumers who could confidently converse in English, they described how they act on the advice of their GP to attend the hospital should their health needs become urgent and their GP is not available. That said, they also found little advantage, compared to ED, in locum doctor services given that you also had to wait for the doctor to arrive to receive care.

Aboriginal and Torres Strait Islander community

A similar perspective was shared by Aboriginal Elders who had accessed locum doctor services and Nurse on Call. They described AH services as a *"second rate experience"*, highlighting the discrepancy in the quality of health services available in the AH period compared to business hours. In making these observations, consumers noted the lack of experience or qualifications of home visiting doctors and the hesitancy of other GPs in medical practices that open late to provide care.

> *"I don't have a problem with doctors, I have a problem with the provision of after-hour services…there is no structured system to give us the same care of what we would get from our normal doctor…even though they have temp or locum doctors, they don't have the experience or knowledge…they don't have access to our records unless you give them permission"*
>
> **Consumer (Aboriginal Elder)**

For this reason, there was a preference to wait and see their usual GP unless the urgency of their condition warranted an ambulance. The group also highlighted their concern about the care provided in aged care facilities during the AH period. They noted the inadequate number of nursing staff rostered to care for residents and the out-of-pocket expenses that are incurred when residents require care in the AH period.

4. The ED isn't equipped to manage mental health issues

People with mental ill-health

The focus groups highlighted that in the possible scenario where a consumer had immediate mental health issues, there was a preference to wait and see their usual GP or psychologist rather than attend the ED. There was a general perception that the ED doesn't have the ability to deal with mental health issues, acknowledging this is, perhaps, due to its highly demanding and stressful environment. Consumers recognised the demands on the emergency care system, including the Crisis Assessment and Treatment (CAT) teams being "stretched to the limit", increased waiting times in ED and how psych patients are generally placed in an isolated cubicle in ED for 24-48 hours before being placed in a ward bed, which are barriers to providing the most appropriate care for this cohort.

> *"for a physical complaint that was causing me great pain and it was serious, I would use emergency and I wouldn't have a problem with that, but I wouldn't use it for mental health issues"*
>
> **Consumer (adult identifying as LGBTIQ)**

LGBTIQ community

The LGBTIQ cohorts spoke about how their felt their mental health needs were not considered seriously when they were in ED. There was a generally perception that ED staff aren't trained to, or have the capacity to, address mental health issues or interact with the LGBTIQ community. There was also discussion as to whether ED staff had sufficient knowledge to undertake an assessment and refer them on to appropriate services.

> *"my ex-partner is a trans man…I do wonder how he would have been received and whether EDs know of trans or queer services to refer people to, or just the basics of knowing how to treat a trans person with respect"*
>
> **Consumer (adult identifying as LGBTIQ)**

A similar concern was raised by health providers, particularly those that provided bespoke services to target consumers with complex needs. For example, one homelessness service discussed the commitment to work with hospitals so that they can ensure their clients are able to be connected to appropriate community mental health services. The provider described the frequency at which their clients go in and out of the hospital system as their mental health needs remain acute and unstable on discharge.

> *"they are medically fit to be discharged but mentally they're not…the are still acute and unstable, they come to us, but they can only maintain a presence in the community for only so long as their stress and vulnerability reaches a point where they have to go back to hospital, so it becomes a cycle – in and out"*
>
> **Health provider (homelessness services)**

The need for more resources to ED, training and education for health service staff and the provision of health information for consumers on their rights were identified as possible solutions.

5. Charging a gap payment during the AH period is a barrier for marginalised community members

While many consumers were aware of the primary health services that operated or were open late on weeknights or during weekends, access was problematic due to the gap payment that was applied during this time period. This was a "huge" barrier for most groups, with cost being a major factor as to why they selected to attend certain health services.

The majority of consumers reported utilising bulk-billing services and noted their preference to wait (i.e. to Monday if on a weekend) to receive care until they could be bulk-billed again or, alternatively, if the matter was urgent, they would go to the ED.

> *"they do stop bulk-billing after 5 o'clock and if you are a walk in, you'll have to pay $70-$80. You don't get bulk-billed on a Saturday"*
>
> **Consumer (person with complex mental health issues)**

> *"more accessible for low income cos that's a major barrier that I face because I don't have any family and I don't have private healthcare…if it's not able to be bulk-billed…I'm sort of at their mercy…I've had to be admitted a number of times but the public system is just rubbish but I need money to go to a private hospital"*
>
> **Consumer (young adult identifying as LGBTIQ)**

6. Providers find providing primary health services during the AH period difficult

Providing primary health services after hours doesn't make economic sense

Key informants from general practice spoke about an unwillingness for the sector to change because of the actual costs involved in providing services during the AH period. If NWMPHN was to consider providing financial incentives to general practices to increase opening hours, the suggestion was made to adopt an approach that targeted high ED referring general practices or high need areas rather than providing opportunities that were open for all.

Providers also spoke about the various additional resources or outlays required when providing AH services. For example, one general practice spoke about the need for additional safety controls (e.g. security guards) and recalled how their location near short-term housing attracted drug-seeking clients.

Finding a workforce willing to work during the AH period is problematic

Despite a willingness to increase operating hours, recruiting general practice staff to work in the AH period was considered problematic, with a reluctance from day time staff to work in the night time. One practice reported difficulties recruiting International Medical Graduates (IMG) to work in the AH period despite being located within a District of Workforce Shortage.

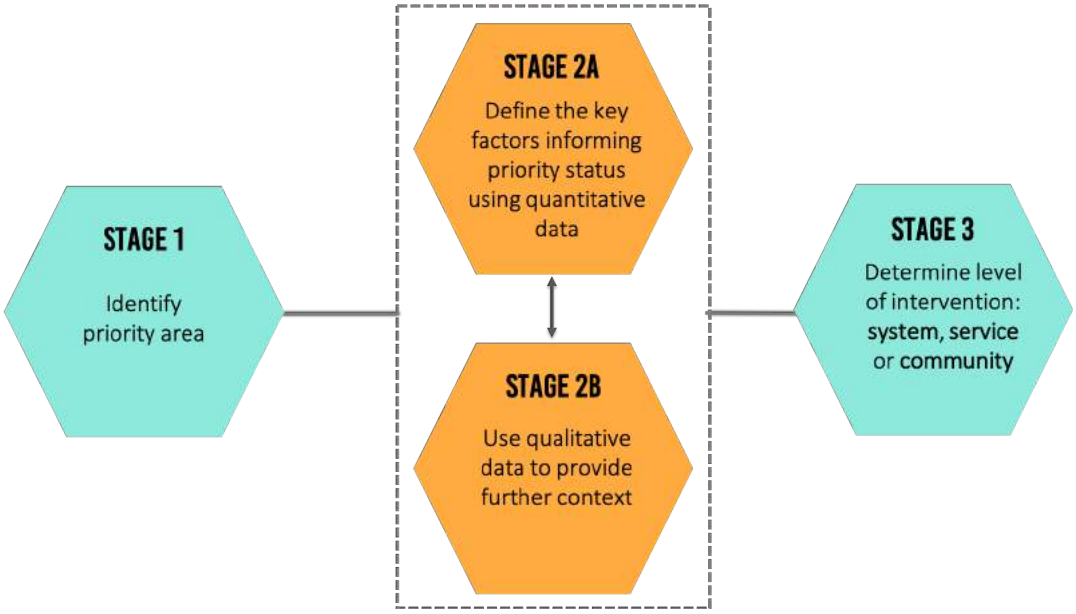
6. RECOMMENDATIONS TO ENHANCE AH PRIMARY CARE IN NWMPHN

RECOMMENDATIONS TO ENHANCE AFTER-HOURS PRIMARY HEALTH CARE IN NWMPHN

The findings set out in this document suggest that the AH needs in the NWMPHN catchment are varied and multifaceted. This must be reflected in the commissioning of any AH response in the catchment.

To support the future commissioning agenda of the NWMPHN, Impact Co. has developed a three-stage approach, or **AH Commissioning Framework**, to assist the NWMPHN to scope and determine the intent of interventions in the AHPHC system in its catchment. The AH Commissioning Framework is depicted in **Figure 44** below.

Figure 44: Overview of AH Commissioning Framework



The purpose, key inputs and outputs for each stage of the AH Commissioning Framework is outlined in **Table 7.**

Table 46: AH Commissioning Framework: Purpose, input and outputs.

	STAGE 1	STAGE 2A	STAGE 2B	STAGE 3
Purpose	To identify a priority issue relating to the AHPHC system in NWMPHN	To determine key factors informing priority status	To understand the broader context relating to the priority issue identified in Stage 1	To identify the nature of intervention required in the AHPHC system
Input	• LGA ranking from Composite Index Score • PHN Guidelines • Priority areas / cohorts, as prescribed by the Commonwealth Department of Health, from time to time	Ranking of LGA according to the factors set out in the Composite Index Score, being: • AH Need • Unmet AH Demand • AH Service Availability	• Qualitative data (focus groups and key informant interviews) • Literature review	• Stage 2A findings • Stage 2B findings

	STAGE 1	STAGE 2A	STAGE 2B	STAGE 3
Output	Identification of priority locations (LGAs) or population cohorts	Elements of AH service system requiring greater attention are identified	Additional context providing evidence relating to the priority issue identified in Stage 1	The level of intervention (community, service or system) is determined

Each stage of the AH Commissioning Framework is detailed below:

Stage 1: Identify priority areas

Stage 1 involves the identification of a priority area(s) that will be the focus of the commissioning activity.

Priority areas can be one of two types: cohort-based or place-based.

Cohort-based are those priorities which have been determined by the Commonwealth Department of Health and communicated via the PHN guidelines or are set out in the strategic directions of the PHN. Cohort-related priorities include, but are not limited to the following cohorts:

- People experiencing homelessness
- People with a CALD background
- People who identify as LGBTIQ
- Refugees and newly arrived immigrants
- Older people
- People experiencing mental health
- Aboriginal and Torres Strait Islander people

The second type of priority is one relating to geographic location or placed-based. In this instance, the findings of the Composite Index Score should be taken into consideration, particularly those LGAs that are ranked the highest in terms of overall relative AH needs. As detailed in *Section 4* of this report, particular attention should be directed to the top five LGAs scoring the highest Composite Index Score: Melton, Macedon Ranges, Hume, Hobsons Bay and Brimbank.

Stage 2a: Define the key factors informing priority status using quantitative data

This stage involves using the quantitative data presented in this report to understand why this particular LGA or cohort is identified as a priority area of focus.

Cohort-based Priority Areas

Section 3 of this report presented various demographic and health service data, which has been ranked according to the LGAs with the greatest need. This information will be useful in identifying hotspots for cohort-based priority areas.

Place-based Priority Areas

For place-based priority areas, understanding the results or scores for each sub-index of the Composite Index Score may provide an indication of the factors influencing the LGA's priority status. In *Section 4* of this report, LGAs are ranked according to each of the following sub-indices:

- AH Need
- AH Unmet Demand
- AH Service Availability

As Table 48 illustrates, the level of urgency (or attention required) for each AH sub-index can be based on where a certain LGA is ranked relative to other LGAs in the catchment.

Table 47: Urgency categories according to rank of LGA in each sub-index

Rank	Urgency Category
1 – 6	High urgency
7 – 13	Low urgency

Based on the results in *Section 4*, **Table 48** provides an indication of the level of urgency for each LGA across the three indices. If the level of urgency is high for a particular sub-index, it suggests that any intervention to target the LGA should be focused on those factors or variables used to calculate that particular sub-index score.

Table 48: Urgency categories for each LGA according to each AH sub-index

		AH Need		AH Demand		AH Service Availability	
Composite Index Score Rank	LGA	Rank	Urgency	Rank	Urgency	Rank	Urgency
1	Melton (C)	4	High	6	High	2	High
2	Macedon Ranges (S)	13	Low	13	Low	1	High
3	Hume (C)	1	High	8	Low	4	High
4	Hobsons Bay (C)	10	Low	1	High	3	High
5	Brimbank (C)	2	High	4	High	6	High
6	Wyndham (C)	3	High	11	Low	5	High
7	Moorabool (S)	9	Low	7	Low	7	Low
8	Darebin (C)	6	High	3	High	8	Low
9	Moonee Valley (C)	11	Low	9	Low	9	Low
10	Maribyrnong (C)	5	High	2	High	11	Low
11	Melbourne (C)	7	Low	12	Low	10	Low
12	Moreland (C)	8	Low	5	High	12	Low
13	Yarra (C)	12	Low	10	Low	13	Low

Stage 2b: Use qualitative data to provide further context of key factors

Data gathered from the focus groups and key stakeholder interviews should be used to provide further context to describe why that cohort or place is a priority focus area. The information gathered in *Section 5* of this document highlights the expectations and experiences felt by many of NWMPHN's priority populations, which could not be uncovered through the quantitative data analysis. This is particularly relevant for the LGBTIQ population where quantitative data to describe their location and utilisation of health services is limited or unavailable. The qualitative data can also be supplemented by the key findings emerging from the literature review in *Section 2*.

This context should provide an indication of the problem that could be addressed through a targeted commissioned activity.

Stage 3: Determine level of intervention(s) required

At the last stage, the key factors to explain why a particular location/place or cohort is a priority area should be determined to identify the type of intervention(s) that NWMPHN should implement or commission. These interventions can be divided into three domains:

- System – A system intervention refers to one that will apply to some or all of the health providers and consumers in a region. Such interventions are aimed at integrating or increasing partnerships

between providers to streamline the patient's journey of care. In effect, these interventions are designed to take a collective and system-based approach to make the AHPHC system work better

- Service – A service intervention refers to the enhancement of existing or creation of new services that directly address issues relating to service availability within a specific area
- Community – A community intervention refer to those that are designed to build the awareness and knowledge of consumers or members of a certain community so that they can better access and navigate the AHPHC system.

If the priority issue is place-based, the results from Stage 2A can be used to consider, as a starting point, the domains of interventions that could be in scope using the equation below:

Intervention domain = AH Need urgency category + AH Unmet Demand urgency category + AH Service Availability urgency category

When this equation is applied, Table 49 highlights the possible combinations and the corresponding domain(s) of interventions that could be considered. The domain of interventions(s) relevant to the sub-indices are not necessarily linear, which becomes apparent when the urgency categories are considered in combination.

Table 49: Proposed level of intervention according to urgency category across each sub-index of the Composite Index Score

AH Need	AH Unmet Demand	AH Service Availability	Intervention Domain Required	Rationale
High	Low	Low	**Community**	This indicates that there is sufficient capacity in the service system, indicating that consumers with high AH needs may benefit from targeted interventions aimed at increasing their understanding on how to find appropriate AH services.
Low	High	Low	**System and Community**	The community appears to be utilising emergency and ambulatory services for non-urgent care despite sufficient services in place. This is likely due to a lack of community awareness and / or integration between existing services.
Low	Low	High	**Service**	A direct service response is required, which must be informed by qualitative data relating to the specific needs in a geographic location.
High	Low	High	**System and Service**	This indicates that there is low utilisation of ED and ambulatory services for non-urgent care despite the high need amongst the community. This indicates that there needs to be better communication and connection within the service system. Further, this formula also notes that there are limited AH services available, demonstrating the need for a service-specific response to accompany the system-level intervention.
High	High	Low	**System and Community**	This indicates that there is sufficient service capacity in the AH period, yet residents have high AH needs and are more likely to present to ED. This indicates that there is a need for increased awareness of services available and improved integration between primary and tertiary care.

Low	High	High	**Community and Service**	High utilisation of ED for non-urgent care may be occurring due to the limited availability of AH primary care options. Increasing AH service options will need to occur simultaneously with community awareness, which will support potential consumers being able to make informed choices about the health support to seek out at the appropriate time.
Low	Low	Low	**Targeted intervention may be warranted for specific population groups**	There is sufficient service capacity in the AH period and low unmet demand. Support to improve AH access for specific population groups may be warranted; however, this would require further validation before any action is taken.
High	High	High	**System, Community and Service**	Residents have high AH needs and are likely to present to ED for non-urgent care due to limited AH service options. Interventions therefore need to be multi-faceted, operating at the system, service and community levels.

When the equation is applied to each LGA within the NWMPHN catchment, the different types of interventions required to address the identified gaps in the AHPHC system in NWMPHN become evident. These results are presented in **Table 50,** providing an indication of the types of interventions that could be commissioned to target the specific AH needs for that particular location. That said, as the scores are based on aggregated data for the entire LGA, we acknowledge that there will be pockets of disadvantage that could benefit from NWMPHN's support and this particularly applies for LGAs that have low urgency across the three sub-indices,

Examples of the types of interventions that could be commissioned under each of the three domains are also further detailed below. As per Stage 2B, these intervention examples are consistent with the qualitative insights captured in Sprint 6 (as presented in *Section 5*) and supported by recent literature.

Table 50: Intervention domain for each NWMPHN LGA based on the AH Commissioning Framework

	AH Need	AH Unmet Demand	AH Service Availability	Intervention Domain Required
Melton (C)	High	High	High	**System, Community, Service**
Macedon Ranges (S)	Low	Low	High	**Service**
Hume (C)	High	Low	High	**System and Service**
Hobsons Bay (C)	Low	High	High	**Community and Service**
Brimbank (C)	High	High	High	**System, Community, Service**
Wyndham (C)	High	Low	High	**System and Service**
Moorabool (S)	Low	Low	Low	**Targeted intervention may be warranted for specific population groups**
Darebin (C)	High	High	Low	**System and Community**
Moonee Valley (C)	Low	Low	Low	**Targeted intervention may be warranted for specific population groups**
Maribyrnong (C)	High	High	Low	**System and Community**
Melbourne (C)	Low	Low	Low	**Targeted intervention may be warranted for specific population groups**
Moreland (C)	Low	High	Low	**System and Community**
Yarra (C)	Low	Low	Low	**Targeted intervention may be warranted for specific population groups**

Applying the AH Commissioning Framework

To support the NWMPHN adoption of the AH Commissioning Framework, the following paragraphs provide an example of how this framework could be applied using the data that has been presented earlier in this report.

How to apply the AH Commissioning Framework using a hypothetical example: Maribyrnong

Stage 1:

Due to the strategic direction advised by the Board, the LGA of Maribyrnong has been identified as a priority focus area for NWMPHN.

Stage 2A:

Maribyrnong has the 10th highest Composite Index Score of all the LGAs within the NWMPHN catchment. When each sub-index score is ranked and converted into its relevant urgency category, the following results are obtained:

	AH Need		AH Unmet Demand		AH Service Availability	
	Rank	Urgency	Rank	Urgency	Rank	Urgency
Maribyrnong (C)	5	High	2	High	11	Low

The high urgency in the AH Need sub-index is associated with its high homeless and CALD population, its predicted population growth by 2031 and rates of population who self-rate their health as fair/poor relative to the other LGAs. Maribyrnong also has high rates of Cat 4/5 ED presentations, non-urgent ambulance call-outs and PPHs, which have contributed to a high urgency classification for the AH Unmet Demand sub-index.

Stage 2B:

The literature and qualitative interviews highlight the various barriers faced by the homeless and CALD community in accessing health services, particularly during the AH period. This includes a lack of awareness and integration of existing services, and a reluctance to use alternative AH options.

Stage 3:

When the urgency categories are viewed in combination, the following domain of interventions are suggested (as per **Table 49**):

	AH Need	AH Unmet Demand	AH Service Availability	Intervention Domain Required
Maribyrnong (C)	High	High	Low	**System and Community**

System and community-type interventions, as a starting point, could be explored due to the high AH needs and unmet demand in the area. These interventions reflect the fact that Maribyrnong has a high level of AH service availability when compared to other LGAs, but based on the rankings set out in the Index, residents are not aware of these options (instead relying on ED) or services are not effectively integrated to support their needs.

On this basis, if NWMPHN were to consider taking action in Maribyrnong, the AH Commissioning Framework indicates that the PHN could achieve greater impact with its interventions by:

- Focusing on enhancing the effectiveness of the AH system; and
- Supporting the community to make better decisions about where to access health care in the AH period.

Interventions available to NWMPHN to address the identified gaps in the AHPHC system

What follows is a rapid literature review that identifies a range of examples for the NWMPHN to draw upon when considering the different interventions available to it within the context of the three domains noted above. Unlike the literature review set out in *Section 2,* this literature review is intended to only be brief, and focused on identifying a number of leading examples of system-based, service and community-focused interventions relating to the AHPHC.

System-type intervention examples:

System-type interventions involve various providers across the health system working towards achieving sustainable and meaningful improvements within the processes, environment and configuration of the health system (Carayon et al., 2006; IOM, 2012).

The findings of Sprints 4, 5 and 6 indicate that there are areas of high AH need and demand that require a system-type response. Potential responses could include:

1. LGBTIQ training and education for health professionals

In Sprint 6, this report identified that the LGBTIQ community feels disengaged and often not welcome within mainstream AH services at both the primary and tertiary sector levels. This observation reflects the fact that services are often not designed to be culturally sensitive and, as such, create exclusionary practices and behaviours for members of the LGBTIQ community.

To address this, it is suggested that training and education for health professionals is essential to build trusting and respectful relationships with members of the LGBTIQ community. Further, such training must not be limited to the primary care setting, as creating a culturally safe environment was equally important within tertiary settings. Evidence is limited in Australia however, research involving overseas medical students confirmed that increased exposure to LGBT patients and teaching, specifically on LGBT health, improves student knowledge of (Kelley et al., 2008), engagement with (Sanchez et al., 2006) and attitudes towards (Wallick et al., 1995), LGBT consumers.

At a systems level, the literature suggests that health care systems, processes and procedures should be improved to increase pathways to primary health care for the LGBTIQ community. While the lack of systematic data collection on the LGBTIQ population makes it hard to currently gauge the efficacy of these types of interventions, the literature does support commissioning services that improve inclusion and healthcare access for LGBTIQ communities (Gahagan et al., 2018). For example, the LGBT Foundation's Pride in Practice project in the UK is a quality assurance support service. A Pride in Practice award demonstrates a practice's commitment to ensuring a fully inclusive, patient-centered service. The program includes free training offered to health providers and ensures that practices meet the needs of LGBTIQ patients. The project also offers ongoing support through a dedicated account manager and the provision of resources for each practice (including display posters and health flyers). An evaluation of the project by LGBT Foundation (2017) found that 94% of participating services reported feeling more confident and 96% feeling more informed regarding LGBT issues.

2. NWMPHN becomes a broker for partnerships

The insights from *Sprints 4*, *5* and *6* suggest that there are specific population cohorts residing in the NWMPHN catchment that have complex and multiple needs that require support from various providers across the health system and beyond. As such, there is an opportunity for NWMPHN to become a broker in facilitating partnerships between providers to enable coordinated, seamless and effective care for these communities.

Service providers and people experiencing homelessness, in particular, highlighted the various challenges in accessing appropriate health services, often lamenting that the system was not well-connected or coordinated. To this end, a potential response or model that addresses these challenges could include:

- Health care support coupled with housing and case management. To reduce health inequalities, Stafford et al. (2017) recommends a shift from the traditional silo approach, viewing homelessness as a combined medical and social issue. Most of the literature exploring the topic of homelessness and ED use focuses on the effect of case management. The majority of such studies shows a reduction of ED use and considerable cost savings, while maintaining – or even improving – health outcomes (Connelly, 2014). Findings of a randomised controlled trial in Chicago highlighted the importance of fostering a working partnership between housing and case management services. The magnitude of benefit was large with conservative analyses suggesting a 24% reduction in ED presentations (Sadwoski et al., 2009). Importantly this was not a standalone finding. A systematic review found that six of the eight studies of high-frequency ED users reported that ED use decreased significantly as a result of case management (Althaus et al., 2011).
- Hospital in-reach to improve access to primary care. Access to primary care is pivotal for homeless consumers as it provides opportunities for prevention and early intervention. The Pathway program in the UK (Hewett, 2010; Hewett et al., 2012) is one example of how to deliver practical, patient-focused assistance, which links patients with community services (Gazey et al., 2018). The model involves bringing GPs (with experience in homeless medicine) to work in hospitals alongside specialised nurses and caseworkers (Gazey et al., 2018). The Pathway model has been adapted in The Royal Perth Hospital and although the results are preliminary, there is already demonstration of a marked reduction in the proportion of homeless patients accounting for the top 20 frequent ED presentations, reducing from 80% (between Jul-Dec 2016), to 45% (between Jan-Mar 2018) (Gazey et al., 2018).
- Street Outreach. This approach is an important avenue for engagement between consumers and service providers, which may significantly reduce ED presentations. The Homeless to Home Healthcare After-Hours Service in Brisbane is a nurse-led, mobile outreach service. A recent evaluation found significant cost savings associated with a 24% reduction in ED presentations. Furthermore, an economic evaluation by Connelly (2014) predicted the annual ED presentations for this cohort fall from 7,726 (pre-service) to between 5,805 and 5,908 with the service.
- Emphasis on the role of Care Coordinators in discharge planning. The hospitalisation of a homeless person presents an opportunity to deal with the underlying medical, social and mental health problems (DoH, 2013). Therefore, the process of discharge planning should capitalise on this opportunity and, due to the various needs of the consumer and the various providers involved in managing their care, will need to be coordinated and integrated. Feedback from a homeless service provider suggests that young homeless adults are discharged from the hospital despite still being in an unstable and acute state mentally and faced various barriers in trying to connect these consumers with the appropriate care in the community.

  One solution may include being discharged to a Medical Recovery Centre (MRC) to cater for patients that are not sick enough to remain hospitalised but are not well enough to return to the community. Currently in Australia, there are only a few examples of MRCs (including Sister Francesca Healy Cottage at St Vincent's Hospital Melbourne and Tierney House at St Vincent's Hospital Sydney) (Wood et al., 2017). However, literature from the US highlights that MRCs result in improved health and housing outcomes. For example, Bauer et al., (2012; cited in Doran et al., 2013) found that patients who completed their respite treatment program were re-admitted only 20% of the time, compared to 41% of the time for patients that did not complete respite at an MRC.

  Another approach is to give consumers a mobile phone to ensure adherence to follow-up appointments. This method has been integrated at St Vincent's Hospital Melbourne where The Assessment, Liaison and Early Referral Team (ALERT) provides mobile phones to homeless clients. The ALERT service also provides homeless clients with case workers helping to link clients with community-based health and psychosocial support (Wood et al., 2017). A recent evaluation of this coordinated approach demonstrated a reduction in the overall number of ED presentations (from 315 to 280). Overall, ALERT clients had less unplanned inpatient admissions (138 to 84

admissions) and the average number of admissions per person significantly decreased from 1.4 to 0.8 (Wood et al., 2017).

Service-type intervention examples:

Service-type interventions involve the provision of direct support to providers in areas of low service availability and often high demand amongst the geographic population. This type of support could include:

1. **Support to increase AH service operating hours in LGAs of high need**

While the extension of operating hours represents an oft-used lever by PHNs and, before them, Medicare Locals, to enhance the AHPHC system, a review of the current literature supports the implementation of place-based interventions to increase AH service operating hours in LGAs of high need. In particular, this intervention is seen as contributing directly to a reduction in ED presentations (e.g. O'Malley, 2013).

For example, indicators of primary care access such as opening hours, the proximity of a general practice and availability of home visiting services have been associated with reduced ED visits (van den Heede et al., 2016). Further, on a cohort level, consumers who thought it was easy to access primary care during AH periods visited the ED less often (van den Berg et al., 2016).

The evidence-base regarding financial incentives for increasing AHPHC opening hours is varied. Detailed survey data from an Australian sample of GPs found that increasing doctors' earnings was relatively ineffective in encouraging the provision of AH primary care (Broadway et al., 2016). There is also no evidence of the effectiveness of the Practice Incentives Program (PIP) AH incentive payment, which was intended to provide a consistent model for access to AHPHC nationally. In contrast, a study by Mehta et al. (2017) found that AH incentives to primary care physicians in Ontario, Canada improved access to care for patients and reduce ED visits.

That said, studies suggest that financial incentives to primary care providers to extend opening hours should not be implemented as a standalone solution (AHMAC, 2017). NWMPHN should also aim to address gaps in AH service provision. For example, NWMPHN could consider providing support to extend the scope and scale of primary care facilities to include nurses, therapists and community-based professionals. NWMPHN could also explore how to make use of digital technology, such as AH primary care video-calls, to improve access for consumers, particularly in high priority areas.

2. **Provision of clinical education to address local needs (e.g. CALD specific training in low English proficiency populations)**

Australia's diversity highlights the importance of cultural competence in health care settings, which was a point that was identified in Sprint 6. Cultural competency refers to the ability to interact, communicate and have positive attitudes towards different cultures and cultural differences. Various studies have explored the effectiveness of cultural competency activities in improving patient outcomes. However, research suggests that as a standalone strategy, cultural competency training is not enough (Lie et al., 2011). For this reason, to improve patient outcomes and address community needs, the current literature recommends a combination of cultural competency training alongside (Lie et al., 2011; Joshi et al., 2013):

- the inclusion of trained interpreters;
- community health promoters as part of the health care team;
- case management and the use of specialist refugee health workers; and
- the recruitment of bilingual staff.

A practical approach the NWPHN may consider is incentivising cultural competence training to GPs in highly diverse areas (identified in Sprint 4). Providers may receive accreditation and display posters in waiting rooms (similar to what has been done in the UK Pride in Practice project) to ensure the PHC environment is inclusive for all, including CALD consumers.

Community-type intervention examples:

The qualitative and quantitative findings set out in this report suggest that there are various communities within the NWMPHN catchment who may not be aware of AH services in the region or their right to access

these, ultimately driving higher presentations to ED. To address these barriers, potential interventions could involve:

1. Consumer education relating to increasing awareness of available AH options

The current evidence regarding the effectiveness of consumer education around available AH health care options is inconsistent and dependent on methodology. This should be considered if NWMPHN decide to invest in this avenue.

For example, consumer education is effective when delivered face-to-face. A model of care consisting of 'care facilitators', which was trialed in Western Health between 2004-06, was shown to reduce ED presentations by 20.8% (Bird et al., 2007). The care facilitators were assigned to elderly patients presenting to ED and tasked with providing support to identify required services, including what was available and how to access them. Another suggestion raised by a health provider in the catchment was to have a 'care navigator' employed to assist patients in the ED waiting room of nearby primary care service options.

In contrast, public education campaigns were found to be effective in reducing ED presentations initially but would revert back to pre-campaign levels some months after the campaign ended (Morley et al., 2018; Anantharaman, 2008). The promising, but short-lived, effects of consumer education seems to be a common theme in the literature. This suggests that further research is required to assess the parameters to ensure lasting outcomes ensue (De Salvo et al., 2000) and that more emphasis, at least in the short-term, should be placed on face-to-face training.

Insights from Sprint 6 indicate that some population groups within the NWMPHN catchment are not aware of alternative AH options, such as those from a CALD background. Adapting from an innovative pilot in a general practice identified in *Section 5* of this report, a novel approach that may go hand-in-hand with the aforementioned recommendation is to offer a free or subsidised annual health care check-up to CALD communities with high and unmet needs. Community services can be commissioned to ensure patients are connected to GPs who have completed cultural competency training and have obtained accreditation. During this appointment patients would have a general check-up, potentially discuss some health goals with the GP or nurse, and devise a simple plan as preventative action. The patient may also be given a 'health-care pack', including specific information regarding AHPHC options available to them, education about their rights within the health care system and the difference between emergency and non-urgent care.

2. Consumer awareness of personal rights within a health services (e.g. second opinion)

As identified in Sprint 6, low health literacy is a particular issue for consumers that are disadvantaged or vulnerable. The impact of this is that it has the potential to exacerbate underlying access and equity issues that consumers from these groups often experience outside of the after-hours period (Australian Commission on Safety and Quality in Health Care, 2013).

The literature identifies a number of simple strategies that benefit consumer understanding of their rights and enhances their health literacy (Berkman et al., 2011), including:

- Presenting essential information first and by itself. For example, participants who received only essential information about hospital quality (e.g., death rates) had better comprehension of information than consumers who received both essential and non-essential quality information (e.g., death rates and hospital satisfaction rates) (Peters et al., 2007).
- Using consistent denominators for presenting risk and benefit information. Labelled 'denominator neglect', this phenomenon speaks to consumers' lack of comprehension when denominators are inconsistent. Consider, for example, hypothetical results of a study of 900 patients trialing a new drug for migraines: 80 out of 800 who did not take the drug experienced a severe migraine, compared with 5 out of 100 of those who took the drug. Consumers perceive the treatment to be more effective than it actually is, underestimating the number of patients who experienced a migraine after receiving treatment (n = 5), while simultaneously overestimating the number of people who experienced a migraine and did not receive treatment (n = 80). Using consistent

denominators significantly improved participants comprehension of medical outcomes regarding risk and benefit information (Garcia-Retamero et al., 2009).

- Adding video to verbal narratives.

Furthermore, a practical way that NWMPHN can enhance consumer awareness is to engage with consumers (e.g. focus groups) in the development of health information materials. This will ensure that materials are relevant, understandable and effective in addressing low health literacy (Nilsen et al., 2006).

Finally, ,while not discussed in literature, the NWMPHN may benefit from engaging with community health services in high CALD areas to offer free health literacy sessions. This simple recommendation may help guide new migrants or low English proficiency patients to engage with the primary health care system earlier, preventing the need for ED visits.

While only brief, the above examples describe a number of initiatives that the NWMPHN could adopt if it were to adopt the AH Commissioning Framework and choose to make interventions in the AHPHC system at the system, service and community level.

7. LGA PROFILES

In order of highest Composite Index Score value, this section providers further detail on the AH needs, unmet AH demand and AH service availability for each LGA.

MELTON

Demographic drivers of need for AH primary care

Melton has moderate AH primary health needs, based on demographic drivers relative to the rest of the region.

Melton is the 7th largest LGA, by population, with an estimated 2016 resident population of 141,749. Melton has the fastest growing population in the NWMPHN region with an expected population growth of 6.2% per annum over the next decade.

Melton is one of the more economically disadvantaged LGAs, which is reflected by the fact that it has the second highest proportion of people experiencing high psychological distress (15.5%) and a moderate proportion of residents rating their health as fair to poor (17.6%).

DEMOGRAPHIC DRIVERS OF NEED		
	Value	LGA Rank
Population size	141,749	7
Proportion aged 0-4 years[1]	8.8%	2
Population aged 65+ years[1]	8.2%	11
Homelessness[1]	0.2%	11
Humanitarian settlers[2]	0.0%	11
Indigenous Australian population[1]	0.9%	2
Born in non-English speaking countries[1]	23.7%	8
Poor English proficiency[1]	2.6%	11
Socio-Economic Disadvantage (IRSD)	994	3
High psychological distress[1]	15.5%	2
Self-rated fair to poor health[1]	17.6%	6
Population growth[3]	6.2%	1
AVERAGE LGA RANKING		6.3

[1]Proportion of LGA ERP2016; [2]Proportion of all humanitarian settlers in the NWMPHN region, 2017; [3]Projected annual percent population growth, 2016-2031

Melton is also generally less culturally diverse than the rest of the catchment. However, it has the second highest proportion of people identifying as being of Aboriginal and/or Torres Strait Islander descent (0.9%). Approximately 37% of residents were born overseas and 23.7% were born in non-English speaking nations. A relatively low proportion (2.6%) of the population report having poor English proficiency. Melton residents' five most common countries of birth, after Australia, include: India, Philippines, New Zealand, England, and Malta.

The age distribution of Melton residents is younger than that of the NWMPHN catchment. Melton has the second highest proportion of persons aged 0-4 years (8.8%) and the third lowest proportion of people aged over 65 years (8.2%).

AH emergency department use

INDICATORS OF AH ED USE		
	Value	LGA Rank
Proportion of all Cat4/5 AH ED attendances in NWMPHN	7.1%	8
Cat4/5 AH ED attendance rate per 1000 population	58.6	9
Proportion of Cat4/5 AH ED attendances requiring an interpreter	2.0%	10
AVERAGE LGA RANKING		9.0

Residents of Melton have fewer Cat 4/5 AH ED attendances, on average, then the rest of the catchment. In the two-year period between July 2014 and June 2016, 7.1% of all AH semi-urgent and non-urgent ED attendances in the catchment, as classified by triage categories 4 and 5 (Cat4/5), were attributed to residents of the Melton. After adjusting for population size, Melton has the 9th highest rate of Cat 4/5 AH ED attendances in the NWMPHN catchment with an average of 58.6 attendances per year per 1,000 population.

In the same time period, Melton residents presented in the AH with Cat 4/5 symptoms at 38 different hospitals (the top 13 hospitals are shown in **Figure 45**). The largest proportion (60.0%) presented to Sunshine Hospital, followed by The Royal Children's Hospital (12.2%), Western Hospital (8.7%), The Royal Victorian Eye & Ear Hospital (4.76%), and The Royal Melbourne Hospital (3.10%).

The ***time of day*** breakdown of Cat 4/5 AH ED attendances is presented in **Figure 46**. The greatest average number of category 4 and 5 AH ED attendances per hour occurred on Sundays from 12PM-midnight, followed closely by weekdays from 6PM to 11PM, and Saturday business hours from 8AM to 12PM. The least popular time periods included before 8AM on both weekdays and Saturdays.

Figure 45: Top 13 hospitals where Melton residents presented during the AH period

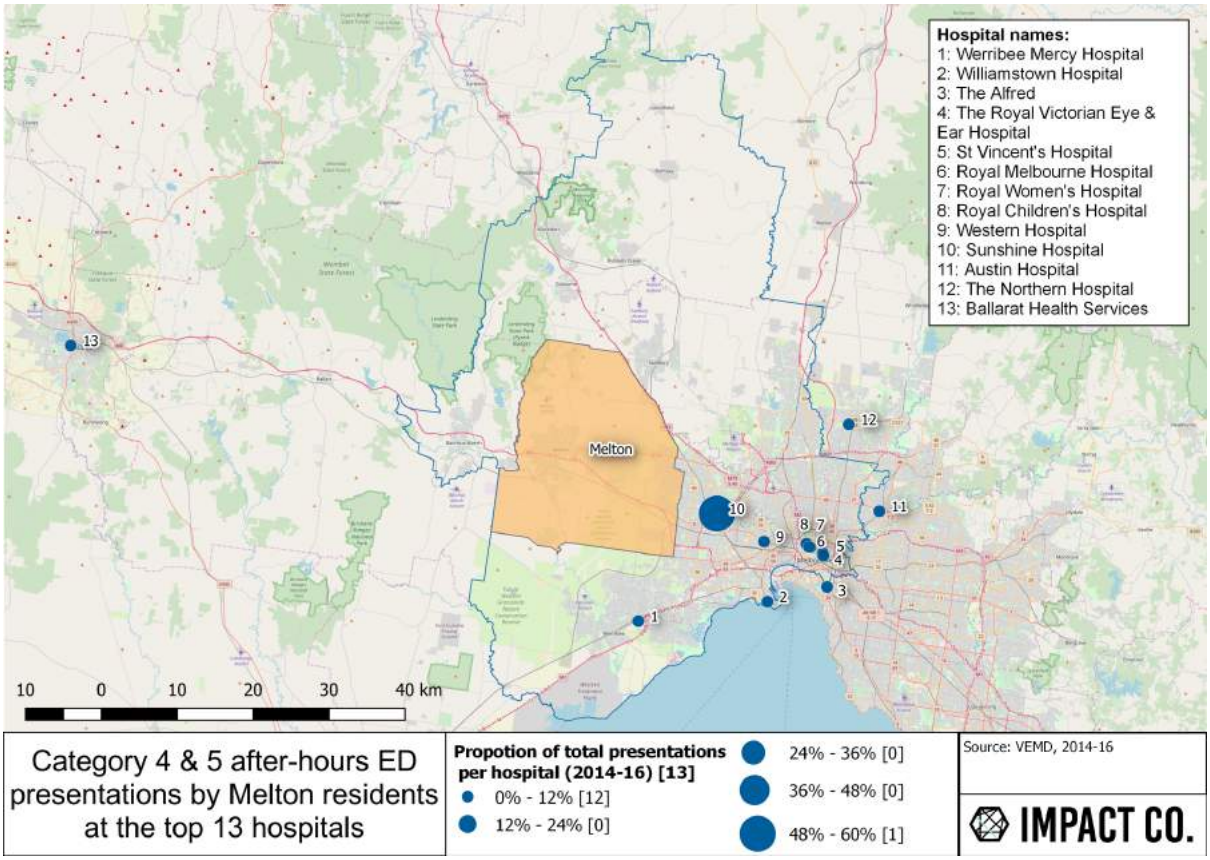
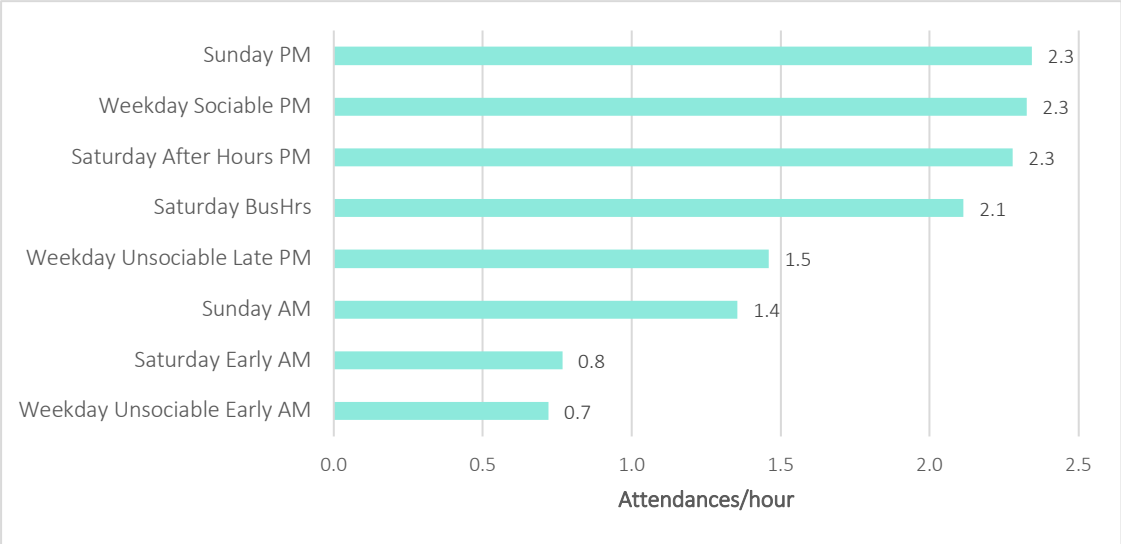


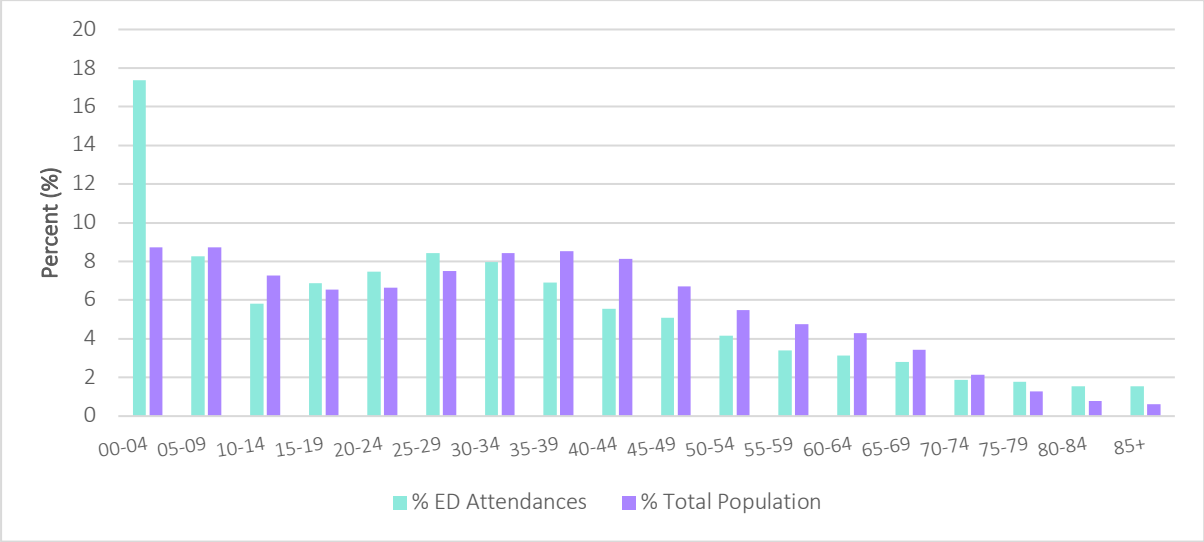
Figure 46: Melton – rate of Category 4 and 5 AH ED attendances by time of day



Profile of AH ED patients

Age distribution of Cat 4/5 patients attending the ED in the AH period is similar to that of most LGAs in the NWMPHN catchment, with a large spike in attendances for children aged 0-4 years and slight over-representation of older adults aged 75 years and older, compared to the general population (see **Figure 47**). The age distribution of Melton's resident population is younger than that of the NWMPHN region, thus the absolute number of children and young people attending ED in the AH periods for Cat 4/5 symptoms is higher than in other LGAs.

Figure 47: Melton – Category 4 and 5 AH ED attendances by patient age, 2014-16



Approximately 24% of Cat 4/5 AH ED attendances by Melton residents were by people born overseas from 142 different countries. The top five non-Australian countries of birth included: India, New Zealand, Malta, Philippines, and England. Melton has the 10th highest proportion of Cat 4/5 AH ED attendances requiring an ***interpreter*** (1.98%). The top five preferred languages spoken by patients who required an interpreter included: Vietnamese, Macedonian, Arabic, Spanish, and Dinka.

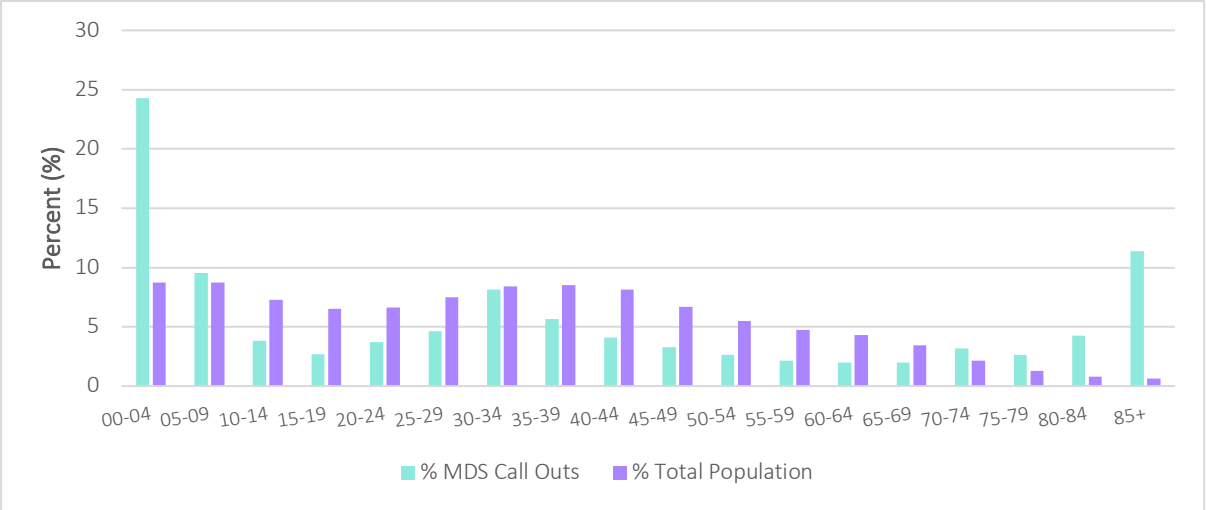
Medical deputising service use

MDS USE		
	Value	LGA Rank
Total call outs	11,548	7
Rate of calls per 1,000 population	81.5	8
AVERAGE LGA RANKING		7.5

Melton has moderate to low utilisation of medical deputising services (MDS) compared to the rest of the catchment. In 2017-18, approximately 82 locum services call outs were made for every 1000 residents, resulting in the 8th highest rate in the catchment.

Age distribution of locum service users is similar in Melton as in other LGAs. Young children aged 0-4 years and older adults aged 70 years and older are disproportionately over-represented compared to the general population (see **Figure 48**). A large proportion of patients serviced are living within aged care facilities. In this regard, Melton has the 9th highest rate in the catchment with 2139 call outs to aged care facilities in 2017-18, accounting for about 18.5% of all calls.

Figure 48: Melton – all MDS call outs by 5-year age group (2017-18)



Ambulance Victoria call outs

AMBULANCE VICTORIA USE		
	Value	LGA Rank
Percent of all ambulance call outs	7.6	8
Percent of all non-urgent call outs	7.9	6
Rate of non-urgent call outs per 100 calls	5.2	4
AVERAGE LGA RANKING		6.0

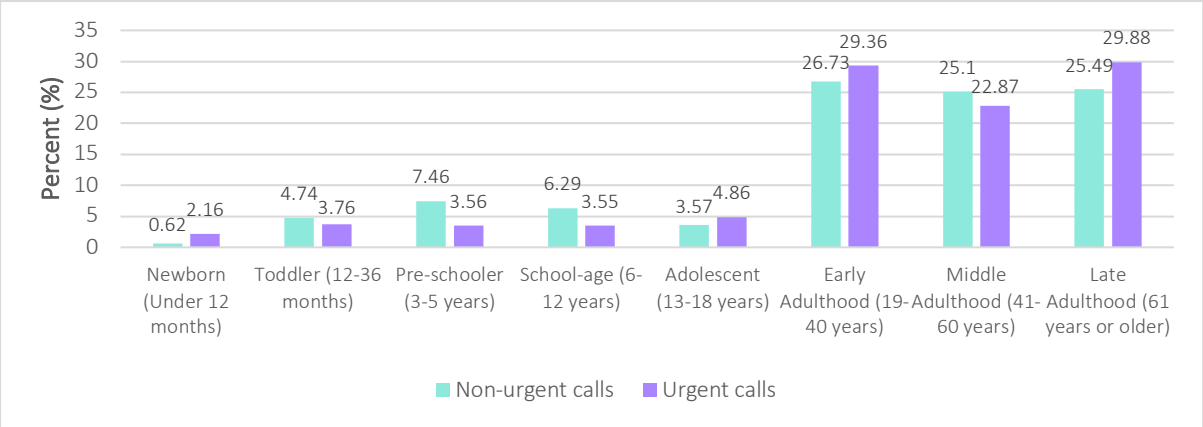
In the three-year period between 2015 and 2018, Melton had a relatively low number of ambulance call outs, accounting for 7.6% of all calls. Of these, 7.9% were referred to alternate service providers, which suggest that the patient's symptoms did not likely warrant an ambulance call and could have been better treated in the community. Melton had the fourth highest rate of non-urgent ambulance call outs in the catchment indicating that, while general ambulance use is low, inappropriate ambulance use for primary-care type symptoms is a greater issue for this population than in most other LGAs.

Profile of non-emergency ambulance call outs

The majority of non-urgent call outs were to adults aged 19 years and older (see **Figure 49**). The age distribution of non-urgent call outs closely mirrors than that of urgent call outs. Only pre-school aged children were substantially over-represented in the non-urgent call out population with a proportion (7.5%) 2.1 times greater than that of urgent call outs for pre-school aged children (3.6%).

The leading reason for non-urgent call outs in Melton was for the problem type classification of 'sick person', accounting for 41% of all non-urgent call outs – nearly five times greater than the next most common reason of 'abdominal pain' at 8.3%. The five most common subdivisions of a 'sick person' classification included: 'other pain', 'vomiting', 'no priority symptoms', 'abnormal breathing', and 'fever/chills'.

Figure 49: Melton - ambulance call outs by age 2015-18



AH service availability

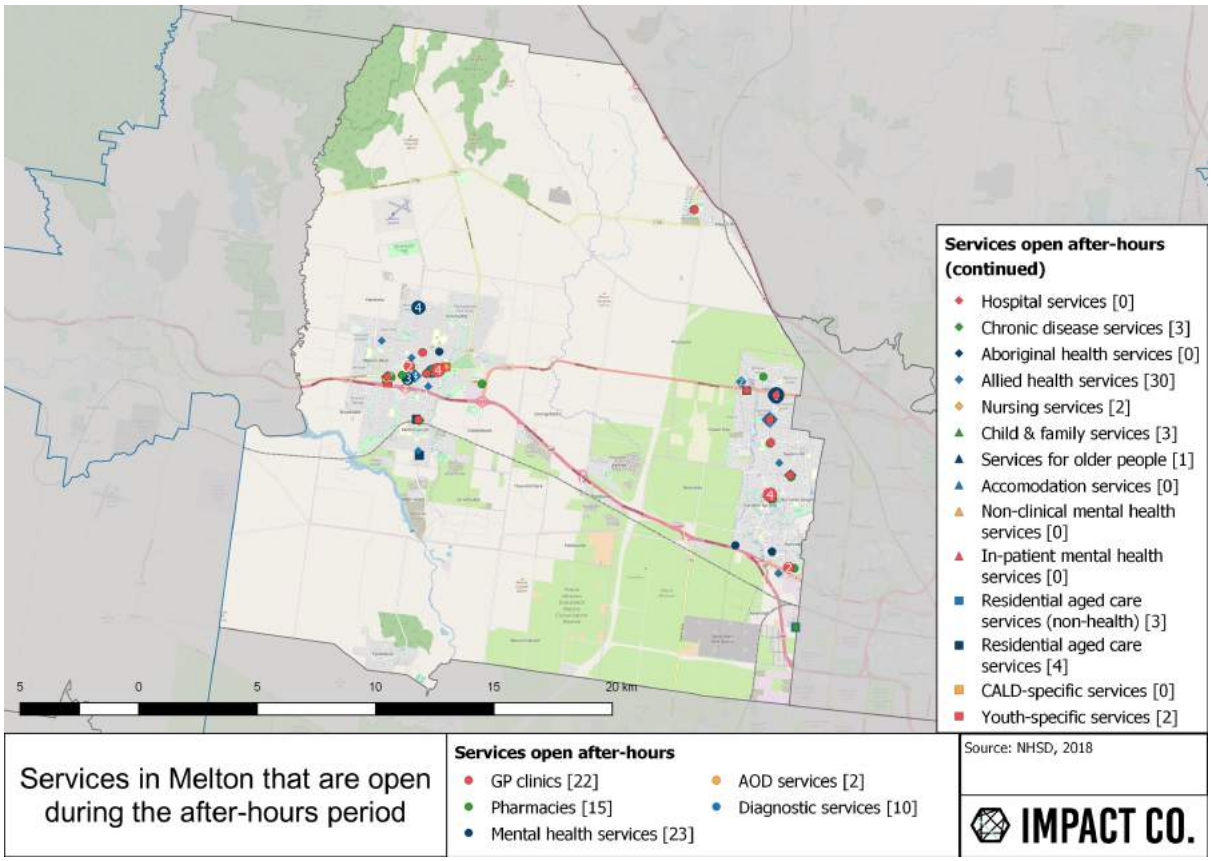
The number of AH services by type, and operating hours during the AH period, in Melton relative to the other LGAs in the NWMPHN catchment are detailed in the table below. This spread of AH services by type is also illustrated in **Figure 50**.

Melton (C)	After-hours services					After-hours hrs/week		
Service Type	Total	AH No.	Rate per 10,000	Rank		No. Hrs	Rate per 10,000	Rank
All After-hours Services	252	121	8.5	2		2762.6	194.9	5
General Practice	25	22	1.6	2		423.9	29.9	8
Pharmacy	15	15	1.1	2		430.9	30.4	4
Mental Health - Clinical in Community	54	23	1.6	4		178.5	12.6	4
Mental Health - Clinical In-patient	0	0	0.0	1		0.0	0.0	1
Mental Health - Non-clinical	2	0	0.0	1		0.0	0.0	1
Allied Health	59	30	2.1	1		369.8	26.1	1
CALD-Specific Health Services[1]	1	0	0.0	1		0.0	0.0	1
Accommodation[2]	4	0	0.0	1		0.0	0.0	1
Aboriginal Health[3]	0	0	0.0	1		0.0	0.0	1
Alcohol & Other Drug Services	7	2	0.1	6		60.5	4.3	6
Aged Care - Residential[4]	10	4	3.4	6		363.7	311.5	5
Aged Care - Non-health[4]	7	3	2.6	12		240.8	206.2	13
Carer Support Services	6	3	0.2	7		353.7	24.9	8
Diagnostic Services	18	10	0.7	10		164.5	11.6	9
Disability Services	5	0	0.0	1		0.0	0.0	1
Children/Family Health Services[5]	23	3	0.9	4		19.5	5.6	5
Women's Health Services[6]	2	1	0.1	10		117.9	16.5	12
Men's Health Services[7]	0	0	0.0	1		0.0	0.0	1
Nursing Care Services	5	2	0.1	9		137.9	9.7	10
Palliative Care Services	0	0	0.0	1		0.0	0.0	1
Sexual Health Services	1	1	0.1	11		5.0	0.4	11
Hospitals	0	0	0.0	1		0.0	0.0	1
Youth Health Services[8]	3	2	1.1	12		2.0	1.1	11
Chronic Disease Services	12	3	0.2	12		139.9	9.9	13
Services for Older Persons[4]	3	1	0.9	8		117.9	101.0	11

DEFINITIONS: Total – total number of service sites listed on the NHSD; AH No. – number of service sites open in the after-hours; Rate per 10,000 (services) – number of service sites open per 10,000 population; 2016 estimated resident population was utilised unless otherwise indicated; Rank – LGA ranking based on rate; all LGAs with a rate of 0 are automatically ranked as 13; No. Hrs – number of service hours per week available in the after-hours; Rate per 10,000 (hrs) – number of weekly service hours available in the after-hours per 10,000 population; 2016 estimated resident population is utilised unless otherwise indicated

[1]Rate calculated using 2016 estimated population born in non-English speaking countries; [2]Rates calculated using 2016 estimated homeless population; [3]Rates calculated using 2016 estimated Aboriginal and Torres Strait Islander population; [4]Rates calculated using 2016 estimated population of persons aged 65+ years; [5]Rates calculated using 2016 estimated population of persons aged 0-14years; [6]Rates calculated using 2016 estimated female population; [7]Rates calculated using 2016 estimated male population; [8]Rates calculated using 2016 estimated population of persons aged 15-24years

Figure 50: Melton – location of AH primary care services



Key findings: Applying the AH Commissioning Framework

Melton has the highest Composite Index Score of all the LGAs within the NWMPHN catchment. When each sub-index score is ranked and converted into its relevant urgency category, the following results are obtained:

	AH Need		AH Unmet Demand		AH Service Availability	
	Rank	Urgency	Rank	Urgency	Rank	Urgency
Melton (C)	4	High	6	High	2	High

Melton scores a high urgency classification for each of the sub-indices due to:

- *AH Need:* Melton has the second highest proportion of the population aged 0-4 years old. The LGA is forecasted to have the highest population growth by 2031, including the highest population growth for the 0-4 years age group. Melton also has the highest proportion of the population living with three or more chronic diseases, a high rate of individuals experiencing high/very high psychological distress, is an area of low socio-economic advantage and has the second highest population of Aboriginal and Torres Strait Islanders.
- *AH Unmet Demand:* Melton's high urgency for this sub-index is driven by its rate for PPHs (overall), which is the third highest in the catchment.
- *AH Service availability:* Melton has the second lowest rate of AH services available per 1,000 population in the catchment. This includes a low rate of general practices, pharmacies, mental health and Aboriginal and Torres Strait Islander-specific services open during the AH period.

When the urgency categories are viewed in combination, the following domains of interventions are suggested:

	AH Need	AH Unmet Demand	AH Service Availability	Intervention Domain Required
Melton (C)	High	High	High	System, Community and Service

Due to the high urgency across all sub-indices, Melton requires support across all three domains. The results suggest that Melton residents have high needs, which are not being supported due to the limited services available and, as a result, are being admitted to the acute sector.

On this basis, if NWMPHN were to consider taking action in Melton, the AH Commissioning Framework indicates that the PHN could achieve greater impact with its interventions by commissioning into the following domains:

- Focusing on enhancing the effectiveness of the AH system;
- Supporting the community to make better decisions about where to access health care in the AH period; and
- Providing targeted support to primary care services so that they have increased capacity to operate during the AH period.

MACEDON RANGES

Demographic drivers of need for AH primary care

Macedon Ranges has some of the lowest AH primary health needs, based on demographic drivers, in the NWMPHN catchment.

Macedon Ranges is the second smallest LGA by population, with an estimated 2016 resident population of 47,512. Approximately 64% of this population resides within the boundaries of NWMPHN.

Macedon Ranges is the most affluent LGA in the region, has the lowest proportion of people experiencing high psychological distress and the lowest self-rating of their health as fair to poor.

DEMOGRAPHIC DRIVERS OF NEED		
	Value	LGA Rank
Population size	47,512	12
Proportion aged 0-4 years[1]	6.7%	8
Population aged 65+ years[1]	16.4%	1
Homelessness[1]	0.1%	13
Humanitarian settlers[2]	0.0%	11
Indigenous Australian population[1]	0.6%	6
Born in non-English speaking countries[1]	4.8%	13
Poor English proficiency[1]	0.3%	12
Socio-Economic Disadvantage (IRSD)	1060	13
High psychological distress[1]	10.5%	13
Self-rated fair to poor health[1]	12.0%	13
Population growth[3]	1.7%	10
AVERAGE LGA RANKING		10.4

[1]Proportion of LGA ERP2016; [2]Proportion of all humanitarian settlers in the NWMPHN region, 2017; [3]Projected annual percent population growth, 2016-2031

Macedon Ranges also has the lowest proportion of residents from a culturally diverse background. Only 20% of residents were born overseas, less than 5% were born in a non-English speaking nation and 0.3% of the population report having poor English proficiency. Macedon Ranges residents' five most common countries of birth, after Australia, include: England, New Zealand, Germany, Scotland, and Italy.

Relative to other LGAs in the region, Macedon Ranges has an older population with more than 16% of residents aged 65 years and older.

AH emergency department use

INDICATORS OF AH ED USE		
	Value	LGA Rank
Proportion of all Cat4/5 AH ED attendances in NWMPHN	0.5%	13
Cat4/5 AH ED attendance rate per 1,000 population	27.3	13
Proportion of Cat4/5 AH ED attendances requiring an interpreter	0.2%	12
AVERAGE LGA RANKING		12.7

In the two-year period between July 2014 and June 2016, 0.5% of all AH semi-urgent and non-urgent ED attendances in the NWMPHN catchment, as classified by triage categories 4 and 5 (Cat4/5), were attributed to residents of the Shire of Macedon Ranges. After adjusting for population size, Macedon Ranges remains the lowest rate LGA of Cat4/5 AH ED attendances in the NWMPHN catchment, with an average of 27.3 attendances per year per 1,000 population.

In the same time period, Macedon Ranges residents presented in the AH period with Cat4/5 symptoms at 34 different hospitals (the top 13 hospitals are shown in **Figure 51**). The largest proportion (28.7%) presented to The Royal Children's Hospital, followed by Sunshine Hospital (24.0%), The Royal Melbourne Hospital (12.9%), The Northern Hospital (7.47%), and The Royal Victorian Eye & Ear Hospital (5.7%).

The ***time of day*** breakdown of Cat4/5 AH ED attendances is presented in **Figure 52**. The greatest average number of Cat4/5 AH ED attendances per hour occurred on Sundays from 12PM-midnight, Saturday 12PM to midnight and weekdays from 6PM to 11PM. The least popular time periods included before 8AM on both weekdays and Saturdays.

Figure 51: Top 13 hospitals where Macedon Ranges residents presented at during the AH period

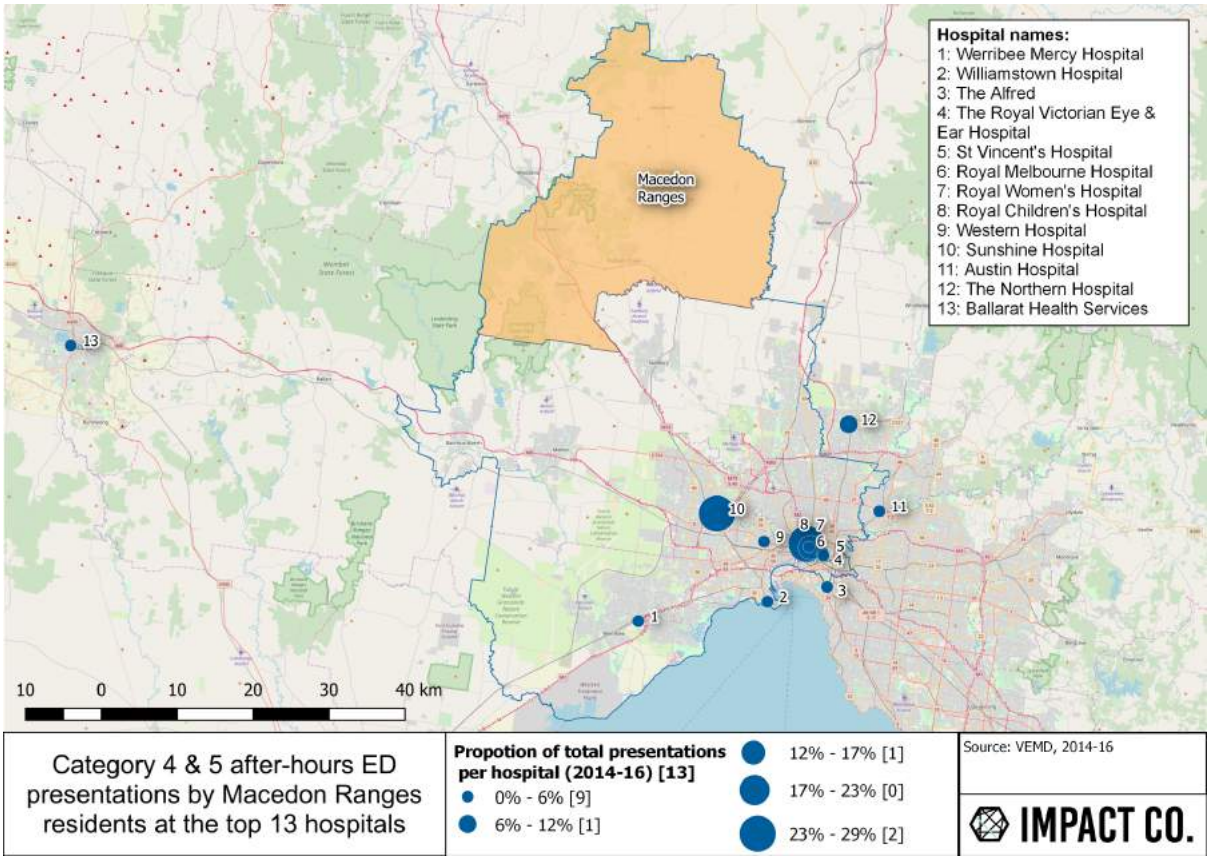
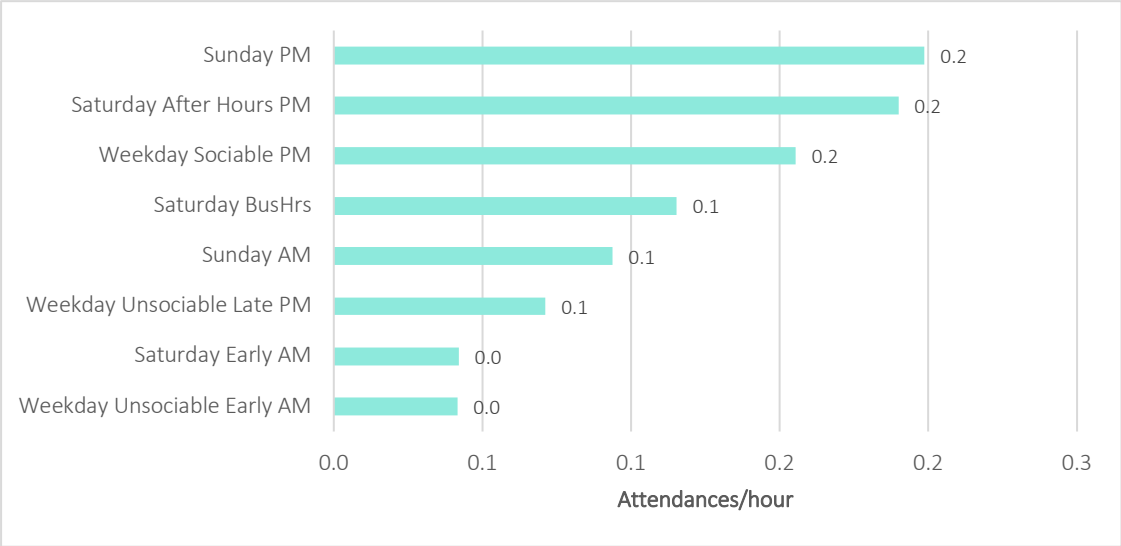


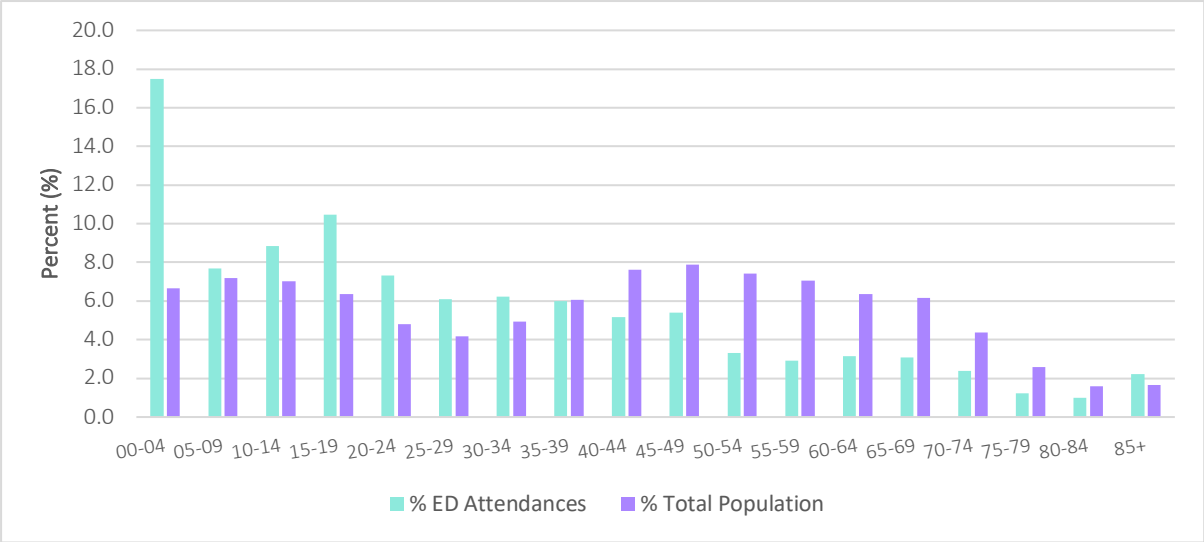
Figure 52: Macedon ranges – Rate of Cat 4/5 ED attendances by time of day



Profile of AH ED patients

Age distribution of Cat4/5 patients attending the ED in the AH period is slightly younger than that of most LGAs in the NWMPHN catchment. Similar to the rest of the region, there is a large spike in attendances for children aged 0-4 years. However, all cohorts under 35 years of age are also over-represented compared to the general population (see **Figure 53**). The usual spike among people aged 70+ years of age is not as prominent in the Macedon Ranges as in other LGAs.

Figure 53: Macedon Ranges – Category 4 and 5 AH ED attendances by patient age, 2014-16



Reflecting the lack of diversity within the region, only 7.5% of Cat4/5 AH ED attendances by residents of the Macedon Ranges were for people who were born overseas. The top five non-Australian countries of birth included: England, Italy, Ireland, New Zealand, and the British Isles. In the two year period, only three Cat4/5 AH ED attendances required an ***interpreter*** (0.23%).

Medical deputising service use

MDS USE		
	Value	LGA Rank
Total call outs	0	12
Rate of calls per 1000 population	0	12
AVERAGE LGA RANKING		12

The residents of Macedon Ranges have no access to either of the two major MDS providers reviewed for this report.

Ambulance Victoria call outs

AMBULANCE VICTORIA USE		
	Value	LGA Rank
Percent of all ambulance call outs	1.4%	12
Percent of all non-urgent call outs	1.0%	12
Rate of non-urgent call outs per 100 call outs	3.6	11
AVERAGE LGA RANKING		11.7

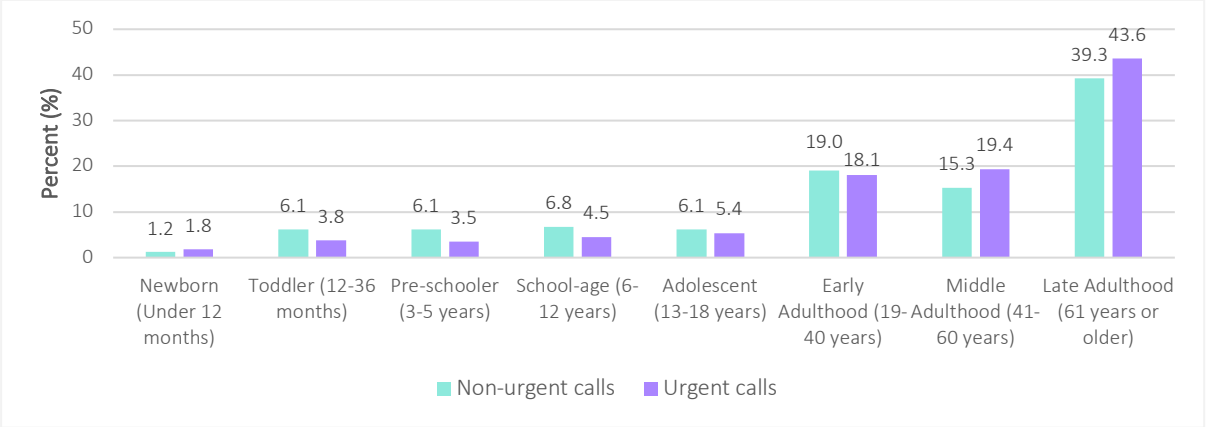
Between 2015 and 2018, Macedon Ranges had the second lowest number of ambulance call outs in the catchment, accounting for 1.4% of all calls. Of these, 3.6% were referred on to alternate service providers; this indicates that the patient's symptoms did not warrant an ambulance call and could have been better treated in the community. Macedon Ranges had the third lowest rate of such non-urgent ambulance call outs in the catchment.

Profile of non-urgent ambulance call outs:

The majority of non-urgent call outs were to adult patients aged 19+ years (see **Figure 54**). The age distribution of non-urgent call outs closely mirrors that of urgent call outs, although children aged 1-12 years are slightly over-represented among non-urgent call outs.

The leading reason for non-urgent call outs in Macedon Ranges was for the problem type classification of 'sick person', accounting for 46% of all non-urgent call outs – more than five times greater than the next most common reason of 'falls' at 8.6%. The five most common subdivisions of a 'sick person' classification included: 'other pain', 'vomiting', 'no priority symptoms', 'fever/chills', and 'abnormal breathing'.

Figure 54: Macedon Ranges - ambulance call outs by age (2015-18)



AH service availability

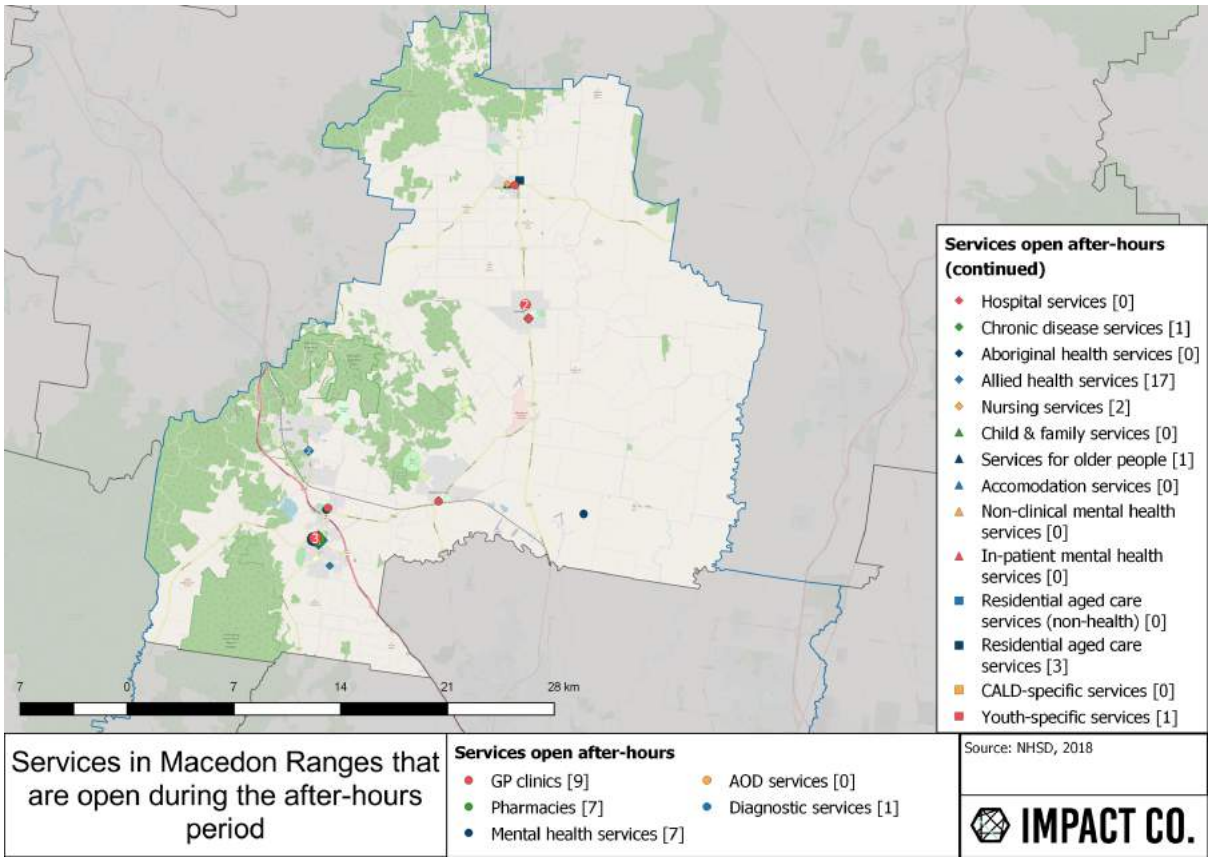
The number of AH services by type, and operating hours during the AH period, in Macedon Ranges relative to the other LGAs in the NWMPHN catchment are detailed in the table below. This spread of AH services by type is also illustrated in **Figure 55**.

Macedon Ranges (S)	After-hours services					After-hours hrs/week		
Service Type	Total	AH No.	Rate per 10,000	Rank		No. Hrs	Rate per 10,000	Rank
All After-hours Services	95	48	10.1	4		912.5	192.1	4
General Practice	11	9	1.9	3		99.5	20.9	3
Pharmacy	7	7	1.5	5		113.0	23.8	2
Mental Health - Clinical in Community	19	7	1.5	3		47.0	9.9	2
Mental Health - Clinical In-patient	0	0	0.0	1		0.0	0.0	1
Mental Health - Non-clinical	0	0	0.0	1		0.0	0.0	1
Allied Health	32	17	3.6	6		142.5	30.0	3
CALD-Specific Health Services[1]	0	0	0.0	1		0.0	0.0	1
Accommodation[2]	0	0	0.0	1		0.0	0.0	1
Aboriginal Health[3]	0	0	0.0	1		0.0	0.0	1
Alcohol & Other Drug Services	1	0	0.0	1		0.0	0.0	1
Aged Care - Residential[4]	6	3	6.0	9		203.8	407.6	8
Aged Care - Non-health[4]	1	0	0.0	1		0.0	0.0	1
Carer Support Services	5	2	0.4	12		235.8	49.6	13
Diagnostic Services	2	1	0.2	2		10.0	2.1	2
Disability Services	2	0	0.0	1		0.0	0.0	1
Children/Family Health Services[5]	5	0	0.0	1		0.0	0.0	1
Women's Health Services[6]	1	0	0.0	1		0.0	0.0	1
Men's Health Services[7]	0	0	0.0	1		0.0	0.0	1
Nursing Care Services	4	2	0.4	12		139.9	29.4	12
Palliative Care Services	0	0	0.0	1		0.0	0.0	1
Sexual Health Services	0	0	0.0	1		0.0	0.0	1
Hospitals	0	0	0.0	1		0.0	0.0	1
Youth Health Services[8]	1	1	2.9	13		1.0	2.9	12
Chronic Disease Services	3	1	0.2	11		6.0	1.3	8
Services for Older Persons[4]	1	1	2.0	12		117.9	235.7	12

DEFINITIONS: Total – total number of service sites listed on the NHSD; AH No. – number of service sites open in the after-hours; Rate per 10,000 (services) – number of service sites open per 10,000 population; 2016 estimated resident population was utilised unless otherwise indicated; Rank – LGA ranking based on rate; all LGAs with a rate of 0 are automatically ranked as 13; No. Hrs – number of service hours per week available in the after-hours; Rate per 10,000 (hrs) – number of weekly service hours available in the after-hours per 10,000 population; 2016 estimated resident population is utilised unless otherwise indicated

[1]Rate calculated using 2016 estimated population born in non-English speaking countries; [2]Rates calculated using 2016 estimated homeless population; [3]Rates calculated using 2016 estimated Aboriginal and Torres Strait Islander population; [4]Rates calculated using 2016 estimated population of persons aged 65+ years; [5]Rates calculated using 2016 estimated population of persons aged 0-14years; [6]Rates calculated using 2016 estimated female population; [7]Rates calculated using 2016 estimated male population; [8]Rates calculated using 2016 estimated population of persons aged 15-24years

Figure 55: Macedon Ranges – location of AH primary care services



Key findings: Applying the AH Commissioning Framework

Macedon Ranges has the second highest Composite Index Score of all the LGAs within the NWMPHN catchment. When each sub-index score is ranked and converted into its relevant urgency category, the following results are obtained:

	AH Need		AH Unmet Demand		AH Service Availability	
	Rank	Urgency	Rank	Urgency	Rank	Urgency
Macedon Ranges (S)	13	Low	13	Low	1	High

Macedon Ranges has low need and low unmet demand. However, it has the lowest rate of services available per 1,000 population during the AH period. Although limited, general practices and pharmacies were the only primary care type services available during the AH period. This finding was mirrored by key informants in this region who highlighted the lack of mental health services in region in the AH period.

When the urgency categories are viewed in combination, the following domain of intervention is suggested:

	AH Need	AH Unmet Demand	AH Service Availability	Intervention Domain Required
Macedon Ranges (S)	Low	Low	High	Service

Due to the high urgency in AH Service Availability, Macedon Ranges requires targeted support to increase the number of services available during the AH period. However, this direct service response will need to be validated by further qualitative data.

Should NWMPHN consider taking action in Macedon Ranges, it is suggested that potential providers articulate the 'need' that could be addressed by direct service support or funding, which could not be uncovered by the quantitative data captured in this report.

HUME

Demographic drivers of need for AH primary care

Hume has some of the highest AH primary health needs, based on demographic drivers, in the catchment.

As of 2016, Hume had an estimated population of 207,830, making it the second largest LGA, by population. The population has the second highest level of socio-economic disadvantage and the third highest proportion of people experiencing high psychological distress (15.3%). Hume residents are also more likely than most in the region to rate their health as fair to poor (19.2%).

DEMOGRAPHIC DRIVERS OF NEED		
	Value	LGA Rank
Population size	207,830	2
Proportion aged 0-4 years[1]	8.1%	3
Population aged 65+ years[1]	10.1%	9
Homelessness[1]	0.4%	7
Humanitarian settlers[2]	55.7%	1
Indigenous Australian population[1]	0.7%	5
Born in non-English speaking countries[1]	30.0%	5
Poor English proficiency[1]	5.8%	3
Socio-Economic Disadvantage (IRSD)	947	2
High psychological distress[1]	15.3%	3
Self-rated fair to poor health[1]	19.2%	3
Population growth[3]	3.1%	5
AVERAGE LGA RANKING		4.0

[1]Proportion of LGA ERP2016; [2]Proportion of all humanitarian settlers in the NWMPHN region; [3]Projected annual percent population growth, 2016-2031

Hume has a higher proportion of residents from a culturally diverse background compared to the rest of the region. The area also has the largest population of people with a refugee status, with almost 56% all new humanitarian migrants initially settling in Hume in 2017. Approximately 42% of residents were born overseas, 30% were born in a non-English speaking nation and 5.8% report having poor English proficiency. Hume residents' five most common countries of birth, after Australia, include: Iraq, India, Turkey, Lebanon, and New Zealand.

Relative to other LGAs in the region, Hume has a higher proportion of persons aged 0-4 years (8.1%) and lower proportion of people aged 65+ years (10.1%).

AH emergency department use

INDICATORS OF AH ED USE		
Indicators of after-hours emergency department attendance	**Value**	**LGA Rank**
Proportion of all Cat4/5 AH ED attendances in NWMPHN	10.2%	3
Cat4/5 AH ED attendance rate per 1,000 population	57.6	10
Proportion of Cat4/5 AH ED attendances requiring an interpreter	3.8%	8
AVERAGE LGA RANKING		7.0

In the two-year period between July 2014 and June 2016, 10.2% of all AH semi-urgent and non-urgent ED attendances in the catchment, as classified by triage categories 4 and 5 (Cat4/5), are attributed to residents of Hume. After adjusting for population size, Hume becomes the LGA with the 10th highest rate of Cat4/5 AH ED attendances in the NWMPHN catchment, with an average of 57.6 attendances per year per 1,000 population.

In the same time period, Hume residents presented in the AH period with Cat4/5 symptoms at 37 different hospitals (the top 13 hospitals are shown in **Figure 56**). The largest proportion (35.6%) presented to The Northern Hospital, followed by The Royal Children's Hospital (20.8%), The Royal Melbourne Hospital (11.6%), Sunshine Hospital (10.2%), and The Royal Victorian Eye & Ear Hospital (6.8%).

The ***time of day*** breakdown of Cat4/5 AH ED attendances is presented in **Figure 57**. The greatest average number of Cat4/5 AH ED attendances per hour occurred during Saturday from 12PM-midnight, followed closely by weekdays 6PM-11PM, and Sundays between 12PM and midnight. The least popular time periods included before 8AM on both weekdays and Saturdays.

Figure 56: Top 13 hospitals where Hume residents presented at during the AH period

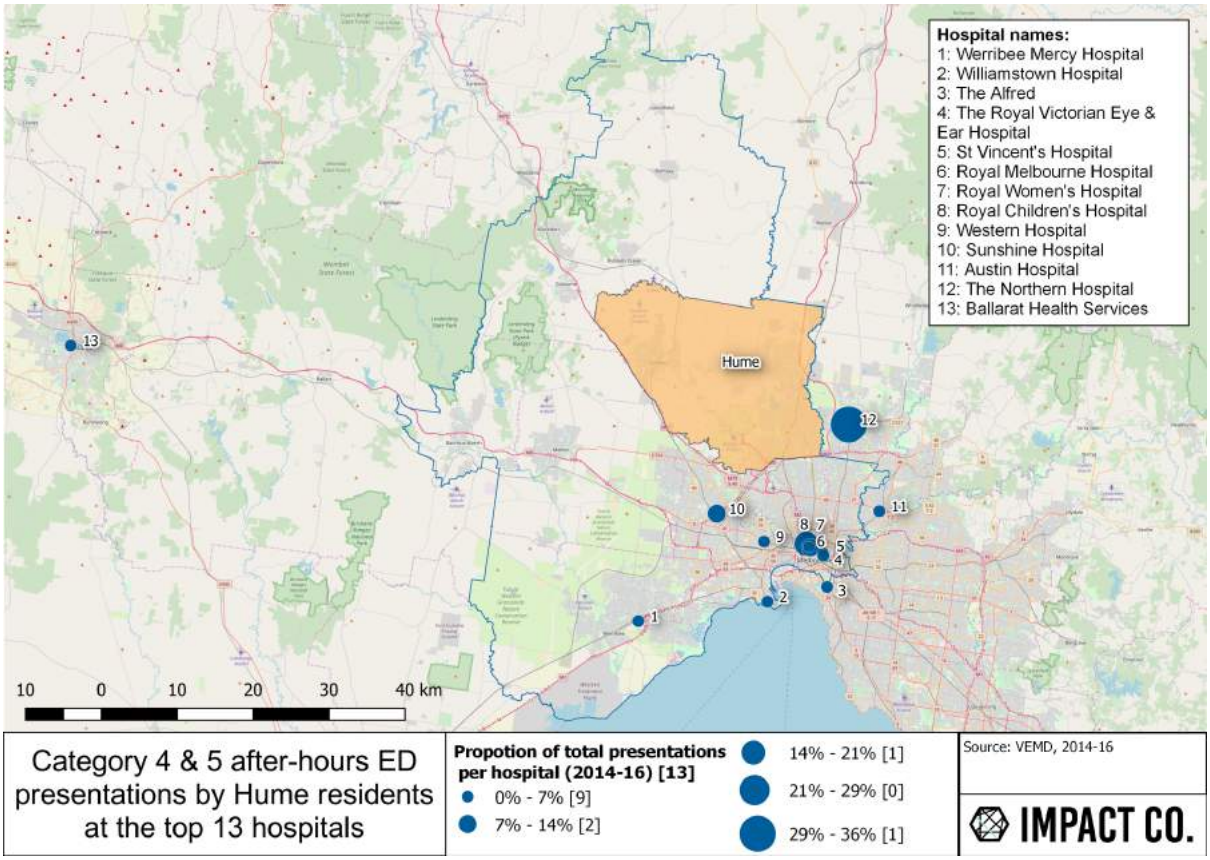
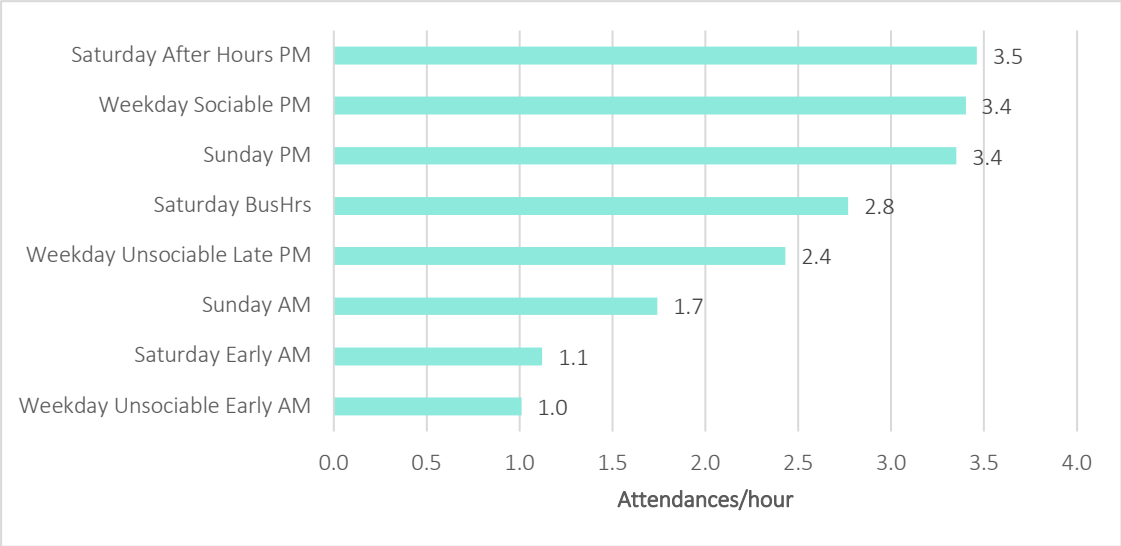


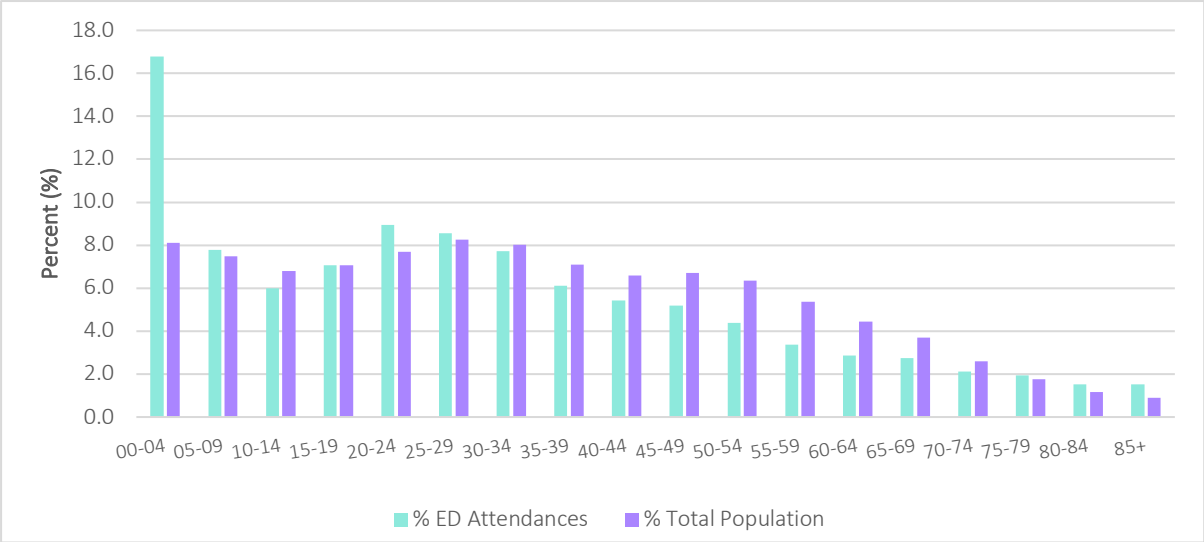
Figure 57: Hume – Rate of Category 4 and 5 AH attendances by time of day



Profile of AH ED attendances

Age distribution of Cat4/5 patients attending the ED in the AH period is similar to that of most LGAs in the catchment, with a large spike in attendances for children aged 0-4 years and slight over-representation of older adults aged 75+ years (see **Figure 58**). There is also a slight over-representation of patients aged 20-24 years compared to the general population.

Figure 58: Hume – Category 4 and 5 AH ED attendances by patient age (2014-16)



Approximately 29% of Cat4/5 AH ED attendances by Hume residents were for people born overseas from 144 different countries. The top five non-Australian countries of birth included: Iraq, Turkey, Lebanon, Italy, and India. Hume has the 8th highest proportion of Cat4/5 AH ED attendances requiring an ***interpreter*** (3.8%). The top five preferred languages spoken by patients who required an interpreter included: Arabic, Turkish, Assyrian Neo-Aramaic, Italian, and Greek.

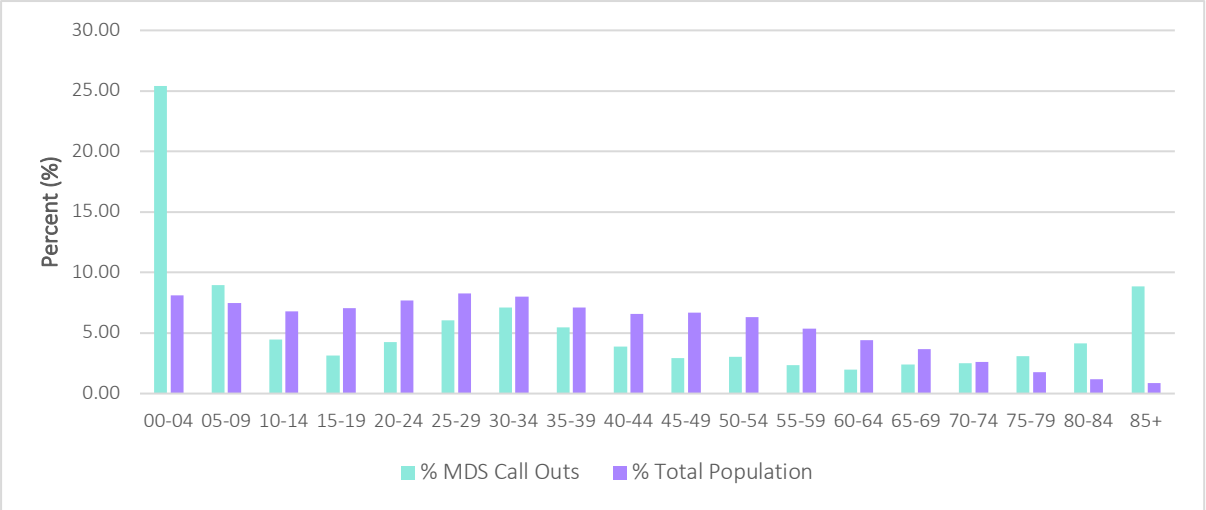
Medical deputising service use

MDS USE		
	Value	**LGA Rank**
Total call outs	14,508	4
Rate of calls per 1000 population	69.8	10
AVERAGE LGA RANKING		7.0

Although total MDS call outs in Hume is relatively high, after adjusting for Hume's relatively large population size, locum services are not very well utilised. This is reflected by the fact that only 70 calls made for every 1000 residents, resulting in the fourth lowest rate in the catchment.

Age distribution of locum service users is similar in Hume as in other LGAs. Young children aged 0-4 years and older adults aged 75+ years are disproportionately over-represented compared to the general population (see **Figure 59**). A large proportion of patients serviced are living within aged care facilities. In this regard, Hume ranks 11th in the catchment with 2148 call outs to aged care facilities in 2017-18, accounting for about 15% of all calls.

Figure 59: Hume – All MDS call outs by 5 year age group (2017-18)



Ambulance Victoria call outs

AMBULANCE VICTORIA USE		
	Value	LGA Rank
Percent of all ambulance call outs	13.4	1
Percent of all non-urgent call outs	13.6	2
Rate of non-urgent call outs per 100 calls	5.0	7
AVERAGE LGA RANKING		3.3

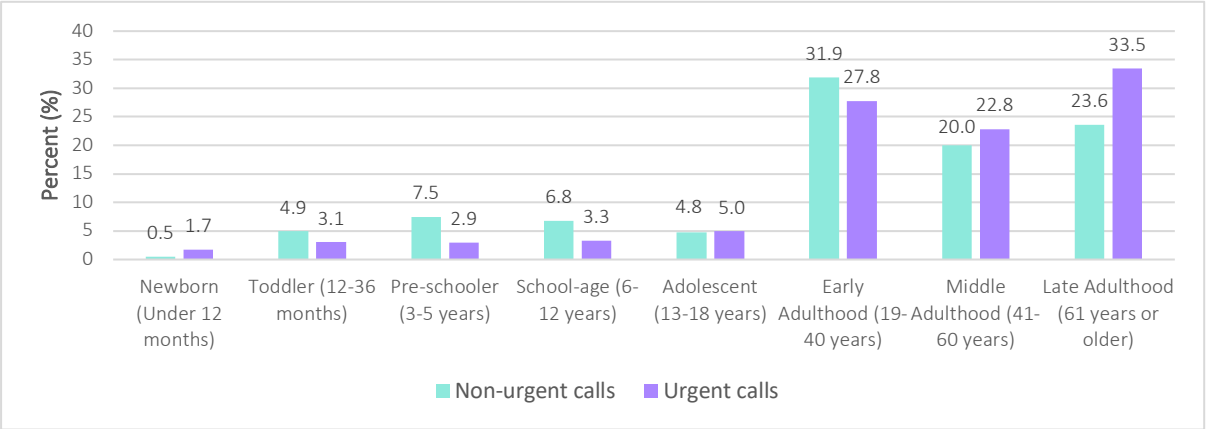
Between 2015 and 2018, Hume had the highest number of ambulance call outs in the catchment, accounting for 13.4% of all calls. Of these, 5% were referred on to alternate service providers indicating that the patient's symptoms did not likely warrant an ambulance call and could have been better treated in the community. Hume had the 7th highest rate of such non-urgent ambulance call outs in the catchment.

Profile of non-emergency call-outs

The majority of non-urgent call outs were to adult patients aged 19+ years (see **Figure 60**). The age distribution of non-urgent call outs is slightly younger than that of urgent call outs. The proportion of non-urgent call outs for pre-schoolers and school-aged children were more than twice as high as the proportion of urgent call outs for the same age cohorts.

The leading reason for non-urgent call outs in Hume was for the problem type classification of 'sick person', accounting for 42.4% of all non-urgent call outs – more than five times greater than the next most common reason of 'abdominal pain' at 8.1%. The five most common subdivisions of a 'sick person' classification included: 'other pain', 'vomiting', 'no priority symptoms', 'abnormal breathing', and 'dizziness/vertigo'.

Figure 60: Hume - ambulance call outs by age (2015-18)



AH service availability

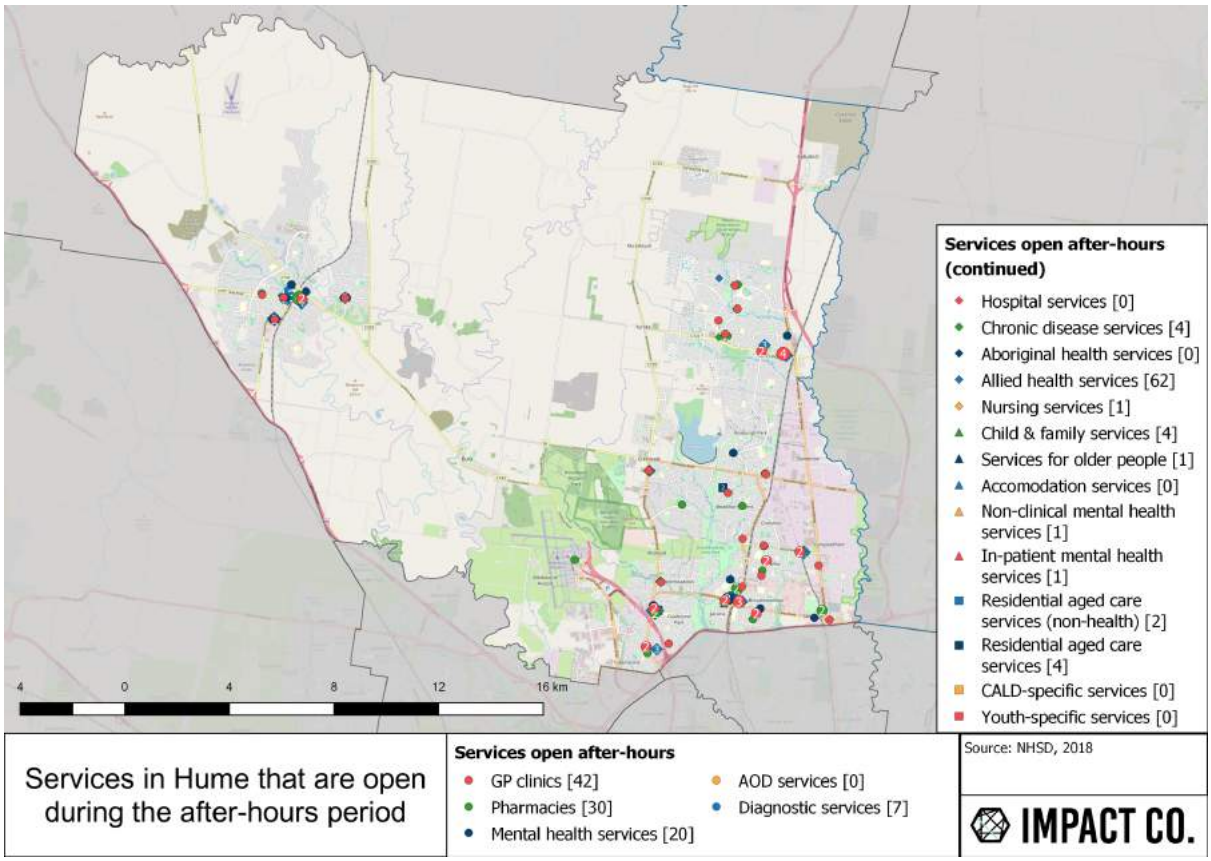
The number of AH services by type, and operating hours during the AH period, in Hume relative to the other LGAs in the NWMPHN catchment are detailed in the table below. This spread of AH services by type is also illustrated in **Figure 61**.

Hume (C)	After-hours services				After-hours hrs/week		
Service Type	Total	AH No.	Rate per 10,000	Rank	No. Hrs	Rate per 10,000	Rank
All After-hours Services	369	179	8.6	3	3447.3	165.9	1
General Practice	50	42	2.0	4	857.1	41.2	12
Pharmacy	30	30	1.4	4	854.3	41.1	6
Mental Health - Clinical in Community	58	20	1.0	2	222.9	10.7	3
Mental Health - Clinical In-patient	1	1	0.1	7	117.9	5.7	9
Mental Health - Non-clinical	6	1	0.1	7	117.9	5.7	10
Allied Health	108	62	3.0	3	771.9	37.1	5
CALD-Specific Health Services[1]	1	0	0.0	1	0.0	0.0	1
Accommodation[2]	6	0	0.0	1	0.0	0.0	1
Aboriginal Health[3]	0	0	0.0	1	0.0	0.0	1
Alcohol & Other Drug Services	6	0	0.0	1	0.0	0.0	1
Aged Care - Residential[4]	30	4	1.9	3	375.6	179.4	3
Aged Care - Non-health[4]	9	2	1.0	7	20.0	9.6	7
Carer Support Services	12	2	0.1	5	24.0	1.2	4
Diagnostic Services	13	7	0.3	4	126.1	6.1	7
Disability Services	11	2	0.1	6	127.9	6.2	9
Children/Family Health Services[5]	30	4	0.9	5	16.5	3.5	3
Women's Health Services[6]	2	0	0.0	1	0.0	0.0	1
Men's Health Services[7]	0	0	0.0	1	0.0	0.0	1
Nursing Care Services	4	1	0.1	3	117.9	5.7	9
Palliative Care Services	1	0	0.0	1	0.0	0.0	1
Sexual Health Services	1	0	0.0	1	0.0	0.0	1
Hospitals	2	0	0.0	1	0.0	0.0	1
Youth Health Services[8]	5	0	0.0	1	0.0	0.0	1
Chronic Disease Services	11	4	0.2	9	62.9	3.0	10
Services for Older Persons[4]	4	1	0.5	6	10.0	4.8	5

DEFINITIONS: Total – total number of service sites listed on the NHSD; AH No. – number of service sites open in the after-hours; Rate per 10,000 (services) – number of service sites open per 10,000 population; 2016 estimated resident population was utilised unless otherwise indicated; Rank – LGA ranking based on rate; all LGAs with a rate of 0 are automatically ranked as 13; No. Hrs – number of service hours per week available in the after-hours; Rate per 10,000 (hrs) – number of weekly service hours available in the after-hours per 10,000 population; 2016 estimated resident population is utilised unless otherwise indicated

[1]Rate calculated using 2016 estimated population born in non-English speaking countries; [2]Rates calculated using 2016 estimated homeless population; [3]Rates calculated using 2016 estimated Aboriginal and Torres Strait Islander population; [4]Rates calculated using 2016 estimated population of persons aged 65+ years; [5]Rates calculated using 2016 estimated population of persons aged 0-14years; [6]Rates calculated using 2016 estimated female population; [7]Rates calculated using 2016 estimated male population; [8]Rates calculated using 2016 estimated population of persons aged 15-24years

Figure 61: Hume – location of AH primary care services



Key findings: Applying the AH Commissioning Framework

Hume has the third highest Composite Index Score of all the LGAs within the NWMPHN catchment. When each sub-index score is ranked and converted into its relevant urgency category, the following results are obtained:

	AH Need		AH Unmet Demand		AH Service Availability	
	Rank	Urgency	Rank	Urgency	Rank	Urgency
Hume (C)	1	High	8	Low	4	High

The high urgency in the AH Need sub-index is associated with its high overall population size, its low socio-economic status, and its high rate of individuals reporting high/very high levels of psychological distress.

Hume also had the highest number of humanitarian settlers in 2017 across the catchment. The services available to support these high needs in the AH period are minimal, which has attributed to its high urgency classification for the AH Service Availability sub-index.

When the urgency categories are viewed in combination, the following intervention domains are suggested:

	AH Need	AH Unmet Demand	AH Service Availability	Intervention Domain Required
Hume (C)	High	Low	High	System and Service

Despite the high needs of residents, there is a low utilisation of ED and ambulatory services for non-urgent care. This suggests that residents may be presenting to services when their health condition exacerbates, which is reflected with Hume having the highest rate of PPHs in the catchment or the limited availability of AH primary care services to provide early interventions.

On this basis, if NWMPHN were to consider taking action in Hume, the AH Commissioning Framework indicates the PHN could achieve greater impact with its interventions by:

- Focusing on enhancing the effectiveness of the AH system to create better links between providers to support the complex needs of residents; and
- Providing targeted support to primary care services so that they have increased capacity to operate during the AH period.

HOBSONS BAY

Demographic drivers of need for AH primary care

Hobsons Bay has low AH primary health needs, based on demographic drivers, relative to other LGAs within the catchment.

As of 2016, Hobsons Bay had an estimated population of 93,392, making it the 9th largest LGA, by population, in the region. The population has lower than average levels of socio-economic disadvantage and the proportion of people experiencing high psychological distress (12.7%). Hobsons Bay residents are also relatively less likely than most in the region to rate their health as fair to poor (17%).

Hobsons Bay has a lower proportion of residents from a culturally diverse background compared to the rest of the region. Approximately 37% of residents were born overseas, 21.6% were born in a non-English speaking nation and 3.6% report having poor English proficiency. Hobsons Bay residents' five most common countries of birth, after Australia, include: England, India, New Zealand, Italy, and Vietnam.

DEMOGRAPHIC DRIVERS OF NEED		
	Value	LGA Rank
Population size	93,392	9
Proportion aged 0-4 years[1]	7.1%	4
Population aged 65+ years[1]	14.4%	4
Homelessness[1]	0.4%	8
Humanitarian settlers[2]	2.42%	7
Indigenous Australian population[1]	0.5%	7
Born in non-English speaking countries[1]	21.6%	10
Poor English proficiency[1]	3.6%	9
Socio-Economic Disadvantage (IRSD)	1015	10
High psychological distress[1]	12.7%	9
Self-rated fair to poor health[1]	17.0%	7
Population growth[3]	1.1%	12
AVERAGE LGA RANKING		8.0

[1]Proportion of LGA ERP2016; [2]Proportion of all humanitarian settlers in the NWMPHN region; [3]Projected annual percent population growth, 2016-2031

Relative to other LGAs in the region, Hobsons Bay has a slightly higher proportion of persons aged 0-4 years (7.1%) and people aged 65+ years (14.4%).

AH emergency department use

INDICATORS OF AH ED USE		
Indicators of after-hours emergency department attendance	Value	LGA Rank
Proportion of all Cat4/5 AH ED attendances in NWMPHN	9.2%	5
Cat4/5 AH ED attendances per year per 1,000 population	129.6	1
Proportion of Cat4/5 AH ED attendances requiring an interpreter	2.5%	9
AVERAGE LGA RANKING		5.0

In the two-year period between July 2014 and June 2016, 9.2% of all AH semi-urgent and non-urgent ED attendances in the catchment, as classified by triage categories 4 and 5 (Cat4/5), are attributed to residents of Hobsons Bay. After adjusting for population size, Hobsons Bay becomes the LGA with the highest rate of Cat4/5 AH ED attendances in the NWMPHN catchment, with an average of 129.6 attendances per year per 1,000 population.

In the same time period, Hobsons Bay residents presented in the AH period with Cat4/5 symptoms at 38 different hospitals (the top 13 hospitals are shown in **Figure 62**). The largest proportion (41.4%) presented to Williamstown Hospital, followed by Western Hospital (16.2%), Mercy Public Hospitals Inc (14.2%), Sunshine Hospital (8.3%), and The Royal Children's Hospital (8.1%).

The ***time of day*** breakdown of Cat4/5 AH ED attendances is presented in **Figure 63**. The greatest average number of Cat4/5 AH ED attendances per hour occurred during Saturday business hours (8AM-12PM) followed by Sundays and Saturdays from 12PM-midnight. The least popular time periods included before 8AM on both weekdays and Saturdays.

Figure 62: Top 13 hospitals where Hobsons Bay residents presented at during the AH period

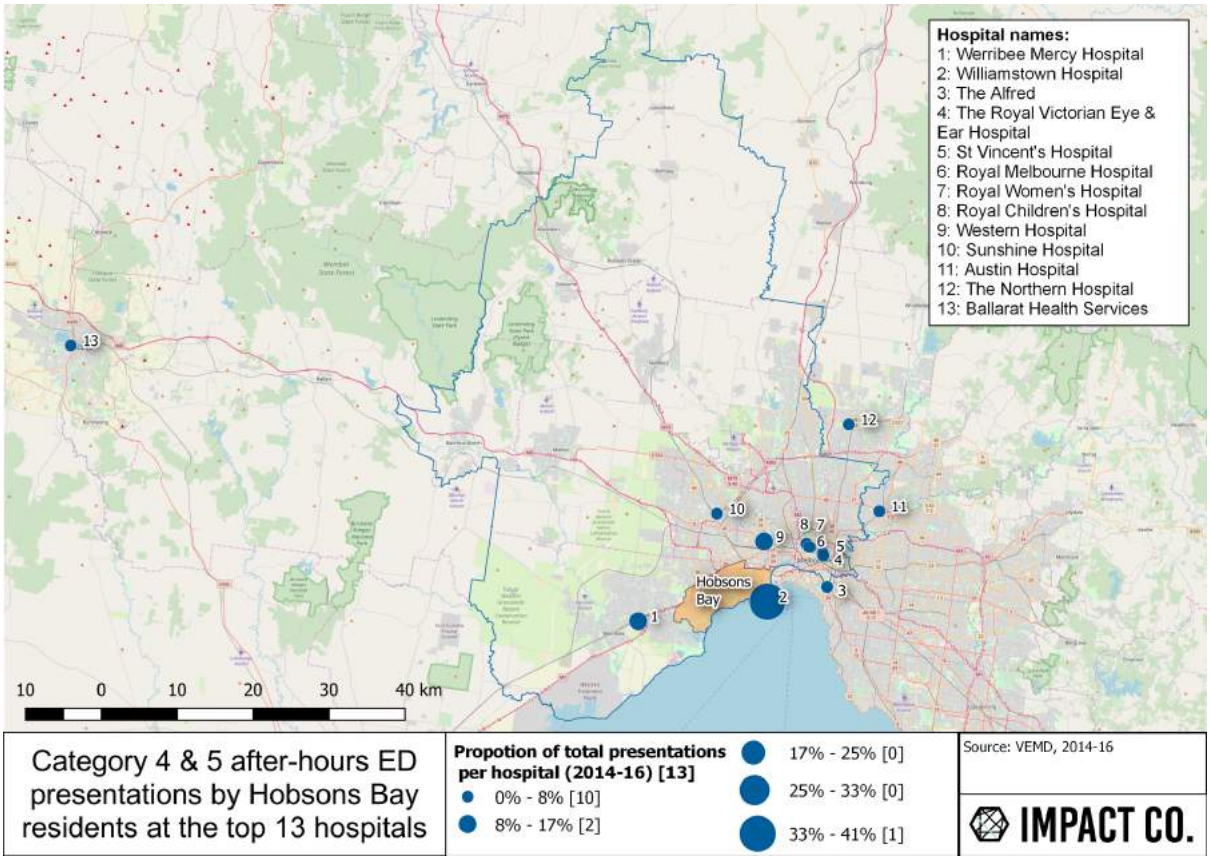
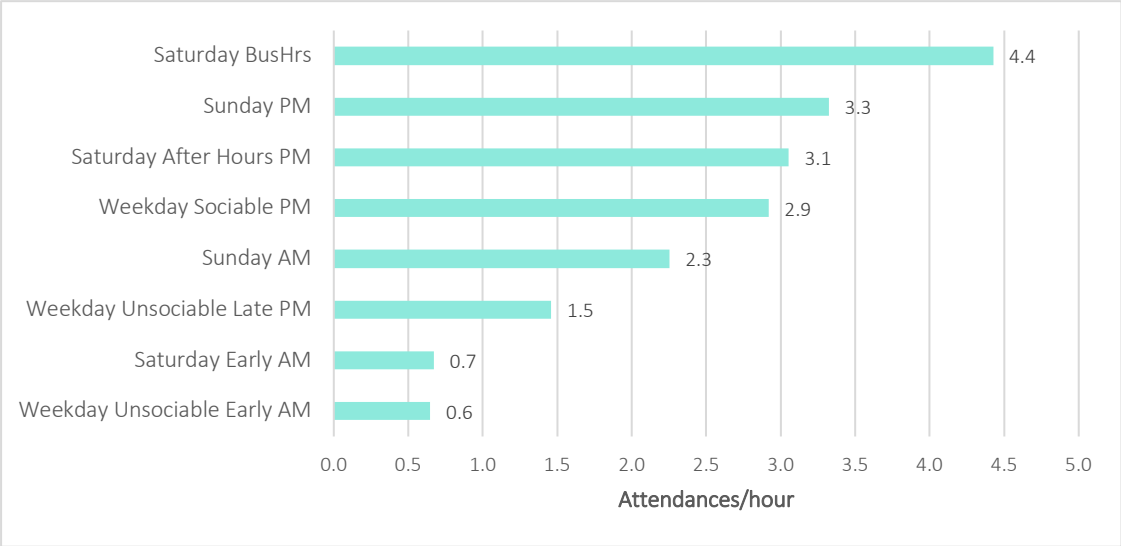


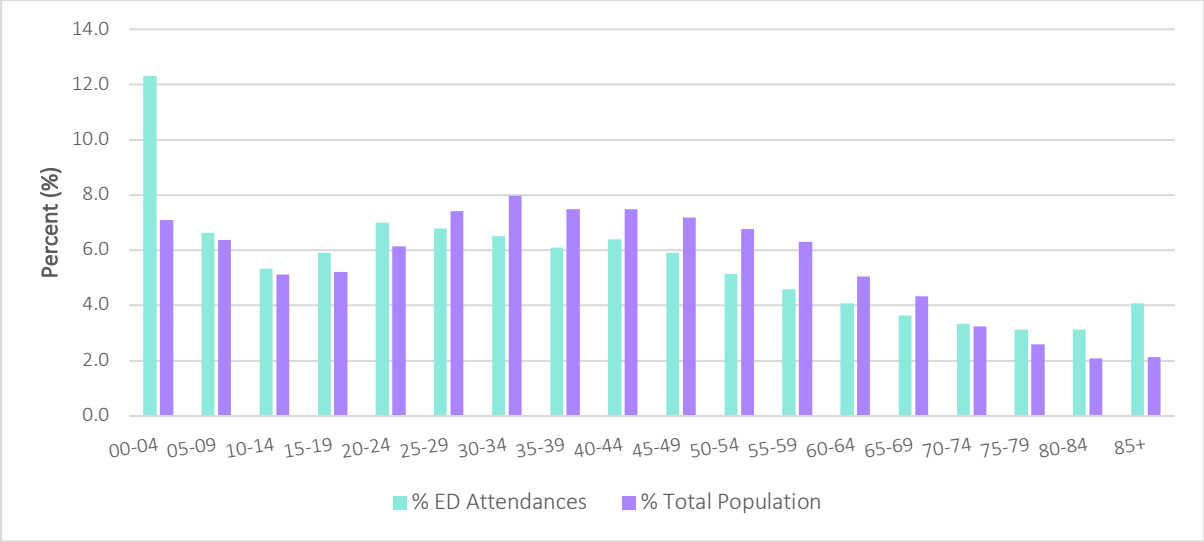
Figure 63: Hobsons Bay – Rate of Cat 4/5 AH ED attendances by time of day



Profile of AH ED patients

Age distribution of Cat4/5 patients attending the ED in the AH period is similar to that of most LGAs in the catchment, with spikes in attendances for children aged 0-4 years and older adults aged 70+ years (see **Figure 64**). There is also a slight over-representation of patients aged 15-24 years compared to the general population.

Figure 64: Hobsons Bay – Cat4/5 AH ED attendances by patient age (2014-16)



Approximately 27% of Cat4/5 AH ED attendances by Hobsons Bay residents were for people born overseas from 145 different countries. The top five non-Australian countries of birth included: England, Lebanon, Italy, New Zealand, and Malta. Hobsons Bay has the 9th highest proportion of Cat4/5 AH ED attendances requiring an ***interpreter*** (2.5%). The top five preferred languages spoken by patients who required an interpreter included: Italian, Greek, Arabic, Vietnamese, and Macedonian.

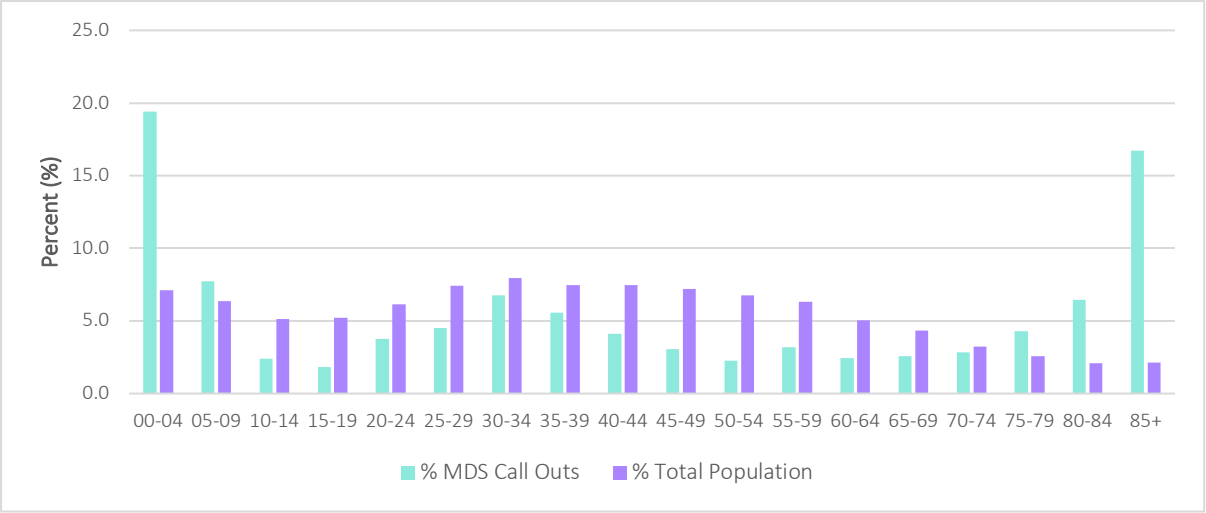
Medical deputising service use

MDS USE		
	Value	LGA Rank
Total call outs	8,293	10
Rate of calls per 1000 population	88.8	5
AVERAGE LGA RANKING		7.5

Although total MDS call outs in Hobsons Bay is relatively low, after adjusting for Hobsons Bay's relatively smaller population size, locum services are moderately well utilised with 89 calls made for every 1000 residents, resulting in the fifth highest rate in the catchment.

Age distribution of locum service users is similar in Hobsons Bay as in other LGAs. Young children aged 0-4 years and older adults aged 75+ years are disproportionately represented compared to the general population (see **Figure 65**). A large proportion of patients serviced are living within aged care facilities. In this regard, the City of Hobsons Bay ranks 6th in the catchment with 2362 call outs to aged care facilities in FY17-18 accounting for about 28% of all calls.

Figure 65: Hobsons Bay – All MDS call outs by 5 year age group (2017-18)



Ambulance Victoria call outs

Ambulance Victoria Use		
	Value	LGA Rank
Percent of all ambulance call outs	5.1	10
Percent of all non-urgent call outs	5.3	9
Rate of non-urgent call outs per 100 calls	5.2	5
AVERAGE LGA RANKING		8.0

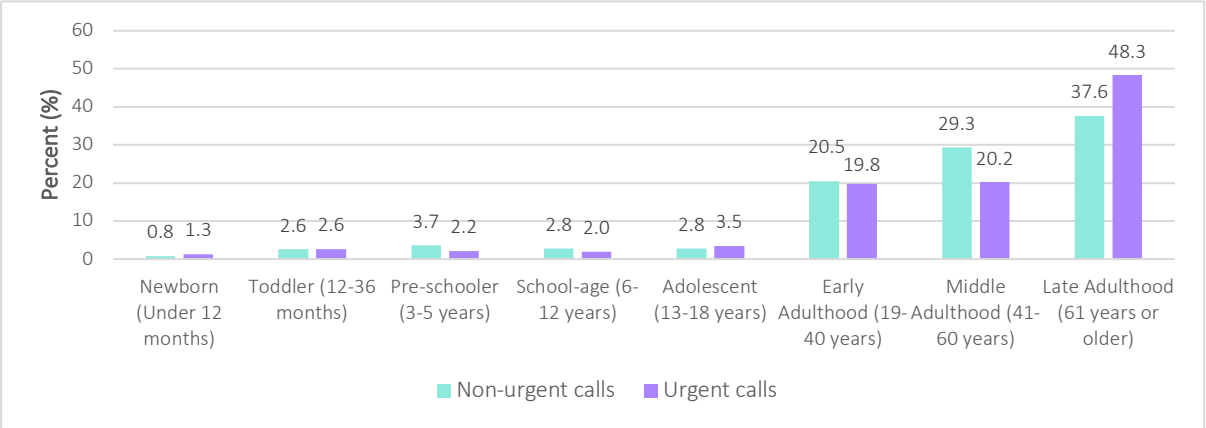
Between 2015 and 2018, Hobsons Bay had a relatively low number of ambulance call outs, accounting for about 5% of all calls made in the catchment. Of these, 5.2% were referred on to alternate service providers indicating that the patient's symptoms did not likely warrant an ambulance call and could have been better treated in the community. Hobsons Bay had the 5th highest rate of non-urgent ambulance call outs in the catchment.

Profile of non-urgent ambulance call outs

The majority of non-urgent call outs were to adult patients aged 19+ years. The age distribution of non-urgent call outs closely mirrors that of urgent call outs (see **Figure 66**).

The leading reason for non-urgent call outs in Hobsons Bay was for the problem type classification of 'sick person', accounting for 49.1% of all non-urgent call outs – more than 7 times greater than the next most common reason of 'abdominal pain' at 6.8%. The five most common subdivisions of a 'sick person' classification included: 'other pain', 'no priority symptoms', 'abnormal breathing', 'vomiting', and 'dizziness/vertigo'.

Figure 66: Hobsons Bay - ambulance call outs by age (2015-18)



AH service availability

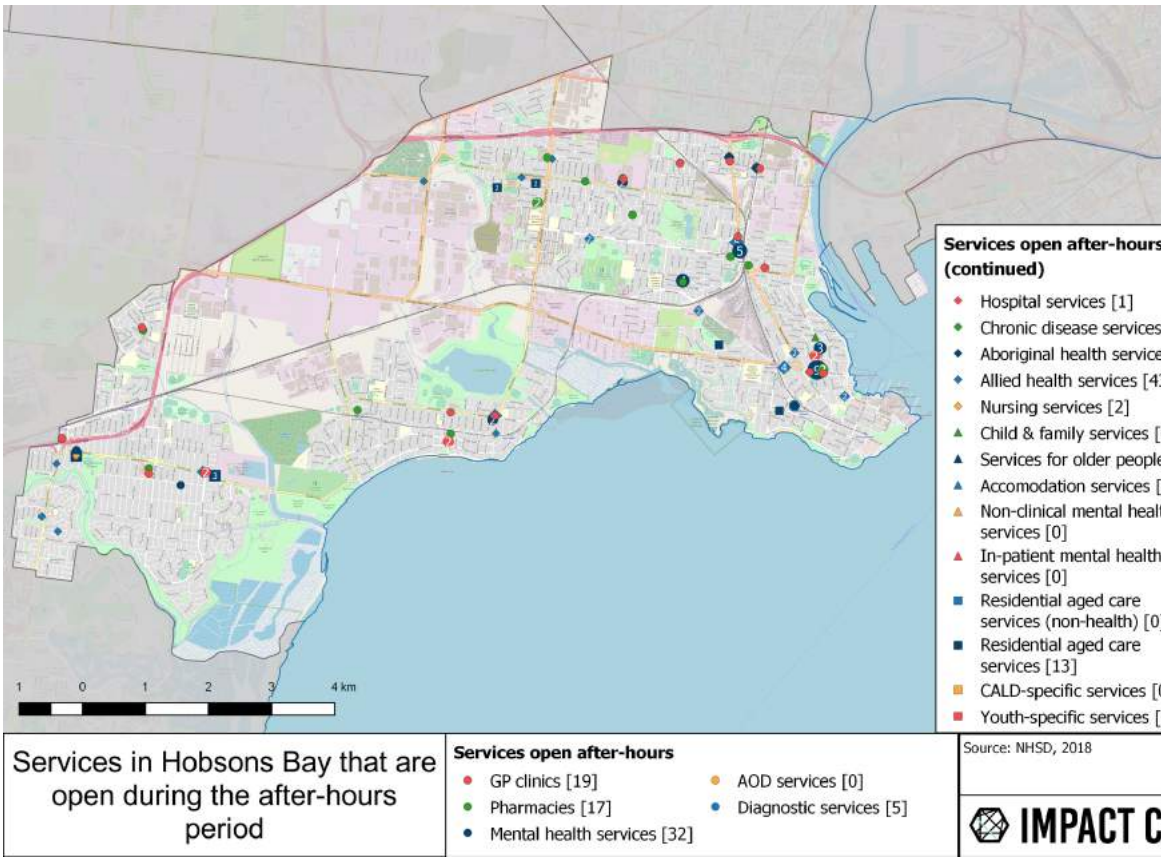
The number of AH services by type, and operating hours during the AH period, in Hobsons Bay relative to the other LGAs in the NWMPHN catchment are detailed in the table below. This spread of AH services by type is also illustrated in **Figure 61**.

Hobsons Bay (C)	After-hours services					After-hours hrs/week		
Service Type	Total	AH No.	Rate per 10,000	Rank		No. Hrs	Rate per 10,000	Rank
All After-hours Services	277	126	13.5	7		1990.4	213.1	6
General Practice	24	19	2.0	5		214.4	23.0	4
Pharmacy	18	17	1.8	6		247.5	26.5	3
Mental Health - Clinical in Community	69	32	3.4	7		415.0	44.4	7
Mental Health - Clinical In-patient	1	0	0.0	1		0.0	0.0	1
Mental Health - Non-clinical	4	0	0.0	1		0.0	0.0	1
Allied Health	79	43	4.6	7		527.5	56.5	8
CALD-Specific Health Services[1]	2	0	0.0	1		0.0	0.0	1
Accommodation[2]	3	0	0.0	1		0.0	0.0	1
Aboriginal Health[3]	0	0	0.0	1		0.0	0.0	1
Alcohol & Other Drug Services	4	0	0.0	1		0.0	0.0	1
Aged Care - Residential[4]	23	13	9.7	13		1246.3	926.4	13
Aged Care - Non-health[4]	7	0	0.0	1		0.0	0.0	1
Carer Support Services	7	1	0.1	6		117.9	12.6	6
Diagnostic Services	6	5	0.5	8		252.7	27.1	13
Disability Services	5	0	0.0	1		0.0	0.0	1
Children/Family Health Services[5]	21	6	3.5	10		73.5	42.3	11
Women's Health Services[6]	3	0	0.0	1		0.0	0.0	1
Men's Health Services[7]	0	0	0.0	1		0.0	0.0	1
Nursing Care Services	12	2	0.2	11		24.0	2.6	8
Palliative Care Services	0	0	0.0	1		0.0	0.0	1
Sexual Health Services	0	0	0.0	1		0.0	0.0	1
Hospitals	1	1	0.1	9		117.9	12.6	11
Youth Health Services[8]	1	0	0.0	1		0.0	0.0	1
Chronic Disease Services	5	0	0.0	1		0.0	0.0	1
Services for Older Persons[4]	6	1	0.7	7		117.9	87.6	10

DEFINITIONS: Total – total number of service sites listed on the NHSD; AH No. – number of service sites open in the after-hours; Rate per 10,000 (services) – number of service sites open per 10,000 population; 2016 estimated resident population was utilised unless otherwise indicated; Rank – LGA ranking based on rate; all LGAs with a rate of 0 are automatically ranked as 13; No. Hrs – number of service hours per week available in the after-hours; Rate per 10,000 (hrs) – number of weekly service hours available in the after-hours per 10,000 population; 2016 estimated resident population is utilised unless otherwise indicated

[1]Rate calculated using 2016 estimated population born in non-English speaking countries; [2]Rates calculated using 2016 estimated homeless population; [3]Rates calculated using 2016 estimated Aboriginal and Torres Strait Islander population; [4]Rates calculated using 2016 estimated population of persons aged 65+ years; [5]Rates calculated using 2016 estimated population of persons aged 0-14years; [6]Rates calculated using 2016 estimated female population; [7]Rates calculated using 2016 estimated male population; [8]Rates calculated using 2016 estimated population of persons aged 15-24years

Figure 67: Hobsons Bay – location of AH primary care services



Key findings: Applying the AH Commissioning Framework

Hobsons Bay has the fourth highest Composite Index Score of all the LGAs within the NWMPHN catchment. When each sub-index score is ranked and converted into its relevant urgency category, the following results are obtained:

	AH Need		AH Unmet Demand		AH Service Availability	
	Rank	Urgency	Rank	Urgency	Rank	Urgency
Hobsons Bay (C)	10	Low	1	High	3	High

Hobsons Bay had the highest score for the AH Unmet Demand sub-index, which is predominately due to the LGA accounting for the highest rate of Cat 4/5 presentations per 1,000 population in the catchment. Hobsons Bay also had a high rate of non-urgent ambulance call outs. This is potentially due to the limited primary care services available to access during the AH period.

When the urgency categories are viewed in combination, the following intervention domains are suggested:

	AH Need	AH Unmet Demand	AH Service Availability	Intervention Domain Required
Hobsons Bay (C)	Low	High	High	Community and Service

If NWMPHN were to consider taking action in Hobsons Bay, the AH Commissioning Framework suggests that services or providers would benefit from direct support to extend their operating hours into the AH period. Increasing AH options would need to occur simultaneously with community awareness. This will support residents to make informed choices about where (and when) to seek appropriate health support.

BRIMBANK

Demographic drivers of need for AH primary care

Brimbank has the greatest AH primary health needs, based on demographic drivers, of all LGAs within the catchment.

As of 2016, Brimbank had an estimated population of 205,741, making it the 3rd largest LGA, by population, in the region. The population is the most socio-economically disadvantaged in the catchment and has the highest proportion of people experiencing high psychological distress (16.0%) and self-assessed poor health (21.2%).

Residents of the Brimbank are from a range of diverse cultural and linguistic backgrounds with more than 55% of the population born overseas, greater than 40% are born from a non-English speaking nation, and more than 10.4% reporting poor English proficiency. Brimbank residents five most common countries of birth, after Australia, are: Vietnam, India, Philippines, Malta, and New Zealand.

DEMOGRAPHIC DRIVERS OF NEED		
	Value	LGA Rank
Population size	205,741	3
Proportion aged 0-4 years[1]	6.8%	6
Population aged 20-24 years[1]	8.1%	5
Population aged 65+ years[1]	13.2%	7
Homelessness[1]	0.7%	4
Humanitarian settlers[2]	12.2%	3
Indigenous Australian population[1]	0.4%	11
Born in non-English speaking countries[1]	42.2%	2
Poor English proficiency[1]	10.4%	1
Socio-Economic Disadvantage (IRSD)	921	1
High psychological distress[1]	16.0%	1
Self-rated fair to poor health[1]	21.2%	1
Population growth[3]	0.9%	13
AVERAGE LGA RANKING		4.4

[1]Proportion of LGA ERP 2016; [2]Proportion of all humanitarian settlers in the NWMPHN region; [3]Projected annual percent population growth

Relative to other LGAs in the region, Brimbank has an average-sized population of high-need age cohorts of persons aged 0-4 years (6.8%) and 65+ years (13.2%), and people experiencing homelessness (0.7%).

AH emergency department use

Brimbank has the greatest number of people presenting to ED in the AH period with semi-urgent and non-urgent symptoms, as classified by triage categories 4 and 5 (Cat4/5). After adjusting for population size, Brimbank maintains the third highest rate of Cat4/5 AH ED attendances in the NWMPHN catchment.

INDICATORS OF AH ED USE		
	Value	LGA Rank
Proportion of all Cat4/5 AH ED attendances in NWMPHN	14.4%	1
Cat4/5 AH ED attendance rate per 1000 population	91.8	3
Proportion of Cat4/5 AH ED attendances requiring an interpreter	7.8%	1
AVERAGE LGA RANKING		1.7

Between July 2014 and June 2016, Brimbank residents presented in the AH period with Cat4/5 symptoms at 38 different hospitals (the top 13 hospitals are shown in **Figure 68**). The vast majority (66%) presented to Sunshine Hospital, followed by Western Hospital (11%), The Royal Children's Hospital (7%), The Royal Victorian Eye and Ear Hospital (4%), and The Royal Melbourne Hospital (3%).

The ***time of day*** breakdown of Cat4/5 AH ED attendances is presented in **Figure 69**. The greatest number of Cat4/5 AH ED attendances per hour occur on Sundays after 12PM, Saturdays from 8AM-12PM, and Saturdays from 12PM to midnight. The least popular time periods include before 8AM on both weekdays and Saturdays.

Figure 68: Top 13 hospitals where Brimbank residents presented at during the AH period

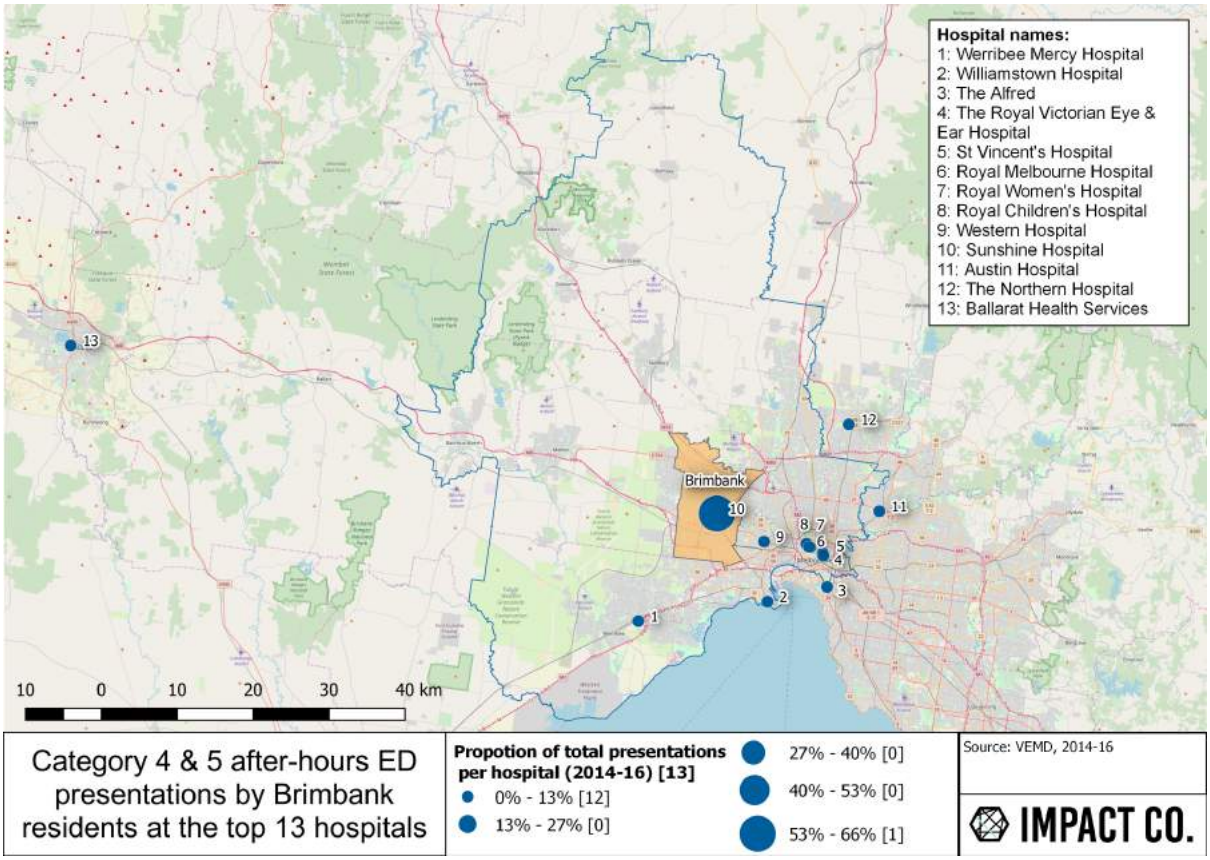
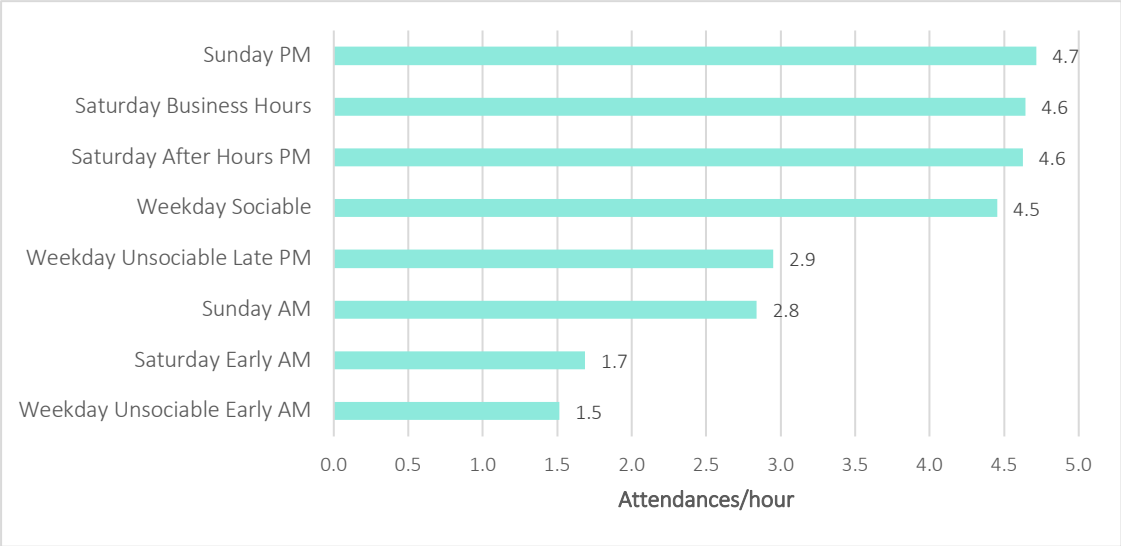


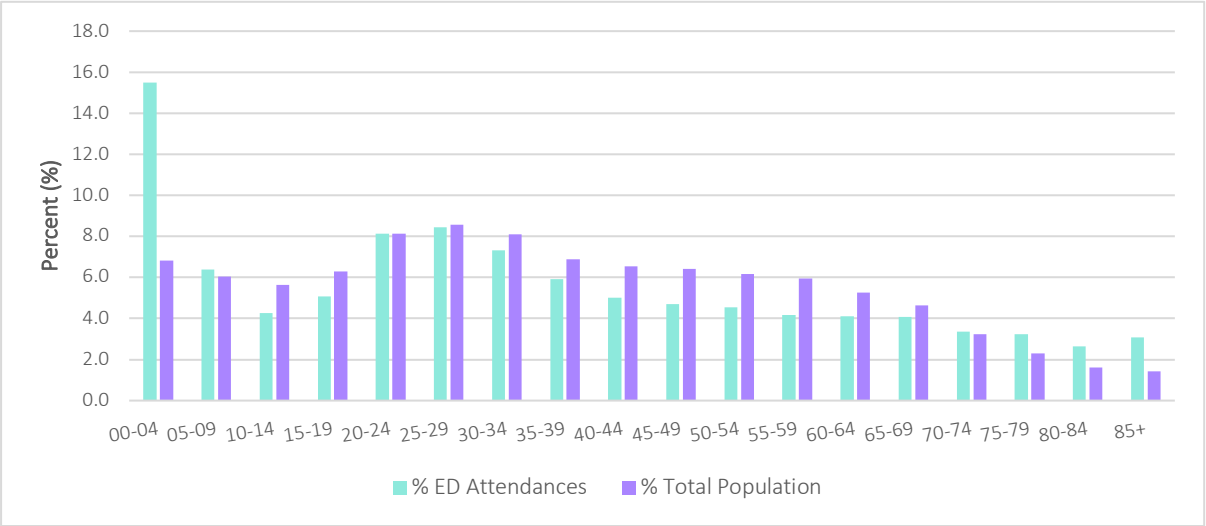
Figure 69: Brimbank – Rate of Cat 4/5 AH ED attendances by time of day



Profile of AH ED patients

Age distribution of Cat4/5 patients attending the ED in the AH period is similar to that of most LGAs in the catchment, with spikes in attendances for children aged 0-4 years and older adults aged 70+ years (see **Figure 70**).

Figure 70: Brimbank – Cat 4/5 AH ED attendances by patient age (2014-16)



Reflecting on the diversity of the area's population, more than 40% of Cat4/5 AH ED attendances by Brimbank residents were for people born overseas from 171 different countries. The top five non-Australian countries of birth included: Vietnam, Malta, India, Macedonia, and Italy. Unsurprisingly, Brimbank has the highest proportion of Cat4/5 AH ED attendances requiring an ***interpreter*** (7.8%). The top five languages spoken by patients who required an interpreter included: Vietnamese, Greek, Macedonian, Italian and Croatian.

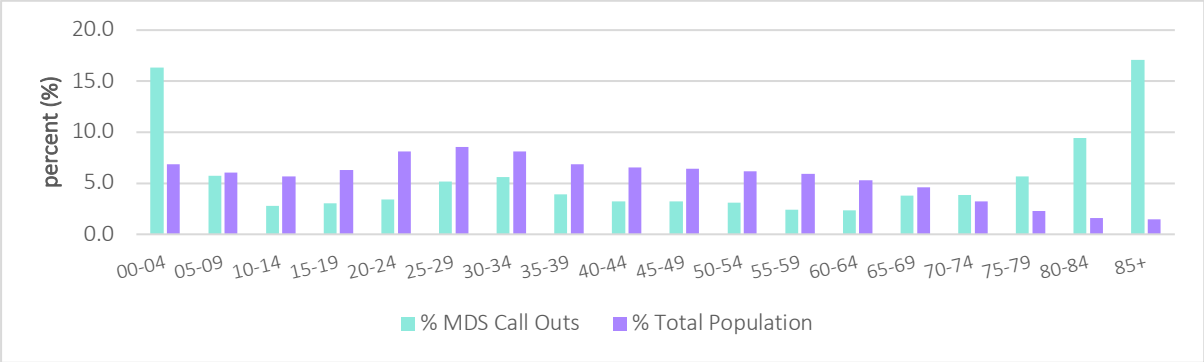
Medical deputising services use

MDS USE		
	Value	LGA Rank
Total call outs	10,356	8
Rate of calls per 1,000 population	50.3	11
AVERAGE LGA RANKING		9.5

MDS use is relatively low in Brimbank compared to other LGAs in the catchment. Brimbank ranks 8th in terms of total call outs, accounting for about 7% of all call outs in the 2017-18. Adjusting for population size indicates that locum services are substantially under-utilised with only 50 calls made for every 1000 residents, resulting in the second lowest rate in the catchment.

Age distribution of locum service users in Brimbank is similar to other LGAs. Service use is highest for young children aged 0-4years, young adults aged 25-40years, and older adults aged 80-95years (see **Figure 71**).

Figure 71: Brimbank – All MDS call outs by 5 year age group (2017-18)



A large proportion of patients serviced are living within aged care facilities. In this regard, Brimbank ranks 5th in the catchment with 3044 call outs to aged care facilities in FY17-18 accounting for nearly 30% of all calls.

Ambulance Victoria call outs

AMBULANCE VICTORIA USE		
	Value	LGA Rank
Percent of all ambulance call outs	11.5%	2
Percent of non-urgent ambulance call outs	12.1%	3
Non-urgent call outs as a percentage of all call outs	5.3%	3
AVERAGE LGA RANKING		2.7

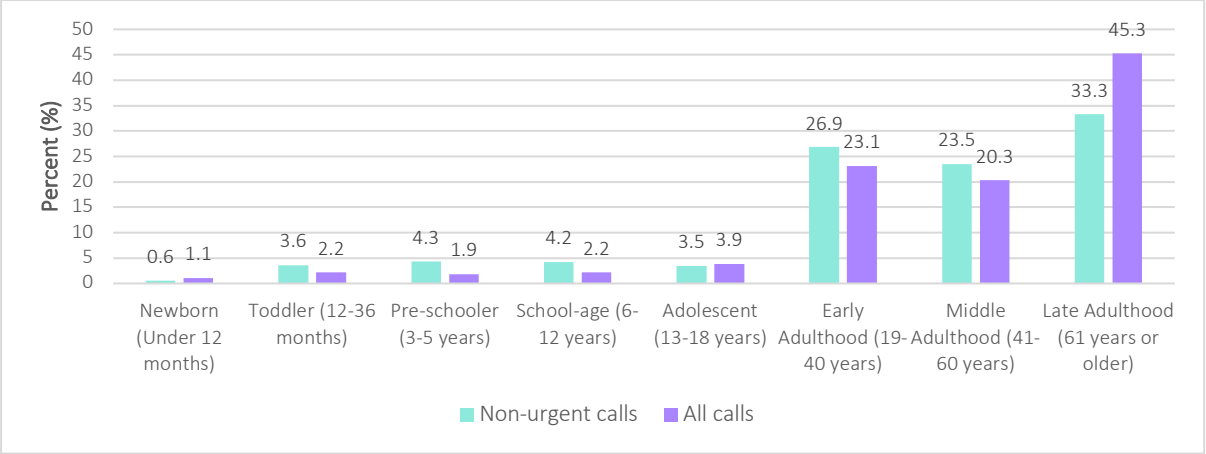
Between 2015-2018, Brimbank had the second highest rate of ambulance call outs in the catchment, accounting for 11.5% of all calls. Of these, 5.3% were referred on to alternate service providers indicating that the patient's symptoms did not likely warrant an ambulance call and could have been better treated in the community. Brimbank had the third highest rate of such non-urgent ambulance call outs in the catchment.

Profile of non-urgent ambulance call outs

The age distribution of non-urgent ambulance call outs to Brimbank is slightly younger than the age distribution of urgent call outs (see **Figure 72**). Non-urgent ambulance call outs for pre-schoolers (aged 3-5 years) and school-aged children (aged 6-12 years) were proportionally twice as high as urgent ambulance call outs accounting for 4.3% and 4.2% of non-urgent call outs compared to 1.9% and 2.2% of urgent call outs, respectively.

The leading reason for non-urgent call outs in Brimbank was for the problem type classification of 'sick person', accounting for 42.8% of all non-urgent call outs – more than six times greater than the next most common reason of 'haemorrhage/laceration' at 6.7%. The five most common subdivisions of a 'sick person' classification included: 'other pain', 'abnormal breathing', 'no priority symptoms', 'dizziness/vertigo', and 'vomiting'.

Figure 72: Brimbank – Non-urgent ambulance call outs by age (2015-18)



AH service availability

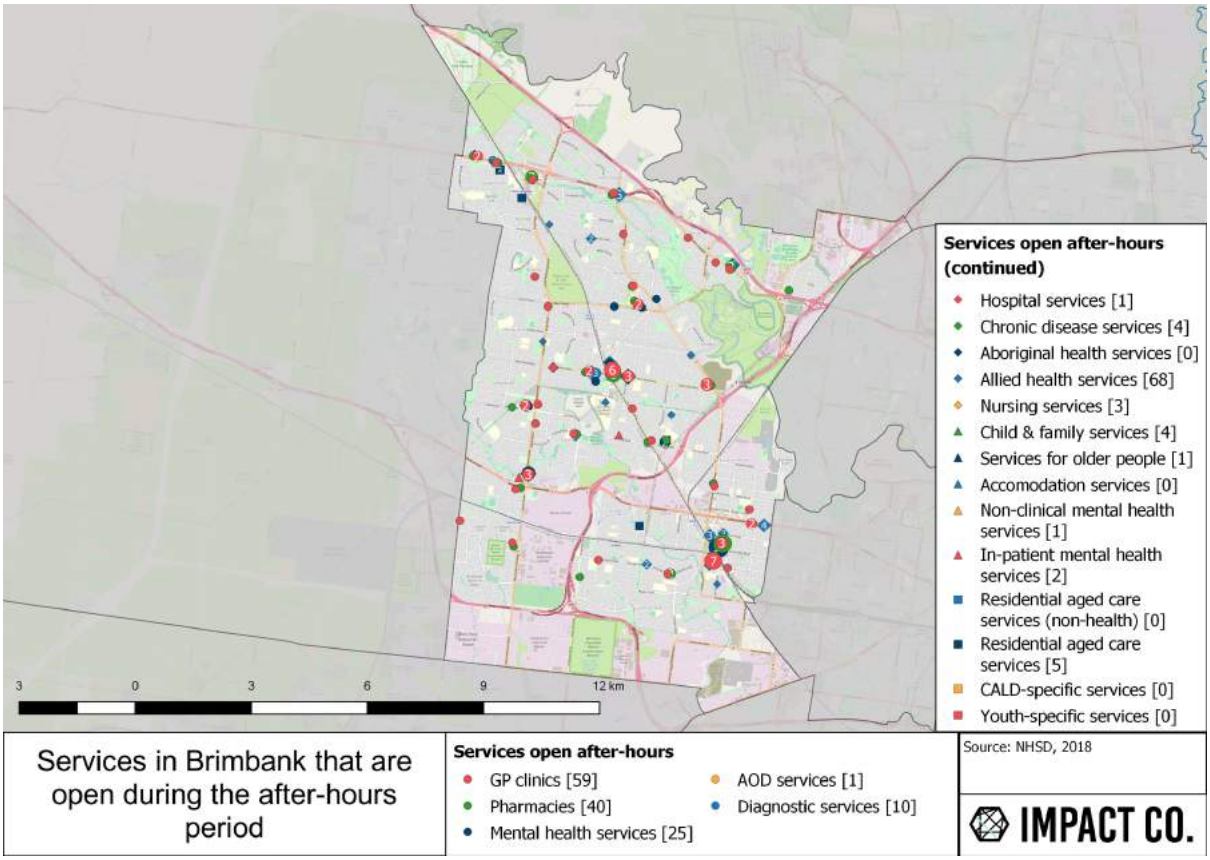
The number of AH services by type, and operating hours during the AH period, in Brimbank relative to the other LGAs in the NWMPHN catchment are detailed in the table below. This spread of AH services by type is also illustrated in **Figure 73**.

Brimbank (C)	After-hours services					After-hours hrs/week		
Service Type	Total	AH No.	Rate per 10,000	Rank		No. Hrs	Rate per 10,000	Rank
All After-hours Services	468	221	10.7	5		3740.5	181.8	2
General Practice	69	59	2.9	11		761.9	37.0	10
Pharmacy	44	40	1.9	7		859.0	41.8	7
Mental Health - Clinical in Community	68	25	12.2	13		969.2	47.1	8
Mental Health - Clinical In-patient	3	2	1.0	13		137.9	6.7	11
Mental Health - Non-clinical	4	1	0.5	13		31.0	1.5	9
Allied Health	113	68	3.3	5		599.3	29.1	2
CALD-Specific Health Services[1]	3	0	0.0	1		0.0	0.0	1
Accommodation[2]	6	0	0.0	1		0.0	0.0	1
Aboriginal Health[3]	1	0	0.0	1		0.0	0.0	1
Alcohol & Other Drug Services	6	1	0.1	4		117.9	5.7	7
Aged Care - Residential[4]	43	5	1.8	2		541.5	199.3	4
Aged Care - Non-health[4]	14	0	0.0	1		0.0	0.0	1
Carer Support Services	15	1	0.1	3		117.9	5.7	5
Diagnostic Services	15	10	0.5	7		65.5	3.2	4
Disability Services	32	1	0.1	5		16.0	0.8	5
Children/Family Health Services[5]	28	4	1.1	6		14.0	3.7	4
Women's Health Services[6]	7	0	0.0	1		0.0	0.0	1
Men's Health Services[7]	0	0	0.0	1		0.0	0.0	1
Nursing Care Services	19	3	0.2	10		18.0	0.9	5
Palliative Care Services	2	0	0.0	1		0.0	0.0	1
Sexual Health Services	4	1	0.1	10		9.0	0.4	12
Hospitals	2	1	0.1	7		2.5	0.1	7
Youth Health Services[8]	1	0	0.0	1		0.0	0.0	1
Chronic Disease Services	7	4	0.2	10		21.0	1.0	5
Services for Older Persons[4]	7	1	0.4	4		3.0	1.1	4

DEFINITIONS: Total – total number of service sites listed on the NHSD; AH No. – number of service sites open in the after-hours; Rate per 10,000 (services) – number of service sites open per 10,000 population; 2016 estimated resident population was utilised unless otherwise indicated; Rank – LGA ranking based on rate; all LGAs with a rate of 0 are automatically ranked as 13; No. Hrs – number of service hours per week available in the after-hours; Rate per 10,000 (hrs) – number of weekly service hours available in the after-hours per 10,000 population; 2016 estimated resident population is utilised unless otherwise indicated

[1]Rate calculated using 2016 estimated population born in non-English speaking countries; [2]Rates calculated using 2016 estimated homeless population; [3]Rates calculated using 2016 estimated Aboriginal and Torres Strait Islander population; [4]Rates calculated using 2016 estimated population of persons aged 65+ years; [5]Rates calculated using 2016 estimated population of persons aged 0-14years; [6]Rates calculated using 2016 estimated female population; [7]Rates calculated using 2016 estimated male population; [8]Rates calculated using 2016 estimated population of persons aged 15-24years

Figure 73: Brimbank – location of AH primary care services



Key findings: Applying the AH Commissioning Framework

Brimbank has the fifth highest Composite Index Score of all the LGAs within the NWMPHN catchment. When each sub-index score is ranked and converted into its relevant urgency category, the following results are obtained:

	AH Need		AH Unmet Demand		AH Service Availability	
	Rank	Urgency	Rank	Urgency	Rank	Urgency
Brimbank (C)	2	High	4	High	6	High

Brimbank scores a high urgency classification for each of the sub-indices due to:

- *AH Need:* Brimbank has the third highest population and, according to SEIFA, is the lowest socio-economic LGA in the catchment. Brimbank also has the highest proportion of residents born overseas in the predominately non-English speaking country and residents with low English proficiency. The LGA also had the highest rate of residents who reported high/very high psychological distress and self-rated their health as poor or fair.
- *AH Unmet Demand:* Brimbank's high urgency for this sub-index is driven by its high rate of Cat 4/5 presentations to ED and rate of PPHs.
- *AH Service availability:* While AH primary care services due exist in Brimbank, the scale of these services are insufficient when adjusted for population size. Despite its large CALD population, the LGA has no CALD specific services available during the AH period.

Feedback from the focus groups with CALD residents in Brimbank suggests there are various barriers to accessing AH services during the AH period, including a lack of awareness and integration of existing services, and a reluctance to use alternative AH options. For this reason, if their own GP is not available, their preference is to attend the ED.

When the urgency categories are viewed in combination, the following intervention domains are suggested:

	AH Need	AH Unmet Demand	AH Service Availability	Intervention Domain Required
Brimbank (C)	High	High	High	System, Community and Service

The AH Commissioning Framework suggests that residents in Brimbank have high needs and are likely to present to ED for non-urgent care due to the limited AH service options. As such, interventions across the three domains will need to be explored to address the AH gaps in Brimbank. If NWMPHN is to commission services in this area, greater impact could be achieved by investing in interventions that:

- Integrate the health system, particularly models of care that streamline the patient journey between the primary and tertiary care sector to reduce hospitalisations;
- Provide direct support to primary care providers to extend opening hours into the AH period; and
- Involve community awareness campaigns that target the CALD communities and provide information on AH service options available and their rights when accessing health services.

WYNDHAM

Demographic drivers of need for AH primary care

Wyndham has moderate to high AH primary health needs, based on demographic drivers, relative to the rest of the region.

Wyndham is the largest LGA, by population, with an estimated 2016 resident population of 228,088. Wyndham is also one of the fastest growing populations in the catchment with a projected annual population growth of 4.3% over the next decade. The level of socio-economic disadvantage is slightly higher than the national average, as it the proportion of residents that experience high psychological distress (14.8%). However, a lower than average proportion of residents rate their health as fair to poor (16.1%).

DEMOGRAPHIC DRIVERS OF NEED		
	Value	LGA Rank
Population size	228,088	1
Proportion aged 0-4 years[1]	10.1%	1
Population aged 65+ years[1]	7.4%	12
Homelessness[1]	0.3%	10
Humanitarian settlers[2]	12.3%	2
Indigenous Australian population[1]	0.8%	3
Born in non-English speaking countries[1]	32.3%	4
Poor English proficiency[1]	3.5%	10
Socio-Economic Disadvantage (IRSD)	1009	6
High psychological distress[1]	14.8%	4
Self-rated fair to poor health[1]	16.1%	9
Population growth[3]	4.3%	3
AVERAGE LGA RANKING		5.4

[1]Proportion of LGA ERP2016; [2]Proportion of all humanitarian settlers in the NWMPHN region, 2017; [3]Projected annual percent population growth, 2016-2031

Wyndham has a more culturally diverse population than the majority of the catchment. Approximately 47% of residents were born overseas and 32.3% were born in non-English speaking nations. Wyndham also has the second largest population of newly settled refugees and the third largest proportion of people who identify as being of Aboriginal and Torres Strait Islander descent. Despite its relative diversity, few residents (3.5%) report having poor English proficiency. The five most common countries of birth for Wyndham residents, after Australia, include: India, New Zealand, Philippines, China, and England.

The age distribution in Wyndham is younger than the majority of the catchment. Wyndham has the highest proportion of persons aged 0-4 years (10.1%) and the second lowest proportion of persons aged 65 years and older (7.4%).

AH emergency department use

INDICATORS OF AH ED USE		
	Value	LGA Rank
Proportion of all Cat4/5 AH ED attendances in NWMPHN	12.28%	2
Cat4/5 AH ED attendance rate per 1,000 population	56.3	11
Proportion of Cat4/5 AH ED attendances requiring an interpreter	1.6%	11
AVERAGE LGA RANKING		8.0

Between July 2014 and June 2016, Wyndham had the second highest number of AH semi-urgent and non-urgent, as classified by triage categories 4 and 5 (Cat4/5), ED attendances, accounting for 12.28% of all attendances. This high volume is mostly attributable to Wyndham's large population size. However, after adjusting for population size, Wyndham has one of the lowest rates of Cat4/5 AH ED attendances with an average of 56.31 attendances per year per 1,000 population.

In the same time period, Wyndham residents presented in the AH period with Cat4/5 symptoms at 38 different hospitals (the top 13 hospitals are shown in **Figure 74**). The largest proportion (60.9%) presented to Mercy Public Hospitals Inc, followed by Sunshine Hospital (14.0%), The Royal Children's Hospital (8.8%), Western Hospital (4.4%), and The Royal Victorian Eye & Ear Hospital (3.0%).

The ***time of day*** breakdown of Cat4/5 AH ED attendances is presented in **Figure 75**. The greatest average number of Cat4/5 AH ED attendances per hour occurred on weekdays from 6PM to 11PM followed by

Saturdays from 12PM-midnight, and Saturday business hours (8AM-12PM). The least popular time periods included before 8AM on both weekdays and Saturdays.

Figure 74: Top 13 hospitals where Wyndham residents presented at during the AH period

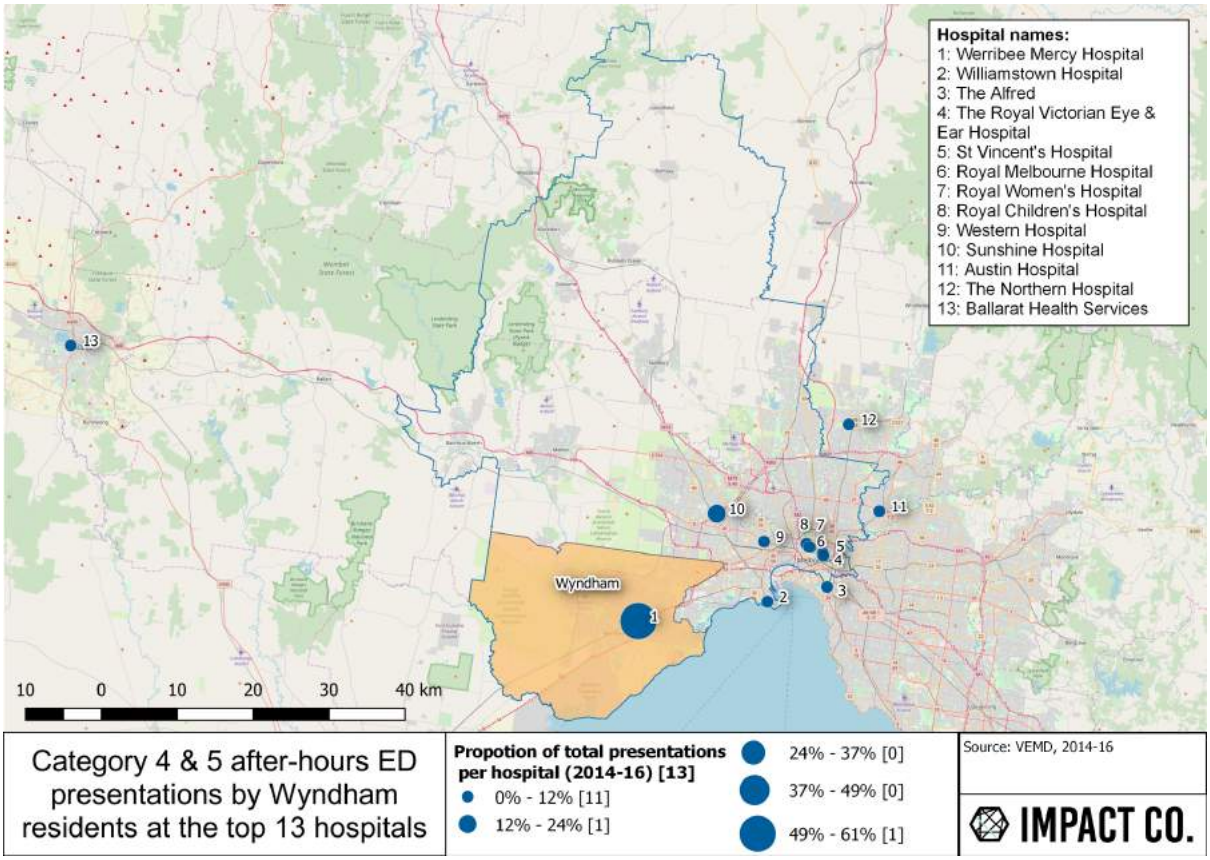
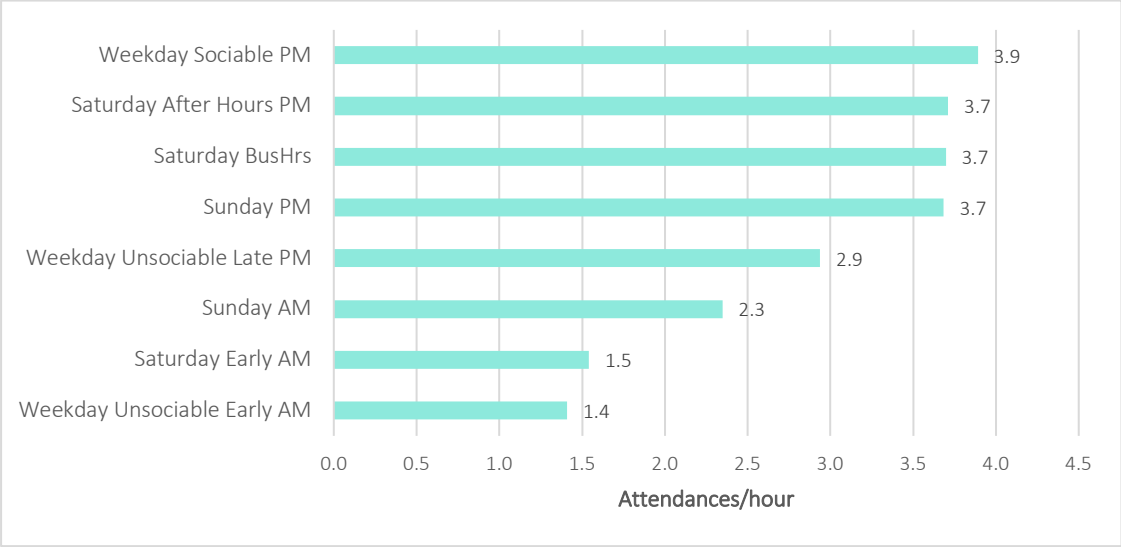


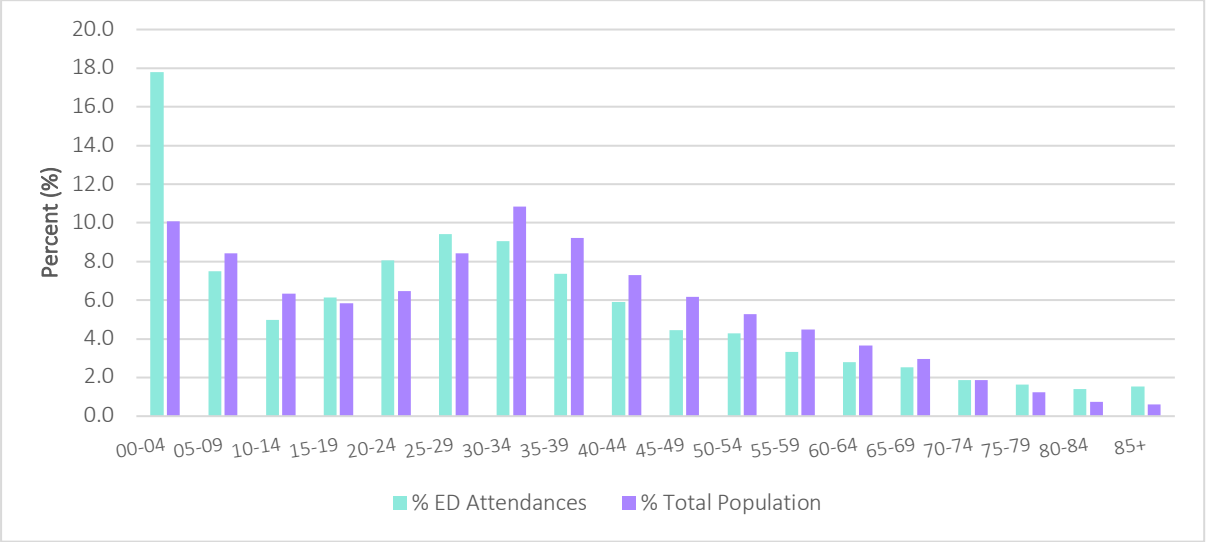
Figure 75: Wyndham – Rate of Cat 4/5 AH ED attendances by time of day



Profile of AH ED patients

Age distribution of Cat4/5 patients attending the ED in the AH period is similar to most LGAs in the catchment, with a large spike in attendances for children aged 0-4 years and slight over-representation of older adults aged 75 years and older, compared to the general population (see **Figure 76**). In Wyndham, unlike in most other LGAs, there is also a slight over-representation of young adults aged 20-30 years compared to the general population.

Figure 76: Wyndham - Cat4/5 AH ED attendances by patient age (2014-16)



Approximately 31% of Cat4/5 AH ED attendances by Wyndham residents were for people born overseas from 172 different countries. The top five non-Australian countries of birth included: India, New Zealand, Philippines, England, and Italy. Wyndham has the second lowest proportion of Cat4/5 AH ED attendances requiring an ***interpreter*** (1.59%). The top five preferred languages spoken by the patients who required an interpreter included: Mandarin, Karen, Arabic, Italian, and Hindi.

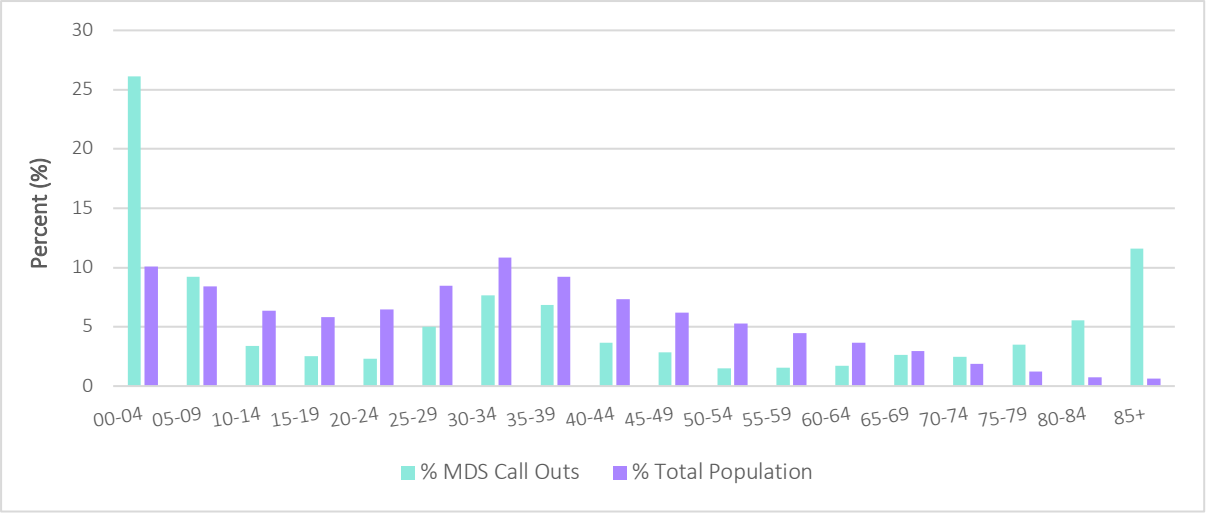
Medical deputising service use

MDS USE		
	Value	LGA Rank
Total call outs	17,330	2
Rate of calls per 1,000 population	76.0	9
AVERAGE LGA RANKING		5.5

In 2017-18, Wyndham had the second highest absolute number of MDS call outs. However, after adjusting for population size, it is apparent that locum services are less utilised compared to the rest of the region with 76 MDS call outs made for every 1,000 residents – the 9th highest rate in the catchment.

Age distribution of locum service users in Wyndham is similar to other LGAs. Young children aged 0-4 years and older adults aged 70 years and older are disproportionately over-represented compared to the general population (see **Figure 77**). A large proportion of patients serviced are living within aged care facilities. In this regard, the City of Wyndham has the 8th highest rate in the catchment with 3,961 call outs to aged care facilities in 2017-18, accounting for about 23% of all calls.

Figure 77: Wyndham – All MDS call outs by 5 year age group (2017-18)



Ambulance Victoria call outs

AMBULANCE VICTORIA USE		
	Value	LGA Rank
Percent of all ambulance call outs	9.6%	5
Percent of all non-urgent call outs	8.8%	5
Rate of non-urgent call outs per 100 calls	4.6	8
AVERAGE LGA RANKING		6.0

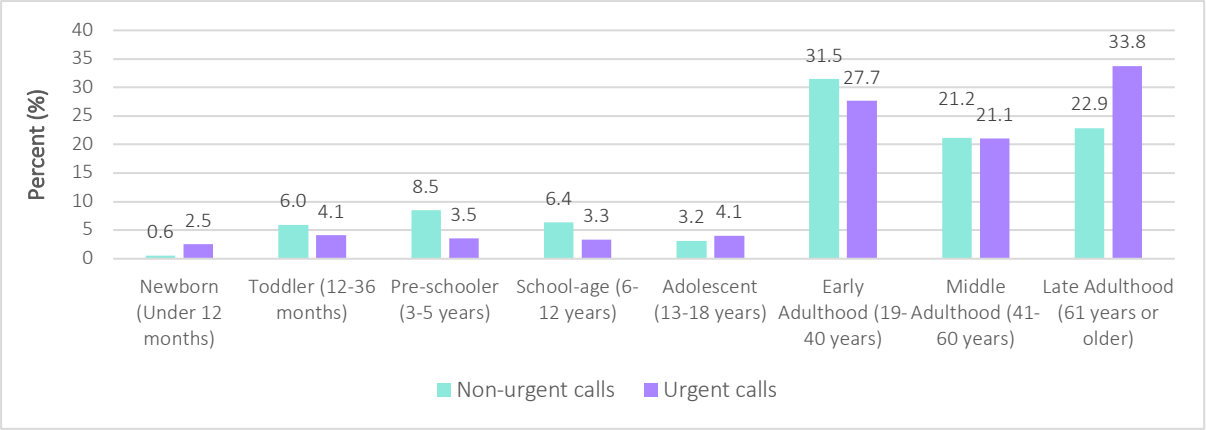
Between 2015 – 2018, Wyndham had a moderate number of ambulance call outs, accounting for 9.6% of all calls. Of these, 4.6% were referred on to alternate service providers indicating that the patient's symptoms did not likely warrant an ambulance call and could have been better treated in the community. Wyndham had the 8th highest rate of such non-urgent ambulance call outs in the catchment indicating that, although general ambulance use is similar to the regional average, inappropriate ambulance use for primary-care type symptoms is less of an issue for this population than the majority of the catchment.

Profile of non—urgent ambulance call outs

The majority of non-urgent call outs were to adult patients aged 19 years and older. The age distribution of non-urgent call outs varies slightly from that of urgent call outs. Pre-school and school-aged children were over-represented in the non-urgent call out population. The proportions of pre-school and school-aged children were 2.4 and 1.9 times greater, respectively, than the proportion of urgent call outs for the same age cohorts. For newborns however, the proportion of non-urgent call out were 4.5 times less than that of urgent call outs. This is highlighted in **Figure 78**.

The leading reason for non-urgent call outs in Wyndham, similar for all LGAs, was for the problem type classification of 'sick person', accounting for 41% of all non-urgent call outs – six times greater than the next most common reason of 'abdominal pain' at 7%. The five most common subdivisions of a 'sick person' classification included: 'vomiting', 'other pain', 'abnormal breathing', 'no priority symptoms', and 'dizziness/vertigo'.

Figure 78: Wyndham - Ambulance call outs by age (2015-18)



AH service availability

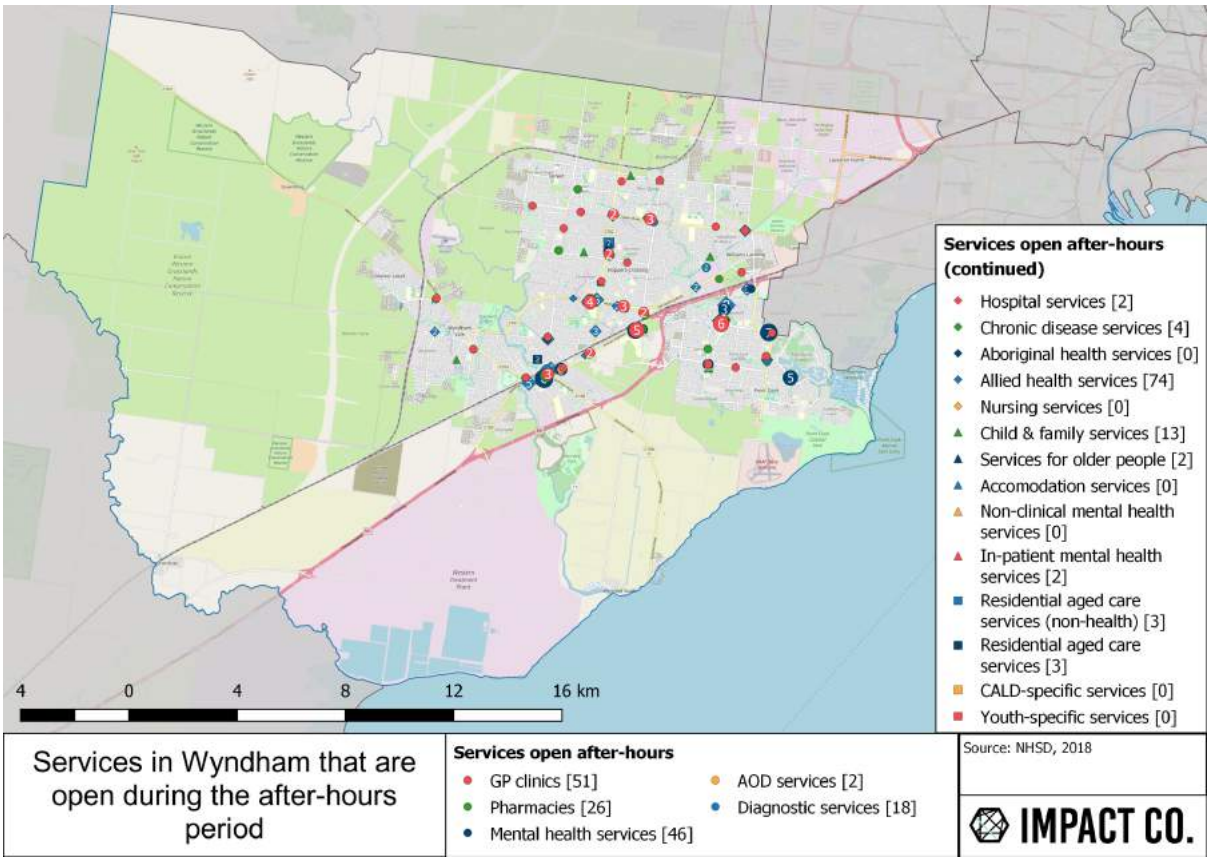
The number of AH services by type, and operating hours during the AH period, in Wyndham relative to the other LGAs in the NWMPHN catchment are detailed in the table below. This spread of AH services by type is also illustrated in **Figure 79**.

Wyndham (C)	After-hours services					After-hours hrs/week		
Service Type	Total	AH No.	Rate per 10,000	Rank		No. Hrs	Rate per 10,000	Rank
All After-hours Services	413	247	10.8	6		5131.8	225.0	7
General Practice	58	51	2.2	6		1332.5	58.4	13
Pharmacy	26	26	1.1	3		734.0	32.2	5
Mental Health - Clinical in Community	81	46	2.0	5		934.0	41.0	6
Mental Health - Clinical In-patient	2	2	0.1	10		149.9	6.6	10
Mental Health - Non-clinical	6	0	0.0	1		0.0	0.0	1
Allied Health	103	74	3.2	4		1175.4	51.5	6
CALD-Specific Health Services[1]	4	0	0.0	1		0.0	0.0	1
Accommodation[2]	3	0	0.0	1		0.0	0.0	1
Aboriginal Health[3]	0	0	0.0	1		0.0	0.0	1
Alcohol & Other Drug Services	9	2	0.1	5		22.0	1.0	4
Aged Care - Residential[4]	19	3	1.8	1		145.9	86.1	1
Aged Care - Non-health[4]	5	3	1.8	10		48.0	28.3	9
Carer Support Services	4	0	0.2	8		0.0	0.0	1
Diagnostic Services	21	18	0.8	12		385.0	16.9	11
Disability Services	14	3	0.1	7		22.0	1.0	6
Children/Family Health Services[5]	49	13	2.3	9		97.0	17.1	8
Women's Health Services[6]	4	2	0.2	12		74.0	6.5	11
Men's Health Services[7]	1	1	0.1	11		27.0	2.3	13
Nursing Care Services	3	0	0.0	1		0.0	0.0	1
Palliative Care Services	1	0	0.0	1		0.0	0.0	1
Sexual Health Services	4	0	0.0	1		0.0	0.0	1
Hospitals	3	2	0.1	8		21.0	0.9	8
Youth Health Services[8]	1	0	0.0	1		0.0	0.0	1
Chronic Disease Services	8	4	0.2	8		99.0	4.3	11
Services for Older Persons[4]	6	2	1.2	11		32.0	18.9	8

DEFINITIONS: Total – total number of service sites listed on the NHSD; AH No. – number of service sites open in the after-hours; Rate per 10,000 (services) – number of service sites open per 10,000 population; 2016 estimated resident population was utilised unless otherwise indicated; Rank – LGA ranking based on rate; all LGAs with a rate of 0 are automatically ranked as 13; No. Hrs – number of service hours per week available in the after-hours; Rate per 10,000 (hrs) – number of weekly service hours available in the after-hours per 10,000 population; 2016 estimated resident population is utilised unless otherwise indicated

[1]Rate calculated using 2016 estimated population born in non-English speaking countries; [2]Rates calculated using 2016 estimated homeless population; [3]Rates calculated using 2016 estimated Aboriginal and Torres Strait Islander population; [4]Rates calculated using 2016 estimated population of persons aged 65+ years; [5]Rates calculated using 2016 estimated population of persons aged 0-14years; [6]Rates calculated using 2016 estimated female population; [7]Rates calculated using 2016 estimated male population; [8]Rates calculated using 2016 estimated population of persons aged 15-24years

Figure 79: Wyndham – location of AH primary care services



Key findings: Applying the AH Commissioning Framework

Wyndham has the sixth highest Composite Index Score of all the LGAs within the NWMPHN catchment. When each sub-index score is ranked and converted into its relevant urgency category, the following results are obtained:

	AH Need		AH Unmet Demand		AH Service Availability	
	Rank	Urgency	Rank	Urgency	Rank	Urgency
Wyndham (C)	3	High	11	Low	5	High

The high urgency classification for the AH Need sub-index in Wyndham is related to having the highest population in the catchment and the highest proportion of the population aged 0-4 years. The area is also expected to have the third highest population growth by 2031. Wyndham has the second highest proportion of the population living with three or more chronic illnesses, the third highest Aboriginal and Torres Strait Islander population and a high rate of the population reporting high/very high levels of psychological distress. Despite these demographic needs, Wyndham has a high urgency classification for the AH Service Availability sub-index.

Qualitative feedback suggests that the area predominately consists of young families and blue-collar workers who are more likely to access AH services for convenience. The area also has a growing refugee community who prefer to physical present to known services and, due to language barriers, are unlikely to access locum or Nurse on Call services.

When the urgency categories are viewed in combination, the following intervention domains are suggested:

	AH Need	AH Unmet Demand	AH Service Availability	Intervention Domain Required
Wyndham (C)	High	Low	High	System and Service

Despite the high needs of residents, there is a low utilisation of ED and ambulatory services for non-urgent care. This suggests that residents may be presenting to these services when their health condition exacerbates, which is reflected with Wyndham having the second highest rate of PPHs in the catchment or the limited availability of AH primary care services to provide early interventions.

On this basis, if NWMPHN were to consider taking action in Wyndham, the AH Commissioning Framework indicates the PHN could achieve greater impact with its interventions by:

- Focusing on enhancing the effectiveness of the AH system to create better links between providers to support the complex needs of residents; and
- Providing targeted support to primary care services so that they have increased capacity to operate during the AH period.

MOORABOOL

Demographic drivers of need for AH primary care

The Shire of Moorabool has relatively moderate AH primary health needs, based on demographic drivers, compared to the rest of the NWMPHN catchment.

Moorabool is the smallest LGA, by population, with an estimated 2016 resident population of 32,658. Approximately 64% of this population resides within the boundaries of NWMPHN. Moorabool's population experiences moderate socio-economic disadvantage compared to the rest of the catchment. The shire has the 8th highest proportion of people experiencing high psychological distress (13.1%) and self-rating their health as fair to poor (16.6%).

DEMOGRAPHIC DRIVERS OF NEED		
	Value	LGA Rank
Population size	32,658	13
Proportion aged 0-4 years[1]	6.7%	7
Population aged 65+ years[1]	15.1%	3
Homelessness[1]	0.2%	12
Humanitarian settlers[2]	0.0%	11
Indigenous Australian population[1]	1.1%	1
Born in non-English speaking countries[1]	5.5%	12
Poor English proficiency[1]	0.3%	13
Socio-Economic Disadvantage (IRSD)	1010	7
High psychological distress[1]	13.1%	8
Self-rated fair to poor health[1]	16.6%	8
Population growth[3]	2.9%	6
AVERAGE LGA RANKING		8.4

[1]Proportion of LGA ERP2016; [2]Proportion of all humanitarian settlers in the NWMPHN region, 2017; [3]Projected annual percent population growth, 2016-2031

Moorabool has the lowest proportion of residents from a culturally diverse background. Only 19% of residents were born overseas, 5.5% were born in a non-English speaking nation and 0.3% of the population report having poor English proficiency. Moorabool residents' five most common countries of birth, after Australia, include: England, New Zealand, Scotland, India, and Germany.

Relative to other LGAs in the region, Moorabool has an older population with 15.1% of residents aged 65 years and older.

AH emergency department use

INDICATORS OF AH ED USE		
Indicators of after-hours emergency department attendance	Value	LGA Rank
Proportion of all Cat4/5 AH ED attendances in NWMPHN	1.0	12
Cat4/5 AH ED attendance rate per 1,000 population	28.5	12
Proportion of Cat4/5 AH ED attendances requiring an interpreter	0.1	13
AVERAGE LGA RANKING		12.3

In the two-year period between July 2014 and June 2016, 1.0% of all AH semi-urgent and non-urgent ED attendances in the catchment, as classified by triage categories 4 and 5 (Cat4/5), were attributed to residents of Moorabool. After adjusting for population size, Moorabool remains the LGA with the second lowest rate of Cat4/5 AH ED attendances in the catchment with an average of 28.48 attendances per year per 1,000 population.

In the same time period, Moorabool residents presented in the AH Period with Cat4/5 symptoms at 37 different hospitals (the top 13 hospitals are shown in **Figure 80**). The largest proportion (42.1%) presented to Ballarat Health Services, followed by Sunshine Hospital (24.9%), The Royal Children's Hospital (6.9%), Western Hospital (6.0%), and The Royal Victorian Eye & Ear Hospital (3.9%). The ***time of day*** breakdown of Cat4/5 AH ED attendances is presented in **Figure 81**. The greatest average number of Cat4/5 AH ED attendances per hour occurred on Saturday from 12PM to midnight, followed by Sundays from 12PM-midnight, and weekdays from 6PM to 11PM. The least popular time periods included before 8AM on both weekdays and Saturdays.

Figure 80: Top 13 hospitals where Moorabool residents presented at during the AH period

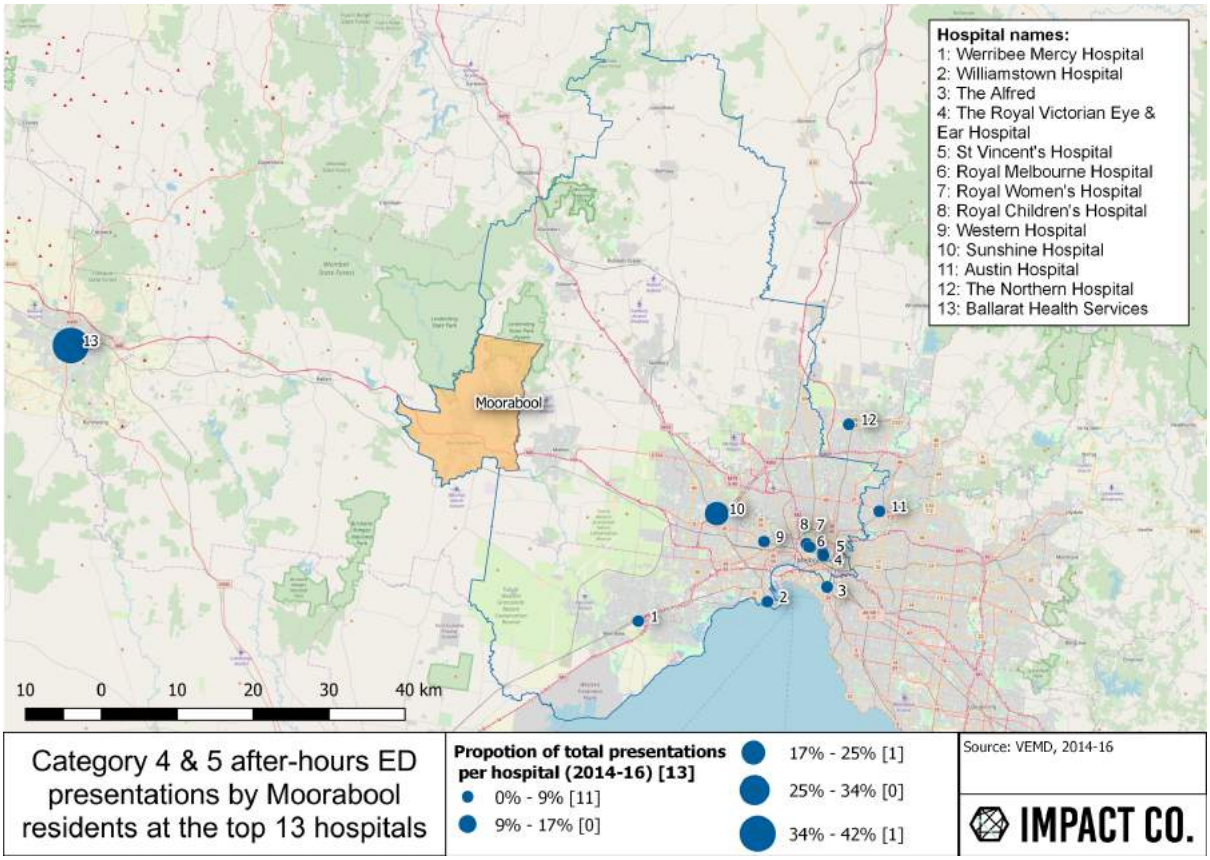
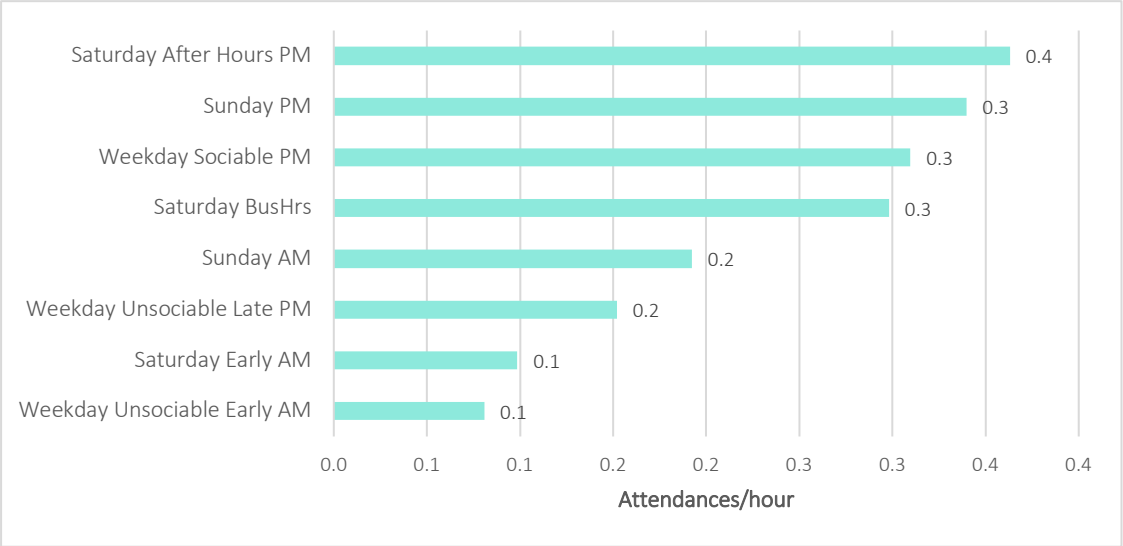


Figure 81: Moorabool – Rate of Cat 4/5 AH ED attendances by time of day

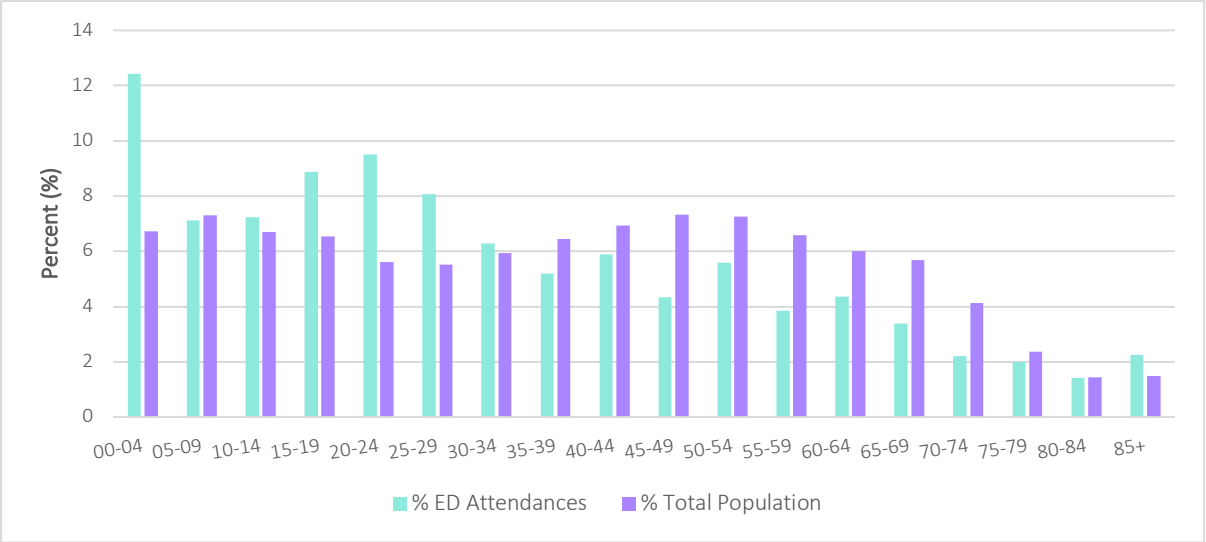


Profile

Profile of AH ED patients

Age distribution of Cat4/5 patients attending the ED in the AH period is younger than that of most LGAs in the catchment. Similar to the rest of the region, there is a large spike in attendances for children aged 0-4 years however, cohorts aged 15-29 are also over-represented compared to the general population (see **Figure 82**). The usual spike among people aged 70+ years of age is not as prominent in Moorabool as in other LGAs.

Figure 82: Moorabool - Cat4/5 AH ED attendances by patient age (2014-16)



Reflecting the lack of diversity within the region, only 9.9% of Cat4/5 AH ED attendances by residents of Moorabool were for people who were born overseas. The top five non-Australian countries of birth included: England, New Zealand, Malta, 'Not Stated', and Germany. In a two-year period, only two Cat4/5 AH ED attendances required an ***interpreter*** (0.1%).

Medical deputising service use

MDS USE		
	Value	LGA Rank
Total call outs	0	12
Rate of calls per 1,000 population	0	12
AVERAGE LGA RANKING		12.0

The residents of Moorabool have no access to either of the two major MDS reviewed for this report.

Ambulance Victoria call outs

AMBULANCE VICTORIA USE		
	Value	LGA Rank
Percent of all ambulance call outs	1.3%	13
Percent of all non-urgent call outs	0.7%	13
Rate of non-urgent call outs per 100 call outs	2.6	13
AVERAGE LGA RANKING		13.0

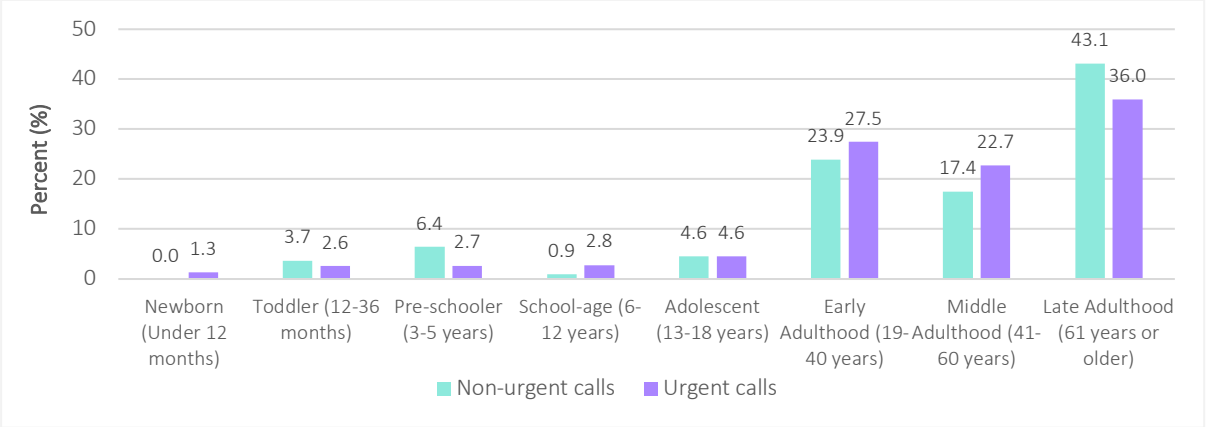
Between 2015-2018, Moorabool had the lowest number of ambulance call outs in the catchment, accounting for 1.3% of all calls. Of these, 2.6% were referred on to alternate service providers, which indicate that the patient's symptoms did not likely warrant an ambulance call and could have been better treated in the community. Moorabool had the lowest rate of such non-urgent ambulance call outs in the catchment.

Profile of non-urgent ambulance call oust

The majority of non-urgent call outs were to adult patients aged 19 years and older (see **Figure 83**). The age distribution of non-urgent call outs closely mirrors that of urgent call outs, with the exception of pre-school aged children. The proportion of non-urgent call outs for pre-school aged children were 2.4 times greater than that of urgent call outs.

The leading reason for non-urgent call outs in Moorabool was for the problem type classification of 'sick person', accounting for 39% of all non-urgent call outs – nearly four times greater than the next most common reason of 'falls' at 10%. The five most common subdivisions of a 'sick person' classification included: 'other pain', 'vomiting', 'dizziness/vertigo', 'abnormal breathing', and 'no priority symptoms'.

Figure 83: Moorabool - Ambulance call outs by age (2015-18)



AH services availability

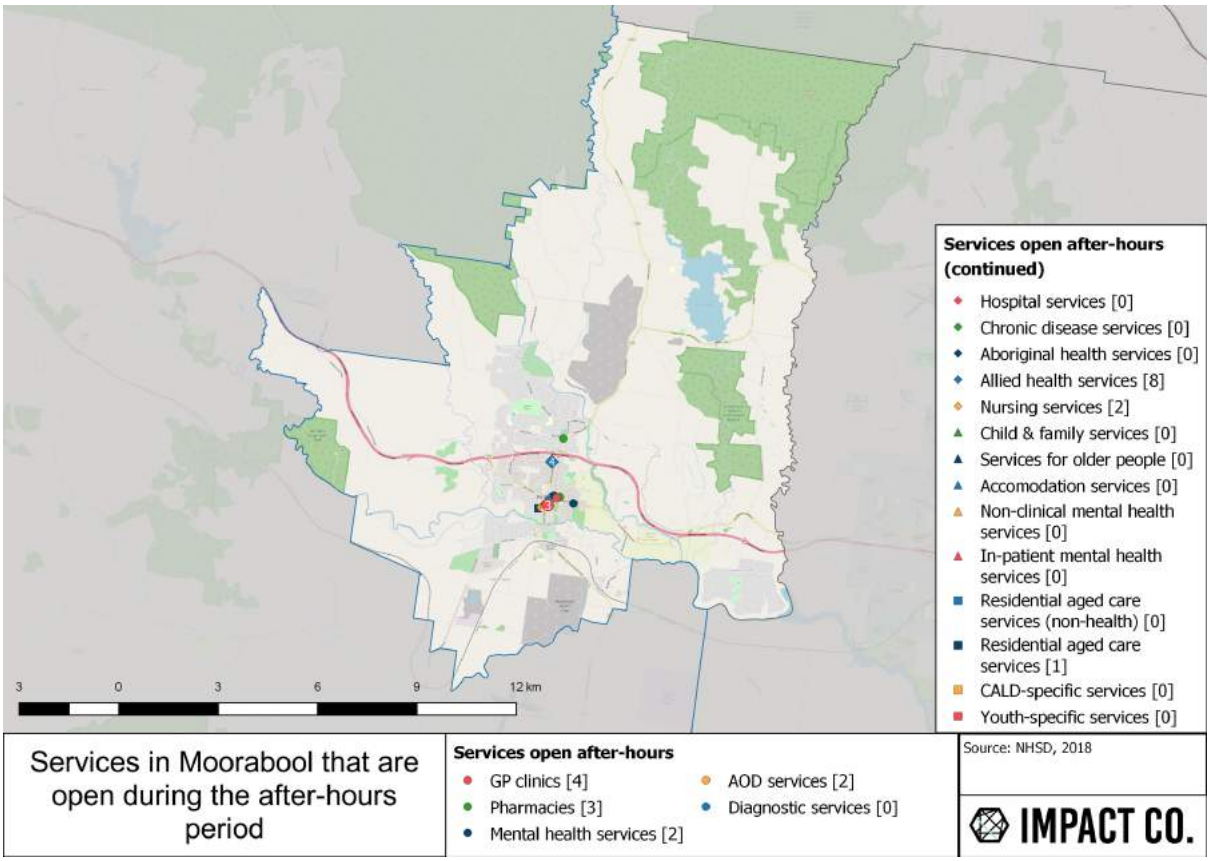
The number of AH services by type, and operating hours during the AH period, in Moorabool relative to the other LGAs in the NWMPHN catchment are detailed in the table below. This spread of AH services by type is also illustrated in **Figure 84**.

Moorabool (S)	After-hours services					After-hours hrs/week		
Service Type	Total	AH No.	Rate per 10,000	Rank		No. Hrs	Rate per 10,000	Rank
All After-hours Services	53	21	6.4	1		627.2	192.0	3
General Practice	6	4	1.2	1		83.5	25.6	5
Pharmacy	3	3	0.9	1		47.0	14.4	1
Mental Health - Clinical in Community	4	2	0.6	1		25.0	7.7	1
Mental Health - Clinical In-patient	0	0	0.0	1		0.0	0.0	1
Mental Health - Non-clinical	0	0	0.0	1		0.0	0.0	1
Allied Health	19	8	2.5	2		101.0	30.9	4
CALD-Specific Health Services[1]	0	0	0.0	1		0.0	0.0	1
Accommodation[2]	3	0	0.0	1		0.0	0.0	1
Aboriginal Health[3]	0	0	0.0	1		0.0	0.0	1
Alcohol & Other Drug Services	3	2	0.6	10		235.8	72.2	12
Aged Care - Residential[4]	6	1	3.2	5		117.9	373.3	7
Aged Care - Non-health[4]	0	0	0.0	1		0.0	0.0	1
Carer Support Services	1	0	0.0	1		0.0	0.0	1
Diagnostic Services	2	0	0.0	1		0.0	0.0	1
Disability Services	2	0	0.0	1		0.0	0.0	1
Children/Family Health Services[5]	3	0	0.0	1		0.0	0.0	1
Women's Health Services[6]	1	0	0.0	1		0.0	0.0	1
Men's Health Services[7]	0	0	0.0	1		0.0	0.0	1
Nursing Care Services	5	2	0.6	13		134.9	41.3	13
Palliative Care Services	0	0	0.0	1		0.0	0.0	1
Sexual Health Services	0	0	0.0	1		0.0	0.0	1
Hospitals	1	0	0.0	1		0.0	0.0	1
Youth Health Services[8]	0	0	0.0	1		0.0	0.0	1
Chronic Disease Services	2	0	0.0	1		0.0	0.0	1
Services for Older Persons[4]	8	0	0.0	1		0.0	0.0	1

DEFINITIONS: Total – total number of service sites listed on the NHSD; AH No. – number of service sites open in the after-hours; Rate per 10,000 (services) – number of service sites open per 10,000 population; 2016 estimated resident population was utilised unless otherwise indicated; Rank – LGA ranking based on rate; all LGAs with a rate of 0 are automatically ranked as 13; No. Hrs – number of service hours per week available in the after-hours; Rate per 10,000 (hrs) – number of weekly service hours available in the after-hours per 10,000 population; 2016 estimated resident population is utilised unless otherwise indicated

[1]Rate calculated using 2016 estimated population born in non-English speaking countries; [2]Rates calculated using 2016 estimated homeless population; [3]Rates calculated using 2016 estimated Aboriginal and Torres Strait Islander population; [4]Rates calculated using 2016 estimated population of persons aged 65+ years; [5]Rates calculated using 2016 estimated population of persons aged 0-14years; [6]Rates calculated using 2016 estimated female population; [7]Rates calculated using 2016 estimated male population; [8]Rates calculated using 2016 estimated population of persons aged 15-24years

Figure 84: Moorabool – location of AH primary care services



Key findings: Applying the AH Commissioning Framework

Moorabool has the seventh highest Composite Index Score of all the LGAs within the NWMPHN catchment. When each sub-index score is ranked and converted into its relevant urgency category, the following results are obtained:

	AH Need		AH Unmet Demand		AH Service Availability	
	Rank	Urgency	Rank	Urgency	Rank	Urgency
Moorabool (S)	9	Low	7	Low	7	Low

Moorabool has a low urgency classification for all three sub-indices of the Composite Index Score. That said, it is worth noting that Moorabool has the highest proportion of the population that identifies as being of Aboriginal and Torres Strait Islander descent. It also has the third highest proportion of the population aged over 65 years, as well as the third highest rate of the population living with three or more chronic illnesses. In regard to AH Unmet Demand, Moorabool had the highest proportion of mental health Cat 4/5 ED attendances of all AH ED presentations.

When the urgency categories are viewed in combination, the following intervention domains are suggested:

	AH Need	AH Unmet Demand	AH Service Availability	Intervention Domain Required
Moorabool (S)	Low	Low	Low	Targeted intervention may be warranted for specific population groups

The AH Commissioning Framework indicates that there is sufficient service capacity in the AH period to support the community. However, support to improve AH access for specific population groups may be warranted. As such, if NWMPHN is to commission interventions in this area, potential providers will need to articulate the rationale for support and validate the 'need' before any action is taken.

DAREBIN

Demographic drivers of need for AH primary care

Darebin has moderate AH primary health needs, based on demographic drivers, relative to other LGAs within the catchment.

As of 2016, Darebin had an estimated population of 155,022, making it the 5th largest LGA, by population, in the region. The population has an average level of socio-economic disadvantage and had the 5th highest proportion of people experiencing high psychological distress (13.4%). Nearly 20% of Darebin residents rate their health as fair to poor, the 2nd highest proportion in the catchment.

Darebin has a relatively average proportion of residents from culturally diverse backgrounds compared to the rest of the region. Approximately 40% of residents were born overseas, 26.8% were born in a non-English speaking nation and 5.7% report having poor English proficiency. Darebin residents' five most common countries of birth, after Australia, include: Italy, China, India, Greece, and England.

DEMOGRAPHIC DRIVERS OF NEED		
	Value	LGA Rank
Population size	155,022	5
Proportion aged 0-4 years[1]	6.2%	10
Population aged 65+ years[1]	13.9%	5
Homelessness[1]	0.6%	5
Humanitarian settlers[2]	4.0%	5
Indigenous Australian population[1]	0.8%	4
Born in non-English speaking countries[1]	26.8%	7
Poor English proficiency[1]	5.7%	4
Socio-Economic Disadvantage (IRSD)	1004	5
High psychological distress[1]	13.4%	5
Self-rated fair to poor health[1]	19.3%	2
Population growth[3]	1.7%	9
AVERAGE LGA RANKING		5.5

[1]Proportion of LGA ERP2016; [2]Proportion of all humanitarian settlers in the NWMPHN region; [3]Projected annual percent population growth

Relative to other LGAs in the region, Darebin has a smaller proportion of persons aged 0-4 years (6.2%) and an average-sized proportion of people aged 65+ years (13.9%).

AH emergency department use

INDICATORS OF AH ED USE		
Indicators of after-hours emergency department attendance	Value	LGA Rank
Proportion of all Cat4/5 AH ED attendances in NWMPHN	8.1%	6
Cat4/5 AH ED attendance rate per 1,000 population	60.8	8
Proportion of Cat4/5 AH ED attendances requiring an interpreter	5.4%	5
AVERAGE LGA RANKING		6.3

Between July 2014 and June 2016, 8.1% of all AH semi-urgent and non-urgent ED attendances in the catchment, as classified by triage categories 4 and 5 (Cat4/5), are attributed to residents of Darebin. After adjusting for population size, the Darebin has the 8th highest rate of Cat4/5 AH ED attendances in the catchment, with 60.8 attendances per 1,000 population.

In the same time period, Darebin residents presented in the AH period with Cat4/5 symptoms at 38 different hospitals (the top 13 hospitals are shown in **Figure 85**). The majority (37.6%) presented to Austin Hospital, followed by St Vincent's Hospital (12.5%), The Royal Children's Hospital (11.3%), The Northern Hospital (9.8%), and Mercy Public Hospitals Inc (9.5%). The ***time of day*** breakdown of Cat4/5 AH ED attendances is presented in **Figure 86**. The greatest number of Cat4/5 AH ED attendances per hour occurred on Saturdays from 8AM-12PM followed closely by weekends from 12PM-midnight and weekdays from 6PM-11PM. The least popular time periods include before 8AM on both weekdays and Saturdays.

Figure 85: The top 13 hospitals where Darebin residents presented at during the AH period

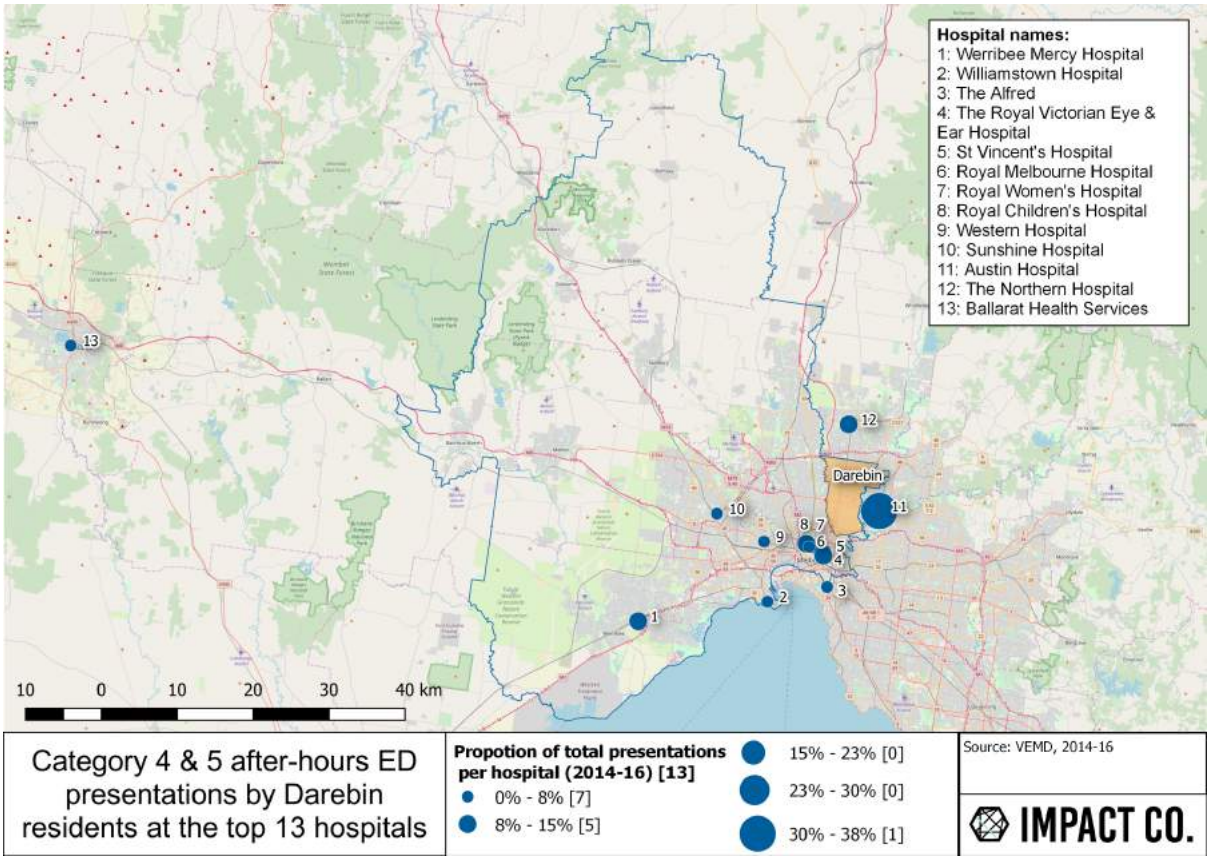
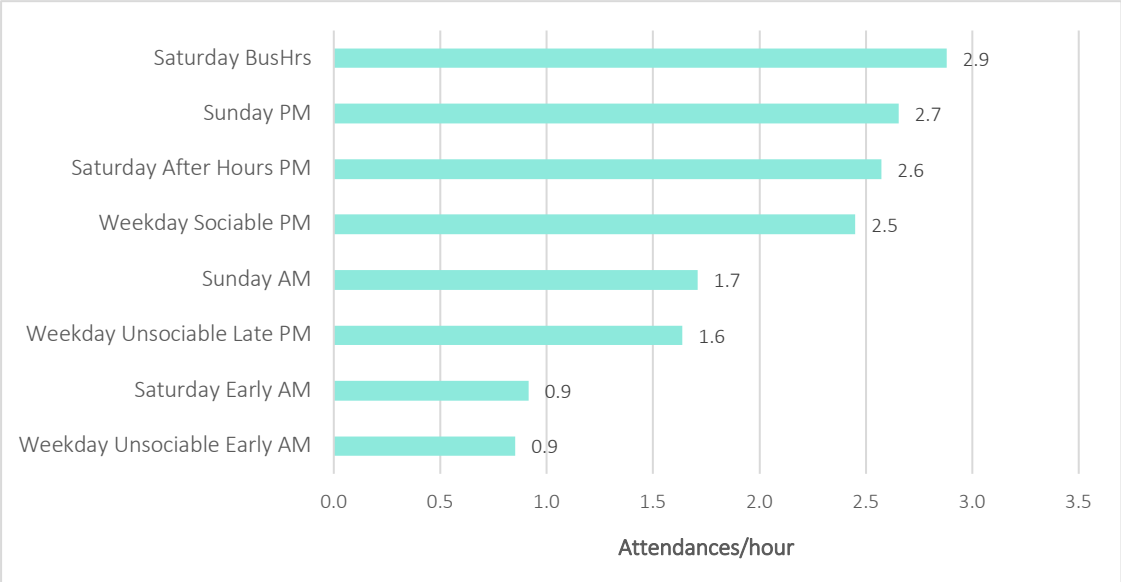


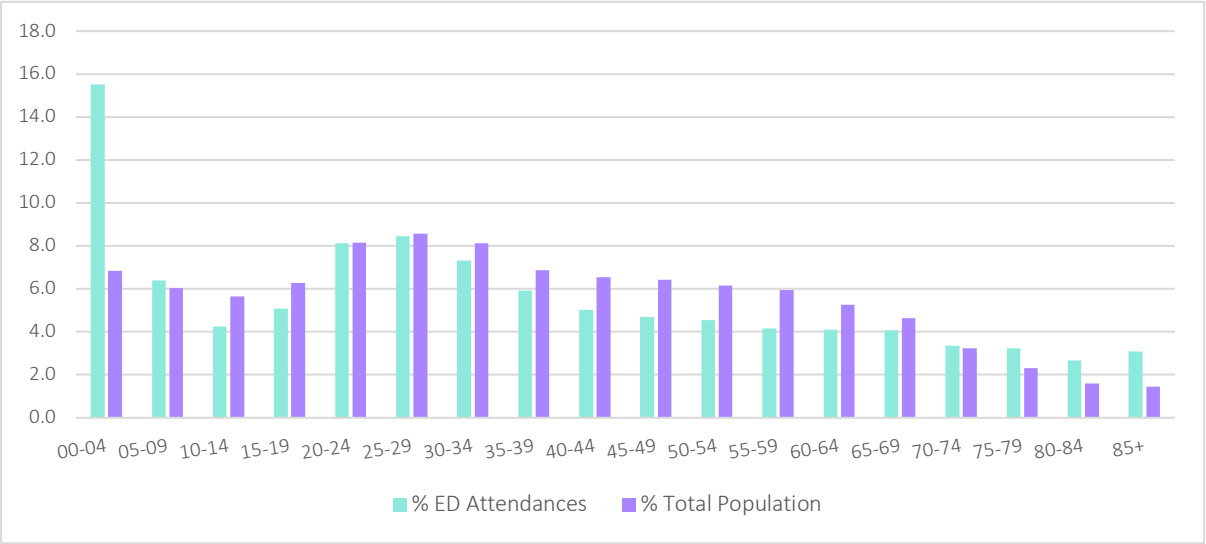
Figure 86: Darebin – Rate of Cat 4/5 AH ED attendances by time of day



Profile of AH ED patients

Age distribution of Cat4/5 patients attending the ED in the AH period is similar to that of most LGAs in the catchment, with spikes in attendances for children aged 0-4 years and older adults aged 70+ years (see **Figure 87**).

Figure 87: Darebin - Cat4/5 AH ED attendances by patient age (2014-16)



Approximately 32% of Cat4/5 AH ED attendances by Darebin residents were for people born overseas from 143 different countries. The top five non-Australian countries of birth included: Italy, Greece, India, China, and England. Darebin has the 5th highest proportion of Cat4/5 AH ED attendances requiring an ***interpreter*** (5.4%). The top five languages spoken by patients who required an interpreter included: Greek, Italian, Arabic, Mandarin, and Vietnamese.

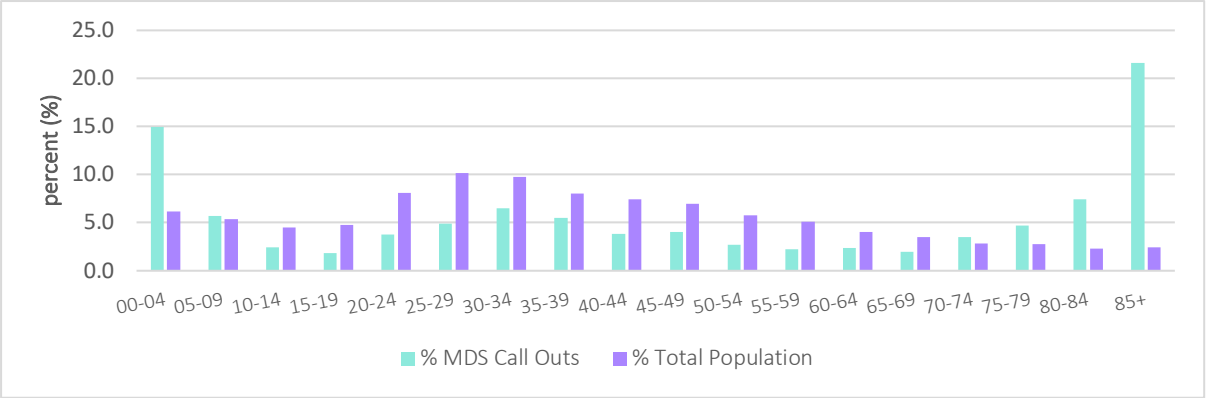
Medical deputising service use

MDS USE		
	Value	LGA Rank
Total call outs	16,003	3
Rate of calls per 1,000 population	103.2	3
AVERAGE LGA RANKING		3

MDS use is relatively high in Darebin compared to other LGAs in the catchment. Darebin ranks 3rd in terms of total call outs, accounting for about 11% of all call outs in the 2017-18. Adjusting for population size also indicates that locum services are relatively well utilised with 103 calls made for every 1,000 residents, resulting in the third highest rate in the catchment.

Age distribution of locum service users in Darebin is similar to other LGAs. Young children aged 0-4 years and older adults aged 70+ years are disproportionally over-represented compared to the general population. (see **Figure 88**). A large proportion of patients serviced are living within aged care facilities. In this regard, the Darebin ranks 4th in the catchment with 5,203 call outs to aged care facilities in 2017-18, accounting for about 32% of all calls.

Figure 88: Darebin – All MDS call outs by 5 year age group (2017-18)



Ambulance Victoria call outs

AMBULANCE VICTORIA USE		
	Value	LGA Rank
Percent of all ambulance call outs	9.2%	6
Percent of all non-urgent call outs	15.1%	1
Rate of non-urgent call outs per 100 calls	8.2	1
AVERAGE LGA RANKING		2.7

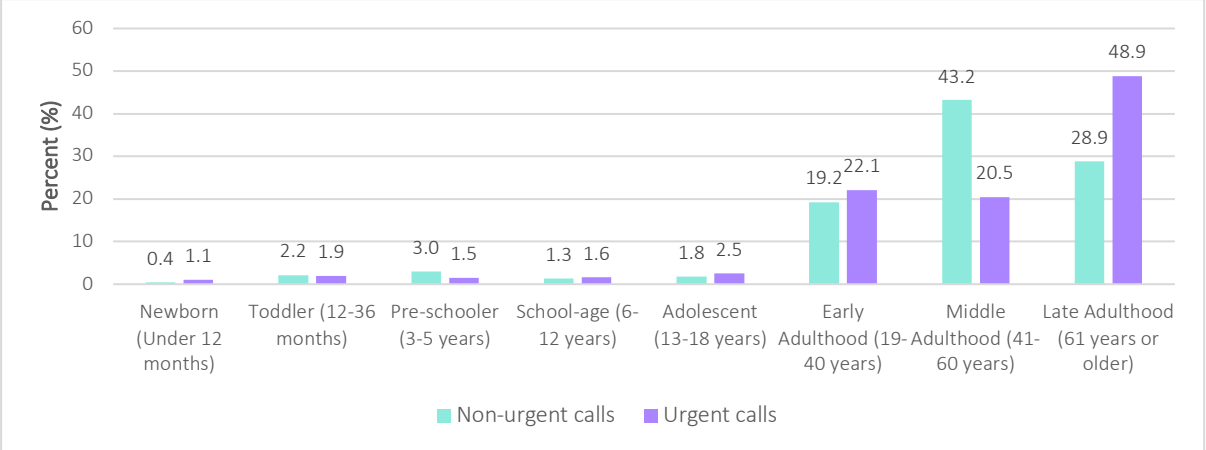
Between 2015-2018, Darebin had a moderate number of ambulance call outs, accounting for approximately 9% of all calls made in the catchment. Of these, 8.2% were referred on to alternate service providers, which indicates that the patient's symptoms did not likely warrant an ambulance call and could have been better treated in the community. Darebin had the highest rate (8.2 per 100 calls) and proportion (15.1%) of non-urgent ambulance call outs in the catchment.

Profile of non-urgent ambulance call outs

The majority of non-urgent call outs were to adult patients aged 19+ years. Notably, the age distribution of non-urgent call outs only varies from urgent call outs for two age groups: pre-schoolers and middle-aged adults. The proportion of non-urgent call outs for both pre-schoolers (3-5 years) and middle-aged adults (41-60 years) are twice as high as urgent ambulance call outs, accounting for 3.0% and 43.2% of non-urgent call outs compared to 1.5% and 20.5% of urgent call outs, respectively. This is highlighted in **Figure 89.**

The leading reason for non-urgent call outs in Darebin was for the problem type classification of 'sick person', accounting for 37.3% of all non-urgent call outs – 2.6 times greater than the next most common reason of 'abdominal pain' at 14.1%. The five most common subdivisions of a 'sick person' classification included: 'other pain', 'abnormal breathing', 'no priority symptoms', 'vomiting', and 'dizziness/vertigo'.

Figure 89: Darebin - Ambulance call outs by age (2015-18)



AH service availability

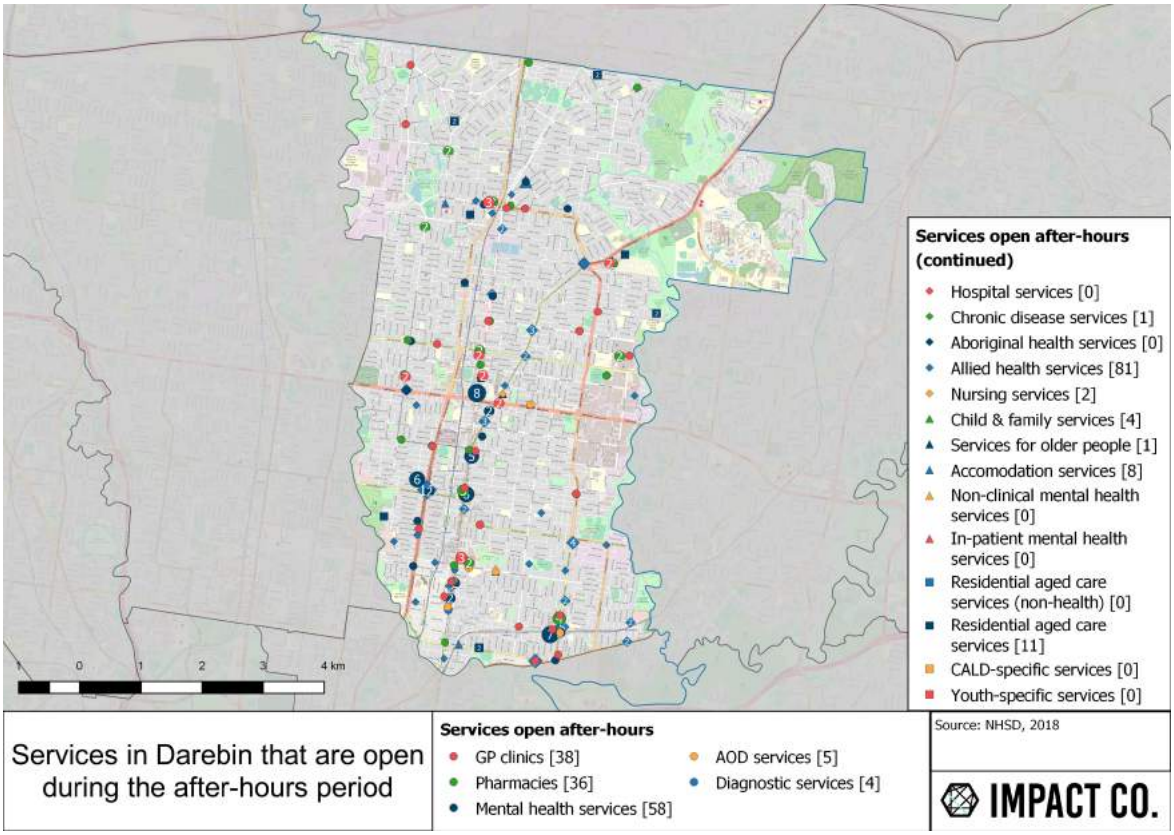
The number of AH services by type, and operating hours during the AH period, in Darebin relative to the other LGAs in the NWMPHN catchment are detailed in the table below. This spread of AH services by type is illustrated in **Figure 90**.

Darebin (C)	After-hours services					After-hours hrs/week		
Service Type	Total	AH No.	Rate per 10,000	Rank		No. Hrs	Rate per 10,000	Rank
All After-hours Services	578	248	16.0	8		4837.3	312.0	9
General Practice	51	38	2.5	8		474.4	30.6	9
Pharmacy	38	36	2.3	10		738.4	47.6	8
Mental Health - Clinical in Community	151	58	3.7	8		796.7	51.4	9
Mental Health - Clinical In-patient	4	0	0.0	1		0.0	0.0	1
Mental Health - Non-clinical	12	0	0.0	1		0.0	0.0	1
Allied Health	132	81	5.2	8		884.0	57.0	9
CALD-Specific Health Services[1]	3	0	0.0	1		0.0	0.0	1
Accommodation[2]	24	8	8.2	12		858.2	882.9	13
Aboriginal Health[3]	2	0	0.0	1		0.0	0.0	1
Alcohol & Other Drug Services	15	5	0.3	8		259.8	16.8	9
Aged Care - Residential[4]	39	11	5.1	7		1045.0	485.5	9
Aged Care - Non-health[4]	13	0	0.0	1		0.0	0.0	1
Carer Support Services	36	6	0.4	10		566.5	36.5	10
Diagnostic Services	12	4	0.3	3		74.0	4.8	6
Disability Services	31	3	0.2	8		79.4	5.1	8
Children/Family Health Services[5]	28	4	1.6	7		38.0	15.3	7
Women's Health Services[6]	1	0	0.0	1		0.0	0.0	1
Men's Health Services[7]	1	0	0.0	1		0.0	0.0	1
Nursing Care Services	9	2	0.1	7		24.0	1.5	6
Palliative Care Services	1	1	0.1	11		19.0	1.2	11
Sexual Health Services	1	0	0.0	1		0.0	0.0	1
Hospitals	0	0	0.0	1		0.0	0.0	1
Youth Health Services8	0	0	0.0	1		0.0	0.0	1
Chronic Disease Services	4	1	0.1	4		6.0	0.4	4
Services for Older Persons[4]	9	1	0.5	5		19.0	8.8	7

DEFINITIONS: Total – total number of service sites listed on the NHSD; AH No. – number of service sites open in the after-hours; Rate per 10,000 (services) – number of service sites open per 10,000 population; 2016 estimated resident population was utilised unless otherwise indicated; Rank – LGA ranking based on rate; all LGAs with a rate of 0 are automatically ranked as 13; No. Hrs – number of service hours per week available in the after-hours; Rate per 10,000 (hrs) – number of weekly service hours available in the after-hours per 10,000 population; 2016 estimated resident population is utilised unless otherwise indicated

[1]Rate calculated using 2016 estimated population born in non-English speaking countries; [2]Rates calculated using 2016 estimated homeless population; [3]Rates calculated using 2016 estimated Aboriginal and Torres Strait Islander population; [4]Rates calculated using 2016 estimated population of persons aged 65+ years; [5]Rates calculated using 2016 estimated population of persons aged 0-14years; [6]Rates calculated using 2016 estimated female population; [7]Rates calculated using 2016 estimated male population; [8]Rates calculated using 2016 estimated population of persons aged 15-24years

Figure 90: Darebin – location of AH primary care services



Key findings: Applying the AH Commissioning Framework

Darebin has the sixth lowest Composite Index Score of all the LGAs within the NWMPHN catchment. When each sub-index score is ranked and converted into its relevant urgency category, the following results are obtained:

	AH Need		AH Unmet Demand		AH Service Availability	
	Rank	Urgency	Rank	Urgency	Rank	Urgency
Darebin (C)	6	High	3	High	8	Low

The high urgency in the AH Need sub-index is due to its high proportion of the population aged 65 years and over, homeless or sleeping rough and identifying as being of Aboriginal and Torres Strait Islander descent. Darebin also has the second highest rate of the population self-rating their health as fair or poor in the catchment. The highest rate of non-urgent ambulance call outs was made by Darebin residents, which has attributed to the high urgency for the AH Unmet Demand sub-index.

When the urgency categories are viewed in combination, the following intervention domains are suggested:

	AH Need	AH Unmet Demand	AH Service Availability	Intervention Domain Required
Darebin (C)	High	High	Low	System and Community

The AH Commissioning Framework suggests that there is sufficient primary care service capacity in the AH period, yet residents with high AH needs are more likely to utilise emergency or ambulatory services. As such, if NWMPHN is to commission services in this area, it will have a greater impact supporting interventions that:

- Focus on enhancing the effectiveness of the AH system, particularly models of care that streamline the consumer journey from tertiary to primary care; and
- Support the community to make better decisions about where to access care in the AH period.

MOONEE VALLEY

Demographic drivers of need for AH primary care

Moonee Valley has low AH primary health needs, based on demographic drivers, relative to the rest of the region.

Moonee Valley is the 8th largest LGA, by population, with an estimated 2016 resident population of 122,968. Moonee Valley is one of the most affluent LGAs in the region with low levels of psychological distress and self-rated fair to poor health.

Moonee Valley is generally less culturally diverse than the rest of the catchment. Approximately 34% of residents were born overseas and 22.0% were born in non-English speaking nations. A relatively low proportion (3.61%) of the population report having poor English proficiency. Moonee Valley residents' five most common countries of birth, after Australia, include: Italy, India, Vietnam, England, and China.

DEMOGRAPHIC DRIVERS OF NEED		
	Value	LGA Rank
Population size	122,968	8
Proportion aged 0-4 years[1]	5.9%	11
Population aged 65+ years[1]	15.6%	2
Homelessness[1]	0.3%	9
Humanitarian settlers[2]	2.0%	9
Indigenous Australian population[1]	0.4%	12
Born in non-English speaking countries[1]	22.0%	9
Poor English proficiency[1]	3.6%	8
Socio-Economic Disadvantage (IRSD)	1035	11
High psychological distress[1]	11.7%	10
Self-rated fair to poor health[1]	14.7%	11
Population growth[3]	1.4%	11
AVERAGE LGA RANKING		9.3

[1]Proportion of LGA ERP2016; [2]Proportion of all humanitarian settlers in the NWMPHN region; [3]Projected annual percent population growth, 2016-2031

The age distribution of Moonee Valley residents is older than that of the catchment. Moonee Valley has the second highest proportion of persons aged 65 years and older (15.6%) and the third lowest proportion of persons aged 0-4 years (5.9%).

AH emergency department use

INDICATORS OF AH ED USE		
	Value	LGA Rank
Proportion of all Cat4/5 AH ED attendances in NWMPHN	6.9%	9
Cat4/5 AH ED attendance rate per 1,000 population	77.8	5
Proportion of Cat4/5 AH ED attendances requiring an interpreter	5.2%	6
AVERAGE LGA RANKING		6.7

Residents of Moonee Valley have fewer AH semi-urgent and non-urgent, as classified by triage categories 4 and 5 (Cat4/5) ED attendances, on average, than the rest of the catchment. Between July 2014 and June 2016, 6.94% of all Cat4/5 AH ED attendances in the catchment were attributed to residents of Moonee Valley. Adjusting for population size, Moonee Valley had the fifth highest rate of Cat4/5 AH ED attendances, with an average of 77.8 attendances per year per 1,000 population.

In the same time period, Moonee Valley residents presented in the AH period with Cat4/5 symptoms at 38 different hospitals (the top 13 hospitals are shown in **Figure 91**). The largest proportion (28.2%) presented to The Royal Melbourne Hospital, followed by The Royal Children's Hospital (25.7%), Western Hospital (10.9%), The Royal Women's Hospital (10.0%), and Sunshine Hospital (8.7%). The ***time of day*** breakdown of Cat4/5 AH ED attendances is presented in **Figure 92**. The greatest average number of Cat4/5 AH ED attendances per hour occurred on Sundays from 12PM-midnight followed by Saturday business hours from 8AM to 12PM and weekdays from 6PM to 11PM. The least popular time periods included before 8AM on both weekdays and Saturdays.

Figure 91: The top 13 hospitals where Moonee Valley residents presnted at during the AH period

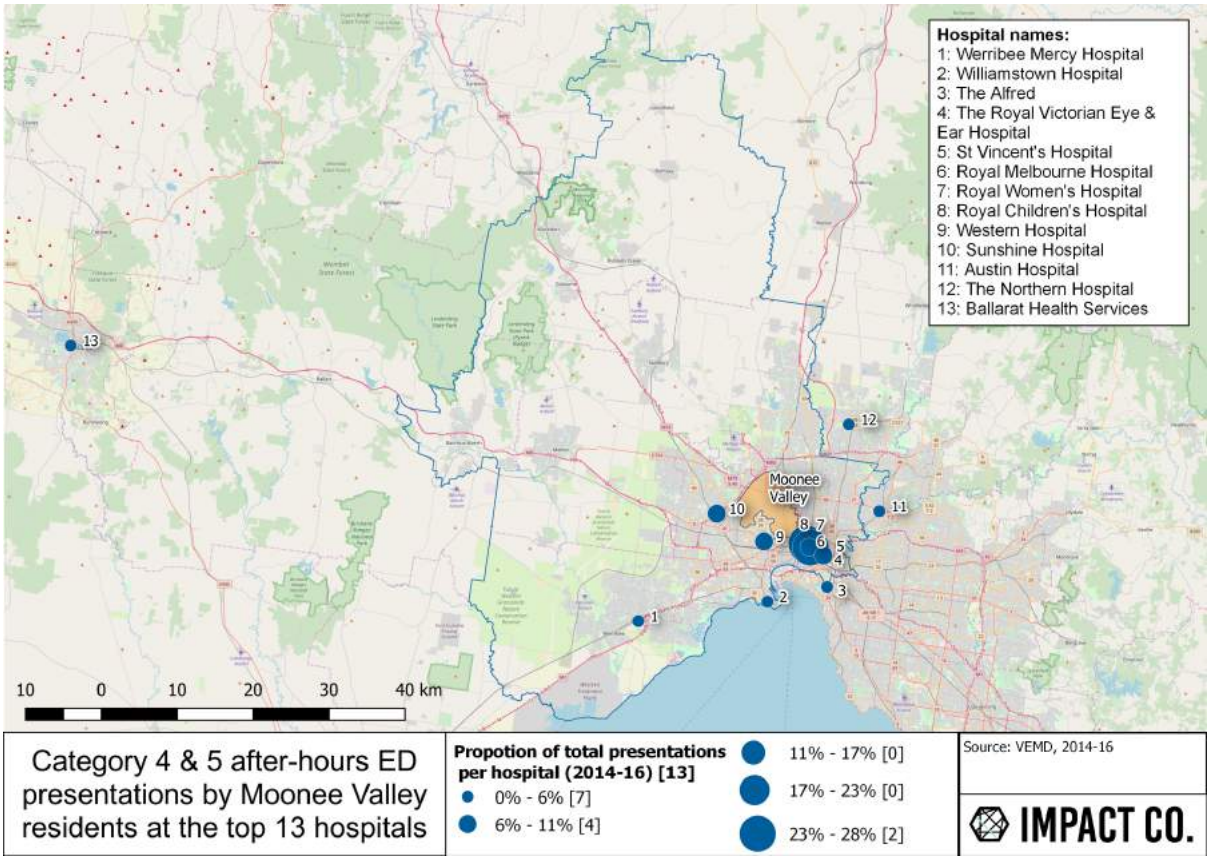
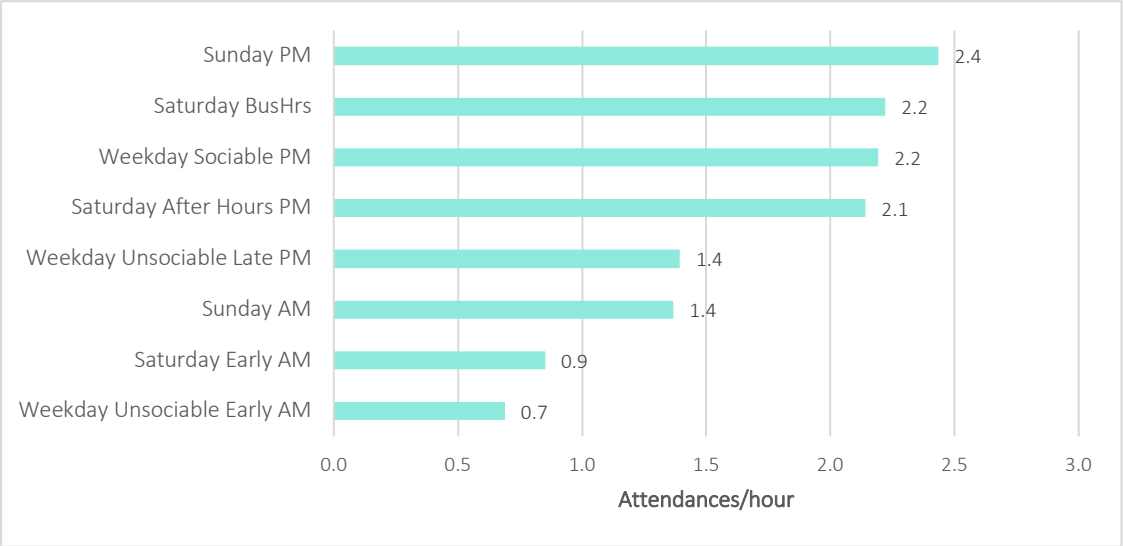


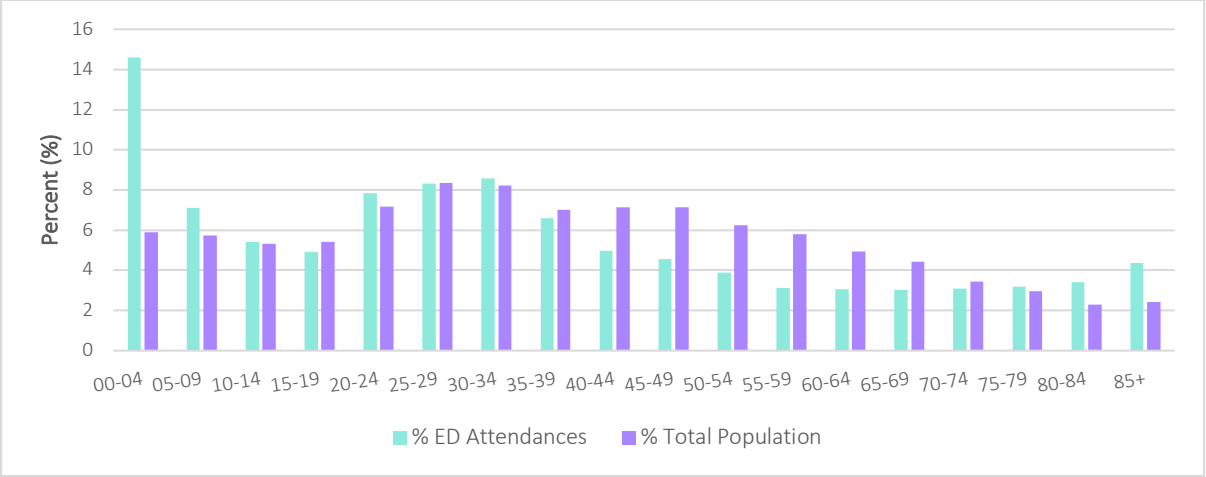
Figure 92: Moonee Valley – Rate of Cat 4/5 AH ED attendances by time of day



Profile of AH ED patients

Age distribution of Cat4/5 patients in Moonee Valley attending the ED in the AH period is similar to most LGAs in the catchment, with a large spike in attendances for children aged 0-4 years and slight over-representation of older adults aged 75 years and older, compared to the general population (see **Figure 93**).

Figure 93: Moonee Valley - Cat4/5 AH ED attendances by patient age (2014-16)



Approximately 30% of Cat4/5 AH ED attendances by Moonee Valley residents were for people born overseas from 149 different countries. The top five non-Australian countries of birth included: Italy, India, Greece, Vietnam, and Somalia. Moonee Valley has the 6th highest proportion of Cat4/5 AH ED attendances requiring an ***interpreter*** (5.2%). The top five preferred languages spoken by patients who required an interpreter included: Italian, Greek, Vietnamese, Cantonese, and Arabic.

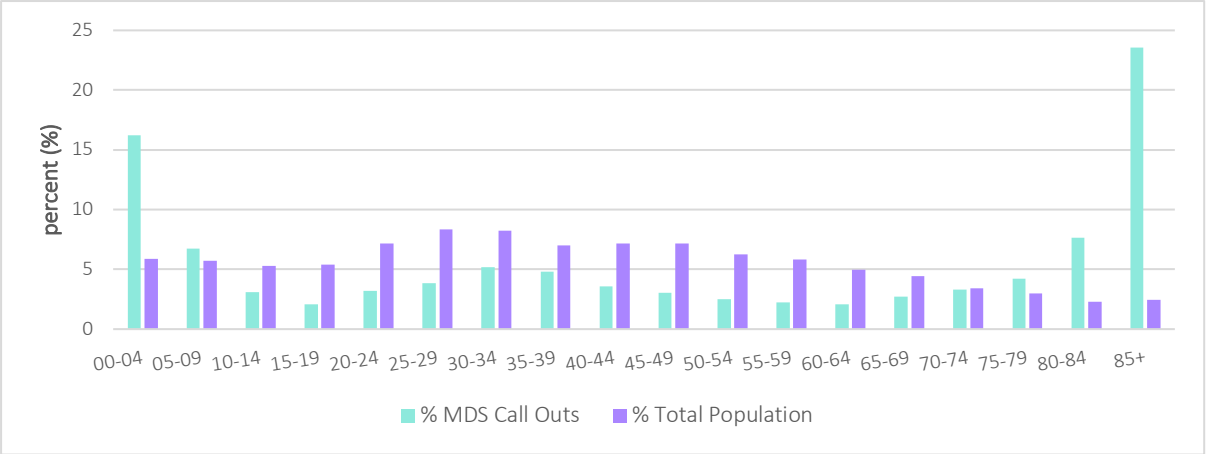
Medical deputising service use

MDS USE		
	Value	**LGA Rank**
Total call outs	13,361	5
Rate of calls per 1,000 population	108.7	2
AVERAGE LGA RANKING		3.5

Moonee Valley has high utilisation of MDSs compared to the rest of the catchment. In 2017-18, approximately 109 locum services call outs were made for every 1,000 residents, resulting in the second highest rate in the catchment.

The age distribution of locum service users in Moonee Valley is similar to other LGAs. Young children aged 0-4 years and older adults aged 75 years and older are disproportionately over-represented compared to the general population (see **Figure 94**). Moonee Valley had the 3rd highest rate of services to aged care facilities, 3,938 call outs to aged care facilities in 2017-18, accounting for about 34% of all calls.

Figure 94: Moonee Valley – All MDS call outs by 5 year age group (2017-18)



Ambulance Victoria use

AMBULANCE VICTORIA USE		
	Value	LGA Rank
Percent of all ambulance call outs	8.1%	7
Percent of all non-urgent call outs	6.6%	8
Rate of non-urgent call outs per 100 calls	4.1	9
AVERAGE LGA RANKING		8.0

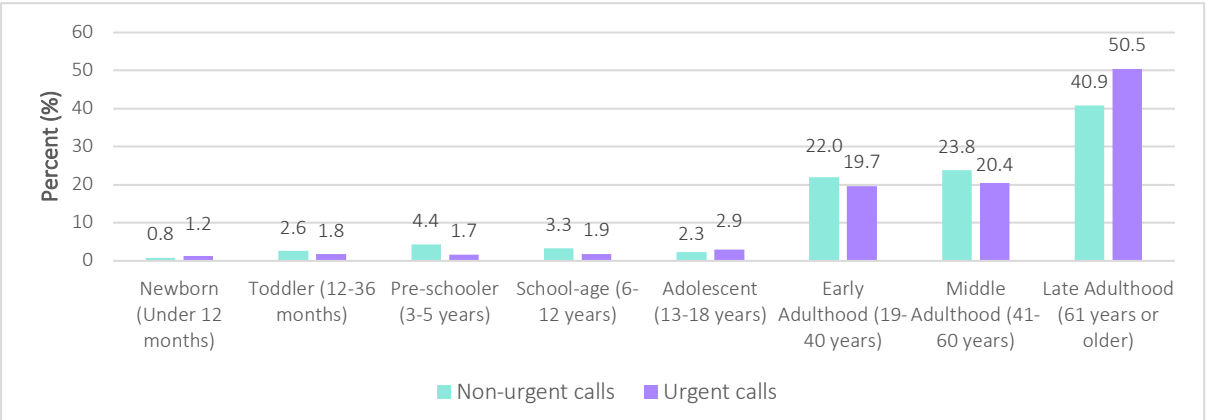
Between 2015-2018, Moonee Valley accounted for 8.1% of all ambulance call outs in the region. Of these, 4.1% were referred on to alternate service providers indicating that the patient's symptoms did not likely warrant an ambulance call and could have been better treated in the community. Moonee Valley had the 9th highest rate of such non-urgent ambulance call outs in the catchment indicating that, while general ambulance use is moderate, inappropriate ambulance use for primary-care type symptoms is less of an issue for this population than in most other LGAs.

Profile of non-urgent ambulance call outs

The majority of non-urgent call outs were to adult patients aged 19 years and older. The age distribution of non-urgent call outs closely mirrors than that of urgent call outs. Only pre-school aged children were substantially over-represented in the non-urgent call out population, with non-urgent calls occurring 2.5 times greater than that of urgent call outs. This is illustrated in **Figure 95**.

The leading reason for non-urgent call outs in Moonee Valley was for the problem type classification of 'sick person', accounting for 43% of all non-urgent call outs – more than five times greater than the next most common reason of 'falls' at 8.3%. The five most common subdivisions of a 'sick person' classification included: 'no priority symptoms', 'other pain', 'vomiting', 'abnormal breathing', and 'dizziness/vertigo'.

Figure 95: Moonee Valley - ambulance call outs by age (2015-18)



AH service availability

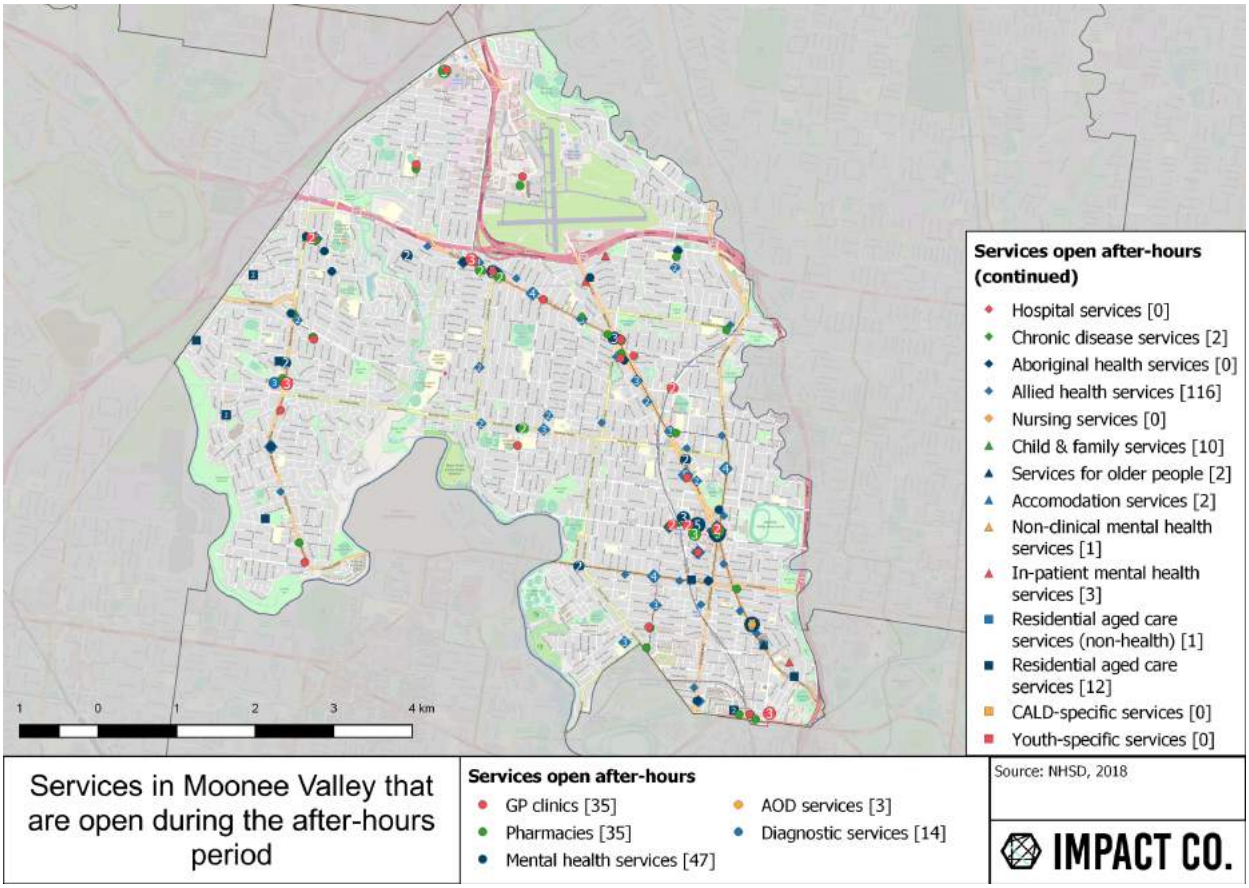
The number of AH services by type, and operating hours during the AH period, in Moonee Valley relative to the other LGAs in the NWMPHN catchment are detailed in the table below. This spread of AH services by type is illustrated in **Figure 96**.

Moonee Valley (C)	After-hours services					After-hours hrs/week		
Service Type	Total	AH No.	Rate per 10,000	Rank		No. Hrs	Rate per 10,000	Rank
All After-hours Services	526	283	23.0	11		4699.8	382.2	10
General Practice	50	35	2.9	10		348.3	28.3	6
Pharmacy	36	35	2.9	11		738.6	60.1	13
Mental Health - Clinical in Community	96	47	3.8	9		884.3	71.9	10
Mental Health - Clinical In-patient	5	3	0.2	12		207.8	16.9	13
Mental Health - Non-clinical	6	1	0.1	8		1.0	0.1	7
Allied Health	181	116	9.4	12		1314.9	106.9	12
CALD-Specific Health Services[1]	0	0	0.0	1		0.0	0.0	1
Accommodation[2]	7	2	5.0	10		5.0	12.4	8
Aboriginal Health[3]	0	0	0.0	1		0.0	0.0	1
Alcohol & Other Drug Services	7	3	0.2	7		30.0	2.4	5
Aged Care - Residential[4]	33	12	6.3	11		1310.7	685.3	12
Aged Care - Non-health[4]	14	1	0.5	6		2.5	1.3	6
Carer Support Services	17	5	0.4	11		589.4	47.9	12
Diagnostic Services	25	14	1.1	13		170.0	13.8	10
Disability Services	18	3	0.2	10		125.9	10.2	10
Children/Family Health Services[5]	34	10	4.8	11		75.3	36.1	10
Women's Health Services[6]	2	1	0.2	11		8.0	1.3	10
Men's Health Services[7]	1	1	0.2	13		8.0	1.3	12
Nursing Care Services	9	0	0.0	1		0.0	0.0	1
Palliative Care Services	2	1	0.1	13		117.9	9.6	13
Sexual Health Services	1	1	0.1	12		3.0	0.2	10
Hospitals	2	0	0.0	1		0.0	0.0	1
Youth Health Services[8]	0	0	0.0	1		0.0	0.0	1
Chronic Disease Services	4	2	0.2	6		58.5	4.8	12
Services for Older Persons[4]	11	2	1.1	10		11.5	6.0	6

DEFINITIONS: Total – total number of service sites listed on the NHSD; AH No. – number of service sites open in the after-hours; Rate per 10,000 (services) – number of service sites open per 10,000 population; 2016 estimated resident population was utilised unless otherwise indicated; Rank – LGA ranking based on rate; all LGAs with a rate of 0 are automatically ranked as 13; No. Hrs – number of service hours per week available in the after-hours; Rate per 10,000 (hrs) – number of weekly service hours available in the after-hours per 10,000 population; 2016 estimated resident population is utilised unless otherwise indicated

[1]Rate calculated using 2016 estimated population born in non-English speaking countries; [2]Rates calculated using 2016 estimated homeless population; [3]Rates calculated using 2016 estimated Aboriginal and Torres Strait Islander population; [4]Rates calculated using 2016 estimated population of persons aged 65+ years; [5]Rates calculated using 2016 estimated population of persons aged 0-14years; [6]Rates calculated using 2016 estimated female population; [7]Rates calculated using 2016 estimated male population; [8]Rates calculated using 2016 estimated population of persons aged 15-24years

Figure 96: Moonee Valley – location of AH primary health services



Key findings: Applying the AH Commissioning Framework

Moonee Valley has the fifth lowest Composite Index Score of all the LGAs within the NWMPHN catchment. When each sub-index score is ranked and converted into its relevant urgency category, the following results are obtained:

	AH Need		AH Unmet Demand		AH Service Availability	
	Rank	Urgency	Rank	Urgency	Rank	Urgency
Moonee Valley (C)	11	Low	9	Low	9	Low

Moonee Valley has a low urgency classification for all three sub-indices of the Composite Index Score. That said, it is worth noting that Moonee Valley has the second highest proportion aged 65 years and over and the fifth highest rate of Cat 4/5 presentations to EDs during the AH period.

When the urgency categories are viewed in combination, the following intervention domains are suggested:

	AH Need	AH Unmet Demand	AH Service Availability	Intervention Domain Required
Moonee Valley (C)	Low	Low	Low	Targeted intervention may be warranted for specific population groups

The AH Commissioning Framework indicates that there is sufficient service capacity in the AH period to support the community. However, support to improve AH access for specific population groups may be warranted. As such, if NWMPHN is to commission interventions in this area, potential providers will need to articulate the rationale for support and validate the 'need' before any action is taken.

MARIBYRNONG

Demographic drivers of need for AH primary care

Maribyrnong has moderate AH primary health needs, based on demographic drivers.

Maribyrnong is the third smallest LGA, by population, with an estimated 2016 resident population of 87,355. Maribyrnong is the fourth most economically disadvantaged LGA in the region, has a moderate proportion of people experiencing high psychological distress (13.2%) and has the fourth highest proportion of people who rate their health as fair to poor (18.9%). Maribyrnong also has the third highest proportion of people experiencing homelessness (0.8%).

DEMOGRAPHIC DRIVERS OF NEED		
	Value	LGA Rank
Population size	87,355	11
Proportion aged 0-4 years[1]	7.0%	5
Population aged 65+ years[1]	9.6%	10
Homelessness[1]	0.8%	3
Humanitarian settlers[2]	3.6%	6
Indigenous Australian population[1]	0.5%	8
Born in non-English speaking countries[1]	32.5%	3
Poor English proficiency[1]	7.2%	2
Socio-Economic Disadvantage (IRSD)	995	4
High psychological distress[1]	13.2%	7
Self-rated fair to poor health[1]	18.9%	4
Population growth[3]	3.5%	4
AVERAGE LGA RANKING		5.6

[1]Proportion of LGA ERP2016; [2]Proportion of all humanitarian settlers in the NWMPHN region; [3]Projected annual percent population growth, 2016-2031

Maribyrnong has a higher proportion of residents from a culturally diverse background compared to the rest of the region. Approximately 48% of residents were born overseas, 32.5% were born in a non-English speaking nation and 7.2% of the population report having poor English proficiency. Maribyrnong residents' five most common countries of birth, after Australia, include: Vietnam, India, China, England, and New Zealand.

Relative to other LGAs in the region, Maribyrnong has a moderate proportion of persons aged 0-4 years (7.0%) and a lower proportion of people aged 65 years and older (9.6%)

AH emergency department use

INDICATORS OF AH ED USE		
	Value	LGA Rank
Proportion of all Cat4/5 AH ED attendances in NWMPHN	6.7%	10
Cat4/5 AH ED attendance rate per 1,000 population	100.4	2
Proportion of Cat4/5 AH ED attendances requiring an interpreter	7.3%	2
AVERAGE LGA RANKING		4.7

Between July 2014 and June 2016, 6.7% of all AH semi-urgent and non-urgent ED attendances in the catchment, as classified by triage categories 4 and 5 (Cat4/5), were attributed to residents of Maribyrnong. After adjusting for population size, the Maribyrnong becomes the LGA with the second highest rate of Cat4/5 AH ED attendances in the catchment, with an average of 100 attendances per year per 1,000 population.

In the same time period, Maribyrnong residents presented in the AH period with Cat4/5 symptoms at 38 different hospitals (the top 13 hospitals are shown in **Figure 97**). The largest proportion (43.9%) presented to Western Hospital, followed by The Royal Children's Hospital (13.4%), Sunshine Hospital (10.8%), Williamstown Hospital (8.8%), and The Royal Women's Hospital (7.3%). The ***time of day*** breakdown of Cat4/5 AH ED attendances is presented in **Figure 98**. The greatest average number of Cat4/5 AH ED attendances per hour occurred during Saturday business hours 8AM-12PM followed closely by Sundays from 12PM-midnight, Saturdays from 12PM-midnight and Weekdays from 6PM to 11PM. The least popular time periods included before 8AM on both weekdays and Saturdays.

Figure 97: Top 13 hospitals where Maribyrnong residents presented at during the AH period

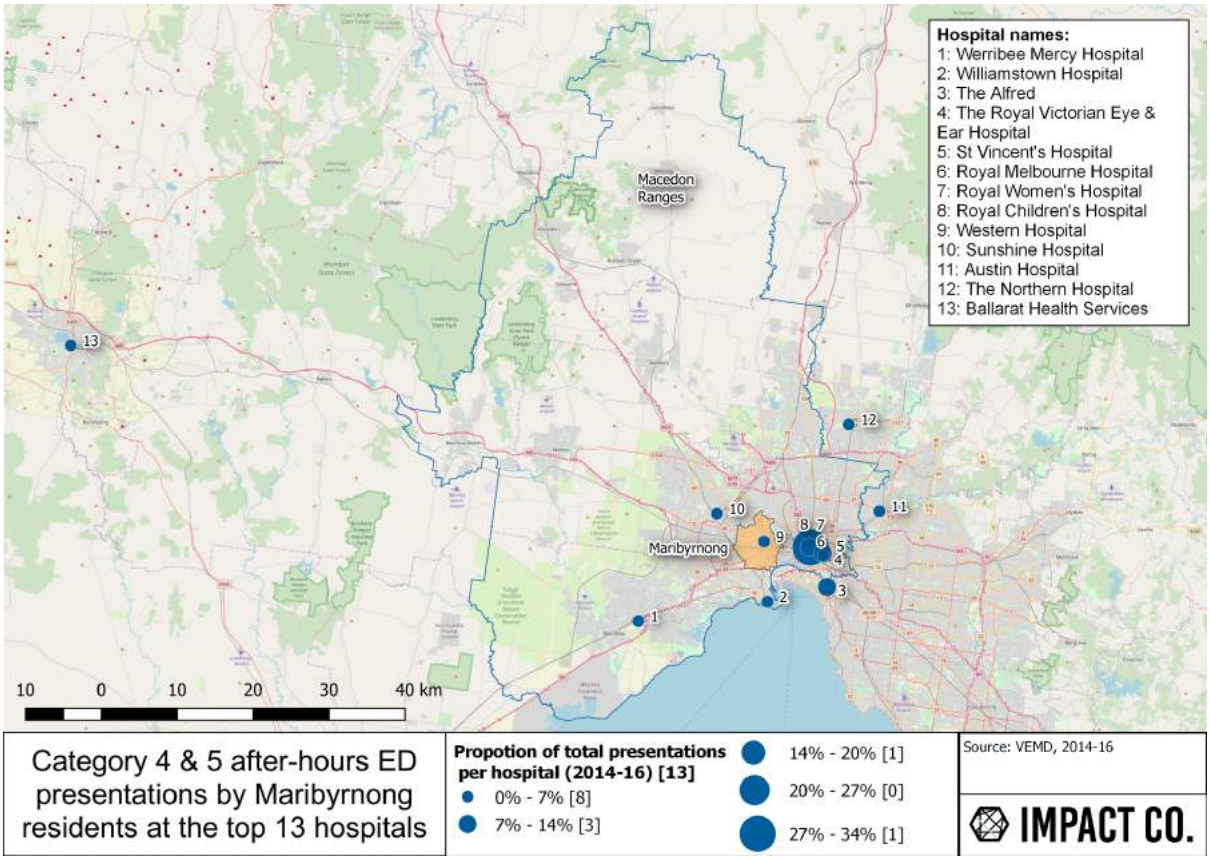
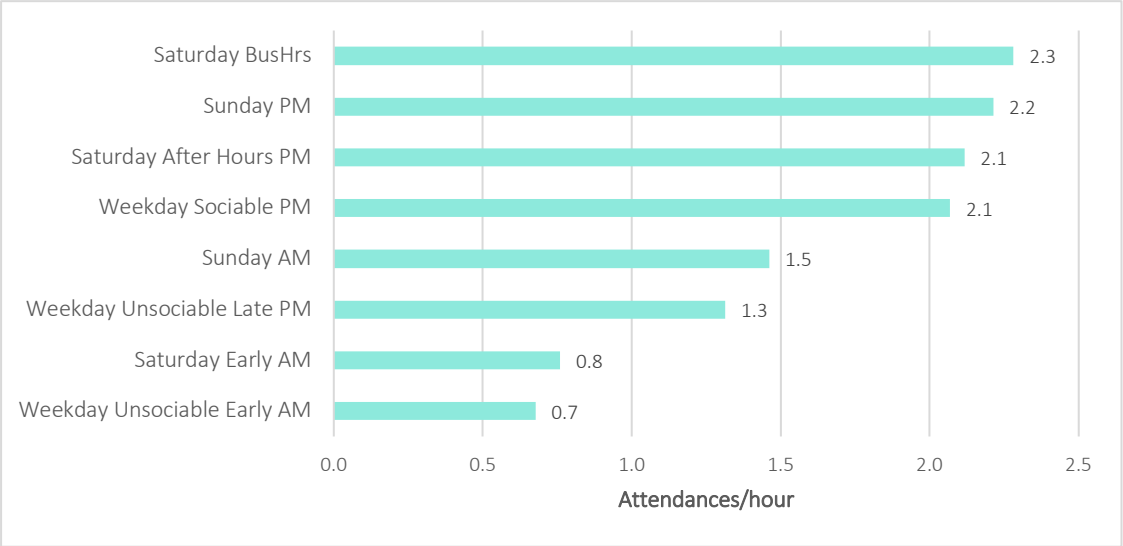


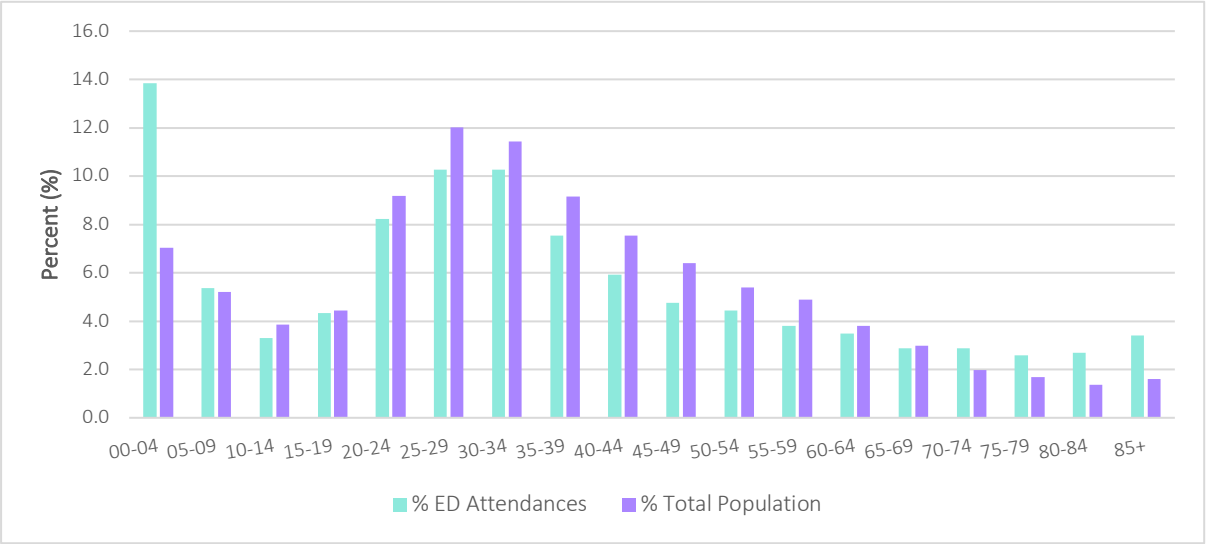
Figure 98: Maribyrnong – Rate of Cat 4/5 AH ED attendances by time of day



Profile of AH ED patients

Age distribution of Cat4/5 patients attending the ED from Maribyrnong in the AH period is similar to that of most LGAs in the catchment, with a large spike in attendances for children aged 0-4 years and slight over-representation of older adults aged 70+ years compared to the general population (see **Figure 99**).

Figure 99: Maribyrnong - Cat4/5 AH ED attendances by patient age (2014-16)



Approximately 36% of Cat4/5 AH ED attendances by Maribyrnong residents were for people born overseas from 157 different countries. The top five non-Australian countries of birth included: Vietnam, India, Greece, New Zealand, and Italy. Maribyrnong has the second highest proportion of Cat4/5 AH ED attendances requiring an ***interpreter*** (7.3%). The top five preferred languages spoken by patients who required an interpreter included: Vietnamese, Greek, Italian, Cantonese, and Macedonian.

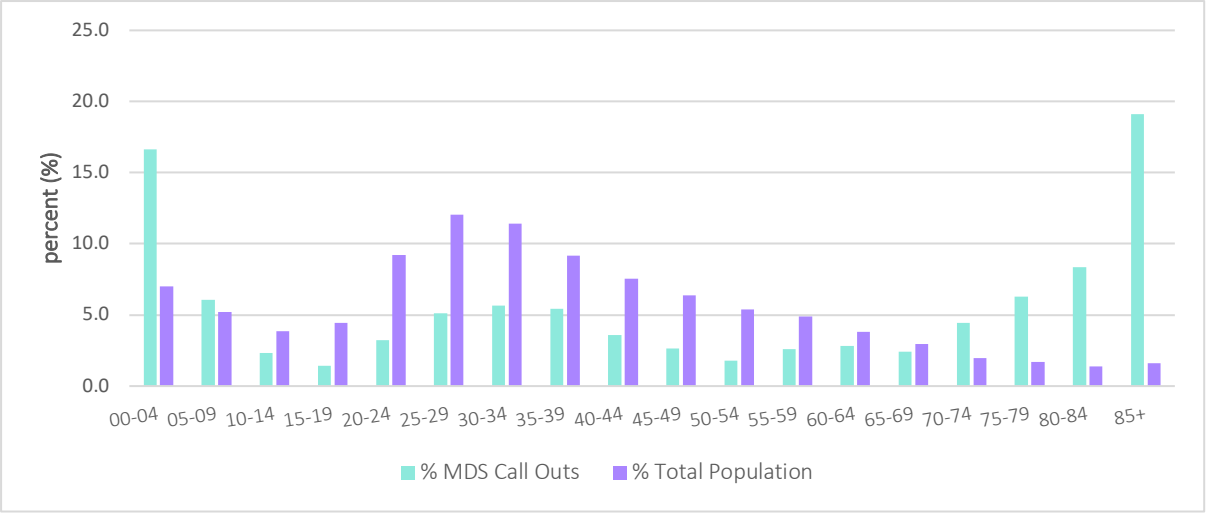
Medical deputising service use

MDS USE		
	Value	**LGA Rank**
Total call outs	8,652	9
Rate of calls per 1,000 population	99.0	4
AVERAGE LGA RANKING		6.5

Although total MDS call outs in Maribyrnong is relatively low, adjusting for its relatively small population size indicates that locum services are, in fact, relatively well utilised. in 2017-18, 99 call outs were made for every 1,000 residents, resulting in the fourth highest rate in the catchment.

Age distribution of locum service users in Maribyrnong is similar to other LGAs. Young children aged 0-4 years and older adults aged 70 years and older are disproportionately over-represented compared to the general population (see **Figure 100**). Maribyrnong also has an exceptionally large proportion of call outs to patients aged 85 years and older compared to other LGAs. In 2017-18, Maribyrnong had the highest rate of MDS call outs to aged care facilities with 3,296 call outs, which accounted for about 39% of all calls.

Figure 100: Maribyrnong – All MDS call outs by 5 year age group (2017-18)



Ambulance Victoria use

AMBULANCE VICTORIA USE		
	Value	LGA Rank
Percent of all ambulance call outs	5.0%	11
Percent of all non-urgent call outs	5.1%	10
Rate of non-urgent call outs per 100 call outs	5.1	6
AVERAGE LGA RANKING		9.0

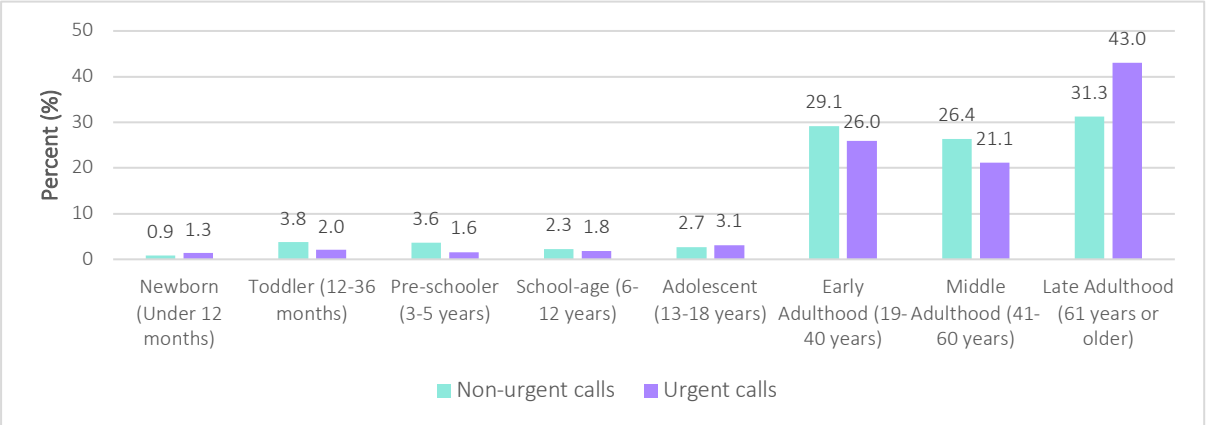
Between 2015-2018, Maribyrnong had the third lowest number of ambulance call outs in the catchment, accounting for 5.0% of all calls. Of these, 5.1% were referred on to alternate service providers, indicating that the patient's symptoms did not likely warrant an ambulance call and could have been better treated in the community. Maribyrnong had the 6th highest rate of such non-urgent ambulance call outs in the catchment.

Profile of non-urgent ambulance call outs

The majority of non-urgent call outs were to adult patients aged 19+ years. The age distribution of non-urgent call outs closely mirrors that of urgent call outs, with the exception of pre-school aged children who had 2.3 times the number of non-urgent call outs compared to urgent call outs. This is demonstrated in **Figure 101**.

The leading reason for non-urgent call outs in Maribyrnong was for the problem type classification of 'sick person', accounting for 43% of all non-urgent call outs – nearly five times greater than the next most common reason of 'psych' at 8.8%. The five most common subdivisions of a 'sick person' classification included: 'other pain', 'abnormal breathing', 'no priority symptoms', 'vomiting', and 'dizziness/vertigo'.

Figure 101: Maribyrnong - ambulance call outs by age (2015-18)



AH service availability

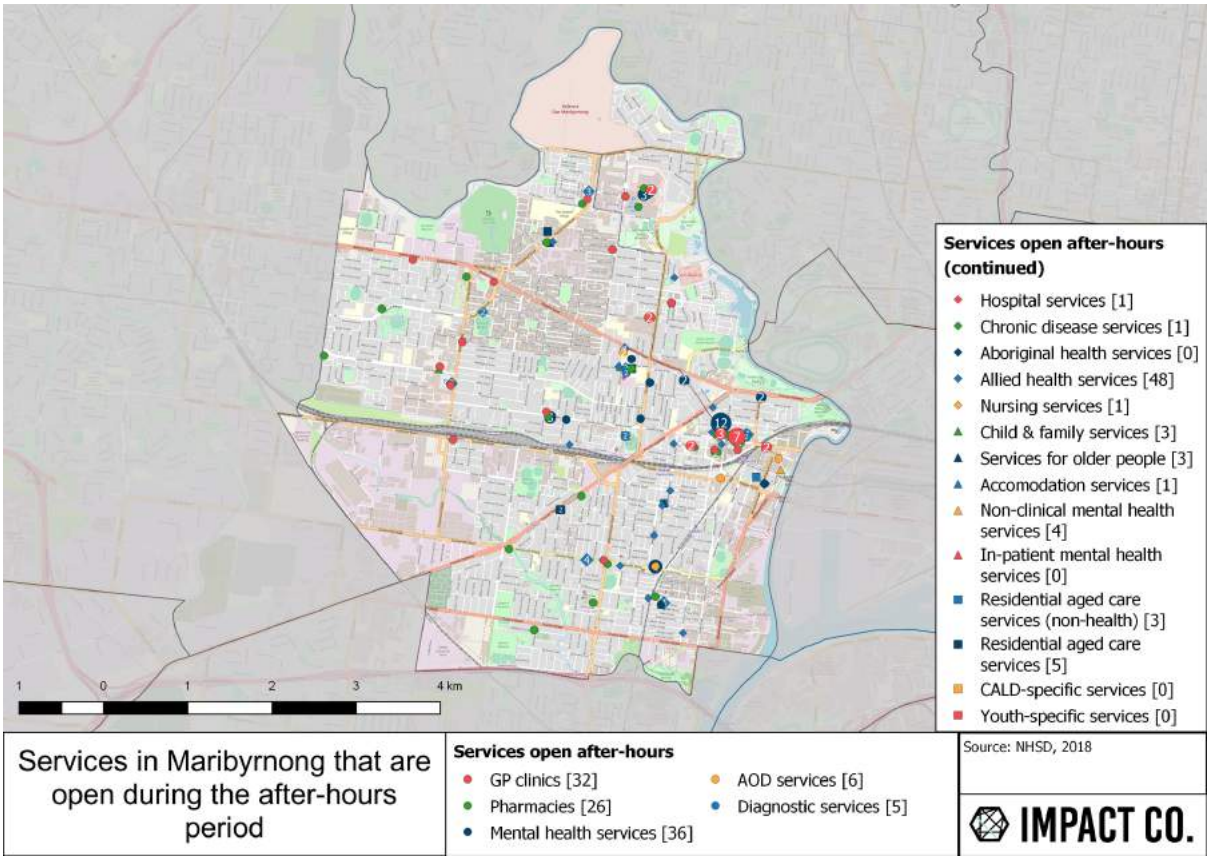
The number of AH services by type, and operating hours during the AH period, in Maribyrnong relative to the other LGAs in the NWMPHN catchment are detailed in the table below. This spread of AH services by type is illustrated in **Figure 102**.

Maribyrnong (C)	After-hours services					After-hours hrs/week		
Service Type	Total	AH No.	Rate per 10,000	Rank		No. Hrs	Rate per 10,000	Rank
All After-hours Services	456	177	20.3	10		4139.8	473.9	11
General Practice	42	32	3.7	3		351.7	40.3	11
Pharmacy	28	26	3.0	5		465.9	53.3	11
Mental Health - Clinical in Community	90	36	4.1	10		1528.1	174.9	12
Mental Health - Clinical In-patient	0	0	0.0	1		0.0	0.0	1
Mental Health - Non-clinical	13	4	0.5	12		254.3	29.1	13
Allied Health	86	49	5.6	9		491.0	56.2	7
CALD-Specific Health Services[1]	5	0	0.0	1		0.0	0.0	1
Accommodation[2]	16	1	1.4	8		20.0	28.1	9
Aboriginal Health[3]	2	0	0.0	1		0.0	0.0	1
Alcohol & Other Drug Services	30	6	0.7	12		155.9	17.8	10
Aged Care - Residential[4]	18	5	5.9	8		283.8	337.3	6
Aged Care - Non-health[4]	13	2	2.4	11		90.5	107.5	11
Carer Support Services	24	3	0.3	9		215.9	24.7	7
Diagnostic Services	14	5	0.6	9		161.9	18.5	12
Disability Services	34	5	0.6	13		122.0	14.0	13
Children/Family Health Services[5]	32	3	2.1	8		29.0	20.6	9
Women's Health Services[6]	2	0	0.0	1		0.0	0.0	1
Men's Health Services[7]	0	0	0.0	1		0.0	0.0	1
Nursing Care Services	9	1	0.1	5		6.0	0.7	4
Palliative Care Services	1	0	0.0	1		0.0	0.0	1
Sexual Health Services	0	0	0.0	1		0.0	0.0	1
Hospitals	3	1	0.1	10		117.9	13.5	12
Youth Health Services[8]	0	0	0.0	1		0.0	0.0	1
Chronic Disease Services	4	1	0.1	5		9.5	1.1	7
Services for Older Persons[4]	11	3	3.6	13		238.3	283.2	13

DEFINITIONS: Total – total number of service sites listed on the NHSD; AH No. – number of service sites open in the after-hours; Rate per 10,000 (services) – number of service sites open per 10,000 population; 2016 estimated resident population was utilised unless otherwise indicated; Rank – LGA ranking based on rate; all LGAs with a rate of 0 are automatically ranked as 13; No. Hrs – number of service hours per week available in the after-hours; Rate per 10,000 (hrs) – number of weekly service hours available in the after-hours per 10,000 population; 2016 estimated resident population is utilised unless otherwise indicated

[1]Rate calculated using 2016 estimated population born in non-English speaking countries; [2]Rates calculated using 2016 estimated homeless population; [3]Rates calculated using 2016 estimated Aboriginal and Torres Strait Islander population; [4]Rates calculated using 2016 estimated population of persons aged 65+ years; [5]Rates calculated using 2016 estimated population of persons aged 0-14years; [6]Rates calculated using 2016 estimated female population; [7]Rates calculated using 2016 estimated male population; [8]Rates calculated using 2016 estimated population of persons aged 15-24years

Figure 102: Maribyrnong – location of AH primary care services



Key findings: Applying the AH Commissioning Framework

Maribyrnong has the fourth lowest Composite Index Score of all the LGAs within the NWMPHN catchment. When each sub-index score is ranked and converted into its relevant urgency category, the following results are obtained:

	AH Need		AH Unmet Demand		AH Service Availability	
	Rank	Urgency	Rank	Urgency	Rank	Urgency
Maribyrnong (C)	5	High	2	High	11	Low

The high urgency in the AH Need sub-index is associated with its high homeless and CALD population, its predicted population growth by 2031 and rates of population who self-rate their health as fair/poor relative to the other LGAs. Maribyrnong also has high rates of Cat 4/5 ED presentations, non-urgent ambulance call-outs and PPHs, which have attributed to a high urgency classification for the AH Unmet Demand sub-index. The literature and qualitative interviews highlight the various barriers faced by the homeless and CALD community in accessing health services, particularly during the AH period. This includes a lack of awareness and integration of existing services, and a reluctance to use alternative AH options.

When the urgency categories are viewed in combination, the following intervention domains are suggested:

	AH Need	AH Unmet Demand	AH Service Availability	Intervention Domain Required
Maribyrnong (C)	High	High	Low	System and Community

System and community-type interventions, as a starting point, could be explored due to the high AH needs and unmet demand in the area. These interventions reflect the fact that Maribyrnong has a high level of AH service availability when compared to other LGAs. However, based on the rankings set out in the Index, residents are not aware of these options (instead relying on ED) or services are not effectively integrated to support their needs.

On this basis, if NWMPHN were to consider taking action in Maribyrnong, the AH Commissioning Framework indicates that the PHN could achieve greater impact with its interventions by:

- Focusing on enhancing the effectiveness of the AH system; and
- Supporting the community to make better decisions about where to access health care in the AH period.

MELBOURNE

Demographic drivers of need for AH primary care

Melbourne has moderate to low AH primary health needs, based on demographic drivers.

Melbourne is the 6th largest LGA, by population, with an estimated 2016 resident population of 148,039. Melbourne has a moderate level of socio-economic disadvantage relative to the rest of the region. It has one of the lowest proportions of people experiencing high psychological distress (10.8%) and people who rate their health as fair to poor (14.7%). Despite its higher than average affluence, Melbourne has the highest proportion of people experiencing homelessness (1.2%) in the catchment.

DEMOGRAPHIC DRIVERS OF NEED		
	Value	LGA Rank
Population size	148,039	6
Proportion aged 0-4 years[1]	3.4%	13
Population aged 65+ years[1]	6.8%	13
Homelessness[1]	1.2%	1
Humanitarian settlers[2]	2.1%	8
Indigenous Australian population[1]	0.3%	13
Born in non-English speaking countries[1]	45.0%	1
Poor English proficiency[1]	5.5%	5
Socio-Economic Disadvantage (IRSD)	1010	7
High psychological distress[1]	10.8%	11
Self-rated fair to poor health[1]	14.7%	12
Population growth[3]	4.6%	2
AVERAGE LGA RANKING		7.7

[1]Proportion of LGA ERP2016; [2]Proportion of all humanitarian settlers in the NWMPHN region, 2017; [3]Projected annual percent population growth, 2016-2031

Melbourne has the highest proportion of residents from a culturally diverse background in the catchment. Approximately 67% of residents were born overseas and 45.0% were born in non-English speaking nations. Overseas-born residents in Melbourne are likely more affluent and/or educated than other overseas-born populations in the catchment as only a moderate proportion (5.5%) of the population report having poor English proficiency. The City of Melbourne residents' five most common countries of birth, after Australia, include: China, Malaysia, India, Indonesia, and England.

Relative to other LGAs in the region, Melbourne has the lowest proportion of high AH primary care using age cohorts with persons aged 0-4 years and over 65 years accounting for only 3.4% and 6.8% of the resident population, respectively.

AH emergency department use

INDICATORS OF AH ED USE		
	Value	LGA Rank
Proportion of all Cat4/5 AH ED attendances in NWMPHN	7.4%	7
Cat4/5 AH ED attendance rate per 1,000 population	65.6	7
Proportion of Cat4/5 AH ED attendances requiring an interpreter	4.8%	7
AVERAGE LGA RANKING		7.0

Between July 2014 and June 2016, 7.4% of all AH semi-urgent and non-urgent ED attendances in the catchment, as classified by triage categories 4 and 5 (Cat4/5), were attributed to residents of Melbourne. After adjusting for population size, Melbourne becomes the LGA with the seventh highest rate of Cat4/5 AH ED attendances in the catchment with an average of 65.6 attendances per year per 1,000 population.

In the same time period, Melbourne residents presented in the AH period with Cat4/5 symptoms at 38 different hospitals (the top 13 hospitals are shown in **Figure 103**). The largest proportion (33.6%) presented to The Royal Melbourne Hospital, followed by The Royal Children's Hospital (16.8%), St Vincent's Hospital (13.3%), The Royal Women's Hospital (12.0%), and The Alfred Hospital (11.4%). The ***time of day*** breakdown of Cat4/5 AH ED attendances is presented in **Figure 104**. The greatest average number of Cat4/5 AH ED attendances per hour occurred during Sundays from 12PM-midnight followed by Saturdays from 12PM-midnight and Saturday during business hours (8AM-12PM). The least popular time periods included before 8AM on both weekdays and Saturdays.

Figure 103: Top 13 hospitals where Melbourne residents presented at during the AH period

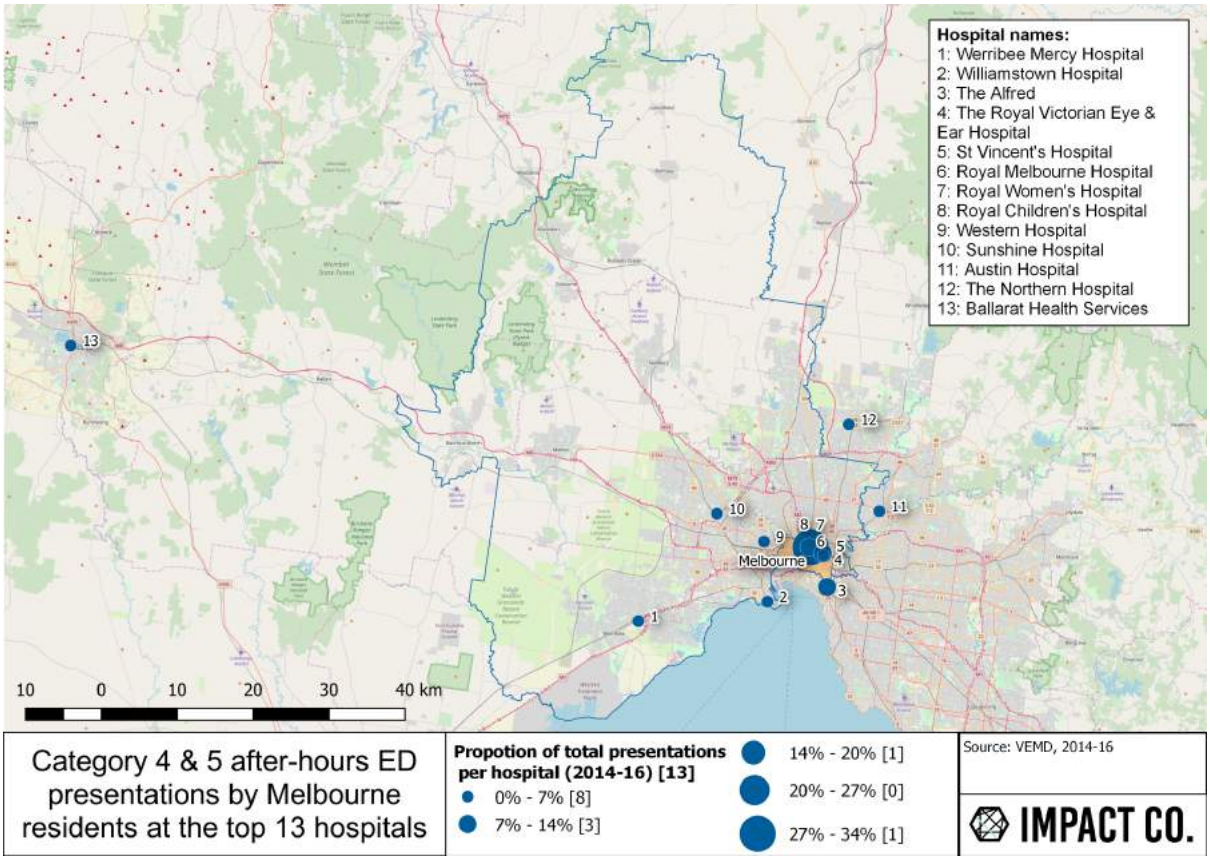
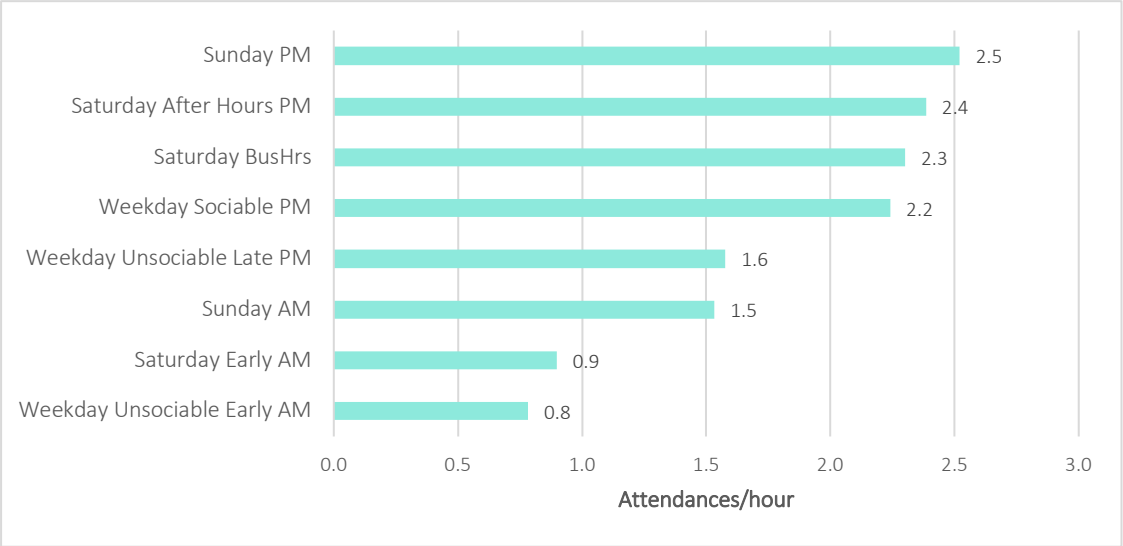


Figure 104: Melbourne – Rate of Cat 4/5 ED AH attendances by time of day

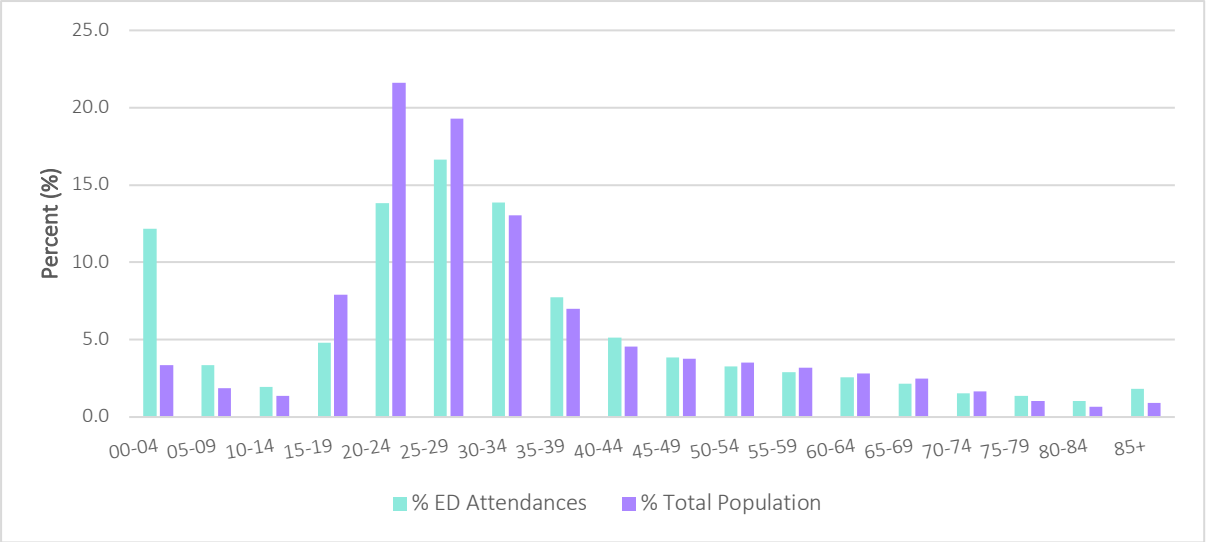


Profile

Profile of AH ED patients

Age distribution of Cat4/5 patients attending the ED from Melbourne in the AH period is similar to that of most LGAs in the catchment, with a large spike in attendances for children aged 0-4 years and slight over-representation of older adults aged 75 years and older compared to the general population (see **Figure 105**). The age distribution of Melbourne's resident population has a much higher proportion of young adults aged 20 to 34 years compared to the rest of the catchment. As such, there is a larger number of AH Cat4/5 ED attendances by this age cohort.

Figure 105: Melbourne - Cat4/5 AH ED attendances by patient age (2014-16)



Approximately 47% of Cat4/5 AH ED attendances by Melbourne residents were for people born overseas from 168 different countries. The top five non-Australian countries of birth included: China, India, England, New Zealand, and Somalia. Melbourne has the 7th highest proportion of Cat4/5 AH ED attendances requiring an ***interpreter*** (4.8%). The top five preferred languages spoken by patients who required an interpreter included: Mandarin, Arabic, Somali, Cantonese, and Vietnamese.

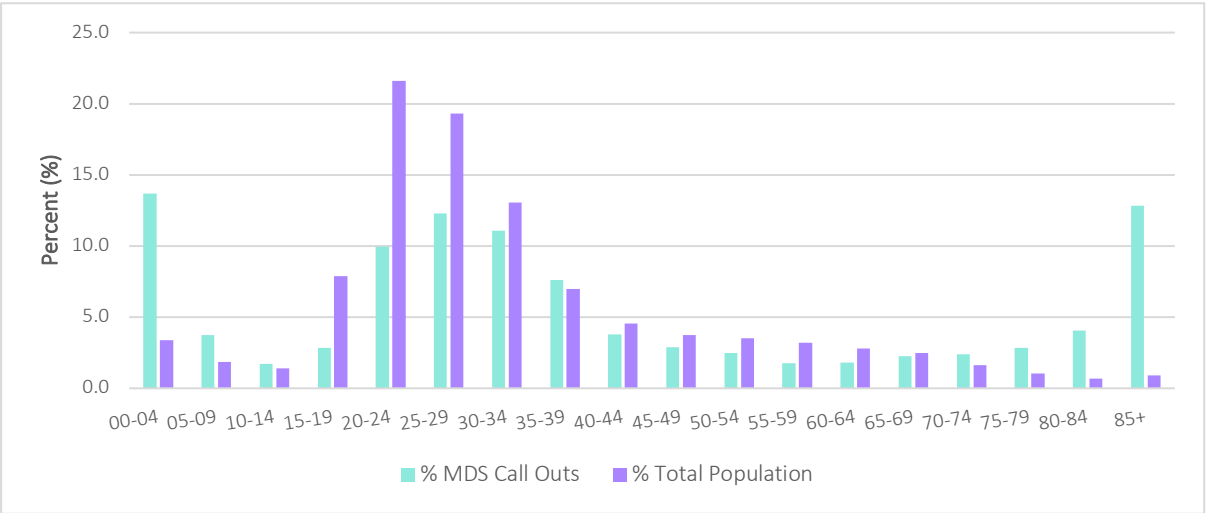
Medical deputising service use

MDS USE		
	Value	LGA Rank
Total call outs	12,881	6
Rate of calls per 1,000 population	87.0	6
AVERAGE LGA RANKING		6.0

Melbourne has moderate utilisation of MDSs compared to the rest of the catchment. In 2017-18, 87 locum services call outs were made for every 1,000 residents, resulting in the sixth highest rate in the catchment.

Age distribution of locum service users in Melbourne is similar to other LGAs. Young children aged 0-4 years and older adults aged 70 years and older are disproportionately over-represented compared to the general population (see **Figure 106**). A large proportion of patients serviced are living within aged care facilities in Melbourne, with 1,804 calls outs made, which accounted for about 18% of all calls.

Figure 106: Melbourne – All MDS call outs by 5 year age group (2017-18)



Ambulance Victoria call outs

AMBULANCE VICTORIA USE		
	Value	LGA Rank
Percent of all ambulance call outs	11.1%	3
Percent of all non-urgent call outs	7.3%	7
Rate of non-urgent call outs per 100 calls	3.3	12
AVERAGE LGA RANKING		7.3

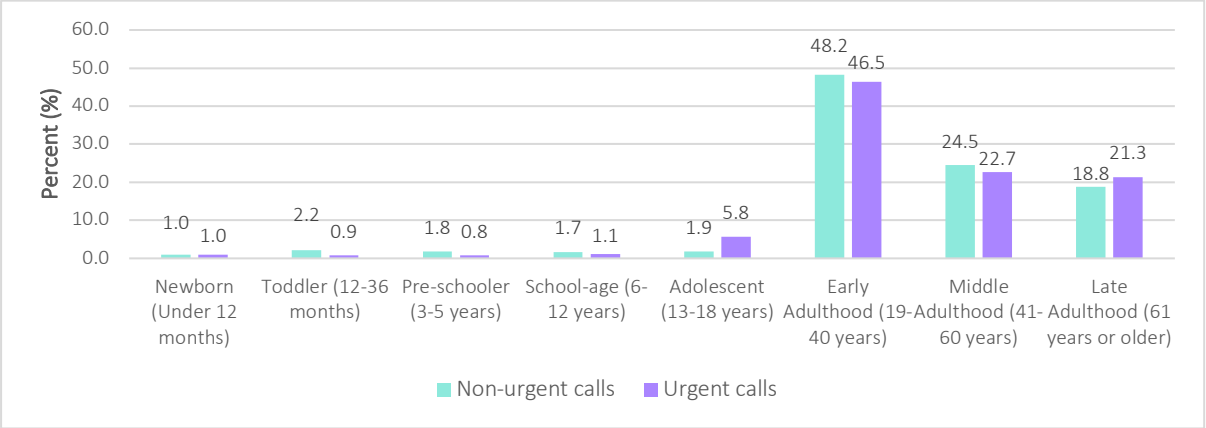
Between 2015-2018, Melbourne had the third highest number of ambulance call outs in the catchment, accounting for 11.1% of all calls. Of these, 7.3% were referred on to alternate service providers, which indicates that the patient's symptoms did not likely warrant an ambulance call and could have been better treated in the community. Melbourne had the second lowest rate of such non-urgent ambulance call outs in the catchment indicating that, while general ambulance use is high, inappropriate ambulance use for primary-care type symptoms is not a major issue for this population.

Profile of non-urgent ambulance call outs

The majority of non-urgent call outs were to adult patients aged 19+ years (see **Figure 107**). The age distribution of non-urgent call outs is trends slightly towards the younger age groups compared to urgent call outs. The proportion of non-urgent call outs for toddlers and pre-schoolers were 2.5 and 2.3 times greater, respectively, than the same age cohorts among urgent call outs. Unique to residents of Melbourne, the proportion of call outs for teenagers was 3.1 times lower for non-urgent symptoms compared to urgent symptoms.

The leading reason for non-urgent call outs in Melbourne was for the problem type classification of 'sick person', accounting for 34% of all non-urgent call outs – three times greater than the next most common reason of 'unconscious/fainting' at 10.8%. The five most common subdivisions of a 'sick person' classification included: 'other pain', 'no priority symptoms', 'abnormal breathing', 'vomiting', and 'dizziness/vertigo'.

Figure 107: Melbourne - ambulance call outs by age (2015-18)



AH service availability

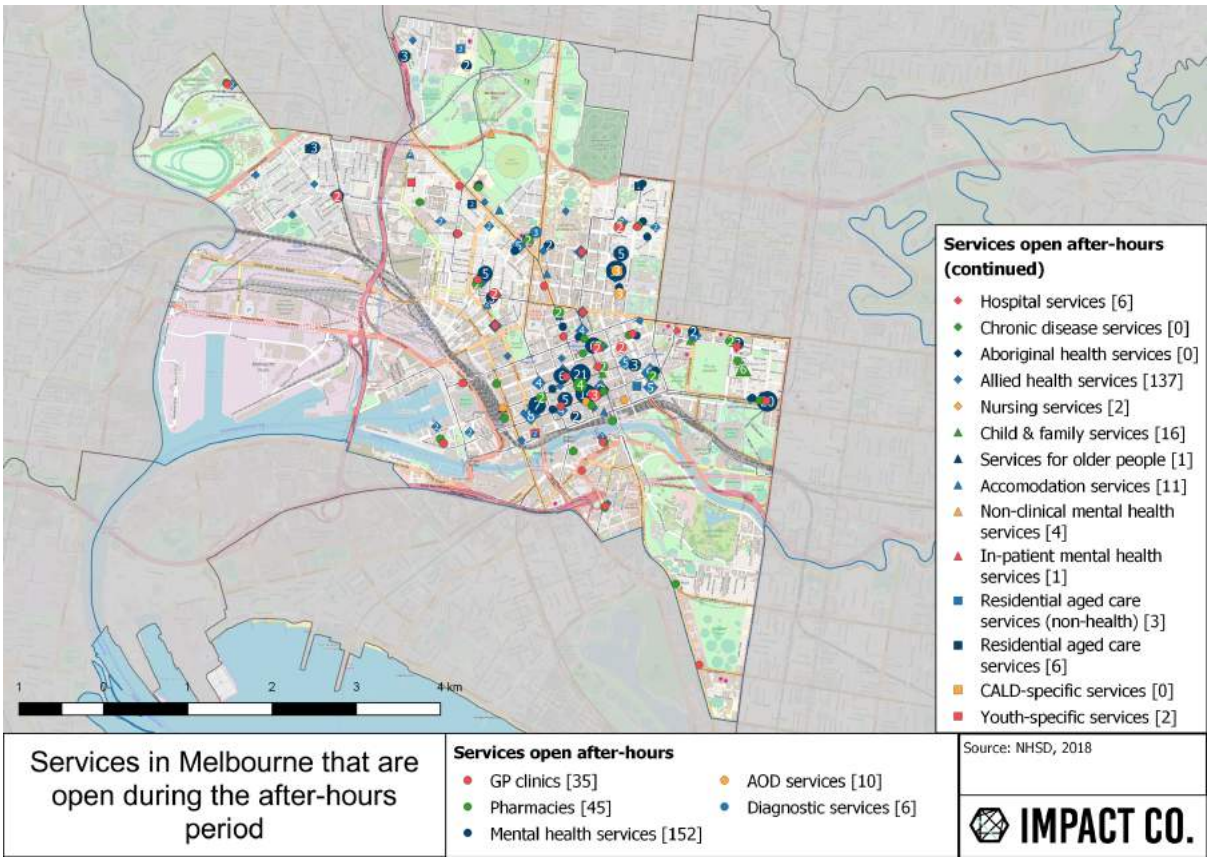
The number of AH services by type, and operating hours during the AH period, in Melbourne relative to the other LGAs in the NWMPHN catchment are detailed in the table below. This spread of AH services by type is illustrated in **Figure 108**.

Melbourne (C)	After-hours services				After-hours hrs/week		
Service Type	Total	AH No.	Rate per 10,000	Rank	No. Hrs	Rate per 10,000	Rank
All After-hours Services	1151	436	29.45	13	10403.7	702.8	13
General Practice	70	35	2.36	7	220.1	14.9	1
Pharmacy	49	45	3.04	13	855.6	57.8	12
Mental Health - Clinical in Community	358	152	10.27	12	5224.0	352.9	13
Mental Health - Clinical In-patient	2	1	0.07	9	117.9	8.0	12
Mental Health - Non-clinical	22	4	0.27	10	95.9	6.5	11
Allied Health	259	137	9.25	11	1527.7	103.2	11
CALD-Specific Health Services[1]	7	0	0.00	1	0.0	0.0	1
Accommodation[2]	52	11	6.38	11	708.9	411.0	11
Aboriginal Health[3]	1	0	0.00	1	0.0	0.0	1
Alcohol & Other Drug Services	32	10	0.68	11	324.6	21.9	11
Aged Care - Residentia[l4]	14	6	6.01	10	503.5	504.2	10
Aged Care - Non-health[4]	31	3	3.00	13	192.9	193.2	12
Carer Support Services	16	1	0.07	4	8.0	0.5	3
Diagnostic Services	40	6	0.41	5	69.0	4.7	5
Disability Services	67	4	0.27	11	50.0	3.4	7
Children/Family Health Services[5]	64	16	16.40	13	657.8	674.0	13
Women's Health Services[6]	11	4	0.53	13	138.4	18.4	13
Men's Health Services[7]	3	1	0.14	12	0.1	0.0	11
Nursing Care Services	17	2	0.14	8	10.0	0.7	3
Palliative Care Services	2	1	0.07	12	117.9	8.0	12
Sexual Health Services	16	0	0.00	1	0.0	0.0	1
Hospitals	10	6	0.41	13	469.7	31.7	13
Youth Health Services[8]	6	2	0.46	10	29.5	6.7	13
Chronic Disease Services	13	0	0.00	1	0.0	0.0	1
Services for Older Persons[4]	13	1	1.00	9	55.0	55.1	9

DEFINITIONS: Total – total number of service sites listed on the NHSD; AH No. – number of service sites open in the after-hours; Rate per 10,000 (services) – number of service sites open per 10,000 population; 2016 estimated resident population was utilised unless otherwise indicated; Rank – LGA ranking based on rate; all LGAs with a rate of 0 are automatically ranked as 13; No. Hrs – number of service hours per week available in the after-hours; Rate per 10,000 (hrs) – number of weekly service hours available in the after-hours per 10,000 population; 2016 estimated resident population is utilised unless otherwise indicated

1Rate calculated using 2016 estimated population born in non-English speaking countries; 2Rates calculated using 2016 estimated homeless population; 3Rates calculated using 2016 estimated Aboriginal and Torres Strait Islander population; 4Rates calculated using 2016 estimated population of persons aged 65+ years; 5Rates calculated using 2016 estimated population of persons aged 0-14years; 6Rates calculated using 2016 estimated female population; 7Rates calculated using 2016 estimated male population; 8Rates calculated using 2016 estimated population of persons aged 15-24years

Figure 108: Melbourne – location of AH primary care services



Key findings: Applying the AH Commissioning Framework

Melbourne has the third lowest Composite Index Score of all the LGAs within the NWMPHN catchment. When each sub-index score is ranked and converted into its relevant urgency category, the following results are obtained:

	AH Need		AH Unmet Demand		AH Service Availability	
	Rank	Urgency	Rank	Urgency	Rank	Urgency
Melbourne (C)	7	Low	12	Low	10	Low

Melbourne has a low urgency classification for all three sub-indices of the Composite Index Score. That said, it is worth noting that Melbourne has the highest proportion of the population reporting as homeless and is projected to have the second highest growth in the population by 2031. There is also a large proportion of the population who were born overseas or have low English proficiency.

When the urgency categories are viewed in combination, the following intervention domain are suggested:

	AH Need	AH Unmet Demand	AH Service Availability	Intervention Domain Required
Melbourne (C)	Low	Low	Low	Targeted intervention may be warranted for specific population groups

The AH Commissioning Framework indicates that there is sufficient service capacity in the AH period to support the community. However, support to improve AH access for specific population groups may be warranted. As such, if NWMPHN is to commission interventions in this area, potential providers will need to articulate the rationale for support and validate the 'need' before any action is taken.

MORELAND

Demographic drivers of need for AH primary care

Moreland has moderate AH primary health needs, based on demographic drivers, relative to the rest of the region.

Moreland is the 4th largest LGA, by population, with an estimated 2016 resident population of 172,091. Moreland is one of the more socio-economically advantaged LGAs in the region, has a moderate proportion of residents experiencing high psychological distress (13.2%) and rating their health as fair to poor (18.6%).

DEMOGRAPHIC DRIVERS OF NEED		
	Value	LGA Rank
Population size	172,091	4
Proportion aged 0-4 years[1]	6.5%	9
Population aged 65+ years[1]	13.4%	6
Homelessness[1]	0.5%	6
Humanitarian settlers[2]	5.3%	4
Indigenous Australian population[1]	0.5%	9
Born in non-English speaking countries[1]	27.1%	6
Poor English proficiency[1]	4.8%	6
Socio-Economic Disadvantage (IRSD)	1014	9
High psychological distress[1]	13.2%	6
Self-rated fair to poor health[1]	18.6%	5
Population growth[3]	1.8%	8
AVERAGE LGA RANKING		6.5

[1]Proportion of LGA ERP2016; [2]Proportion of all humanitarian settlers in the NWMPHN region, 2017; [3]Projected annual percent population growth, 2016-2031

Moreland has a moderately culturally diverse population compared to the rest of the catchment. Approximately 41% of residents were born overseas and 27.1% were born in non-English speaking nations. A relatively moderate proportion (4.8%) of the population report having poor English proficiency. Moreland residents' five most common countries of birth, after Australia, include: Italy, India, Greece, England, and Pakistan.

The age distribution of Moreland residents is similar to that of the greater catchment. Moreland has the 9th highest proportion of persons aged 0-4 years (6.5%) and the 6th highest proportion of people aged over 65 years (13.4%).

AH emergency department use

INDICATORS OF AH ED USE		
	Value	LGA Rank
Proportion of all Cat4/5 AH ED attendances in NWMPHN	10.0%	4
Cat4/5 AH ED attendance rate per 1,000 population	68.6	6
Proportion of Cat4/5 AH ED attendances requiring an interpreter	6.2%	4
AVERAGE LGA RANKING		4.7

Residents of Moreland have more AH semi-urgent and non-urgent, as classified by triage categories 4 and 5 (Cat4/5) ED attendances, on average, than the majority of the catchment. Between July 2014 and June 2016, 10.0% of all Cat4/5 AH ED attendances in the catchment were attributed to residents of Moreland. After adjusting for population size, Moreland has the 4th highest rate of Cat4/5 AH ED attendances with an average of 68.6 attendances per year per 1,000 population.

In the same time period, Moreland residents presented in the AH period with Cat4/5 symptoms at 38 different hospitals (the top 13 hospitals are shown in **Figure 109**). The largest proportion (31.4%) presented to The Royal Melbourne Hospital, followed by The Royal Children's Hospital (22.3%), The Royal Women's Hospital (12.3%), St. Vincent's Hospital (9.2%), and The Royal Victorian Eye & Ear Hospital (3.1%). The ***time of day*** breakdown of Cat4/5 AH ED attendances is presented in **Figure 110**. The greatest average number of Cat4/5 AH ED attendances per hour occurred on Sundays from 12PM-midnight followed by Saturdays from 12PM to midnight, and Saturday business hours from 8AM to 12PM. The least popular time periods included before 8AM on both weekdays and Saturdays.

Figure 109: Top 13 ospitals where Moreland residents presented at during the AH period

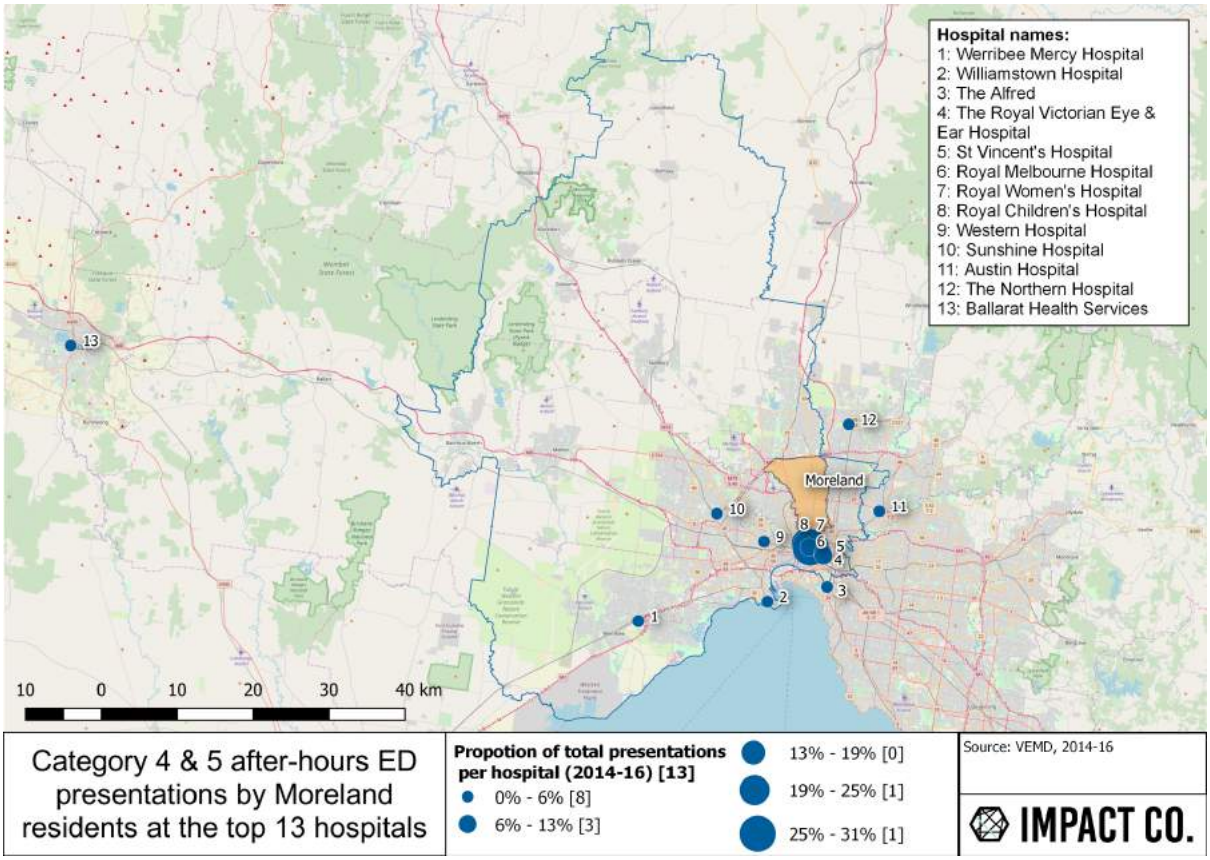
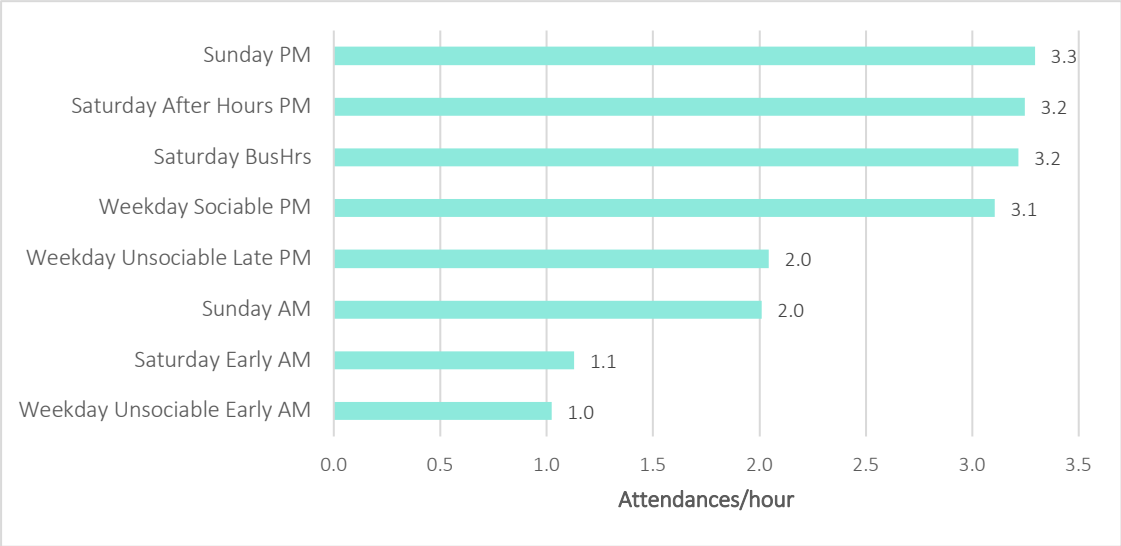


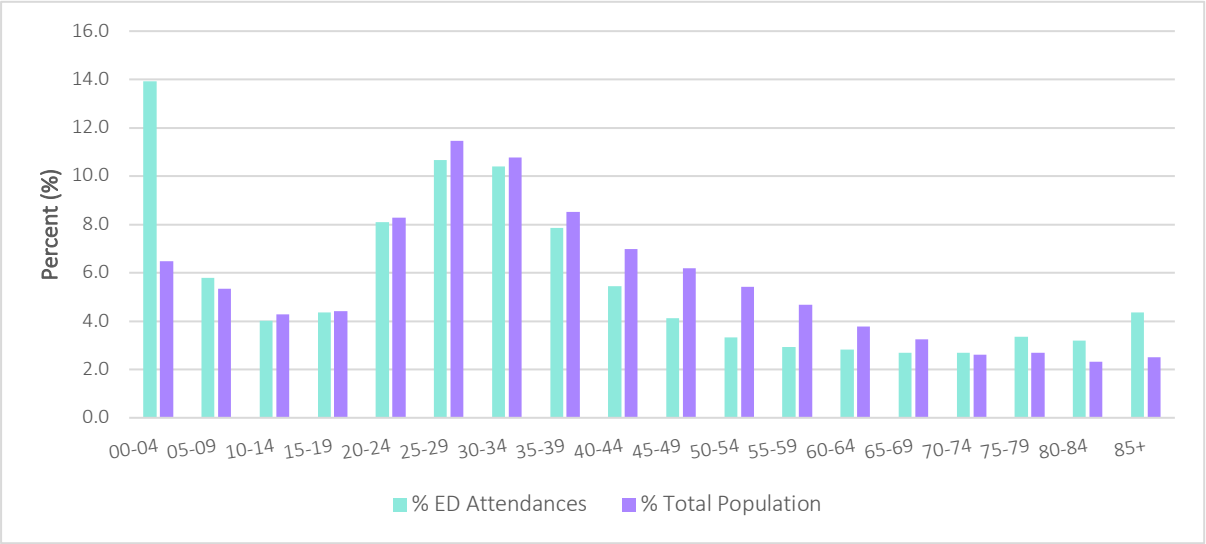
Figure 110: Moreland – Rate of Cat 4/5 AH ED attendances by time of day



Profile of AH ED patients

Age distribution of Cat4/5 patients attending the ED in the AH period is similar to that of most LGAs in the catchment, with a large spike in attendances for children aged 0-4 years and slight over-representation of older adults aged 75 years and older, compared to the general population (see **Figure 111**).

Figure 111: Moreland - Cat4/5 AH ED attendances by patient age (2014-16)



Approximately 33% of Cat4/5 AH ED attendances by Moreland residents were for people born overseas from 158 different countries. The top five non-Australian countries of birth included: Italy, Greece, Lebanon, India and Pakistan. Moreland has the fourth highest proportion of Cat4/5 AH ED attendances requiring an ***interpreter*** (6.20%). The top five preferred languages spoken by patients who required an interpreter included: Italian, Greek, Arabic, Turkish, and Mandarin.

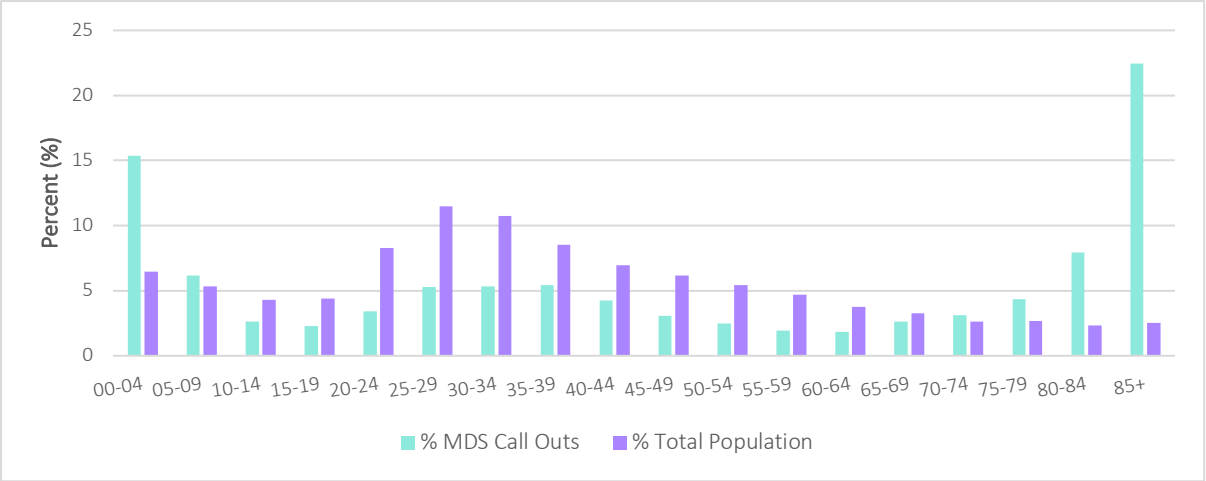
Medical deputising service use

MDS USE		
	Value	LGA Rank
Total call outs	25,178	1
Rate of calls per 1,000 population	146.3	1
AVERAGE LGA RANKING		1.0

In 2017-18, Moreland had not only the highest absolute number of MDS call outs but also had the highest rate of MDS use in the catchment with 146 locum services call outs made for every 1,000 residents.

Age distribution of locum service users from Moreland is similar to other LGAs. Young children aged 0-4 years and older adults aged 70 years and older are disproportionately over-represented compared to the general population (see **Figure 112**). Moreland had the highest rate of patients serviced in aged care facilities with 3,961 call outs made in 2017-18, accounting for about 36% of calls in this area.

Figure 112: Moreland – All call outs by 5 year age group (2017-18)



Ambulance Victoria call outs

AMBULANCE VICTORIA USE		
	Value	LGA Rank
Percent of all ambulance call outs	10.7%	4
Percent of all non-urgent call outs	11.8%	4
Rate of non-urgent call outs per 100 calls	5.5	2
AVERAGE LGA RANKING		3.3

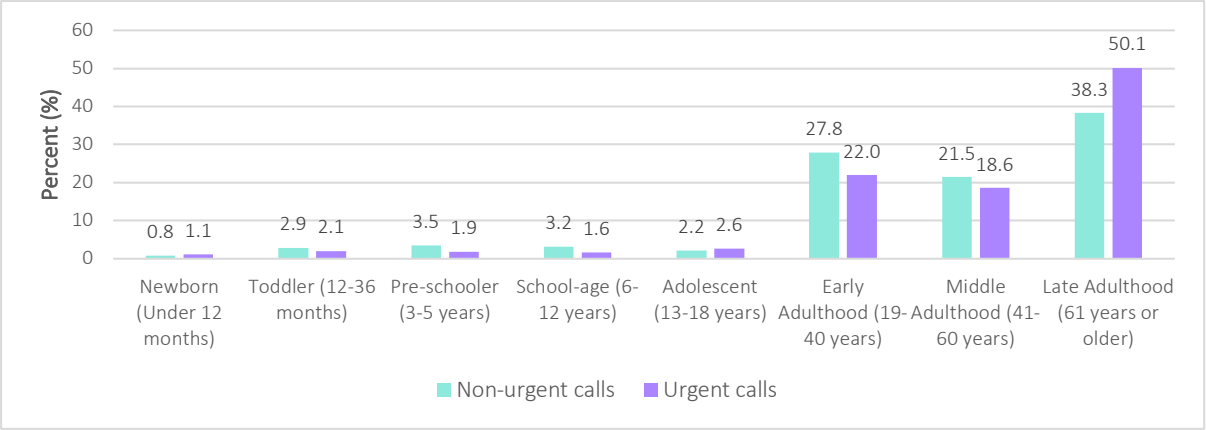
Between 2015-2018, Moreland had a relatively high number of ambulance call outs, accounting for 10.7% of all calls. Of these, 5.5% were referred on to alternate service providers, which indicate that the patient's symptoms did not likely warrant an ambulance call and could have been better treated in the community. Moreland had the second highest rate of such non-urgent ambulance call outs in the catchment which suggests that inappropriate ambulance use for primary-care type symptoms is a greater issue for this population.

Profile of non-urgent ambulance call outs

The majority of non-urgent call outs were to adult patients aged 19 years and older (see **Figure 113**). The age distribution of non-urgent call outs closely mirrors than that of urgent call outs, with the exception of pre-school and school-aged children who were over-represented in the non-urgent call out population. The proportion of non-urgent calls for pre-school and school-aged children were 1.9 times greater than the proportion of urgent call outs.

The leading reason for non-urgent call outs in Moreland was for the problem type classification of 'sick person', accounting for 46% of all non-urgent call outs – six times greater than the next most common reason of 'falls' at 7%. The five most common subdivisions of a 'sick person' classification included: 'other pain', 'no priority symptoms', 'abnormal breathing', 'vomiting', and 'dizziness/vertigo'.

Figure 113: Moreland - Ambulance call outs by age (2015-18)



AH service availability

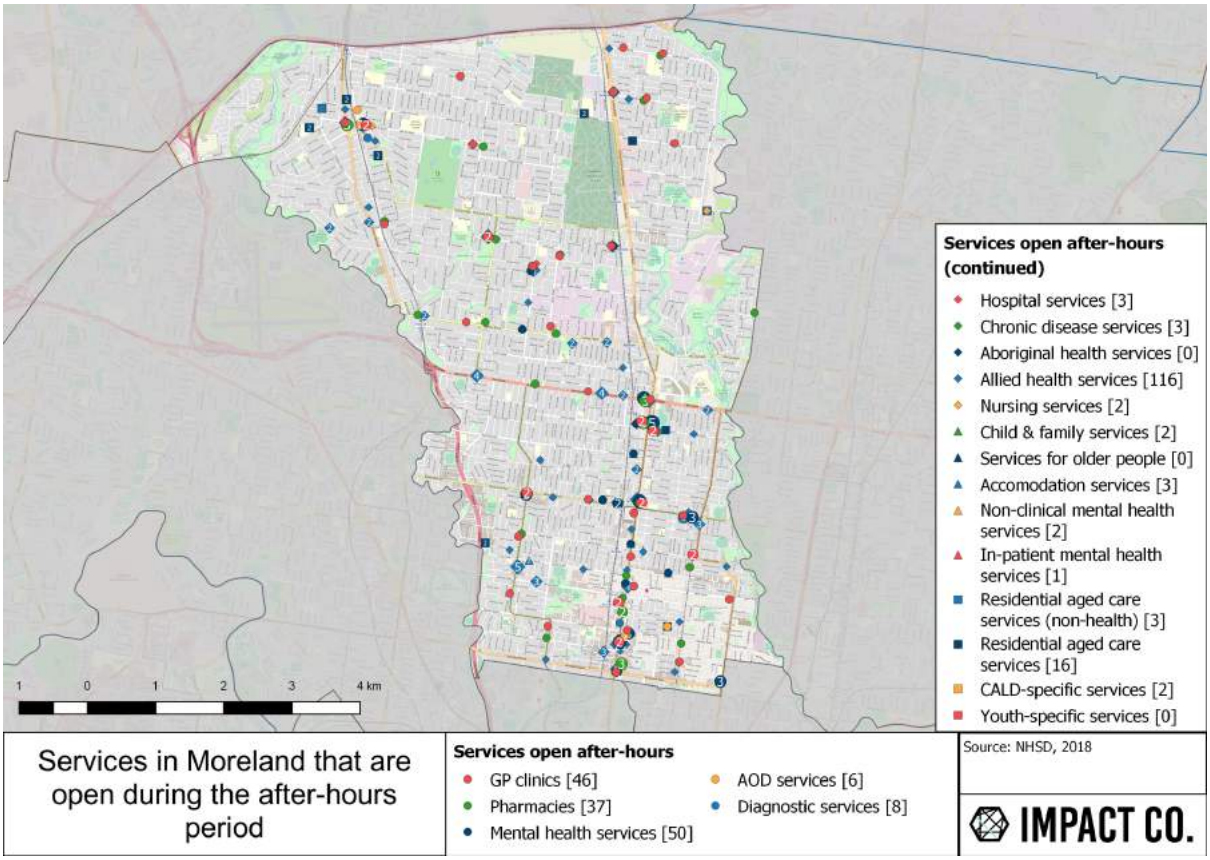
The number of AH services by type, and operating hours during the AH period, in Moreland relative to the other LGAs in the NWMPHN catchment are detailed in the table below. This spread of AH services by type is illustrated in **Figure 114**.

Moreland (C)	After-hours services					After-hours hrs/week		
Service Type	Total	AH No.	Rate per 10,000	Rank		No. Hrs	Rate per 10,000	Rank
All After-hours Services	580	297	17.3	9		4749.2	276.0	8
General Practice	60	46	2.7	9		490.5	28.5	7
Pharmacy	38	37	2.2	8		901.7	52.4	10
Mental Health - Clinical in Community	110	50	2.9	6		483.9	28.1	5
Mental Health - Clinical In-patient	2	1	0.1	8		10.0	0.6	7
Mental Health - Non-clinical	10	2	0.1	9		12.0	0.7	8
Allied Health	179	116	6.7	10		1301.1	75.6	10
CALD-Specific Health Services[1]	4	2	0.4	13		12.0	2.6	13
Accommodation[2]	16	3	3.9	9		240.8	312.3	10
Aboriginal Health[3]	0	0	0.0	1		0.0	0.0	1
Alcohol & Other Drug Services	20	6	0.4	9		103.0	6.0	8
Aged Care - Residential[4]	40	16	7.0	12		1401.7	608.6	11
Aged Care - Non-health[4]	11	3	1.3	9		143.9	62.5	10
Carer Support Services	24	9	0.5	13		596.5	34.7	9
Diagnostic Services	11	8	0.5	6		172.9	10.0	8
Disability Services	31	7	0.4	12		211.0	12.3	11
Children/Family Health Services[5]	34	2	0.7	3		18.0	6.5	6
Women's Health Services[6]	4	0	0.0	1		0.0	0.0	1
Men's Health Services[7]	0	0	0.0	1		0.0	0.0	1
Nursing Care Services	9	2	0.1	6		28.0	1.6	7
Palliative Care Services	0	0	0.0	1		0.0	0.0	1
Sexual Health Services	1	0	0.0	1		0.0	0.0	1
Hospitals	3	3	0.2	11		145.4	8.4	10
Youth Health Services[8]	2	0	0.0	1		0.0	0.0	1
Chronic Disease Services	9	3	0.2	7		24.0	1.4	9
Services for Older Persons[4]	8	0	0.0	1		0.0	0.0	1

DEFINITIONS: Total – total number of service sites listed on the NHSD; AH No. – number of service sites open in the after-hours; Rate per 10,000 (services) – number of service sites open per 10,000 population; 2016 estimated resident population was utilised unless otherwise indicated; Rank – LGA ranking based on rate; all LGAs with a rate of 0 are automatically ranked as 13; No. Hrs – number of service hours per week available in the after-hours; Rate per 10,000 (hrs) – number of weekly service hours available in the after-hours per 10,000 population; 2016 estimated resident population is utilised unless otherwise indicated

[1]Rate calculated using 2016 estimated population born in non-English speaking countries; [2]Rates calculated using 2016 estimated homeless population; [3]Rates calculated using 2016 estimated Aboriginal and Torres Strait Islander population; [4]Rates calculated using 2016 estimated population of persons aged 65+ years; [5]Rates calculated using 2016 estimated population of persons aged 0-14years; [6]Rates calculated using 2016 estimated female population; [7]Rates calculated using 2016 estimated male population; [8]Rates calculated using 2016 estimated population of persons aged 15-24years

Figure 114: Moreland – location of AH primary care services



Key findings: Applying the AH Commissioning Framework

Moreland has the second lowest Composite Index Score of all the LGAs within the NWMPHN catchment. When each sub-index score is ranked and converted into its relevant urgency category, the following results are obtained:

	AH Need		AH Unmet Demand		AH Service Availability	
	Rank	Urgency	Rank	Urgency	Rank	Urgency
Moreland (C)	8	Low	5	High	12	Low

The high urgency in the AH Unmet Demand sub-index is associated with its high proportion of non-urgent call outs out of all ambulance call outs in Moreland, which is the second highest in the catchment.

When the urgency categories are viewed in combination, the following intervention domains are suggested:

	AH Need	AH Unmet Demand	AH Service Availability	Intervention Domain Required
Moreland (C)	Low	High	Low	System and Community

System and community-type interventions, as a starting point, could be explored due to the high AH unmet demand in the area. These interventions reflect the fact that Moreland has sufficient AH primary care services in place yet are likely to use emergency and ambulatory services instead. On this basis, if NWMPHN were to consider taking action in Moreland, the AH Commissioning Framework indicates that the PHN could achieve greater impact with its interventions by:

- Focusing on enhancing the effectiveness of the AH system to support the transition from tertiary to primary care; and
- Supporting consumers to make more informed decisions on where to seek care in the AH period.

YARRA

Demographic drivers of need for AH primary care

Yarra has low AH primary health needs, based on demographic drivers, relative to the rest of the region.

Yarra is the 4th smallest LGA, by population, with an estimated 2016 resident population of 93,380. It is the second most affluent LGA in the region with a lower than average proportion of residents experiencing high psychological distress (10.7%) and rating their health as fair to poor (16.0%). Despite its affluence, Yarra has the second highest proportion of people experiencing homelessness (0.9%).

DEMOGRAPHIC DRIVERS OF NEED		
	Value	LGA Rank
Population size	93,380	10
Proportion aged 0-4 years[1]	4.8%	12
Population aged 65+ years[1]	10.4%	8
Homelessness[1]	0.9%	2
Humanitarian settlers[2]	0.3%	10
Indigenous Australian population[1]	0.4%	10
Born in non-English speaking countries[1]	17.5%	11
Poor English proficiency[1]	4.0%	7
Socio-Economic Disadvantage (IRSD)	1035	11
High psychological distress[1]	10.7%	12
Self-rated fair to poor health[1]	16.0%	10
Population growth[3]	2.1%	7
AVERAGE LGA RANKING		9.2

[1]Proportion of LGA ERP2016; [2]Proportion of all humanitarian settlers in the NWMPHN region, 2017; [3]Projected annual percent population growth, 2016-2031

Yarra has a less culturally diverse population than the majority of the catchment. Approximately 39% of residents were born overseas, 17.5% were born in non-English speaking nations, and 4% report having poor English proficiency. Yarra residents' five most common countries of birth, after Australia, include: England, New Zealand, Vietnam, China, and Greece.

Yarra has relatively low proportions of high-need AH age cohorts with the second lowest proportion of persons aged 0-4 years (4.8%) and an average proportion of persons aged 65 years and older (10.4%).

AH emergency department use

INDICATORS OF AH ED USE		
	Value	LGA Rank
Proportion of all Cat4/5 AH ED attendances in NWMPHN	5.6%	11
Cat4/5 AH ED attendance rate per 1,000 population	82.8	4
Proportion of Cat4/5 AH ED attendances requiring an interpreter	7.3%	3
AVERAGE LGA RANKING		6.0

Between July 2014 and June 2016, Yarra had the 3rd lowest number of AH semi-urgent and non-urgent, as classified by triage categories 4 and 5 (Cat4/5), ED attendances – accounting for 5.6% of all attendances. However, after adjusting for population size, Yarra has a higher than average rate of Cat4/5 AH ED attendances with an average of 82.8 attendances per year per 1,000 population.

In the same time period, Yarra residents presented in the AH period with Cat4/5 symptoms at 38 different hospitals (the top 13 hospitals are shown in **Figure 115**). The largest proportion (44.3%) presented to St. Vincent's Hospital, followed by The Royal Children's Hospital (16.2%), The Royal Victorian Eye & Ear Hospital (9.3%), The Royal Women's Hospital (8.9%), and The Royal Melbourne Hospital (8.0%). The ***time of day*** breakdown of Cat4/5 AH ED attendances is presented in **Figure 116**. The greatest average number of Cat4/5 AH ED attendances per hour occurred during Saturday business hours (8AM-12PM), followed by Sundays from 12PM-midnight, and Saturdays from 12PM to midnight. The least popular time periods included before 8AM on both weekdays and Saturdays.

Figure 115: Top 13 hospitals where Yarra residents presented at during the AH period

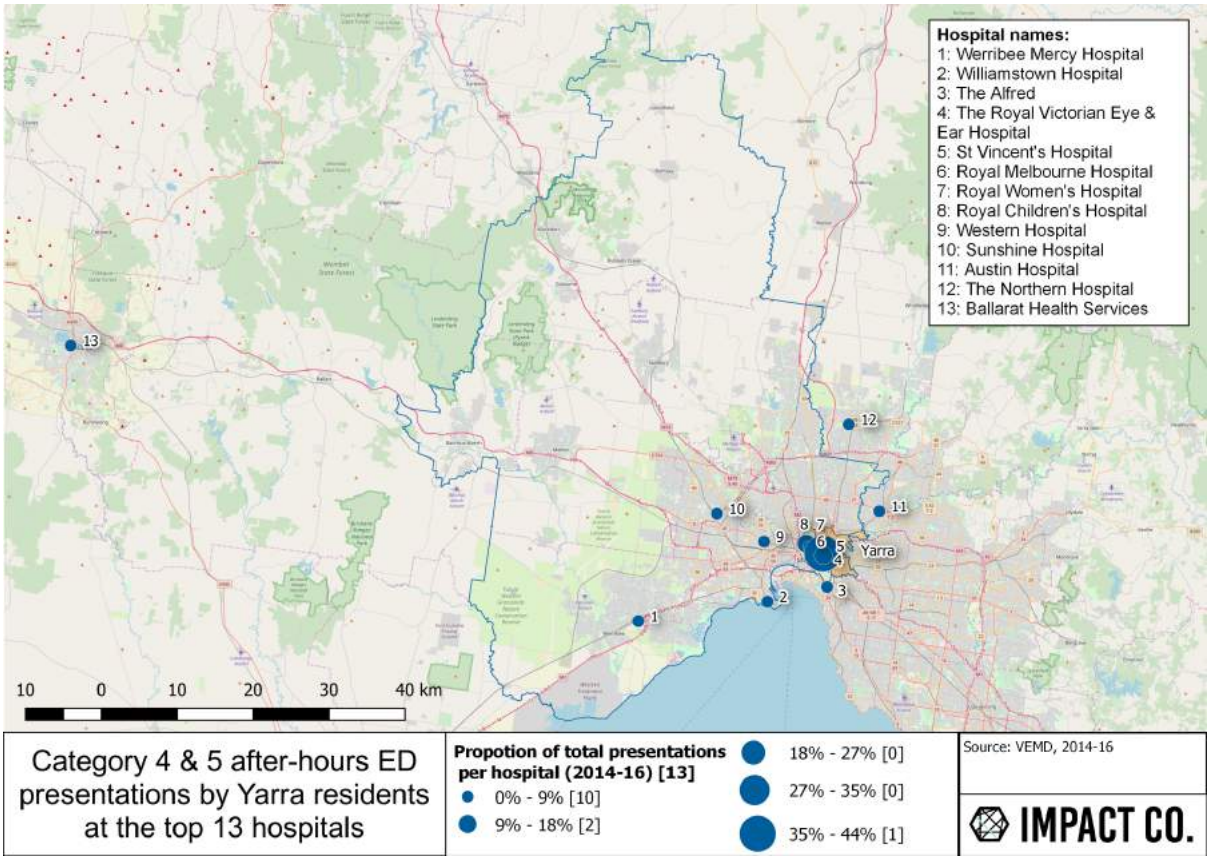
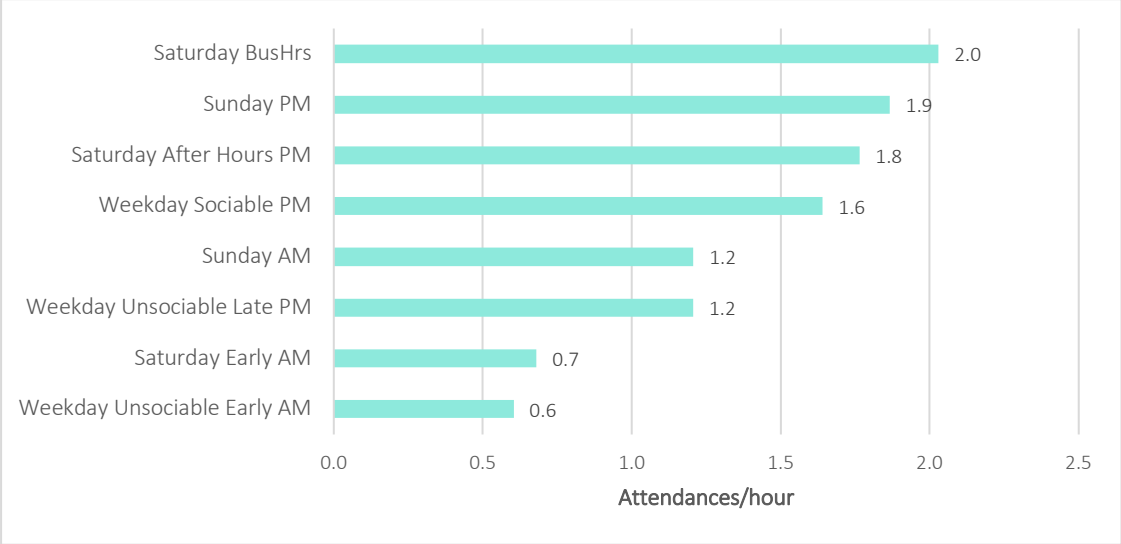


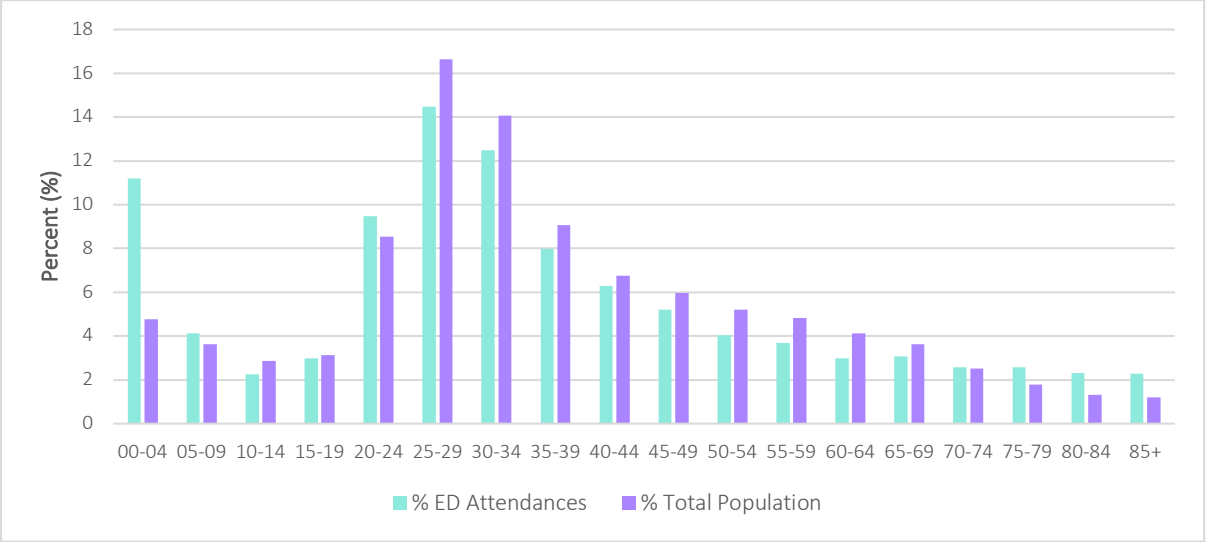
Figure 116: Yarra – Rate of Cat 4/5 AH ED attendances by time of day



Profile of AH ED patients

Age distribution of Cat4/5 patients attending the ED from Yarra in the AH period is similar to that of most LGAs in the catchment, with a large spike in attendances for children aged 0-4 years and slight over-representation of older adults aged 75 years and older, compared to the general population (see **Figure 117**). The resident population in Yarra has a larger than average proportion of young adults aged 20-39 years. Correspondingly, there is a large absolute number of Cat4/5 AH ED attendances for this age cohort.

Figure 117: Yarra - Cat4/5 AH ED attendances by patient age (2014-16)



Approximately 35% of Cat4/5 AH ED attendances by Yarra residents were for people born overseas from 152 different countries. The top five non-Australian countries of birth included: Vietnam, Greece, England, New Zealand, and Sudan. Yarra has the 3rd highest proportion of Cat4/5 AH ED attendances requiring an ***interpreter*** (7.3%). The top five preferred languages spoken by the patients who required an interpreter included: Vietnamese, Greek, Mandarin, Cantonese, and Italian.

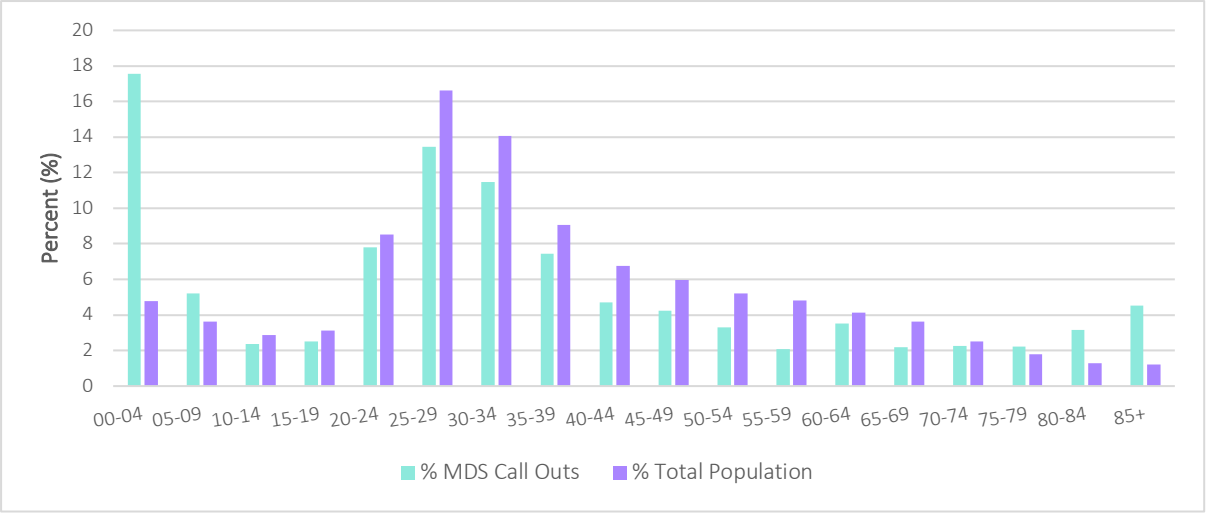
Medical deputising service use

MDS USE		
	Value	LGA Rank
Total call outs	7,737	11
Rate of calls per 1000 population	82.9	7
AVERAGE LGA RANKING		9.0

In 2017-18, Yarra had the 3rd lowest absolute number of MDS call outs. However, after adjusting for population size, locum services use in Yarra is similar to the regional average with 82.9 MDS call outs made for every 1,000 residents – the 7th highest rate in the catchment.

Age distribution of locum service users in Yarra is similar to other LGAs. Young children aged 0-4 years and older adults aged 70 years and older are disproportionately over-represented compared to the general population (see **Figure 118**). However, unlike the rest of the catchment, the over-representation of older population is not as pronounced, with only a relatively small proportion of patients serviced were living within aged care facilities. In this regard, Yarra had the lowest rate of all LGAs, at 564 services, with call outs to aged care facilities in 2017-18, which accounted for 9% of all calls to the area.

Figure 118: Yarra – All MDS call outs by 5 year age group (2017-18)



Ambulance Victoria call outs

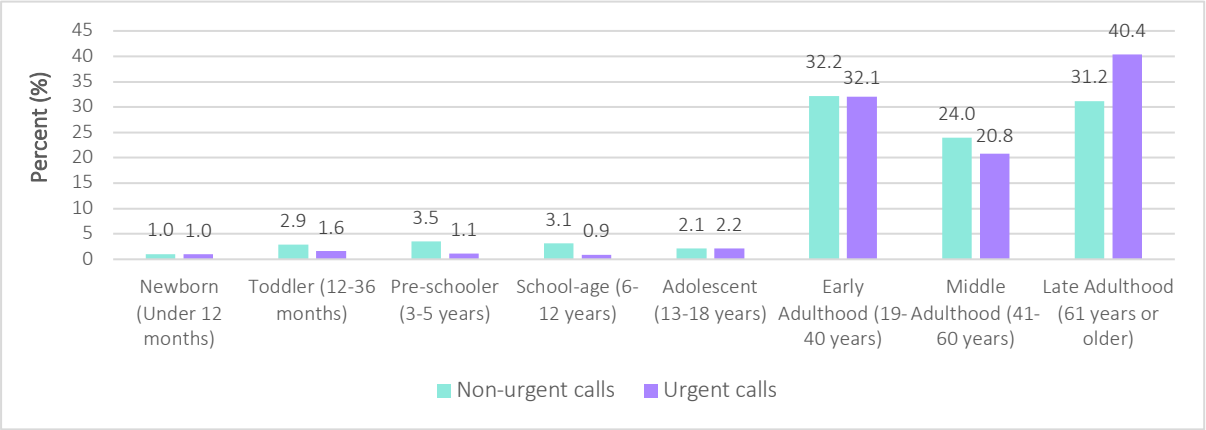
AMBULANCE VICTORIA USE		
	Value	LGA Rank
Percent of all ambulance call outs	6.2%	9
Percent of non-urgent call outs	4.9%	11
Rate of non-urgent call outs per 100 calls	3.9	10
AVERAGE LGA RANKING		10.0

Between 2015-2018, Yarra had a lower than average number of ambulance call outs, accounting for 6.2% of all calls to the catchment. Of these, 4.9% were referred on to alternate service providers, which indicates that these patient's symptoms did not likely warrant an ambulance call and could have been better treated in the community. Yarra had the 10th highest rate of such non-urgent ambulance call outs in the catchment indicating that inappropriate ambulance use for primary-care type symptoms is less of an issue for this population.

Profile of non-urgent ambulance call outs

The majority of non-urgent call outs were to adult patients aged 19 years and older (see **Figure 119**). The age distribution of non-urgent call outs tended to lean towards the younger age groups compared to the age distribution for urgent call outs. Toddlers, pre-schoolers and school-aged children were over-represented among non-urgent call outs. The proportions of toddlers, pre-schoolers and school-aged children were 1.8, 3.2 and 3.5 times greater, respectively, to have non-urgent calls outs compared to urgent call outs.

Figure 119: Yarra - Ambulance call outs by age (2015-18)



The leading reason for non-urgent call outs in Yarra, as for all LGAs, was for the problem type classification of 'sick person', accounting for 42% of all non-urgent call outs – nearly six times greater than the next most

common reason of 'unconscious/fainting' at 7.5%. The five most common subdivisions of a 'sick person' classification included: 'no priority symptoms', 'other pain', 'vomiting', 'abnormal breathing', and 'fever/chills'.

AH service availability

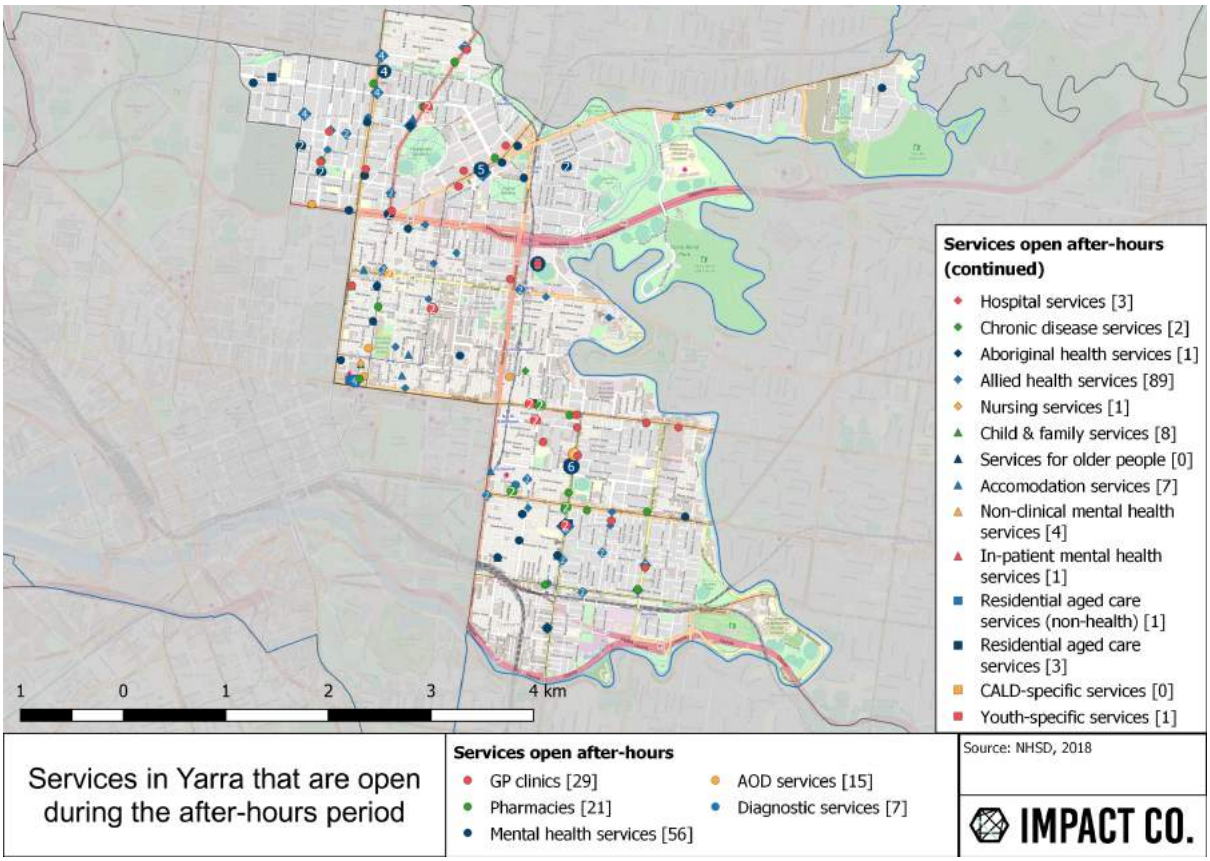
The number of AH services by type, and operating hours during the AH period, in Yarra relative to the other LGAs in the NWMPHN catchment are detailed in the table below. This spread of AH services by type is illustrated in **Figure 120**.

Yarra (C)	After-hours services					After-hours hrs/week		
Service Type	Total	AH No.	Rate per 10,000	Rank		No. Hrs	Rate per 10,000	Rank
All After-hours Services	619	255	27.3	12		4636.5	496.5	12
General Practice	47	29	3.1	12		195.0	20.9	2
Pharmacy	22	21	2.3	9		455.0	48.7	9
Mental Health - Clinical in Community	169	56	6.0	11		865.7	92.7	11
Mental Health - Clinical In-patient	2	1	0.1	11		44.5	4.8	8
Mental Health - Non-clinical	11	4	0.4	11		118.0	12.6	12
Allied Health	143	89	9.5	13		1055.8	113.1	13
CALD-Specific Health Services[1]	3	0	0.0	1		0.0	0.0	1
Accommodation[2]	32	7	8.4	13		396.2	472.7	12
Aboriginal Health[3]	3	1	0.3	13		2.0	0.5	13
Alcohol & Other Drug Services	41	15	1.6	13		753.8	80.7	13
Aged Care - Residential[4]	21	3	3.1	4		159.9	164.0	2
Aged Care - Non-health[4]	10	1	1.0	8		17.0	17.4	8
Carer Support Services	19	5	0.0	1		375.8	40.2	11
Diagnostic Services	19	7	0.8	11		28.5	3.1	3
Disability Services	25	2	0.2	9		124.0	13.3	12
Children/Family Health Services[5]	31	8	7.6	12		56.5	53.7	12
Women's Health Services[6]	0	0	0.0	1		0.0	0.0	1
Men's Health Services[7]	1	0	0.0	1		0.0	0.0	1
Nursing Care Services	11	1	0.1	4		117.9	12.6	11
Palliative Care Services	1	0	0.0	1		0.0	0.0	1
Sexual Health Services	8	5	0.5	13		20.0	2.1	13
Hospitals	4	3	0.3	12		76.5	8.2	9
Youth Health Services[8]	1	1	0.9	11		1.0	0.9	10
Chronic Disease Services	7	2	0.2	13		10.0	1.1	6
Services for Older Persons[4]	9	0	0.0	1		0.0	0.0	1

DEFINITIONS: Total – total number of service sites listed on the NHSD; AH No. – number of service sites open in the after-hours; Rate per 10,000 (services) – number of service sites open per 10,000 population; 2016 estimated resident population was utilised unless otherwise indicated; Rank – LGA ranking based on rate; all LGAs with a rate of 0 are automatically ranked as 13; No. Hrs – number of service hours per week available in the after-hours; Rate per 10,000 (hrs) – number of weekly service hours available in the after-hours per 10,000 population; 2016 estimated resident population is utilised unless otherwise indicated

[1]Rate calculated using 2016 estimated population born in non-English speaking countries; [2]Rates calculated using 2016 estimated homeless population; [3]Rates calculated using 2016 estimated Aboriginal and Torres Strait Islander population; [4]Rates calculated using 2016 estimated population of persons aged 65+ years; [5]Rates calculated using 2016 estimated population of persons aged 0-14years; [6]Rates calculated using 2016 estimated female population; [7]Rates calculated using 2016 estimated male population; [8]Rates calculated using 2016 estimated population of persons aged 15-24years

Figure 120: Yarra – location of AH primary care services



Key findings: Applying the AH Commissioning Framework

Yarra has the lowest Composite Index Score of all the LGAs within the NWMPHN catchment. When each sub-index score is ranked and converted into its relevant urgency category, the following results are obtained:

	AH Need		AH Unmet Demand		AH Service Availability	
	Rank	Urgency	Rank	Urgency	Rank	Urgency
Yarra (C)	12	Low	10	Low	13	Low

Yarra has a low urgency classification for all three sub-indices of the Composite Index Score. That said, it is worth noting that Yarra has the second highest proportion of the population reporting as homeless. The LGA also has a high rate of Cat 4/5 presentations to ED during the AH period. The qualitative feedback obtained from the homeless community suggests a tendency to go to the ED during the AH period due to the limited alternative AH service options.

When the urgency categories are viewed in combination, the following intervention domains are suggested:

	AH Need	AH Unmet Demand	AH Service Availability	Intervention Domain Required
Yarra (C)	Low	Low	Low	Targeted intervention may be warranted for specific population groups

The AH Commissioning Framework indicates that there is sufficient service capacity in the AH period to support the community. However, support to improve AH access for specific population groups may be warranted. As such, if NWMPHN is to commission interventions in this area, potential providers will need to articulate the rationale for support and validate the 'need' before any action is taken.

APPENDIX A – LIST OF NHSD SERVICE CATEGORIES USED IN COMPOSITE SCORE INDEX ANALYSIS

Service Category (Impact Co. assigned)	Primary Service Type (NHSD data)
General Practice	General Practice/GP (doctor)
	GP Surgery GP Skin Cancer Services
Pharmacy	Hospital Pharmacy
	Pharmacy
Mental Health Clinical Outpatient	Adult Mental Health Services
	Child and Adolescent Mental Health Services
	General Mental Health Services
	Mental health assessment/triage/crisis response
	Mental health case management/continuing care
	Mental health non-residential rehabilitation
	Perinatal Mental Health
	Bereavement counselling
	Crisis counselling
	Clinical Psychology Service
	Family counselling and/or family therapy
	Psychiatry (requires referral)
	Psychology
	Sexual assault counselling
	Telephone Counselling
	Trauma counselling
	Victims of crime counselling
	Support groups
Mental Health non-clinical	Mental health advocacy
	Mental health information/referral
Mental Health Clinical In-patient	Mental health inpatient services (hospital psychiatric unit) - requires referral
	Mental health residential rehabilitation/community care unit
Residential Aged Care	Aged Care Residential Permanent
	Aged Care Residential Respite High Care
	Aged Care Residential Respite Low Care
	Aged Residential Care
Aged Care non-health service	Aged care assessment
	Aged Care information/referral
	Aged Care Transport
Chronic Disease Service	Chronic Disease Management
	Diabetes Educator
	Cancer Support Groups
	Dialysis Service
	Community Cancer Services
AOD Service	Drug and/or alcohol counselling
	Drug and/or alcohol information/referral
	Drug and/or alcohol support groups
	Non-residential alcohol and/or drug dependence treatment

	Residential alcohol and/or drug dependence treatment
	Pharmacotherapy (e.g. methadone) program
	Needle and Syringe Program
Aboriginal Health Service	Aboriginal Health Clinic
	Aboriginal Health Worker
Allied Health Service (non-Mental Health)	Chiropractic
	Exercise Physiology
	Physiotherapy
	Massage therapy
	Occupational therapy
	Speech pathology/therapy
	Kinesiology
	Osteopathy
	Podiatry
Accommodation Services	Accommodation placement and/or support
	Accommodation/Tenancy
	Crisis/emergency accommodation
	Homelessness support
	Housing information/referral
CALD-specific Services	Culturally tailored health promotion
	Culturally tailored support groups
	Interpreting/Multilingual/Language service
	Migrant Health Clinic
	Refugee Health Clinic
Carer Support Services	Carer support
	Respite care
Services for older persons	Case management for older persons
	Geriatric medicine
	Personal care for older persons
Diagnostic Services	Diagnostic Radiology/Xray/CT/Fluoroscopy
	Diagnostic Ultrasound
	Endoscopy Service
	Magnetic Resonance Imaging (MRI)
	Pathology - General
	Pathology - Genetics
	Pathology - Haematology
Disability Services	Disability advocacy
	Disability aids & equipment
	Disability Care Transport
	Disability case management
	Disability day programs & activities
	Disability information/referral
	Disability support packages

	Assist-Personal Activities
Children/Family Health Services	Early childhood intervention
	Early Childhood Supports
	Early Parenting Support
	Family planning
	Family Violence
	Family violence counselling
	Integrated Family Services
	Maternal, Child and Family Health
	Midwifery Service
	Parenting & family support/education
Hospitals	Hospital Services
Women's Health Services	Gynaecology
Men's Health Services	Men's Health Clinic
Nursing Care Services	Home Nursing
	Nursing
Palliative Care Services	Palliative Medicine
Sexual Health Services	Sexual health
Youth-specific Services	Youth drop in/assistance/support
	Youth Health Clinic

APPENDIX B – LIST OF COMPOSITE INDEX SCORE INDICATORS

INDICATORS USED TO MEASURE 'AH NEED'

Label	Description	Source	Calculations	Rational for inclusion
Estimated resident population (ERP) 2016	2016 Estimated Resident Population	PHIDU/ Census2016	-	Larger population size will require additional AH services compared to smaller populations
ERP 0-4YR %	Proportion of 2016 resident population who are 0-4 years old	PHIDU/ Census2016	ERP2016 0-4 year olds / ERP2016	Literature review and VEMD analysis
ERP 65+YR %	Proportion of 2016 resident population who are 65years of age or older	PHIDU/ Census2016	ERP2016 20-24 year olds / ERP2016	Literature review and VEMD analysis
pop growth %	Projected annual percentage population growth between 2016 and 2031	Victoria in Future	(ERP2031-ERP2016/ERP2016*100)/ 15years	A growing population will require additional AH services to serve future needs.
growth 0-4YR %	Projected annual percentage population growth among 0-4 year olds between 2016 and 2031	Victoria in Future	(ERP 0-4year olds in 2031-ERP 0-4 year olds in 2016/ERP 0-4 year olds in 2016*100)/15years	Growth among high AH ED using population cohorts will increase the needs for AH services to serve these cohorts
growth 65+YR %	Projected annual percentage population growth among 65+ year olds between 2016 and 2031	Victoria in Future	(ERP 65 year olds in 2031-ERP 65+ year olds in 2016/ERP 65+ year olds in 2016*100)/15years	Growth among high AH ED using population cohorts will increase the needs for AH services to serve these cohorts
ERP hless %	Proportion of 2016 resident population who were homeless	PHIDU/ Census2016	ERP2016 homeless persons / ERP2016	Literature review; priority focus of NWMPHN
% of Humanitarian Settlers	Proportion of humanitarian settlers who were settled in the NWMPHN region in 2017	DSS	Number of humanitarian settlers in LGA / Total number of humanitarian settlers in NWMPHN	Refugee health is a priority focus of the PHN. Refugees are recorded in migration data under the 'Humanitarian Migration Stream'. This visa subclass includes refugees and is the best indicator available for identifying where refugees are settling in Australia
Born in top5 humanitarian countries	Proportion of 2016 resident LGA population born in one of the top 5 countries contributing to humanitarian settlement in Australia.	DSS/ Census2016/ PHIDU2016	Number of people in LGA born in Iraq, Syria, Afghanistan, Myanmar or Iran / LGA ERP2016	Humanitarian settlers by LGA only indicates where new refugee migrants initially settled/intended to settle. This indicator was included to provide a better indication of where vulnerable population groups from the countries where most refugees are coming from have settled over a longer period of time.

ERP ATSI	Proportion of 2016 resident population who identify as Aboriginal and/or Torres Strait Islander	PHIDU/Census 2016	Number of indigenous persons 2016/ ERP2016	Literature review; priority focus of the PHN
ERP NESB %	Proportion of 2016 resident population born in predominately NES countries	PHIDU/Census 2016	Number of people born in predominantly non-English speaking countries / ERP2016	Literature review; priority focus of NWMPHN
ERP PoorEng %	Proportion of 2016 resident population with poor English proficiency	PHIDU/Census 2016	Number of people with poor English proficiency / ERP2016	Literature review; priority focus of NWMPHN
IRSD	SEIFA Index of Relative Socio-Economic Disadvantage Score (IRSD)	PHIDU/Census 2016	1/IRSD	Literature review
Psych distress	ASR per 100 people, aged 18 years and over, with high or very high psychological distress based on K10 scale	PHIDU 2014-15	-	Literature review
Fair/poor health ASR100	ASR per 100 people aged 15 years and over with fair or poor self-assessed health PHIDU 2014-15	PHIDU 2014-15	-	Literature review; people with poor health are more likely to require primary health services generally, therefore it follows that they will also be more likely to require services in the AH period as well
3 or more Chronic Diseases	Proportion of 2014 population living with 3 or more chronic diseases	VPHS 2014	-	Literature review; people with complex chronic conditions are more likely than the general population to require primary health services generally, therefore it follows that they will also be more likely to require services in the AH period as well.

INDICATORS USED TO MEASURE 'UNMET AH DEMAND'

Label	Description	Source	Calculations	Rational for inclusion
Cat4/5 AH Attendances	Rate per 1000 population for all category 4 and 5 emergency department attendances occurring in the after-hours period	VEMD 2015-16	Number of after-hours cat4&5 ED attendances in 2015-16 / (LGA ERP2016 *1000)	Literature review; it is assumed that individuals accessing the ED for non-urgent health issues could have been better served in the community. This data is used as an indicator of need for AH primary health services that was not met by the services available in the community

% MH Attendances	After-hours triage category 4 and 5 mental-health related ED attendances as a proportion of all after-hours ED attendances	VEMD 2015-16	Number of after-hours mental health related cat4&5 ED attendances in 2015-16 / (Number of all after-hours cat4&5 ED attendances *100)	Literature review; mental-health specific attendances have been included because mental health issues were identified as being associated with high ED utilisation and mental health is a priority area of the PHN
PPH ASR/100,000	Age standardised rate per 100,000 admissions (all hospitals) for all potentially preventable conditions	PHIDU 2014-15	-	Potentially preventable hospitalisations (PPH) are conditions where hospitalisation was believed to be avoidable with timely and adequate non-hospital care. Rate of PPH has been used here as an indicator of the unmet demand for primary health services.
% non-urgent AV calls outs	Non-urgent ambulance call outs made in the after-hours period as a proportion of all ambulance call outs	Ambulance Victoria, 2015-2018	Number of after-hours non-urgent ambulance call outs / (Number of all after-hours ambulance call outs *100)	Call outs classified as non-urgent are those that were referred on to alternate service providers and are thus likely could have been better treated in the community. This data is therefore used as an indicator of need for after-hours primary health services that were not being met by the services available in the community.

INDICATORS USED TO MEASURE 'AH SERVICE AVAILABILITY'

Label	Description	Source	Calculations	Rational for inclusion
ALL SERVICE	Rate per 1000 population of services open in the after-hours period	NHSD; PHIDU	Number of services open/LGA ERP2016 *1000	LGAs with smaller populations will likely have fewer open services, this is appropriate. To control for population size of each LGA the rate of services open per 1000 population was utilised.
GP SERVICE	Rate per 1000 population of GP services open in the after-hours period	NHSD; PHIDU	Number of GP services open / LGA ERP2016*1000	Individual services were selected for inclusion based on their alignment with NWMPHN priorities and funding remit.
PHARM SERVICE	Rate per 1000 population of pharmacy services open in the after-hours period	NHSD; PHIDU	Number of pharmacies open / LGA ERP2016*1000	
MH SERVICE	Rate per 1000 population of mental health services open in the after-hours period	NHSD; PHIDU	Number of MH services open / LGA ERP2016*1000	

ATSI SERVICE	Rate per 1000 Aboriginal and Torres Strait Islander population of Aboriginal and Torres Strait Islander health services open in the after-hours period per 1000 Aboriginal and Torres Strait Islander people	NHSD; PHIDU	Number of Aboriginal and Torres Strait Islander health services available in the after-hours period / ATSI ERP2016*1000	
CALD SERVICE	Rate per 1000 CALD population of services specifically targeting culturally and linguistically diverse people available in the after-hours period	NHSD; PHIDU	Number of CALD-specific services available in the after-hours period / LGA Poor English Proficiency ERP2016*1000	The population of people who have poor English proficiency was utilised as an indicator of the size of the CALD population as people in this cohort are likely to have the most difficulty accessing and navigating the health system and thus require specifically tailored services.
AOD SERVICE	Rate per 1000 population of alcohol and other drug (AOD) services available in the after-hours period	NHSD; PHIDU	Number of AOD service available in the after-hours period / LGA ERP2016*1000	
ALL HOURS	Rate per 1000 population of all service hours available in the after-hours period	NHSD; PHIDU	Number of service hours available in the after-hours period / LGA ERP2016*1000	Including the number of service hours provides an estimate of the available capacity of services open in the after-hours and allows for a more accurate ranking of service availability.
GP HOURS	Rate per 1000 population of GP service hours available in the after-hours period	NHSD; PHIDU	Number of GP service hours available in the after-hours period / LGA ERP2016*1000	
PHARM HOURS	Rate per 1000 population of pharmacy service hours open in the after-hours period	NHSD; PHIDU	Number of pharmacy service hours available in the after-hours period / LGA ERP2016*1000	
MH HOURS	Rate per 1000 population of mental health service hours open in the after-hours period	NHSD; PHIDU	Number of mental health service hours available in the after-hours period / LGA ERP2016*1000	
ATSI HOURS	Rate per 1000 Aboriginal and Torres Strait Islander population of Aboriginal and Torres Strait Islander health services hours available in the after-hours period	NHSD; PHIDU	Number of Aboriginal and Torres Strait Islander health service hours available in the after-hours period / ATSI ERP2016*1000	
CALD HOURS	Rate per 1000 CALD population of service hours specifically targeting culturally and linguistically diverse people available in the after-hours period	NHSD; PHIDU	Number of CALD-specific service hours available in the after-hours period / LGA Poor English Proficiency ERP2016*1000	

AOD HOURS	Rate per 1000 population of alcohol and other drug (AOD) service hours available in the after-hours period	NHSD; PHIDU	Number of AOD service hours available in the after-hours period / LGA ERP2016*1000	
MDS COVERAGE	Estimated National Home Doctor Service (NHDS) service coverage by LGA	NHDS	none	Service coverage by postcode and suburb was provided by NHDS. The list indicated whether a suburb was fully covered, partially covered or not at all covered by the locum service. Some suburbs are split across postcodes, some postcodes are split across LGAs and PHN boundaries, and population density within postcodes was not accounted for. Therefore, the final proportions are only a rough estimate of the true coverage. However, the general coverage trend across the catchment is informative and accurate.

APPENDIX C – PARTICIPANTS IN THE QUALITATIVE INTERVIEWS

Appendix C: List of participants in qualitative interviews

KEY INFORMANT PARTICIPANTS

Priority Population Group	Organisation	Interviewee
General population: Population growth and fringe areas	Macedon Ranges Health	Yvonne Campbell (General Manager, Primary Care Services)
	IPC Health	Sofi Milenkovski (Manager, Clinical Operations)
	Western Health	Dr Arlene Wake (Executive Director, Community Integration, Allied Health & Service Planning)
	Coolaroo Clinic	Dr John Hodgson (GP)
	Gisborne Medical Centre	Dr Rashida Moiz (GP)
Aboriginal and Torres Strait Islanders	IPC Health	Sofi Milenkovski (Manager, Clinical Operations)
Older adults	IPC Health	Sofi Milenkovski (Manager, Clinical Operations)
Paediatric and adolescents	The Royal Children's Hospital	A/Prof. Ed Oakley (Chief of Clinical Care)
	Headspace (Sunshine)	Chris Brunner (Practice Manager)
People at risk of, or experiencing, homelessness	Melbourne City Mission	Wayne Merritt (General Manager, Homelessness and Justice) and Simone Bursey (Clinical and Therapeutic Services Manager)
	cohealth	Sally Mitchell (Executive Director, Mental Health, AoD & Homelessness)
Disability	Your Community Health	Liz Chondros (Community Development Manager)
LGBTIQ	Drummond Street Services	Karen Field (CEO)
	Merri Community Health Service	Maryanne Tadic (General Manager, Healthy Communities)
Refugee and Asylum Seekers	Drummond Street Services	Karen Field (CEO)
	North Richmond Community Health Service	Demos Krouskos (CEO)
	IPC Health	Sofi Milenkovski (Manager, Clinical Operations)
	Merri Community Health Service	Maryanne Tadic (General Manager, Healthy Communities)

CONSUMER FOCUS GROUPS

Priority Population Group	Group Name	Host Organisation
Aboriginal and Torres Strait Islanders	Elders Lounge	IPC Health
Older adults	Knitting Group, Deer Park	IPC Health
LGBTIQ	1:1 interview with consumer accessing Queerspace services	Drummond Street Services
	YGLAM Queer Youth Theatre Group	Merri Community Health
People at risk of, or experiencing, homelessness	Consumers accessing The Living Room	Youth Projects
	Consumers accessing services at Central City	cohealth
CALD	St Albans Multicultural Group	Brimbank City Council
	Vietnamese Elderly Group	Brimbank City Council
People experiencing complex mental health	Consumers accessing services or members of the Consumer Advisory Group (CAG)	cohealth

APPENDIX D – INTERVIEW GUIDES FOR THE QUALITATIVE INTERVIEWS

Appendix D: Interview guides for the qualitative interviews

KEY INFORMANT INTERVIEW GUIDE

Introduction:

Before each one-on-one interview, the facilitator will introduce themselves as an independent Consultant engaged by NWMPHN. The purpose of this interview/focus group is to develop a richer understanding as part of its review of health services that support people during the after-hours period.

Specifically, the facilitator will cover:

- *confidentiality and anonymity;*
- *opportunity to shape the future activities of the PHN*
- *description of what NWMPHN will do with this information; and*
- *the interview approach, including: duration and if the session will be recorded/notes taken.*

Patient characteristics and interactions with health services

1. What are the key health issues that individuals present to your service with?
    a. Do these consumers reside in a specific geographic area?
2. Can you describe why [specify community group] visit your service for care?

Health seeking behaviour during the after-hours period

3. Are there specific issues that this [specify community group] present with during the after-hours period?
    a. chronic or acute issues?
    b. are there any non-health reasons?
4. What happens when your service is closed and these issues present? [non-hospital question]
5. What response is provided to category 4 or 5 patients who could be treated by other services in the community? [hospital question]

Relationship with hospitals and other services

5. What happens after a patient who is admitted or presents to a hospital ED?
    a. Is your service providing a discharge summary, or involved (in collaboration with the hospital) with the provision of outpatient care?
    b. Are any initiatives/strategies employed to minimise their return? [hospital question]

Possible solutions

7. Is there something that can be done to limit presentations of this [specify community group] during the after-hours period?

Conclusion

- *Thank interviewees for their participation and contribution*
- *Reiterate that their identities will be kept confidential and results will be anonymised.*
- *Provide contact details in case they have any additional questions related to the survey*

CONSUMER FOCUS GROUP INTERVIEW GUIDE:

Introduction:

Before each focus group, the facilitator will introduce themselves as an independent Consultant engaged by NWMPHN. The purpose of this interview/focus group is to develop a richer understanding as part of its review of health services that support people during the after-hours period.

Specifically, the facilitator will cover:

- *confidentiality and anonymity;*
- *opportunity to shape the future activities of the PHN*
- *description of what NWMPHN will do with this information; and*
- *the interview approach, including: duration and if the session will be recorded/notes taken.*

Questions:

1. When you have a particular issue regarding your health, who do you visit or contact for care or treatment?

    a. How often would you see that particular health professional? Is it on a routine basis as part of a plan or program, or only when you needed it?

2. What are some of the factors for why you chose a particular GP or a certain health professional over another? (e.g. cost, travel/access, friendliness of the doctor etc.…)

    a. What makes a good GP? Are there particular traits or characteristics you would like them to have?

3. Thinking about the times you had a good experience with a particular GP or doctor, what were some of the things that make this experience so positive?

4. Thinking about the times when you had an unsatisfactory experience with a health system, what made it unpleasant?

5. Are there certain challenges you experience when trying to access health services?

6. What happens when you need health care support and it's during the weekend or late at night? What would you do, or where would you go for treatment or help?

    a. Why would you pick a hospital?
    b. Why would you pick a GP?
        i. Past experience?
        ii. Knowledge or recommendation from others?

Conclusion

- *Thank interviewees for their participation and contribution*
- *Reiterate that their identities will be kept confidential and results will be anonymised.*
- *Provide contact details in case they have any additional questions related to the survey*

REFERENCES

References:

Allen, A.R., Turbitt, E., & Freed, G.L. (2016). Use of home visiting GP services by paediatric patients presenting at emergency departments. *Australian Family Physician, 45* (4): 230-235.

Allen, P., Cheek, C., Foster, S., Ruigrok, M., Wilson, D., & Shires, L. (2015). Low acuity and general practice-type presentations to emergency departments: A rural perspective. *Emergency Medicine Australasia, 27* (2): 113-118

Aminzadeh, F., & Dalziel, W.M. (2002). Older adults in the emergency department: A systematic review of patterns of use, adverse outcomes, and effectiveness of interventions. *Annals of Emergency Medicine, 39* (3): 238-247.

Anantharaman, V. (2008). Impact of health care system interventions on emergency department utilization and overcrowding in Singapore. *Int J Emerg Med*, *1*(1):11–20.

Austin Health. (2016). *Austin 2025: Clinical Service Plan*. Available from: http://www.austin.org.au

Australasian College for Emergency Medicine (ACEM). (2018). *Guidelines on the Implementation of the Australasian Triage Scale in Emergency Departments*. Accessed 19 July 2018 from http://www.acem.orga.u

Australian Bureau of Statistics (ABS). (2017a). *Survey of Health Care, Australia 2016*. Cat. No. 4343.0. Available from: http://www.ausstats.abs.gov.au

Australian Bureau of Statistics (ABS). (2017b). *Patient experiences in Australia: Summary of findings, 2016-17*. Accessed 19 July 2018 from http://www.abs.gov.au

Australian Bureau of Statistics (ABS). (2015). *National Health Survey: Mental health and co-existing physical conditions, 2014-15.* Accessed 17 October 2018 from http://www.abs.gov.au

Australian Commission on Safety and Quality in Health Care (ACSQHC). (2013). *Consumers, the health system and health literacy: Taking action to improve safety and quality.* Consultation Paper. Sydney: Australia. Accessed 27 November 2018 from https://www.safetyandquality.gov.au/wp-content/uploads/2012/01/Consumers-the-health-system-and-health-literacy-Taking-action-to-improve-safety-and-quality3.pdf

Australian Health Ministers' Advisory Council, 2017, *Aboriginal and Torres Strait Islander Health Performance Framework 2017 Report*, AHMAC, Canberra. Accessed 3 December 2018 https://www.pmc.gov.au/sites/default/files/publications/indigenous/hpf-2017/overview/About.html

Australian Institute of Health and Welfare (AIHW). (2018). *Australia's hospitals at a glance 2016-17*. Health services series no. 85. Cat. No. HSE 204. Canberra: AIHW

Australian Institute of Health and Welfare (AIHW). (2017a). *Emergency department care 2016-17: Australian hospital statistics.* Health services series no. 80. Cat. No. HSE 194. Canberra: AIHW

Australian Institute of Health and Welfare (AIHW). (2017b). *Aboriginal and Torres Strait Islander Health Performance Framework 2017 report: Victoria*. Cat. No. IHW 183. Canberra: AIHW.

Australian Institute of Health and Welfare (AIHW). (2014). *Australian hospital statistics 2013-14: Emergency department care*. Canberra: AIHW.

Australian Institute of Health and Welfare (AIHW). (2008). *Rural, regional and remote health: Indicators of health status and determinants of health*. Rural Health Series no.9. Cat. No. PHE 97. Canberra: AIHW.

Ballard, E.D., Cwik, M., Van Eck, K., Goldstein, M., Alfes, C., Wilson, M.E., Virden, J.M., Horowitz, L.M., Wilcox, H.C. (2017). Identification of at-risk youth by suicide screening in a paediatric emergency department. *Prevention Science, 18* (2): 174-182.

Barbera, L., Taylor, C., & Dudgeon, D. (2010). Why do patients with cancer visit the emergency department near the end of life? *Canadian Medical Association Journal, 182* (6): 563 – 568.

Bauer, G.R., Scherim, A. I., Deutsch, M., & Massarella, C. (2014). Reported emergency department avoidance, use, and experiences of transgender persons in Ontario, Canada: results from a respondent-driven sampling survey. *Annals of Emergency Medicine, 63* (6): 713-720.

Behr, J.G., & Diaz, R. (2016). Emergency department frequent utilization for non-emergency presentments: Results from a regional urban trauma center study. *PLoS ONE, 11* (1).

Berkman, N.D., Sheridan, S.L., Donahue, K.E., Halpern, D.J., Viera, A., Crotty, K., Holland, A., Brasure, M., Lohr, K.N., Harden, E., Tant, E., Wallace, I., Viswanathan, M. (2011). Health Literacy Interventions and Outcomes: An Updated Systematic Review. *Evid Rep Technol Assess.* (199): 1 - 941.

Berry, A., Brousseau, D., Brotanek, J.M., Tomany-Korman, S., & Flores, G. (2008). Why do parents bring children to the emergency department for nonurgent conditions? A qualitative study. *Pediatric Emergency Medicine, 8* (6): 360-367.

Bingham, A.L., Allen, A.R., Turbitt, E., Nicolas, C., & Freed, G.L. (2015). Co-payments and parental decision-making: A cross-sectional survey of the impact on general practice and emergency department presentations. *Australian Family Physician, 44* (12): 921 – 925.

Bird, S.R., Kurowski, W., Dickman, G.K., & Kronborg, I. (2007). Integrated care facilitation for older patients with complex health care needs reduces hospital demand. *Australian Health Review. 31(*3): 451-461.

Broadway, B., Kalb, G., Li, J., & Scott, A. (2016). *Do financial incentives influence GP's decisions to do after-hours work? A discrtete choice labour supply model.* Melbourne Institute Working Paper Series: Working Paper no. 12/16. Accessed 3 December 2018 https://melbourneinstitute.unimelb.edu.au/downloads/working_paper_series/wp2016n12.pdf

Butun, A., & Hemingway, P. (2018). A qualitative systematic review of the reasons for parental attendance at the emergency department with children with minor illness. *International Emergency Nursing, 36*: 56-62

Carayon, P., Hundt, A.S., Karsh, B.T., Gurses, A.P., Alvarado, C.J., Smith, M., & Brennan, P.F. (2006). Work system design for patient safety: The SEIPS model. *Quality & Safety in Health Care. 15*(Supplement I): i50-i58.

Carret., M.LV., Fassa, A.G., & Kawachi, I. (2007). Demand for emergency health service: factors associated with inappropriate use., *BMC Health Services Research, 7* (131).

Chisholm-Straker, M., Jardine, L, Bennouna, C., Morency-Brassard, N., Coy, L., Egemba, M.O., & Shearer, P.L. Transgender and gender nonconforming. *Transgender Health, 2* (1): 8-16

Coster, J.E., Turner, J.K., Bradbury, D., & Cantrell, A. (2017). Why do people choose emergency and urgent care services? A rapid review utilizing a systematic literature search and narrative synthesis. *Academic Emergency Medicine, 24* (9): 1137 – 1148.

Connelly, L. (2014). *An economic evaluation of the Homeless to Home health care after-hours service.* Accessed 27 November 2018 from http://www.micAfter-hours projects.org.au/resource_files/micAfterhours /IR_130_An-Economic-Evaluation-of-the-Homeless-to-Home-Health care-After-hours - Service.pdf

Conroy, E., Bower, M., Flatau, P., Zaretzky, K. (2014). *The MISHA Project: From Homelessness to Sustained Housing 2010-2013.* Sydney: Mission Australia. Accessed 27 November 2018 from https://www.missionaustralia.com.au/what-we-do/researchevaluation/misha

Davies, A., & Wood, L.J. (2018) Homeless health care: meeting the challenges of providing primary care. *Med J Australia. 209*(5): 230-234.

de Graaff, B., Nelson, M., & Neil, A. (2017). Up, up and away: The growth of after hours MBS claims. *Australian Family Physician, 46* (6): 407-411.

De Salvo, A., Rest, S.B., Nettleman, M., Freer, S., Knight, T. (2000). Patient education and emergency room visits. *Clin Perform Qual Health Care. 8*(2): 35-37

Deloitte Access Economics. (2016). *Analysis of after hours primary care pathways: National Association of Medical Deputising Services*. Canberra: Deloitte Access Economics

Dent, A.W., Phillips, G.A., Chenhall, A.J., & McGregor, L.R. (2003). The heaviest repeat users of an inner city emergency department are not general practice patients. *Emergency Medicine (Fremantle, W.A), 15* (4): 322-329

Department of Health (DoH). (2003). *Discharge from hospital: pathway, process and practice.* London. Accessed 27 November 2018 http://www.wales.nhs.uk/sitesplus/documents/829/DoH%20-%20Discharge%20Pathway%202003.PDF

Dinh, M.M., Berendsen Russell, S., Bein, K.J., Chalkley, D.R., Muscatello, D., Paoloni, R., & Ivers, R. (2016). Statewide retrospective study of low acuity emergency presentations in New South Wales, Australia: who, what, where and why? *BMJ Open, 2016* (6): e010964.

Doran, K.M., Ragins, K.T., Gross, C.P., Zerger, S. (2013). Medical respite programs for homeless patients: a systematic review. *J Health Care Poor Underserved. 24(*2): 499-524.

Dorney-Smith, S., Hewett, N., Khan, Z., & Smith, R. (2016). Integrating health care for homeless people: experiences of the KHP pathway homeless team. *Br J Healthcare Manage. 22*(4): 215-224.

Freed, G.L., Allen, A.R., Turbitt, E., Nicolas, C., & Oakley, E. (2016). Parent perspectives and reasons for lower urgency paediatric presentations to emergency departments. *Emergency Medicine Australasia, 28* (2), 211-215.

Freed, G., Gafforini, S., & Carson, N. (2015). Age-related variation in primary care type presentations to emergency departments. *Australian Family Physician, 44* (8): 584-588.

Gafforini, S., Turbitt, E., & Freed, G.L. (2016). Lower urgency paediatric injuries: Parent preferences for emergency department or general practitioner care. *Emergency Medicine Australasia, 28* (5): 564-568.

Gahagan, J., and Subirana-Malaret, M. (2018). Improving pathways to primary health care among LGBTQ populations and health care providers: key findings from Nova Scotia, Canada. *International Journal for Equity in Health. 17*(1): 76.

Garcia-Retamero, R., & Galesic, M. (2009). Communicating treatment risk reduction to people with low numberacy skills: a cross-cultural comparison. *Am J Public Health. 99*(2): 2196 – 2202.

Gazey, A., Vallesi, S., Cumming, C., & Wood, L. (2018). *Royal Perth Hospital Homeless Team: A report on the first 18 months of operation.* School of Population and Global Health, Univeristy of Western Australia. Accessed 3 December 2018 http://homelesshealthcare.org.au/wp-content/uploads/2018/07/Royal-Perth-Hospital-Homeless-Team-FINAL-report-June-2018.pdf

Gill, S.D, & Sheridan, M. (2016). Consumers vote with their feet – Emergency departments are popular for a reason. *Australian Journal of Primary Health, 22*: 269.

Gill, D., & Sharpe, M. (1999). Frequent consulters in general practice: a systematic review of studies in prevalence, associations and outcomes. *Journal of Psychosomatic Research, 47* (2): 115-130.

Greiner, P.A., Snowdon, D.A., Greiner, L.H. (1996). The relationship of self-rated function and self-rated health to concurrent function ability, functional decline and mortality findings from the Nun study. *Journal of Gerontology: Social Sciences, 51B* (5): S234-S241.

Grudzen, C.R., Stone, S.C., & Morrison, R.S. (2011). The palliative care model for emergency department patients with advanced illness. *Journal of Palliative Medicine, 14* (8): 945-950.

Hendry, S.J., & Beattie, T.F., & Heaney, D. (2005). Minor illness and injury: Factors influencing attendance at a paediatric accident and emergency department. *Archives of Disease in Childhood, 90* (6): 629-633.

Hewett, N. (2010). *Evaluation of the London Pathway for Homeless Patients.* London: UCL Hospitals. Accessed 3 December 2018 https://www.pathway.org.uk/wp-content/uploads/2013/02/London_Pathway_Evaluation.pdf

Hewett, N., Halligan, A., Boyce, T. (2012). A general practitioner and nurse led approach to improving hospital care for homeless people. *BMJ*. 345.

Hoffman, A., & Emanuel, E.J. (2013). Reengineering US health care. *JAMA. 309*(7): 661-662.

Institute of Medicine (IOM). (2012). *Best care at lower cost: The path to continuously learning health care in America.* Washington, DC: National Academies Press. Accessed 27 November 2018 from https://www.nap.edu/read/13444/chapter/1

Jackson, C. (2014). *Review of after hours primary health care: Report to the Minister for Health and Minister for Sport*. Retrieved 15 October 2018 from: http://www.health.gov.au/internet/main/publishing.nsf/content/79278C78897D1793CA257E0A0016A804/$File/Review-of-after-hours-primary-health-care.docx

Jenkins, B., & Katz, I. (2015). *Adolescents' and young adults' use of emergency departments: An evidence check rapid review brokered by the Sax Institute for NSW Kinds and Families, May 2015*. Available from: http://www.apo.org.au

Joshi, C., Russell, G., Cheng, I.H., Kay, M., Pottie, K., Alston, M., Smith, M., Chan, B., Vasi, S., Lo, W., Shukrullah, W., Harris, M.F. (2013). A narrative synthesis of the impact of primary health care delivery models for refugees in resettlement countries on access, quality and coordination. *International Journal for Equity in Health. 12*: 88.

Kaplan, G., Bo-Linn, G., Carayon, P., Pronovost, P., Rouse, W., Reid, P., & Saunders, R. (2013). *Bringing a systems approach to health.* Discussion Paper, Institute of Medicine and National Academy of Engineering, Washington, DC. Accessed 27 November 2018 from https://www.nae.edu/File.aspx?id=86344

Kelley, L., Chou, C.L., Dibble, S.L., & Robertson, P.A. (2008): A Critical Intervention in Lesbian, Gay, Bisexual, and Transgender Health: Knowledge and Attitude Outcomes Among Second-Year Medical Students. *Teaching and Learning in Medicine: An International Journal*, *20*(3): 248-253.

Knox, S.A., & Britt, H. (2004). The contribution of demographic and morbidity factors to self-reported visit frequency of patients: a cross-sectional study of general practice patients in Australia. *BMC Family Practice, 5* (17).

Kushel, M.B., Perry, S., Bangsberg, D., Clark, R., & Moss. A.R. (2002). Emergency department use among the homeless and marginally housed: Results from a community-based study. *American Journal of Public Health, 92* (5): 779-784.

Lee, Y. (2000). The predictive value of self-assessed general, physical, and mental health on functional decline and mortality in older adults. *Journal of Epidemiology and Community Health, 54*: 123-129.

Lie, D.A., Lee-Ray, E., Gomez, A., Bereknyei, S., Clarence, H., Braddock, I. (2011). Does cultural competency training of health professionals improve patient outcomes? A systematic review and proposed algorithm for future research. *Journal of General Internal Medicine*. *26*(3): 317-325.

Little, P., Somerville, J., Williamson, I., Warner, G., Moore, M., Wiles, R., George, S., Smith, A., & Peveler, R. (2001). Psychosocial, lifestyle, and health status variables in predicting high attendance among adults. *British Journal of General Practice, 51*: 987-994.

Lunsky, Y., Lin, E., Balogh, R., Klein-Geltink, J., Wilton, A.S., & Kurdyak, P. (2012). Emergency department visits and use of outpatient physician services by adult with developmental disability and psychiatric disorder. *Canadian Journal of Psychiatry, 57* (10): 601-607.

Lunsky, Y., Lin, E., Balogh, R., Klein-Geltink, J., Bennie, J., Wilton, A., & Kurdyak. (2011). Are adults with developmental disabilities more likely to visit ED? *The American Journal of Emergency Medicine, 29* (4): 463-465.

McKenzie, R., Williamson, M., & Roberts, R. (2016). Who uses the 'after hours GP helpline'? A profile of users of an after-hours primary care helpline. *Australian Family Physician, 45* (5): 313-318

Mahmoud, I., Eley, R., & Hou X. (2015). Subjective reasons why immigrant patients attend the emergency department. *BMC Emergency Medicine, 15* (4).

Martin, A., Martin, C., Martin, P.B., Martin, P.AB., Green, G., & Eldridge, S. (2002). 'Inappropriate' attendance at an accident and emergency department by adults registered in local general practice: how is it related to their use of primary care? *Journal of Health Services Research & Policy, 7* (3).

Masso, M., Bezzina, A.J., Siminski, P., Middleton, R., & Eagar, K. (2007). Why patients attend emergency departments for conditions potentially appropriate for primary care: Reasons given by patients and clinicians differ. *Emergency Medicine Australia, 19* (4): 333-340

Mehta, N., Kpelitse, K.A., Devlin, R.A., Li, L., Sarma, S. (2017). *Primary Care Access and Emergency Department Utilization: Theory and Evidence from Canada.* CHESG Special Edition. Accessed 3 December 2018 https://www.canadiancentreforhealtheconomics.ca/wp-content/uploads/2017/06/Mehta-et-al.pdf

Moore, G., Gerdtz, M., Manias, E., Hepworth, G., & Dent, A. (2007). Socio-demographic and clinical characteristics of re-presentation to an Australian inner-city emergency department: Implications for service delivery. *BMC Public Health, 7* (320).

Morley, C., Unwin, M., Peterson, G. M., Stankovich, J., Kinsman, L. (2018). Emergency department crowding: A systematic review of causes, consequences and solutions. *PLoS ONE*. *13*(8).

Nagree, Y., Camarda, V.J., Fatovich, D.M., Cameron, P.A., Dey, I., Gosbell, A.D., McCarthy, S.M., & Mountain, D. (2013). Quantifying the proportion of general practice and low-acuity patients in the emergency department. *Medical Journal of Australia, 198* (11): 612-615.

Nilsen, E., Myrhaug, H., Johansen, M., Oliver, S., & Oxman, A. (2006). Methods of consumer involvement in developing healthcare policy and research, clinical practice guidelines and patient information material. *Cochrane Database of Systematic Reviews. 19*(3).

National Health Performance Authority (NHPA). (2016). *Healthy communities: Use of emergency department and GP services in 2013-14*. Sydney: NHPA.

O'Malley, A.S. (2013). After-Hours Access To Primary Care Practices Linked With Lower Emergency Department Use And Less Unmet Medical Need. *Health Aff. 32*(1): 175-183.

Pawson, H., Parsell, C., Saunders, P., Hill, T., & Liu, E. (2018). *Australian Homelessness Monitor.* Accessed 27 November 2018 from https://issr.uq.edu.au/files/3347/FINAL_for_print_AHM_full_report.pdf

Pearson, D.A., Bruggman, A.R., & Haukoos, J.S. (2007). Out-of-hospital and emergency department utilization by adult homeless patients. *Annals of Emergency Medicine, 50* (6): 646-652.

Quilty, S., Shannon, G., Yao, A., Sergent, W. & McVeigh, M. (2016). Factors contributing to frequent attendance to the emergency department of a remote Northern Territory hospital. *Medical Journal of Australia, 204* (3): 111.e1-111.e7

Rieke, K., Smolsky, A., Bock, E., Erkes, L.P., Porterfield, E., & Watanabe-Galloway, S. (2015). Mental and nonmental health hospital admissions among chronically homeless adults before and after supportive housing placement. *Soc Work Public Health. 30*(6): 496-503

Sadowski, L.S., Kee R.A., Vander-Weele T,J., Buchanan, D. (2009). Effect of a Housing and Case Management Program on Emergency Department Visits and Hospitalizations Among Chronically Ill Homeless Adults: A Randomized Trial. *JAMA. 301*(17): 1771–1778.

Salvi, F., Morichi, V., Grilli, A., Giorgi, R., De Tommaso, G., & Dessi-Fulgheri, P. (2007). The elderly in the emergency department: a critical review of problems and solutions. *Internal and Emergency Medicine, 2007* (2): 292-301

Sanchez, N.F., Rabatin, J., Sanchez, J.P., Hubbard, S., & Kalet, A. (2006). Medical students' ability to care for lesbian, gay, bisexual, and transgendered patients. *Fam Med. 38*(1): 21-27.

Scheck, A. (2015). Special report: LGBT patients in the ED (do ask, do tell). *Emergency Medicine News, 37* (7): 16-17

Shea, S., Lima, J., Diez-Roux, A., Jorgensen, N.W., McClelland, R.L. (2016). Socioeconomic status and poor health outcome at 10 years of follow-up in the multi-ethnic study of atherosclerosis. *PLoS One, 11* (11).

Siminski, P.M., Bezzina, A.J., Lago, L.P., & Eagar, K. (2008). Trends in primary care presentations at emergency departments in New South Wales (1999 – 2006). *Australian Journal of Primary Health, 14* (3): 45-52.

Siminski, P., Cragg, S., Middleton, R., Masso, M., Lago, Luise, Green, J., & Eagar, K. (2005). Primary care patients' views on why they present to emergency departments: Inappropriate attendances or inappropriate policy? *Australian Journal of Primary Health, 11* (2): 87-95

Stafford, A., Wood, L. (2017). Tackling health disparities for people who are homeless? Start with social determinants. *Int J Environ Res Public Health. 14*(12): 1535.

The LGBT Foundation. (2017). *LGBT Foundation Pride in Practice.* Accessed 27 November 2018 https://lgbt.foundation/prideinpractice

Thomas, D. & Anderson, I. (2006). Use of emergency departments by Aboriginal and Torres Strait Islander people. *Emergency Medicine Australia, 18* (1): 68-76.

Turrell, G., Stanley, L, de Looper, M., & Oldenburg, B. (2006). *Health Inequalities in Australia: Morbidity, health behaviours, risk factors and health service use*. Health Inequalities Monitoring Series No.2. AIHW Cat. No. PHE 72. Canberra: Queensland University of Technology and the Australian Institute of Health & Welfare.

Unwin, M., Kinsman, L., & Rigby S. (2016). Why are we waiting? Patients' perspectives for accessing emergency department services with non-urgent complaints. *International Emergency Nursing, 29* (2016): 3-8.

Uscher-Pines, L., Pines, J., Kellermann, A., Gillen, E., & Mehrotra, A. (2013). Deciding to visit the emergency department for non-urgent conditions: A systematic review of the literature. *The American Journal of Managed Care, 19* (1): 47-59.

van den Heede, K., & van de Voorde, C. (2016). Interventions to reduce emergency department utilisation: a review of reviews. *Health Policy. 120*(12): 1337-1349.

van den Berg, M.J., van Loenen, T., & Westert, G.P. (2016). Accessible and continuous primary care may help reduce rates of emergency department use. An international survey in 34 countires. *Fam Pract. 33*(1): 42-50.

Wallace, E.M., Cooney, M.C., Conroy, M., & Tworney, F. (2012). Why do palliative care patients present to the emergency department? Avoidable or unavoidable? *American Journal of Hospice & Palliative Medicine, 00* (0): 1-4.

Wallick, M.M., Cambre, K.M., & Townsend, M.H. (1995). Influence of a freshman-year panel presentation on medical students' attitudes toward homosexuality. *Academic Medicine. 70*(9): 839-841.

Williams, A., O'Rourke, P., & Keough, S. (2009). Making choices: why parents present to the emergency department for non-urgent care. *Archives of Disease in Childhood, 94*: 817-820.

Wong, A.C., Claudet,I., Sorum, P., & Mullet, E. (2015). Why do parents bring their children to the emergency department? A systematic inventory of motives. *International Journal of Family Medicine, 2015*, article ID 978412.

Wood, L., Vallesi, S., Martin, K., Lester, L., Zaretzky, K., Flatau, P., & Gazey, A. (2017). *St Vincent's Hospital Melbourne homelessness programs evaluation report: an evaluation of ALERT, CHOPS, The Cottage and Prague House.* Perth: Centre for Social Impact, University of Western Australia. Accessed 27 November 2018
https://www.researchgate.net/profile/Lisa_Wood8/publication/320014059_St_Vincent's_Hospital_Melbourne_Homelessness_Programs_Evaluation_Report_An_evaluation_of_ALERT_CHOPS_The_Cottage_and_Prague_House/links/5a5eca60458515c03ee0be76/St-Vincents-Hospital-Melbourne-Homelessness-Programs-Evaluation-Report-An-evaluation-of-ALERT-CHOPS-The-Cottage-and-Prague-House.pdf

IMPACT CO.