HEALTHY AGEING IN RURAL AND REMOTE AUSTRALIA: CHALLENGES TO OVERCOME

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Royal Flying Doctor Service

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Commitment to Indigenous Reconciliation

The Royal Flying Doctor Service (RFDS) of Australia 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 Indigenous Australians and other Australians. The RFDS is committed to improved health outcomes and access to health services for all Indigenous 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 separate Indigenous peoples of Australia. However, the term 'Indigenous Australians' is used interchangeably with 'Aboriginal and Torres Strait Islander peoples' in order to assist readability.

Data limitations

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

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Abbreviations

ABS	Australian Bureau of Statistics
ACAR	Aged Care Approvals Round
ACS	acute coronary syndrome
AHPRA	Australian Health Practitioner Regulation Agency
AIHW	Australian Institute of Health and Welfare
ASGS	Australian Statistical Geography Standard
AUD	Australian dollar
CABG	coronary artery bypass graft
CHD	coronary heart disease
COACH	Coaching patients On Achieving Cardiovascular Health
COAG	Council of Australian Governments
COPD	chronic obstructive pulmonary disease
CR	cardiac rehabilitation
CT	computed tomography
CVD	cardiovascular disease
Cwlth	Commonwealth
DALY	disability-adjusted life years
DM	diabetes mellitus
FIM	Functional Independence Measure
GP	general practitioner
HT	hypertension
iCCNet	Integrated Cardiovascular Clinical Network
ICD	International Statistical Classification of Diseases and Related Health Problems
MBS	Medicare Benefits Schedule
MI	myocardial infarction
NATSIFACP	National Aboriginal and Torres Strait Islander Flexible Aged Care Program
ORH	Operational Research in Health
PBS	Pharmaceutical Benefits Scheme
PCI	percutaneous coronary interventions
PEs	primary evacuations
RAP	Reconciliation Action Plan
RFDS	Royal Flying Doctor Service
SA3	Statistical Area Level 3
SPOT	Service Planning and Operational Tool

Foreword

The Hon Ken Wyatt AM, MP

On average, Australians are living longer and are healthier than ever before, however, our ageing population means rising numbers of people with chronic conditions and increased need for health services for older Australians.

Aged care is vitally important for rural and remote areas, where the challenge of essential rehabilitation and aged care services means many country Australians are being relocated to major cities and towns, often far removed from family and friends.

Higher rates of illness experienced by some First Nations people increases the country city disparity, as they make up a large percentage of the population in remote areas.

I welcome this research report from the Royal Flying Doctor Service, which looks closely into current health service access for older Australians living in country areas.

The treatment and management of chronic disease requires integrated care that involves collaboration and coordination between service providers and services across primary, secondary and tertiary care settings.

This paper is a step in the right direction, analysing national clinical data from RFDS aeromedical retrievals of older persons, to make preventative recommendations, to improve health outcomes for older Australians in the bush.

There is no quick fix but the RFDS' push for targeted, innovative services for managing chronic heart disease, cancer and neurological illness will improve results for senior Australians in the rural and remote areas and lead to a better quality of life in their later years.

I encourage the careful consideration of this report, to ensure that health services for country Australians are appropriate, well-targeted and responsive to changing needs

The Hon Ken Wyatt AM, MP
Minister for Indigenous Health
Minister for Senior Australians and Aged Care

Executive summary

Overall, the Australian population is ageing. The 2018 median Australian age was 37.2 years, which is estimated to grow to a median age of 39.0 years in the year 2028. In 2018, people aged 65 years and over made up 15.6% of Australia's population. This is projected to increase to 22% in 2061 and to 25% in 2101. As people live longer, the prevalence of chronic diseases will increase, resulting in increased health service utilisation by older Australians.

Most of the population growth in older Australians will be concentrated in major cities in the next 10 years; however, the older population in rural and remote Australia is growing at a faster rate (2.9% per year) compared to all other age groups in rural and remote areas (1.3%). To date there has been very little information published on the health of older Australians in rural and remote areas of our country. This report provides, for the first time, epidemiological data on older rural and remote Australians who accessed Royal Flying Doctor Service (RFDS) aeromedical and primary health care services, most often in areas where few other health services are available.

The RFDS conducted 23,377 aeromedical retrievals for patients aged 65 and older in the three years between 1st July 2014 and 30th June 2017. This included 13,867 (59.3%) males and 9,445 (40.4%) females, with 18,252 (78.1%) being non-Indigenous people. The main reason for an aeromedical retrieval was associated with diseases of the circulatory system (31.8%), injury (12.8%), and diseases of the digestive system (9.2%). When comparing genders, males were more likely ($p<0.05$) to have diseases of the circulatory system, abnormal clinical and laboratory findings, neoplasms and diseases of the genitourinary system than females. Whereas females were more likely ($p<0.05$) than males to have injury and factors influencing health status, such as encountering health services in circumstances related to reproduction.

The RFDS also provides extensive primary health care services throughout Australia, including general practitioner (GP) clinics in rural and remote areas. For example, the RFDS Queensland Section provided 9,456 episodes of primary health care to patients aged 65 years or older between 1st of May 2016 and 31st May 2018 (2 years). This consisted of a total of 9,456 patient episodes. The leading primary health care diagnoses included diseases of the circulatory system (19.4%), diseases of the skin and subcutaneous tissue (14.8%), and diseases of the musculoskeletal system and connective tissue (11.1%). Although more males sought treatment at these primary health care clinics ($p<0.05$), female patients were more likely to receive treatment for diseases of the circulatory system ($p<0.05$), diseases of the musculoskeletal system and connective tissue ($p<0.05$), abnormal laboratory findings ($p<0.05$), and mental and behavioural disorders ($p<0.05$). Males, however, were significantly more likely than females to be treated for diseases associated with blood and immune disorders ($p<0.05$), although they were generally spread evenly throughout diagnostic categories.

The combined national aeromedical and Queensland primary health care leading diagnosis included diseases of the circulatory system (28.3%), injury and poisoning (9.4%), and diseases of the skin and subcutaneous system (4.7%).

Comparing to the broader Australian population, the three most common diagnoses following an older person attending an emergency department included pain in throat and pain in chest (i.e. chest pain), abdominal and pelvic pain, and cellulitis. The main reasons that older people experienced hospitalisations were for diseases of the circulatory system, and injury and poisoning.

The treatment and management of chronic disease, and the key health issues the RFDS responds to in rural and remote Australia, requires integrated care that involves collaboration and coordination between service providers and services across primary, secondary and tertiary care settings. However, the majority of health services are in metropolitan areas and rural and remote patients have limited access to other health care services, including specialist and rehabilitation services, often requiring travel of more than 60 minutes. For example:

- Older people in rural and remote areas are more likely to suffer a stroke than those in major cities, however the provision of stroke services in the bush is very poor;
- There are also significantly fewer physiotherapists and occupational therapists in rural and remote areas to oversee injury rehabilitation following falls, a key reason for an RFDS aeromedical retrieval of an older person;
- While the rates of all cancers are higher in rural and remote areas, there is a lack of access to various oncology subspecialist treatments, such as medical and radiation oncology, haematology and palliative care, and allied health services;
- The top diagnostic reason for a person aged over 65 to access RFDS aeromedical or primary health care services included in this report was for diseases of the circulatory system, and particularly cardiovascular disease. However, cardiac services, including cardiac rehabilitation services and programs aimed at prevention are still predominantly located in major cities and inner regional areas; and,
- With the population of rural and remote areas ageing at a rate faster than any other in Australia, dementia and neurological conditions are expected to increase significantly over coming years, and there are not currently adequate services to respond.

When comparing the retrieval locations of patients aged 65 and older, many were from areas of low provision of aged care, thus resulting in many either staying in hospital or being admitted to aged care facilities far removed from their communities. This situation has a significant impact on older people and their families, and often results in isolation when older people have to be transferred into long-stay hospitalisation or residential aged care. There is also an increased burden on emergency departments and geriatric evaluation and management units of hospitals. Coupled with poor provision of aged care facilities in rural and remote areas, these gaps in health care services may be leading to increased avoidable death rates in the bush.

The RFDS recommends the development, by the Council of Australian Governments (COAG), of a coordinated National Healthy Ageing Strategy which identifies the health status and service delivery challenges in rural and remote areas, and through locally appropriate solutions, focuses on increasing access to stroke services; injury rehabilitation services; cardiac rehabilitation services; dementia services; and increasing the availability of local aged care places.

Chapter 1: Introduction

> In 2016, life expectancy at birth in Australia was 80.4 years for males and 84.6 years for females, with people aged 65 years and over in the year 2018 accounting for 15.6% of Australia's population. As people live longer, they will also develop and manage a greater prevalence of chronic disease, resulting in increased health service utilisation.

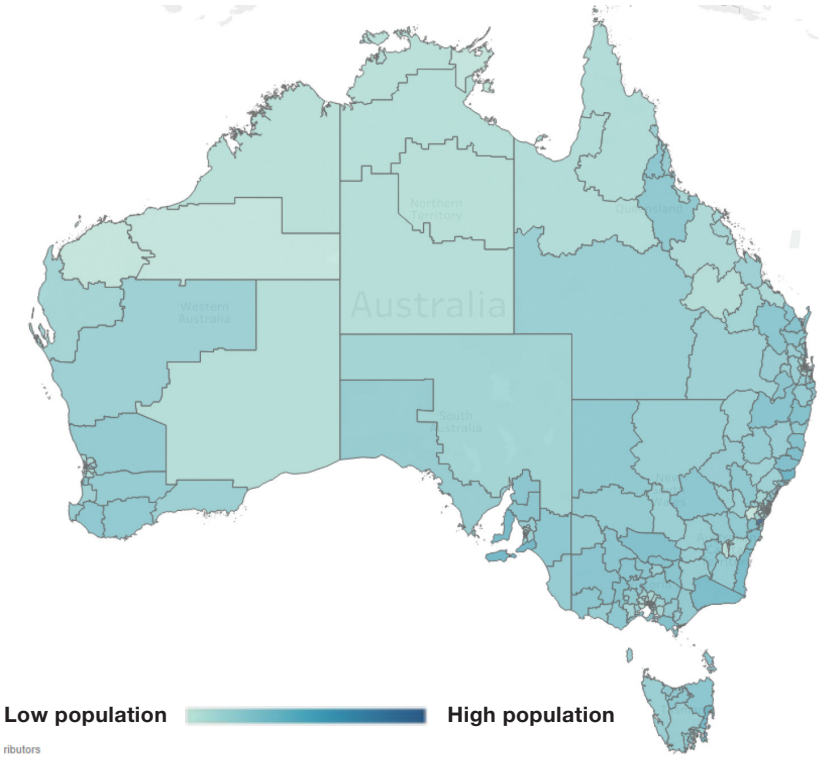
> People aged 65 years and older are evenly distributed throughout Australia, although the rate of disease burden increases with remoteness, with rural and remote patients suffering from significantly more chronic disease than people in major cities. This issue is compounded by fewer residential aged care places available in rural and remote areas, with 38% of facilities in remote areas and 72% in very remote areas having fewer than 20 places.

1.1Australia's health

The Australian population life expectancy is expected to continue to grow, indicating improvements in health.[1] In 2016, life expectancy at birth was 80.4 years for males and 84.6 years for females. However, overall the Australian population is ageing—this is due to a reduction in the 'replacement of fertility' (or average child per mother) combined with increasing life expectancy. The median age (the age that half the population is older than and half is younger than) of the Australian population has increased by 3.0 years over the last two decades, from 34 years in 1995 to 37 years in 2015.[2] This figure is projected to increase to between 38.6 years and 40.5 years in 2031 and to between 41.0 years and 44.5 years in 2061.[3] The 2018 median age was 37.2 years,[4] which is estimated to grow to a median age of 39 years in 2028. In the year 2018, people aged 65 years and over made up 15.6% of Australia's population.[5] This is projected to increase to 22% in 2061 and to 25% in 2101.[6] It is expected that as people live longer, they will also develop and manage a greater prevalence of chronic disease, thus resulting in increased health service demand and utilisation.

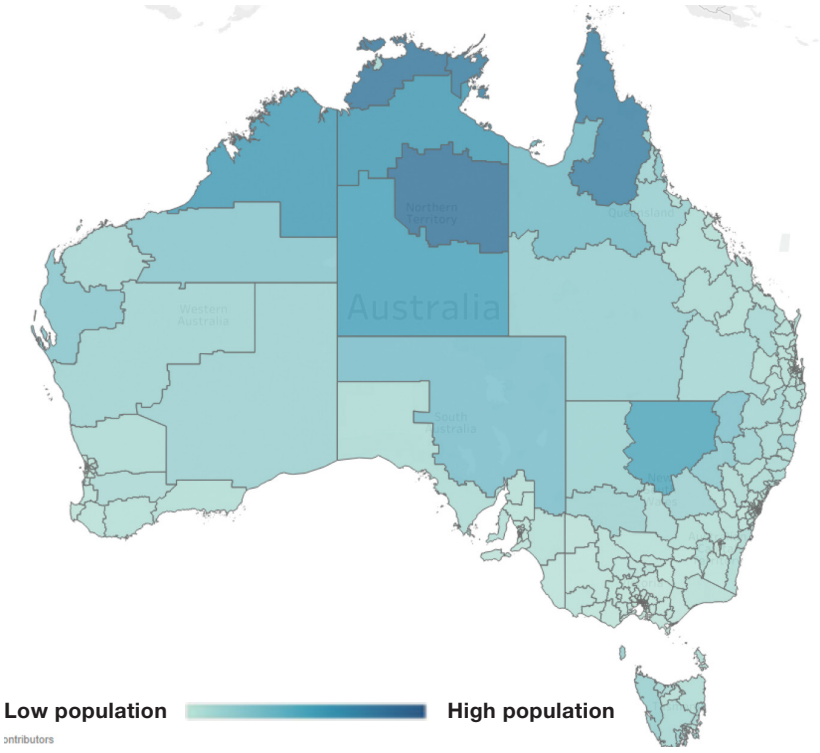
Thirty-three percent (33%) of those aged 65 and older live in New South Wales, and 25% in Victoria. The distribution of those aged 65 or older as a proportion of the total population differs across the states, with 19% in Tasmania, 18% in South Australia, 16% in New South Wales, 15% in Queensland, and 7% in the Northern Territory.[5] However, the distribution by Statistical Area Level 3 (SA3, as per the Australian Bureau of Statistics (ABS)) of the older population is relatively even (Figures 1.1 and 1.2), although many live in major cities within these areas, often due to service availability.[7, 8]

Figure 1.1 Distribution of total population aged 65 years or older in 2016 per SA3



Source: Author's extrapolation from RFDS data

Figure 1.2 Distribution of Indigenous population aged 65 years or older in 2016 per SA3



Source: Author's extrapolation from RFDS data

While the Australian population's health is improving, resulting in increased life expectancy, subsections of the Australian population, including rural and remote populations, still experience increased morbidity and mortality as compared to major cities.[6]

1.2 Rural and remote health

Twenty-nine percent (29%) of the Australian population live in rural and remote areas, with 18% living in inner regional areas, 8.9% in outer regional areas, 1.4% in remote areas and 0.9% in very remote areas.[9] People living in rural and remote areas tend to have a lower life expectancy and higher prevalence of disease and injury, coupled with poorer access to health services as compared to major cities.[10, 11]

In 2015, age-standardised potentially avoidable death rates increased as remoteness increased, with people living in very remote areas having a death rate over 2.5 times as high as people living in major cities (256 per 100,000 population compared with 96 per 100,000 population).[11] People living in rural and remote Australia have much higher DALYs (disability-adjusted life years) compared to those living in major cities and inner regional areas. There are many potential reasons for this, reflecting both social and geographical factors, such as reduced educational and employment opportunities, income, and health care provision and thus access. As per Gardiner et al.,[10] those living in rural and remote areas face more occupational and physical risks, including farming and mining injury, transport accidents and potentially domestic violence. This coupled with higher rates of tobacco smoking, drug use and alcohol misuse all contribute to poorer health outcomes.[9-11]

The mortality rates and causes differ in rural and remote as compared to major cities. In 2009–11, rural and remote people had higher mortality rates (1.4 times) compared to people in major cities, with coronary heart disease (CHD) being between 1.2 and 1.5 times more prevalent in rural and remote areas. The 2016 Australian Health Status Report[9] demonstrated that the rate of death due to land motor vehicle accidents was four times higher. The leading comorbidity associated with cardiovascular disease (CVD) is diabetes mellitus (DM), with rural and remote patients experiencing between 2.5 and 4 times higher prevalence. Of interest, in 2017 the Royal Flying Doctor Service (RFDS) conducted 7,696 aeromedical transfers for predominately diseases of the circulatory system, with many of the patients having comorbidities such as hypertension (HT), and DM.[6]

1.3 Older persons' health

Disease types impacting older Australians are different to disease types impacting younger Australians. In 2018, the burden (DALY) from CHD was highest among older people aged 75–84 (13%), followed by dementia (7.7%), chronic obstructive pulmonary disease COPD (6.8%), stroke (6.1%), and lung cancer (4.5%). Dementia was more prominent (15%) among older people aged 85–94 and was the leading cause of disease burden among women aged 85–94. CHD was the leading cause of burden (17%) among all older people aged 85–94. Stroke was the third leading (8.6%) cause of burden in this age group, among both men and women. The leading causes of burden among very old people (aged 95 and over) included dementia (21%), CHD (19%), and stroke (9.2%) The top five also included infections and injuries (3.1%), which can be more hazardous to a person's health in older age.

Dementia and neurological conditions are expected to significantly increase during the next 10 years.[6] One of the main reasons for the increase in neurological disorders is longer life expectancy. People live longer and, accordingly, suffer dementia more often than several decades ago. Because neurological disorders are more prevalent in older adults and people are living longer (because of decreases in the number of deaths from CVD and cancer), there is an unprecedented increase in the number of people affected by neurological disorders.[12]

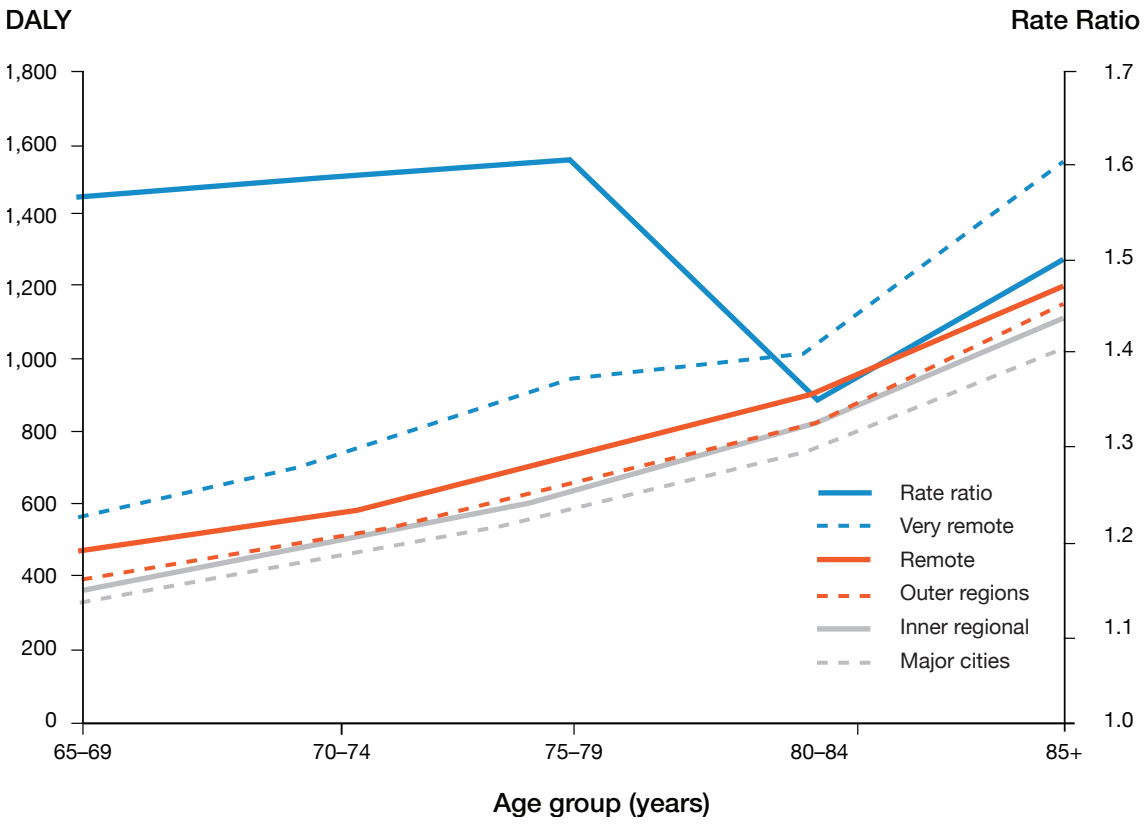
1.4 Rural and remote older persons' health

The prevalence of disease and the causes of death differ among population groups, including differences by age, gender, ethnicity and remoteness. The reasons for this are driven by variations in the population's characteristics, including illness and risk factors, and access to health services in rural and remote Australia.[1] The mortality rates in rural and remote Australia are significantly higher compared to major cities, with these disparities increased by the higher rates of illness among Aboriginal and Torres Strait Islander people, who make up the majority of the population in remote areas of Australia.[6]

As discussed, Australians are living longer and are healthier than ever before. Some groups, however, continue to face disadvantage that affects both their mental and physical health and their opportunities for social and economic engagement within their communities. The *Aged Care Act 1997* (Cwlth) defines some populations as 'people with special needs'—people with particular care needs that should be taken into consideration. Two of these groups include people from Aboriginal and Torres Strait Islander communities, and those who live in rural or remote areas, both of which are of central focus to the RFDS.

The rates of disease burden increase with both remoteness and age. Based on 2011 data,[13] the disease burden in rural and remote areas was higher than major cities, as detailed in Figure 1.3. This issue is compounded by fewer residential aged care places available in rural and remote areas, with 38% of facilities in remote areas and 72% in very remote areas having fewer than 20 places. Older Australians in remote or very remote areas accounted for 0.7% of people aged 65 and over in permanent residential aged care.[13]

Figure 1.3 Disability-adjusted life years by age and geographical location



Source: Australian Institute of Health and Welfare. Older Australia at a glance. Canberra, Australia: AIHW, 2017.

Indigenous Australians continue to face disadvantage in areas of education, income, employment and housing. The relationship between these social determinants and both mental and physical health is well established. Indigenous Australians of all ages face substantial health issues. This population has a higher mortality rate and a lower life expectancy, reflected in the younger age profile of Indigenous Australians—in 2016, just 4% (31,000) of the Indigenous population were aged 65 and over compared with 15% (3.7 million) of the non-Indigenous population.[6]

1.5 Report aims and research questions

To date there has been very little information communicated on rural and remote older persons' health. This report aims to provide epidemiology data on aeromedical retrievals for older rural and remote Australians who accessed the RFDS between the years 2014 and 2017. As such, this report has the following primary research questions:

- What are the leading RFDS aeromedical retrieval and primary health care diagnoses for older rural and remote Australians?
- What services are available for older rural and remote Australians and does this differ by remoteness?

Chapter 2: Methods

- Older persons were defined as >65 years old. This age was used rather than >75 years old due to the higher prevalence of disease in rural and remote communities, coupled with higher rates of disadvantaged groups, thus leading to reduced life expectancies.
- The whole geography of Australia was included, including major cities, rural, and remote areas. The term 'rural and remote' was defined as all areas outside Australia's major cities.
- The design of this report was to determine the epidemiology trends in older persons living in rural and remote Australia, who accessed the RFDS primary healthcare and aeromedical retrieval services.
- Data used included patient data from RFDS databases, and external Department of Health and clinical registration databases.

2.1 Defining rural and remote Australia

The 2016 Australian Census counted 23.4 million people living in Australia, which was an increase of 8.8% since the 2011 census.[14] Indigenous Australians comprise approximately 2.8% (n=649,171)[14] of the total Australian population, although comprise almost half of the rural and remote population.[15] Non-Indigenous Australians most commonly live in major cities. Based on recent census data,[14] the leading non-Indigenous ancestry was English (36.0%), followed by Irish (11.0%), Scottish (9.3%), and Chinese (5.6%).

Rural and remote parts of Australia encompass the majority of Australia's landmass,[15] however based on 2013 estimates, almost 71% of the population (n=16,678,000) resided in Australia's major cities. A little over 27% (n=6,342,000) of Australians resided in regional areas with just 2.3% (n=540,300) living in remote or very remote Australia.[16]

2.2 Defining older Australians

In the latest Australian Institute of Health and Welfare (AIHW) report, older persons were defined as those who were >75 years old.[1] However, consistent with broader literature, this report defines older persons as >65 years old, due to the higher prevalence of disease in rural and remote communities, coupled with higher rates of disadvantaged groups, thus leading to reduced age life expectancies. As such, this report uses the 65-year-old threshold for the wider rural and remote population. It should be noted however, that publications focusing on Indigenous health normally use a >55-year-old threshold to define older Indigenous populations.[17]

2.3 Setting

The RFDS operates a 24-hour, seven-days-a-week (24/7) aeromedical retrieval service, supported by a 24/7 telehealth system, to people who live, work or travel in rural and remote regions of Australia, are unable to access normal medical services, and who experience a medical emergency requiring definitive care in a tertiary hospital. The RFDS also provides extensive primary healthcare services throughout Australia including, although not limited to, GP and nursing clinics. The types of services differ in response to configuration of other local health services in particular operating regions.

The RFDS services from which these data have been drawn were provided in rural and remote areas, with the term 'rural and remote' including all areas outside Australia's major cities. This includes areas that are classified as inner and outer regional (RA2 and RA3 respectively) and remote or very remote (RA4 and RA5 respectively) under the Australian Statistical Geography Standard (ASGS).[18] [1]

2.4 Design and participants

The study is a cross-sectional study based on prospective collected patient data for RFDS retrievals from 1 January 2014 to 31 December 2017 (4 years) and from Queensland RFDS primary healthcare clinics from 1 May 2016 to 31 May 2018 (2 years). Although patient data was collected for all age-groups, this analysis only included those patients aged ≥65 years.

2.5 Data sources

To determine healthcare service provision, we used ABS census, and Health Direct data sources,[19] and then inputted them into the RFDS Service Planning and Operational Tool (SPOT) to determine population coverage. SPOT is designed for exploring healthcare coverage in remote and very remote Australia. Working from a geographic distribution of 'demand' and a set of healthcare facilities that provide cover for a range of services, SPOT calculates the proportion of demand covered by those facilities within a user-specified drive time. Demand is represented by population levels in different categories (e.g. mental health services) as well as some specific RFDS demand types (retrievals).

In addition to Health Direct data sources,[19] we also used RFDS clinical databases, to provide data on non-MBS medical service provision (such as the location and number of RFDS primary healthcare clinics provided throughout Australia). This was completed in addition to the collecting of patient demographic information, medical history, diagnosis, location, service provider and type, and extensive information concerning patient treatment.

2.6 Statistical analysis

A combination of descriptive statistics, t-test, and Chi-square analysis was used in data analysis, with significance determined at $p<0.05$. All analyses were performed using the statistical software package R version 3.5.1.

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1 The ASGS allocates one of seven remoteness categories to an area (major cities, inner regional, outer regional, remote, very remote, migratory-offshore-shipping, and no usual address), based on its distance from a range of population centres. Each of these remoteness categories are also defined by population characteristics. The remoteness structure of the ASGS uses the same principles of the earlier remoteness classification system—the Australian Standard Geographical Classification System Remoteness Areas (ASGC-RA)—which was formerly used to define remoteness structure. Although the ASGS remoteness areas have been defined using a different base unit, the remoteness areas from the ASGC and the ASGS are generally comparable, according to the Australian Bureau of Statistics (ABS). The Modified Monash Model uses the ASGS-RA as a base, and further differentiates areas in inner and outer regional Australia based on local town size. The Modified Monash Model was developed to recognize the challenges in attracting health workers to more remote and smaller communities[18] and improves categorisation of metropolitan, regional, rural and remote areas according to both geographical remoteness and town size. It is a tool often used to inform health resource allocation by government policymakers. The Modified Monash Model was not used in this report, as it concerns workforce incentives to promote clinicians to relocate to rural and remote areas. The ASGS-RA was used in this report, as it provides good classification as it pertains to resource allocation per 100,000 population.

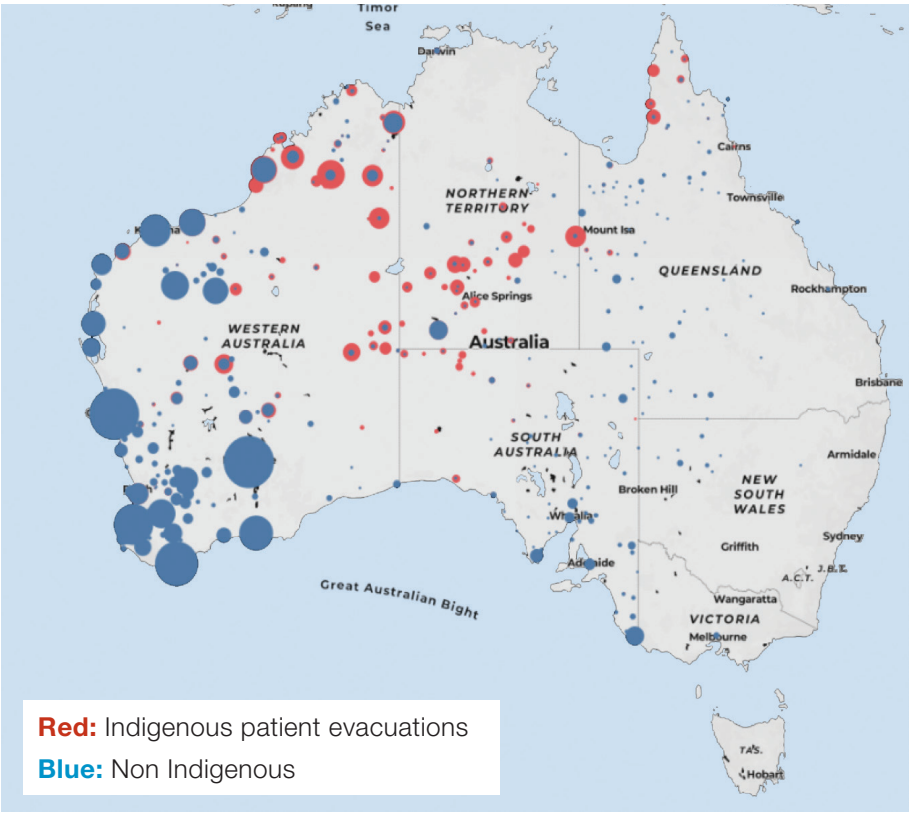
Chapter 3: Epidemiology of RFDS patients aged 65 or older in rural and remote Australia

- The RFDS provided 23,377 aeromedical retrievals nationally for patients aged 65 and older between 2014 and 2017.
- The combined aeromedical and primary healthcare leading diagnoses included diseases of the circulatory system (28.3%), injury and poisoning (9.4%), and diseases of the skin and subcutaneous system (4.7%).
- Consistently, the three most common diagnoses following an older person attending an emergency department included pain in throat and pain in chest (i.e. chest pain), abdominal and pelvic pain, and cellulitis. The main reasons that older people experienced hospitalisations included diseases of the circulatory system, and injury and poisoning.
- While rural and remote older persons' diagnostic data appears to be consistent with general Australian trends, there is a higher chronic disease prevalence at a younger age in rural and remote areas (65 years old), as compared to major cities (70 years old), as well as more avoidable deaths.

3.1 RFDS aeromedical epidemiology trends in people aged 65 or older

The RFDS provided 23,377 (32.8%) aeromedical retrievals for patients aged 65 and older between 2014 and 2017, with 13,867 (59.3%) males and 9,445 (40.4%) females. This included 1,690 Indigenous patients (7.2%), consisting of 762 (45.1%) male and 928 (54.9%) female patients. These results indicated that non-Indigenous males were more likely ($p<0.05$) to receive an RFDS aeromedical retrieval, whereas Indigenous females were more likely ($p<0.05$), indicating a reversal in ethnicity gender trends. As detailed in Figure 3.1, the majority of Indigenous patients were retrieved from remote areas of Australia.

Figure 3.1 RFDS aeromedical retrievals by Indigenous status, by location (July 2014–June 2017)



Note: The majority (85.3%) of the Indigenous status was recorded throughout Australia. However, Queensland RFDS did not routinely collect Indigenous or non-Indigenous status, with 3,231 patients missing (35%) this data. As such, they were excluded from Figure 3.1. Thus Figure 3.1 does not reflect Queensland Indigenous or non-Indigenous retrievals.

The main reasons for an RFDS aeromedical retrieval for a patient over 65 between 2014 and 2017 were associated with diseases of the circulatory system (31.8%), injury (12.8%), and diseases of the digestive system (9.2%), as detailed in Figure 3.2. When comparing genders, males were more likely ($p<0.05$) to have diseases of the circulatory system, abnormal clinical and laboratory findings, neoplasms and disease of the genitourinary system. Females were more likely ($p<0.05$) to have injury, factors influencing health status and contact with health services. Further detail is provided in Table 3.1.

Figure 3.2 RFDS aeromedical retrievals for patients aged 65 and older, diagnosis by gender and percentage

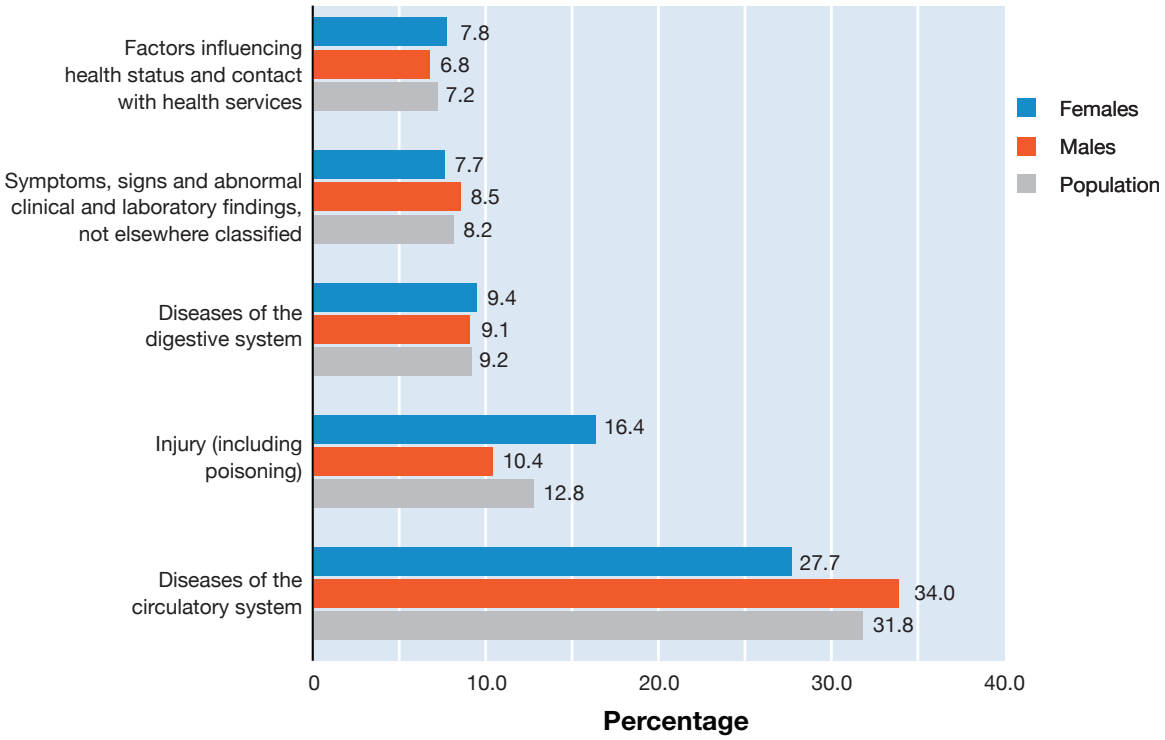


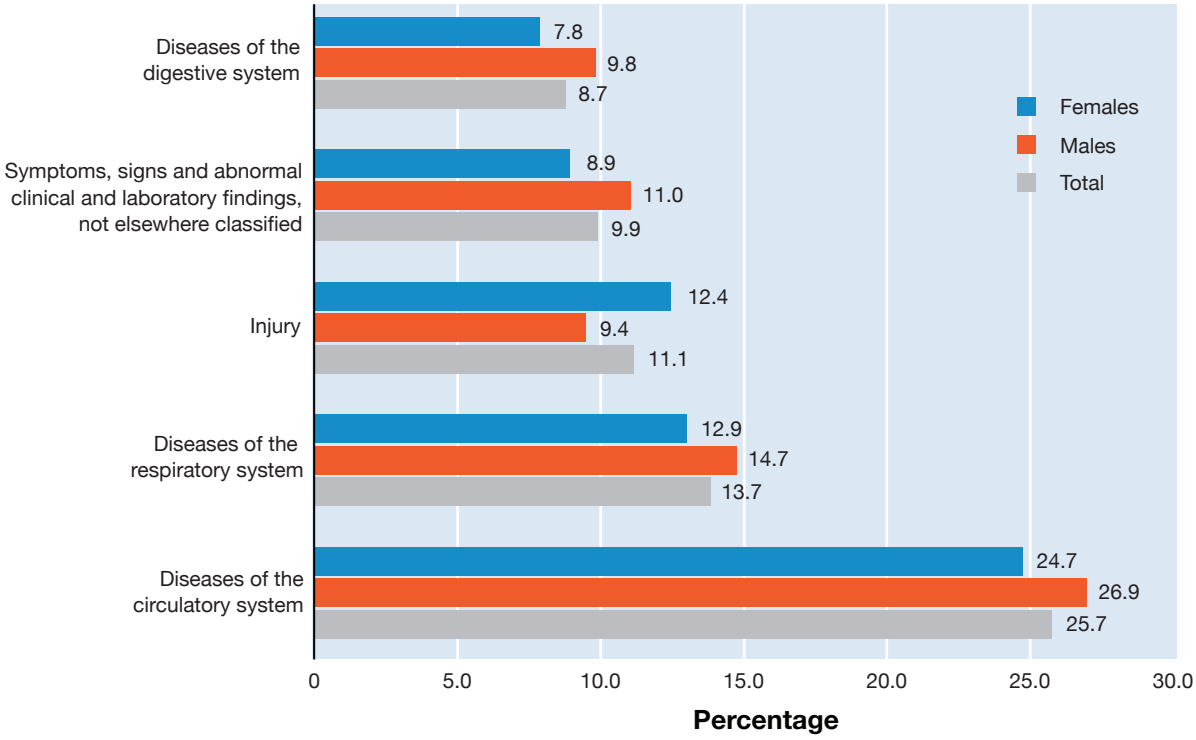
Table 3.1 RFDS aeromedical retrievals for patients aged 65 and older, diagnosis by gender and probability

Diagnosis (ICD chapter)	Male (%)	Female (%)	Probability	Interpretation
Diseases of the circulatory system [9]	4,826 (34.0)	2,617 (27.7)	**<0.05**	Significantly more males
Injury [19]	1,439 (10.4)	1,549 (16.4)	**<0.05**	Significantly more females
Diseases of the digestive system [11]	1,257 (9.1)	893 (9.4)	>0.05	Populations the same
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified [18]	1,187 (8.6)	724 (7.7)	**<0.05**	Significantly more males
Factors influencing health status and contact with health services [21]	949 (6.8)	741 (7.8)	**<0.05**	Significantly more females
Diseases of the respiratory system [10]	724 (5.2)	533 (5.6)	>0.05	Populations the same
Repatriation	662 (4.8)	530 (5.6)	**<0.05**	Significantly more females
Neoplasms [2]	710 (5.1)	419 (4.4)	**<0.05**	Significantly more males
Diseases of the genitourinary system [14]	639 (4.6)	323 (3.4)	**<0.05**	Significantly more males
Diseases of the musculoskeletal system and connective tissue [13]	257 (1.8)	192 (2.0)	>0.05	Populations the same
Total	**13,867 (59.3)**	**9,445 (40.4)**	<0.05	**Significantly more males**

Note: ICD refers to the International Statistical Classification of Diseases and Related Health Problems.

The main reason for an aeromedical retrieval for an Indigenous patient was for diseases of the circulatory system (25.7%), followed by diseases of the respiratory system (13.7%), and injury (11.1%), as detailed in Figure 3.3. Of interest, although Indigenous females were more likely to require an RFDS aeromedical retrieval, the differences in disease by gender were non-significant ($p>0.05$) indicating no statistical differences in disease rates between Indigenous genders. This is detailed in Table 3.2.

Figure 3.3 RFDS aeromedical retrievals for Indigenous patients aged 65 years and older, patient diagnosis by gender and percentage



Note: Although acute myocardial infarction (MI) is a disease of the circulatory system, where possible the most detailed ICD classification was used.

Table 3.2 RFDS aeromedical retrieval Indigenous patients aged 65 and older, patient diagnosis by gender and probability

Diagnosis (ICD chapter)	Male (%)	Female (%)	Probability	Interpretation
Diseases of the circulatory system [9]	205 (26.9)	229 (24.7)	>0.05	Populations the same
Diseases of the respiratory system [10]	112 (14.7)	120 (12.9)	>0.05	Populations the same
Injury [19]	72 (9.4)	115 (12.4)	>0.05	Populations the same
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified [18]	84 (11.0)	83 (8.9)	>0.05	Populations the same
Diseases of the digestive system [11]	75 (9.8)	72 (7.8)	>0.05	Populations the same
Diseases of the genitourinary system [14]	41 (5.4)	65 (7.0)	>0.05	Populations the same
Certain infectious and parasitic diseases [1]	31 (4.1)	47 (5.1)	>0.05	Populations the same
Diseases of the skin and subcutaneous tissue [12]	33 (4.3)	26 (2.8)	>0.05	Populations the same
Endocrine, nutritional and metabolic diseases [4]	15 (2.0)	26 (2.8)	>0.05	Populations the same
Neoplasms [2]	16 (2.1)	24 (2.6)	>0.05	Populations the same
Total	**762 (45.1)**	**928 (54.9)**	**<0.05**	**Significantly more females overall**

3.2 RFDS primary health epidemiology trends in people aged 65 or older

The RFDS provides extensive primary health care services throughout Australia, including, although not limited to, GP clinics. The types of services provided differ in response to configuration of other local health services in particular operating regions. The RFDS Queensland Section Primary Healthcare Service treated 37,563 patients from 1st of May 2016 until the 31st May 2018 (2 years), including general practice patients (n=31,610), medical specialist outreach patients (n=5,931), and programs such as the Medicare Rural and Remote Medical Benefits Scheme Clinic (n=14), Men's Business program (n=2), and Child Health New Directions program (n=3). There was a total of 9,456 patient episodes for patients over 65, including significantly ($p<0.05$) more male patients, with 5,378 (57%) males and 4,077 (43%) females. There were 1,663 (18%) Indigenous patients, with 733 (44%) males and 930 (56%) female patients. This indicates that female Indigenous patients aged >65 years of age were more likely ($p<0.05$) than Indigenous males of the same age group to access RFDS primary health care.

The leading diagnoses included diseases of the circulatory system (19.4%), diseases of the skin and subcutaneous tissue (14.8%), and diseases of the musculoskeletal system and connective tissue (11.1%) (Table 3.3). Although more males sought treatment at the primary health care clinics ($p<0.05$), female patients were more likely to receive treatment for diseases of the circulatory system ($p<0.05$), diseases of the musculoskeletal system and connective tissue ($p<0.05$), abnormal laboratory findings ($p<0.05$), and mental and behavioural disorders ($p<0.05$). Males, however, were significantly more likely to be treated for diseases associated with blood and immune disorders ($p<0.05$), although they were generally spread eventually throughout treatment diagnosis. These results are detailed in Figure 3.3.

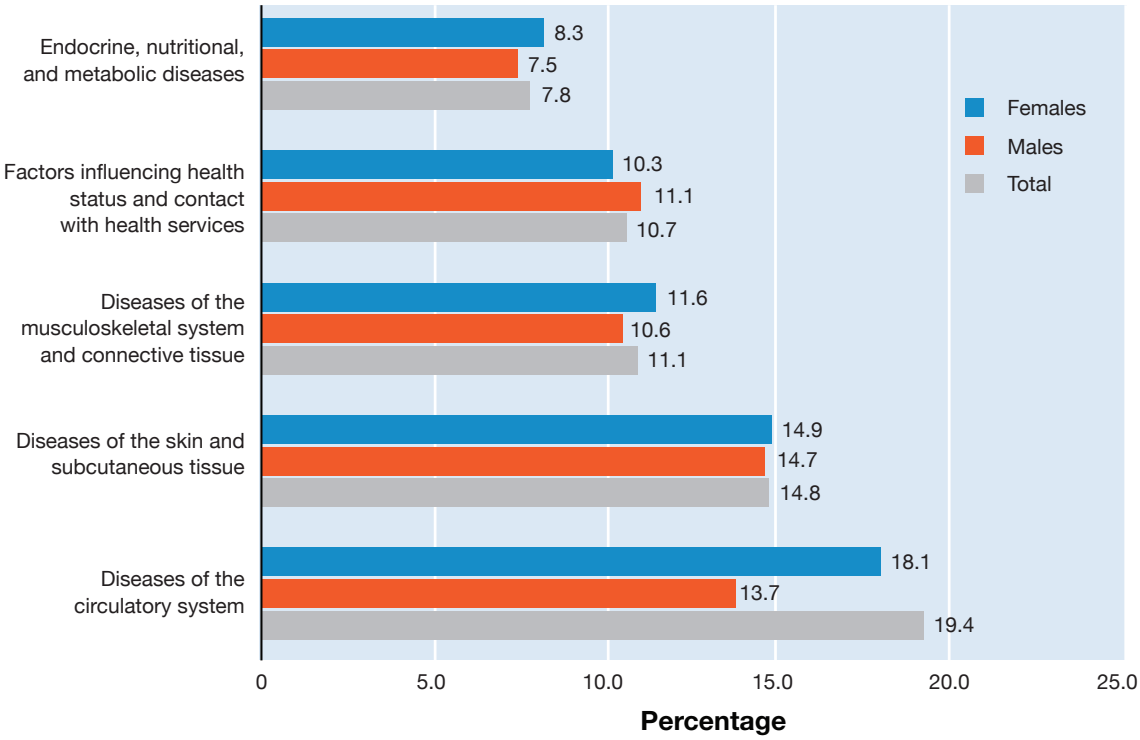
These findings in part reflect Australia-wide primary health care data that indicated that in 2013–14 the most common principal diagnoses among people aged 65 and over were diseases of the circulatory system, and injury, poisoning and certain other consequence of external causes.[13] The strength of the results presented within this report is that they provide clear primary health care data on rural and remote patients age 65 or older. This has previously been a limitation of population-wide diagnostic data.

Table 3.3 RFDS Queensland primary health patient (>65 years old) diagnosis and count

ICD Code Description	Total (%)
Diseases of the circulatory system	1,832 (19.4)
Diseases of the skin and subcutaneous tissue	1,399 (14.8)
Diseases of the musculoskeletal system and connective tissue	1,045 (11.1)
Factors influencing health status and contact with health services	1,016 (10.7)
Endocrine, nutritional and metabolic diseases	743 (7.9)
Diseases of the respiratory system	640 (6.8)
Diseases of the digestive system	540 (5.7)
Diseases of the genitourinary system	525 (5.6)
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	466 (4.9)
Mental and behavioural disorders	204 (2.2)
Diseases of the eye and adnexa	204 (2.2)
Diseases of the nervous system	180 (1.9)
Neoplasms	162 (1.7)
Diseases of blood and blood-forming organs and certain disorders involving the immune mechanism	155 (1.6)
Diseases of the ear and mastoid process	151 (1.6)
Injury, poisoning and certain other consequences of external causes	102 (1.1)
Certain infectious and parasitic diseases	85 (0.9)
Total	**9,456**

Note: Factors influencing health status and contact with health services includes care involving dialysis, use of rehabilitation services, radiotherapy, chemotherapy and palliative care.

Figure 3.4 RFDS Queensland primary health care patient (>65 years old) diagnosis type and percentage



3.3 RFDS combined aeromedical and primary health epidemiology trends in people aged 65 or older

The combined aeromedical and primary health care leading diagnoses included diseases of the circulatory system (28.3%), injury and poisoning (9.4%), and diseases of the skin and subcutaneous system (4.7%). These results need to be interpreted with caution, as the aeromedical data spanned 3 years, whereas the primary health care data spanned 2 years.

This is the first comprehensive epidemiology of rural and remote patients within Australia which allows comparisons to Australia-wide estimates. Unfortunately, the literature does not specifically detail the leading primary health care diagnoses of older people living in metropolitan areas, thus making comparisons difficult. However, these findings are consistent with Australia-wide prevalence reports.[13] The three most common diagnoses following an older person (>65 years old) attending an emergency department, included pain in throat and pain in chest (i.e. chest pain), abdominal and pelvic pain, and cellulitis. The main reasons that older people (>65 years old) experienced hospitalisations included diseases of the circulatory system, and injury and poisoning.[13]

These results indicate that preventative and rehabilitation services are needed in the rural and remote older persons population, to help reduce the prevalence of both aeromedical and primary health care presentations related to the circulatory system and injuries. This should also include targeted programs for older males in reducing CVD risk factors, and programs targeting older females in reducing injury risks.

Chapter 4: Services available for older rural and remote Australians

- There are significant shortages of essential health services in rural and remote Australia, including insufficient hospital, emergency department, and general practitioner provision.
- To access basic treatments, rural and remote patients are required to travel more than 60 minutes, which is often not feasible for older people.
- The provision of rehabilitation services in rural and remote areas is significantly lower than major cities. This is concerning considering the high rates of falls in the older rural and remote population.
- The provision of cardiac services is poor in rural and remote areas. This includes reduced access to physical activity programs, nutritional programs, and specialist medical and cardiac rehabilitation programs. This is concerning given the high rates of heart failure and its comorbidities, such as renal disease, DM and pulmonary disease, in older rural and remote populations.
- Stroke rates are high amongst older people in rural and remote areas, however stroke rehabilitation provision is poor.
- The incidence of all cancers is higher for people in regional areas, with a significantly higher incidence of bowel cancer, melanoma (associated with sun exposure) and prostate cancer. However, the majority of cancer treatment facilities are located in major cities.
- Aged care within Australia is considered high need with rural and remote areas consistently under-serviced per 100,000 population.

This chapter details the provision of essential health services needed to manage the most common conditions experienced by those over 65, including those RFDS is seeing in rural and remote populations. It will be demonstrated that there are significant shortages of essential health services in rural and remote Australia,[6] including those most needed by older people. This is concerning as these populations have increased chronic disease prevalence, and increased morbidity and mortality.[20, 21]

Reduced accessibility to health and welfare services may be one reason for the lower life expectancy in rural and remote populations as compared to those living in major cities. As the majority of Indigenous Australians live in rural and remote areas, reduced access could also be a reason for the difference in Indigenous and non-Indigenous disease prevalence, as the majority of non-Indigenous live in major cities. In 2014–15, nearly one quarter of Indigenous people (24%) reported problems accessing service providers; this proportion increased to 1 in 3 (33%) for Indigenous people living in remote or very remote areas. As well, the rate of hospitalisations for Indigenous Australians that were potentially preventable is around 3.4 times that for non-Indigenous Australians. Older Indigenous people have poorer health and higher rates of disability than other older Australians. In the 2011 census, older Aboriginal and Torres Strait Islander people were almost three times as likely as older non-Indigenous people to need help with self-care, mobility or communication tasks.[13]

4.1 Health care services in rural and remote Australia

4.1.1 Hospitals, emergency departments and general practitioners in remote Australia

Hospitals, emergency departments, and GP services are an important component of a contemporary health care system and of importance to rural and remote populations. Achieving equitable access to hospital services is very important and a significant issue for rural communities. The majority of health care services are located in major cities in Australia,[6] with the majority of remote older patients required to travel more than 60 minutes to access hospital services. Table 4.1 indicates the remote communities with the poorest coverage of hospital services by population, with the poorest coverage including West Arnhem, Albany and the Goldfields.

Table 4.1 Remote and very remote population hospital service coverage by SA3

Region (SA3)	Total population 2016*	Covered within 60 minutes**	Population covered %***
Daly - Tiwi - West Arnhem	14,666	618	4.2%
Albany	3,156	930	29.5%
Goldfields	7,042	3,500	49.7%
Katherine	20,791	10,612	51.0%
Barkly	6,203	3,506	56.5%
East Pilbara	25,991	14,880	57.3%
Bowen Basin - North	10,589	6,076	57.4%
Outback - North and East	11,433	6,785	59.3%
Central Highlands (Qld)	9,239	5,492	59.4%
East Arnhem	7,560	4,529	59.9%
Moree - Narrabri	2,812	1,735	61.7%
Port Douglas - Daintree	675	435	64.4%
Mid West	9,908	6,473	65.3%
Wheat Belt - North	8,414	5,538	65.8%
Wheat Belt - South	5,235	3,674	70.2%
Alice Springs	39,689	28,233	71.1%
Biloela	1,572	1,142	72.6%
Broken Hill and Far West	2,585	1,890	73.1%
Lower Murray	2,207	1,620	73.4%
Charters Towers - Ayr - Ingham	6,536	4,827	73.9%

* The population and service provision only include those within remote and very remote areas, all others are excluded. Please also note, that this only includes mainland Australia.

** This is calculated using geographical mapping using average motor vehicle (bus, car, and motorbike) drive times based on average road speeds. Implies the population has access to motor vehicle transport.

*** This percentage includes those covered with a 60-minute drive time. It does not consider clinic or hospital wait times or whether the clinic or hospital has patient workload capacity.

As with hospital services, emergency department provision in remote areas is poor. This makes any emergency medical evacuation by road difficult, thus requiring RFDS aeromedical evacuation. This is reflected in the high number of older populations suffering injuries (e.g. as a result of a fall) that required emergency retrieval in the past two years. Table 4.2 indicates the remote communities with the poorest coverage of emergency departments by population, with the poorest coverage including West Arnhem, Kuranda and Albany.

Table 4.2 Remote and very remote population emergency department coverage by SA3

Region	Total population 2016*	Covered within 60 minutes**	Population covered %***
Daly - Tiwi - West Arnhem	14,666	525	3.6%
Tablelands (East) - Kuranda	1,335	308	23.1%
Albany	3,156	930	29.5%
Goldfields	7,042	3,500	49.7%
Katherine	20,791	10,612	51.0%
Central Highlands (Qld)	9,239	5,240	56.7%
Bowen Basin - North	10,589	6,075	57.4%
Outback - North and East	11,433	6,785	59.3%
East Arnhem	7,560	4,529	59.9%
Moree - Narrabri	2,812	1,735	61.7%
Port Douglas - Daintree	675	435	64.4%
Broken Hill and Far West	2,585	1,690	65.4%
Wheat Belt - North	8,414	5,538	65.8%
Barkly	6,203	4,151	66.9%
Lower Murray	2,207	1,497	67.8%
Wheat Belt - South	5,235	3,674	70.2%
Mid West	9,908	7,051	71.2%
Alice Springs	39,689	28,698	72.3%
Charters Towers - Ayr - Ingham	6,536	4,826	73.8%
Darling Downs (West) - Maranoa	13,737	10,649	77.5%

* The population and service provision only include those within remote and very remote areas, all others are excluded. Please also note, that this only includes mainland Australia.

** This is calculated using geographical mapping using average motor vehicle (bus, car, and motorbike) drive times based on average road speeds. Implies the population has access to motor vehicle transport.

*** This percentage includes those covered with a 60-minute drive time. It does not consider clinic or emergency department wait times or whether the clinic or emergency department has patient workload capacity.

Following a hospital admission and/or an emergency department presentation, many older patients will be discharged home for follow-up care with their family, community, and, if available, their family doctor. This requires effective transition between care, as problems with clinical handover can have a negative impact on patient outcomes.[22] The RFDS does extensive inter-hospital transfers, with 70,342 patients transferred by road in 2016–17.[6] This is aimed, in part, at reducing patient transfer risks, through continuity of clinical care.

There are many factors that promote effective discharge planning for older patients as they move from hospital to community care. This includes support network education and effective communication between the acute care provider and the patient's general practice. This has long been identified as problematic,[23] with many finding rural and remote areas[6] are further influenced by delayed and/or inaccurate communication which affects continuity of care and contributes to adverse patient outcomes.[24] Watson et al.[22] found that of the 50 participants in their study, 76% attended general practice follow-up within seven days. Those who were not married (54% versus 84%) and non-drivers (53% versus 90%) were less likely to attend a follow-up. This study was conducted in a major city, which generally has a high provision of health care services, including GPs.[6] As the provision of GPs in rural and remote areas is significantly less than metropolitan areas, coupled with geographical barriers to attendance, it is likely that those who live rurally and remotely would be even less likely to attend follow-up care following hospital discharge. Table 4.3 indicates the communities with the lowest provision of GPs, requiring many patients to travel more than 60 minutes.

Table 4.3 Remote and very remote population general practitioner coverage by SA3

Region	Total population 2016*	Covered within 60 minutes**	Population covered %***
Broken Hill and Far West	2,585	514	19.9%
Albany	3,156	1,757	55.7%
East Arnhem	7,560	4,529	59.9%
Goldfields	7,042	4,374	62.1%
Moree - Narrabri	2,812	1,746	62.1%
Gascoyne	9,717	6,195	63.8%
Far North	19,934	13,909	69.8%
Outback - North and East	11,433	8,164	71.4%
Wheat Belt - South	5,235	3,842	73.4%
Lower Murray	2,207	1,629	73.8%
Charters Towers - Ayr - Ingham	6,536	4,837	74.0%
Wheat Belt - North	8,414	6,238	74.1%
Central Highlands (Qld)	9,239	6,921	74.9%
Daly - Tiwi - West Arnhem	14,666	11,517	78.5%
Kimberley	36,343	28,910	79.5%
Darling Downs (West) - Maranoa	13,737	11,071	80.6%
Biloela	1,572	1,272	80.9%
East Pilbara	25,991	21,082	81.1%
Mid West	9,908	8,098	81.7%
Outback - South	18,051	14,800	82.0%

* The population and service provision only include those within remote and very remote areas, all others are excluded. Please also note, that this only includes mainland Australia.

** This is calculated using geographical mapping using average motor vehicle (bus, car, and motorbike) drive times based on average road speeds. Implies the population has access to motor vehicle transport.

*** This percentage includes those covered with a 60-minute drive time. It does not consider clinic wait times or whether the clinic has patient workload capacity.

4.2 Treatment and management of chronic conditions

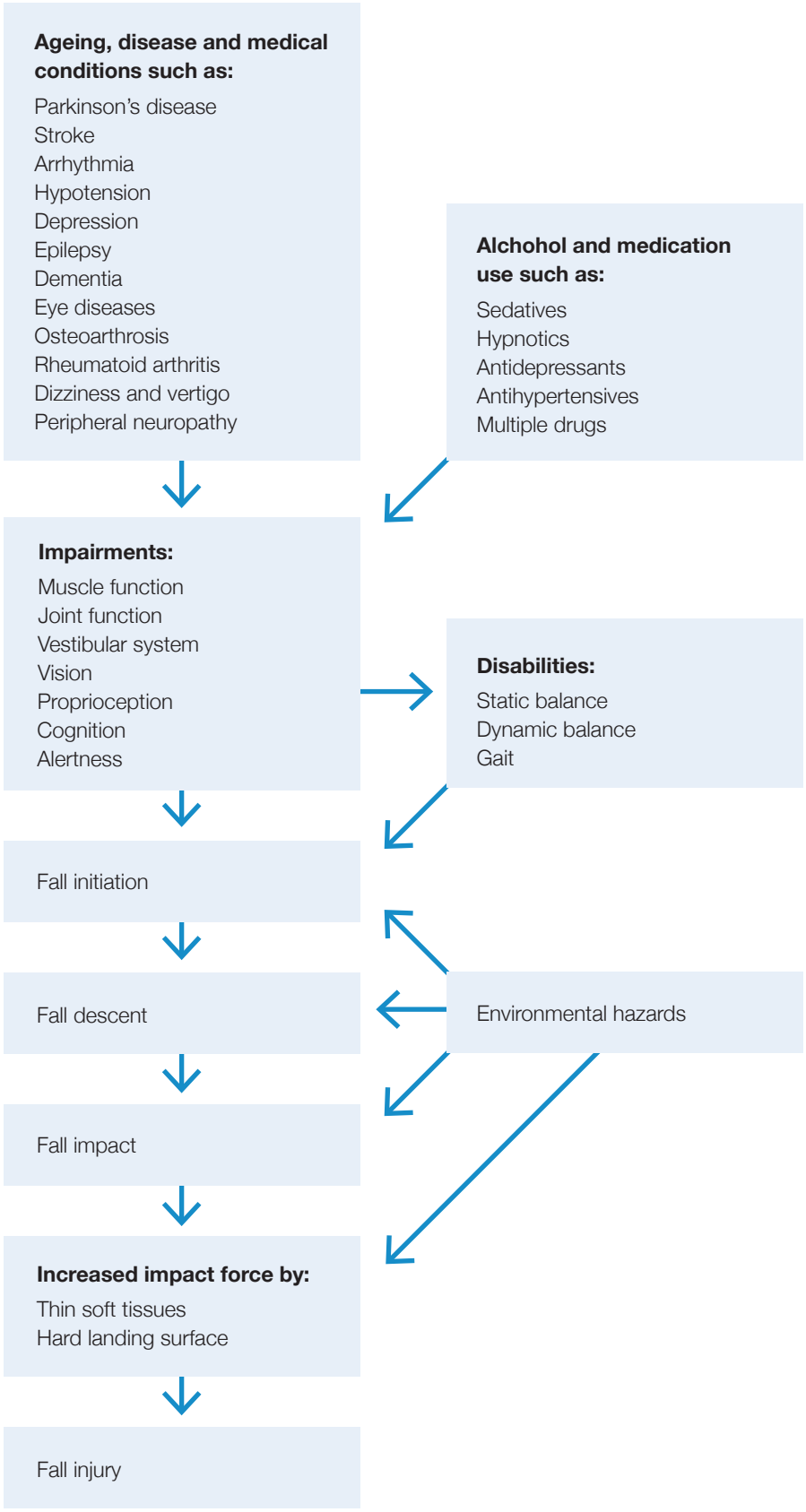
The treatment and management of chronic disease requires integrated care that involves collaboration and coordination between service providers and services across primary, secondary and tertiary care settings. Integrated care should extend beyond a patient's normal service provider to include access to the wider medical community, inclusive of specialists including physicians, hospitals, GPs, allied health and nursing providers and Indigenous Health Workers.

4.2.1 Injury prevention and older persons rehabilitation

Many RFDS aeromedical retrieval for patients 65 years or older are response to injuries, specifically as a result of falls. Falls and fall-induced injuries in older people are common, further raising injury burden and costs.[6, 25]

The rates of people aged 65 years or older living in the community and those in aged care facilities or nursing homes who have a fall ranges from 30% to 50%, with half falling repeatedly.[25] Fall rates rise with age, with functional impairment and disability common in those aged 90 years or older. As such, fall prevention is essential in the planning of effective injury prevention. Generally, fall prevention consists of regular strength and balance training, nutritional interventions (such as vitamin D and calcium), medication review, hearing and vision intervention, and the reduction of home-based hazards and management. The key factors that influence falls are detailed in Figure 4.1. Of interest, many of the conditions that the RFDS treats in people aged 65 years or older also have a direct impact on falls risk. This, coupled with the high rates of medication and alcohol use in this age group and population, heightens the need for falls and injury reduction strategies.

Figure 4.1 Variables that contribute to increased falls risk in older Australians

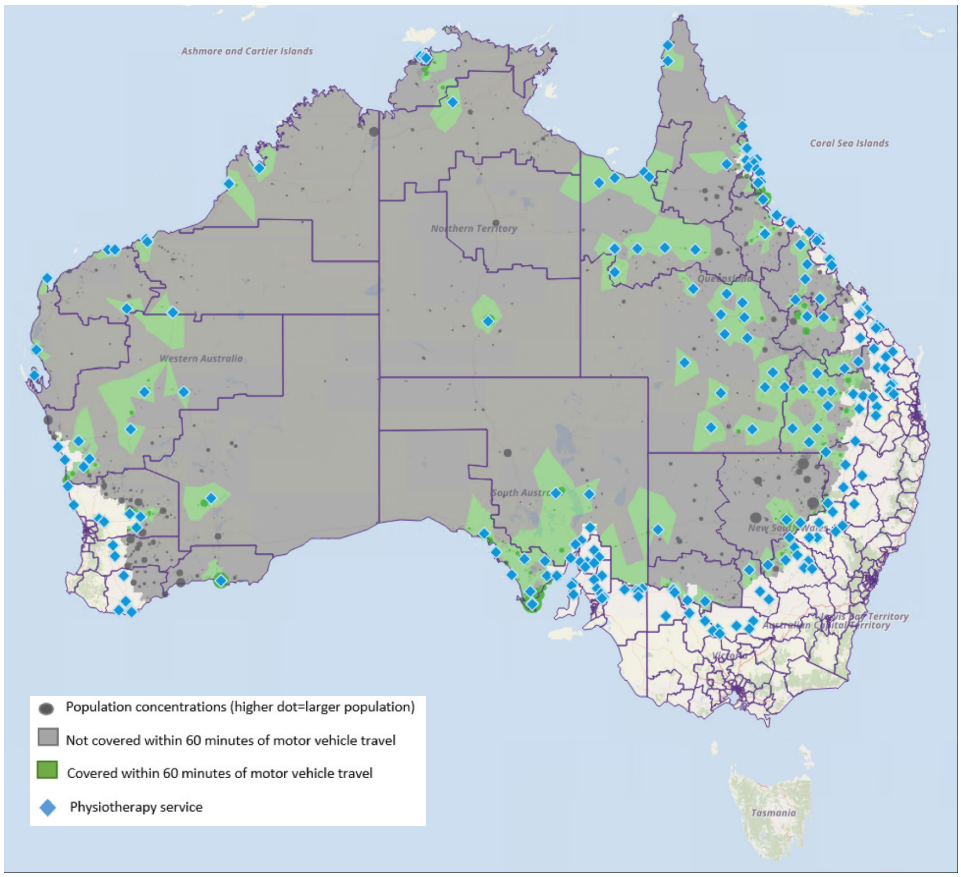


Source: Kannus, P., et al. Prevention of falls and consequent injuries in elderly people. The Lancet 2005;l366(9500): 1885–1893.[25]

The provision of allied health services, including physiotherapist and occupational therapist rehabilitation services, in rural and remote areas is significantly lower than major cities even when accounting for population differences,[26] as detailed in Figures 4.2 and 4.3. This lack of access leads to older rural and remote patients spending more time as a hospital inpatient,[27] to receive essential injury rehabilitation.[28-30]

Rehabilitation services aim to assist people with loss of function or ability due to injury or disease to attain the highest possible level of independence (physically, psychologically, socially and economically) following that incident or illness. This can be achieved through a multidisciplinary team consisting of rehabilitation medicine physicians and nursing and allied health professionals. The process involves individual assessment, treatment, regular review, discharge planning (if an inpatient), community integration and follow-up of people who are referred to that service. Rehabilitation services are guided by principles including: leadership, equitable access, interdisciplinary care teams, care coordination, patient-centred care, evidence-based care, appropriate care settings and clinical process and outcomes.[31] While traditionally many rehabilitation services have been provided in the inpatient hospital environment, it is recognised that there should be a far greater emphasis on ambulatory models of care, both in disease management and also in the provision of rehabilitation after people have suffered sudden or progressive onset of disabling conditions as a result of illness, injury or the effects of chronic disease.

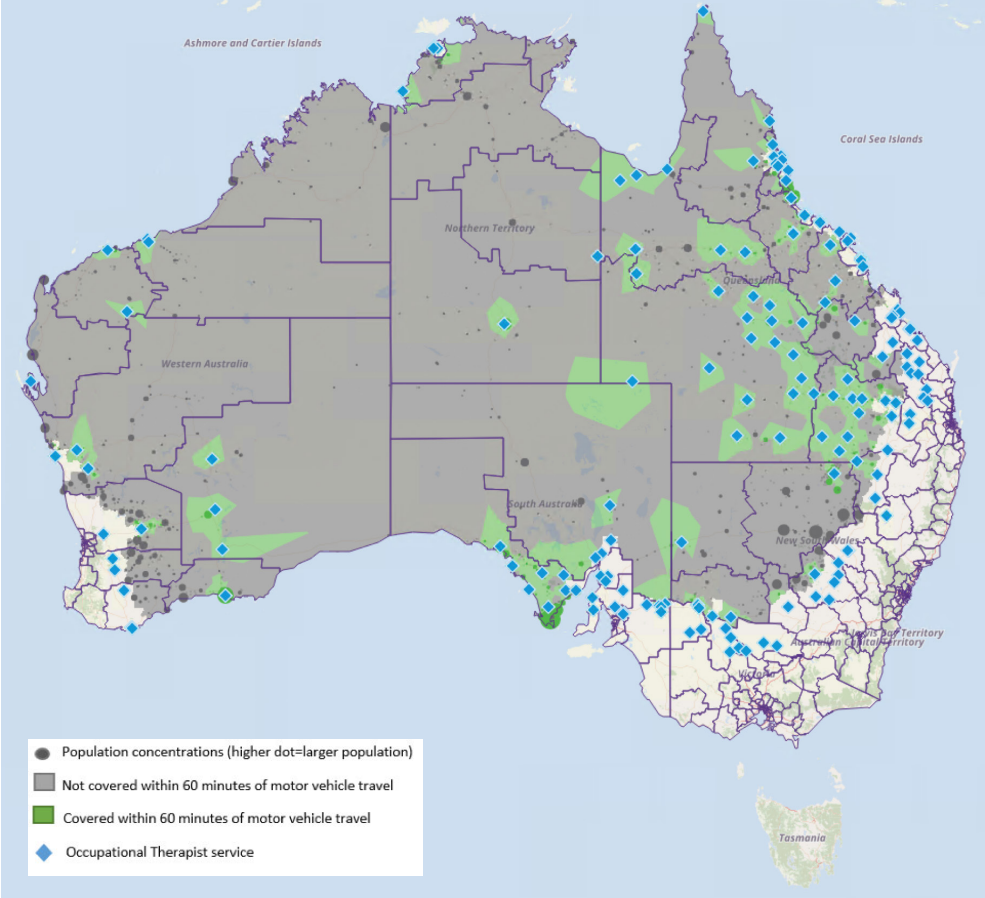
Figure 4.2 Non-RFDS physiotherapist provision for patients aged 65 years or older in remote and very remote Australia 2016–17*



* The physiotherapist service is not specific to older populations. i.e. the service may provide clinical support to multiple age groups.

Source: Author's extrapolation from RFDS data

Figure 4.3 Non-RFDS occupational therapist provision for patients aged 65 years or older in remote and very remote Australia 2016–17*



* The occupational therapist service is not specific to older populations. i.e. the service may provide clinical support to multiple age groups.

Source: Author's extrapolation from RFDS data.

Figures 4.2 and 4.3 indicate that there are many rural and remote areas with no provision of physiotherapist and occupational therapist rehabilitation services. As such, those patients with the highest clinical need have the lowest provision, which is potentially contributing to the significantly poorer outcomes that rural and remote people have as compared to their city counterparts.[6, 32]

4.2.2 Cardiovascular disease

4.2.2.1 Coronary heart disease

Underlying CHD is the primary cause of heart failure, which is usually accompanied by a history of myocardial infarction (MI, better known as heart attack). Other causes of heart failure, and by extension CHD, include HT, idiopathic cardiomyopathy and valvular heart disease. The primary risk factors for these conditions include age (those aged 65 years or older at a heightened risk), family history of CVD, history of smoking, poor diet, obesity, DM, high cholesterol, excessive alcohol consumption and inadequate physical activity.[33] Rural and remote populations have significantly higher rates of many of these risk factors, including obesity, DM, high cholesterol, excessive alcohol consumption and poor diets due to high fresh food cost.[6] Rural and remote people admitted to hospital with acute heart failure often have comorbidities with shared risk factors, such as renal disease, DM and pulmonary disease.[34] As such, it is not surprising that the rates of heart failure are highest in rural and remote Australia, as detailed in Tables 4.4 and 4.5.

Table 4.4 Highest rates: Preventable hospitalisation rate—heart failure, by SA3

Area name (SA3)	State	Rate	Hospitalisations	Remoteness (RA)
Barkly	NT	994	61	Very remote (RA5)
Kimberly	WA	632	154	Very remote (RA5)
Alice Springs	NT	554	167	Remote (RA4)
Mount Druitt	NSW	437	350	Major city (RA1)
Bourke - Cobar - Coonamble	NSW	429	137	Remote (RA4)
Port Douglas - Daintree	Qld	424	50	Outer regional (RA3)
Katherine	NT	400	58	Remote (RA4)
Wagga Wagga	NSW	363	471	Inner regional (RA2)
Outback - South	Qld	358	86	Very remote (RA5)
Griffith-Murrumbidgee (west)	NSW	340	216	Outer regional (RA3)

Notes:

- Rates are age and sex standardised to the Australian population.
- Rates are based on the number of hospitalisations in public and private hospitals (numerator) and people in the geographical area (denominator).
- Analysis is based on the patient's area of usual residence, not the place of hospitalisation.

Sources: AIHW analysis of National Hospital Morbidity Database 2014–15 and ABS Estimated Resident Population 30th June 2014.[9]

Table 4.5 Lowest rates: Preventable hospitalisation rate—heart failure, by SA3

Area name (SA3)	State	Rate	Hospitalisations	Remoteness (RA)
Dural - Wisemans Ferry	NSW	90	29	Major city (RA1)
Sherwood - Indooroopilly	Qld	94	48	Major city (RA1)
Warringah	NSW	95	220	Major city (RA1)
Launceston	Tas	96	115	Major city (RA1)
Surf Coast - Bellarine Peninsula	Vic	98	109	Major city (RA1)

Notes:

- Rates are age and sex standardised to the Australian population.
- Rates are based on the number of hospitalisations in public and private hospitals (numerator) and people in the geographical area (denominator.)
- Analysis is based on the patient's area of usual residence, not the place of hospitalisation.

Sources: AIHW analysis of National Hospital Morbidity Database 2014–15 and ABS Estimated Resident Population 30th June 2014.[9]

Effective management of heart failure involves multidisciplinary care across the acute and primary care sectors, and a combination of strategies, including:[35]

- Non-pharmacological approaches, such as physical activity programs, and fluid or dietary management;
- Pharmacotherapy, including diuretics, angiotensin-converting enzyme inhibitors and beta-blockers;
- Surgical procedures and supportive devices—for example, coronary artery bypass graft surgery, or cardiac resynchronisation therapy with or without insertion of an implantable cardiac defibrillator; and
- Cardiac rehabilitation services,[28, 29] such as cardiac rehabilitation and healthy living programs.

The provision of heart services are generally poor in rural and remote areas. This includes reduced access to physical activity programs, nutritional programs, and specialist medical and cardiac rehabilitation programs.[36] Pharmaceutical access is generally considered adequate as compared to metropolitan areas.[6]

4.2.2.2 Stroke

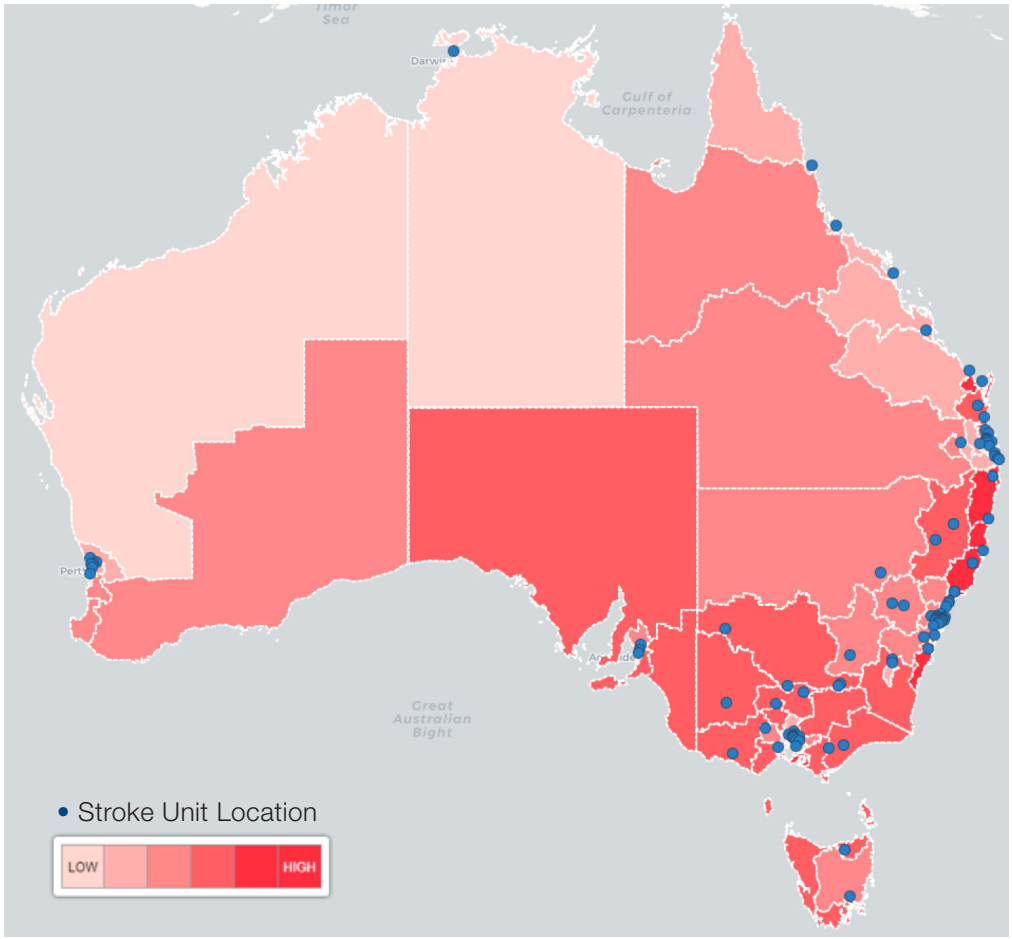
Stroke is a common and a potentially debilitating condition. It is the second leading cause of mortality and the third leading cause of morbidity. One in six people will have a stroke during their lifetime. In Australia, currently, there are around 470,000 people living with this condition; this is projected to reach 709,000 people in 2032. The financial cost of stroke is substantial and amounts to $5 billion (AUD) per annum in Australia.[30] Rural and remote Australians are 19% more likely to suffer a stroke.[37]

According to AIHW 2009–10 estimates,[38] the age-adjusted stroke hospitalisation rate for people living in rural or remote areas (212 hospitalisations per 100,000 population) was 1.5 times higher that of people living in major cities (139 per 100,000). Furthermore, in 2006–10, the age-adjusted stroke death rate was 34 per 100,000 population for people living metropolitan areas compared with rates of 37 to 38 per 100,000 for people living in rural and remote areas.

Rehabilitation services for stroke survivors are provided across a range of care settings. These include inpatient units, day hospitals, outpatient clinics, community centres, home-based services and virtual clinics via telehealth.[39] Patient access to these services is impacted by their availability within the patients community, and their suitability to the individual's needs. Recent data[40] demonstrated that only 59% of patients with stroke received an assessment for rehabilitation, and of these patients only 46% had a referral made for ongoing rehabilitation, even though three quarters (75%) of those who had an assessment for rehabilitation had an identified need for ongoing rehabilitation. These rates are significantly lower than the recommendation that every patient with stroke be assessed for rehabilitation.[41]

Stroke rehabilitation provision is a problem in rural and remote areas, partially due to the difficulty in getting appropriate medical intervention within the critical time period of three hours. Based on a recent Stroke Foundation survey,[42] consisting of 121 eligible stroke rehabilitation services, the majority (92.6%) of programs were from major cities with nine (7.4%) from rural areas. This indicates that provision of stroke services is poor in rural areas, which is consistent with recent workforce provision reports,[6] and Figure 4.4, which details that most of the provision is in major cities or inner regional areas. The Stroke Foundation survey[42] also measured patient outcomes, aimed at allowing health professionals to evaluate the effectiveness of their rehabilitation therapies. Based on the audit, they found that the median Functional Independence Measure (FIM) in rural patients was lower than that of metropolitan areas, with the urban median FIM change following treatment equalling 20%, compared to the rural change rate of 17%. This indicates that both provision and outcomes of stroke rehabilitation in the bush are worse than that of metropolitan areas. This lack of provision would increase the rates of acute stroke in rural and remote areas, thus leading to increased reliance on the RFDS aeromedical services.

Figure 4.4 Number of strokes (>65 years old) in 2017 and corresponding stroke unit provision



Source: Stroke Foundation. No postcode untouched: Stroke in Australia. Melbourne, Australia: Stroke Foundation, 2017.[37]

As most of the provision of stroke services is in major cities, there is a reliance on regional emergency departments to provide initial care, with many regional emergency departments unable to provide time-critical therapies. Stroke patients need an assessment by a stroke specialist to ensure a patient is suitable for treatment. Telemedicine provides those living in rural and regional areas with the opportunity to quickly access stroke specialists who can correctly diagnose stroke and support clinicians on the ground to administer time-critical thrombolysis treatment or arrange transfer to a comprehensive stroke centre for clot retrieval treatment. Telemedicine services are now operating in limited areas, but more investment is required to develop a nationally coordinated stroke telemedicine network.

However, successful TeleStroke (which allows remote stroke neurologist access to patients) delivery of care still requires the treating centre to complete a CT (computed tomography) scan immediately, which is not always feasible due to many reasons, including the availability of skilled technicians.[43] This limitation could be reduced using small portable CT scanners, which require limited training, to rule out brain haemorrhage. In theory, TeleStroke could support regional areas and the RFDS, via remote evaluation by a stroke neurologist before thrombolysis treatment, thus reducing treatment times. A study by Shuaib et al.[43] concluded that portable scanners, in coordination with telemedicine, can be used successfully in the evaluation of patients in rural and remote regions that are not within timely reach of stroke experts or do not have available conventional imaging with CT scans.

4.2.3 Services for neoplasms—cancer

The results of this report indicated that neoplasms were a prominent reason for older rural and remote patients seeking the RFDS aeromedical and primary health care services. Rural and remote cancer patients have reduced survival rates as compared to people in major cities, and are more likely to die within five years of diagnosis.[44] The main contributing factors for poor survival include:[45]

- reduced availability of diagnostic and treatment services;
- delayed diagnosis;
- lower socioeconomic status;
- reduced rates of physical activity;
- increased rates of high-risk alcohol consumption;
- higher rates of smoking; and
- increased sun exposure.

The incidence of all cancers is higher for people in rural and remote areas, which may be partly due to lifestyle factors. There is a significantly higher incidence of bowel cancer, melanoma (associated with sun exposure) and prostate cancer. The incidence of cervical cancer, lung cancer (associated with smoking) and cancer of unknown primary site are significantly higher in those living in remote areas compared to those in major cities. Rural men experience poorer survival rates from prostate cancer than their urban counterparts due to reduced use of diagnostic and treatment services.[46]

The majority of cancer treatment facilities are located in major cities. According to the National Rural Health Alliance, one third of patients diagnosed with cancer live outside metropolitan areas, in areas that also have the lowest health care provision.[6] Cancer patients who live furthest from a large treatment centre are at the highest risk of a poor treatment outcomes.[44]

Many rural and remote patients prefer to be treated near their community support network. This preference to be treated close to their home and family should not compromise access to high-quality care. There is a need to utilise new technologies such as tele-oncology to enable improved access without compromising quality of care. Satisfaction with tele-oncology services have been perceived as high among rural and remote patients.[47]

4.3 Aged care facilities

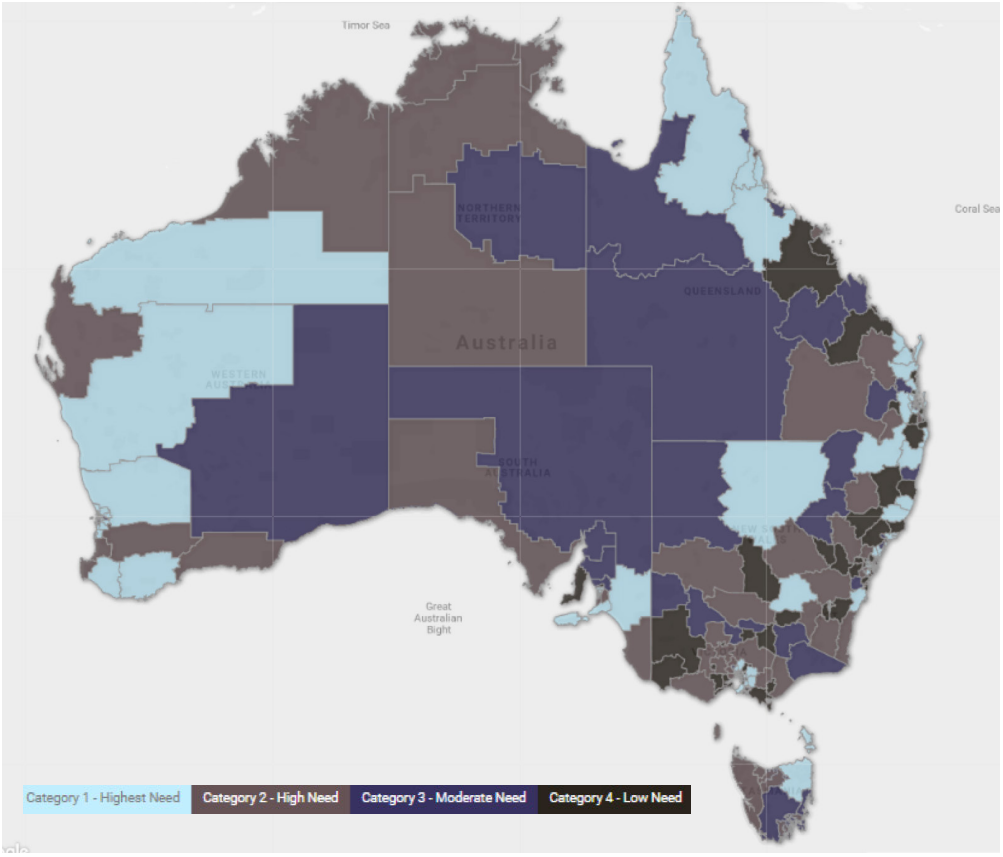
Aged care within Australia is considered a high need area.[48] This is in part due to the ageing population and a growth in chronic diseases, such as neurological conditions, as people live longer.[6] Provision can be poor in metropolitan areas, although rural and remote areas are consistently under-serviced per 100,000 population.[6] There are fewer residential aged care places available in remote and very remote areas, with 38% of facilities in remote areas and 72% in very remote areas having fewer than 20 places. Older Australians in remote or very remote areas accounted for 0.7% of people aged 65 and over in permanent residential aged care.[13]

Most of the population growth in older Australians will be concentrated in major cities in the next 10 years, however the older population in rural and remote Australia is growing at a faster rate (2.9% per year) compared to all other age groups within rural and remote areas (1.3%), thus supporting the belief that the population in rural and remote Australia is ageing.[49] This growth has mainly been associated with the non-Indigenous population, although initial data indicates that the Indigenous population is ageing at a much faster rate than the non-Indigenous population. This has implications for rural and remote population ageing, given that the majority of the Indigenous population resides outside of major cities.[6]

Some 15% (112,000) of Indigenous Australians are aged 50 and over, yet less than 1% of people in permanent residential aged care at 30 June 2015 identified as being Aboriginal or Torres Strait Islander.[13] The age profile of Indigenous Australians in permanent residential aged care was substantially younger than that of their non-Indigenous counterparts: 1 in 4 (26%) Indigenous Australians were aged under 65 compared with fewer than 4% of non-Indigenous Australians. To address the inequality older Indigenous Australians may face in accessing aged care, some places and programs within the aged care system are specifically allocated for people who identify as Aboriginal and Torres Strait Islander. Indigenous Australians can access aged care services through the National Aboriginal and Torres Strait Islander Flexible Aged Care Programme. At 30 June 2015, the program had 802 operational places, predominantly located in rural and remote Australia.[13]

When comparing the retrieval locations of patients aged 65 and older, many were from areas of low provision of aged care (as detailed in Figure 4.5), thus resulting in many either staying in hospital or being admitted to aged care facilities far removed from their communities.[7] Figure 4.5, details the provision of aged care services per 100,000 population based upon the Aged Care Approvals Round (ACAR)[2] recipients, which gives an indication of accredited aged care facilities.

Figure 4.5 Areas in greatest need of aged care services per 100,000 population



Source: Australian Government Department of Health. 2016–17 ACAR map. Canberra, Australia: Department of Health, 2016.[50] Available at: http://www.health.gov.au/internet/main/publishing.nsf/Content/ACAR-Map.

2 The Aged Care Approvals Round (ACAR) is a competitive application process that enables prospective and existing approved providers of aged care to apply for a range of new Australian Government funded aged care places and financial assistance in the form of a capital grant.

Chapter 5: Discussion and Recommendations

- Older people who live in rural and remote areas are often required to travel more than 60 minutes to access basic hospital, emergency department, and GP care. It is vitally important that interventions be introduced aimed at increasing the provision of essential health services in rural and remote areas, especially as it relates to an ageing population.
- Rural and remote people are much more likely to suffer a stroke than people in major cities. Despite this statistic, the provision of stroke services in the bush is poor. The use of small portable CT scanners in combination with TeleStroke (remote stroke neurologist access) services is an example of a novel way to reduce this imbalance.
- Rural and remote patients lack access to various oncology subspecialist treatments, such as medical and radiation oncology, haematology and palliative care, and allied health services. Tele-oncology services have been determined as a cost-effective and clinically non-inferior alternative to traditional methods of service delivery.
- Cardiac rehabilitation (CR) is the recommended 'Gold Standard' protocol for the treatment of CVD. The COACH program is an example of a standardised coaching program delivered by telephone and mail-out for people with or at high risk of chronic disease. The COACH program (Coaching patients On Achieving Cardiovascular Health) could be used in prevention and rehabilitation of CVD patients who do not have access to metropolitan-based CR programs.
- The poor provision of aged care in the bush leads to older patients being relocated to areas of higher provision.
- The RFDS recommends development by the Council of Australian Governments (COAG) of a coordinated National Healthy Ageing Strategy that identifies the particular needs of older people in rural and remote areas.

5.1 Health care for ageing Australians in rural and remote areas

The RFDS is essential to the provision of health care in rural and remote areas. The combined aeromedical and primary health care leading diagnoses included diseases of the circulatory system (28.3%), injury and poisoning (9.4%), and diseases of the skin and subcutaneous system (4.7%). Beyond these RFDS services, many of these patients have limited access to other health care services, including specialist and rehabilitation services, often requiring travel of more than 60 minutes.

The treatment and management of chronic disease, and the key health issues the RFDS responds to in rural and remote Australia, requires integrated care that involves collaboration and coordination between service providers and services across primary, secondary and tertiary care settings. Unfortunately, within rural and remote areas there are still significant shortages of stroke services, injury rehabilitation, cancer treatment services and CVD rehabilitation services. This coupled with poor aged care provision may be leading to increased avoidable death rates in the bush.

5.2 Stroke services

Rural and remote people are much more likely to suffer a stroke then those in major cities,[1] and despite this statistic the provision of stroke services in the bush is poor.[6] The use of small portable CT scanners in combination with TeleStroke services is an example of a novel way to reduce this imbalance. New portable CT scanners allow for brain scanning with minimal training and provide early thrombolysis treatment of acute ischaemic stroke. Research evaluating TeleStroke demonstrates that it is effective, efficient and safe for treating acute ischaemic stroke.[43] A small number of dedicated stroke specialists can manage a large population at risk provided via TeleStroke. By having a CT scanner locally, many patients would avoid the need to be transported to larger facilities, likely more than 500 kilometres away, for assessment, diagnosis and treatment. This however would not reduce the need for locally based stroke rehabilitation services.

5.3 Access to oncology services

Rural and remote patients lack access to various oncology subspecialist treatments, such as medical and radiation oncology, haematology and palliative care and allied health services. This is due to low workforce provision, and the long distances patients are required to travel, with the majority of treatment options within major cities.[6, 47] This, in part, is believed to lead to reduced rural and remote patient survival rates. An Australian study by Sabesan et al.[47] measured the effectiveness of a service based at Townsville Cancer Centre (Queensland) which provided routine and urgent medical oncology services to rural and remote communities through videoconferencing. They concluded that participants were satisfied with the model of care, and benefits included: effective communication between patients and specialists, reduced travel time and money expenditure, and superior specialist support for rural health workers. Although tele-oncology services are not widespread, this study demonstrates the potential of broadening to other rural and remote areas.

5.4 Cardiac rehabilitation

Cardiac rehabilitation (CR) is the recommended 'Gold Standard' protocol for the treatment of CVD. The patient benefits associated with a CR program include reduced mortality, symptom relief, smoking cessation, enhanced physical ability and improved psychological wellbeing.[51, 52] Guidelines recommend CR for patients with acute coronary syndrome (ACS), and for patients who have received coronary revascularisation, including coronary artery bypass graft (CABG) surgery or percutaneous coronary interventions (PCI), or valvular surgery.[52, 53] CR programs are a cost-effective and comprehensive approach to address CVD risk factors, and help restore an individual's physiological, psychological, nutritional and functional status.[54-57] CR programs have shown reductions in morbidity and mortality by nearly 25% compared to conventional care.[58-60] Cardiac services, including CR programs, health services with cardiac capacity, and programs aimed at prevention, are mainly located in major cities and inner regional areas.

The Coaching patients On Achieving Cardiovascular Health (COACH) program was established in 2009 with the aim of assisting people diagnosed with chronic diseases, specifically CVD, and to reduce the risk of future complications, such as heart attack and stroke. The COACH program is a standardised coaching program delivered by telephone and mail-out for people with or at high risk of chronic disease. Trained health professionals ("coaches") coach people to achieve national recommended target levels for their particular risk factors and to take medications as recommended by guidelines for the management of their particular medical condition or conditions.[61] The program has been found to be better than usual primary health care in reducing risk factors in two randomised control trials.[62, 63]

Another example of an effective program is the ProActive Heart program, which could either be used by RFDS clinicians when referring patients for CR or embedded into current RFDS telehealth services. ProActive Heart is delivered by trained health professionals termed "Health Coaches" via the telephone, as with the COACH program. The Health Coaches are based off-site which provides flexibility around the translation of ProActive Heart into clinical practice, either utilising telehealth lines or helplines available to CHD patients (such as the Heart Foundation's Heartline in Australia) or through acute clinical settings. The intervention commences within two weeks of hospital discharge, and is delivered by study-trained health professionals over the course of up to 10 30-minute scripted telephone health coaching sessions. Participants also receive a ProActive Heart handbook and an educational resource to use during the coaching sessions. The intervention focuses on appropriate modification of CHD risk factors, compliance with pharmacological management and management of psychosocial issues.

The development of a regionalised clinical cardiac support network in South Australia is another example of a program that has been developed to improve access to services for people from remote and rural Australia with CVD.[64] Specifically, the South Australian Integrated Cardiovascular Clinical Network (iCCNet) supports the capacity of primary care to manage suspected MI by providing expert risk stratification, point-of-care troponin testing and cardiologist-supported decision-making for people with suspected MI.[64] This program was progressively implemented in non-metropolitan areas of South Australia from 2001 to 2008. It provides rapid assessment of non-metropolitan patients, and, with the RFDS, facilitates timely transport of patients to metropolitan hospitals to receive medical interventions such as coronary angiography, percutaneous coronary intervention, CABG surgery and CR services. Researchers evaluated the relationship between availability of the iCCNet service and mortality by reviewing 30-day death rates among patients with MI presenting to rural hospitals before and after the clinical network implementation, and comparing and contrasting these with mortality rates among primary MI presentations in metropolitan hospitals. The results demonstrated that the immediate cardiac support provided through iCCNet was associated with a 22% odds ratio in 30-day mortality ($p=0.007$).[64] In addition, there was a strong association between network support and transfer of patients to metropolitan hospitals ($p<0.001$), with lower mortality observed among transferred patients. "These interventions closed the gap in mortality between rural and metropolitan patients in South Australia". [64]

The COACH program, the ProActive Heart program and the South Australian iCCNet are examples of programs and initiatives that could implemented in rural and remote areas to improve outcomes for people with CVD.

5.5 Responding to dementia

Dementia and neurological conditions are expected to significantly increase during the next 10 years.[6] One of the main reasons for the increase in neurological disorders is longer life expectancy. People live longer and, accordingly, suffer dementia more often than several decades ago. Because neurological disorders are more prevalent in older adults and people are living longer (because of decreases in the number of deaths from CVD and cancer), there is an unprecedented increase in the number of people affected by neurological disorders.[12] This is an area of need, which needs to be considered in policy development. This is particularly the case in remote areas where there are less services designed for neurological disease burden management.

5.6 Aged care services

The poor provision of aged care in the bush leads to older patients being relocated to areas of higher provision. This has been highlighted by Bernoth et al.,[7] who stated that "participants described how they believed their only option in obtaining aged care for their loved ones was for them to be uprooted from their communities to become totally, socially disconnected from all they knew and loved and forced into exile". This study found that feelings of aloneness were common, with many participants believing their loved ones died more quickly due to being relocated from their rural and remote communities.[7] This situation is not unique, with respite centres and palliative facilities in rural and remote areas, such as Tenant Creek and Alice Springs, generally being at capacity and therefore not accessible to older people. As stated by Gibb and Dempsey,[8] "What is needed are respite and palliative care services in remote communities. This would mean that as people's need for support services progresses to this stage, they can remain close to family".

The need to maintain social contact is an important social issue for older people,[65] with social connectedness being based on relationships with family, friends and their community.[66] Many of the RFDS older patients describe a strong sense of social connectedness with their family, friends and rural communities, prior to their needing residential aged care following an acute injury. Buckley and McCarthy state that little is known about social connectedness and the meaning it has for an older person, although they contend that the more social ties an older person has, the less socially isolated they feel.[66] By preventing older patients from remaining within driving distance of their communities, we are reducing their social networks and increasing their rates of isolation, both of which contribute to increased depression and anxiety.

Many not-for-profit or private providers have withdrawn their service provision in rural and remote areas, due to the inability to deliver sustainable care services.[8] This could be due to the costs for running aged care services in rural and remote areas that are not incurred in major cities, such as the costs of purchasing and transporting food. These additional costs need to be formally budgeted in government funding allocations to regional councils and Aboriginal controlled health organisations that offer care services to older people and those living with a disability.[8]

The National Aboriginal and Torres Strait Islander Flexible Aged Care Program (NATSIFACP),[3] has generally been acknowledged as a program that could be employed further in improving residential and flexible care in rural and remote areas of Australia.[67] This model provides a viable option that could result in sustainable ways of providing aged care in remote communities.

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3 The National Aboriginal and Torres Strait Islander Flexible Aged Care Program funds organisations to provide culturally appropriate aged care to older Aboriginal and Torres Strait Islander people close to home and community. Flexible aged care services can deliver a mix of residential and home care services in accordance with the needs of the community. Services funded under the Program are located mainly in rural and remote areas. The National Aboriginal and Torres Strait Islander Flexible Aged Care Program is administered outside of *the Aged Care Act 1997*. For more information: https://agedcare.health.gov.au/sites/g/files/net1426/f/documents/02_2017/natsifacp_guidelines_october_2016.pdf.

5.7 Conclusion and recommendation

People in rural and remote communities generally want to remain independent and in control of how and where they live for as long as possible. They want to continue to be connected to their families, friends and communities and to be able to exercise some measure of choice if they require care—including the choice to age in their own communities. It is vitally important that interventions be introduced aimed at targeting poor provision of the essential health services outlined in this chapter in rural and remote areas, especially as it relates to an ageing population.

The RFDS recommends the development by the Council of Australian Governments (COAG) of a coordinated National Healthy Ageing Strategy which identifies the health status and service delivery challenges in rural and remote areas, and through locally appropriate solutions, focuses on increasing access to stroke services; injury rehabilitation services; CR services and dementia services; and increasing the availability of local aged care places.

Chapter 6: Conclusion and future research interventions

The provision of essential services for older rural and remote Australian patients is poor. This poor provision means patients are required to travel to receive acute and chronic disease treatment, which for many is not realistic, based on personal and geographical limitations.

This imbalance could be a contributing factor for the lower life expectancies in rural and remote areas. As such, it is important that innovative models of care be implemented. This could include telemedicine for injury, stroke and CHD rehabilitation, in addition to tele-oncology and remote neurological specialist support (such as TeleStroke). It is hoped that by providing telemedicine services to rural and remote communities, we can reduce the health imbalance of rural and remote communities in a cost-effective and efficient manner. As such, future studies may wish to pilot test telemedicine interventions aimed at older rural and remote populations, to determine whether the clinical outcomes and patient perceived benefits are non-inferior to traditional methods of delivery. By conducting a pilot study, most likely embedded in a current RFDS telemedicine service, we will be able to determine benefits before an extensive Australian-wide implementation.

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