EQUITABLE PATIENT ACCESS TO PRIMARY HEALTHCARE IN AUSTRALIA

Fergus W Gardiner, Lara Bishop, Barbara de Graaff, Julie A Campbell, Lauren Gale, and Frank Quinlan

Research Report | December 2020

Royal Flying Doctor Service

Acknowledgments

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*corresponding author: Fergus Gardiner, Royal Flying Doctor Service; (02) 6269 5500; Fergus.gardiner@rfds.org.au

About the Royal Flying Doctor Service (RFDS)

The RFDS is one of the largest and most comprehensive aeromedical organisations in the world. Using the latest in aviation, medical and communications technology, the RFDS delivers extensive primary healthcare (PHC) and 24-hour emergency service to those who live, work and travel throughout Australia.

Commitment to Indigenous Reconciliation

The Royal Flying Doctor Service of Australia (RFDS) respects and acknowledges Aboriginal and Torres Strait Islander peoples as the First Australians and our vision for reconciliation is a culture that strives for unity, equity and respect between Aboriginal and Torres Strait Islander peoples and other Australians. The RFDS is committed to improved health outcomes and access to health services for all Aboriginal and Torres Strait Islander Australians, and our Reconciliation Action Plan (RAP) outlines our intentions to use research and policy to drive improvement. RFDS research and policy reports include Indigenous data as part of a broader effort to improve health outcomes and access to health services for Indigenous Australians as a contribution to the 'Close the Gap' campaign. This research and policy report contributes to the aims of the RAP.

Royal Flying Doctor Service Research and Policy Unit

In mid-2015, the RFDS established a Research and Policy Unit, located in Canberra. The Unit's role is to gather evidence about, and recommend solutions to, improving health outcomes and health service access for patients and communities cared for by RFDS programs. The Research and Policy Unit can be contacted by phone on (02) 6269 5500 or by email at enquiries@rfds.org.au.

Notes about this report

Use of the term 'Indigenous'

The term 'Aboriginal and Torres Strait Islander peoples' is preferred in RFDS publications when referring to the distinct Indigenous peoples of Australia. However, the term 'Indigenous Australians' is used interchangeably with 'Aboriginal and Torres Strait Islander peoples' in order to assist readability.

Throughout this publication, the term 'Indigenous Australians' refers to all persons who identify as being of Aboriginal, Torres Strait Islander, or both Aboriginal and Torres Strait Islander origin.

Data limitations

Data in RFDS reports come from a number of different administrative datasets, all of which have limitations that should be considered when interpreting the results.

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Abbreviations

the Atlas	Australian Atlas of Healthcare Variation
ABS	Australian Bureau of Statistics
AIHW	Australian Institute of Health and Welfare
CVD	Cardiovascular disease
GP	General practitioner
MBS	Medicare Benefits Schedule
MI	Myocardial infarction
RA	Regional area
RFDS	Royal Flying Doctor Service
SPOT	Service Planning and Operational Tool
WHO	World Health Organization

Foreword

Dr Stephen Duckett

Access to healthcare in the bush is critical. Despite much work over past decades, many people in rural, regional and remote communities across Australia continue to experience difficulty in accessing adequate medical care and health outreach programs.

Australia prides itself on its healthcare system: however, there are many people within Australia that do not have reasonable access to primary healthcare. This report defines and focuses on those who miss out on access because of where they live. For me, the nearest general practice is a five-minute walk away. This report defines poor geographic access as more than an hour's drive away. On this definition, there are more than 42,000 Australians without any primary care within an hour's drive, and 65,000 without a GP within an hour.

Sometimes the people with poor geographic access are families or groups of less than 10 people; sometimes there might be a couple of hundred living in close proximity.

There is much evidence to show that good primary healthcare is associated with better population health, lower costs and greater equity in health (such as reducing disparities between Indigenous and non-Indigenous groups). Australia needs to improve its primary healthcare system to boost its capacity to provide a range of cultural and community-developed basic services for all Australians, rather than just to those in major cities

We have to look at imaginative solutions to address these access problems: 90 years ago John Flynn showed that imagination when he founded what became the Royal Flying Doctor Service. Providing a 'mantle of safety' for the outback, bringing services to people in remote Australia, will continue to be part of the solution to overcoming geographic barriers to access. The 'mantle of safety' now also includes telehealth services but we need to invest more in such services, including tele-monitoring and other forms of technology enabled care, to provide better access to primary care advice and treatment across a range of disciplines, including allied health.

Australians should have access to core primary healthcare, regardless of where they live in Australia.

Dr Stephen Duckett
Health Program Director
Grattan Institute

GRATTAN Institute

Summary

Rural and remote populations have poorer health outcomes and lower levels of access to healthcare. People living in these areas are frequently required to travel, sometimes significant distances, to inner regional areas and major cities to access comprehensive primary healthcare services.

There has previously been little research that determines if there is equitable access to primary healthcare for patients with an equal need in rural and remote as compared to other areas of Australia. Equitable access requires the provision of care of equal quality to everyone. Age, gender, Indigenous status, income, geographic location or any other demographic variable should not result in poorer access to care.

Equity in healthcare ensures equal access for those with an equal need; equal utilisation for those with an equal need; and equal or equitable outcomes, often measured by quality-adjusted life expectancy.[2] Equitable access can therefore be measured by reviewing population health outcomes, such as mortality comparisons between different population groups. **This report finds that rural and remote populations are a high needs population, and identifies specific locations where there is inequitable access to primary healthcare services** - general practitioners (GPs), nursing, oral health, mental health and Aboriginal Health Services.

This report also considers reasonable access to healthcare: the fulfilment or obtainment of health services in a timely, accessible, affordable and culturally appropriate manner. There is currently no agreed, comprehensive definition of what otherwise constitutes reasonable access to healthcare, including the maximum distance a person should be required to travel to access healthcare, and the type and frequency of health services that should be accessible to a person within this travel distance. This is problematic for many organisations delivering healthcare to people living outside of major cities, such as the Royal Flying Doctor Service (RFDS), who strive to provide high-quality, culturally appropriate healthcare in a timely manner.

In the rural and remote context with small populations spread across large geographical areas, it is not realistic for everyone to have access to permanent, local services. However, all should have reasonable access to services. The Australian Institute of Health and Welfare (AIHW), proposes a patient's ability to access primary healthcare within 60 minutes of motor vehicle travel as one measure of reasonable access. This report adopts this measure and contends that **to achieve reasonable or equitable access to primary healthcare, people should have, at a minimum, GP, nursing, oral health and mental health services accessible within 60 minutes.** Access in this regard could include the ability to utilise permanent services, visiting or 'fly-in fly-out' services within 60 minutes, and have timely access to telehealth services as part of an integrated suite of services.

This report finds that 42,805 Australians, or **almost 10% of people living in inner regional, outer regional, remote or very remote Australia, had no access to any primary healthcare services within a 60-minute drive time.** Through the Stronger Rural Health Strategy, the Commonwealth Government has committed to ensuring "a sustainable, high quality health workforce that is distributed across the country according to community need, particularly in rural and remote communities". This report identifies areas of highest need, being populations and locations without access to primary healthcare services within a 60-minute drive time, and recommends that these should be addressed first.

Future work should be undertaken, as a priority, to develop a more comprehensive definition and baseline measure of what constitutes equitable and reasonable access to primary healthcare. In addition to the 60-minute drive time, consideration should be given to other physical accessibility factors as well as the financial affordability, cultural safety and acceptability of services. Establishing such a minimum benchmark would be of immense value to policy makers, funders and service delivery organisations to provide a common reference point for the services Australians should reasonably expect to receive, no matter where they live.

The need for equitable access has been further highlighted during the COVID-19 pandemic. Many of the severe COVID-19 patients internationally have been reported to have an underlying history of hypertension, diabetes, coronary heart disease, COPD, and renal disease. Remote and very remote populations have higher rates of these conditions making them more vulnerable populations if infection rates increase in these areas. Simultaneously, these populations have poorer access to primary health care and preventative services. Reducing the incidence of comorbidities by ensuring reasonable and adequate access to comprehensive primary health care would lower these risks.

Research Aims

The primary aims of this brief report are to determine how many Australians have access to primary healthcare, and identify population concentrations that do not have access to primary healthcare within a 60-minute drive time. Secondary aims include determining whether rural and remote populations utilise medical services at the same rate as people living in major cities and whether mortality rates vary by remoteness of residence.

For the primary research aim, we used data from the Australian Bureau of Statistics (ABS) to derive geographical population estimates. We defined ‘primary healthcare’ as including nursing, GP, dental, mental health, and Aboriginal health services as registered on Health Direct. We then used the RFDS Service Planning and Operational Tool (SPOT) to map coverage of primary healthcare services across Australia, with a focus on rural and remote Australia. To determine utilisation by remoteness area (major city, inner and outer regional, and remote and very remote) we used open access Medicare Benefits Schedule (MBS) statistics. ABS population data was used to determine utilisation per 100,000 population. To determine whether rural and remote populations have equal mortality as compared to major cities, we used the ABS 2017–18 age-standardised death rates by remoteness area. We report our data and findings as summary descriptive statistics.

Summary of findings

Results show that major cities had at least one primary healthcare service available (i.e. GP, nurse clinic, dentist and/or a mental health service). 91.1% (n=5,815,981) of people living in inner regional, outer regional, remote and very remote Australia had access to at least one primary healthcare service within a 60-minute drive time. **However, 42,805 people had no access to any primary healthcare services within a 60-minute drive time.** Furthermore, when looking at the specific primary healthcare type, **65,050 Australians had no access to a GP, 440,387 had no access to a nurse-led clinic, 142,269 had no access to dental services, and 106,848 had no access to mental health services** within a 60-minute drive time. Indigenous Australians accounted for between 11.3% and 31.4% of people without access to primary healthcare services, depending on the primary healthcare type. Additionally, **41,758 Indigenous Australians did not have access to Aboriginal health services,** which are known to provide culturally appropriate primary healthcare.

Utilisation of Australian MBS items, in the financial year 2017–18, ranged from 1.7 million per 100,000 population in major cities to 1.0 million per 100,000 in very remote regions. People in major cities accounted for the majority (72.1%) of MBS services, while rural and remote residents accounted for the remainder (27.9%) of MBS services used in Australia. Outside of the MBS, the RFDS provided an additional 148,749 individual primary healthcare medical services to rural and remote areas of Australia, resulting in an additional 615.0 services per 100,000 of the Australian population. When calculating the average MBS utilisation by person (i.e. the number of MBS services used, on average, per person over the financial year 2017–18), people living in major cities and inner regional areas utilised an average of 17.2 and 17.7 MBS services respectively. MBS service utilisation decreased with increasing remoteness, with MBS utilisation rates of 16.1, 13.0 and 10.1 services per person in outer regional, remote and very remote areas respectively. However, when combined with the RFDS medical service utilisation, remote and very remote areas increased to 16.3 and 13.8 average services, per person, respectively.

In regard to the comparison of population health outcomes, the infant death rate increased with increasing remoteness. There were 2.9 deaths per 1,000 live births in major cities compared to 5.1 deaths per 1,000 live births in rural and remote Australia. Remote and very remote areas had the highest rate of infant deaths, with 6.3 deaths per 1,000 live births. Similarly, the overall age-standardised death rate increased with remoteness from 5.2 in major cities to 6.6 per 1,000 in rural and remote Australia. Average age at death was 82.5 years in major cities and 65.3 years in very remote areas.

In summary, this study found that there are large numbers of Australians in rural and remote areas without primary healthcare access, with low utilisation of MBS, and a higher mortality rate as compared to major city areas. The rural and remote populations included in this study have high social economic disadvantage, high chronic disease rates, coupled with lower healthcare service provision.

It is recommended that ensuring all Australians have access to comprehensive primary healthcare services – GP, nursing, oral health, mental health and Aboriginal health – within a 60-minute drive time, be an initial benchmark for governments and service providers. Further, that the provision of these essential services to the locations shown in this report to have no or significantly low access be prioritised in government interventions.

1. Introduction

Key points:

- Rural and remote populations have consistently been shown to have lower levels of access to healthcare and are required to travel into inner regional and major city centres to access primary healthcare services. However, there has been no research that determines what is reasonable or equal access for those patients with an equal need in rural and remote Australia.
- Reasonable access and health coverage is the fulfilment or obtainment of health services in an accessible, affordable and acceptable manner.
- The Australian Institute of Health and Welfare (AIHW) proposes that all Australians should be able to access primary healthcare within 60 minutes by motor vehicle travel.
- Access to permanent primary healthcare for everyone in rural and remote Australia within 60 minutes may not be realistic. However, rural and remote populations should have regular access to other healthcare delivery options, such as visiting clinics, within 60 minutes and/or timely access to telehealth services. Regular access needs to be reflective of community needs.
- The literature indicates that, at a minimum, rural and remote populations should have access to general practitioners (GPs), nurses, dentists and mental health services within a 60-minute drive time, either via a permanent service, or a visiting clinic and/or have timely access to telehealth services.
- However, there has been little research to determine how many rural and remote people have access to these services within a 60-minute timeframe, and the population concentrations that would benefit from additional healthcare provision to help reduce travel time to 60 minutes or less.

There is currently no agreed definition of reasonable or equitable access to health services, despite frequent references to this concept in policy documents and published literature.[2] This absence of a definition of a commonly accepted and discussed term in Australian healthcare[3] is problematic because funders and service delivery organisations, such as the Royal Flying Doctor Service (RFDS) of Australia, do not have a common reference point to judge their adherence to this concept.[4] This is especially difficult when making comparisons across diverse populations, including rural and remote as compared to major city, and Indigenous compared to non-Indigenous, populations.[2] This brief report is not intended to review the extensive literature that purports to address the various, and often conflicting, notions of equity, access and/or need. Rather, this report aims to provide a brief description of the relevance of the reasonable access principle of equity, and then test whether there is equal access to specific primary healthcare services for those in equal need within rural and remote Australia.

There is much research on equity within healthcare from various perspectives.[5,6] These perspectives on equity in healthcare are often associated with: equal access for those with an equal need; equal utilisation for those with an equal need; and equal or equitable outcomes, often measured by quality-adjusted life expectancy.[2] Equal access for those patients with an equal need requires that all patients with need also have equal opportunities to access healthcare.[4] Equal utilisation is associated with those with an equal need also making equal use of healthcare. This equity principle requires more proactive efforts by policymakers and relies on the premise that all Australians have equal access to service provision. The idea of equal outcomes is often measured by comparing population mortality and morbidity,[2] such as comparing rural and remote to major city populations.[7] Based on these definitions, we believe that equal access to healthcare for those in equal need should be used as the primary measure of healthcare equity in the rural and remote context. This is because it relates directly to healthcare provision, does not discriminate between people who are already ill purely due to exogenous factors, and it respects reasons why different people in equal need may use more or less of a given health service.

Rural and remote populations have consistently been shown to have lower levels of access to healthcare,[8] and are required to travel into inner regional and major city centres to access primary healthcare services.[7] However, there has been no research that determines what is reasonable or equal access for those patients with an equal need in rural and remote Australia.

The World Health Organization (WHO) defines reasonable health coverage as attained “when people actually obtain the health services they need and benefit from financial risk protection”, whereas they define reasonable health access as “the opportunity or ability to do both of these things”.[9] Hence, health coverage is not possible without reasonable access. Based on the literature, reasonable access has three dimensions, including physical accessibility, financial affordability and acceptability.[10-12]

The first principle, ‘physical accessibility’, is especially relevant to rural and remote populations and is fulfilled when high-quality services are readily available, and located close to people who need them. To achieve this, services need to be available and have the required inputs to provide the service, including structures, medical equipment, and health personnel, products and technologies. The Australian accreditation frameworks require a certain level of service quality; however, the tyranny of distance in rural and remote Australia is believed to impact the ability of people to physically access services within a reasonable traveling time.[9]

The second principle is ‘financial affordability’. Financial affordability is in part improved by providing populations with access to Medicare and block-funded services. However, these funding streams do not consider patient out-of-pocket expenses, such as the costs of transportation and time away from work. Affordability is thus impacted by the wider health system funding arrangements and by household incomes.

The last principle, 'acceptability', concerns a patient's willingness to accept and seek services. Patients may be less willing to access health services if the services do not consider community social and cultural factors, such as language, age, gender, or the ethnicity or religion of the people they serve.[9] This is especially important in a rural and remote context, which has a high proportion of Indigenous Australians. As such, reasonable access and health coverage is the fulfilment or obtainment of health services in an accessible, affordable and acceptable manner. Rural and remote residents should be able to access emergency care in less than 60 minutes and secondary care in less than two hours.[13] The Australian Institute of Health and Welfare (AIHW) proposes that all Australians should be able to access primary healthcare within 60 minutes by motor vehicle travel.[3,14] This time limit is consistent with research which found that 20% of rural Indigenous patients travel more than 30 minutes to seek Aboriginal Health services, but only 8% would travel longer than 60 minutes.[15]

Access to permanent primary healthcare for everyone in rural and remote Australia within 60 minutes may not be realistic. However, rural and remote populations should have regular access to other healthcare delivery options, such as visiting clinics within 60 minutes and/or timely access to telehealth services, especially in light of the social isolation restrictions due to COVID-19. Regular access needs to be reflective of community needs. For example, a clinic that traditionally visits a community monthly may need to visit more often depending on the changing community needs, such as in the case of a cancer patient needing chemotherapy or a young mother needing prenatal care. As such, policymakers should aim to provide primary healthcare access to all Australians within 60 minutes of motor vehicle travel, or when this option is not available, to use other efficient service delivery options, such as telehealth.

Reasonable or equitable access to primary healthcare is vitally important, however it is unclear what core primary healthcare services should be available to all Australians living in rural and remote communities. The AIHW defines primary healthcare as "typically the first contact an individual with a health concern has with the health system", with primary healthcare covering health services "not related to a hospital visit, including health promotion, prevention, early intervention, treatment of acute conditions, and management of chronic conditions".[16] The AIHW considers general practitioners (GPs), nurses, allied health professionals (undefined), midwives, pharmacists, dentists, and Aboriginal health practitioners as primary healthcare professionals.[16] This is consistent with a survey of 39 experts that found rural and remote populations should have access to primary healthcare services that provide: care of the sick and injured, mental health, maternal/child health, allied health, sexual/reproductive health, rehabilitation, and oral/dental health services, and public health/illness prevention.[17] Furthermore, the WHO and other research defines core primary healthcare services as having capacity to provide GP, nursing, oral health and mental health services.[18,19]

As such, at a minimum, rural and remote populations should have access to GPs, nurses, dentists and mental health services within a 60-minute drive time, via a permanent service, a visiting clinic and/or timely access to telehealth services. Rural and remote populations have been identified as having a higher prevalence of chronic disease, as compared to major city populations, and have been identified as a high needs group, especially remote Indigenous populations.[3] However, there has been little research to determine how many rural and remote people have access to these services within a 60-minute timeframe, and which population concentrations would benefit from additional healthcare provision to help reduce access travel time to 60 minutes or less.

1.1. Aims

The primary aims of this report are to:

- determine how many Australians have access to primary healthcare within a 60-minute drive time; and
- identify population concentrations that do not have access to primary healthcare within a 60-minute drive time.

The secondary aims of this report are to:

- determine whether rural and remote populations utilise medical services at a similar rate to major city populations; and
- determine whether rural and remote populations have equal mortality as compared to major cities.

2. Methods

Key points:

- The RFDS provides essential aeromedical and primary healthcare to rural and remote populations and visitors who are unable to access traditional services, including those provided through the Medicare Benefits Schedule (MBS).
- To determine how many Australians, have access to primary healthcare within a 60-minute drive time, we used 2016–17 population data from the Australian Bureau of Statistics (ABS) to derive geographical population estimates. We then used the Service Planning and Operational Tool (SPOT) to map coverage of primary healthcare services across Australia.
- To determine utilisation by remoteness area we used open access MBS statistics. Using the overall 2017–18 MBS utilisation values, we then used the 2016–17 ABS population data to determine utilisation per 100,000 population.
- To capture the utilisation of services outside of the MBS, which are block funded, we used RFDS episodes of care and patient use of medical services. To determine utilisation per patient and per 100,000 population, we used the 2016–17 ABS population data to determine population for the areas serviced by the RFDS.
- To determine whether rural and remote populations have equal mortality rates as compared to major cities, we used the ABS 2017–18 age-standardised death rates by remoteness area.
- We report our data as summary descriptive statistics. All statistical analysis was conducted in Excel (Microsoft). Healthcare locations were mapped using RFDS SPOT mapping software.

2.1. Setting

This report includes populations throughout Australia, with a focus on the rural and remote areas serviced by the RFDS. The RFDS provides essential aeromedical and primary healthcare to rural and remote populations and visitors who are unable to access traditional services, including those provided through the Medicare Benefits Schedule (MBS). As with other literature,[7,20,21] the terms 'rural' and 'remote' include all areas outside Australia's major cities, including areas classified as inner and outer regional (RA2 and RA3, respectively) and remote or very remote (RA4 and RA5, respectively) by the Australian Statistical Geography Standard.[22]

2.2. Data sources

For this report's primary aim, we used data from the Australian Bureau of Statistics (ABS) to derive geographical population estimates for the year 2016–17. Consistent with the AIHW,[16] we defined 'primary healthcare' as including non-RFDS and RFDS GP, nursing, dental, mental health, and Aboriginal health services as registered on Health Direct (including visiting or fly-in fly-out clinics). For an extensive list, please refer to Heath Direct.[23] We then used the Service Planning and Operational Tool (SPOT) to map coverage of primary healthcare services across Australia, with a focus on rural and remote Australia. Working from a geographic distribution of 'demand (population)' and a set of healthcare facilities that provide cover for a range of services (in this case, primary healthcare services), SPOT calculates the proportion of demand covered by those facilities within a user-specified drive time.[7] Demand is represented by population levels in different categories, including the total Australian 2016–17 population.

To determine utilisation by remoteness area (major city, inner and outer regional, and remote and very remote) we used open access MBS statistics.[24] Using the overall 2017–18 MBS utilisation values, we then used the ABS 2016–17 Census data (last completed census) to determine utilisation per 100,000 population.

To capture the utilisation of services outside of the MBS which are block-funded, we used RFDS episodes of care and patient use of medical services. To determine utilisation per patient and per 100,000 population, we used the ABS 2016–17 population data to determine population for the areas serviced by the RFDS.

To determine whether rural and remote populations have equal mortality rates as compared to major cities, we used the ABS 2017–18 age-standardised death rates by remoteness area.[25] Deaths were recorded as deaths registered for the 2017 calendar year.[26] Infant deaths were calculated per 1,000 live births, with rates calculated for 2017–18 and then averaged by remoteness area. Average age at death was calculated for 2017–18 and then averaged by remoteness area.

2.3. Statistical analysis

We report our data as summary descriptive statistics. All statistical analysis was conducted in Excel (Microsoft). Healthcare locations were mapped using RFDS SPOT mapping software.

3. Results

Key points:

- 42,805 people had no access to any primary healthcare services within a 60-minute drive time.
- There were 65,050 Australians who had no access to a GP within a 60-minute drive time.
- There were 440,387 people without access to a nurse-led clinic within a 60-minute drive time.
- There were 142,269 people without access to dental services within a 60-minute drive time.
- There were 106,848 people without access to mental health services within a 60-minute drive time.
- There were 41,758 Indigenous Australians without access to Aboriginal health services within a 60-minute drive time
- The Australian MBS utilisation rate in 2017–18 was 1,712,763 service item numbers per 100,000 population. Utilisation per 100,000 population ranged from 1.7 million services in major cities to 1.3 million and 1.0 million services in remote and very remote regions, respectively, with major cities using the majority (72.1%) of Medicare services, and rural and remote using just 27.9%.
- The RFDS provided an additional 148,749 individual primary healthcare medical services to rural and remote areas of Australia, resulting in an additional 615.0 services per 100,000 of the Australian population.
- When calculating the average MBS utilisation by person, major cities and inner regional areas had an average of 17.2 and 17.7 respectively, as compared to 16.1, 13.0 and 10.1 in outer regional, remote, and very remote areas. However, when combined with the RFDS medical service utilisation, remote and very remote areas increased to 16.3 and 13.8, respectively.
- Infant deaths per 1,000 live births increased with remoteness, with 2.9 deaths in major cities compared to 5.1 in rural and remote Australia. Specifically, the infant death rate was 6.2 deaths per 1,000 births in remote and very remote Australia.
- The age-standardised death rate increased with remoteness from 5.2 deaths per 1,000 population in major cities to 6.6 per 1,000 population in rural and remote Australia. This reflects the average age at death, which was 82.5 years in major cities and 65.3 years in very remote areas.

In the year 2016–17 there was an estimated 24,190,907 people living in Australia, with 17,311,782 people in major cities, and 6,879,125 in rural and remote areas. All major cities had a least one primary healthcare service available. 91.1% (n=5,815,981) of people living in inner regional, outer regional, remote and very remote Australia had access to at least one primary healthcare service within a 60-minute drive time. However, 42,805 people had no access to any primary healthcare services within a 60-minute drive time. The geographical regions with the highest populations of people without access to primary healthcare services within a 60-minute drive time included East Pilbara (n=3,540; 8.3%), West Pilbara (n=3,495; 8.2%), Darling Downs (n=2,535; 5.9%), the Kimberley (n=2,230; 5.2%), and the Bourke–Cobar–Coonamble region (n=2,230; 5.2%) (see Table 1).

Table 1 Rural and remote regions with lowest levels of access to primary healthcare (RFDS and non-RFDS) within a 60-minute drive

States and territories	Permanent population 2016 (%)	Population without any primary healthcare coverage within 60 minutes' drive† (%)	Population without GP coverage within 60 minutes' drive† (%)	Population without nursing clinic coverage within 60 minutes' drive† (%)	Population without dental services coverage within 60 minutes' drive† (%)	Population without mental health coverage within 60 minutes' drive† (%)	Aboriginal population without Aboriginal health coverage within 60 minutes' drive† (%)
Western Australia (WA)	2,555,978 (10.6)	16,301 (38.1)	27,043 (41.6)	81,069 (18.4)	52,522 (36.9)	48,397 (45.3)	9,428 (22.6)
Queensland (Qld)	4,845,152 (20.0)	10,882 (25.4)	11,590 (17.8)	59,092 (13.4)	19,814 (13.9)	17,110 (16.0)	7,468 (17.9)
Northern Territory (NT)	245,678 (1.0)	6,053 (14.1)	13,662 (21.0)	40,927 (9.3)	25,302 (17.8)	19,030 (17.8)	6,579 (15.8)
New South Wales (NSW)	7,732,858 (32.0)	4,365 (10.2)	5,428 (8.3)	8,439 (1.9)	15,761 (11.1)	10,452 (9.8)	1,378 (3.3)
South Australia (SA)	1,712,843 (7.1)	1,940 (4.5)	3,743 (5.8)	39,175 (8.9)	5,809 (4.1)	6,432 (6.0)	1,100 (2.6)
Tasmania (Tas)	522,414 (2.2)	1,210 (2.8)	1,342 (2.1)	124,012 (28.2)	7,711 (5.4)	2,779 (2.6)	13,439 (32.2)
Victoria (Vic)	6,173,172 (25.5)	2,054 (4.8)	2,242 (3.4)	87,673 (19.9)	15,350 (10.8)	2,648 (2.5)	2,366 (5.7)
Australian Capital Territory (ACT)	403,104 (1.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Australia	**24,191,199 (100.0)**	**42,805 (0.2)**	**65,050 (0.3)**	**440,387 (1.8)**	**142,269 (0.6)**	**106,848 (0.4)**	**41,758 (0.2)**

States and territories	Permanent population 2016 (%)	Population without any primary healthcare coverage within 60 minutes' drive† (%)	Population without GP coverage within 60 minutes' drive† (%)	Population without nursing clinic coverage within 60 minutes' drive† (%)	Population without dental services coverage within 60 minutes' drive† (%)	Population without mental health coverage within 60 minutes' drive† (%)	Aboriginal population without Aboriginal health coverage within 60 minutes' drive† (%)
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New South Wales (NSW)	7,732,858 (32.0)	4,365 (10.2)	5,428 (8.3)	8,439 (1.9)	15,761 (11.1)	10,452 (9.8)	1,378 (3.3)
South Australia (SA)	1,712,843 (7.1)	1,940 (4.5)	3,743 (5.8)	39,175 (8.9)	5,809 (4.1)	6,432 (6.0)	1,100 (2.6)
Tasmania (Tas)	522,414 (2.2)	1,210 (2.8)	1,342 (2.1)	124,012 (28.2)	7,711 (5.4)	2,779 (2.6)	13,439 (32.2)
Victoria (Vic)	6,173,172 (25.5)	2,054 (4.8)	2,242 (3.4)	87,673 (19.9)	15,350 (10.8)	2,648 (2.5)	2,366 (5.7)
Australian Capital Territory (ACT)	403,104 (1.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Australia	24,191,199 (100.0)	42,805 (0.2)	65,050 (0.3)	440,387 (1.8)	142,269 (0.6)	106,848 (0.4)	41,758 (0.2)

Esperance (WA)	16,189 (3.7)	1,506 (3.5)	1,534 (2.4)	16,152 (3.7)	2,483 (1.7)	3,135 (2.9)	625 (1.5)
Katherine (WA)	20,707 (4.7)	1,488 (3.5)	2,964 (4.6)	19,974 (4.5)	4,180 (2.9)	6,713 (6.3)	896 (2.1)
Alice Springs (NT)	39,288 (8.9)	1,361 (3.2)	3,589 (5.5)	7,205 (1.6)	10,874 (7.6)	1,598 (1.5)	2,864 (6.9)

States and territories	Permanent population 2016 (%)	Population without any primary healthcare coverage within 60 minutes' drive† (%)	Population without GP coverage within 60 minutes' drive† (%)	Population without nursing clinic coverage within 60 minutes' drive† (%)	Population without dental services coverage within 60 minutes' drive† (%)	Population without mental health coverage within 60 minutes' drive† (%)	Aboriginal population without Aboriginal health coverage within 60 minutes' drive† (%)
Wheat Belt-North (WA)	8,186 (1.8)	1,303 (3.0)	2,274 (3.5)	5,999 (1.4)	5,446 (3.8)	6,413 (6.0)	248 (0.6)
Central Highlands (Qld)	9,139 (2.1)	1,198 (2.8)	1,315 (2.0)	4,908 (1.1)	2,708 (1.9)	2,376 (2.2)	1,123 (2.7)
Mid West (WA)	9,667 (2.2)	1,157 (2.7)	1,477 (2.3)	4,855 (1.1)	6,329 (4.4)	2,233 (2.1)	907 (2.2)
Outback-North (NT)	29,315 (6.6)	1,066 (2.5)	1,978 (3.0)	4,991 (1.1)	3,211 (2.3)	1,075 (1.0)	325 (0.8)
Moree-Narrabri (NSW)	2,784 (0.6)	1,055 (2.5)	1,057 (1.6)	2,389 (0.5)	1,014 (0.7)	1,431 (1.3)	112 (0.3)
Charters Towers-Ayr-Ingham (Qld)	6,861 (1.5)	1,051 (2.5)	1,059 (1.6)	5,885 (1.3)	1,721 (1.2)	1,721 (1.6)	47 (0.1)
Outback-North-East (SA)	11,277 (2.5)	1,050 (2.5)	1,069 (1.6)	7,493 (1.7)	3,211 (2.3)	4,707 (4.4)	853 (2.0)
Eyre Peninsula and South West (SA)	36,922 (8.3)	890 (2.1)	1,765 (2.7)	34,182 (7.8)	2,598 (1.8)	1,725 (1.6)	247 (0.6)
Far North (Qld)	20,139 (4.5)	874 (2.0)	1,209 (1.9)	6,431 (1.5)	1,573 (1.1)	1,120 (1.0)	5,247 (12.6)
East Arnhem (NT)	7,391 (1.7)	809 (1.9)	3,010 (4.6)	809 (0.2)	3,010 (2.1)	1,948 (1.8)	806 (1.9)
Wheat Belt-South (WA)	5,232 (1.2)	624 (1.5)	1,152 (1.8)	3,047 (0.7)	3,923 (2.8)	5,219 (4.9)	163 (0.4)
Barkly (NT)	6,090 (1.4)	517 (1.2)	914 (1.4)	4,552 (1.0)	2,674 (1.9)	1,951 (1.8)	407 (1.0)
Albany (WA)	2,953 (0.7)	478 (1.1)	1,376 (2.1)	1,848 (0.4)	2,926 (2.1)	2,937 (2.7)	55 (0.1)
Broken Hill and Far West (NSW)	2,527 (0.6)	472 (1.1)	472 (0.7)	1,173 (0.3)	2,185 (1.5)	472 (0.4)	102 (0.2)
Lower Murray (NSW)	2,384 (0.5)	398 (0.9)	428 (0.7)	1,668 (0.4)	442 (0.3)	1,004 (0.9)	39 (0.1)
Rockhampton (Qld)	335 (0.1)	317 (0.7)	317 (0.5)	335 (0.1)	318 (0.2)	319 (0.3)	5 (0.0)
Biloela (Qld)	1,548 (0.3)	291 (0.7)	291 (0.4)	1,548 (0.4)	1,379 (1.0)	430 (0.4)	52 (0.1)
Burnett (Qld)	251 (0.1)	183 (0.4)	202 (0.3)	251 (0.1)	199 (0.1)	198 (0.2)	3 (0.0)
Others	22,065 (5.0)	3,666 (8.6)	7,745 (11.9)	225,389 (51.2)	29,904 (21.0)	10,634 (1.0)	16,371 (39.2)
Total	443,170 (100.0)	42,805 (9.7)	65,050 (14.7)	440,387 (99.4)	142,269 (32.1)	106,848 (24.1)	41,758 (9.4)
Total	**443,170 (100.0)**	**42,805 (9.7)**	**65,050 (14.7)**	**440,387 (99.4)**	**142,269 (32.1)**	**106,848 (24.1)**	

* Excluding any city or township areas.

† That is, 60 minutes' drive from place of residence to permanently located services in metropolitan, rural or remote areas. This excludes clinic waiting times and consideration of clinic patient workload capacity; for example, a health service may not have capacity to see additional patients. While these communities may have access to primary healthcare support, they had the highest proportions of rural and remote patients who needed to travel more than 60 minutes to access this support.

Note: Percentages are reported to one decimal point, and thus may not sum perfectly to 100%.

There were specific areas without GP, nursing, dental, mental health, and Aboriginal health services. Specifically, 65,050 Australians had no access to a GP within a 60-minute drive time. The majority of people without access to a GP were located in Western Australia (n=27,043; 41.6%), Queensland (n=11,590; 17.8%), and the Northern Territory (n=13,662; 21.0%). The regions of the Kimberly (n=4,902; 7.5%), West Pilbara (n=4,752; 7.3%), East Pilbara (n=3,690; 5.7%), and Alice Springs (n=3,589; 5.5%) had the most people without GP access.

There were 440,387 people without access to a nurse-led clinic within a 60-minute drive time. Of all Australians without access to a nurse-led clinic, the majority were located in Tasmania (n=124,012; 28.2%), Victoria (n=87,673; 19.9%), and Western Australia (n=81,069; 18.4%). The geographical regions with the highest populations of people without access to nurse-led clinics within a 60-minute drive time included the Eyre Peninsula (n=34,182; 7.8%), Katherine (n=19,974; 4.5%), East Pilbara (n=18,589; 4.2%), West Pilbara (n=11,985; 2.7%), and Esperance (n=16,152; 3.7%).

There were 142,269 people without access to dental services within a 60-minute drive time. Of all Australians without access to dental services, the majority were located in Western Australia (n=52,522; 36.9%), the Northern Territory (n=25,302; 17.8%), and Queensland (n=19,814; 13.9%). The geographical regions with the highest populations of people without access to dental services within a 60-minute drive time included West Pilbara (n=11,570; 8.1%), Alice Springs (n=10,874; 7.6%), the Kimberly (n=7,426; 5.2%), the region of Bourke, Cobar and Coonamble (n=6,779; 4.8%), and the Mid-West (n=6,329; 4.4%).

There were 106,848 people without access to mental health services within a 60-minute drive time. Of all Australians without access to mental health services, the majority were located in Western Australia (n=48,397; 45.3%), the Northern Territory (n=19,030; 17.8%), and Queensland (n=17,110; 16.0%). The geographical regions with the highest populations of people without access to mental health services within a 60-minute drive time included West Pilbara (n=11,570; 10.8%), Daly-Tiwi-West Arnhem (n=6,820; 6.4%), Katherine (n=6,713; 6.3%), Wheat Belt-North (n=6,413; 6.0%), and the Kimberly (n=6,259; 5.9%).

There were 41,758 Indigenous Australians without access to Aboriginal health services within a 60-minute drive time. Of all Indigenous Australians without access to Aboriginal health services, the majority were located in Tasmania (n= 13,439; 32.2%), Western Australia (n=9,428; 22.6%), and Queensland (n= 7,468; 17.9%). The geographical regions with the highest populations of people without access to Aboriginal health services within a 60-minute drive time included Braddon (Tas) (n=7,391; 17.7%), Far North (n=5,247; 12.6%), Bass (Tas) (n=3,356; 8.0%), Kimberly (NT) (n=2,988; 7.2%), and Alice Springs (n=2,864; 6.9%).

To help with operational planning we have included geographical mapping of primary healthcare provision, divided by each RFDS section and operation. This is aimed at determining local areas without any GP, nursing, dental, mental health, or Aboriginal health service availability (see Appendices 1–6), in which the RFDS could consider providing services.

The Australian MBS utilisation rate in 2017–18 was 1,712,763 service item numbers per 100,000 people (Table 2). Utilisation per 100,000 population ranged from 1.7 million services in major cities to 1.3 million and 1.0 million services in remote and very remote regions respectively, with major cities using the majority (72.1%) of Medicare services, and rural and remote using just 27.9%.

Table 2 Patient utilisation of the Medicare Benefits Schedule and RFDS primary healthcare services, in the financial year 2017–18

	Population	Number of MBS services	Average per population	RFDS episodes of care*	RFDS medical services provided	Average RFDS per population	Combined total average per person	Per 100,000 MBS	Per 100,000 RFDS	Total per 100,000
Major city	17,311,782	298,619,825	17.2	0	0	0	17.2	1,724,951	0	1,724,951
Inner regional	4,343,266	76,762,653	17.7	0	0	0	17.7	1,767,395	0	1,767,395
Outer regional	2,040,906	32,929,973	16.1	148,749	965,488	3.3	16.1	1,613,498	25,349	1,613,498
Remote	293,402	3,808,778	13.0				16.3	1,298,143		1,323,492
Very remote	201,551	2,045,434	10.1		754,787	3.7	13.8	1,014,847	3,690	1,018,537
Australia	**24,190,907**	**414,166,663**	**17.1**	**148,749**	**1,720,275**	**3.5**	**20.6**	**1,712,763**	**615**	**1,713,378**

* This includes RFDS GP, nursing, dental and telehealth clinics. RFDS mental health services were not included as the service commenced in January 2019, and data for a full year were unavailable.

The RFDS provided an additional 148,749 individual primary healthcare medical services to rural and remote areas of Australia, resulting in an additional 615.0 services per 100,000 of the Australian population. When calculating the average number of MBS utilisations by person, major cities and inner regional areas had an average of 17.2 and 17.7, respectively, compared to 16.1, 13.0 and 10.1 in outer regional, remote and very remote areas. However, when combined with the RFDS medical service utilisation, remote and very remote areas increased to 16.3 and 13.8 respectively. These figures are presented in detail in Table 2.

In 2017–18 there were 160,909 deaths in Australia. The average age at death was 81.8 years. Infant deaths per 1,000 live births increased with remoteness, with 2.9 deaths in major cities compared to 5.1 in rural and remote Australia. Specifically, the infant death rate was 6.2 deaths per 1,000 births in remote and very remote Australia. The age-standardised death rate increased with remoteness from 5.2 deaths per 1,000 population in major cities to 6.6 per 1,000 population in rural and remote Australia. Average age at death was 82.5 years in major cities and 65.3 years in very remote areas (Table 3).

Table 3 Medicare utilisation and population deaths by remoteness, in the financial year 2017–18

	Population	Number of Medicare services (%)	Per 100,000 population
Major city	17,311,782	298,619,825 (72.1)	1,724,951
Inner regional	4,343,266	76,762,653 (18.5)	1,767,395
Outer regional	2,040,906	32,929,973 (7.9)	1,613,498
Remote	293,402	3,808,778 (0.9)	1,298,143
Very remote	201,551	2,045,434 (0.5)	1,014,847
Australia	**24,190,907**	**414,166,663 (100.0)**	**1,712,763**

	Population	Deaths	Infant deaths (per 1,000 live births)	Standardised death rate (per 1,000 population)	Average age at death
Major city	17,311,782	105,060	2.9	5.2	82.5
Inner regional	4,343,266	36,365	3.6	5.9	81.5
Outer regional	2,040,906	16,149	4.1	6.1	79.3
Remote	293,402	1,792	4.8	6.4	74.8
Very remote	201,551	1,054	7.7	7.9	65.3
Australia	**24,190,907**	**160,420**	**3.2**	**5.5**	**81.8**

Note: Percentages are reported to one decimal point, and thus may not sum perfectly to 100%.

4. Discussion

Key points:

- To achieve reasonable or equitable access to primary healthcare, people should have, at a minimum, GP, nursing, oral health and mental health services accessible within 60 minutes, via a permanent service, a visiting clinic, and/or timely access to telehealth services.
- Although we found that most people had access to a primary healthcare service, many people in those regions had limited access to GPs (n=65,050; 14.7%), nurse-led clinics (n=440,387; 99.4%), dentists (n=142,269; 32.1%), mental health services (n=106,848; 24.1%), and Aboriginal health services (n= 41,758; 9.4%). This finding is consistent with research demonstrating that many rural and remote areas have poor provision of GPs, nurses, dentists, and mental health workers.
- These results are concerning, as a country that prides itself on its healthcare is at the same time not providing the "highest attainable standard of health", which is "one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition".[1] By not providing basic primary healthcare, we are not fulfilling this basic human right to all Australians.
- An undersupply of acute and subacute hospital services, and to a lesser extent, access to aged care services, has been commonly reported in rural and remote areas. Geographical accessibility and the need to travel to access health services, often over large distances, is a major challenge, particularly for older people.
- We found that rural and remote Australians use the MBS at a much lower rate than people living in major cities. Many rural and remote areas of Australia do not have access to services provided through the MBS, and as such utilise fewer of these services. In addition, the out-of-pocket costs incurred whilst seeking these services, such as travel and productivity losses, may be a further factor in lower utilisation rates.
- Rural and remote populations have a disproportionately higher level of socioeconomic disadvantage compared to major city areas, a factor also associated with increased avoidable mortality and higher rates of chronic disease. It appears that those with the highest need are accessing and utilising primary healthcare services at lower rates.

> To improve access or healthcare availability, existing policies have included offering primary healthcare infrastructure grants, increasing generalist training in rural and remote areas, increasing skilled immigration, and encouraging provider substitution. There have been some problems with these policy interventions, such as an over-reliance on overseas-trained clinicians, time delays, a lack of national coordination, and a lack of a focus on retention of the rural and remote workforce.

> Future policies, aimed at improving retention of health workers in rural and remote Australia, should consider supporting: interventions that employ/admit students from rural and remote backgrounds; the establishment of rural and remotely located medical schools with a focus on training rural students; clear career educational progression; enhanced scope of practice; and improving living conditions for the rural and remote workforce.

This report found that all people in major cities (100.0%) had access to at least one primary healthcare service within a 60-minute drive from their place of residence. While the majority of people residing in rural and remote locations also had such access, almost 9% did not have access to any type of primary healthcare service. However, there are many remote populations without any access to at least one primary healthcare service, such as the Pilbara region, with 7,035 people without access. As such these remote areas have low healthcare service provision, coupled with high social economic disadvantage, and high chronic disease rates. This is concerning, given that if COVID-19 infection (or any major disease) reached these areas the ability to identify early would be significantly impacted, which in turn would led to compounded worse outcomes for these communities.

We found that rural and remote populations utilise medical services at a much lower rate compared to people in major cities (1.0 million per 100,000 versus 1.7 million, respectively), with rural and remote populations using just 27.9% of Medicare services. However, when combined with RFDS service utilisation, major cities and inner regional areas have an average utilisation per patient of 17.2 and 17.7, compared with outer regional, remote and very remote areas, which have 16.1, 16.3 and 13.8 respectively. Furthermore, it was found that the rate of infant deaths increased with remoteness, with 2.9 deaths per 1,000 live births in major cities compared to 5.1 in rural and remote Australia. Similarly, the age-standardised death rate also increased with remoteness, from 5.2 deaths per 1,000 population in major cities to 6.6 deaths per 1,000 population in rural and remote Australia, reflecting average age at death differences between major cities and very remote areas (82.5 versus 65.3 years, respectively).

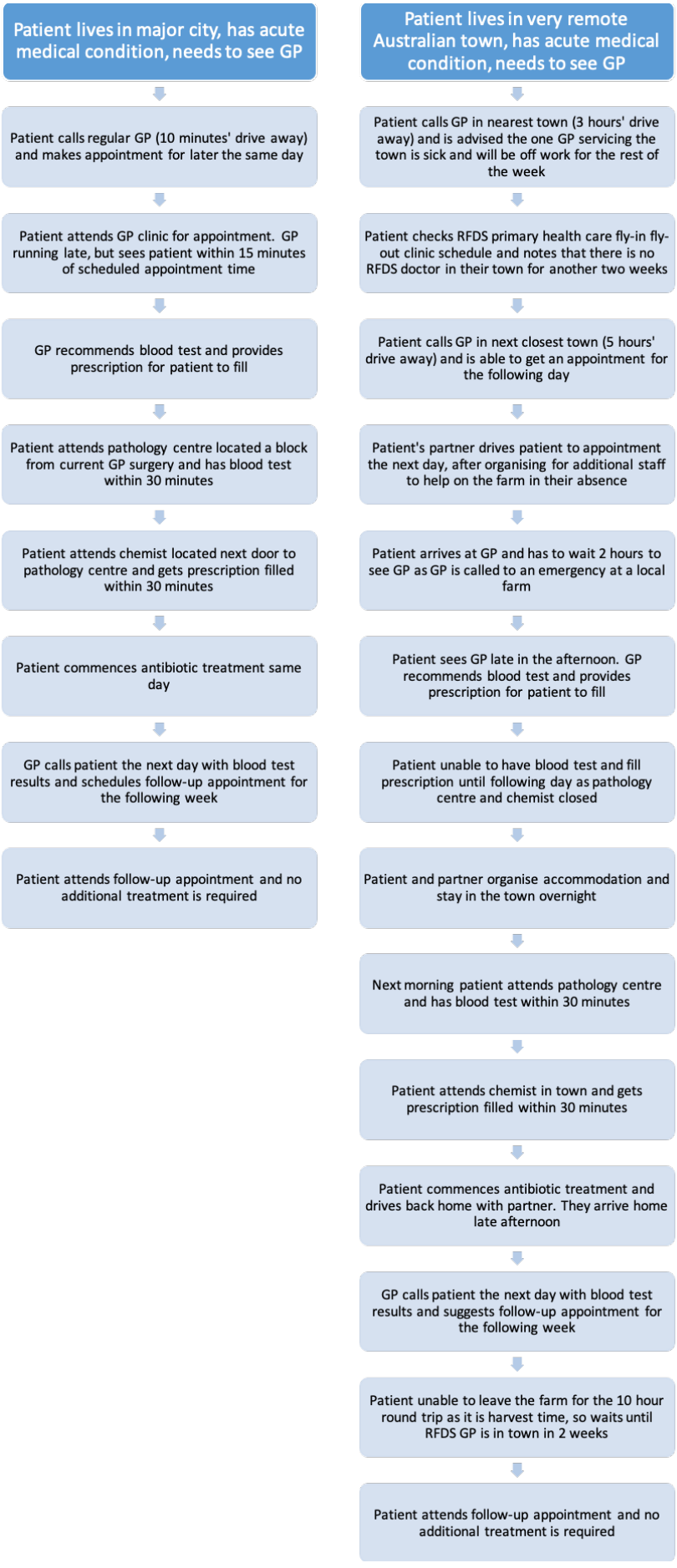
While the majority (91.1%) of rural and remote areas had access to at least one primary healthcare service, including non-RFDS and RFDS GP, nursing, dental, mental health services, and Aboriginal health services, within a 60-minute drive time, significant gaps were observed. For these populations, 14.7% had no access to a GP within a 60-minute drive (n=65,050), 99.4% to a nurse-led clinic (n=440,387; 99.4%), 32.1% to a dentist (n=142,269), 24.1% to a mental health service (n=106,848), and 41,758 Indigenous Australians to an Aboriginal health service. These findings are consistent with research demonstrating that many rural and remote areas have poor clinical provision of GPs, nurses, dentists and mental health workers.[27,28]

The current study is the first to show population areas without reasonable access to primary healthcare, and is consistent with a survey of 454 community members and 52 clinicians living or working in rural and remote areas.[28,29] The surveyed community members stated that access to general health services was the most important health consideration, with almost one-third of responses (32.5%) identifying general health access as a key priority.[29] The respondents believed health expenditure should be prioritised towards expanding access to health services in country areas. The clinicians stated that more resources should be invested into health literacy education, the provision of mental health services, and to improving health infrastructure.[28] Our findings, combined with previous findings, indicate that primary healthcare access and clinical service provision continues to be a problem in rural and remote Australia.

To achieve reasonable or equitable access to primary healthcare, people should have, at a minimum, access to GP, nursing, oral health and mental health services, within 60 minutes, provided via a permanent service or a visiting clinic, and/or timely access to telehealth services.[18] However, as our results demonstrate, there are many communities throughout Australia without these services. Furthermore, these figures do not account for actual clinical numbers in these areas, or the ability for current clinics/services to provide treatment. This is concerning, as a country that prides itself on its healthcare, is at the same time not providing the "highest attainable standard of health", which is "one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition".[1] By not providing basic primary healthcare, we are not fulfilling this basic human right to all Australians.

Many Australians living in rural and remote areas need to travel hundreds of kilometres to access health services, or alternatively wait for health services to visit, such as the RFDS.[30] An undersupply of acute and subacute hospital services, and to a lesser extent, access to aged care services,[8] has been commonly reported in rural and remote areas.[31] Geographical accessibility and the need to travel to access health services, often over large distances, is a major challenge, particularly for older people.[32] Many older patients require assistance from family members or other forms of transport to access services,[33] which is not always feasible in rural and remote areas, potentially leading some patients to only seek help at crisis point.[34] A recent study found that a large proportion of people, especially older people from rural and remote regions, need to drive for more than 60 minutes to reach health services, including hospitals, emergency departments, primary healthcare, and rehabilitation and management services.[35] This difficulty is highlighted in Figure 1, which details a metropolitan and a very remote patient primary healthcare journey.

Figure 1 Comparison between a major city and a very remote patient journey



The Australian Atlas of Healthcare Variation (the Atlas) series has been designed to show the variation and inequities in the way healthcare is delivered and utilised. The Atlas uses data sourced from four national health datasets, including MBS data, National Hospital Morbidity Database, National Perinatal Data Collection, and Pharmaceutical Benefits Scheme data.[36] The Atlas series often demonstrates that rural and remote populations have higher rates of disease, coupled with lower rates of service utilisation. For example, The Second Australian Atlas of Healthcare Variation[37] indicates that rural and remote populations, especially Indigenous Australians, are at greater risk of having a myocardial infarction (MI) (heart attack) and atrial fibrillation (abnormal heart rhythm). The Third Australian Atlas of Healthcare Variation[36] found that rates of cardiac tests, imaging and standard echocardiography were significantly higher in major cities as compared to rural and remote areas. As rural and remote people are at greater risk of heart disease, there appears to be a maldistribution of essential preventative services.[3] This maldistribution is further highlighted by the RFDS aeromedical retrieval numbers for MI, which may have been reduced with equitable screening.[38]

Consistent with the Atlas, we found that rural and remote Australians use MBS at a much lower rate than people living in major cities. However, many rural and remote areas of Australia do not have access to the MBS, and as such utilise less Medicare services because they are required to travel, consequently incurring greater out-of-pocket expenses.[39] However, as Medicare is designed to provide equitable access to healthcare for all Australians,[40] MBS utilisation is often used as a proxy in rural and remote areas as an indicator of service provision without considering non-Medicare service utilisation, including block-funded organisations such as the RFDS. Future research should consider rural and remote population use of non-Medicare and Medicare services, to get a clear picture of service utilisation and frequency. This would allow comparisons between rural and remote and major city populations.

We found that the mortality rates are higher in rural and remote areas as compared to major cities (6.6 versus 5.2 deaths per 1,000 population), where access to healthcare is higher. Poorer access to health care, coupled with higher infant mortality rates (5.1 versus 2.9 per 1,000 children), is believed to contribute to lower life expectancy in rural and remote areas as compared to major cities (65.3 versus 82.5 years, respectively).

The leading cause of death in rural and remote Australia is cardiovascular disease (CVD), and specifically MI and stroke.[3,35] Higher CVD mortality rates in rural and remote areas have been attributed to barriers in accessing optimal health services, higher costs, difficulties in sourcing fresh food, higher proportions of Indigenous residents, and geographical isolation.[41] This is consistent with our results that indicated that 126,767 people in rural and remote areas (of whom 37.7% are Indigenous) do not have access to hospital services, such as emergency departments. This is concerning as early diagnosis and management is required for MI and stroke, with delays greater than 60 minutes linked to increased death rates.[42,43]

We found that rural and remote areas had higher infant mortality rates. Research has demonstrated that rural and remote mothers are more likely to be teenagers, to be Indigenous, and to have had a previous premature birth, prolonged ruptured membrane, and antenatal corticosteroid.[44] Mothers from major cities, in comparison, were more likely to have assisted conception and a caesarean section. Mothers from major cities were more likely to give birth in a tertiary hospital, with rural mothers having significantly ($p<0.01$) higher rates of infant mortality.[45] Certain maternal behaviours are associated with increased risk for adverse perinatal outcomes, such as preterm birth and small-for-gestational-age infants.[46] It is believed that certain maternal and paternal behaviours, such as smoking and alcohol use, and other factors, such as late initiation of antenatal care, are higher in rural and remote areas due to socioeconomic disparities.[47] Furthermore, poor pregnancy outcomes are associated with earlier and higher prevalence of hypertension, obesity, coronary heart disease, type 2 diabetes mellitus, autoimmune thyroid disease and some forms of cancer.[46,48] All of these conditions are significantly higher in rural and remote populations.[3]

Rural and remote populations have a disproportionately higher level of socioeconomic disadvantage compared to major city areas, a factor also associated with increased avoidable mortality and higher rates of chronic disease.[3] Like remoteness, this disparity is likely to be multifactorial and influenced by lower education levels and poorer health literacy, higher rates of health-damaging behaviours, fewer preventative measures being undertaken, and reduced access to healthcare services.[3] It appears that those with the highest need, are accessing and utilising primary healthcare services at lower rates.

Future policy interventions are required to address areas without access to basic primary healthcare services. These interventions should be aimed at providing enough core and sustainable primary healthcare services to these rural and remote areas. To improve access or healthcare availability, existing policies have included primary healthcare infrastructure grants (such as the National Rural and Remote Health Infrastructure Program), increasing generalist training in rural and remote areas, increasing skilled immigration, and provider substitution (such as nurse practitioners rather than medical officers; and dental training for rural generalists). There have been some problems with these policy interventions, such as an over-reliance on overseas trained clinicians, time delays, a lack of national coordination, and a lack of a focus on retention of the rural and remote workforce.[49] Whilst current empirical evidence to support such approaches is limited, a carefully considered and well-supported combination of approaches is likely to provide the best outcomes.[50]

The WHO has published a comprehensive set of strategies to encourage health workers to stay in remote and rural areas. These include modifying the ways students are selected and educated, while creating better working and living conditions. Specifically, this should include remodelling rural and remote education, undertaking regulatory interventions, offering financial incentives and improving personal and professional support.[51] These inventions are summarised in Table 4, and include a range of interventions that can be combined to improve the retention of the health workforce in rural and remote areas. Future policies, aimed at improving retention of health workers in rural and remote Australia, should consider supporting:

- interventions that employ/admit students from rural and remote and Indigenous backgrounds;
- the establishment of rural and remotely located medical schools with a focus on training rural students;
- clear career educational progression, such as supporting a nurses' aide in becoming a registered nurse;
- enhanced scope of practice, such as increased medication-prescribing capabilities for nurse practitioners; and
- improved living conditions for the rural and remote workforce, such as the provision of appropriate housing, access to appropriate schooling for families of remote health workers, and support for partners of health workers to find jobs.

Table 4 Evidence-based recommendations to improve the retention of the rural and remote workforce

Intervention type	Intervention	Quality of the evidence
Education	Students from a rural and remote background	There is reliable evidence that a rural background increases the likelihood of long-term practice in rural and remote areas.[52-55]
	Health professional schools outside of major cities	There is some limited research that medical schools located in rural areas are more likely to produce clinicians that practice in these areas.[50]
	Clinical rotations in rural areas during studies	There is some limited research that exposure to rural communities during studies influences future practice locations.[50,56-58]
	Curricula that reflect rural health issues	There is evidence that education focusing on primary care or a generalist perspective is conducive to producing practitioners willing and able to work in rural areas.[59-61]
	Continuous professional development for rural health workers	There is limited direct evidence on the effect of continuing education programs on retention. However, there is much supportive evidence that if delivered in rural areas, and if focused on the expressed needs of rural health workers, these programs are likely to improve the competence of rural health workers, make them feel like they are a part of a professional group, and increase their desire to remain and practise in those areas.[62]
Regulatory interventions	Enhanced scope of practice	It is unclear whether expanded scope of practice helps with workforce retention, however the evidence does show that it helps with increased job satisfaction. This was highlighted in an Australian study that found that enrolled nurses who were allowed to prescribe reported higher levels of job satisfaction than non-medication-endorsed nurses.[63,64]
	Different types of health workers	There is good evidence that suggests that different types of health workers, such as clinical officers and health assistants, contribute to improved health outcomes in rural and remote communities.[64]
	Compulsory service	Mandatory deployment of health workers in remote or rural areas for a certain period of time has been a popular intervention. However, few evaluations have been conducted in relation to the retention of health workers either during or post their obligated service period. There have been studies that revealed that physicians raised serious complaints over the management of their compulsory service scheme, however they did feel that the experience improved their competencies and had been rewarding overall.[65,66]
	Subsidised education for return of service	Normally a subsidised education involves health students entering into a contract whereby they receive some sort of financial incentive (either scholarships for their education, or loans to pay back their education, or direct financial incentives), and in exchange they commit to serve in a rural area for a certain period of time. A systematic review analysed the effectiveness of financial incentives given in return for medical service in rural areas.[67] In 18 studies there were good retention rates, yet numerous studies included in this systematic review had serious methodological flaws and therefore these findings should be interpreted with some caution.
Financial incentives	Appropriate financial incentives	Financial incentives are regularly used to encourage health workers to move and hopefully stay in rural and remote areas. However, there are few comprehensive evaluations of the effectiveness of financial incentives in rural and remote areas, with the evidence suggesting mixed results. In Australia, financial incentives were established for long-serving physicians in remote and rural areas and the amount paid varied according to location and length of service.[51,68]

Intervention type	Intervention	Quality of the evidence
Personal and professional support	Better living conditions	There is a lack of direct evidence that improving rural health infrastructure and living conditions improves retention.[69] However, studies have shown that better accommodation is one of the most important factors influencing clinicians to remain in rural areas.[70]
	Safe and supportive working environment	The literature on improving the working environment and retention is limited, however a Cochrane systematic review showed that "questionnaire-based surveys suggest that professional and personal support may also influence health professionals' choice to work in underserved areas. Professional development, ongoing training and style of health service management were important factors influencing retention of health professionals in underserved areas".[71] Health professionals are less likely to practise in facilities that are in a state of disrepair and that do not have basic supplies, such as running water, gloves, elementary basic drugs and rudimentary equipment.[70,72]
	Outreach support	There is limited evidence that clinical support outreach programs improve retention. However, there is some evidence from observational studies that these programs improve competencies and job satisfaction of rural health workers.[73-75]
	Career development programs	There is limited evidence that providing a career ladder (i.e. providing a sequence of roles from junior to senior ranks) can help retain health workers. However, evidence from surveys shows that clear career prospects are important factors for rural and remote health workers.[76] This may include a nursing ladder, consisting of an entry point of nurse aide, and progressing to patient care technician, enrolled nurse and registered nurse.
	Professional networks	There is some evidence that shows that rural professional associations increase retention. For example, the 'Dr Doc' program launched in South Australia has reportedly reduced the number of rural physicians who want to leave their practice.[77]
	Public recognition measures	There is no literature that shows public recognition increases retention, with much of the non-evidence-based literature associated with case studies. However, it is likely that simple public recognition measures can go a long way in raising the status and morale of rural health workers and thus contribute to their retention.[51]

Source: Adapted from World Health Organization. Increasing access to health workers in remote and rural areas through improved retention, 2010. https://apps.who.int/iris/bitstream/handle/10665/44369/9789241564014_eng.pdf?sequence=1&isAllowed=y. Accessed 12 July, 2019.

5. Limitations

A limitation of this report, is that it used registration data from a single source – the Health Direct database. Registration with Health Direct is voluntary and is initiated by individual health services. While Health Direct was believed to be the most robust database of healthcare services at the time of publication, some services may not have been registered, and therefore not included in the data provided through Health Direct.

This study was limited in that health service utilisation did not account for the clinical capacity of the primary healthcare provider to see additional patients; rural and remote patients wait significantly longer than major city patients to receive an appointment and see a clinician,[3] indicating that more clinicians are needed to cover the current available services. A further limitation was that utilisation only included MBS utilisation and did not cover other block funded service providers, other than the RFDS. Furthermore, frequency of utilisation and dose were not considered. This study did not differentiate whether the RFDS clinic was permanent or fly-in fly-out, or the distribution of the workforce within the rural and remote geographic regions studied.

6. Conclusion & Recommendations

This study found that 42,000 Australians do not have access to primary healthcare services within a 60-minute drive time of their place of residence. Our health system does not provide equitable access to primary healthcare for patients with an equal need in rural and remote locations. Further, there is lower utilisation of Medicare services by rural and remote Australians compared to people living in major cities. Similarly, rural and remote Australians have higher mortality rates compared to people living in major cities.

The impact of lack of equitable access to healthcare services is further highlighted in light of the COVID-19 pandemic which has seen regular primary health care reduced and disparity in services exacerbated. Populations in these areas have high rates of conditions that contribute to poorer COVID-19 outcomes, such as diabetes, renal disease, and hypertension. As such, identification and subsequent patient outcomes from COVID-19 could be significantly worse.

This report recommends that governments ensure all Australians have access to comprehensive primary healthcare services – GP, nursing, oral health, mental health and Aboriginal health – by adopting the Australian Institute of Health and Welfare's benchmark of service within a 60-minute drive time. Further, it is recommended that governments prioritise the provision of these essential services to the locations shown to have no or significantly low access to existing services.

This report has taken the Australian Institute of Health and Welfare's simple measure of 60-minute drive time to demonstrate population areas of Australia where there is not reasonable access to primary healthcare services. **Further work should be undertaken to develop a more comprehensive definition and baseline measure for what constitutes equitable and reasonable access to primary healthcare.** In addition to the 60-minute drive time, consideration should be given to other accessibility factors, timeliness, and the financial affordability, cultural safety and acceptability of services. Establishing such a minimum standard would be of immense value to policy makers, funders and service delivery organisations to provide a common reference point for the services Australians should reasonably expect to receive, no matter where they live.

Future research should also consider the capacity of non-Medicare-funded primary healthcare services, such as RFDS services an Aboriginal Community Controlled Health Services to provide timely services to patients in rural and remote Australia. Research should consider: the frequency of service provision; numbers of clinicians providing services; the types of services provided; patient utilisation of services; and importantly the health needs of underserved specific communities reflective of chronic disease prevalence. A nationally agreed standard or benchmark for care will advance improved health outcomes for Australians who currently get sicker, and die earlier, because they have less access to care. A national plan to address priority regions and populations should accompany agreement on equitable access to care.

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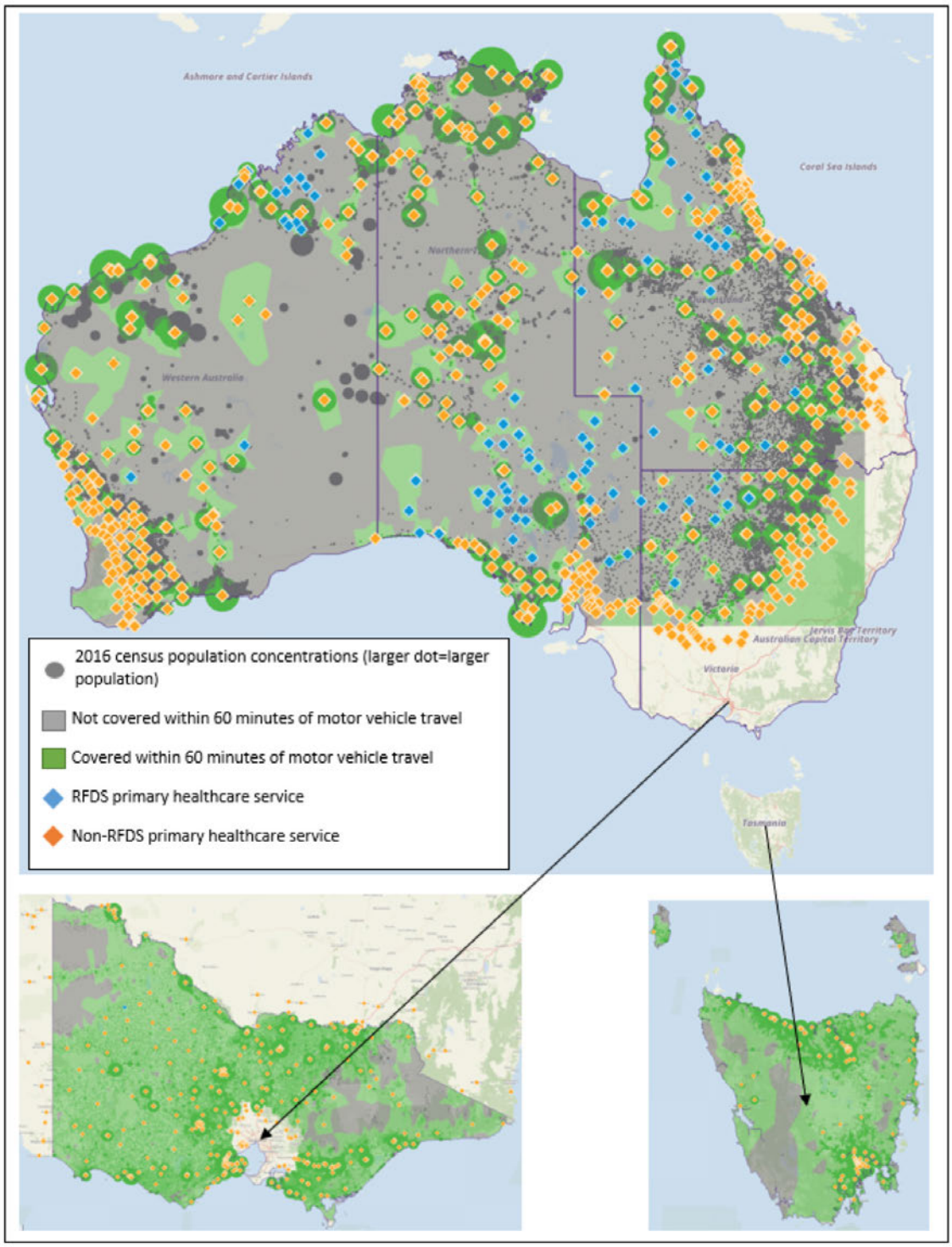
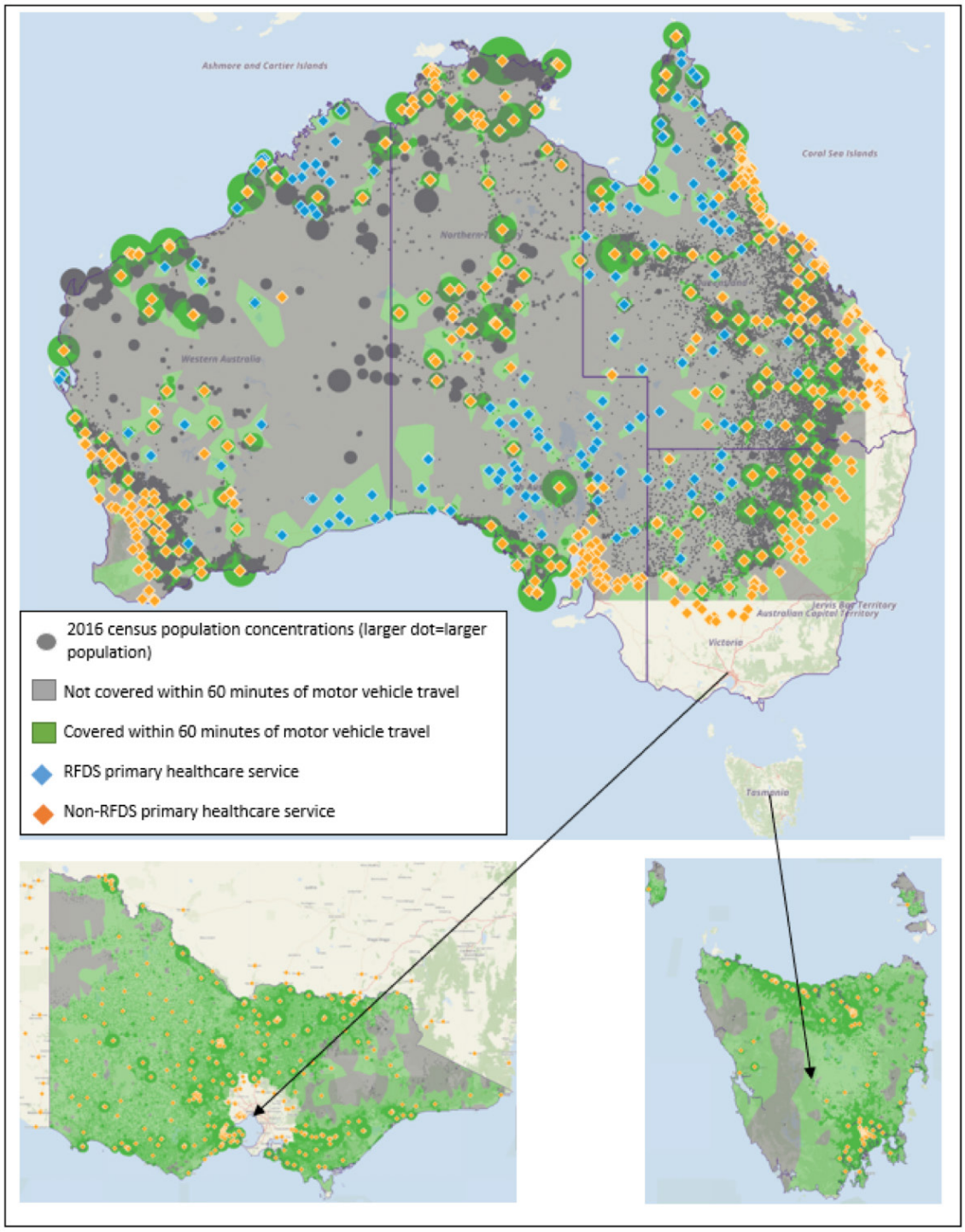
Appendices

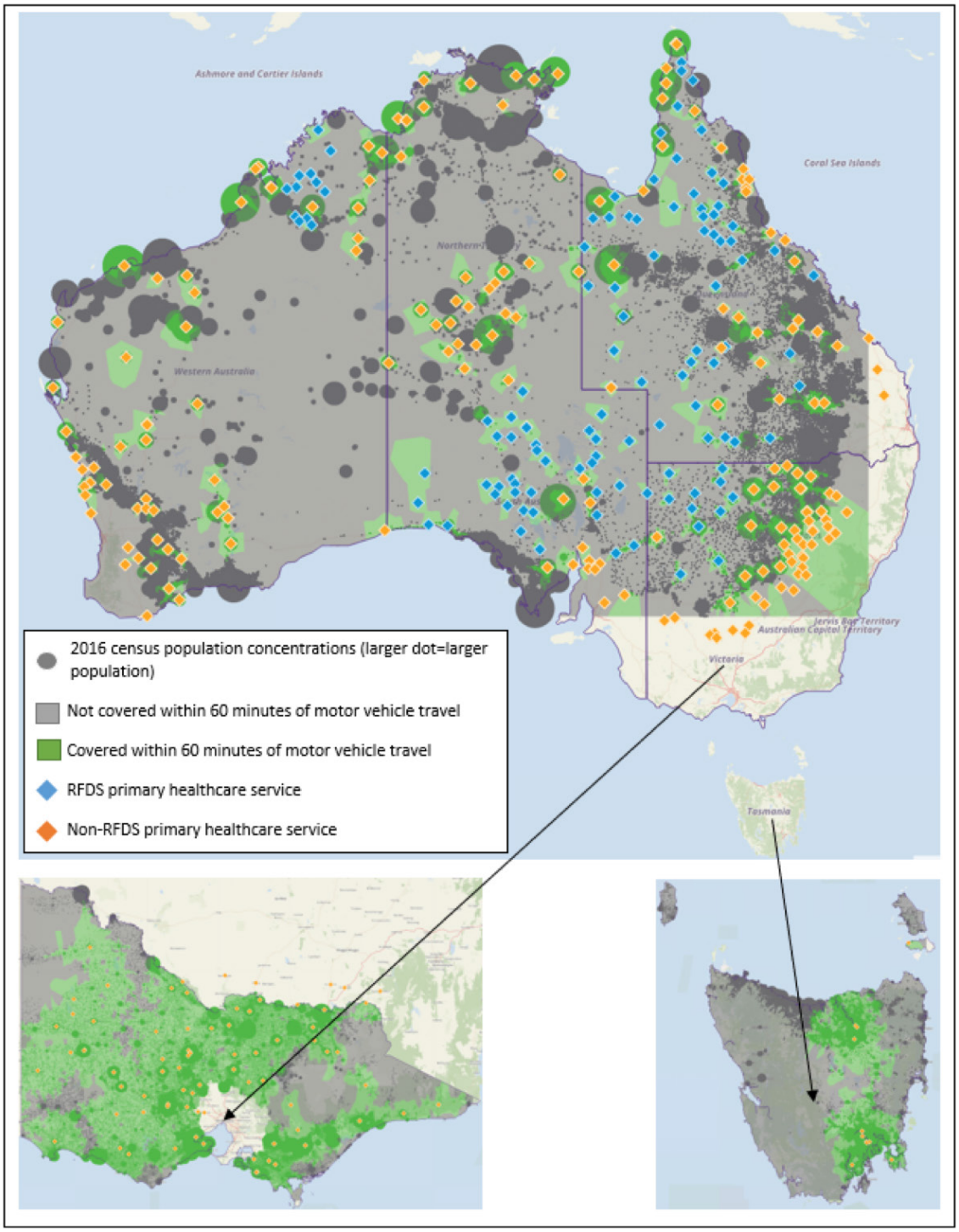
Appendix 1 Rural and remote primary healthcare (combined) locations and corresponding population concentrations, by RFDS section and operation



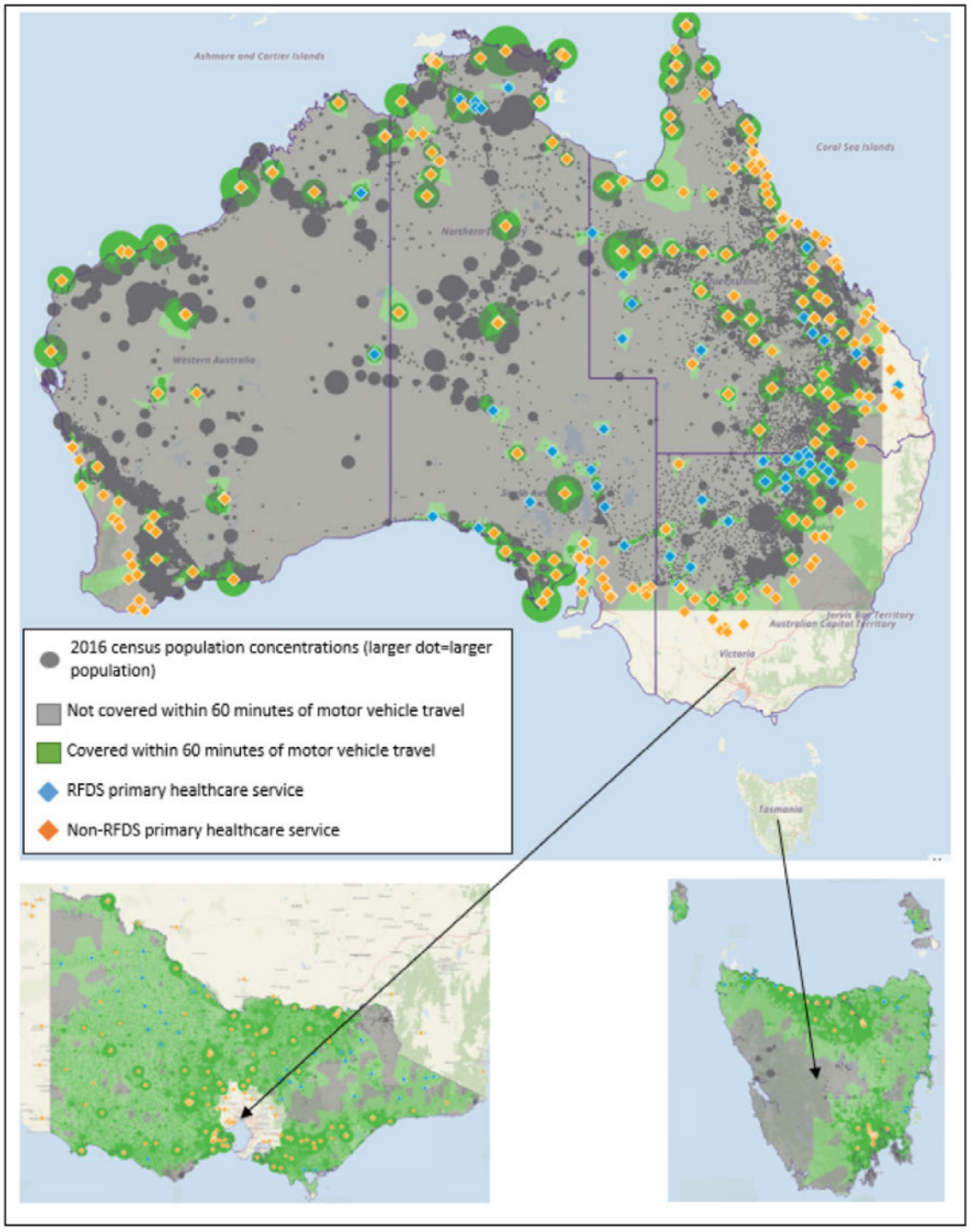
Appendix 2 Rural and remote GP locations and corresponding population concentrations, by RFDS section and operation



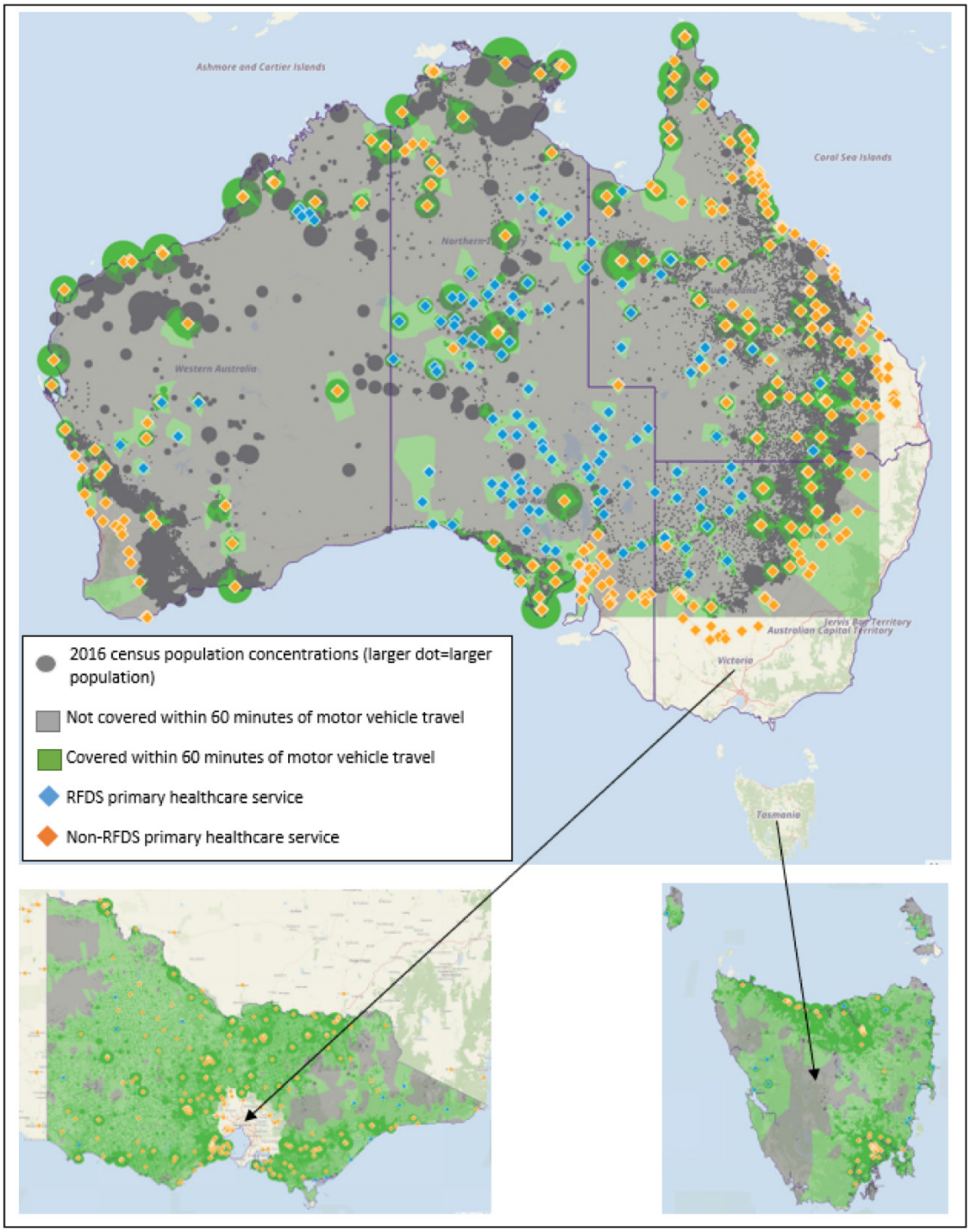
Appendix 3 Rural and remote nurse-led clinic locations and corresponding population concentrations, by RFDS section and operation



Appendix 4 Rural and remote dental clinic locations and corresponding population concentrations, by RFDS section and operation



Appendix 5 Rural and remote mental health service locations and corresponding population concentrations, by RFDS section and operation



Royal Flying Doctor Service