



PROVIDING AEROMEDICAL CARE TO REMOTE INDIGENOUS COMMUNITIES

Lara Bishop, Martin Laverty and Lauren Gale



Acknowledgements

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Commitment to Indigenous Reconciliation

The RFDS has developed a Reconciliation Action Plan (RAP),¹ which commenced in 2016. The RAP proposes, among other things, to use research and policy to improve Indigenous health outcomes. 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 new Research and Policy Unit, located in Canberra. The Unit's role is to gather evidence about, and recommend solutions to, overcoming barriers to poor health outcomes and limited 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@rfd.org.au.

Notes about this report

Use of the term 'Indigenous'

The term 'Aboriginal and Torres Strait Islander people' 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. The use of the term 'Indigenous' to describe Australia's Aboriginal and Torres Strait Islander peoples follows the Australian Institute of Health and Welfare's use of the term in their recent publication, *The health and welfare of Australia's Aboriginal and Torres Strait Islander peoples* (Australian Institute of Health and Welfare, 2015d).

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.

'Indigenous' and 'indigenous'

'Indigenous' is used to describe Australia's Aboriginal and/or Torres Strait Islander peoples, whereas 'indigenous' is used to describe to the world's indigenous peoples.

Data limitations

It should be noted that the measurement of Indigenous health outcomes and comparisons between Indigenous and non-Indigenous data may be complicated by deficiencies in the data being used (Freemantle, Officer, McAullay, & Anderson, 2007). Data in this report come from a number of different administrative datasets and surveys, all of which have limitations that should be considered when interpreting the results. There is likely under-identification of Indigenous Australians in statutory and administrative data collections (Freemantle et al., 2007). For example, Indigenous status may not have been accurately recorded or may be incomplete in some datasets (Australian Institute of Health and Welfare, 2015a), such as in Australian mortality data where a proportion deaths are not reported as Aboriginal or Torres Strait Islander during the death registration process (Australian Institute of Health and Welfare, 2014b). There are also deficiencies within the RFDS dataset. Data from patients whose Indigenous status is unknown have been excluded from the analyses undertaken for the current report. It is likely that a proportion of these patients are Indigenous. Consequently, RFDS data are likely to underrepresent the true impact of health conditions on Indigenous Australians.

¹ The RFDS Reconciliation Action Plan can be viewed here: https://www.flyingdoctor.org.au/assets/files/RN013_RAP_P1_low-res.pdf.

Contents

Acknowledgements	2
Commitment to Indigenous Reconciliation.....	3
Royal Flying Doctor Service Research and Policy Unit	3
Notes about this report.....	3
Data limitations	3
Abbreviations.....	8
Foreword.....	9
Matthew Cooke.....	9
1.0 Introduction	13
2.0 Purpose statement	15
3.0 Indigenous peoples and their health	16
3.1 Global indigenous health.....	16
3.2 Indigenous Australians.....	18
3.3 Australian Indigenous health	22
3.4 Closing the Gap	25
4.0 The RFDS in remote and rural Australia.....	27
4.1 Structure of the RFDS	27
4.2 Services provided by the RFDS.....	27
4.3 The RFDS fleet	30
4.4 RFDS tasking and retrieval process.....	30
4.5 RFDS staff	31
5.0 Aeromedical retrievals of Indigenous Australians in remote and rural Australia	32
5.1 International standard for classifying diseases and related health problems	32
5.2 RFDS data collection and coding	33
5.3 Patient characteristics	34
5.4 Demand for aeromedical retrievals by Indigenous Australians.....	37
5.5 Aeromedical retrievals of Indigenous Australians by ICD-10-AM diagnoses.....	38
5.6 Leading ICD-10-AM diagnoses triggering an aeromedical retrieval for Indigenous Australians, by 5-year age groups.....	103
5.7 Discussion	104
5.8 Future opportunities—RFDS Indigenous data	105
5.9 Summary	106
6.0 Conclusion	107

Tables

Table 5.1. ICD-10-AM chapters	33
Table 5.2. Leading three reasons Indigenous Australians required an aeromedical retrieval, by 5-year age group, July 2013–December 2015*	103

Figures

Figure 3.1. Major difficulties, trends, and factors that affect indigenous health	17
Figure 3.2. Indigenous, non-Indigenous and total population, by remoteness, 30 June 2011	19
Figure 3.3. Indigenous population clusters, 2011	20
Figure 3.4. Distribution of Indigenous estimated resident population by remoteness and jurisdiction, 2011	21
Figure 3.5. Age structure of the Australian population, by Indigenous status, 30 June 2011	22
Figure 3.6. Leading broad causes of death, by Indigenous status, 2008–2012 (percent)	24
Figure 4.1. RFDS national aeromedical footprint	28
Figure 4.2. RFDS primary healthcare clinics, by ASGS remoteness areas, 2014–2015	29
Figure 5.1. Most common reasons for an aeromedical retrieval of Indigenous Australians, and corresponding proportion among non-Indigenous Australians, July 2013–December 2015	35
Figure 5.2. Demand for aeromedical retrievals by Indigenous Australians, January–December 2015	37
Figure 5.3. Demographic data for aeromedical retrievals of Indigenous patients with certain infectious and parasitic diseases, July 2013–December 2015	40
Figure 5.4. Gender of Indigenous patients by age who underwent an aeromedical retrieval for certain infectious and parasitic diseases, July 2013–December 2015	41
Figure 5.5. Demographic data for aeromedical retrievals of Indigenous patients with neoplasms, July 2013–December 2015	43
Figure 5.6. Gender of Indigenous patients by age who underwent an aeromedical retrieval for neoplasms, July 2013–December 2015	44
Figure 5.7. Demographic data for aeromedical retrievals of Indigenous patients with diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism, July 2013–December 2015	46
Figure 5.8. Gender of Indigenous patients by age who underwent an aeromedical retrieval for diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism, July 2013–December 2015	47
Figure 5.9. Demographic data for aeromedical retrievals of Indigenous patients with endocrine, nutritional and metabolic diseases, July 2013–December 2015	49
Figure 5.10. Gender of Indigenous patients by age who underwent an aeromedical retrieval for endocrine, nutritional and metabolic diseases, July 2013–December 2015	50
Figure 5.11. Demographic data for aeromedical retrievals of Indigenous patients with mental and behavioural disorders, July 2013–December 2015	53
Figure 5.12. Gender of Indigenous patients by age who underwent an aeromedical retrieval for mental and behavioural disorders, July 2013–December 2015	54

Figure 5.13. Demographic data for aeromedical retrievals of Indigenous patients with diseases of the nervous system, July 2013–December 2015	56
Figure 5.14. Gender of Indigenous patients by age who underwent an aeromedical retrieval for diseases of the nervous system, July 2013–December 2015	57
Figure 5.15. Demographic data for aeromedical retrievals of Indigenous patients with diseases of the eye and adnexa, July 2013–December 2015	59
Figure 5.16. Demographic data for aeromedical retrievals of Indigenous patients with diseases of the ear and mastoid process, July 2013–December 2015	61
Figure 5.17. Demographic data for aeromedical retrievals of Indigenous patients with diseases of the circulatory system, July 2013–December 2015	63
Figure 5.18. Demand for aeromedical retrievals by Indigenous Australians for diseases of the circulatory system, January to December, 2015	63
Figure 5.19. Gender of Indigenous patients by age who underwent an aeromedical retrieval for diseases of the circulatory system, July 2013–December 2015	64
Figure 5.20. Demographic data for aeromedical retrievals of Indigenous patients with diseases of the respiratory system, July 2013–December 2015	66
Figure 5.21. Demand for aeromedical retrievals by Indigenous Australians for diseases of the respiratory system, January to December, 2015	67
Figure 5.22. Gender of Indigenous patients by age who underwent an aeromedical retrieval for diseases of the respiratory system, July 2013–December 2015	68
Figure 5.23. Demographic data for aeromedical retrievals of Indigenous patients with diseases of the digestive system, July 2013–December 2015	70
Figure 5.24. Demand for aeromedical retrievals by Indigenous Australians for diseases of the digestive system, January to December, 2015	70
Figure 5.25. Gender of Indigenous patients by age who underwent an aeromedical retrieval for diseases of the digestive system, July 2013–December 2015	71
Figure 5.26. Demographic data for aeromedical retrievals of Indigenous patients with diseases of the skin and subcutaneous tissue, July 2013–December 2015	73
Figure 5.27. Gender of Indigenous patients by age who underwent an aeromedical retrieval for diseases of the skin and subcutaneous tissue, July 2013–December 2015	74
Figure 5.28. Demographic data for aeromedical retrievals of Indigenous patients with diseases of the musculoskeletal system and connective tissue, July 2013–December 2015	76
Figure 5.29. Gender of Indigenous patients by age who underwent an aeromedical retrieval for diseases of the musculoskeletal system and connective tissue, July 2013–December 2015	77
Figure 5.30. Demographic data for aeromedical retrievals of Indigenous patients with diseases of the genitourinary system July 2013–December 2015	79
Figure 5.31. Gender of Indigenous patients by age who underwent an aeromedical retrieval for diseases of the genitourinary system, July 2013–December 2015	80
Figure 5.32. Demographic data for aeromedical retrievals of Indigenous patients for pregnancy, childbirth and the puerperium, July 2013–December 2015	82
Figure 5.33. Demand for aeromedical retrievals by Indigenous Australians for pregnancy, childbirth and the puerperium, January to December, 2015	82
Figure 5.34. Gender of Indigenous patients by age who underwent an aeromedical retrieval for pregnancy, childbirth and the puerperium, July 2013–December 2015	83
Figure 5.35. Demographic data for aeromedical retrievals of Indigenous patients with certain conditions originating in the perinatal period, July 2013–December 2015	85
Figure 5.36. Gender of Indigenous patients by age who underwent an aeromedical retrieval for certain conditions originating in the perinatal period, July 2013–December 2015	86
Figure 5.37. Demographic data for aeromedical retrievals of Indigenous patients with congenital malformations, deformations and chromosomal abnormalities, July 2013–December 2015	88
Figure 5.38. Demographic data for aeromedical retrievals of Indigenous patients with symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified, July 2013–December 2015	90

Figure 5.39. Gender of Indigenous patients by age who underwent an aeromedical retrieval for symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified, July 2013–December 2015	91
Figure 5.40. Demographic data for aeromedical retrievals of Indigenous patients with injury, poisoning and certain other consequences of external causes, July 2013–December 2015	94
Figure 5.41. Demand for aeromedical retrievals by Indigenous Australians for injury, poisoning and certain other consequences of external causes, January to December, 2015.....	94
Figure 5.42. Gender of Indigenous patients by age who underwent an aeromedical retrieval for injury, poisoning and certain other consequences of external causes, July 2013–December 2015.....	95
Figure 5.43. Demographic data for aeromedical retrievals of Indigenous patients with factors influencing health status and contact with health services, July 2013–December 2015	99
Figure 5.44. Gender of Indigenous patients by age who underwent an aeromedical retrieval for factors influencing health status and contact with health services, July 2013–December 2015	100
Figure 5.45. Demographic data for aeromedical retrievals of Indigenous patients with ill-defined conditions, July 2013–December 2015.....	101
Figure 5.46. Gender of Indigenous patients by age who underwent an aeromedical retrieval for ill-defined conditions, July 2013–December 2015	102

Abbreviations

AATSIHS	Australian Aboriginal and Torres Strait Islander Health Survey
ABS	Australian Bureau of Statistics
ACCHO	Aboriginal Community Controlled Health Organisation
ACCCHS	Aboriginal community controlled health service
ACS	acute coronary syndromes
ACT	Australian Capital Territory
AIDS	acquired immune deficiency syndrome
AIHW	Australian Institute of Health and Welfare
ASGS	Australian Statistical Geography Standard
COAG	Council of Australian Governments
COPD	chronic obstructive pulmonary disease
CKD	chronic kidney disease
CVD	cardiovascular disease
ESKD	end stage kidney disease
GP	general practitioner
HIV	human immunodeficiency virus
ICD	International Statistical Classification of Diseases and Related Health Problems
ICD-10-AM	International Statistical Classification of Diseases and Related Health Problems, 10th revision, Australia Modification
IHT	inter-hospital transfer
indigenous	refers to the world's indigenous peoples
Indigenous	refers to Australia's Aboriginal and/or Torres Strait Islander peoples
KRT	kidney replacement therapy
MBS	Medical Benefits Schedule
NATSIHS	National Aboriginal and Torres Strait Islander Health Survey
NATSINPAS	National Aboriginal and Torres Strait Islander Nutrition and Physical Activity Survey
NATSISS	National Aboriginal and Torres Strait Islander Social Survey
NETS	Newborn paediatric Emergency Transport Services
NSW	New South Wales
NT	Northern Territory
ORH	Operational Research in Health Ltd.
PE	primary evacuation
Qld	Queensland
RAP	Reconciliation Action Plan
RFDS	Royal Flying Doctor Service
SA	South Australia
SAAS	South Australia Ambulance Service
SIDS	Sudden Infant Death Syndrome
Tas	Tasmania
Vic	Victoria
WA	Western Australia
WHO	World Health Organization
24/7	24-hour, seven-days-a-week

Foreword

Matthew Cooke



Thank you for the opportunity to provide a foreword, to this Royal Flying Doctor Service (RFDS)—“*Providing aeromedical care to remote Indigenous communities*” report. I commend the RFDS in progressing its organisational commitment to reconciliation and the focused attention the RFDS network is undertaking to ensure the organisation’s Reconciliation Action Plan (RAP) has real meaning.

The findings of this report are valuable in assisting State, Territory and National social and health policy teams and elected officials with relevant real time information drawn from the RFDS Aeromedical Teams data—the first report of its kind by the RFDS.

We would be hard pressed to find any member of our regional and remote communities who do not know of, or who have personally benefited from, the services provided by RFDS which assures the fundamental principle that **all Australians** have access to universal high quality health care. The RFDS and the National Aboriginal Community Controlled Health Organisation (NACCHO) member services share a very unique space in rural and remote Australia as principle service providers to communities. Our members have a long tradition working with the RFDS and value the critical assistance that their service provides to regional and remote Aboriginal and Torres Strait Islander peoples.

I would highlight the key finding in the report that “an integrated approach to improving the health of Indigenous Australians which considers the social determinates of health, health risk factors and other factors impacting Indigenous Australians is required.” We also note the key findings to improve holistic approaches, include active involvement of our communities and building collaborative working relationships.

I acknowledge the RFDS efforts to collect data that will help to identify key areas where early intervention and prevention strategies would likely reduce aeromedical retrievals and therefore hospital admissions. The findings of the report demonstrate that we have a great deal more to do particularly in relation to injury prevention, as well as providing comprehensive early screening to detect emerging conditions and put in place appropriate care aimed at improving the wellbeing of our communities.

In moving beyond the report there are at least two immediate opportunities where the strengths of both our service networks could support improvements and bring about better health gains for Aboriginal and Torres Strait Islander peoples:

- > Supporting improvements in culturally secure service delivery by RFDS and other ‘mainstream’ health service providers;
- > Leveraging the expertise within our respective networks to improve clinical care aimed at greater prevention, early intervention and assuring our communities receive the right care at the right time in the right place.

NACCHO looks forward to continuing collaborative working arrangements with the RFDS in the future.

A handwritten signature in black ink, appearing to read 'M Cooke', written in a cursive style.

Matthew Cooke

Chairperson National Aboriginal Community Controlled Health Organisation (NACCHO)

NACCHO is the national peak body representing over 140 Aboriginal Community Controlled Health Organisations providing comprehensive primary health and related support in over 300 fixed outreach and mobile clinics in urban, rural and remote Australia.

Executive summary

In 2011, 669,881 Australians or 3% of the Australian population identified as Aboriginal and/or Torres Strait Islander (Indigenous) Australians. The 2011 Census data demonstrated that 142,900 Indigenous Australians, or 21% of the Indigenous population, lived in remote and very remote areas. A central purpose of the Royal Flying Doctor Service (RFDS) is to provide health services to those who live in remote and very remote areas. Accordingly, this research considers the health of Indigenous Australians living in remote and very remote areas. It details illness and accident demand for aeromedical retrievals of Indigenous Australians by the RFDS from remote and very remote Australia.

In 1989, the National Aboriginal Health Strategy Working Party affirmed the term *Aboriginal health* means not just the physical wellbeing of an Indigenous person but also the social, emotional and cultural wellbeing of the whole community in which each individual is able to achieve their full potential as a human being. Indigenous Australians' decisions about when and why to seek health services, treatment acceptance, adherence and follow-up, and the success of prevention and health promotion, is accordingly influenced by culture.

Indigenous Australians' health outcomes are poorer than non-Indigenous Australians in relation to chronic and communicable diseases, mental health, infant health, and life expectancy. Indigenous Australians are 1.2 times as likely as non-Indigenous Australians to die from cancer and 1.5 times as likely as non-Indigenous Australians to die from cardiovascular disease (CVD). Indigenous Australians are 1.8 times as likely to die from an injury as non-Indigenous Australians and twice as likely as non-Indigenous Australians to be hospitalised for an injury. Indigenous Australians are twice as likely to die as a result of self-harm (suicide) than non-Indigenous Australians and three times as likely to die from chronic lower respiratory diseases. Indigenous Australians are three times as likely to die of digestive conditions and five times as likely as non-Indigenous Australians to die from endocrine, nutritional, and metabolic conditions such as diabetes. There is no biomedical reason to explain any of these disparities.

The substantial difference in health outcomes between Indigenous and non-Indigenous Australians is known as 'the Gap.' Reducing the gap between Indigenous and non-Indigenous Australians underpins much of Australia's policies about Indigenous health.



Within national hospital statistics, data are reported on the care of Indigenous Australians who attend hospital for any reason. The outcomes for Indigenous Australians who arrive at hospital from remote or very remote Australia via an aeromedical retrieval are also captured in these data. However, not all components of care provided to Indigenous Australians, who are transported via an RFDS aeromedical retrieval, are reported in the national dataset.

Specifically, the number of Indigenous patients transported by the RFDS for any reason, their primary diagnosis prior to arrival at hospital, and demographic data have not been previously reported. This research reports this data for the first time, using the International Statistical Classification of Diseases and Related Health Problems, 10th Edition, Australian Modification (ICD-10-AM) service data recorded by the RFDS in the period between 1 July 2013 and 31 December 2015.

Between July 2013 and December 2015, the RFDS conducted 75,763 aeromedical retrievals, equivalent to 83 aeromedical retrievals per day. Indigenous status was recorded for 62,528 patients. Patients whose Indigenous status was unknown were excluded from further data analysis. Of the 62,528 retrievals, 17,606 (28.2%) aeromedical retrievals were of Indigenous Australians from remote and very remote Australia. The current report considers the reasons for these healthcare interventions, to inform policy actions on what might prevent the future need for these episodes of care.

When Indigenous aeromedical retrieval data were analysed using the 22 categories of ICD-10-AM, plus an additional category for unknown or ill-defined conditions, the RFDS was able to identify the most significant illnesses impacting the Indigenous Australians it serves. The socio-demographic characteristics of the population were also identified.

The data revealed that: Indigenous females (53.8%) were 1.2 times as likely as Indigenous males (46.2%) to undergo an aeromedical retrieval; the average age at which an Indigenous Australian underwent an aeromedical retrieval was 30–34 years; Indigenous children aged 0–4 years (14.1% of Indigenous aeromedical retrievals) were the group of Indigenous patients most likely to undergo an aeromedical retrieval; and the largest volume of aeromedical retrievals originated in central Australia, the north of Western Australia, and the north of Queensland.

Indigenous Australians were most likely to require an aeromedical retrieval for injury, poisoning and other consequences of external causes: 17.9% of all Indigenous aeromedical retrievals. Diseases of the circulatory system, such as heart attacks or stroke, were the second most common reason for an aeromedical retrieval: 14.3% of all Indigenous aeromedical retrievals. Diseases of the respiratory system, such as a respiratory infection, influenza, and pneumonia, were the third most common reason for an aeromedical retrieval of Indigenous Australians: 12.8% of Indigenous aeromedical retrievals. Together, injury, poisoning and other consequences of external causes, diseases of the circulatory system, and diseases of the respiratory system accounted for almost half (45.0%) of all RFDS aeromedical retrievals of Indigenous Australians.

Other illnesses impacting Indigenous Australians that triggered an aeromedical retrieval included: diseases of the digestive system, including the oesophagus, stomach, appendix, liver, and diseases associated with dental caries (7.8% of Indigenous aeromedical retrievals); pregnancy, childbirth and the puerperium (7.2% of Indigenous aeromedical retrievals); symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (6.5% of Indigenous aeromedical retrievals); diseases of the genitourinary system, such as renal failure (5.5% of Indigenous aeromedical retrievals); diseases of the skin and subcutaneous tissue (5.1% of Indigenous aeromedical retrievals); ill-defined conditions (4.5% of Indigenous aeromedical retrievals); mental and behavioural disorders (4.0% of Indigenous aeromedical retrievals); infectious and parasitic diseases (2.7% of Indigenous aeromedical retrievals); diseases of the musculoskeletal system and connective tissue (2.3% of Indigenous aeromedical retrievals); diseases of the nervous system, such as meningitis, Parkinson or Alzheimer disease (2.2% of Indigenous aeromedical retrievals); and endocrine, nutritional and metabolic diseases (2.1% of Indigenous aeromedical retrievals).

Unsurprisingly, some diseases only required emergency health transport in the most acute circumstances. These included: conditions originating in the perinatal period (1.5% of Indigenous aeromedical retrievals); neoplasms, or abnormal tissue growth (1.0% of Indigenous aeromedical retrievals); diseases of the blood and blood-forming organs and disorders involving the immune system (0.5% of Indigenous aeromedical retrievals), diseases of the eye and adnexa (0.2% of Indigenous aeromedical retrievals); diseases of the ear and mastoid process (0.2% of Indigenous aeromedical retrievals); and congenital malformations, deformations and chromosomal abnormalities (0.2% of Indigenous aeromedical retrievals).

For Indigenous Australians between the ages of five and 39 years, injury, poisoning and certain other consequences of external causes was the leading reason for an aeromedical retrieval, accounting for around 30% of retrievals for each 5-year age group up to 34 years and around 20% for Indigenous Australians aged 35–39 years. A previous RFDS report on injuries in remote and rural Australia called for the development of a new national injury prevention plan incorporating evidence-based strategies aimed at reducing injuries (Bishop, Gale, & Laverty, 2016). The current report reiterates this call for a new national injury prevention plan, and recommends such a plan incorporates specific, evidence-based, culturally appropriate strategies to reduce injuries amongst remote and rural Indigenous Australians.

The age pattern of Indigenous aeromedical retrievals showed that remote and rural Indigenous children, aged 0–4 years, accounted for the greatest proportion of all aeromedical retrievals, with around one in seven Indigenous aeromedical retrievals for a child under five years of age. More specifically, 22.6% of Indigenous Australians that underwent an aeromedical retrieval for diseases of the respiratory system were under one year of age. The overrepresentation of young Indigenous children in aeromedical retrievals, compared with other age groups, suggests that illness and injury prevention and intervention messages that target young children, their parents or carers, and health professionals serving these communities, may be helpful in reducing the incidence, or mediating the impacts of, illnesses and injuries for young Indigenous children. Specific, culturally appropriate, evidence-based illness and injury prevention strategies should be reviewed, developed, adopted, and evaluated for remote and rural Indigenous Australians, taking into account the state-based services in areas where Indigenous Australians reside.

Organisations providing health care to Indigenous Australians, such as the RFDS, also have an important role to play in improving health outcomes for Indigenous Australians. There is strong evidence that inequitable access to quality healthcare, based on ethnicity, contributes to health disparities for Indigenous Australians. Consequently, better health outcomes are achieved when services and providers are culturally competent. There exists the potential for cultural competencies expected of health workers providing clinical care to Indigenous Australians in mainstream health settings to be articulated in a new national framework, designed and overseen by Indigenous lead clinical experts, as a measure to contribute to better Indigenous health outcomes. Such a framework would ideally provide evidence-based recommendations on the development of culturally appropriate services, and promote culturally appropriate face-to-face service delivery by healthcare professionals serving Indigenous Australians.

1.0 Introduction

Remote and rural² Australians generally experience poorer health than people living in major cities. They have reduced access to health care, travel greater distances to receive medical services, experience higher rates of ill health, and demonstrate higher levels of mortality, morbidity and health and disease risk factors, than people living in major cities (Australian Institute of Health and Welfare, 2014a).

Aboriginal and Torres Strait Islander (Indigenous) Australians living in remote and rural Australia are further disadvantaged compared to their non-Indigenous counterparts—they demonstrate higher rates of illnesses, injuries, deaths and hospitalisations than non-Indigenous Australians, and these generally increase with increasing remoteness (Australian Institute of Health and Welfare, 2012a, 2014a; Osborne, Baum, & Brown, 2013). The poorer health of remote and rural-Indigenous Australians is also impacted by the social determinants of Indigenous health, which are well recognised nationally and internationally. These relate to the loss of language and connection to the land, environmental deprivation, spiritual, emotional and mental disconnectedness, a lack of cultural respect, lack of opportunities for self-determination, poor educational attainment, reduced opportunities for employment, poor housing, and negative interactions with government systems (King, Smith, & Gracey, 2009; Osborne et al., 2013).

The relationship of remoteness to health is particularly important for Indigenous Australians, who are overrepresented in remote and rural Australia (Australian Institute of Health and Welfare, 2014a). Data from Australia's most recent Australian Census (2011) demonstrated that 669,881 Australians, or 3% of the population, identified as Indigenous (Australian Bureau of Statistics, 2013b), and that 142,900 Indigenous Australians, or 21% of the Indigenous population, lived in remote and very remote areas (Australian Institute of Aboriginal and Torres Strait Islander Studies, 2014). Around 45% of people in very remote Australia (91,600 people), and 16% of people in remote Australia (51,300 people) were Indigenous (Australian Bureau of Statistics, 2013b; Australian Institute of Aboriginal and Torres Strait Islander Studies, 2014).

Timely and accessible medical care is crucial for Indigenous Australians who have poorer health outcomes compared with non-Indigenous Australians. In addition to ensuring the provision of culturally appropriate primary health care and other health services for Indigenous Australians in remote and rural areas, it is imperative that seriously sick or injured Indigenous Australians have timely access to treatment in a tertiary hospital. Early recognition of patients that require aeromedical retrieval, rapid retrieval, and rapid access to definitive care can improve patient outcomes for sick or injured Indigenous Australians (McDonnell, Aitken, Elcock, & Veitch, 2009) who may need to be transported long distances to receive medical care for their illness or injury. Where road transportation is not appropriate or possible, other methods of transporting a sick or injured Indigenous patient to receive medical treatment may be required. In these cases, the Royal Flying Doctor Service (RFDS) fixed-wing, long-distance aeromedical retrieval service may be tasked with transporting a sick or injured Indigenous patient to a major tertiary hospital to receive definitive care³ (Margolis & Ypinazar, 2009). Given its role as the primary, and often only, emergency healthcare provider in parts of remote and rural Australia, the RFDS therefore has first hand experience of the impacts of illnesses and injuries on remote and rural Indigenous Australians.

² The term 'remote and rural' is used to encompass all areas outside Australia's major cities. This includes areas classified as inner regional (RA2), outer regional (RA3), remote (RA4) and very remote (RA5) under the Australian Statistical Geography Standard (ASGS). For more information on how the RFDS defines remote and rural Australia, go to <https://www.flyingdoctor.org.au/what-we-do/research/defining-rural-remote/>.

³ Definitive care: care that is provided in a medical facility equipped to handle a patient with a serious illness or injury (<https://www.flyingdoctor.org.au/nswact/our-services/>).

Accordingly, the RFDS produced this research and policy paper to identify the main causes of illness and injury for remote and rural Indigenous Australians. The paper was also developed to highlight the impact of illnesses and injuries on Indigenous Australians, and to describe the role of the RFDS in providing aeromedical retrievals to ensure equity of access to care for sick or injured Indigenous Australians. Although the RFDS provides care to all Australians in remote and rural areas, the current paper specifically considers the health of Indigenous Australians attended by the RFDS. Indigenous Australians are both overrepresented in remote and rural Australia and overrepresented in the client base of the RFDS, which provides healthcare to a higher proportion of Indigenous Australians than their representation in remote and rural Australia (The Centre for International Economics, 2015).

Indigenous RFDS aeromedical retrieval data are presented for the first time in the current research and policy paper. The paper presents both quantitative data around the illnesses and injuries experienced by Indigenous Australians who are transported by the RFDS to receive medical care in a tertiary hospital, and descriptive data around the other services the RFDS provides to Indigenous Australians. This paper presents national data on the causes of Indigenous deaths and hospitalisations, and specific information around remote and rural Indigenous health. It considers options to address key illnesses and injuries amongst Indigenous Australians in remote and rural areas of Australia served by the RFDS. Furthermore, it provides the platform for discussions between Indigenous and non-Indigenous service delivery organisations, researchers, policymakers, corporate and private sectors, and philanthropic organisations, to identify collaborative and innovative approaches to improving the health status of remote and rural Indigenous Australians and to reducing the incidence, prevalence and impacts of illnesses and injuries that require emergency treatment in a tertiary hospital, for Indigenous Australians served by the RFDS.

To achieve this, the research and policy paper comprises six sections. The current section introduces the report. Section two describes the purpose of the report. Section three considers the general health status of indigenous peoples throughout the world, in Australia, and in remote and rural areas of Australia. Section four broadly describes the suite of healthcare services provided by the RFDS, and accessible to Indigenous Australians. Section five presents and discusses RFDS aeromedical retrieval data for Indigenous Australians transported to a tertiary hospital to receive medical care for an illness or injury. Section six concludes the report.

2.0 Purpose statement

The RFDS respects and acknowledges Indigenous peoples as the first Australians, and is committed to improved health outcomes and access to health services for all Indigenous Australians.

The RFDS formalised this commitment in 2016 and released its first Reconciliation Action Plan (RAP). The RAP was developed as a means of committing the RFDS to the 'Close the Gap' campaign in order to improve both health outcomes and access to health services for Indigenous Australians (Royal Flying Doctor Service of Australia, 2016). Given that around one-third of face-to-face RFDS primary healthcare services, and more than one-quarter of aeromedical retrievals, are to Indigenous Australians, this is vital (The Centre for International Economics, 2015). The RFDS provides health care, such as aeromedical retrievals, primary healthcare services, telehealth,⁴ oral health services, and medical chests to around 300,000 Australians annually, many of whom are Indigenous (Royal Flying Doctor Service of Australia, 2016).

One of the commitments made by the RFDS in our RAP was to seek to use information from RFDS services to inform research and policy to improve Indigenous health outcomes. The current paper has been developed to fulfil this aim. It seeks to contribute to the national dataset by providing data around the health of Indigenous Australians that receive an aeromedical retrieval by the RFDS. Although the outcomes for Indigenous patients who arrive at hospital via an aeromedical retrieval are captured in national hospital statistics, not all components of care are captured in national data. For example, the number of Indigenous RFDS patients transported via an aeromedical retrieval for any reason, their primary diagnosis, and demographic data, have not previously been reported. Consequently, the data presented in the current report will enable governments and policy makers to facilitate the development of evidence-based solutions to improving health outcomes for Indigenous Australians around a range of illnesses and injuries.

The RFDS has a mature dataset around aeromedical retrievals and these data underpin the current report. Quantitative data around primary healthcare services are not currently consistent across all of the remote and rural areas serviced by the RFDS. Consequently, comprehensive quantitative primary healthcare data are not presented in the current report. However, descriptive information around primary healthcare delivered by the RFDS are presented. A future report will present quantitative data around RFDS primary healthcare services for Indigenous Australians.

The current paper was also developed for internal use—to facilitate service planning for future Indigenous aeromedical retrievals, to identify the main illnesses impacting Indigenous Australians in areas served by the RFDS and better respond to these, to facilitate better targeting of its primary healthcare service, and to identify areas where the RFDS could implement targeted preventative strategies to reduce the impacts of the most prevalent illnesses. A review of Indigenous aeromedical retrieval data also provides an opportunity for the RFDS to identify where services are being delivered in accordance with best practice, where there are any gaps in service provision, and what, if any, improvements in service provision should be implemented.

Finally, the research paper will serve as a platform for creating new, and strengthening existing, partnerships between the RFDS, Indigenous health organisations, such as the Aboriginal Community Controlled Health Organisations (ACCHOs), and other organisations delivering healthcare to Indigenous Australians in remote and rural Australia.

⁴ The term telehealth refers to telephone consultations between RFDS clinicians and other clinicians, first aiders or patients.

3.0 Indigenous peoples and their health

3.1 Global indigenous health

The United Nations Declaration on the Rights of Indigenous Peoples states:

“indigenous individuals have an equal right to the enjoyment of the highest attainable standard of physical and mental health” and that “states shall take the necessary steps with a view to achieving progressively the full realization of this right”⁵ (United Nations, 2009, p. 156).

However, despite this goal, health disparities between indigenous and non-indigenous peoples continue to exist throughout the world (United Nations, 2009).

Compared to non-indigenous peoples, indigenous peoples experience poorer health, are more likely to suffer from disability and reduced quality of life, and have a lower life expectancy than their non-indigenous counterparts (United Nations, 2009). For virtually every health condition, from infectious diseases such as human immunodeficiency virus (HIV)/acquired immune deficiency syndrome (AIDS), malaria and tuberculosis to cardiovascular disease (CVD), diabetes, cancer, respiratory diseases, accidents and injuries, mental health, and child mortality, indigenous peoples experience poorer health than non-indigenous peoples (Gracey & King, 2009; King et al., 2009; United Nations, 2009). Many of the most widespread causes of mortality, especially among indigenous children, such as malnutrition, diarrhoea, parasitic infections and tuberculosis, are preventable (United Nations, 2009).

In developed countries, such as Australia, New Zealand, Canada and the United States of America, lifestyle diseases, such as obesity, CVD, type 2 diabetes, and physical, social and mental disorders related to the misuse of alcohol and drugs, are increasing as indigenous peoples move away from traditional lifestyles (Durey & Thompson, 2012; Gracey & King, 2009).

In addition to health disparities, indigenous peoples experience disparities in access to treatment for many illnesses (Durey & Thompson, 2012). Inadequate clinical care, poor disease prevention strategies, and a lack of health promotion activities contribute to the poor health of indigenous peoples (Gracey & King, 2009).

A review of the major difficulties, trends and factors that affect indigenous health was undertaken by Gracey and King (2009), who identified many persistent problems, areas where improvement had occurred and areas of deterioration in indigenous peoples' health (Figure 3.1). Persistent problems included multiple health problems as well as systemic, bureaucratic and government prejudices and ignorance, and denial regarding the poor state of indigenous health (Gracey & King, 2009). Improvements in some areas of health, such as reductions in vaccine-preventable diseases and improved pregnancy outcomes, and systemic improvements, such as greater awareness of the seriousness of health issues impacting indigenous peoples in some regions, were identified (Gracey & King, 2009). Areas of deterioration included the rapid upsurge of lifestyle diseases and diseases associated with alcohol and drugs (Gracey & King, 2009).

⁵ United Nations Declaration on the Rights of Indigenous Peoples, Article 24.2.

Figure 3.1. Major difficulties, trends, and factors that affect indigenous health

Persistent problems

- > Poverty, hunger, environmental contamination, frequent infections, and parasites
 - > Infant and child malnutrition and growth failure
 - > High infant⁶ and young child mortality
 - > Maternal ill health and high mortality
 - > Chronic ill health and disabilities
 - > Shortened life expectancy
 - > Poor understanding of the complexities of indigenous health by health professionals
 - > Widespread prejudice about perceived inadequacies of indigenous people
 - > False expectations that medical strategies alone can overcome indigenous health problems
 - > Government preoccupation with sickness services rather than wellness strategies
 - > Bureaucratic mishandling of culturally sensitive matters beyond their rigid protocols
 - > Insufficient chances for indigenous people to be trained and take part in their health care
 - > Inadequate systematic data to allow surveillance and improvement of indigenous health care
 - > Government indifference, ignorance, neglect, and denial about the poor state of indigenous health
-

Areas with improvement

- > Suppression of some vaccine-preventable diseases
 - > Improved pregnancy outcomes, including birthweights
 - > Lower rates of some infections and related deaths, especially in infants and young children
 - > Reduced maternal, infant, and young child mortality
 - > Increased life expectancy in some populations
 - > Improved education in some indigenous groups and their employment in health-related fields
 - > Introduction of indigenous components to education and training of health professionals
 - > Training of indigenous people for careers in health professions
 - > Increased participation of indigenous people and groups in policymaking and political affairs
 - > Widening awareness of the seriousness of health issues in indigenous peoples
 - > Formal recognition by some national governments of indigenous peoples' rights (e.g. Australia, Canada, Japan)
-

Areas of deterioration

- > Erosion of the authority of indigenous elders
 - > Illnesses associated with overcrowding and environmental contamination in squatter settlements, urban slums, and disaster situations
 - > The rapid upsurge of lifestyle diseases
 - > Respiratory and peripheral vascular disease associated with cigarette smoking
 - > Diseases and social problems associated with misuse of alcohol and other drugs
 - > Emotional, mental, and psychiatric illnesses
 - > Interpersonal and family violence, including, child abuse, homicide, and suicide
 - > Motor vehicle and other accidents and poisonings
 - > Sexually transmissible diseases, including HIV/AIDS
-

Source: Gracey and King (2009, p. 70).

⁶ 'Infant' refers to children under one year of age.

3.2 Indigenous Australians

Aboriginal and Torres Strait Islanders are the Indigenous people of Australia (Australian Institute of Health and Welfare, 2014a). Indigenous Australians live in all parts of the nation and have a wide range of lifestyles and social, cultural, educational and family backgrounds (Australian Institute of Health and Welfare, 2015d). Indigenous Australia is diverse and dynamic and “continues to evolve and develop in response to historical and contemporary circumstances” (Department of Health, 2013, p. 8).

Today’s Indigenous Australians are descendants of the Aboriginal and Torres Strait Islander peoples who began to occupy Australia more than 50,000 years ago (Australian Institute of Health and Welfare, 2015d). Historically, there were more than 600 clan groups on mainland Australia and 14 inhabited islands in the Torres Strait (Smith, 2016).

Prior to settlement by the British, Indigenous Australians led traditional lifestyles, were efficient hunters and gatherers, and competent resource managers (Smith, 2016). They lived in small societies and had strong kinship ties which provided security and intimacy and bound the communities together (Smith, 2016). Their life was intertwined with spirituality, Indigenous lore and kinship systems and their land was considered not only to give life—it was life (Broome, 1982 cited in Smith, 2016; Poroch, Arabena, Tongs, Larkin, Fisher, & Henderson, 2009).

Colonisation of Australia by the British in 1788 severely disrupted Indigenous societies and resulted in disease epidemics (Australian Institute of Health and Welfare, 2015d). Indigenous Australians, like many other indigenous groups that have been impacted by colonisation, were adversely affected in terms of their physical, social, emotional and mental health and wellbeing, and these effects have been profound (Gracey & King, 2009). Colonisation of Australia not only resulted in the loss of traditional lifestyles and poor health and wellbeing of Indigenous Australians, but also resulted in poor access to employment, education, social services, and adequate health care (Abdolhosseini, Bonner, Montano, Young, Wadsworth, Williams, & Stoner, 2015).

The Australian Government recognises that:

“dispossession, interruption of culture and intergenerational trauma have significantly impacted on the health and wellbeing of Aboriginal and Torres Strait Islander people, and that they share a continuing legacy of resilience, strength and determination” (Department of Health, 2013, p. 8).

To address some of the associated health issues, the Australian Government made a commitment to improving health outcomes for Indigenous Australians through the development of the *National Aboriginal and Torres Strait Islander Health Plan 2013–2023* (the Plan) (Department of Health, 2013). The Plan is “central to the Australian Government’s targeted approach to ensure that Aboriginal and Torres Strait Islander people can enjoy the same standard of health as other Australians” (Department of Health, 2013, p. 4). The *Implementation Plan for the National Aboriginal and Torres Strait Islander Health Plan 2013–2023* (Department of Health, 2015) provides further direction and detail on current Australian Government policy and program priorities in Indigenous health. These plans align with other plans and strategies developed by the Australian Government to improve health and social and emotional wellbeing (Department of Health, 2013).

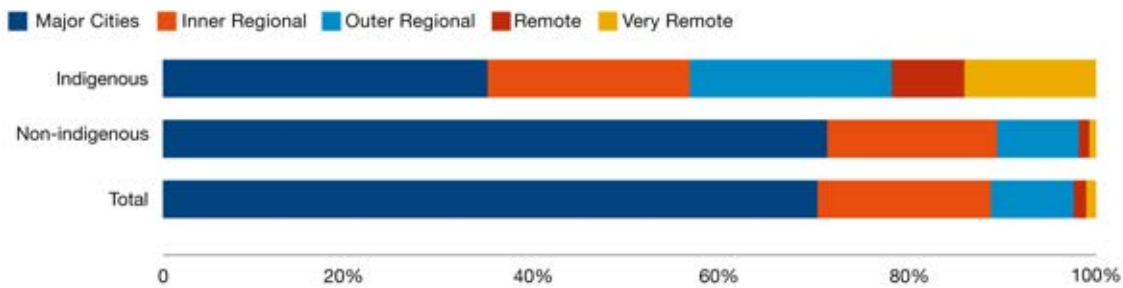
Plans such as these are imperative for improving the health of Indigenous Australians, especially for those Indigenous Australians who live in remote and rural areas and who experience a disproportionately high level of poor health.

3.2.1 Indigenous Australians in remote and rural Australia

Data from the 2011 Australian Census indicated that 669,881 Australians, or 3% of the population, identified as Indigenous (Australian Bureau of Statistics, 2013b). In 2011, 606,200 (90%) Indigenous Australians identified as Aboriginal only, 38,100 (6%) identified as Torres Strait Islander only, and 25,600 (4%) identified as being of both Aboriginal and Torres Strait Islander origin (Australian Bureau of Statistics, 2013b). In June 2014, the Indigenous population was estimated to have increased to 713,600 people, which represented 3% of the Australian population (Australian Institute of Health and Welfare, 2015d).

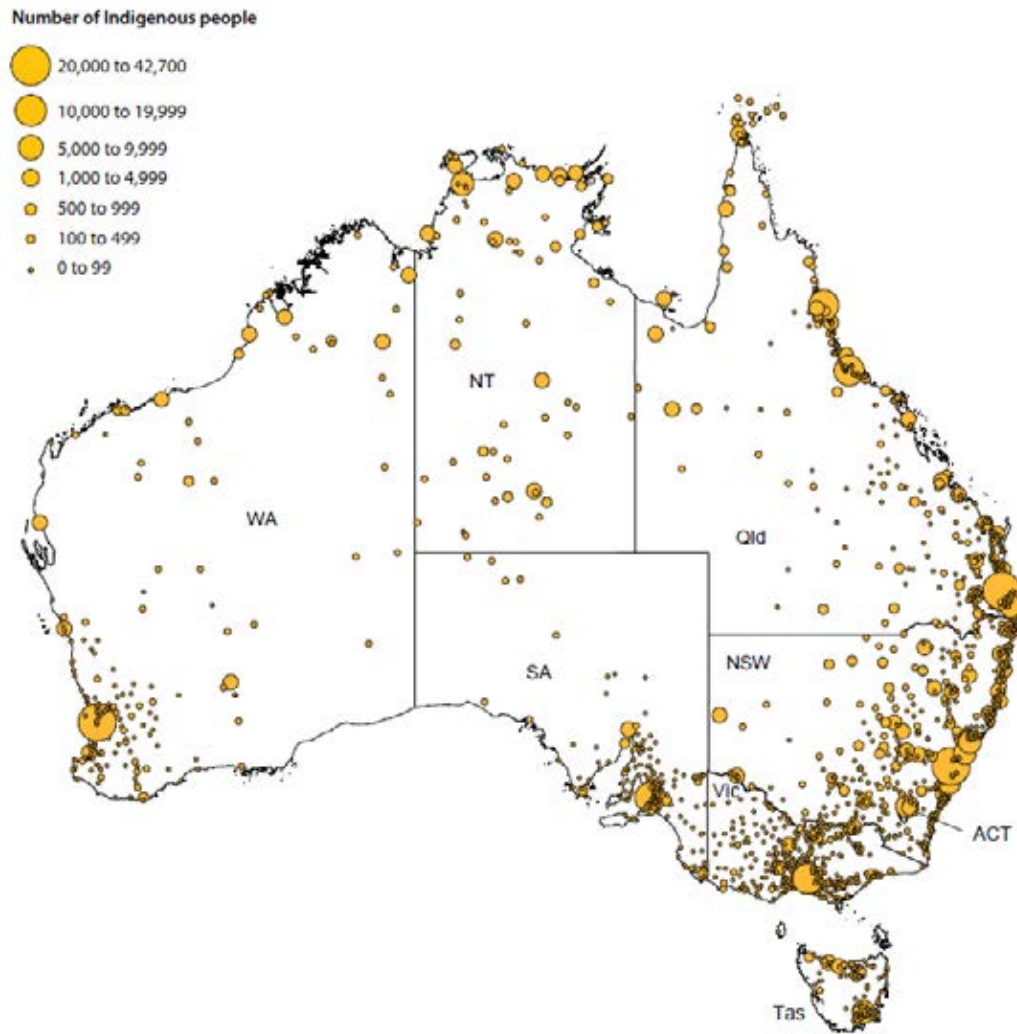
Although Indigenous Australians were most likely to live in non-remote areas of Australia (79%), rather than remote/very remote areas (21%) in 2011, almost half (45%) of all people in very remote areas and 16% in remote areas were Indigenous (Australian Institute of Health and Welfare, 2014a). By comparison, 98% of non-Indigenous Australians lived in non-remote areas, while 2% lived in remote/very remote areas (Australian Institute of Health and Welfare, 2014a). Figure 3.2 shows Indigenous, non-Indigenous and total population, by remoteness, and Figure 3.3 shows Indigenous population clusters.

Figure 3.2. Indigenous, non-Indigenous and total population, by remoteness, 30 June 2011



Source: Data extrapolated from Australian Bureau of Statistics (2013a).

Figure 3.3. Indigenous population clusters, 2011

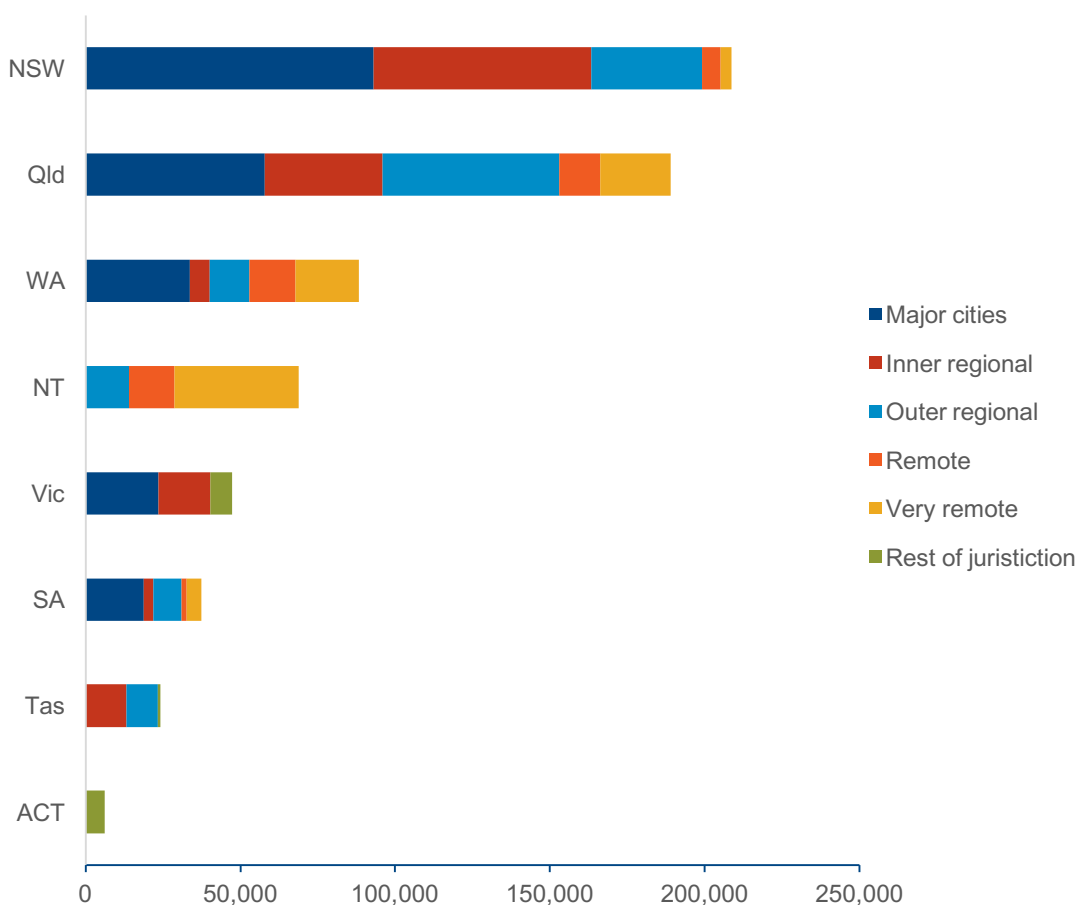


Note: Population clusters are based on data from urban centres and localities.

Source: Australian Institute of Health and Welfare (2015d, p. 14).

Figures 3.3 and 3.4 demonstrate that in 2011, the largest populations of Indigenous Australians were located in New South Wales (NSW) (208,476 people) and Queensland (Qld) (188,954) (Australian Bureau of Statistics, 2013b). Despite these states having the largest absolute numbers of Indigenous Australians, the Indigenous population represented only 2.9% of the population NSW and 4.2% of the population in Qld. In most states and territories, Indigenous Australians represented less than 5% of the total population (Australian Institute of Health and Welfare, 2014a). An exception to this was the Northern Territory (NT), with 68,850 Indigenous Australians representing 29.8% of the population of the NT (Australian Bureau of Statistics, 2013b). Across all states and territories, excluding the ACT, Indigenous Australians are overrepresented in regional (RA2, RA3) and remote (RA4 and RA5) areas, compared with non-Indigenous Australians.

Figure 3.4. Distribution of Indigenous estimated resident population by remoteness and jurisdiction, 2011⁷

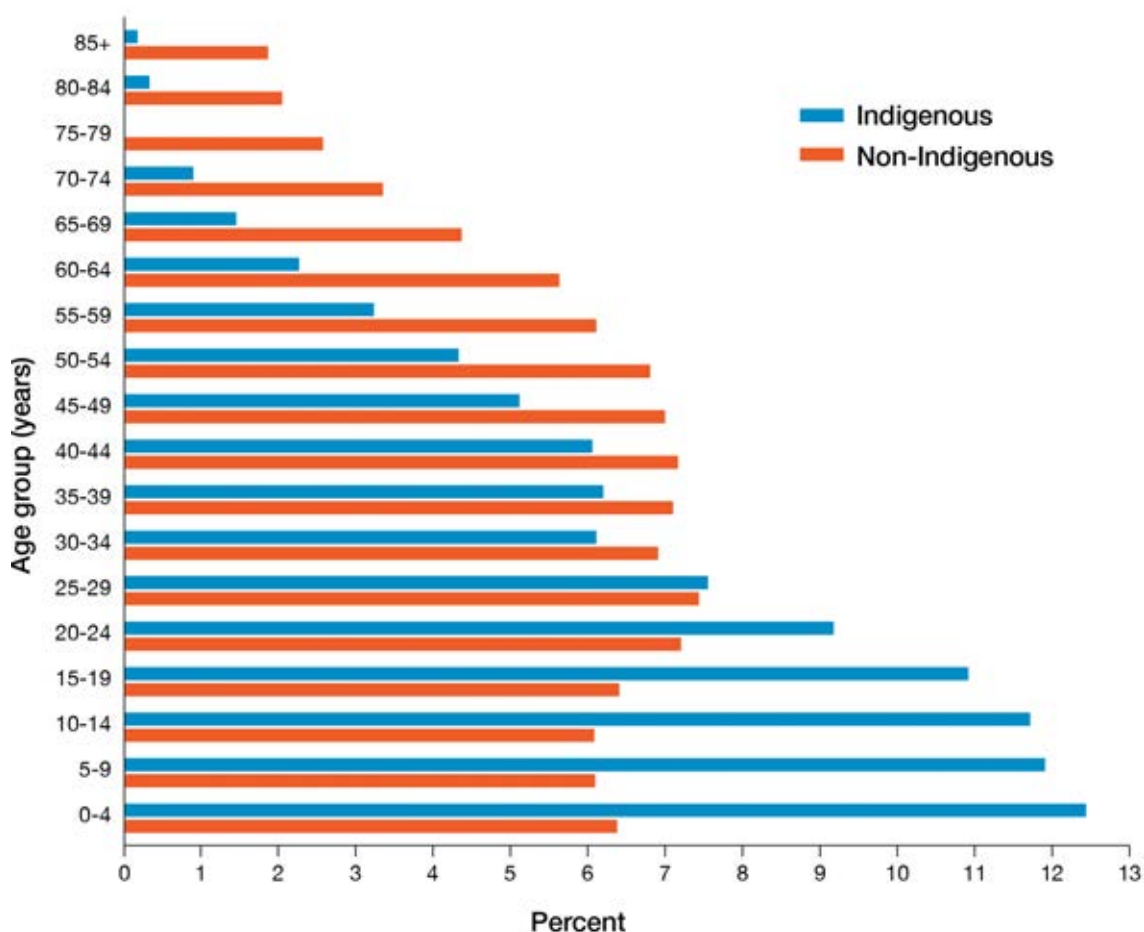


Source: Data extrapolated from Australian Bureau of Statistics (2013a).

When the age structure of the Australian population is considered, it is evident that the Indigenous population has a much younger age structure than the non-Indigenous population (Australian Institute of Health and Welfare, 2015d) (Figure 3.5). Higher fertility rates amongst Indigenous women, and deaths at younger ages among the Indigenous population, are responsible for this difference (Australian Institute of Health and Welfare, 2015d). In 2011, the median age of the Indigenous population was 21.8 years, compared with 37.6 years for the non-Indigenous population (Australian Institute of Health and Welfare, 2015d). In 2011, twice as many Indigenous Australians (36%), as non-Indigenous Australians (18%), were aged under 15. Similarly, three times fewer Indigenous Australians (3.4%), compared to non-Indigenous Australians (14%) were aged 65 and over (Australian Institute of Health and Welfare, 2015d).

⁷ In Vic, outer regional and remote areas were combined by the ABS to produce "rest of jurisdiction." Similarly, in the ACT, major cities and inner regional areas were combined by the ABS to produce "rest of jurisdiction." These data were combined by the ABS for confidentiality reasons.

Figure 3.5. Age structure of the Australian population, by Indigenous status, 30 June 2011



Source: Australian Institute of Health and Welfare (2015d, p. 10). Data extrapolated by the Australian Institute of Health and Welfare (AIHW) from Australian Bureau of Statistics (2013a).

3.3 Australian Indigenous health

Australia’s remote and rural areas differ significantly in their location, economic activities, climate and demography (Australian Institute of Health and Welfare, 2010). Consequently, health status may vary within each of the broad remoteness categories (Australian Institute of Health and Welfare, 2010). However, the evidence indicates that as a whole, remote and rural Australians generally experience poorer health than people living in major cities, including higher levels of mortality, morbidity and health and disease risk factors (Australian Institute of Health and Welfare, 2008, 2014a). Australians living in remote and rural areas have higher death rates from injuries, CVD, other circulatory diseases, chronic obstructive pulmonary disease, diabetes and suicide (Australian Institute of Health and Welfare, 2014a). They also have higher rates of overweight and obesity, higher daily smoking rates, higher rates of risky alcohol consumption and higher rates of preventable hospitalisations (Australian Institute of Health and Welfare, 2014a).

When the composition of remote and rural residents is considered, it is clear that a disproportionately large percentage of remote and rural residents are Indigenous Australians (Australian Institute of Health and Welfare, 2014a). At the 2011 Census, almost half (45%) of all people in very remote areas and 16% in remote areas were Indigenous (Australian Institute of Health and Welfare, 2014a).

Much of the worldwide research around health has been focused on non-indigenous peoples' notions of health, especially around diseases and their treatment, which contrasts strongly with many indigenous peoples' holistic views of health (King et al., 2009). Many governments operate in terms of a biomedical model of health, which can impact service delivery, program availability and uptake by indigenous peoples (Abdolhosseini et al., 2015). Consequently, it is necessary to understand how Indigenous Australians view health and what good health means to them, if we hope to improve the health of Indigenous Australians.

Indigenous Australians view health in a holistic context and this is reflected in their definition of health (Department of Health, 2013).

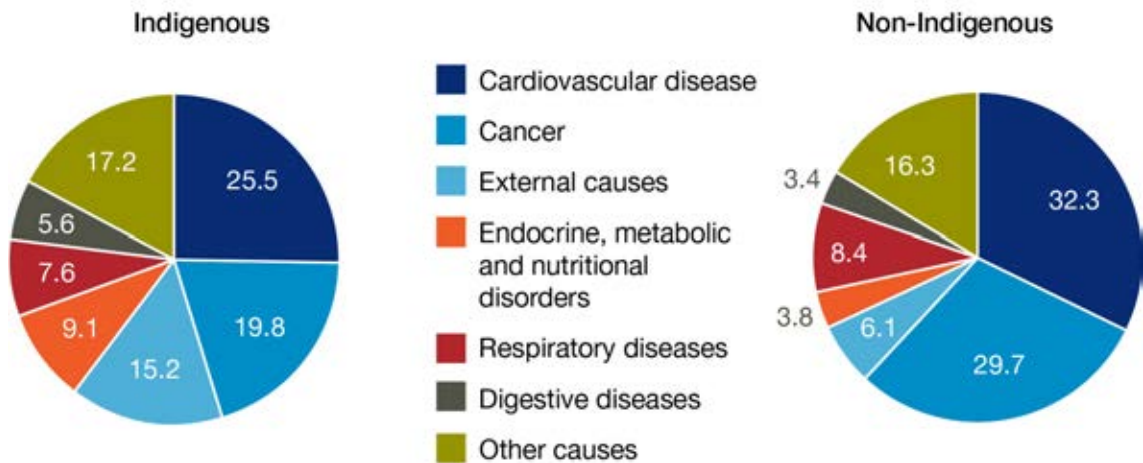
“Aboriginal health’ means not just the physical wellbeing of an individual but refers to the social, emotional and cultural wellbeing of the whole Community in which each individual is able to achieve their full potential as a human being, thereby bringing about the total wellbeing of their Community. It is a whole-of-life view and includes the cyclical concept of life-death-life” (National Aboriginal Health Strategy Working Party, 1989).

There is strong evidence of a positive association between culture and language and improved health, education, wellbeing and employment outcomes for Indigenous Australians (Department of Health, 2013). Indigenous Australians' decisions about when and why to seek health services, treatment acceptance, adherence and follow-up, and the success of prevention and health promotion can be influenced by culture (Department of Health, 2013). Consequently, better health outcomes are likely to be achieved when services and providers are culturally competent (Department of Health, 2013).

Across all remoteness areas, Indigenous Australians generally experience poorer health than non-Indigenous Australians (Australian Institute of Health and Welfare, 2014a) in relation to chronic and communicable diseases, mental health, infant health, and life expectancy (Aboriginal and Torres Strait Islander Social Justice Commissioner, 2005). Indigenous Australians are five times as likely as non-Indigenous Australians to die from endocrine, nutritional and metabolic conditions such as diabetes, and three times as likely to die of digestive conditions (Australian Institute of Health and Welfare, 2015c). Age adjusted data demonstrated that in 2014–2015 Indigenous Australians were more than twice as likely as non-Indigenous Australians to be hospitalised for any reason (Australian Institute of Health and Welfare, 2016b). Indigenous Australians are twice as likely as non-Indigenous Australians to be hospitalised for an injury (Australian Institute of Health and Welfare, 2015b), and 1.8 times as likely to die from an injury, than non-Indigenous Australians (Henley & Harrison, 2015). Indigenous Australians are three times as likely to die from chronic lower respiratory diseases and twice as likely to die as a result of self-harm (suicide) than non-Indigenous Australians (Australian Bureau of Statistics, 2016a).

Figure 3.6 shows the leading broad causes of death amongst Indigenous and non-Indigenous Australians in NSW, Qld, Western Australia (WA), South Australia (SA) and the NT in 2008–2012. The most common causes of death amongst Indigenous Australians were CVD (25.5%), cancer (19.8%) and external causes of injury and poisoning (15.2%—including suicide (4.8%) and transport accidents (3.9%)) (Australian Institute of Health and Welfare, 2015d). Age-standardised death rates demonstrated that in 2008–2012, Indigenous Australians (284.2 per 100,000 population) were 1.5 times as likely as non-Indigenous Australians to die from CVD (191.4 per 100,000 population) (Australian Institute of Health and Welfare, 2015d). Indigenous Australians (219.2 per 100,000 population) were 1.2 times as likely as non-Indigenous Australians (175.6 per 100,000 population) to die from cancer, and twice as likely to die from injury and poisoning (74.9 (Indigenous) versus 38.1 (non-Indigenous) per 100,000 population) in 2008–2012 (Australian Institute of Health and Welfare, 2015d).

Figure 3.6. Leading broad causes of death, by Indigenous status, 2008–2012 (percent)



Data are for New South Wales, Queensland, Western Australia, South Australia and the Northern Territory. Data sourced from AIHW National Mortality Database.

Source: Australian Institute of Health and Welfare (2015d, p. 113).

In addition to demonstrating higher age-standardised death rates for a number of illnesses and injuries, Indigenous Australians also experience higher prevalence rates of communicable diseases compared with non-Indigenous Australians, including shigellosis (2.6× greater), pertussis (whooping cough) (54.3× greater), and tuberculosis (6× greater) (Abdolhosseini et al., 2015).

Similarly, life expectancy is lower and mortality rates are higher amongst Indigenous Australians compared to non-Indigenous Australians. In 2010–2012, the estimated life expectancy at birth was 10.6 years lower for Indigenous males (69.1 years) compared to non-Indigenous males (79.7 years) and 9.5 years lower for Indigenous females (73.7 years) compared to non-Indigenous females (83.1 years) (Australian Institute of Health and Welfare, 2015d).

Fatal burden of disease studies have also demonstrated the existence of health inequalities—the fatal burden of disease and injury in the Indigenous population is estimated to be 2.6 times that experienced by non-Indigenous Australians, with injuries (22%) and CVD (21%) contributing the most to the fatal burden of disease for Indigenous Australians (Australian Institute of Health and Welfare, 2015c).

When compared with Canada’s First Nations people and New Zealand’s Māoris, who experienced a similar pattern of colonisation, Indigenous Australians have poorer health status across many indicators (Australian Institute of Health and Welfare, 2009; Smith, 2016).

These data demonstrate that there are clear health inequalities between Indigenous and non-Indigenous Australians. “The consequent and often substantial difference in almost all measures of health and welfare between Indigenous and non-Indigenous Australians has become known as ‘the Gap’” (Australian Institute of Health and Welfare, 2015d, p. 2). Reducing the health gap between Indigenous and non-Indigenous Australians, or ‘Closing the Gap’ underpins much of the Australian Government’s policies around Indigenous health.

3.4 Closing the Gap

In 2008, all Australian governments committed to work towards a better future for Indigenous Australians by ‘Closing the Gap’ in health and welfare between Indigenous and non-Indigenous Australians (Australian Institute of Health and Welfare, 2015d).

As part of this initiative, the Council of Australian Governments (COAG) agreed to six specific targets and timelines to address the disadvantage faced by Indigenous Australians in life expectancy, child mortality, education and employment (Council of Australian Governments, 2012a). The targets are set out in the *National Indigenous Reform Agreement* between the Australian Government and the state and territory governments (Council of Australian Governments, 2012b). The COAG ‘Closing the Gap’ targets for Indigenous disadvantage were to:

- > Close the gap in life expectancy within a generation (by 2031);
- > Halve the gap in mortality rates for Indigenous children under five within a decade (by 2018);
- > Ensure all Indigenous four-year-olds in remote communities have access to early childhood education within five years (by 2013);
- > Halve the gap in reading, writing and numeracy achievements for Indigenous children within a decade (by 2018);
- > Halve the gap for Indigenous students in year 12 equivalent attainment by 2020; and
- > Halve the gap in employment outcomes between Indigenous and non-Indigenous Australians within a decade (by 2018) (Australian Institute of Health and Welfare, 2015d; Council of Australian Governments, 2012b).

In May 2014, COAG agreed to an additional target to:

- > Close the gap in school attendance within five years (by 2018) (Australian Institute of Health and Welfare, 2015d).

The original early childhood education target, to ensure all Indigenous four-year-olds in remote communities had access to early childhood education within five years, expired unmet in 2013. In December 2015, a renewed ‘Closing the Gap’ target was agreed between Australian Governments. The target aims to have:

- > “95 per cent of all Indigenous four-year-olds enrolled in early childhood education (by 2025)” (Department of the Prime Minister and Cabinet, 2016, p. 12).

Progress against the ‘Closing the Gap’ targets is reported annually. The 2016 ‘Closing the Gap’ report by the Prime Minister demonstrated, as in previous years, mixed levels of success in meeting the targets (Department of the Prime Minister and Cabinet, 2016). As the report points out, the:

“targets and their impacts cannot be considered independently—they are intrinsically interlinked. Improvements in one area can positively impact another. For example, providing children with a healthy start to life will give them the best chance of academic success which will, in turn, have positive flow-on effects for employment opportunities”
(Department of the Prime Minister and Cabinet, 2016, p. 5).

It is clear that good Indigenous health “is not determined solely by the presence or absence of pathogens and the failure of bodily functions (that is, clinical illness); it is more holistic and is also closely associated with the social and behavioural determinants of health, as well as the performance of health systems” (Australian Institute of Health and Welfare, 2015d, p. 3). Data from the 2014–2015 National Aboriginal and Torres Strait Islander Social Survey (NATSISS), which demonstrated, for example, that Indigenous Australians have poorer educational outcomes, lower levels of employment and poorer housing than non-Indigenous Australians, supports the need to address the social determinants that underpin health outcomes, in order to improve these health outcomes (Australian Bureau of Statistics, 2016b).

Clearly, improvements in the health of Australia’s Indigenous peoples requires a comprehensive understanding of the interplay between health outcomes and the social determinants that impact health outcomes.

4.0 The RFDS in remote and rural Australia

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 health care and 24-hour emergency service to those who live, work and travel throughout Australia.

4.1 Structure of the RFDS

The RFDS is a federated health charity. Services are delivered through RFDS 'Sections' and 'Operations,' comprising RFDS Central Operations (includes SA and NT), RFDS Qld Section, RFDS South Eastern (SE) Section⁸ (includes NSW), RFDS Tasmanian (Tas) Section, RFDS Victorian (Vic) Section, and RFDS Western Operations (includes WA). Each of the RFDS Sections and Operations have responsibility for the delivery of health services to the communities they serve through the establishment of effective systems and maintenance of efficient operations. The Sections and Operations are coordinated at a national level by the RFDS of Australia—Federation Company, Canberra.

4.2 Services provided by the RFDS

4.2.1 Aeromedical retrievals

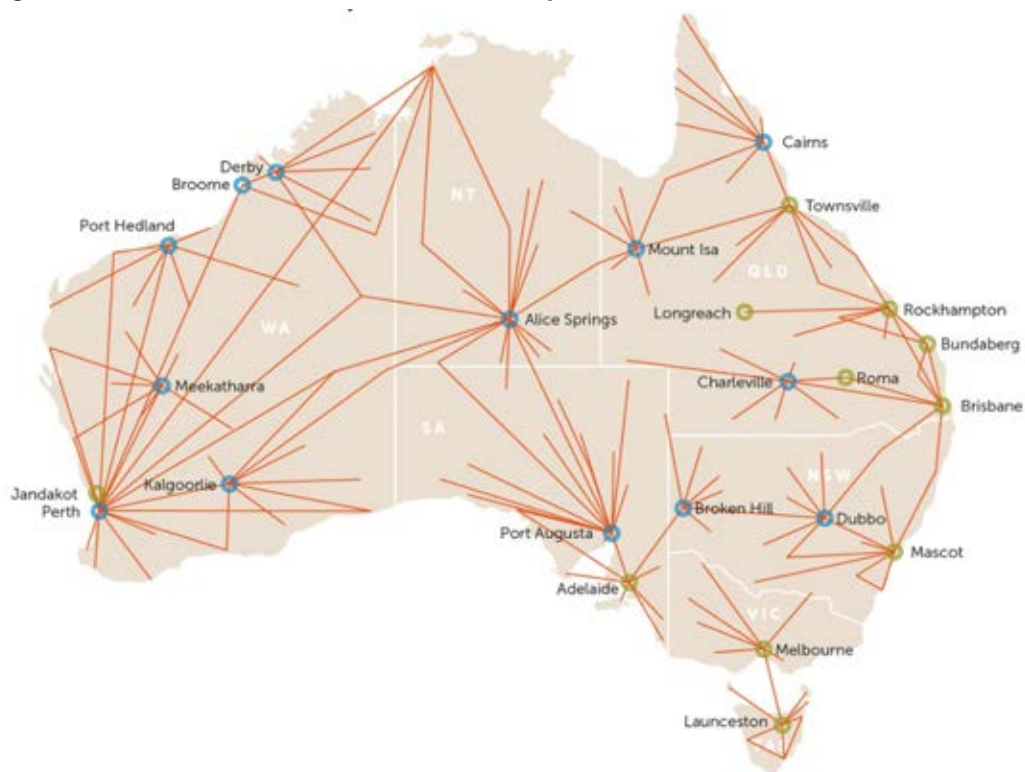
In major cities, the care of sick or injured Australians is characterised by timely access to emergency services, including road ambulance and hospital services. However, most Australian states and territories comprise remote and regional areas that are either difficult to access by road or too remote to enable timely hospital transfer by road ambulance. Comprehensive medical services are often unavailable in these areas, and aeromedical retrieval may be the most effective way of transporting patients to receive timely hospital care. Patients sustaining illnesses and injuries may need to be transported long distances, in emergency situations, to receive definitive care in a tertiary hospital (McDonnell et al., 2009). The RFDS, as a provider of aeromedical retrieval services, fills this gap and provides a vital service to remote and rural Australians who require emergency medical treatment in a tertiary hospital, and who are unable to access local emergency medical treatment in a hospital, due to their remoteness.

The RFDS is a key provider of remote and rural prehospital care and retrieval services. There are other organisations that also provide retrieval responses, such as Careflight, South Australia Ambulance Service (SAAS) MedSTAR, Ambulance Victoria, Ambulance Tasmania, and The NSW Newborn paediatric Emergency Transport Services (NETS). These are supported by health systems and services that coordinate, contract and fund aeromedical retrieval services, and by numerous ambulance services, general practitioners (GPs), and large and small hospitals. Although other providers play an important role in the transport and care of patients in remote and rural Australia, the current research paper focuses solely on the delivery of care by the RFDS.

⁸ The SE Section of the RFDS also provides aeromedical retrieval services to patients in Tas and Vic.

The RFDS operates a 24-hour, seven-days-a-week (24/7) aeromedical retrieval service, supported by a 24/7 telehealth system, to patients who live, work or travel in remote and rural Australia and who experience a medical emergency requiring definitive care in a tertiary hospital. Patients requiring definitive care in a tertiary hospital are transported via a primary evacuation⁹ (PE) or inter-hospital transfer¹⁰ (IHT), hereafter referred to as an aeromedical retrieval. The RFDS operates its aeromedical retrieval service from 24 bases in Australia (Figure 4.1).

Figure 4.1. RFDS national aeromedical footprint



Source: Royal Flying Doctor Service (2016).

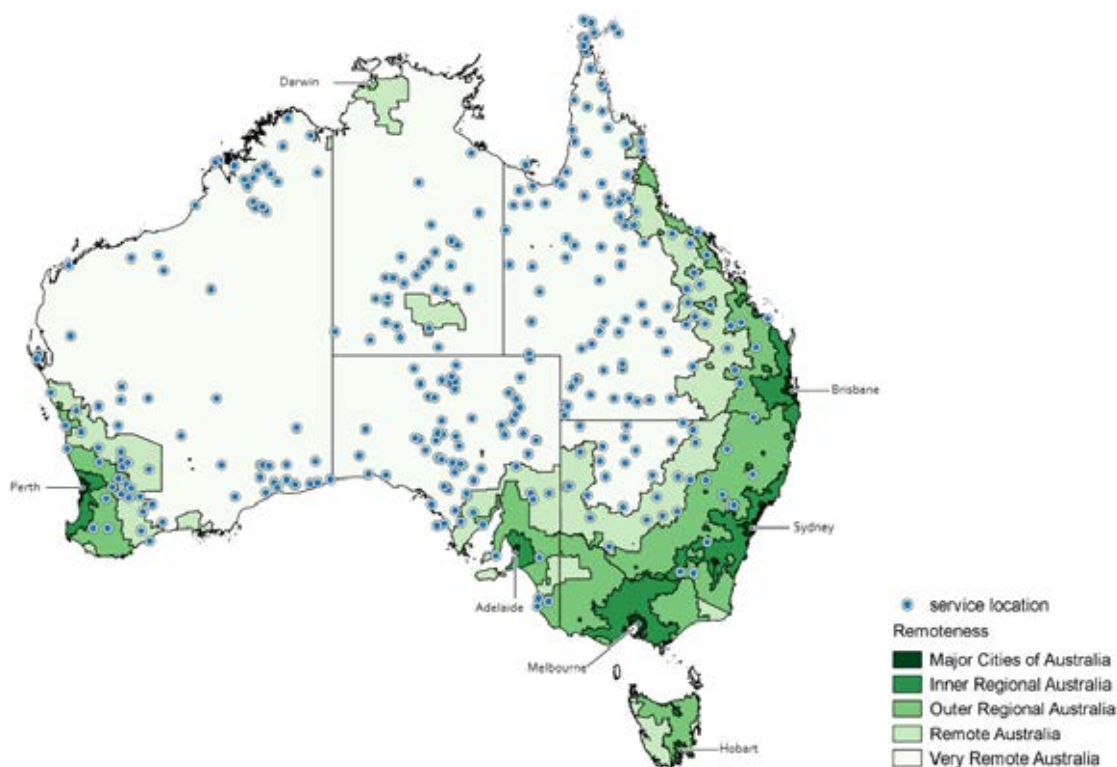
4.2.2 RFDS primary healthcare services in remote and rural Australia

In addition to aeromedical retrievals, the RFDS provides primary healthcare services, for example through its clinic program, to people in remote and rural areas (Figure 4.2). By providing services to people who, because of geographic factors, are beyond reasonable access to normal medical infrastructure, the RFDS plays a pivotal role in the provision of universal access to primary healthcare.

⁹ Primary evacuation: "The provision of emergency medical services to victims of illness or accident who are in a serious or potentially life threatening condition who are beyond the normal medical infrastructure and who require transport and/or medical and nursing care during transport to the nearest suitable hospital (including all fixed wing air transport services directly related to these emergency medical services) but excluding transfers from one hospital to another" (Aspex Consulting, 2014, p. 7).

¹⁰ Inter-hospital transfer: "Transfer of patients between hospitals designated as normal medical infrastructure to get specialist treatment and life-saving surgery required" (Aspex Consulting, 2014, p. 34).

Figure 4.2. RFDS primary healthcare clinics, by ASGS remoteness areas, 2014–2015



Source: Developed for the RFDS by the AIHW, 2016.

All RFDS primary healthcare services are accessible to Indigenous and non-Indigenous Australians. Indigenous focused healthcare may be available in regions serviced by the RFDS through ACCHOs, which are controlled by, and accountable to, Aboriginal people in the areas in which they operate. ACCHOs aim to deliver holistic, comprehensive and culturally appropriate health care to the community that controls it. Although the majority of patients accessing care delivered by ACCHOs are Indigenous, non-Indigenous Australians can also access these services (Australian Institute of Health and Welfare, 2013b).

Within the RFDS, primary healthcare is provided through medical, nursing and oral health care clinics with more than 15,000 clinics delivered in 2014–2015.

The aims of the primary health clinic program are to:

- > Deliver primary health clinics, nursing services and allied health services in areas beyond the normal medical infrastructure in areas of market failure and in most need;
- > Deliver primary health clinics and nursing services on a regular basis where there are no other regular similar services, including no MBS billable services, and within a multidisciplinary context wherever possible; and
- > Deliver flexibly planned and conducted services based on need and the Program's priorities in collaboration with relevant stakeholders and other service providers, including the communities receiving the service.

4.2.3 Telehealth

The RFDS operates a 24/7 telehealth system. In the RFDS, telehealth consultations (also called remote consultations), describe telephone calls that come into an RFDS base from individuals or health workers in remote and rural areas who require medical assistance or advice from an RFDS doctor. This service supports the aeromedical retrieval service and provides a service to remote and rural residents who require doctor or nurse consultations. In most cases, the patient has no permanent medical services available and limited, if any, access to a hospital (The Centre for International Economics, 2015). Unlike other telehealth

services, which are more akin to triage and referral services, the RFDS telehealth service seeks to resolve medical issues for the patient (The Centre for International Economics, 2015). Calls to this service range from GP services to assist in managing chronic conditions, such as diabetes, asthma or heart conditions, to emergency calls around poisons or injuries (The Centre for International Economics, 2015). Many issues discussed in telehealth consultations are resolved without patients needing to be transported to hospital or requiring additional evaluation (The Centre for International Economics, 2015).

4.2.4 Ground transport services

The RFDS also operates a non-emergency patient ground transport service in Vic, NSW and SA and an emergency patient ground transport service in SA. Known as mobile patient care in Vic, this service is provided on behalf of Ambulance Victoria, to people who need to travel to hospital or to specialist care. The service operates from 11 bases located around Vic, and is supported by aircraft capability at Essendon Airport. In SA, the RFDS operates emergency ambulance services at three sites—Marla, Andamooka and Marree.

4.2.5 Other services

Other health services provided by the RFDS include medical chests, oral health services, outreach programs, health promotion and education activities, clinic charter services, repatriation services, evacuations by charter aircraft from tour vessels along the Kimberly coast, and assistance with staffing other aeromedical services that provide rescue activities.

4.3 The RFDS fleet

The RFDS currently operates a fleet of 67 aircraft. RFDS aircraft are equipped with intensive care facilities and carry a full range of emergency and resuscitation medications and equipment, including facilities for extensive electronic patient monitoring (Margolis & Ypinazar, 2009). Facilities for invasive and non-invasive monitoring, volume- and pressure-controlled mechanical ventilation, multiple infusion devices, a range of trauma and extraction devices, an extensive pharmacy, substantial oxygen reserves and a neonatal isolette (when required), are carried on RFDS aircraft (Margolis & Ypinazar, 2009, p. 364).

To ensure national consistency in the retrieval and transport of injured patients in remote and rural Australia, the RFDS developed *National standards for aeromedical evacuation* (the Standards) (Royal Flying Doctor Service of Australia, 2011). The Standards form a national consensus for aeromedical retrievals within the RFDS Sections and Operations, and contain detailed information regarding the minimum requirements for best practice in the clinical care of patients who are transported by the RFDS. In addition to detailed information regarding best practice in the clinical care of patients, they contain information on communication, coordination, priority, flight crew, aircraft, equipment, monitoring, documentation and quality improvement for aeromedical retrievals (Royal Flying Doctor Service of Australia, 2011).

4.4 RFDS tasking and retrieval process

The retrieval and transport of sick or injured patients from remote and rural Australia can be challenging. There is a requirement for practitioners to possess a broad range of critical care skills and to be able to apply them in a highly restrictive and unpredictable environment. To deliver comprehensive care to sick or injured remote and rural Australians, remote and rural trauma systems also need to be well organised and coordinated (Norton & Kobusingye, 2013). Such services need to integrate prehospital care, transport, and trauma centre components, while also maximising the use of local health resources (Norton & Kobusingye, 2013).

There are potentially many people who play an important role in the prehospital care of sick or injured remote and rural Indigenous Australians. These are first responders—the people who work to provide medical care to a sick or injured person until the RFDS arrives. First responders may include members of the public, family, friends, work colleagues, staff from nursing posts or small rural hospitals, staff from ACCHOs, paramedics, local GPs, etc.

Once first responders have made contact with the RFDS, and a decision to retrieve a patient has been made, planning the retrieval process commences (Margolis & Ypinazar, 2009). Medical treatment is most often initiated prior to the arrival of the RFDS medical crew, by on-the-ground primary and secondary health care services (Margolis & Ypinazar, 2009). RFDS doctors provide advice and assistance to those providing immediate care for a sick or injured patient via the RFDS telehealth service (Margolis & Ypinazar, 2009), which may include prescribing the use of items from an RFDS medical chest—a secure package of pharmaceutical and non-pharmaceutical items held by custodians in remote areas of Australia. This is especially important for primary response retrievals to locations without any health care facilities (Margolis & Ypinazar, 2009) or where there is limited health infrastructure and health professionals to assist with sustaining the life of a patient requiring critical care.

RFDS doctors, ambulance coordinators, hospital emergency physicians and, as relevant, other aeromedical providers, such as rotary-wing aeromedical providers, plan and coordinate the retrieval of sick and injured patients (Margolis & Ypinazar, 2009). Once the RFDS has been tasked with retrieving a patient, the patient is allocated a priority for air transport by RFDS medical staff in accordance with RFDS *National standards for aeromedical evacuation* (Royal Flying Doctor Service of Australia, 2011). The priority system is necessary for ranking patients in order of clinical urgency when the RFDS has multiple requests (Langford, 2015). State and territory-led emergency services operate different methods of prioritisation. The RFDS incorporates these priority systems into its operating procedures in each state and territory.

In all cases, flights depart within specific time frames based on the assessed severity of a patient's condition. For life-threatening emergencies, flights depart in the shortest possible time, subject to weather and essential safety requirements (Langford, 2015). For urgent medical transfers, flights depart promptly, ensuring all flight planning requirements on the ground have been met (Langford, 2015). For less urgent cases, flights are tasked to ensure best use of resources and crew hours (Langford, 2015). When the RFDS has to transport multiple patients, patients with life-threatening illnesses and injuries are prioritised (Langford, 2015).

RFDS aircraft and teams are allocated to patients who require long-distance stretcher transport with medical or nursing care during the trip (Langford, 2015). RFDS medical staff make an assessment of the crew required to support the patient during the flight—some patients require only a flight nurse, while others may require a flight nurse and doctor. Some may also need other specialist care. For example, acute surgical, obstetric and mental health patients may be transferred with a flight nurse alone, while unstable, undifferentiated or complex patients with acute cardiac, respiratory, paediatric or critical care requirements, or major trauma, may have a retrieval team comprising a doctor and flight nurse (Langford, 2015). Patients able to travel by other means, such as road ambulance or private vehicle, are not usually transported by the RFDS (Langford, 2015).

In addition to transporting a patient, the RFDS is also responsible for transporting a patient's treatment records, examination findings, and diagnostic findings, to facilitate quality ongoing care at the destination hospital (Langford, 2015).

4.5 RFDS staff

The Federation of the Royal Flying Doctor Service of Australia employs 1,224 people throughout Australia, comprising full-time, part-time and casual employees. This equates to 1,058.95 full-time equivalent positions (Royal Flying Doctor Service, 2015). Forty three Indigenous Australians, representing 3.5% of the RFDS workforce, are currently employed across the Federation of the Royal Flying Doctor Service of Australia (Royal Flying Doctor Service of Australia, 2016).

5.0 Aeromedical retrievals of Indigenous Australians in remote and rural Australia

Within national hospital statistics, data are reported on the care of Indigenous Australians who attend hospital for any reason. The outcomes for Indigenous Australians who arrive at hospital via an aeromedical retrieval are also captured in these data.

However, not all components of care provided to Indigenous Australians who are transported via an RFDS aeromedical retrieval are reported in the national dataset. Specifically, the number of Indigenous patients transported by the RFDS for any reason, their primary diagnosis prior to arrival at hospital, and demographic data have not been previously reported by the RFDS. As a result, the full impact of illnesses and injuries on remote and rural Indigenous Australians has likely been underestimated, and not brought to the attention of policymakers. To address this, aeromedical retrieval data for remote and rural Indigenous Australians transported by the RFDS are described and presented in the current chapter.

Data from all Indigenous and non-Indigenous aeromedical retrievals from 1 July 2013 to 31 December 2015 (hereafter written as July 2013–December 2015) are presented and briefly described. Comprehensive data around Indigenous aeromedical retrievals are presented and discussed in detail.

5.1 International standard for classifying diseases and related health problems

To ensure consistency in reporting data related to all types of health conditions, the World Health Organization (WHO) developed a clinical cataloguing system called the *International Statistical Classification of Diseases and Related Health Problems* or ICD (World Health Organization, 1994).

The ICD uses alphanumeric codes to enable health professionals to properly note diseases and injuries. It contains codes for signs and symptoms, abnormal findings, complaints, social circumstances, and external causes of injury or diseases and is used to monitor the incidence and prevalence of diseases and other health problems (World Health Organization, 2015). Stored data can be retrieved to produce core national and international statistics (McKenzie, Fingerhut, Walker, Harrison, & Harrison, 2012). Because it is consistently used to classify illnesses and injuries throughout the world, it enables international data to be reliably compared.

Australia uses the ICD-10 Australian Modification (AM) (ICD-10-AM) to record data (National Centre for Classification in Health, 2004). The ICD-10-AM was developed in 1998 by the National Centre for Classification in Health in collaboration with clinicians and coders to ensure the classification of illnesses and injuries were appropriate for Australian clinical practice (Australian Consortium for Classification Development, 2015).

Diseases and injuries are classified under one of 22 chapter headings in the ICD-10-AM (Table 5.1). Each chapter heading has a range of codes which denote specific illnesses and injuries. Specific diagnoses can be recorded using ICD sub-chapters, or ICD 3-character, 4-character or 5-character codes. Data presented in the current report were coded under ICD-10-AM chapter headings.

Table 5.1. ICD-10-AM chapters

Chapter number	Chapter heading	Code range
I	Certain infectious and parasitic diseases	A00–B99
I	Neoplasms	C00–D48
III	Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	D50–D89
IV	Endocrine, nutritional and metabolic diseases	E00–E89
V	Mental and behavioural disorders	F00–F99
VI	Diseases of the nervous system	G00–G99
VII	Diseases of the eye and adnexa	H00–H59
VIII	Diseases of the ear and mastoid process	H60–H95
IX	Diseases of the circulatory system	I00–I99
X	Diseases of the respiratory system	J00–J99
XI	Diseases of the digestive system	K00–K93
XII	Diseases of the skin and subcutaneous tissue	L00–L99
XIII	Diseases of the musculoskeletal system and connective tissue	M00–M99
XIV	Diseases of the genitourinary system	N00–N99
XV	Pregnancy, childbirth and the puerperium	O00–O99
XVI	Certain conditions originating in the perinatal period	P00–P96
XVII	Congenital malformations, deformations and chromosomal abnormalities	Q00–Q99
XVIII	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	R00–R99
XIX	Injury, poisoning and certain other consequences of external causes	S00–T98
XX	External causes of morbidity and mortality	U50–Y98
XXI	Factors influencing health status and contact with health services	Z00–Z99
XXII	Codes for special purposes	U00–U49

Source: World Health Organization (2016).

5.2 RFDS data collection and coding

The RFDS collects patient information for each aeromedical retrieval. Patient notes are normally handwritten by the retrieval doctor or flight nurse, and entered into specific databases. Twice a year, data are collated, cleaned, and standardised, by an external organisation, to enable analyses to be undertaken.

Retrospective data from all RFDS aeromedical retrievals, from July 2013 to December 2015 were analysed for this section of the discussion paper. Indigenous aeromedical retrieval data were further interrogated to provide a comprehensive picture of the range of illnesses and injuries experienced by Indigenous Australians served by the RFDS.

For all aeromedical retrievals conducted between July 2013 and December 2015, multiple variables were recorded. De-identified retrieval data used in the current report included information on:

- > The Section or Operation tasked with performing an aeromedical retrieval (Central Operations, Western Operations, SE Section,¹¹ Qld Section);
- > Retrieval date (day/month/year);
- > Patient's age (either raw age or 5-year age group);
- > Gender (male, female);
- > Indigenous status (Indigenous, non-Indigenous, foreigner (some Sections/Operations)); and
- > Illness or injury responsible for the retrieval using various ICD-10-AM editions and ICD-9.

¹¹ RFDS aeromedical retrieval data presented in the current discussion paper excludes RFDS flights from Mascot airport, which are tasked by Ambulance NSW. It also excludes retrievals from Tas that are undertaken by RFDS under the Ambulance Tas contract.

Data around the Section or Operation tasked with performing the aeromedical retrieval, retrieval date, patient's age and Indigenous status were recoded into categorical variables: the Section or Operation tasked with performing the aeromedical retrieval was recoded into the state/territory from where the patient was retrieved;¹² retrieval date was recoded by month and year; patient's age was recoded into discrete 5-year and 10-year age groupings; and 'foreigners' were recoded as non-Indigenous Australians for the Section/Operation that had employed this coding category, in line with the national data.

Within the RFDS, versions 9 and 10 of the ICD were used to code illnesses and injuries. To facilitate consistency around the illness or injury responsible for the RFDS aeromedical retrieval, data were recategorised according to ICD-10-AM 8th Edition. In the absence of a validated method to recode the subcategories of ICD-9 into ICD-10-AM, and incomplete data around subcategories, data were recoded to clinical diagnostic headings only, rather than subcategories.

Aeromedical retrieval data were coded according to the 22 disease and injury chapter headings of the ICD-10-AM. An additional coding category was included to ensure ill-defined/unknown conditions were captured in the data. Ill-defined/unknown conditions include those where a definitive diagnosis could not be made by the RFDS medical team prior to a patient's arrival at hospital.

5.2.1 Data analyses

All data were analysed using IBM SPSS Statistics for Windows, Version 23.0 or Microsoft Excel 2016.

All analyses used unweighted data, included all Indigenous (and non-Indigenous where relevant) patients who were transported by the RFDS and required definitive care in a tertiary hospital, excluded cases where Indigenous status was unknown, excluded cases where a patient underwent a repatriation transfer (where a patient was transported back to a local health facility, or their home town, after receiving medical care in a tertiary hospital) and excluded cases where no diagnosis was recorded.

5.3 Patient characteristics

Between July 2013 and December 2015, the RFDS conducted 75,763¹³ aeromedical retrievals,¹⁴ equivalent to 83 aeromedical retrievals per day. Of these aeromedical retrievals:

- > 3,317 (4.4%) were repatriation transfers (273 Indigenous, 3044 non-Indigenous);
- > No diagnosis was recorded for 43 (0.06%) patients ((14 Indigenous, 29 non-Indigenous); and
- > Indigenous status was missing for 9,875 (13%) patients.

Patients who underwent a repatriation transfer, had no diagnosis recorded, or where Indigenous status was not recorded, were excluded from further analyses, leaving a sample size of 62,528 patients comprising 17,606 (28.2%) Indigenous patients and 44,922 (71.8%) non-Indigenous patients.

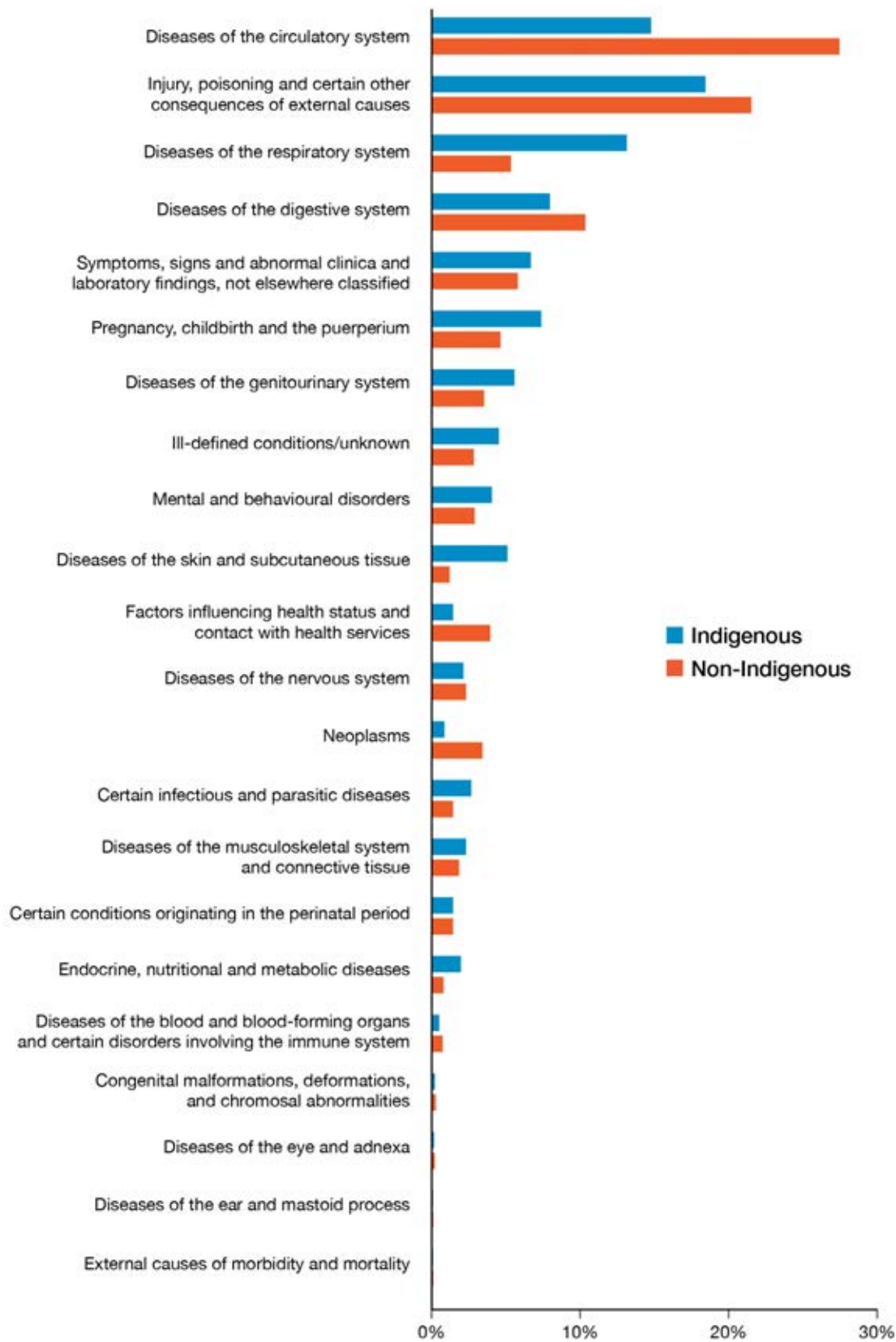
The data demonstrate that 19 Indigenous Australians and 49 non-Indigenous Australians underwent an aeromedical retrieval each day between July 2013 and December 2015. These patients presented with a range of injuries and illnesses and required aeromedical retrieval to a major tertiary hospital to receive definitive care. Data regarding the causes of their aeromedical retrieval, by Indigenous status, are presented in Figure 5.1.

¹² For example, a flight may be tasked from Essendon airport in Vic to pick up a patient in NSW. As the patient was retrieved from NSW, it would be coded as a NSW retrieval.

¹³ This figure includes eight non-Indigenous patients who were retrieved between 12.00 am and 2.00 am on 1 January 2016.

¹⁴ Each patient was only transported on one occasion for an acute episode of a condition, within the 2.5-year time period in which data were collected.

Figure 5.1. Most common reasons for an aeromedical retrieval of Indigenous Australians, and corresponding proportion among non-Indigenous Australians, July 2013–December 2015



The data presented in Figure 5.1 demonstrate that Indigenous Australians were most likely to require an aeromedical retrieval for injury, poisoning and certain other consequences of external causes, which accounted for 17.9% of all Indigenous aeromedical retrievals. Diseases of the circulatory system (e.g. heart attacks, stroke) were the second most common reason for an aeromedical retrieval of an Indigenous patient and were responsible for 14.3% of Indigenous retrievals. Diseases of the respiratory system were also an important reason for an aeromedical retrieval amongst Indigenous Australians (12.8% of Indigenous aeromedical retrievals). Together, injury, poisoning and certain other consequences of external causes, diseases of the circulatory system, and diseases of the respiratory system accounted for almost half (45.0%) of all RFDS aeromedical retrievals of Indigenous Australians.

Conversely, diseases of the circulatory system were the most common reason for an aeromedical retrieval for non-Indigenous Australians, comprising 26.6% of non-Indigenous aeromedical retrievals. Injury, poisoning and certain other consequences of external causes was the second most common reason for an aeromedical retrieval for non-Indigenous Australians (20.9% of non-Indigenous retrievals). Together, diseases of the circulatory system, and injury, poisoning and certain other consequences of external causes comprised almost half (47.7%) of all RFDS aeromedical retrievals for non-Indigenous Australians compared to 32.3% of Indigenous retrievals.

Indigenous patients ranged in age from newborn to 95 years of age,¹⁵ and non-Indigenous patients ranged in age from newborn to 99 years of age.¹⁶ Indigenous females (53.8%) were 1.2 times as likely as Indigenous males (46.2%) to undergo an aeromedical retrieval. Conversely, non-Indigenous males (60.1%) were 1.5 times as likely as non-Indigenous females (39.9%) to undergo an aeromedical retrieval. The mean 5-year age group for Indigenous Australians that underwent an aeromedical retrieval was 30–34 years and the mean 5-year age group for non-Indigenous Australians was 50–54 years. Indigenous children aged 0–4 years (14.1% of Indigenous aeromedical retrievals) were the group of Indigenous patients most likely to undergo an aeromedical retrieval, followed Indigenous Australians aged 40–44 years (8.3%) and 20–24 years (8.0%). In comparison, non-Indigenous Australians aged 65–69 years (9.3% of non-Indigenous retrievals) were the group of non-Indigenous Australians most likely to undergo an aeromedical retrieval, followed by non-Indigenous Australians aged 70–74 years (8.7% of non-Indigenous retrievals) and 60–64 years (8.3% of non-Indigenous retrievals). Children only accounted for 5.4% of non-Indigenous retrievals.

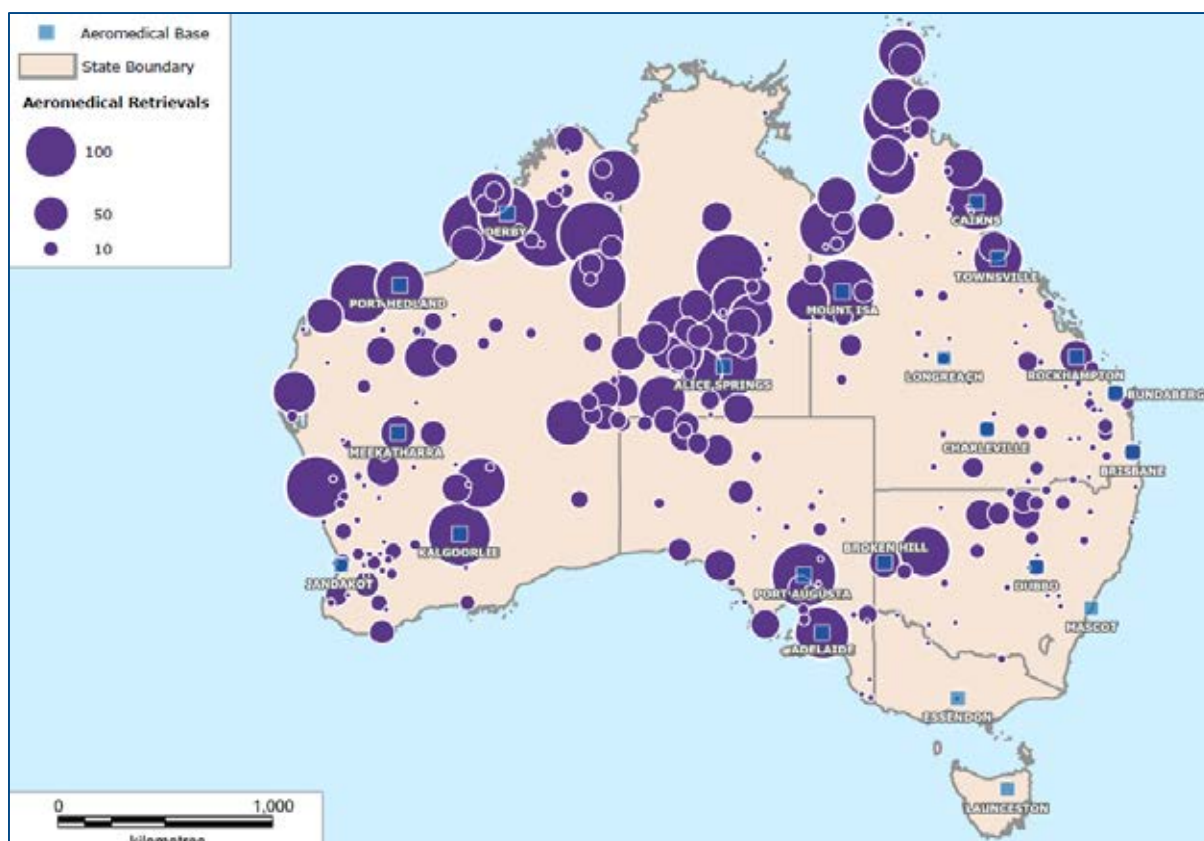
¹⁵ Actual ages were missing for some patients, whose age was only recorded in 5-year age categories. Consequently, there may have been patients older than 95 years.

¹⁶ Actual ages were missing for some patients, whose age was only recorded in 5-year age categories. Consequently, there may have been patients older than 99 years.

5.4 Demand for aeromedical retrievals by Indigenous Australians

There is consistent demand for aeromedical retrievals by Indigenous Australians. Figure 5.2 provides a snapshot of the demand for aeromedical retrievals, for any reason, for a one-year period from 1 January 2015 to 31 December 2015. Figure 5.2 demonstrates that Indigenous aeromedical retrievals were concentrated in central Australia. There was also consistent demand for Indigenous retrievals in many remote and rural areas of WA, Qld, NSW and SA.

Figure 5.2. Demand for aeromedical retrievals by Indigenous Australians, January–December 2015



Source: Developed by ORH (2016).

5.5 Aeromedical retrievals of Indigenous Australians by ICD-10-AM diagnoses

Section 5.4 highlighted the strong demand for aeromedical retrievals by Indigenous Australians. The current section presents detailed data around the types of illnesses and injuries that resulted in Indigenous Australians requiring an aeromedical retrieval between June 2013 and December 2015.

Indigenous data are organised and presented by ICD-10-AM chapter heading and for ill-defined/unknown conditions. Each of the ICD-10-AM chapter headings, as well as ill-defined/unknown conditions are described and examples of illnesses and injuries that are coded under each chapter heading are provided. Previously published national Indigenous data around each chapter heading is presented, including information around Indigenous deaths, Indigenous hospitalisations and Indigenous children.

RFDS Indigenous aeromedical retrieval data are then provided for each of the 22 ICD-10-AM chapter headings where the RFDS collected data,¹⁷ and for ill-defined/unknown conditions, including:

- > The number of Indigenous aeromedical retrievals;
- > The proportion of Indigenous Australians retrieved under each chapter heading as a proportion of all Indigenous aeromedical retrievals;
- > Gender of Indigenous patients that underwent an aeromedical retrieval;
- > The proportion of Indigenous Australians the underwent an aeromedical retrieval for each ICD-10-AM chapter, by state or territory of retrieval;
- > A map showing demand for aeromedical retrievals by Indigenous Australians for the top five illnesses and injuries;
- > A population pyramid that presents Indigenous aeromedical retrieval data by gender and 5-year age groups.¹⁸

¹⁷ RFDS did not collect data for ICD-10-AM Chapter 20—external causes of morbidity and mortality or Chapter 22—codes for special purposes. Although no RFDS data are provided for these chapters, descriptive information and Australian data (where available) are reported.

¹⁸ Population pyramids are not presented for illnesses where less than 50 patients underwent an aeromedical retrieval to ensure that patients cannot be identified.

5.5.1 ICD-10-AM Chapter 1—Certain infectious and parasitic diseases

Certain infectious or parasitic diseases describe diseases generally recognised as communicable or transmissible (World Health Organization, 2016). Direct or indirect communication of these diseases may occur through contact with other humans, animals or other environments that harbour the organism (Australian Institute of Health and Welfare, 2014a). Examples of certain infectious and parasitic diseases include:

- > Tuberculosis;
- > Intestinal infectious diseases—such as cholera; typhoid, botulism;
- > Infections with a predominantly sexual mode of transmission—such as syphilis;
- > Viral hepatitis;
- > HIV;
- > Viral infections of the central nervous system—such as rabies; mosquito- or tick-borne viral encephalitis;
- > Certain zoonotic bacterial diseases—such as anthrax, bubonic plague;
- > Pediculosis, acariasis and other infestations—such as scabies; and
- > Other bacterial diseases—such as pertussis (whooping cough), diphtheria, leprosy (World Health Organization, 2016).

Certain infectious and parasitic diseases are indicated by ICD-10-AM codes A00–B99.

Deaths

Age-standardised death data demonstrated that Indigenous Australians (19.4 per 100,000 population) in NSW, Qld, SA, NT and WA were twice as likely as non-Indigenous Australians (9.2 per 100,000 population) to die from certain infectious and parasitic diseases in 2008–2012 (Australian Institute of Health and Welfare, 2015a). Infectious and parasitic diseases accounted for 2.4% of Indigenous deaths during this period (Australian Institute of Health and Welfare, 2015a), and infections¹⁹ accounted for 3.0% of Indigenous deaths in Australia in 2010 (Australian Institute of Health and Welfare, 2015c).

Hospitalisations

In 2014–2015, Indigenous Australians (11.9 per 1,000 population) were twice as likely as non-Indigenous Australians (6.0 per 1,000 population) to be hospitalised for certain infectious and parasitic diseases (Australian Institute of Health and Welfare, 2016a). Indigenous Australians in remote and very remote areas had higher rates of hospitalisation for infectious diseases compared with Indigenous Australians living in major cities (Australian Institute of Health and Welfare, 2014a).

¹⁹ 'Infections' is a hybrid category composed of certain infections and parasitic diseases, diseases of the nervous system, and diseases of the respiratory system.

Children

Cause of death data from 2008–2012 demonstrated that Indigenous infants (0.2 per 1,000 live births) in NSW, Qld, SA, NT and WA, were twice as likely as non-Indigenous infants (0.1 per 1,000 live births) to die from infectious and parasitic diseases (Australian Institute of Health and Welfare, 2015a). During the same period, Indigenous children aged 1–4 years (1.7 per 100,000 population) were 1.7 times as likely as non-Indigenous children (1.0 per 100,000 population) to die from infectious and parasitic diseases (Australian Institute of Health and Welfare, 2015a).

RFDS data

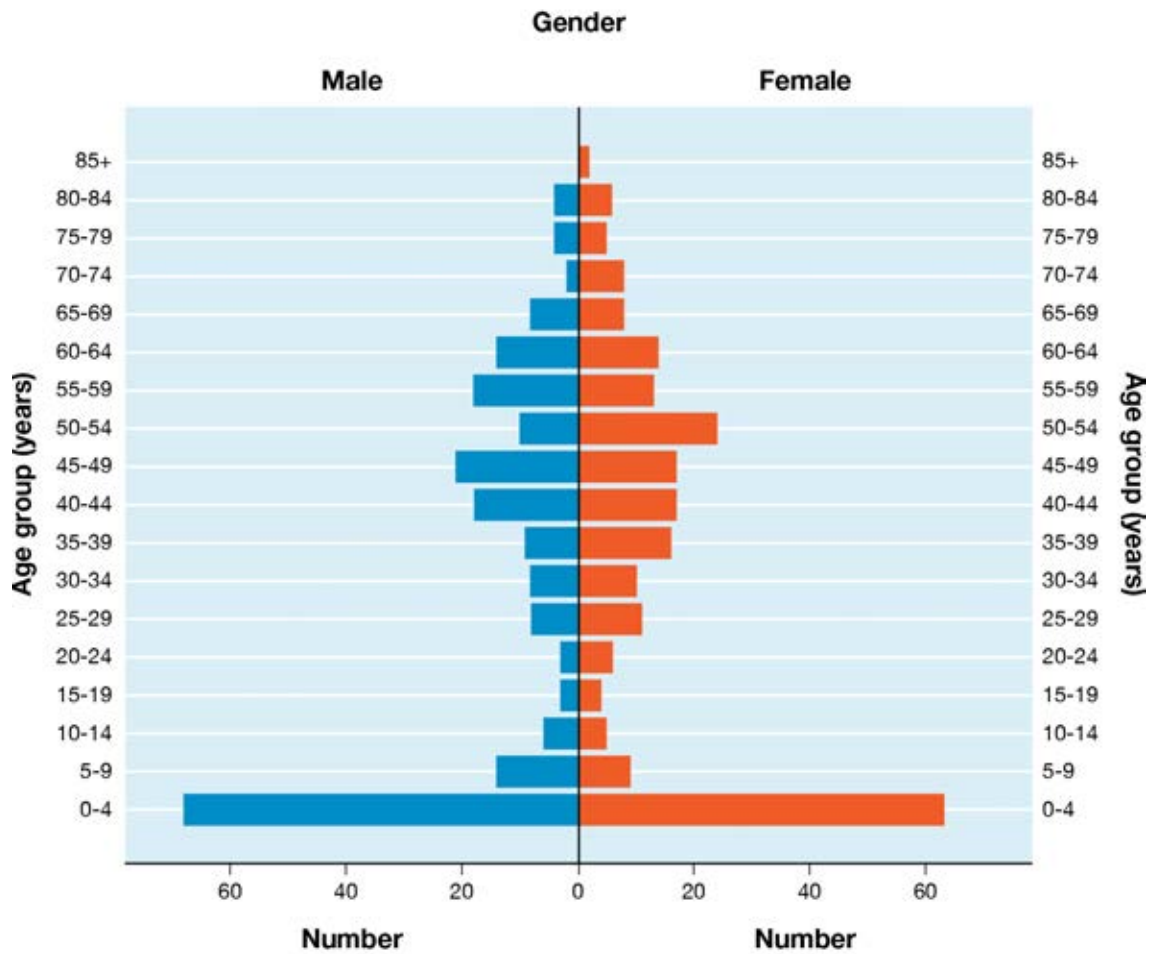
Certain infectious and parasitic diseases accounted for 2.7% of Indigenous aeromedical retrievals by the RFDS between July 2013 and December 2015 (Figure 5.3). Females were 1.1 times as likely as males to require an aeromedical retrieval for certain infectious and parasitic diseases. Retrieved patients ranged in age from under one year of age to 89 years. Almost half (48.3%) of the retrievals of Indigenous Australians for certain infectious and parasitic diseases were from WA.

Figure 5.3. Demographic data for aeromedical retrievals of Indigenous patients with certain infectious and parasitic diseases, July 2013–December 2015

Percentage of total patient retrievals	2.7%
<hr/>	
Number of patients retrieved	
Total	472
Per week	3.6
<hr/>	
Gender of patients retrieved	
Male	47.9%
Female	52.1%
<hr/>	
State of retrieval	
NSW	6.1%
Qld	16.3%
SA	11.9%
NT	17.4%
WA	48.3%

Indigenous children aged 0–9 years (33.8%) were more likely than Indigenous Australians from other age groups to require an aeromedical retrieval for certain infectious and parasitic diseases (Figure 5.4). Children under one year of age were overrepresented, accounting for one in seven (15.4%) aeromedical retrievals for certain infectious and parasitic diseases. Indigenous adults aged 40–49 years (16.0%) were the second most likely group to require an aeromedical retrieval for certain infectious or parasitic diseases.

Figure 5.4. Gender of Indigenous patients by age who underwent an aeromedical retrieval for certain infectious and parasitic diseases, July 2013–December 2015



Certain infectious and parasitic diseases—target groups for interventions

- > Indigenous children aged 0–4 years, with specific emphasis on children under one year of age.
- > Parents/carers of Indigenous children aged under 5 years.

5.5.2 ICD-10-AM Chapter 2—Neoplasms

Neoplasms describe abnormal tissue growth and can be benign (non-cancerous) or malignant (cancerous) (Australian Institute of Health and Welfare, 2014a). Examples of benign neoplasms include:

- > Adenoma—epithelial tissue tumour in a gland or organ, e.g. a colon polyp;
- > Fibroma—connective tissue tumour, e.g. uterine fibroid;
- > Nevi—growth on the skin, e.g. mole; and
- > Lipoma—tumour made of fat cells, e.g. adenolipoma of the skin (National Cancer Institute, 2016).

All neoplasms that are malignant are called cancers. Cancers refer to diseases in which abnormal cells divide without control and can invade nearby tissue (National Cancer Institute, 2016). Some of the main types of cancer include:

- > Carcinoma—in the skin or tissues that surround organs;
- > Leukaemia—affects tissues that make blood, such as bone marrow;
- > Lymphoma—originates in the immune system; and
- > Sarcoma—develops in bone fat, muscle, connective tissue etc. (National Cancer Institute, 2016).

Breast, bowel, lung and prostate cancers are neoplasms (Australian Institute of Health and Welfare, 2015c).

Neoplasms are indicated by ICD-10-AM codes C00–D48.

Deaths

Between 2008 and 2012, cancer accounted for 20% of Indigenous deaths in NSW, Qld, SA, NT and WA (Australian Institute of Health and Welfare, 2014b). During the same period, the age-standardised death rate from neoplasms for Indigenous Australians (224.1 per 100,000 population) was 1.3 times the rate for non-Indigenous Australians (177.9 per 100,000 population) (Australian Institute of Health and Welfare, 2014b). In 1999–2007, Indigenous Australians (40%) had a lower 5-year cancer survival rate than non-Indigenous Australians (52%) (Australian Institute of Health and Welfare, 2014a). Recent research has suggested that “reduced Indigenous survival for some adult cancers was due to Indigenous patients having more advanced disease and co-morbidities (e.g. diabetes type 2) at diagnosis, and also being less likely to receive cancer treatment” (Valery, Youlden, Baade, Ward, Green, & Aitken, 2013, p. 6).

In 2014, malignant neoplasm of trachea, bronchus and lung (C33, C34) was the fourth leading cause of death for Indigenous Australians in NSW, Qld, SA, WA and NT (Australian Bureau of Statistics, 2016a).

Hospitalisations

In 2014–2015, Indigenous Australians (17.0 per 1,000 population) were 0.7 times as likely as non-Indigenous Australians (24.5 per 1,000 population) to be hospitalised for neoplasms (Australian Institute of Health and Welfare, 2016a).

Children

Analysis of childhood cancer data for 1997–2008 demonstrated that Indigenous Australian children aged 0–14 years were 36% less likely to be diagnosed with cancer compared to non-Indigenous children. However, Indigenous children diagnosed with cancer in 1997–2007 were 50% more likely than non-Indigenous children to die from the condition within five years of a cancer diagnosis (Valery et al., 2013).

RFDS data

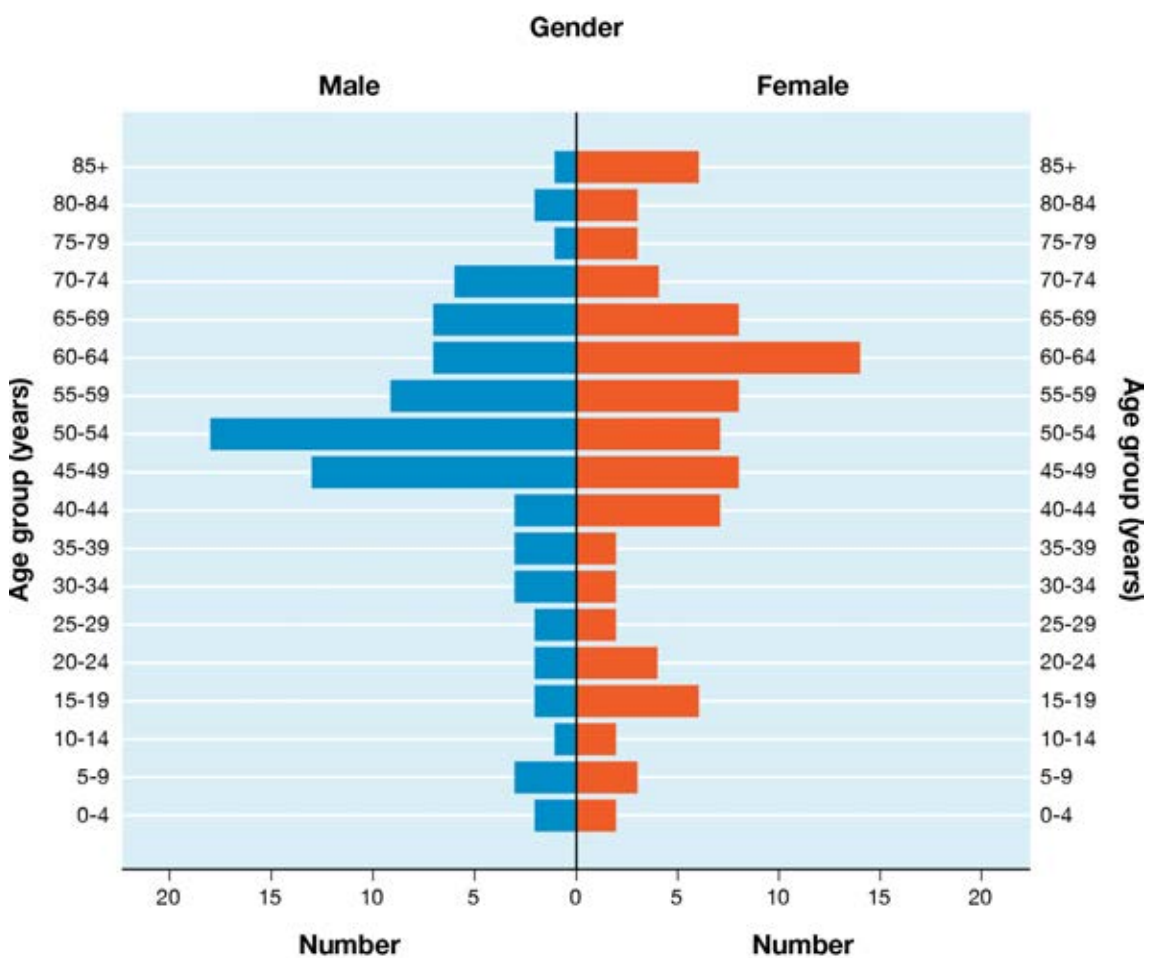
Neoplasms accounted for 1.0% of Indigenous aeromedical retrievals by the RFDS between July 2013 and December 2015 (Figure 5.5). Indigenous females were 1.1 times as likely as Indigenous males to require an aeromedical retrieval for neoplasms. Retrieved patients ranged in age from under one year of age to 95 years. Around one-third of the aeromedical retrievals of Indigenous Australians for neoplasms were from Qld (32.2%).

Figure 5.5. Demographic data for aeromedical retrievals of Indigenous patients with neoplasms, July 2013–December 2015

Percentage of total patient retrievals	1.0%
<hr/>	
Number of patients retrieved	
Total	177
Per week	1.4
<hr/>	
Gender of patients retrieved	
Male	48.0%
Female	52.0%
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State of retrieval	
NSW	0.6%
Qld	32.2%
SA	23.7%
NT	23.7%
WA	19.8%

Almost half of Indigenous Australians that required an aeromedical retrieval for neoplasms were aged 45–64 years (47.7%) (Figure 5.6). Indigenous males aged 45–64 years (26.7%) were 1.3 times as likely as Indigenous females aged 45–64 years (21.0%) to require an aeromedical retrieval for neoplasms.

Figure 5.6. Gender of Indigenous patients by age who underwent an aeromedical retrieval for neoplasms, July 2013–December 2015



Neoplasms—target groups for interventions
 > Indigenous adults aged 45–64 years.

5.5.3 ICD-10-AM Chapter 3—Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism

Blood disorders include coagulation defects, anaemias, and other disorders of the blood components (Universal Class, 2016).

Examples of diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism include:

- > Nutritional anaemias—such as iron deficiency anaemia, vitamin B12 deficiency anaemia;
- > Haemolytic anaemias—such as sickle cell anaemia, thalassemia;
- > Aplastic and other anaemias;
- > Coagulation defects—such as haemophilia;
- > Other diseases of blood and blood-forming organs—such as white blood cell disorders, diseases of the spleen; and
- > Certain disorders involving the immune mechanism—such as sarcoidosis, immune mechanism problems (Universal Class, 2016; World Health Organization, 2016).

Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism are indicated by ICD-10-AM codes D50–D89.

Anaemias, which are common blood disorders, impact on Indigenous Australians. Biomedical results obtained from adult respondents in the National Aboriginal and Torres Strait Islander Health Survey (NATSIHS) and National Aboriginal and Torres Strait Islander Nutrition and Physical Activity Survey (NATSINPAS), which were components of the 2012–2013 Australian Aboriginal and Torres Strait Islander Health Survey (AATSIHS), demonstrated that 7.6% of Indigenous adults were at risk of anaemia (Australian Bureau of Statistics, 2014a). Age-standardised data indicated that Indigenous Australians were 1.9 times as likely as non-Indigenous people to be at risk of developing anaemia (Australian Bureau of Statistics, 2014a). Indigenous Australians living in remote areas had a greater risk of anaemia (10.1%) compared with those living in non-remote areas (6.9%), and Indigenous women (10.3%) were at greater risk of developing anaemia compared to Indigenous men (4.8%).

Deaths

There is a lack of specific data regarding Indigenous deaths from diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism. However, age-standardised death data for all Australians (Indigenous and non-Indigenous combined) demonstrated that in 2014, diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism resulted in 1.9 deaths per 100,000 population (Australian Bureau of Statistics, 2016a).

Hospitalisations

In 2014–2015, Indigenous Australians (6.2 per 1,000 population) were equally as likely as non-Indigenous Australians (6.3 per 1,000 population) to be hospitalised for diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism (Australian Institute of Health and Welfare, 2016a).

RFDS data²⁰

Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism accounted for 0.5% of Indigenous aeromedical retrievals by the RFDS between July 2013 and December 2015 (Figure 5.7). Indigenous females (61.2%) were 1.6 times as likely as Indigenous males (38.8%) to require an aeromedical retrieval for diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism. Retrieved patients ranged in age from under one year of age to 82 years. Half of the aeromedical retrievals of Indigenous Australians for diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism were from WA (49.0%).

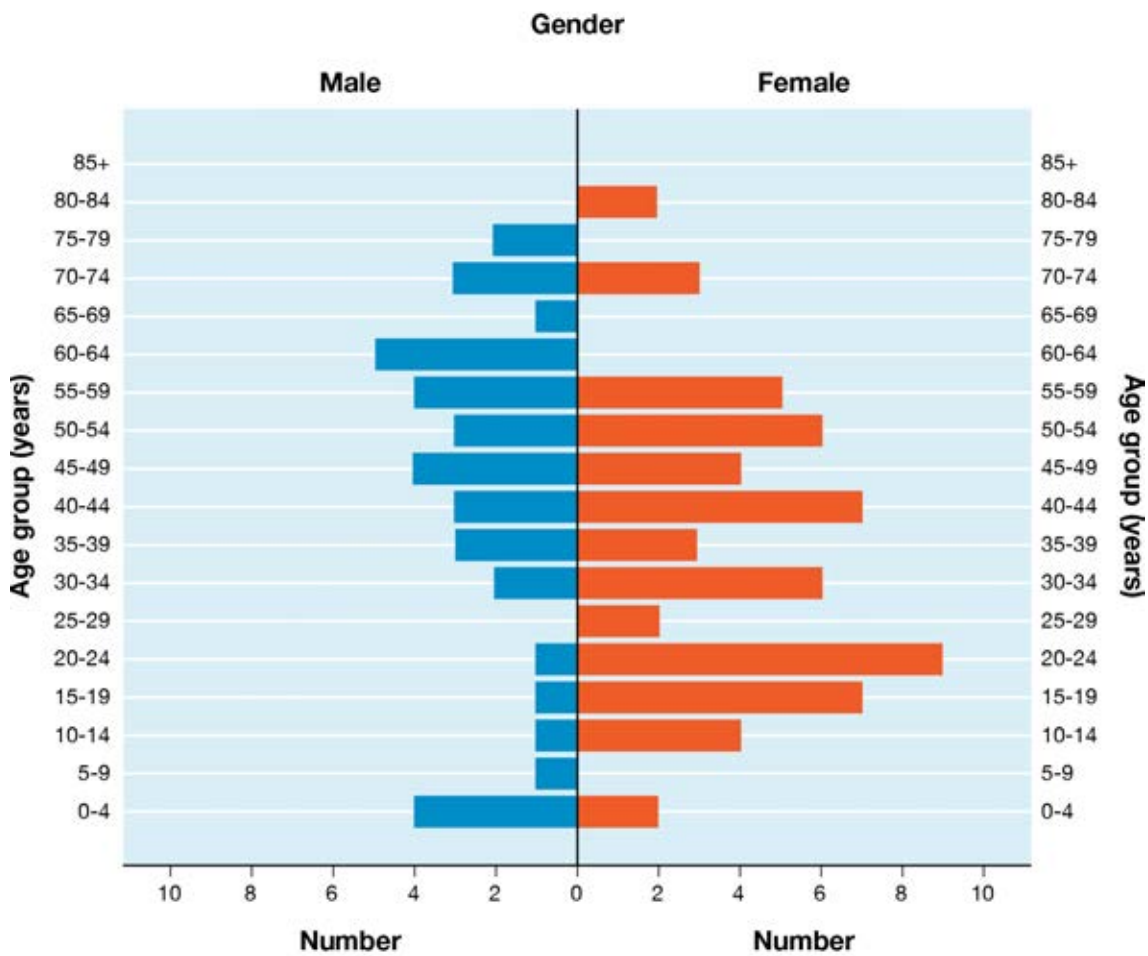
Figure 5.7. Demographic data for aeromedical retrievals of Indigenous patients with diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism, July 2013–December 2015

Percentage of total patient retrievals	0.5%
<hr/>	
Number of patients retrieved	
Total	98
Per week	0.75
<hr/>	
Gender of patients retrieved	
Male	38.8%
Female	61.2%
<hr/>	
State of retrieval	
NSW	2.0%
Qld	26.5%
SA	5.1%
NT	17.4%
WA	49.0%

Indigenous Australians aged 20–24 years (10.2%) and 40–44 years (10.2%) were more likely than other age groups to undergo an aeromedical retrieval for diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism (Figure 5.8).

²⁰ Results should be interpreted with caution due to the small number of Indigenous Australians that required an aeromedical retrieval for diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism.

Figure 5.8. Gender of Indigenous patients by age who underwent an aeromedical retrieval for diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism, July 2013–December 2015



Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism—target groups for interventions

- > Indigenous females of all ages, with specific emphasis on Indigenous females aged 20–24 years.
- > Indigenous adults aged 40–44 years.
- > Indigenous Australians from WA.

5.5.4 ICD-10-AM Chapter 4—Endocrine, nutritional and metabolic diseases

Endocrine diseases occur when there is an abnormality of one of the body's endocrine glands, which are responsible for producing or secreting hormones. The release of hormones can be disrupted when the endocrine body structures do not function properly (Bowie & Schaffer, 2016). Nutritional and metabolic disorders included in this chapter result from deficiencies in vitamins, minerals, and proteins and are impacted by conditions such as obesity, malnutrition, carbohydrate and lipid imbalances (Bowie & Schaffer, 2016). Diabetes mellitus (types 1 and 2), which results from a problem with the pancreas, is the most common and well known endocrine/metabolic disease (Bowie & Schaffer, 2016). When production of insulin is not regulated by the pancreas, it impacts on glucose levels, which in turn impacts on the ability of the body's cells to properly supply the energy needed for metabolic functions (Bowie & Schaffer, 2016).

Examples of endocrine, nutritional and metabolic diseases include:

- > Diabetes mellitus;
- > Disorders of thyroid gland—such as hypothyroidism, hyperthyroidism;
- > Other disorders of glucose regulation and pancreatic internal secretion;
- > Disorders of other endocrine glands—such as the pituitary gland;
- > Malnutrition;
- > Other nutritional deficiencies—such as vitamin B deficiency;
- > Obesity; and
- > Metabolic disorders—such as cystic fibrosis, lactose intolerance (World Health Organization, 2016).

Endocrine, nutritional and metabolic diseases are indicated by ICD-10-AM codes E00–E90.

Deaths

Between 2007 and 2011, Indigenous Australians from NSW, Qld, SA, NT and WA were five times as likely as non-Indigenous Australians to die from endocrine, nutritional and metabolic diseases, which accounted for 9% of Indigenous deaths during the period (Australian Institute of Health and Welfare, 2014a).

Similarly, between 2008 and 2012, the age-standardised death rate from endocrine, nutritional and metabolic diseases for Indigenous Australians (103.3 per 100,000 population) in NSW, Qld, SA, NT and WA was 4.6 times the rate for non-Indigenous Australians (22.7 per 100,000 population) (Australian Institute of Health and Welfare, 2014b). Diabetes, which is a significant endocrine, nutritional and metabolic disease in both Indigenous and non-Indigenous communities, was responsible for 8% of all Indigenous deaths during this period (Australian Institute of Health and Welfare, 2014b). The age-standardised death rate from diabetes for Indigenous Australians (89.9 per 100,000 population) was 5.8 times the rate for non-Indigenous Australians (125.6 per 100,000 population) (Australian Institute of Health and Welfare, 2014b).

In 2014, diabetes (E10-E14) was the second leading cause of death for Indigenous Australians in NSW, Qld, SA, WA and NT (Australian Bureau of Statistics, 2016a). Indigenous Australians (89.9 per 100,000 population) were 5.9 times as likely as non-Indigenous Australians (15.2 per 100,000 population) to die from diabetes in 2014 (Australian Bureau of Statistics, 2016a).

Hospitalisations

In 2014–2015, Indigenous Australians (14.5 per 1,000 population) were 2.3 times as likely as non-Indigenous Australians (6.2 per 1,000 population) to be hospitalised for endocrine, nutritional and metabolic diseases (Australian Institute of Health and Welfare, 2016a).

Children

Diabetes is a significant endocrine, nutritional and metabolic disease that impacts on Indigenous children and young people. In 2006–2011, the age-specific rate of type 2 diabetes for Indigenous Australians was higher than for non-Indigenous Australians—eight times as high among 10–14-year-olds and around four times as high for 15–19 and 20–24-year-olds (Australian Institute of Health and Welfare, 2014c).

RFDS data

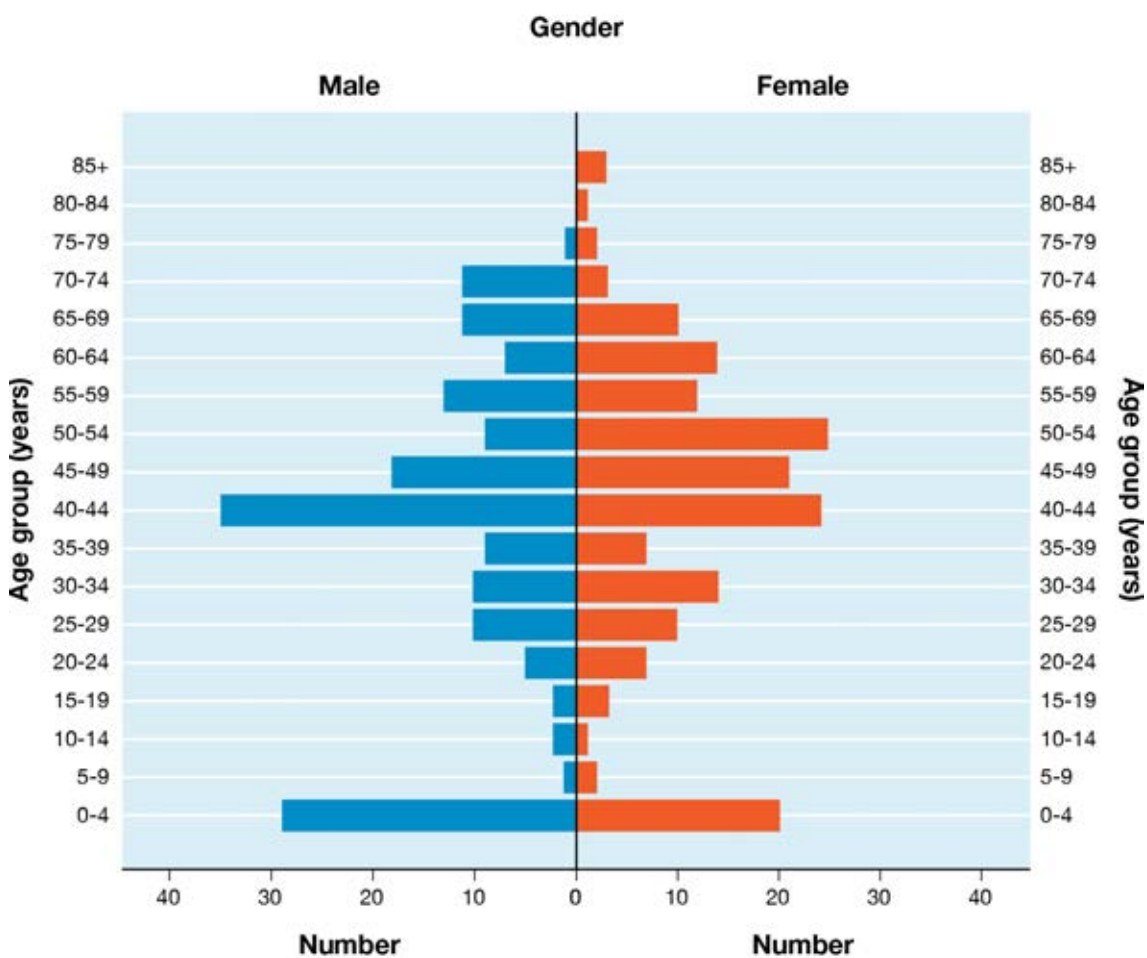
Endocrine, nutritional and metabolic diseases accounted for 2.1% of Indigenous aeromedical retrievals by the RFDS between July 2013 and December 2015, comprising roughly equal numbers of males and females. (Figure 5.9). Retrieved patients ranged in age from under one year of age to 89 years. More than 40% of the aeromedical retrievals of Indigenous Australians for endocrine, nutritional and metabolic diseases were from NT (41.6%).

Figure 5.9. Demographic data for aeromedical retrievals of Indigenous patients with endocrine, nutritional and metabolic diseases, July 2013–December 2015

Percentage of total patient retrievals	2.1%
<hr/>	
Number of patients retrieved	
Total	361
Per week	2.7
<hr/>	
Gender of patients retrieved	
Male	49.6%
Female	50.4%
<hr/>	
State of retrieval	
NSW	1.7%
Qld	9.1%
SA	9.1%
NT	41.6%
WA	38.5%

Indigenous Australians aged 40–44 years (16.8%) and 0–4 years (13.9%) were more likely than other age groups to undergo an aeromedical retrieval for endocrine, nutritional and metabolic diseases (Figure 5.10).

Figure 5.10. Gender of Indigenous patients by age who underwent an aeromedical retrieval for endocrine, nutritional and metabolic diseases, July 2013–December 2015



Endocrine, nutritional and metabolic diseases—target groups for interventions

- > Indigenous Australians aged 40–44 years.
- > Indigenous children aged 0–4 years.
- > Parents/carers of Indigenous children under 5 years of age.

5.5.5 ICD-10-AM Chapter 5—Mental and behavioural disorders

Mental and behavioural disorders include disorders of psychological development (World Health Organization, 2016).

Examples of mental and behavioural disorders include:

- > Organic mental disorders—such as dementia;
- > Mental and behavioural disorders due to psychoactive substance use;
- > Schizophrenia;
- > Affective disorders—such as bipolar disorder, depression;
- > Stress-related and somatoform disorders—such as anxiety, obsessive-compulsive disorder;
- > Eating disorders;
- > Disorders of adult personality and behaviour;
- > Mental retardation; and
- > Behavioural and emotional disorders (onset usually occurring in childhood/adolescence) (World Health Organization, 2016).

Mental and behavioural disorders are indicated by ICD-10-AM codes F00–F99.

Deaths²¹

In 2008–2012, in NSW, Qld, WA, SA and the NT, there were 347 Indigenous deaths from mental health-related conditions (Australian Institute of Health and Welfare, 2015a). Age-standardised death data demonstrated that Indigenous Australians (49 per 100,000 population) were 1.2 times as likely as non-Indigenous Australians (40 per 100,000 population) to die from mental and behavioural disorders (Australian Institute of Health and Welfare, 2015a). Age-standardised deaths from mental and behavioural disorders increased with increasing age in both Indigenous and non-Indigenous Australians in 2008–2012. Very few Indigenous and non-Indigenous Australians under the age of 35 years died as result of mental and behavioural disorders in 2008–2012. However, Indigenous Australians aged 35 years or older were more likely to die from mental and behavioural disorders than non-Indigenous Australians in 2008–2012. Specifically, Indigenous Australians (7.2 per 100,000 population) aged 35–44 years were 5.7 times as likely as non-Indigenous Australians (1.3 per 100,000 population) of the same age to die from mental and behavioural disorders (Australian Institute of Health and Welfare, 2015a).

In 2008–2012, Indigenous Australians (14.7 per 100,000 population) aged 45–54 years were 4.9 times as likely as non-Indigenous Australians (3.0 per 100,000 population) of the same age to die from mental and behavioural disorders (Australian Institute of Health and Welfare, 2015a). In 2008–2012, Indigenous Australians (18.3 per 100,000 population) aged 55–64 years were 2.7 times as likely as non-Indigenous Australians (6.9 per 100,000 population) of the same age to die from mental and behavioural disorders (Australian Institute of Health and Welfare, 2015a). In 2008–2012, Indigenous Australians (91.2 per 100,000 population) aged 65–74 years were 2.9 times as likely as non-Indigenous Australians (31.3 per 100,000 population) of the same age to die from mental and behavioural disorders (Australian Institute of Health and Welfare, 2015a).

²¹ Deaths from mental and behavioural disorders do not include deaths from intentional self-harm (suicide). Intentional self-harm is coded under ICD-10-AM Chapter 19—Injury, poisoning and certain other consequences of external causes.

Further exploration of death data from mental and behavioural disorders illustrates the significant impact of psychoactive substances use (ICD-10-AM codes F10–F19) on Indigenous mortality (Australian Institute of Health and Welfare, 2015a). In 2008–2012, 29.1% of Indigenous deaths due to mental and behavioural disorders were the result of psychoactive substances use, such as alcohol, opioids, cannabinoids, sedative hypnotics, cocaine, other stimulants such as caffeine, hallucinogens, tobacco, volatile solvents, or multiple drug use. During this period, Indigenous Australians (7.3 per 100,000 population) were 4.8 times as likely as non-Indigenous Australians to die as a result of psychoactive substances use (Australian Institute of Health and Welfare, 2015a).

Similarly, in 2006–2010, there were 312 Indigenous deaths from mental health-related conditions (Australian Institute of Health and Welfare, 2013a). Indigenous Australians living in NSW, Qld, WA, SA and the NT were 1.5 times as likely as non-Indigenous Australians to die from mental and behavioural disorders in 2006–2010 (Australian Institute of Health and Welfare, 2013a). Age-standardised death data demonstrated that Indigenous males (49 per 100,000 population) were 1.7 times as likely as non-Indigenous males to die from mental and behavioural disorders. Indigenous females were 1.3 times as likely as non-Indigenous females to die from mental and behavioural disorders (Australian Institute of Health and Welfare, 2013a).

The greater number of deaths from mental and behavioural disorders with age may also represent the impact of conditions associated with ageing, such as dementia. For example, in 2014, Indigenous Australians (50.7 per 100,000 population) in NSW, Qld, SA, WA and NT were 1.1 times as likely as non-Indigenous Australians (45.3 per 100,000 population) to die from dementia (including Alzheimer disease) (Australian Bureau of Statistics, 2016a).

Hospitalisations

In 2014–2015, Indigenous Australians (28.3 per 1,000 population) were 1.7 times as likely as non-Indigenous Australians (16.3 per 1,000 population) to be hospitalised for mental and behavioural disorders (Australian Institute of Health and Welfare, 2016a).

In 2011–2013, 4.2% of Indigenous hospitalisations were for mental and behavioural disorders (Australian Institute of Health and Welfare, 2015a). Age-standardised data demonstrated that Indigenous Australians (27.7 per 1,000 population) were twice as likely as non-Indigenous Australians (14.2 per 1,000 population) to be hospitalised for mental and behavioural disorders in 2011–2013 (Australian Institute of Health and Welfare, 2015a).

Children

In 2008–2009, Indigenous young people aged 12–24 years (2,535 per 100,000 population) were three times as likely to be hospitalised for mental and behavioural disorders as non-Indigenous young people (Australian Institute of Health and Welfare, 2011b). The leading causes of hospitalisation for mental and behavioural disorders amongst Indigenous young people were schizophrenia (306 per 100,000 population), alcohol misuse (348 per 100,000 population) and reactions to severe stress (266 per 100,000 population) (Australian Institute of Health and Welfare, 2011b).

RFDS data

Mental and behavioural disorders accounted for 4.0% of Indigenous aeromedical retrievals by the RFDS between July 2013 and December 2015. Males (60.3%) were 1.5 times as likely as females (39.7%) to undergo an aeromedical retrieval for a mental or behavioural disorder (Figure 5.11). Retrieved patients ranged in age from three years²² to 85 years. More than one-third of Indigenous aeromedical retrievals for mental and behavioural disorders were from WA (37.6%).

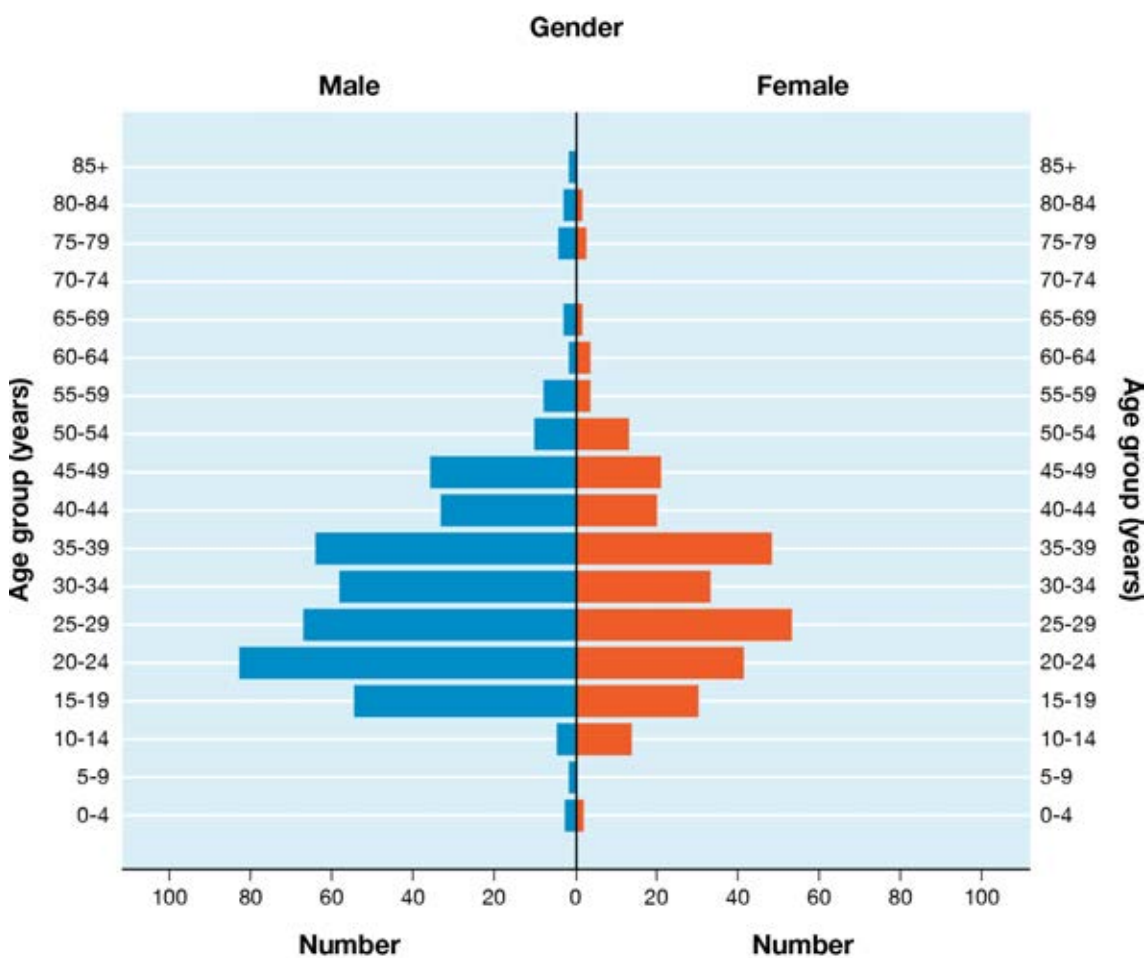
Figure 5.11. Demographic data for aeromedical retrievals of Indigenous patients with mental and behavioural disorders, July 2013–December 2015

Percentage of total patient retrievals	4.0%
<hr/>	
Number of patients retrieved	
Total	715
Per week	2.7
<hr/>	
Gender of patients retrieved	
Male	60.3%
Female	39.7%
<hr/>	
State of retrieval	
NSW	2.2%
Qld	28.0%
SA	16.8%
NT	15.3%
WA	37.6%
Vic	0.1%

Indigenous Australians aged 20–39 years accounted for 62.8% of Indigenous aeromedical retrievals for mental and behavioural disorders (Figure 5.12). Within this age cohort, males aged 20–24 years (11.6%) were the group most likely to require and aeromedical retrieval for mental and behavioural disorders. Indigenous males aged 20–24 years (11.6%) were twice as likely as Indigenous females aged 20–24 years (5.7%) to undergo an aeromedical retrieval for mental and behavioural disorders. Within the 10–14-year age group, Indigenous females (2.0%) were 3.3 times as likely as Indigenous males (0.6%) to undergo and aeromedical retrieval for mental and behavioural disorders.

²² RFDS staff recorded two patients as being newborn. The age of the child was most likely used instead of age of the mother. Although represented in the histogram, these are most likely to be errors in recording or transcription of data.

Figure 5.12. Gender of Indigenous patients by age who underwent an aeromedical retrieval for mental and behavioural disorders, July 2013–December 2015



Mental and behavioural disorders—target groups for interventions

- > Indigenous Australians aged 20–39 years.
- > Indigenous males, especially those aged 20–29 years.
- > Indigenous females aged 10–14 years.

5.5.6 ICD-10-AM Chapter 6—Diseases of the nervous system

The nervous system controls bodily activities (Bowie & Schaffer, 2016), such as walking, speaking, swallowing and breathing. It is made up of the central nervous system, which controls the brain and spinal cord, and the peripheral nervous system, which controls other parts of the body (Bowie & Schaffer, 2016).

Examples of diseases of the nervous system include:

- > Inflammatory diseases of the central nervous system—such as meningitis;
- > Systemic atrophies primarily affecting the central nervous system—such as Huntington disease, motor neuron disease;
- > Extrapyrarnidal and movement disorders—such as Parkinson disease;
- > Other degenerative diseases of the nervous system—such as Alzheimer disease; degeneration of nervous system due to alcohol;
- > Demyelinating diseases of the central nervous system—such as multiple sclerosis;
- > Episodic and paroxysmal disorders—such as epilepsy;
- > Nerve, nerve root and plexus disorders—such as carpal tunnel syndrome;
- > Polyneuropathies and other disorders of the peripheral nervous system—such as Guillain-Barre syndrome;
- > Diseases of myoneural junction and muscle—such as muscular dystrophy; and
- > Cerebral palsy and other paralytic syndromes (World Health Organization, 2016).

Diseases of the nervous system are indicated by ICD-10-AM codes G00–G99.

Deaths

Age-standardised death data demonstrated that Indigenous Australians (24.0 per 100,000 population) in NSW, Qld, SA, NT and WA were 0.9 times as likely as non-Indigenous Australians (25.8 per 100,000 population) to die from diseases of the nervous system (Australian Institute of Health and Welfare, 2015a). Diseases of the nervous system accounted for 2.5% of Indigenous deaths during this period (Australian Institute of Health and Welfare, 2015a).

Hospitalisations

In 2014–2015, Indigenous Australians (10.6 per 1,000 population) were 0.9 times as likely as non-Indigenous Australians (11.2 per 1,000 population) to be hospitalised for diseases of the nervous system (Australian Institute of Health and Welfare, 2016a).

Children

During 2008–2012, Indigenous children aged 0–4 years (4.1 per 100,000 population) in NSW, Qld, SA, NT and WA were 1.2 times as likely as non-Indigenous children aged 0–4 years (3.3 per 100,000 population) to die from diseases of the nervous system (Australian Institute of Health and Welfare, 2015a).

RFDS data

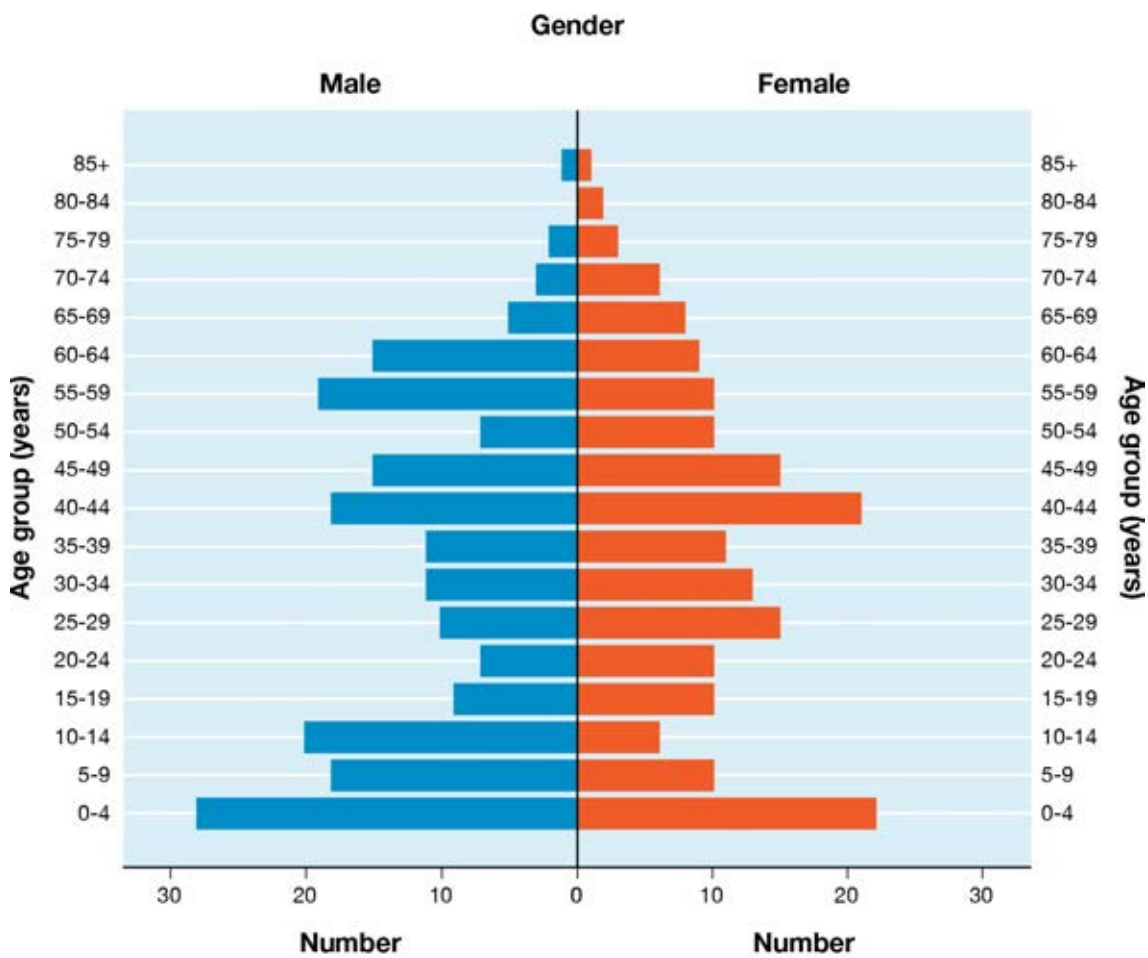
Diseases of the nervous system accounted for 2.2% of Indigenous aeromedical retrievals by the RFDS between July 2013 and December 2015 (Figure 5.13). Indigenous males were slightly more likely than Indigenous females to require an aeromedical retrieval for diseases of the nervous system. Retrieved patients ranged in age from under one year of age to 85 years. Patients were most likely to come from the WA (30.0%).

Figure 5.13. Demographic data for aeromedical retrievals of Indigenous patients with diseases of the nervous system, July 2013–December 2015

Percentage of total patient retrievals	2.2%
<hr/>	
Number of patients retrieved	
Total	384
Per week	2.9
<hr/>	
Gender of patients retrieved	
Male	52.1%
Female	47.9%
<hr/>	
State of retrieval	
NSW	3.9%
Qld	23.2%
SA	13.5%
NT	29.4%
WA	30.0%

Indigenous Australians aged 0–4 years accounted for 13.1% of Indigenous aeromedical retrievals for diseases of the nervous system (Figure 5.14). Indigenous Australians aged 40–44 years (10.2%) were the second largest group of Indigenous Australians transported for diseases of the nervous system.

Figure 5.14. Gender of Indigenous patients by age who underwent an aeromedical retrieval for diseases of the nervous system, July 2013–December 2015



Diseases of the nervous system—target groups for interventions

- > Indigenous Australians aged 0–4 years.
- > Parents/carers of Indigenous children aged under 5 years.
- > Indigenous Australians aged 40–44 years.

5.5.7 ICD-10-AM Chapter 7—Diseases of the eye and adnexa

Diseases of the eye and adnexa refer to all diseases that affect the eye and appendages (adnexa) of the eye, such as the upper or lower eyelid, or the conjunctiva (Bowie & Schaffer, 2016).

Examples of diseases of the eye and adnexa include:

- > Disorders of eyelid, lacrimal system and orbit—such as an abscess or styte;
- > Disorders of conjunctiva—such as conjunctivitis;
- > Disorders of sclera, cornea, iris and ciliary body—such as a corneal ulcer;
- > Disorders of lens—such as cataracts;
- > Disorders of choroid and retina—such as retinal detachment;
- > Glaucoma;
- > Disorders of vitreous body and globe;
- > Disorders of optic nerve and visual pathways—such as optic neuritis;
- > Disorders of ocular muscles, binocular movement, accommodation and refraction—such as myopia, astigmatism; and
- > Visual disturbances and blindness (World Health Organization, 2016).

Diseases of the eye and adnexa are indicated by ICD-10-AM codes H00–H59.

Deaths

There is a lack of specific data regarding Indigenous deaths from diseases of the eye and adnexa. Cause of death data for all Australians (Indigenous and non-Indigenous combined) demonstrated that in 2014, there were only 11 deaths from diseases of the eye and adnexa (Australian Bureau of Statistics, 2016a). For the five-year period from 2010 to 2014, there were 35 deaths (14 male, 21 female) in Australia (Indigenous and non-Indigenous combined) from diseases of the eye and adnexa (Australian Bureau of Statistics, 2016a). Due to the small number of deaths, no age-standardised death data were reported (Australian Bureau of Statistics, 2016a).

Hospitalisations

In 2014–2015, Indigenous Australians (10.5 per 1,000 population) were 0.7 times as likely as non-Indigenous Australians (14.2 per 1,000 population) to be hospitalised for diseases of the eye and adnexa (Australian Institute of Health and Welfare, 2016a).

Indigenous Australians are more likely to have vision problems than non-Indigenous Australians (Australian Institute of Health and Welfare, 2015a). It has been suggested that almost all (94%) vision loss in Indigenous people is considered unnecessary, as it is preventable or treatable (Australian Institute of Health and Welfare, 2015a). Long-term eye or sight problems were more likely amongst older Indigenous Australians and ranged from 8.8% among children aged 0–14 to 92% among those aged 55 years and over (Australian Institute of Health and Welfare, 2015a).

Children

In 2009–2013 there were no Indigenous or non-Indigenous neonatal or perinatal deaths due to diseases of the eye and adnexa (Australian Bureau of Statistics, 2015).

RFDS data²³

Diseases of the eye and adnexa accounted for a very small proportion (0.2%) of Indigenous aeromedical retrievals by the RFDS between July 2013 and December 2015, and were made up of roughly equal numbers of males and females (Figure 5.15). Retrieved patients ranged in age from under one year of age to 84 years. More than half of Indigenous aeromedical

²³ Results should be interpreted with caution due to the small number of Indigenous Australians that required an aeromedical retrieval for diseases of the eye and adnexa. Population pyramids are not provided for diseases of the eye and adnexa to ensure that patients cannot be identified.

retrievals for diseases of the eye and adnexa were from Qld (51.3%).

Figure 5.15. Demographic data for aeromedical retrievals of Indigenous patients with diseases of the eye and adnexa, July 2013–December 2015

Percentage of total patient retrievals	0.2%
<hr/>	
Number of patients retrieved	
Total	39
Per week	0.3
<hr/>	
Gender of patients retrieved	
Male	48.7%
Female	51.3%
<hr/>	
State of retrieval	
Qld	51.3%
SA	2.6%
NT	12.8%
WA	33.3%

There were no clear patterns in the ages and gender of Indigenous Australians that underwent an aeromedical retrieval for diseases of the eye and adnexa, most likely due to the low numbers of patients who were retrieved with these conditions.

Diseases of the eye and adnexa—target groups for interventions

- > Indigenous Australians in Qld.

5.5.8 ICD-10-AM Chapter 8—Diseases of the ear and mastoid process

The ear is part of the nervous system and serves two specific functions—it enables hearing and assists in maintaining balance (Bowie & Schaffer, 2016). The ear is divided into three sections—the external ear, which is the visible outermost part of the ear, the middle ear and the inner ear (Bowie & Schaffer, 2016). The mastoid process is a “large, bony prominence on the base of the skull behind the ear, containing air spaces that connect with the middle ear cavity” (Dictionary.com, 2016).

Examples of diseases of the ear and mastoid process include:

- > Diseases of external ear—such as an external ear abscess, otis externa;
- > Diseases of middle ear and mastoid—such as otitis media, glue ear; and
- > Diseases of inner ear—such as vertigo, Ménière disease (World Health Organization, 2016).

Disorders of the middle ear, such as bacterial and viral infections leading to otitis media, are the most common ear conditions affecting Indigenous Australians (Australian Institute of Health and Welfare, 2015a). This is a common childhood disease, which can result in hearing loss, deafness and further complications such as learning difficulties with repeated episodes of recurrence (Australian Institute of Health and Welfare, 2015a).

Diseases of the ear and mastoid process are indicated by ICD-10-AM codes H60–H95.

Deaths

Similar to diseases of the eye and adnexa, there is a lack of specific data regarding Indigenous deaths from diseases of the ear and mastoid process. Cause of death data for all Australians (Indigenous and non-Indigenous combined) demonstrated that in 2014, there were 14 deaths from diseases of the ear and mastoid process (Australian Bureau of Statistics, 2016a). For the five-year period from 2010 to 2014, there were 47 deaths (32 male, 15 female) in Australia (Indigenous and non-Indigenous combined) from diseases of the ear and mastoid process (Australian Bureau of Statistics, 2016a). Due to the small number of deaths, no age-standardised death data were reported (Australian Bureau of Statistics, 2016a).

Hospitalisations

In 2014–2015, Indigenous Australians (3.1 per 1,000 population) were 1.1 times as likely as non-Indigenous Australians (2.7 per 1,000 population) to be hospitalised for diseases of the ear and mastoid process (Australian Institute of Health and Welfare, 2016a).

Hospitalisation rates for ear problems for Indigenous Australians rose by 45% between 2004 and 2005 and 2012–2013, while rates for non-Indigenous Australians remained relatively stable (Australian Institute of Health and Welfare, 2015a).

Children

In 2009–2013 there were no neonatal or perinatal deaths due to diseases of ear and mastoid process (Australian Bureau of Statistics, 2015). Based on self-reported data from the 2012–2013 AATSIHS, around 7% of Indigenous children aged 0–14 years had hearing problems. Indigenous children aged 0–14 years (39%) were 2.3 times as likely as non-Indigenous children to have otitis media, and around half (48%) of the ear or hearing problems experienced by these children were deafness or partial hearing loss (Australian Institute of Health and Welfare, 2015a).

RFDS data²⁴

Diseases of the ear and mastoid process also accounted for a very small proportion (0.2%) of Indigenous aeromedical retrievals by the RFDS between July 2013 and December 2015 (Figure 5.16). Indigenous females (71.4%) were 2.5 times as likely as Indigenous males (28.6%) to undergo an aeromedical retrieval for diseases of the ear and mastoid process. Retrieved patients ranged in age from under one year of age to 52 years. More than half of Indigenous aeromedical retrievals for diseases of the ear and mastoid process were from WA (57.2%).

Figure 5.16. Demographic data for aeromedical retrievals of Indigenous patients with diseases of the ear and mastoid process, July 2013–December 2015

Percentage of total patient retrievals	0.2%
<hr/>	
Number of patients retrieved	
Total	35
Per week	0.3
<hr/>	
Gender of patients retrieved	
Male	28.6%
Female	71.4%
<hr/>	
State of retrieval	
NSW	5.7%
Qld	17.1%
SA	2.9%
NT	17.1%
WA	57.2%

Indigenous children aged under 10 years accounted for almost half (48.6%) of Indigenous aeromedical retrievals for diseases of the ear and mastoid process.

Diseases of the ear and mastoid process—target groups for interventions

- > Indigenous females.
- > Indigenous children aged 0–9 years.
- > Parents/carers of Indigenous children.

²⁴ Results should be interpreted with caution due to the small number of Indigenous Australians that required an aeromedical retrieval for diseases of the ear and mastoid process. Population pyramids are not provided for diseases of the ear and mastoid process to ensure that patients cannot be identified.

5.5.9 ICD-10-AM Chapter 9—Diseases of the circulatory system

The circulatory system, also known as the cardiovascular system, consists of three main body structures and organs—arteries, veins and the heart (Bowie & Schaffer, 2016). The arteries carry oxygen-rich blood from the heart to the body (except for the pulmonary artery, which carries deoxygenated blood from the heart to the lungs) (Bowie & Schaffer, 2016). The veins carry deoxygenated blood from the body back to the heart (except for the pulmonary vein, which carries oxygenated blood back to the heart), and the heart pumps blood through the body (Bowie & Schaffer, 2016). Circulatory system disorders are often interrelated, and have the potential to impact on multiple parts of the circulatory system (Bowie & Schaffer, 2016). Both infections and physiological factors can lead to diseases of the circulatory system (Bowie & Schaffer, 2016).

Examples of diseases of the circulatory system include:

- > Acute rheumatic fever;
- > Chronic rheumatic heart diseases;
- > Hypertensive diseases—such as high blood pressure;
- > Ischaemic heart diseases—such as angina, myocardial infarction (heart attack);
- > Pulmonary heart disease—such as a pulmonary embolism (blockage of a lung artery);
- > Other forms of heart disease—such as pericarditis (inflammation of lining around the heart);
- > Cerebrovascular diseases—such as a stroke, aneurism;
- > Diseases of arteries, arterioles and capillaries—such as atherosclerosis, aortic aneurysm; and
- > Diseases of veins, lymphatic vessels and lymph nodes, not elsewhere classified—such as varicose veins (World Health Organization, 2016).

Diseases of the circulatory system are indicated by ICD-10-AM codes I00–I99.

Deaths

Age-standardised death data demonstrated that Indigenous Australians (285.7 per 100,000 population) in NSW, Qld, SA, NT and WA were 1.5 times as likely as non-Indigenous Australians (191.8 per 100,000 population) to die from diseases of the circulatory system in 2008–2012 (Australian Institute of Health and Welfare, 2015a). Diseases of the circulatory system accounted for 25.5% of Indigenous deaths during this period (Australian Institute of Health and Welfare, 2015a). Diseases of the circulatory system accounted for 26% of deaths amongst Indigenous Australians in NSW, Qld, SA, NT and WA, and was the leading cause of Indigenous deaths between 2007 and 2011 (Australian Institute of Health and Welfare, 2014a).

In 2014, ischaemic heart disease (I20–I25) was the leading cause of death for Indigenous Australians in NSW, Qld, SA, WA and NT (Australian Bureau of Statistics, 2016a). Indigenous Australians (131.4 per 100,000 population) were 1.7 times as likely as non-Indigenous Australians (75.9 per 100,000 population) to die from ischaemic heart disease (Australian Bureau of Statistics, 2016a).

Hospitalisations

In 2014–2015, Indigenous Australians (31.8 per 1,000 population) were 1.8 times as likely as non-Indigenous Australians (18.1 per 1,000 population) to be hospitalised for diseases of the circulatory system (Australian Institute of Health and Welfare, 2016a).

Children

Age-standardised death data demonstrated that Indigenous Australians aged 0–4 years (5.5 per 100,000 population) in NSW, Qld, SA, NT and WA were 2.5 times as likely as non-Indigenous Australians (2.2 per 100,000 population) to die from diseases of the circulatory system in 2008–2012 (Australian Institute of Health and Welfare, 2015a).

RFDS data

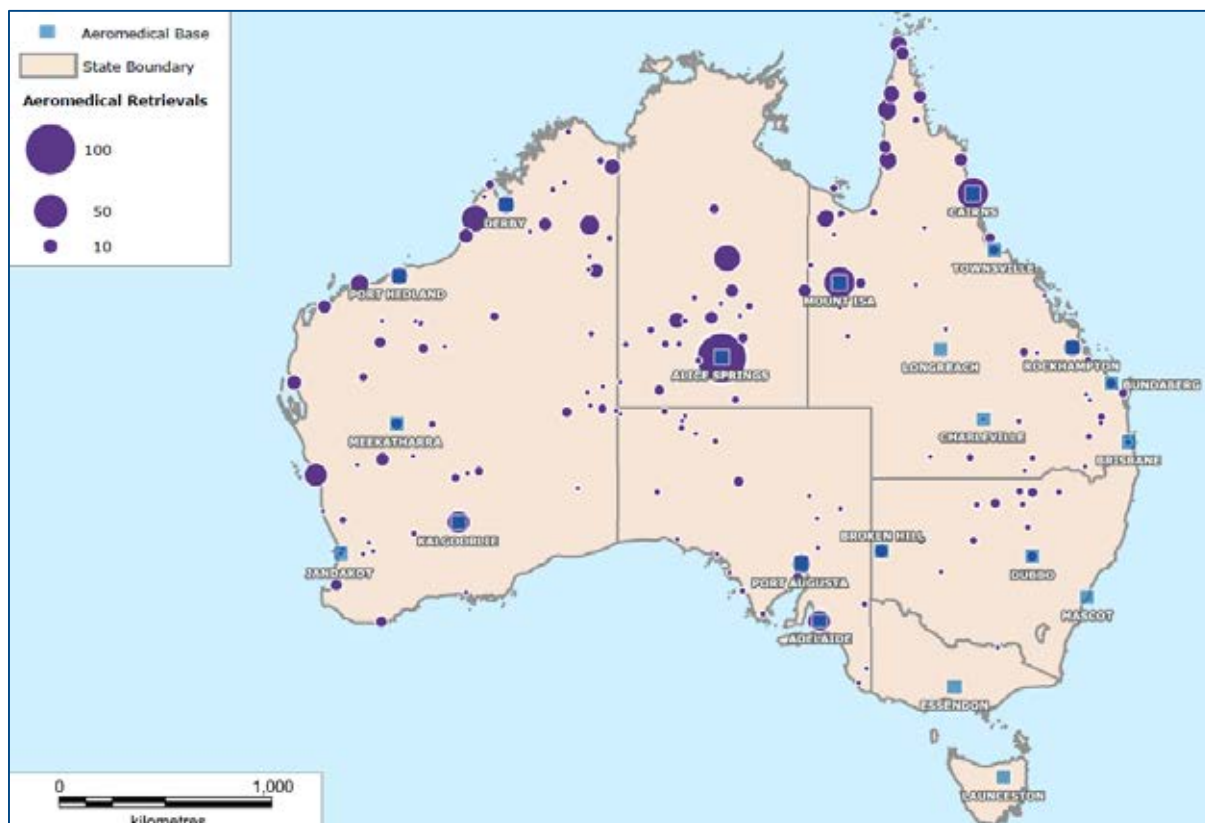
Diseases of the circulatory system accounted for a large proportion (14.3%) of Indigenous

aeromedical retrievals by the RFDS between July 2013 and December 2015 (Figure 5.17). After injury, poisoning and certain other consequences of external causes, diseases of the circulatory system were the second most common reason that Indigenous Australians required an aeromedical retrieval. Indigenous males were slightly more likely than females to undergo an aeromedical retrieval for diseases of the circulatory system. Retrieved patients ranged in age from under one year of age to 90 years. Indigenous Australians with diseases of the circulatory system were most likely to come from WA (36.3%). The demand for aeromedical retrievals by Indigenous Australians for diseases of the circulatory system for the 12 months from January to December 2015 (Figure 5.18) demonstrates the main areas within each state and territory where aeromedical retrievals took place.

Figure 5.17. Demographic data for aeromedical retrievals of Indigenous patients with diseases of the circulatory system, July 2013–December 2015

Percentage of total patient retrievals	14.3%
<hr/>	
Number of patients retrieved	
Total	2,527
Per week	19.4
<hr/>	
Gender of patients retrieved	
Male	52.9%
Female	47.1%
<hr/>	
State of retrieval	
NSW	5.5%
Qld	30.1%
SA	8.2%
NT	19.9%
WA	36.3%

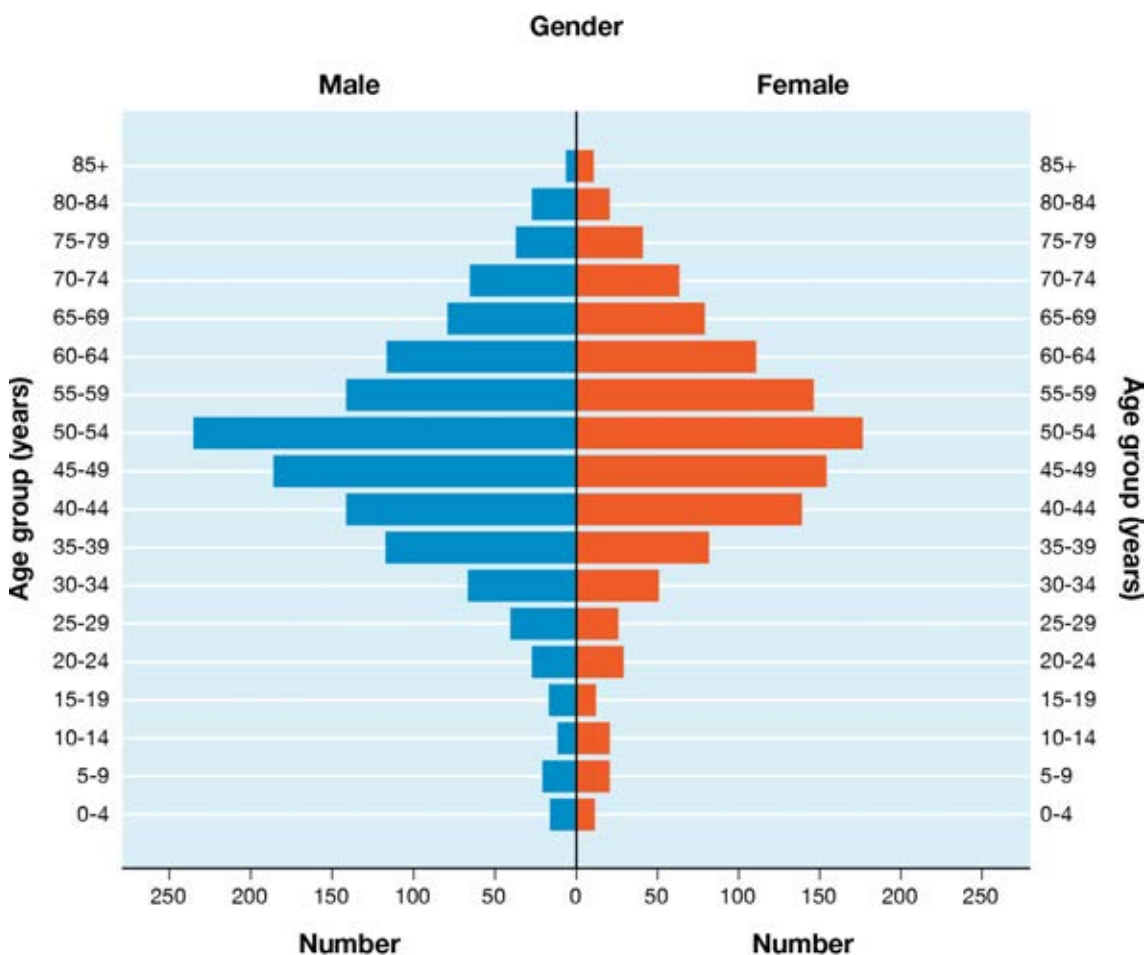
Figure 5.18. Demand for aeromedical retrievals by Indigenous Australians for diseases of the circulatory system, January to December, 2015



Source: Developed by ORH (2016).

Indigenous Australians aged 45–54 years (24.4%) accounted for one-quarter of Indigenous aeromedical retrievals for diseases of the circulatory system (Figure 5.19). The mean age group for Indigenous aeromedical retrievals for diseases of the circulatory system was 45–49 years. This is in contrast to non-Indigenous Australians retrieved for diseases of the circulatory system, who were most likely to come from the 60–64-year age group.

Figure 5.19. Gender of Indigenous patients by age who underwent an aeromedical retrieval for diseases of the circulatory system, July 2013–December 2015



Diseases of the circulatory system—target groups for interventions
 > Indigenous Australians aged 45–54 years.

5.5.10 ICD-10-AM Chapter 10—Diseases of the respiratory system

The respiratory system is made up of structures that exchange oxygen and carbon dioxide in the body and commences its functions when air enters the body through the nose or mouth (Bowie & Schaffer, 2016). The lungs are the main organs of the respiratory system that facilitate the exchange of oxygen and carbon dioxide (Bowie & Schaffer, 2016).

Examples of diseases of the respiratory system include:

- > Acute upper respiratory infections—such as the common cold, acute sinusitis, tonsillitis;
- > Influenza and pneumonia;
- > Other acute lower respiratory infections—such as acute bronchitis;
- > Other diseases of upper respiratory tract—such as chronic sinusitis, nasal polyp;
- > Chronic lower respiratory diseases—such as some types of bronchitis, emphysema, asthma, some types of chronic obstructive pulmonary disease (COPD);
- > Lung diseases due to external agents—such as aspiration pneumonia; and
- > Suppurative and necrotic conditions of lower respiratory tract—such as pleural effusion, not elsewhere classified (World Health Organization, 2016).

Diseases of the respiratory system are indicated by ICD-10-AM codes J00–J99.

Deaths

In 2014, diseases of the respiratory system accounted for 9.0% of Indigenous deaths in NSW, Qld, SA, NT and WA, with chronic lower respiratory diseases (J40–J47), such as COPD, being the most common cause of respiratory death (Australian Bureau of Statistics, 2016a). The age-standardised death rate for chronic lower respiratory diseases was three times higher amongst Indigenous Australians (85.2 per 100,000 population) compared to non-Indigenous Australians (28.1 per 100,000 population) in 2014, making this the third most common cause of death for Indigenous Australians (Australian Bureau of Statistics, 2016a). Between 2008 and 2012, diseases of the respiratory system accounted for 7.6% of Indigenous deaths in NSW, Qld, SA, NT and WA (Australian Institute of Health and Welfare, 2014b). During this period, the age-standardised death rate from diseases of the respiratory system for Indigenous Australians (96.3 per 100,000 population) was 1.9 times the rate for non-Indigenous Australians (49.8 per 100,000 population) in NSW, Qld, SA, NT and WA (Australian Institute of Health and Welfare, 2014b).

Hospitalisations

In 2014–2015, Indigenous Australians (41.1 per 1,000 population) were 2.4 times as likely as non-Indigenous Australians (17.3 per 1,000 population) to be hospitalised for diseases of the respiratory system (Australian Institute of Health and Welfare, 2016a).

In the 2012–2013 AATSIHS, around one-third (31%) of Indigenous Australians reported some form of long-term respiratory disease (Australian Institute of Health and Welfare, 2015d). Age-standardised data demonstrated that Indigenous Australians were 1.2 times as likely as non-Indigenous Australians to report having a long-term respiratory condition (Australian Institute of Health and Welfare, 2015d).

Children

Between 2008 and 2012, diseases of the respiratory system accounted for 39.2% of Indigenous deaths of children aged 0–4 years in NSW, Qld, SA, NT and WA (Australian Institute of Health and Welfare, 2015a). During this period, the age-standardised death rate from diseases of the respiratory system for Indigenous Australians aged 0–4 years (7.6 per 100,000 population) was 3.4 times the rate for non-Indigenous Australians (2.3 per 100,000 population) in NSW, Qld, SA, NT and WA (Australian Institute of Health and Welfare, 2014b). The hospitalisation rates for respiratory diseases among Indigenous children aged 0–4 years were almost twice the rate for other Australian children (Australian Institute of Health and Welfare, 2015a).

Age-specific prevalence data around long-term conditions for Indigenous Australians demonstrated that respiratory diseases were the leading long-term condition affecting 20.9% of 0–14 year-old Indigenous children in 2012–2013 (Australian Institute of Health and Welfare, 2015d).

A study of 320 Aboriginal children, who presented to primary health care clinics between January 2001 and December 2006, demonstrated that the median number of presentations per child in the first year of life was 21 (Kearns, Clucas, Connors, Currie, Carapetis, & Andrews, 2013). Although there were multiple reasons for presentations, upper respiratory tract infections were the most common reason for a clinic presentation, accounting for a median of six visits in the first year of life (Kearns et al., 2013). Similarly, a study of 174 remote-dwelling Aboriginal children by Clucas, Carville, Connors, Currie, Carapetis, and Andrews (2008) found that the median number of times a child presented to a health clinic in their first year of life, between 2001 and 2005, was 23 times. Respiratory infections were the most common reason for attending a clinic and accounted for around one-third (32%) of all clinic presentations (Clucas et al., 2008).

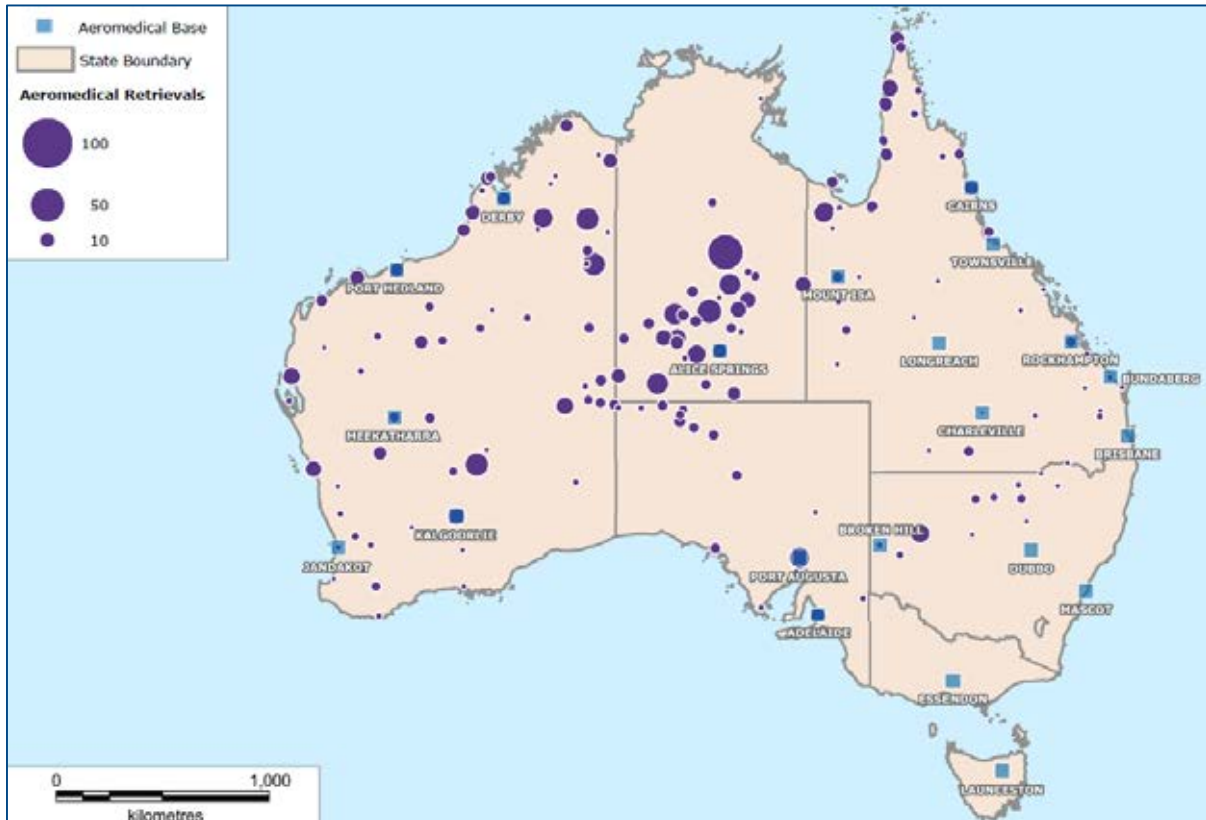
RFDS data

Diseases of the respiratory system accounted for 12.8% of Indigenous aeromedical retrievals with males and females equally represented (Figure 5.20). Around two-thirds of aeromedical retrievals for diseases of the respiratory system were from WA (37.1%) and the NT (32.0%). The demand for aeromedical retrievals by Indigenous Australians for diseases of the respiratory system for the 12 months from January to December 2015 (Figure 5.21) demonstrates the main areas within each state and territory where aeromedical retrievals took place.

Figure 5.20. Demographic data for aeromedical retrievals of Indigenous patients with diseases of the respiratory system, July 2013–December 2015

Percentage of total patient retrievals	12.8%
<hr/>	
Number of patients retrieved	
Total	2,248
Per week	17.3
<hr/>	
Gender of patients retrieved	
Male	50.3%
Female	49.7%
<hr/>	
State of retrieval	
NSW	4.6%
Qld	16.6%
SA	9.7%
NT	32.0%
WA	37.1%

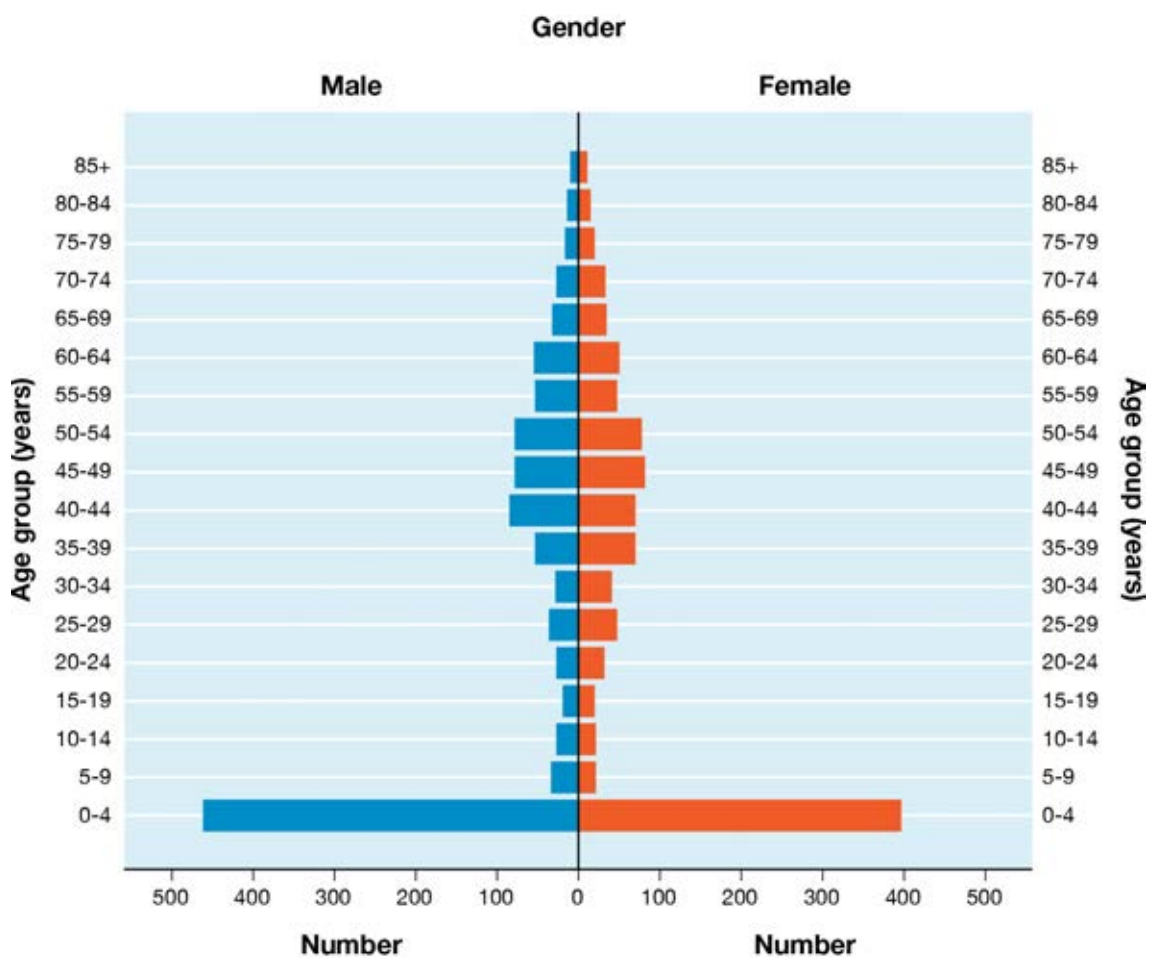
Figure 5.21. Demand for aeromedical retrievals by Indigenous Australians for diseases of the respiratory system, January to December, 2015



Source: Developed by ORH (2016).

Indigenous Australians aged 0–4 years accounted for 39.2% of Indigenous aeromedical retrievals for diseases of the respiratory system (Figure 5.22). Children under one year of age were overrepresented and comprised 22.6% of Indigenous aeromedical retrievals for diseases of respiratory system.

Figure 5.22. Gender of Indigenous patients by age who underwent an aeromedical retrieval for diseases of the respiratory system, July 2013–December 2015



Diseases of the respiratory system—target groups for interventions

- > Indigenous Australians aged 0–4 years, especially those under one year of age.
- > Parents/carers of Indigenous children aged under 5 years.
- > Health professionals treating Indigenous children for diseases of the respiratory system.

5.5.11 ICD-10-AM Chapter 11—Diseases of the digestive system

The digestive system, also known as the alimentary canal, contains a number of major organs, including the oral cavity (mouth), pharynx (throat), oesophagus, stomach, small intestine, large intestine, rectum and anus (Bowie & Schaffer, 2016). In the digestive process, food is taken in via the mouth, broken down for digestion of food and nutrients, and concludes with the elimination of waste (Bowie & Schaffer, 2016).

Examples of diseases of the digestive system include:

- > Diseases of oral cavity, salivary glands and jaws—such as embedded or impacted teeth, dental caries;
- > Diseases of oesophagus, stomach and duodenum—such as gastro-oesophageal reflux disease, gastric or duodenal ulcer;
- > Diseases of appendix—such as acute appendicitis;
- > Hernia;
- > Non-infective enteritis and colitis—such as Crohn disease, ulcerative colitis;
- > Other diseases of intestines—such as irritable bowel syndrome;
- > Diseases of peritoneum—such as peritonitis;
- > Diseases of liver—such as alcoholic liver disease, fibrosis and cirrhosis of liver; and
- > Disorders of gallbladder, biliary tract and pancreas—such as cholangitis, acute pancreatitis (World Health Organization, 2016).

Diseases of the digestive system are indicated by ICD-10-AM codes K00–K93.

Deaths

Between 2008 and 2012, diseases of the digestive system accounted for 5.6% of Indigenous deaths in NSW, Qld, SA, NT and WA (Australian Institute of Health and Welfare, 2014b). During this period, the age-standardised death rate from diseases of the digestive system for Indigenous Australians (47.4 per 100,000 population) was 2.3 times the rate for non-Indigenous Australians (20.5 per 100,000 population) in NSW, Qld, SA, NT and WA (Australian Institute of Health and Welfare, 2014b).

In 2014, cirrhosis and diseases of the liver (K70–K76) accounted for 3.4% of Indigenous deaths, with almost twice as many Indigenous males dying from this disease compared with Indigenous females (Australian Bureau of Statistics, 2016a). Overall, Indigenous Australians (22.8 per 100,000 population) were 3.7 times as likely as non-Indigenous Australians (6.1 per 100,000 population) to die from cirrhosis and diseases of the liver (Australian Bureau of Statistics, 2016a).

Hospitalisations

In 2014–2015, Indigenous Australians (39.2 per 1,000 population) were as likely as non-Indigenous Australians (40.9 per 1,000 population) to be hospitalised for diseases of digestive system (Australian Institute of Health and Welfare, 2016a).

Children

Between 2008 and 2012, diseases of the digestive system accounted for around 1% of deaths amongst Indigenous young people aged 5–14 years in NSW, Qld, SA, NT and WA (Australian Institute of Health and Welfare, 2015d).

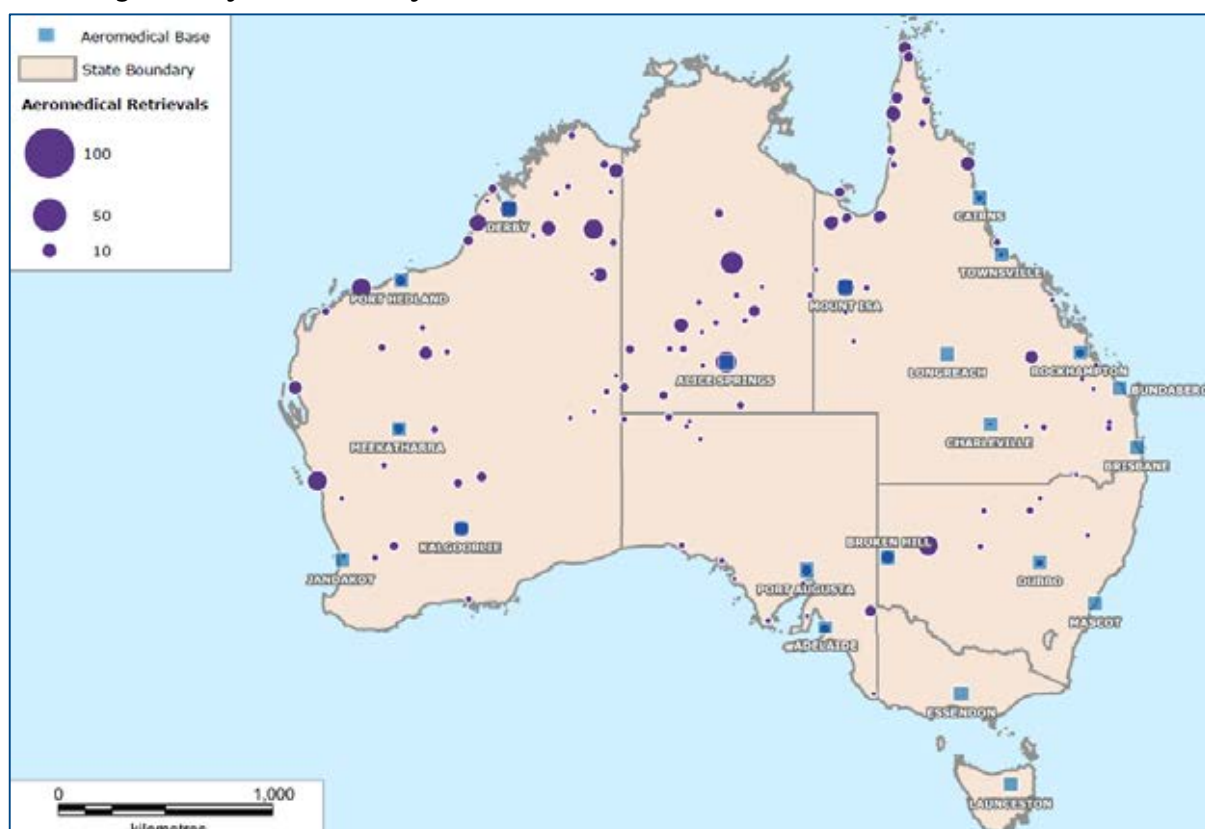
RFDS data

Diseases of the digestive system accounted for 7.8% of Indigenous aeromedical retrievals by the RFDS between July 2013 and December 2015 (Figure 5.23). Indigenous females were 1.2 times as likely as males to undergo an aeromedical retrieval for diseases of the digestive system. Retrieved patients ranged in age from under one year of age to 88 years. Indigenous Australians with diseases of the digestive system were most likely to come from WA (42.8%). The demand for aeromedical retrievals by Indigenous Australians for diseases of the digestive system for the 12 months from January to December 2015 (Figure 5.24) demonstrates the main areas within each state and territory where aeromedical retrievals took place.

Figure 5.23. Demographic data for aeromedical retrievals of Indigenous patients with diseases of the digestive system, July 2013–December 2015

Percentage of total patient retrievals	7.8%
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Number of patients retrieved	
Total	1,374
Per week	10.6
<hr/>	
Gender of patients retrieved	
Male	46.0%
Female	54.0%
<hr/>	
State of retrieval	
NSW	5.2%
Qld	25.3%
SA	6.8%
NT	19.8%
WA	42.8%
Vic	0.1%

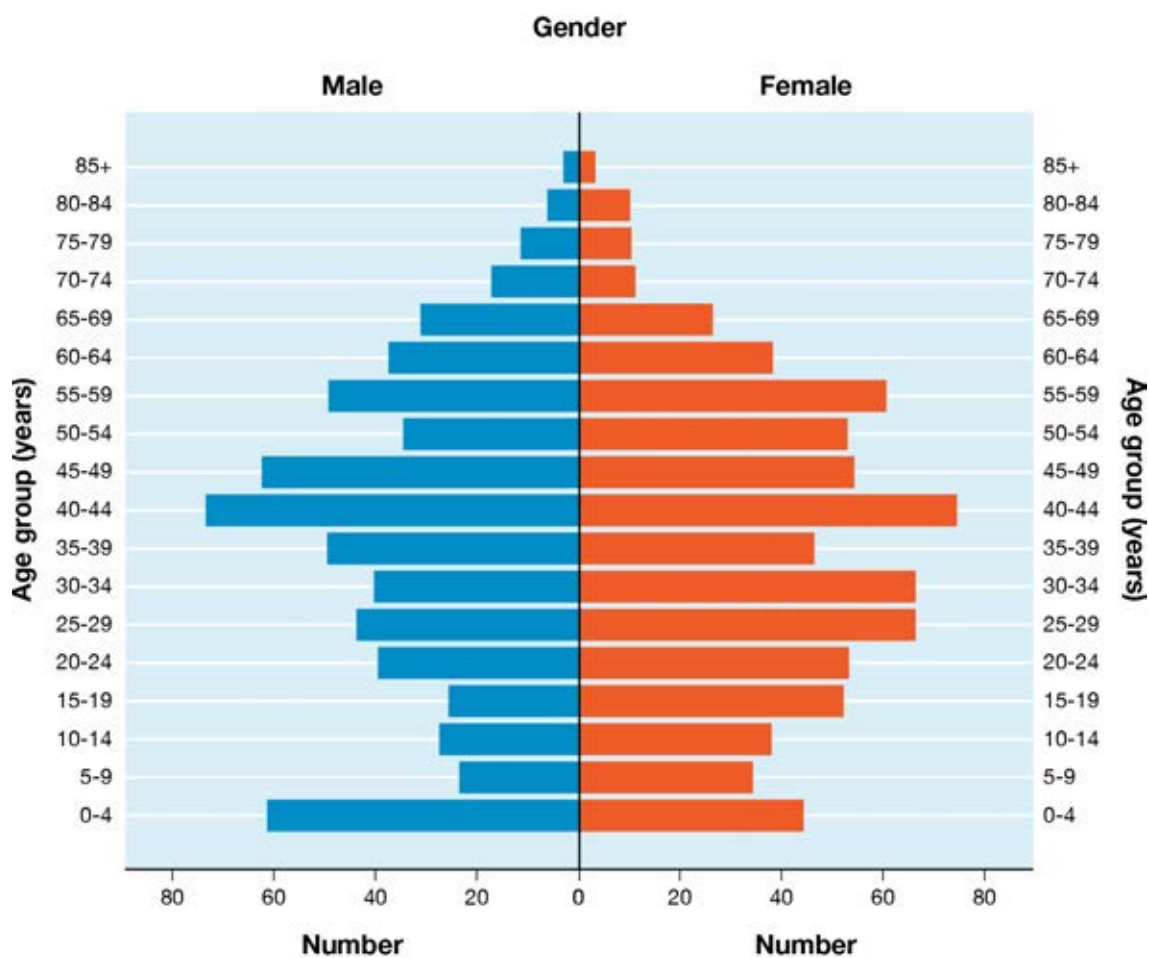
Figure 5.24. Demand for aeromedical retrievals by Indigenous Australians for diseases of the digestive system, January to December, 2015



Source: Developed by ORH (2016).

Indigenous Australians aged 40–44 years (10.7%) were the group most likely to require an aeromedical retrieval for diseases of the digestive system, closely followed by 45–49-year-olds (8.5%) (Figure 5.25).

Figure 5.25. Gender of Indigenous patients by age who underwent an aeromedical retrieval for diseases of the digestive system, July 2013–December 2015



Diseases of the digestive system—target groups for interventions

- > Indigenous Australians aged 0–4 years, especially those under one year of age.
- > Parents/carers of Indigenous children aged under 5 years.
- > Indigenous Australians aged 40–44 years.

5.5.12 ICD-10-AM Chapter 12—Diseases of the skin and subcutaneous tissue

The skin, also known as the integumentary system, provides a shield for the body and is the largest body system (Bowie & Schaffer, 2011). The skin protects deeper tissues, assists in regulating body temperature, assists in blocking bacteria and other foreign materials from entering the body, protects the body from ultraviolet radiation from the sun and temporarily stores fat, glucose, water and salts that are absorbed into the blood and used by different organs in the body (Bowie & Schaffer, 2011).

Examples of diseases of the skin and subcutaneous tissue include:

- > Infections of the skin and subcutaneous tissue—such as impetigo, cellulitis, boils;
- > Bullous disorders—such as pemphigus (a group of blistering autoimmune diseases);
- > Dermatitis and eczema;
- > Papulosquamous disorders—such as psoriasis;
- > Urticaria (hives) and erythema;
- > Radiation-related disorders of the skin and subcutaneous tissue—such as sunburn; and
- > Disorders of skin appendages—such as nail disorders, hair loss (World Health Organization, 2016).

Diseases of the skin and subcutaneous tissue are indicated by ICD-10-AM codes L00–L99.

Skin infections are prevalent among Indigenous Australians. Scabies, in particular, is common in many remote Aboriginal communities, and is responsible for a large proportion of streptococcal skin infections (Northern Territory Department of Health, 2015).

Hospitalisations

In 2014–2015, Indigenous Australians (14.3 per 1,000 population) were 2.2 times as likely as non-Indigenous Australians (6.5 per 1,000 population) to be hospitalised for diseases of the skin and subcutaneous tissue (Australian Institute of Health and Welfare, 2016a).

Age-standardised proportion data from the AATSIHS demonstrated that Indigenous Australians (3.3%) were 0.8 times as likely as non-Indigenous Australians (4.3%) to have a long-term disorder of the skin and subcutaneous tissue (Australian Bureau of Statistics, 2014b).

Children

Data from the NT demonstrated that scabies and related skin sores commonly affect Indigenous children—seven out of every 10 children in the NT will get scabies before one year of age (Northern Territory Department of Health, 2015). A severe form of scabies, called crusted scabies, has a significant impact on individuals with the disease and is associated with lower life expectancy, frequent hospitalisations and development of secondary bacterial complications (Northern Territory Department of Health, 2015).

AATSIHS data from 2012–2013 demonstrated that Indigenous Australian children aged 0–14 years (3.3%) were 0.8 times as likely as non-Indigenous Australians aged 0–14 years (4.2%) to have a long-term disorder of the skin and subcutaneous tissue (Australian Bureau of Statistics, 2014b). Similarly, Indigenous young people aged 15–24 years (2.0%) were 0.5 times as likely as non-Indigenous young people aged 15–24 years (4.3%) to have a long-term disorder of the skin (Australian Bureau of Statistics, 2014b). However, disorders of the skin and subcutaneous tissue were the fourth ranked long-term condition impacting Indigenous young people aged 0–14 years in 2012–2013, after respiratory diseases, eye diseases and vision problems and ear diseases and hearing problems (Australian Institute of Health and Welfare, 2015d).

RFDS data

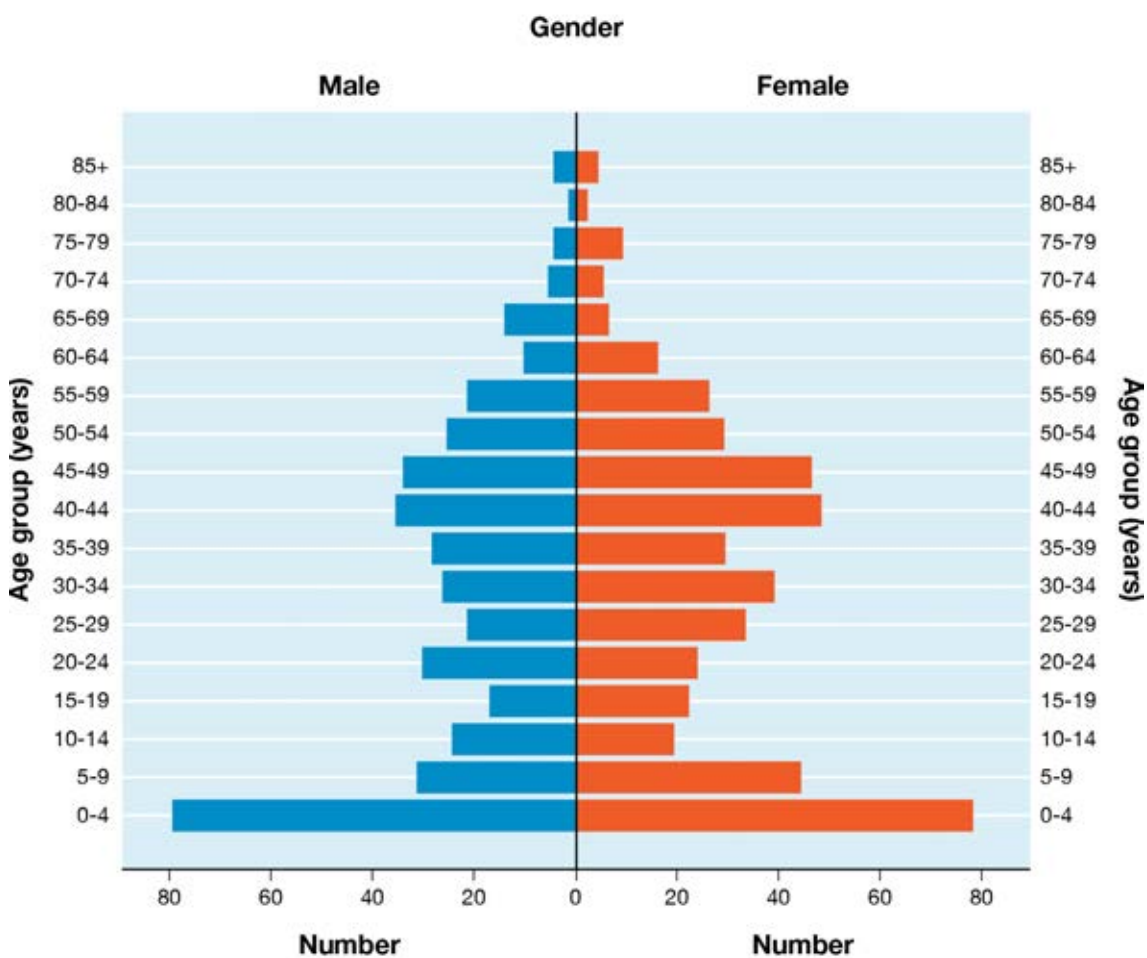
Diseases of the skin and subcutaneous tissue accounted for 5.1% of Indigenous aeromedical retrievals by the RFDS between July 2013 and December 2015 (Figure 5.26). Indigenous females (54.1%) were 1.2 times as likely as Indigenous males (45.9%) to undergo an aeromedical retrieval for diseases of the skin and subcutaneous tissue. Retrieved patients ranged in age from under one year of age to 96 years. Indigenous Australians with diseases of the skin and subcutaneous tissue were most likely to come from the NT (45.5%).

Figure 5.26. Demographic data for aeromedical retrievals of Indigenous patients with diseases of the skin and subcutaneous tissue, July 2013–December 2015

Percentage of total patient retrievals	5.1%
<hr/>	
Number of patients retrieved	
Total	895
Per week	6.9
<hr/>	
Gender of patients retrieved	
Male	45.9%
Female	54.1%
<hr/>	
State of retrieval	
NSW	1.2%
Qld	20.1%
SA	10.1%
NT	45.5%
WA	23.1%

Indigenous Australians aged 0–4 years (17.7%) were the group most likely to require an aeromedical retrieval for diseases of the skin and subcutaneous tissue (Figure 5.27).

Figure 5.27. Gender of Indigenous patients by age who underwent an aeromedical retrieval for diseases of the skin and subcutaneous tissue, July 2013–December 2015



Diseases of the skin and subcutaneous tissue—target groups for interventions

- > Indigenous children aged 0–4 years.
- > Parents/carers of Indigenous children under 5 years of age.
- > Indigenous Australians from the NT.

5.5.13 ICD-10-AM Chapter 13—Diseases of the musculoskeletal system and connective tissue

The musculoskeletal system comprises muscles, bones, ligaments, tendons, cartilage and the joints they form (Lovaasen, 2016). The musculoskeletal system provides a framework for the body and protects the internal organs (Lovaasen, 2016). Pain and inflammation may result from many of the diseases of the musculoskeletal system (Lovaasen, 2016).

Connective tissue disorders most often involve collagen, which is the main component of connective tissue (Lovaasen, 2016). Collagen diseases occur when the immune system malfunctions—the immune system identifies the body’s connective tissue as foreign, and attacks it (Lovaasen, 2016).

Examples of diseases of the musculoskeletal system and connective tissue include:

- > Arthropathies—such as primary generalised osteoarthritis, rheumatoid arthritis, gout;
- > Systemic connective tissue disorders—such as lupus;
- > Dorsopathies—such as kyphosis, lordosis, spondylolysis, scoliosis;
- > Soft tissue disorders—such as myositis (muscle inflammation); and
- > Osteopathies and chondropathies—such as osteoporosis and other disorders of bone density and structure (World Health Organization, 2016).

Diseases of the musculoskeletal system and connective tissue are indicated by ICD-10-AM codes M00–M99.

Deaths

In 2008–2012, 68 Indigenous Australians died as a result of diseases of the musculoskeletal system and connective tissue, which represented 0.6% of Indigenous deaths (2.3 per 100,000 population) in NSW, Qld, WA, SA and the NT (Australian Institute of Health and Welfare, 2015d).

Hospitalisations

In 2014–2015, Indigenous Australians (17.1 per 1,000 population) were 0.8 times as likely as non-Indigenous Australians (21.1 per 1,000 population) to be hospitalised for diseases of the musculoskeletal system and connective tissue in NSW, Qld, WA, SA and the NT (Australian Institute of Health and Welfare, 2016a).

In 2012–2013, 7,201 Indigenous Australians in NSW, Qld, WA, SA and the NT were hospitalised for diseases of the musculoskeletal system and connective tissue, which represented 1.9% of hospitalisations of Indigenous Australians (Australian Institute of Health and Welfare, 2015d). Indigenous Australians (10 per 1,000 population) were 0.8 times as likely as non-Indigenous Australians to be hospitalised for diseases of the musculoskeletal system and connective tissue (Australian Institute of Health and Welfare, 2015d). Indigenous hospitalisations for diseases of the musculoskeletal system and connective tissue increased with age from 2 per 1,000 population for those aged 0–4 years to 38 per 1,000 population for those aged 65 and over, and rose by 54% during 2004–2005 and 2012–2013 compared with a 13% increase for non-Indigenous Australians (Australian Institute of Health and Welfare, 2015d).

In 2012–2013, 20% (127,100) of Indigenous people reported having a long-term health condition caused by musculoskeletal diseases, which was the third most common self-reported long-term condition after eye diseases and vision problems (33%) and respiratory diseases (31%) (Australian Institute of Health and Welfare, 2015d). Specifically, the proportion of Indigenous people reporting musculoskeletal diseases increased with age from 1.1% among those aged 0–14 to 60% among those aged 55 and over (Australian Institute of Health and Welfare, 2015d). The prevalence of long-term musculoskeletal diseases for Indigenous Australians was 1.1 times the rate for non-Indigenous Australians (Australian Institute of Health and Welfare, 2015d).

Children

There is a lack of specific data regarding Indigenous child deaths and hospitalisations from diseases of the musculoskeletal system and connective tissue. However, AIHW data indicated that in 2012–2013, around 1.1% of Indigenous children aged 0–14 had a musculoskeletal disease (Australian Institute of Health and Welfare, 2015d).

RFDS data

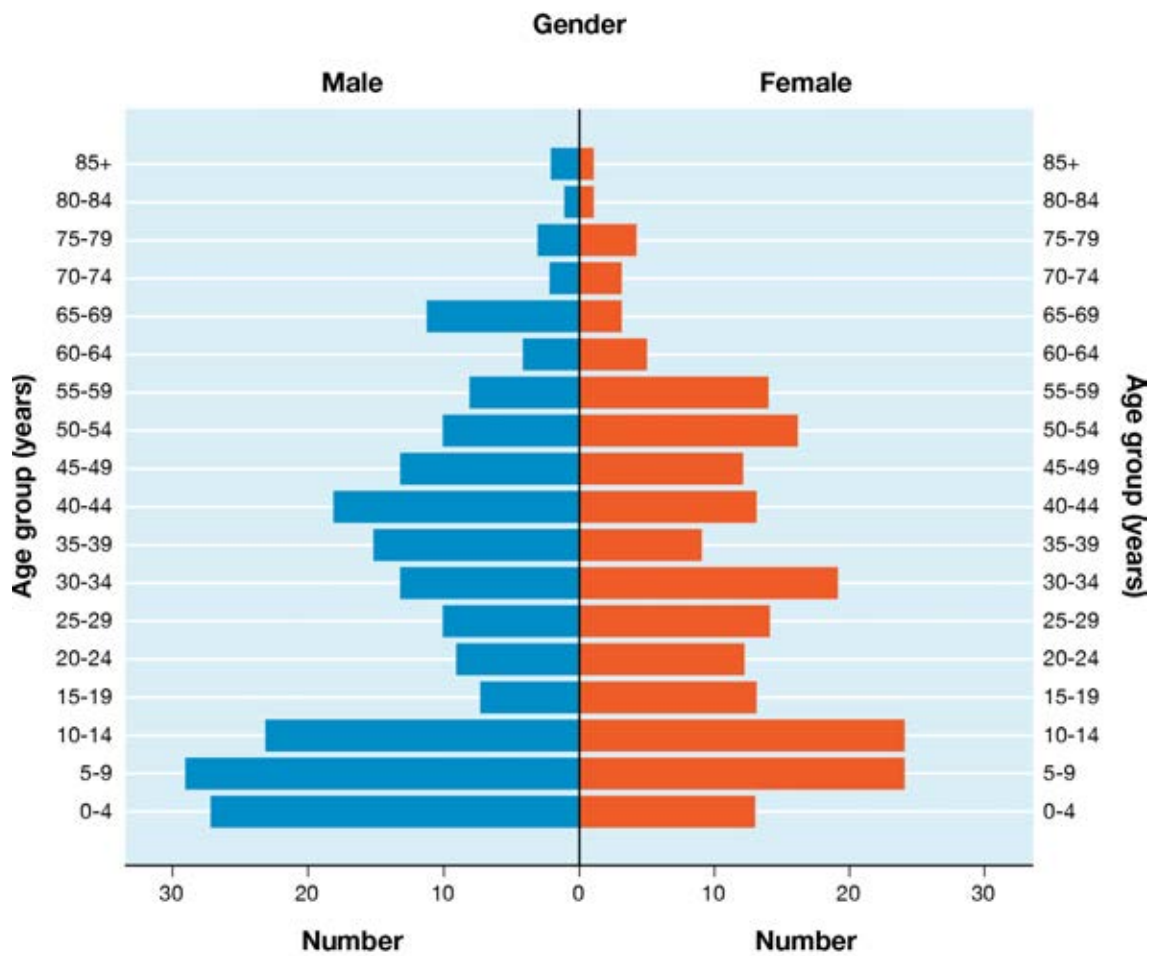
Diseases of the musculoskeletal system and connective tissue accounted for 2.3% of Indigenous aeromedical retrievals by the RFDS between July 2013 and December 2015, with approximately equal proportions of males and females requiring an aeromedical retrieval (Figure 5.28). Retrieved patients ranged in age from under one year of age to 90 years. Indigenous Australians with diseases of the musculoskeletal system were most likely to come from WA (38.1%).

Figure 5.28. Demographic data for aeromedical retrievals of Indigenous patients with diseases of the musculoskeletal system and connective tissue, July 2013–December 2015

Percentage of total patient retrievals	2.3%
<hr/>	
Number of patients retrieved	
Total	407
Per week	3.1
<hr/>	
Gender of patients retrieved	
Male	50.6%
Female	49.4%
<hr/>	
State of retrieval	
NSW	1.7%
Qld	26.5%
SA	8.4%
NT	25.3%
WA	38.1%

Indigenous Australians of all ages experienced diseases of the musculoskeletal system and connective tissue, however Indigenous children aged 0–14 years (34.6%) were more likely than Indigenous Australians from other age groups to require an aeromedical retrieval for diseases of the musculoskeletal system and connective tissue (Figure 5.29).

Figure 5.29. Gender of Indigenous patients by age who underwent an aeromedical retrieval for diseases of the musculoskeletal system and connective tissue, July 2013–December 2015



Diseases of the musculoskeletal system and connective tissue—target groups for interventions

- > Indigenous children aged 0–14 years.
- > Parents/carers of Indigenous children under 15 years of age.

5.5.14 ICD-10-AM Chapter 14—Diseases of the genitourinary system

The kidneys, ureters, urinary bladder, and urethra form the urinary tract (Lovaasen, 2016). Diseases of the genitourinary system include diseases associated with the urinary tract, diseases of the male and female genital tracts and disorders of the breasts (Lovaasen, 2016).

Impaired kidney function can have a deleterious impact on the rest of the body, “causing damage to other organs and bodily processes and, as a result, a number of complications and co-morbidities often occur, including: heart disease; infections; as well as problems with bones and muscles” (Stumpers & Thomson, 2013).

Examples of diseases of the genitourinary system include:

- > Glomerular diseases—such as acute nephritic syndrome causing swelling and inflammation in the kidneys;
- > Renal tubulo-interstitial diseases;
- > Renal failure—also known as kidney failure;
- > Urolithiasis—such as kidney stones;
- > Other diseases of urinary system;
- > Diseases of male genital organs—such as enlarged prostate;
- > Disorders of breast—such as a breast lump or cyst;
- > Inflammatory diseases of female pelvic organs—such as salpingitis (inflamed fallopian tubes); and
- > Non-inflammatory disorders of female genital tract—such as endometritis (World Health Organization, 2016).

Diseases of the genitourinary system are indicated by ICD-10-AM codes N00–N99.

Deaths

Kidney diseases, which are significant within Indigenous communities, accounted for 2.5% of Indigenous deaths between 2008 and 2012 in NSW, Qld, SA, NT and WA (Australian Institute of Health and Welfare, 2014b). During this period, Indigenous Australians (29.6 per 100,000 population) were 2.6 times as likely as non-Indigenous Australians (11.2 per 100,000 population) to die from kidney disease in NSW, Qld, SA, NT and WA (Australian Institute of Health and Welfare, 2014b).

Hospitalisations²⁵

In 2014–2015, Indigenous Australians (17.7 per 1,000 population) were 0.8 times as likely as non-Indigenous Australians (21.1 per 1,000 population) to be hospitalised for diseases of the genitourinary system (Australian Institute of Health and Welfare, 2016a).

Children

Few Indigenous children die from diseases of the genitourinary system. In 2008–2012 only four Indigenous children between the ages of 0 and 14 years died from diseases of the genitourinary system in NSW, Qld, SA, and NT (Australian Institute of Health and Welfare, 2015a).

RFDS data

Diseases of the genitourinary system accounted for 5.5% of Indigenous aeromedical retrievals by the RFDS between July 2013 and December 2015 (Figure 5.30). Indigenous females were 1.6 times as likely as Indigenous males to require an aeromedical retrieval for diseases of the genitourinary system. Retrieved patients ranged in age from under one year of age to 91 years. Indigenous Australians with diseases of the genitourinary system were most likely to come from WA (40.6%).

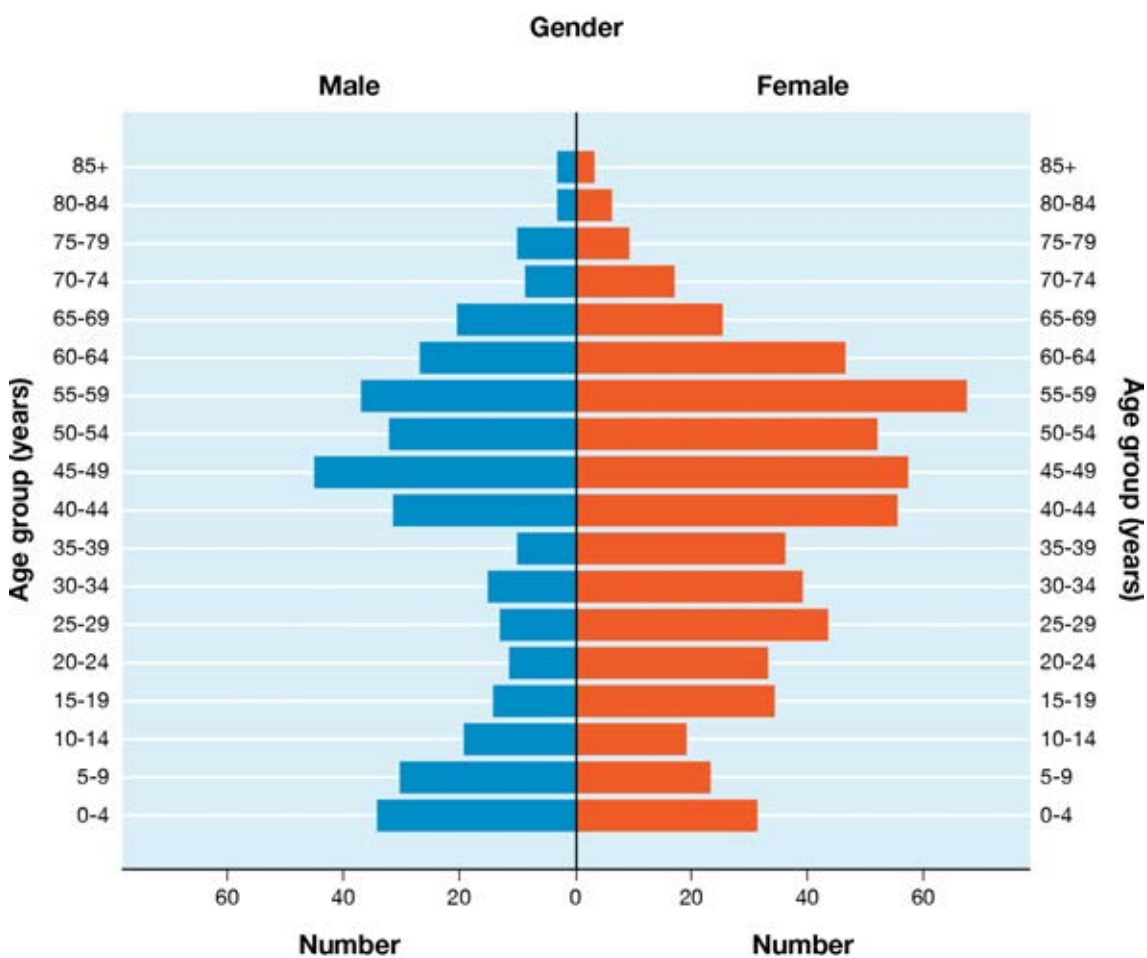
²⁵ Hospital data on ‘end stage kidney disease’ and ‘dialysis’ is included under ICD-10-AM Chapter 21—Factors influencing health status and contact with health services.

Figure 5.30. Demographic data for aeromedical retrievals of Indigenous patients with diseases of the genitourinary system July 2013–December 2015

Percentage of total patient retrievals	5.5%
<hr/>	
Number of patients retrieved	
Total	963
Per week	7.4
<hr/>	
Gender of patients retrieved	
Male	37.8%
Female	62.2%
<hr/>	
State of retrieval	
NSW	1.8%
Qld	21.9%
SA	8.4%
NT	27.2%
WA	40.6%
Vic	0.1%

Indigenous Australians aged 45–59 years (30.2%) were more likely than Indigenous Australians from other age groups to require an aeromedical retrieval for diseases of the genitourinary system (Figure 5.31).

Figure 5.31. Gender of Indigenous patients by age who underwent an aeromedical retrieval for diseases of the genitourinary system, July 2013–December 2015



Diseases of the genitourinary system—target groups for interventions

- > Indigenous females.
- > Indigenous Australians aged 45–59 years.

5.5.15 ICD-10-AM Chapter 15—Pregnancy, childbirth and the puerperium

This chapter describes conditions related to, or aggravated by, pregnancy, childbirth or the puerperium that impact on the mother (ICD10Data.com, Undated). Codes from this chapter are for use only on maternal records (ICD10Data.com, Undated).

Examples of pregnancy, childbirth and the puerperium include:

- > Pregnancy with abortive outcome—such as ectopic pregnancy;
- > Oedema, proteinuria and hypertensive disorders in pregnancy, childbirth and the puerperium—such as pre-eclampsia or eclampsia;
- > Other maternal disorders predominantly related to pregnancy—such as excessive vomiting related to pregnancy;
- > Maternal care related to the fetus and amniotic cavity and possible delivery problems—such as multiple gestation e.g. twin pregnancy;
- > Complications of labour and delivery—such as preterm labour;
- > Delivery—such as forceps delivery, caesarean; and
- > Complications predominantly related to the puerperium—such as infection of obstetric surgical wound (World Health Organization, 2016).

Pregnancy, childbirth and the puerperium are indicated by ICD-10-AM codes O00–O99.

Deaths

Between 2008 and 2012, 12 Indigenous females died during their pregnancy, labour or in the postnatal period (Humphrey, Bonello, Chughtai, Macaldowie, Harris, & Chambers, 2015). The maternal mortality ratio for Indigenous women (13.8 deaths per 100,000 women who gave birth) was 2.1 times the maternal mortality ratio for non-Indigenous women (6.6 deaths per 100,000 women who gave birth) (Humphrey et al., 2015).

Hospitalisations

In 2014–2015, Indigenous Australians (29.7 per 1,000 population) were 1.4 times as likely as non-Indigenous Australians (21.2 per 1,000 population) to be hospitalised for pregnancy, childbirth and the puerperium (Australian Institute of Health and Welfare, 2016a).

RFDS data

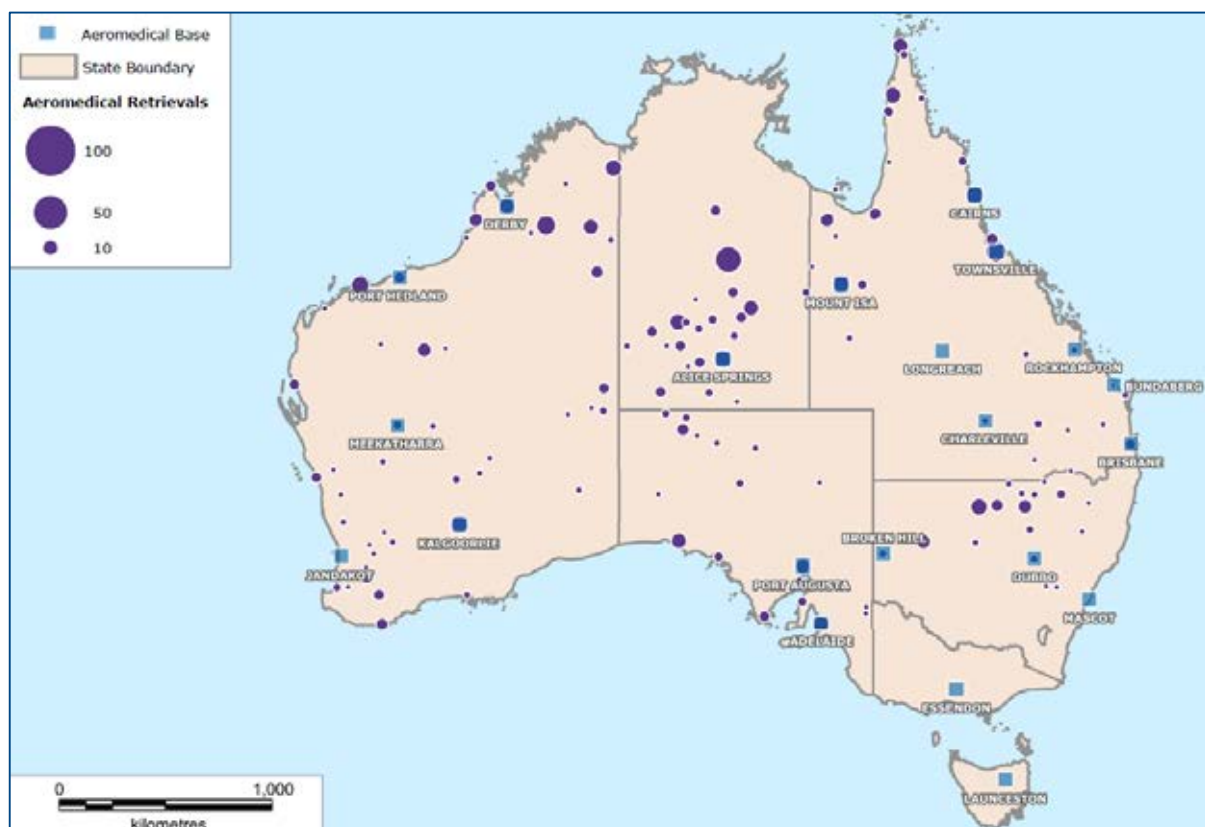
Pregnancy, childbirth and the puerperium accounted for 7.2% of Indigenous aeromedical retrievals by the RFDS between July 2013 and December 2015 (Figure 5.32). As expected, the majority of aeromedical retrievals were for Indigenous females.²⁶ Retrieved patients ranged in age from under one year of age to 68 years. Indigenous Australians with issues related to pregnancy, childbirth and the puerperium were most likely to come from WA (31.7%). The demand for aeromedical retrievals by Indigenous Australians for pregnancy, childbirth and the puerperium for the 12 months from January to December 2015 (Figure 5.33) demonstrates the main areas within each state and territory where aeromedical retrievals took place.

²⁶ Most of the Indigenous males coded as experiencing issues related pregnancy, childbirth and the puerperium were newborn infants who had certain conditions related to the perinatal period. These male infants should have been coded as experiencing certain conditions related to the perinatal period.

Figure 5.32. Demographic data for aeromedical retrievals of Indigenous patients for pregnancy, childbirth and the puerperium, July 2013–December 2015

Percentage of total patient retrievals	7.2%
Number of patients retrieved	
Total	1,269
Per week	9.8
Gender of patients retrieved	
Male	1.7%
Female	98.3%
State of retrieval	
NSW	11.2%
Qld	21.8%
SA	9.6%
NT	25.7%
WA	31.7%

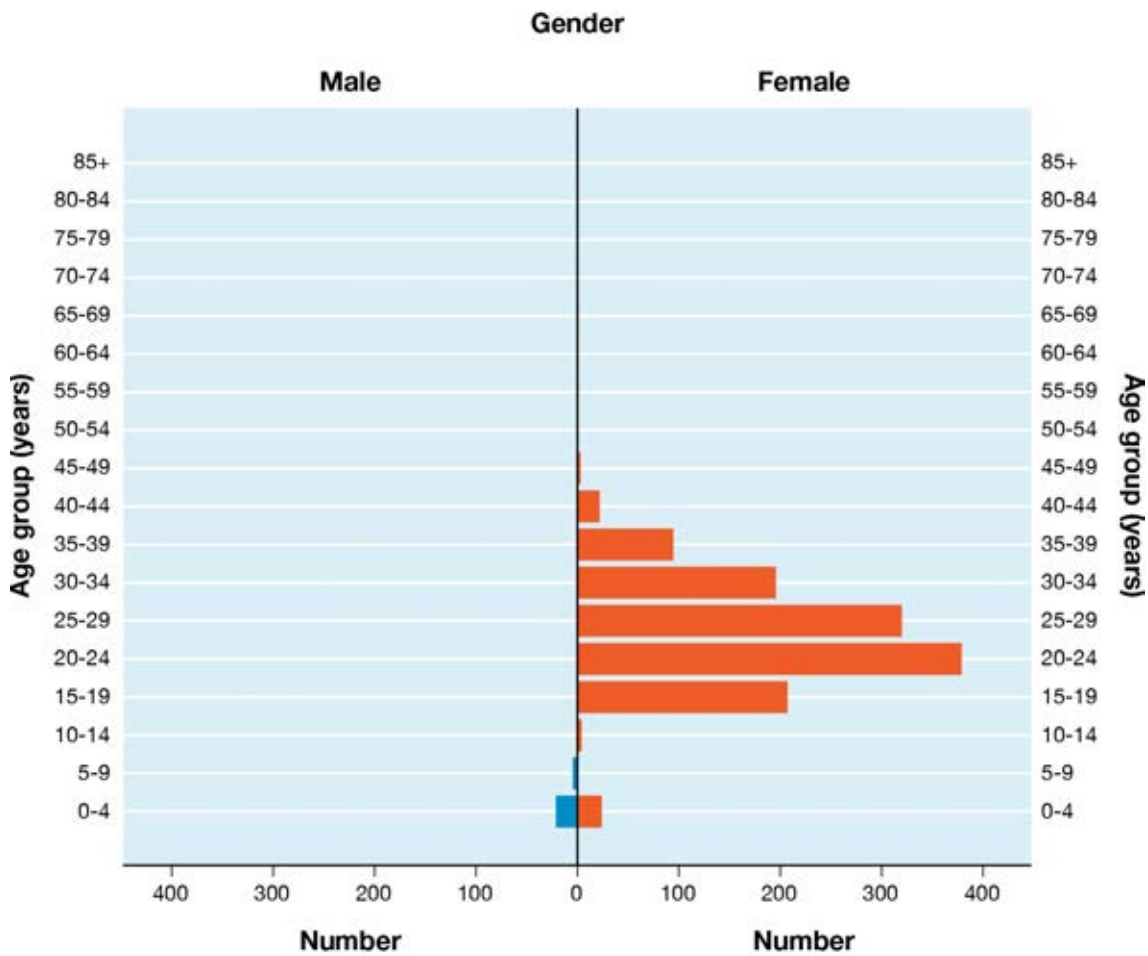
Figure 5.33. Demand for aeromedical retrievals by Indigenous Australians for pregnancy, childbirth and the puerperium, January to December, 2015



Source: Developed by ORH (2016).

Indigenous females aged 20–29 years (54.9%) were more likely than Indigenous Australians from other age groups to require an aeromedical retrieval for pregnancy, childbirth and the puerperium (Figure 5.34). Indigenous females aged 15–19 years (16.2%) also comprised a significant number of aeromedical retrievals for pregnancy, childbirth and the puerperium.

Figure 5.34. Gender of Indigenous patients by age who underwent an aeromedical retrieval for pregnancy, childbirth and the puerperium, July 2013–December 2015



Pregnancy, childbirth and the puerperium—target groups for interventions

- > Indigenous females aged 15–35 years.

5.5.16 ICD-10-AM Chapter 16—Certain conditions originating in the perinatal period

Certain conditions originating in the perinatal describes conditions that have their origin in the fetal or perinatal period (before birth through the first 28 days after birth), even if morbidity occurs later (ICD10Data.com, Undated).

Examples of certain conditions originating in the perinatal period include:

- > Fetus and under one year of age affected by maternal factors and by complications of pregnancy, labour and delivery—such as fetus and newborn affected by maternal infectious and parasitic diseases;
- > Disorders related to length of gestation and fetal growth—such as small for gestational age;
- > Birth trauma—such as fracture of skull due to birth injury;
- > Respiratory and cardiovascular disorders specific to the perinatal period—such as respiratory distress of newborn;
- > Infections specific to the perinatal period;
- > Haemorrhagic and haematological disorders of fetus and under one year of age—such as fetal blood loss;
- > Transitory endocrine and metabolic disorders specific to fetus and under one year of age—such as neonatal diabetes;
- > Digestive system disorders of fetus and under one year of age—such as perinatal intestinal perforation; and
- > Conditions involving the integument and temperature regulation of fetus and under one year of age—such as hypothermia of newborn (World Health Organization, 2016).

Certain conditions originating in the perinatal period are indicated by ICD-10-AM codes P00–P96.

Deaths

Between 2008 and 2012, certain conditions originating in the perinatal period accounted for 2.1% of Indigenous deaths in NSW, Qld, SA, NT and WA (Australian Institute of Health and Welfare, 2014b). During this period, the age-standardised death rate from conditions originating in the perinatal period for Indigenous Australians (4.3 per 100,000 population) was 1.6 times the rate for non-Indigenous Australians (2.6 per 100,000 population) in NSW, Qld, SA, NT and WA (Australian Institute of Health and Welfare, 2014b).

Hospitalisations

In 2014–2015, Indigenous Australians (3.5 per 1,000 population) were 1.3 times as likely as non-Indigenous Australians (2.8 per 1,000 population) to be hospitalised for certain conditions originating in the perinatal period (Australian Institute of Health and Welfare, 2016a).

Children

In 2010–2014, more than half (51.9%) of the 505 Indigenous deaths in infants under one year of age were attributed to certain conditions originating in the perinatal period, which is a similar proportion to that of non-Indigenous infants (50.9%, 1,801 deaths) (Australian Bureau of Statistics, 2016a). However, the infant mortality rate amongst Indigenous infants (6.2 deaths per 1,000 births) was 1.8 times the mortality rate of non-Indigenous infants (3.5 deaths per 1,000 births) (Australian Bureau of Statistics, 2016a).

Certain conditions originating in the perinatal period (39.2% of all deaths) were the leading cause of death amongst Indigenous children aged 0–4 years living in in NSW, Qld, SA, NT and WA in 2008–2012 (Australian Institute of Health and Welfare, 2015a). The mortality rate for Indigenous children (65.3 per 100,000 population) aged 0–4 years was 1.7 times the rate for non-Indigenous children (39.6 per 100,000 population) during this period (Australian Institute of Health and Welfare, 2015a).

RFDS data

Certain conditions originating in the perinatal period accounted for 1.5% of Indigenous aeromedical retrievals by the RFDS between July 2013 and December 2015 (Figure 5.35). Indigenous males were 1.1 times as likely as Indigenous females to require an aeromedical retrieval for certain conditions originating in the perinatal period. Retrieved patients ranged in age from under one year of age to 79²⁷ years of age. Indigenous Australians with certain conditions originating in the perinatal period were most likely to come from Qld (41.5%).

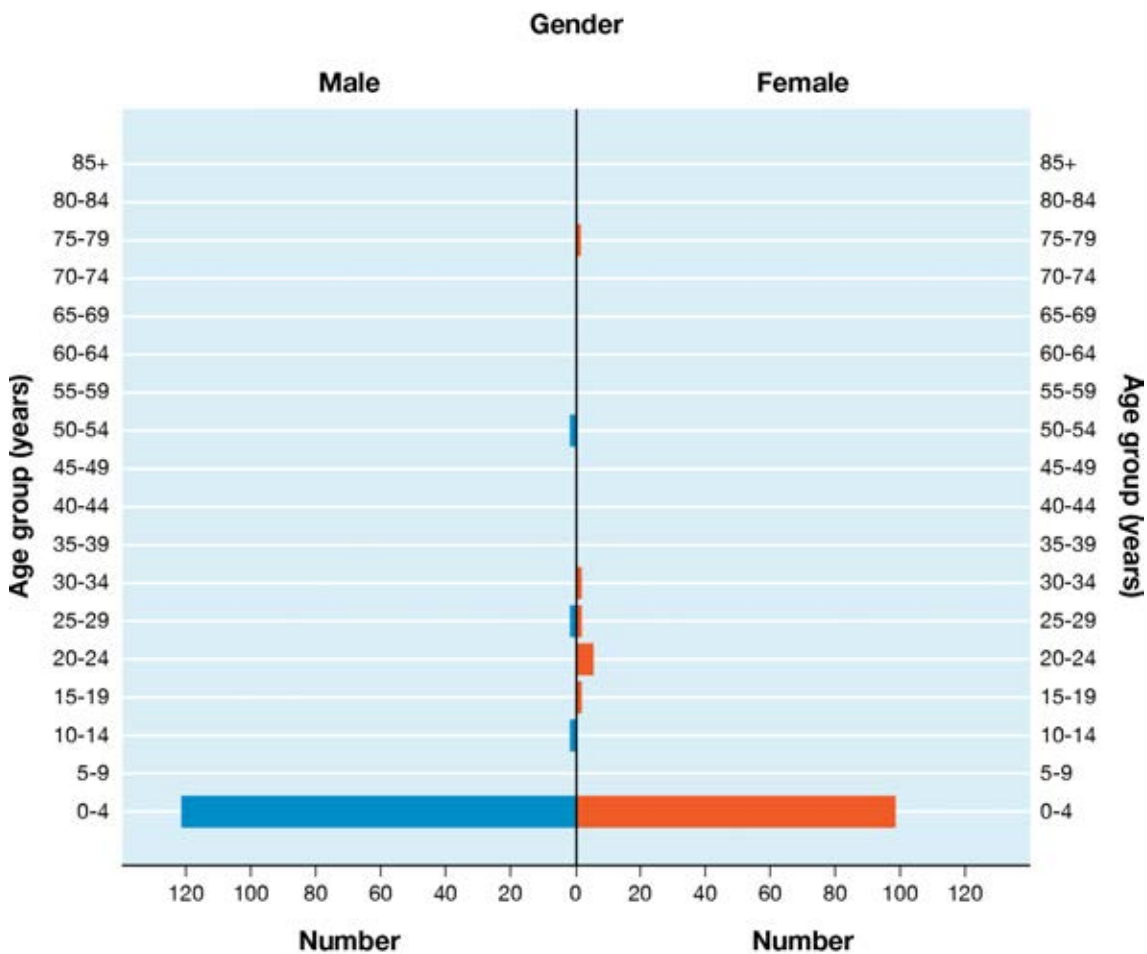
Figure 5.35. Demographic data for aeromedical retrievals of Indigenous patients with certain conditions originating in the perinatal period, July 2013–December 2015

Percentage of total patient retrievals	1.5%
<hr/>	
Number of patients retrieved	
Total	258
Per week	2.0
<hr/>	
Gender of patients retrieved	
Male	52.5%
Female	47.5%
<hr/>	
State of retrieval	
NSW	1.9%
Qld	41.5%
SA	17.1%
NT	5.4%
WA	34.1%

The majority (91.4%) of Indigenous patients retrieved for certain conditions originating in the perinatal period were aged under one year of age (Figure 5.36).

²⁷ A small number of patients appear to have been incorrectly coded as having certain conditions that arose in the perinatal period. Some adults that experienced medical conditions after the birth of a child appear to have been coded as having certain conditions that arose in the perinatal period, which is clearly incorrect.

Figure 5.36. Gender of Indigenous patients by age who underwent an aeromedical retrieval for certain conditions originating in the perinatal period, July 2013–December 2015



Certain conditions originating in the perinatal period—target groups for interventions

- > Indigenous children under one year of age.
- > Parents/carers of Indigenous children under one year of age.

5.5.17 ICD-10-AM Chapter 17—Congenital malformations, deformations and chromosomal abnormalities

Congenital malformations, deformations and chromosomal abnormalities are acquired in utero or at birth (AAPC, 2016). They may be caused by maternal complications, abnormal development, genetic abnormalities, and teratogenic agents (AAPC, 2016).

Many congenital malformations, deformations and chromosomal abnormalities are apparent soon after the birth of a child. However, some are not, and diagnosis may not occur until later (Australian Institute of Health and Welfare, 2015e). Examples that may not be diagnosed immediately after birth include some chromosomal abnormalities where symptoms are mild (Australian Institute of Health and Welfare, 2015e).

Examples of congenital malformations, deformations and chromosomal abnormalities include:

- > Congenital malformations of the nervous system—such as microcephaly (abnormal smallness of the head), neural tube defects e.g. spina bifida;
- > Congenital malformations of the eye, ear, face and neck; the circulatory system; the respiratory system;
- > Cleft lip and cleft palate;
- > Other congenital malformations of the digestive system—such as tongue tie;
- > Congenital malformations of: genital organs; the urinary system; the musculoskeletal system;
- > Other congenital malformations—such as Down syndrome; and
- > Chromosomal abnormalities, not elsewhere classified (World Health Organization, 2016).

Congenital malformations, deformations and chromosomal abnormalities are indicated by ICD-10-AM codes Q00–Q96.

Deaths

In 2014, Indigenous infants (0.7 per 1,000 live births) were 0.8 times as likely as non-Indigenous infants in NSW, Qld, WA, SA and NT (0.9 per 1,000 live births) to die from congenital malformations, deformations and chromosomal abnormalities (Australian Bureau of Statistics, 2016a). During the same period, Indigenous children aged 1–4 years (1.2 per 100,000 population) were 1.4 times as likely as non-Indigenous children aged 1–4 years (0.8 per 100,000 population) to die from congenital malformations, deformations and chromosomal abnormalities (Australian Bureau of Statistics, 2016a).

In 2013, the age-standardised death rate from congenital malformations, deformations and chromosomal abnormalities for Indigenous Australians (4.7 per 100,000 population) was 1.7 times the rate for non-Indigenous Australians (2.4 per 100,000 population) in NSW, Qld, SA, NT and WA (Australian Bureau of Statistics, 2015).

In 2008–2012, 15% of Indigenous infant deaths and 26% of non-Indigenous infant deaths in NSW, Qld, WA, SA and NT were the result of congenital malformations, deformations and chromosomal abnormalities (Australian Institute of Health and Welfare, 2015a). Congenital malformations, deformations and chromosomal abnormalities were the third leading cause of death amongst Indigenous infants during this period (Australian Institute of Health and Welfare, 2015a). Indigenous Australian infants (0.9 per 1,000 live births) were equally as likely as non-Indigenous Australians (1.0 per 1,000 live births) to die from congenital malformations, deformations and chromosomal abnormalities during this period (Australian Institute of Health and Welfare, 2015a).

Congenital malformations, deformations and chromosomal abnormalities were responsible for 6% of deaths of Indigenous children, and 10% of the deaths of non-Indigenous children, aged 1–4 years in 2008–2012 in NSW, Qld, WA, SA and the NT (Australian Institute of Health and Welfare, 2015a). Indigenous Australian children aged 1–4 years (2.4 per 100,000 population) were 1.3 times as likely as non-Indigenous children aged 1–4 years (1.9 per 100,000 population) to die from congenital malformations, deformations and chromosomal abnormalities during this period (Australian Institute of Health and Welfare, 2015a).

Hospitalisations

In 2014–2015, Indigenous Australians (1.4 per 1,000 population) were 0.8 times as likely as non-Indigenous Australians (1.7 per 1,000 population) to be hospitalised for congenital malformations, deformations and chromosomal abnormalities (Australian Institute of Health and Welfare, 2016a).

RFDS data²⁸

Congenital malformations, deformations and chromosomal abnormalities accounted for 0.2% of Indigenous aeromedical retrievals by the RFDS between July 2013 and December 2015 (Figure 5.37). Indigenous males were 1.4 times as likely as Indigenous females to require an aeromedical retrieval for congenital malformations, deformations and chromosomal abnormalities. Retrieved patients ranged in age from under one year of age to 11 years. Indigenous Australians from Qld were more likely (38.2%) than Indigenous Australians from other Australian states to require an aeromedical retrieval for congenital malformations, deformations and chromosomal abnormalities.

Figure 5.37. Demographic data for aeromedical retrievals of Indigenous patients with congenital malformations, deformations and chromosomal abnormalities, July 2013–December 2015

Percentage of total patient retrievals	0.2%
<hr/>	
Number of patients retrieved	
Total	34
Per week	0.3
<hr/>	
Gender of patients retrieved	
Male	58.8%
Female	41.2%
<hr/>	
State of retrieval	
NSW	5.9%
Qld	41.1%
SA	14.7%
NT	11.8%
WA	26.5%

The majority (96.3%) of Indigenous patients retrieved for congenital malformations, deformations and chromosomal abnormalities were 0–4 years of age.

Congenital malformations, deformations and chromosomal abnormalities—target groups for interventions

- > Indigenous children 0–4 years of age.
- > Parents/carers of Indigenous children aged 0–4 years of age.

²⁸ Results should be interpreted with caution due to the small number of Indigenous Australians that required an aeromedical retrieval for congenital malformations, deformations and chromosomal abnormalities. Population pyramids are not provided for congenital malformations, deformations and chromosomal abnormalities to ensure that patients cannot be identified.

5.5.18 ICD-10-AM Chapter 18—Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified

Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified, describe procedures and ill-defined conditions that do not fit into any of the other ICD-10-AM Chapters (ICD10Data.com, Undated). Where signs and symptoms point definitely to a given diagnosis, they will have been assigned to a category in the appropriate chapter. Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified include the less well-defined conditions and symptoms that, without the necessary study of the case to establish a final diagnosis, could potentially be equally classified into two or more diseases or to two or more systems of the body (ICD10Data.com, Undated).

Examples of symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified include:

- > Symptoms and signs involving: the circulatory and respiratory systems; digestive system and abdomen; skin and subcutaneous tissue; nervous and musculoskeletal systems; urinary system; cognition, perception, emotional state and behaviour; speech and voice;
- > General symptoms and signs;
- > Abnormal findings on examination (without diagnosis) of: blood; urine; other body fluids, substances and tissues;
- > Abnormal findings on diagnostic imaging and in function studies, without diagnosis; and
- > Ill-defined and unknown causes of mortality (World Health Organization, 2016).

Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified are indicated by ICD-10-AM codes R00–R99.

Deaths

In 2014, symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified, accounted for 2.5% of Indigenous deaths (Australian Bureau of Statistics, 2016a). Indigenous Australians (16.0 per 100,000 population) from NSW, Qld, WA, SA and the NT were 2.5 times as likely as non-Indigenous Australians (6.8 per 100,000 population) to die from symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (Australian Bureau of Statistics, 2016a).

Hospitalisations

In 2014–2015, Indigenous Australians (42.4 per 1,000 population) were 1.5 times as likely as non-Indigenous Australians (29.1 per 1,000 population) to be hospitalised for symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (Australian Institute of Health and Welfare, 2016a).

Children

Signs, symptoms and ill-defined conditions (which includes Sudden Infant Death Syndrome (SIDS) (ICD-10-AM code R95)) was the second leading cause of death amongst Indigenous infants in NSW, Qld, WA, SA and NT between 2008 and 2012, accounting for 19% of Indigenous infant deaths (Australian Institute of Health and Welfare, 2015a). Specifically, 46 Indigenous infant deaths (0.6 per 1,000 live births) were attributed to SIDS during this period, which was 2.4 times the mortality rate of non-Indigenous infants (0.2 per 1,000 live births) (Australian Institute of Health and Welfare, 2015a).

RFDS data

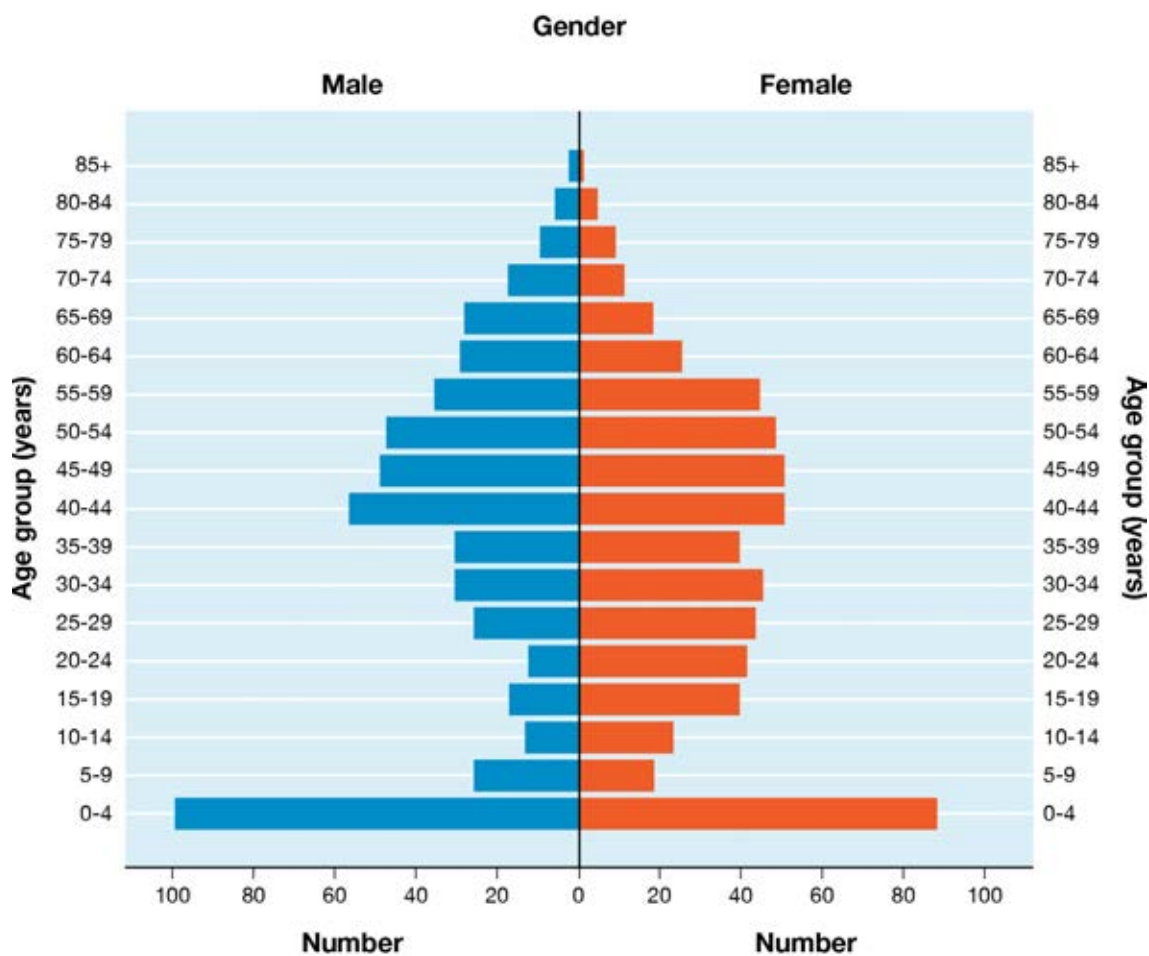
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified accounted for 6.5% of Indigenous aeromedical retrievals by the RFDS between July 2013 and December 2015 (Figure 5.38). Indigenous females were 1.1 times as likely as Indigenous males to require an aeromedical retrieval for symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified. Retrieved patients ranged in age from under one year of age to 87 years. More than half (55.7%) of the retrievals of Indigenous Australians for symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified, were from WA.

Figure 5.38. Demographic data for aeromedical retrievals of Indigenous patients with symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified, July 2013–December 2015

Percentage of total patient retrievals	6.5%
<hr/>	
Number of patients retrieved	
Total	1,149
Per week	8.8
<hr/>	
Gender of patients retrieved	
Male	47.0%
Female	53.0%
<hr/>	
State of retrieval	
NSW	0.5%
Qld	28.6%
SA	2.5%
NT	12.7%
WA	55.7%

Indigenous children aged 0–4 years of age (16.6%) were the group most likely to require an aeromedical retrieval for symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (Figure 5.39). Indigenous Australians aged 40–44 years (9.4%) were the second most likely group to require an aeromedical retrieval for symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified.

Figure 5.39. Gender of Indigenous patients by age who underwent an aeromedical retrieval for symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified, July 2013–December 2015



Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified—target groups for interventions

- > Indigenous children aged 0–4 years, with an emphasis on children under one year of age.
- > Parents/carers of Indigenous children under one year of age.
- > Indigenous Australians aged 40–44 years.
- > Indigenous Australians from WA.

5.5.19 ICD-10-AM Chapter 19—Injury, poisoning and certain other consequences of external causes

An injury describes “the physical damage that results when a human body is suddenly subjected to energy in amounts that exceed the threshold of physiological tolerance—or else the result of a lack of one or more vital elements, such as oxygen” (World Health Organization, 2008, p. 2). Injuries may include the effects of water, as in drowning, strangulation or freezing, or heat, as in burns (Holder, Peden, Krug, Lund, Gururaj, & Kobusingye, 2004). “The time between exposure to the energy and the appearance of an injury is short” (Holder et al., 2004, p. 5). The terms ‘injury’ and ‘poisoning’ encompass the adverse effects on the human body that result from particular events. “These can be accidental, such as falls, vehicle accidents and exposure to chemicals, or intentional such as suicide attempts and assaults by other people” (Australian Bureau of Statistics, 2012, p. 395). Such events, and the factors involved in them, are collectively known as external causes of injury and poisoning.

Examples of injury, poisoning and certain other consequences of external causes include:

- > Injuries to the: head; neck; thorax; abdomen, lower back, lumbar spine and pelvis; shoulder and upper arm; elbow and forearm; wrist and hand; hip and thigh; knee and lower leg; ankle and foot; involving multiple body regions;
- > Injuries to unspecified part of trunk, limb or body region—such as fracture of spine, level unspecified;
- > Effects of foreign body entering through natural orifice—such as foreign body in the ear;
- > Burns and corrosions, including burns and corrosions: of external body surface; confined to eye and internal organs; of multiple and unspecified body regions;
- > Frostbite;
- > Poisoning by drugs, medicaments and biological substances—such as antibiotics or analgesics;
- > Toxic effects of substances chiefly nonmedicinal as to source—such as petrol;
- > Certain early complications of trauma—such as traumatic shock following an injury;
- > Complications of surgical and medical care, not elsewhere classified—such as infections following infusion, transfusion and therapeutic injection; and
- > Sequelae of injuries, of poisoning and of other consequences of external causes (World Health Organization, 2016).

Injury, poisoning and certain other consequences of external causes are indicated by ICD-10-AM codes S00–T98.

Deaths

In 2008–2012, 15% of Indigenous deaths in NSW, Qld, WA, SA and NT were the result of injury, poisoning and certain other consequences of external causes compared with 6.1% of deaths of non-Indigenous people, indicating that Indigenous Australians were 2.5 times as likely as non-Indigenous Australians to die from injury, poisoning and certain other consequences of external causes (Australian Institute of Health and Welfare, 2015d). The most common external causes of death for Indigenous people were suicide (4.8%) and transport accidents (3.9%) (Australian Institute of Health and Welfare, 2015d).

In 2014, Indigenous Australians (23.0 per 1,000 population) were twice as likely as non-Indigenous Australians (11.7 per 1,000 population) to die from intentional self-harm (suicide) (ICD-10-AM codes X60–X84) in NSW, Qld, WA, SA and the NT (Australian Bureau of Statistics, 2016a). Suicide accounted for 5.2% of Indigenous deaths and 1.8% of non-Indigenous deaths in 2014 (Australian Bureau of Statistics, 2016a). Suicide was the second leading cause of death for Indigenous males, and the eighth leading cause of death for Indigenous females in 2014 (Australian Bureau of Statistics, 2016a).

Hospitalisations

In 2014–2015, Indigenous Australians (47.0 per 1,000 population) were 1.8 times as likely as

non-Indigenous Australians (26.1 per 1,000 population) to be hospitalised for injury, poisoning and certain other consequences of external causes (Australian Institute of Health and Welfare, 2016a).

In 2012–2013, 27,653 Indigenous Australians were hospitalised for injury and poisoning, comprising 7.2% of Indigenous hospitalisations (Australian Institute of Health and Welfare, 2015d). Injury was the second leading cause of hospitalisation for Indigenous Australians (Australian Institute of Health and Welfare, 2015d). Within the injury category, assault accounted for 23% of hospitalisations and accidental falls accounted for 19% of hospitalisations (Australian Institute of Health and Welfare, 2015d).

Between 2000 and 2007, Indigenous Australians in WA were 3.6 times more likely to be hospitalised or die from an injury than non-Indigenous Australians (Kay, 2012). Indigenous males aged 35–44 years of age and females aged 24–34 years were hospitalised at rates 4.5 and seven times those of non-Indigenous Australians (respectively) in these age groups in WA (Kay, 2012). The top five causes of unintentional injury were accidental falls, exposure to mechanical forces, transport accidents, other external causes of accidental injury, and exposure to smoke, fire, flames and hot substances (Kay, 2012).

Children

In children aged 0–14 years, injury is a leading cause of hospitalisation and death (Australian Institute of Health and Welfare, 2012b). In 2011–2013 injury rates amongst Indigenous children and young people increased with increasing remoteness of usual residence, and this was more pronounced for Indigenous children aged over 10 years (Australian Institute of Health and Welfare, 2016c). During 2011–2013, 7.2% of the 259,041 children and young people aged 0–24 years, who were hospitalised for an injury in Australia, were Indigenous (Pointer, 2016). However, in remote and very remote areas, over half (51%) of the children and young people hospitalised for an injury in 2011–2013 were Indigenous (Australian Institute of Health and Welfare, 2016c).

Cause of death data from 2008–2012 demonstrated that Indigenous infants (0.5 per 1,000 live births) in NSW, Qld, SA, NT and WA, were twice as likely as non-Indigenous infants (0.2 per 1,000 live births) to die from injury, poisoning and certain other consequences of external causes (Australian Institute of Health and Welfare, 2015a). During the same period, Indigenous children aged 1–4 years (21.2 per 100,000 population) were 3.3 times as likely as non-Indigenous children (6.4 per 100,000 population) to die from injury, poisoning and certain other consequences of external causes (Australian Institute of Health and Welfare, 2015a).

In 2014, Indigenous children aged 0–14 years (2.8 per 100,000 population) were 8.6 times as likely as non-Indigenous children aged 0–14 years (0.3 per 100,000 population) to die from intentional self-harm (suicide) (ICD-10-AM codes X60-X84) in NSW, Qld, WA, SA and the NT (Australian Bureau of Statistics, 2016a). Suicide was the second leading cause of death for this age group, after land transport accidents (Australian Bureau of Statistics, 2016a). During the same period, Indigenous Australians aged 15–24 years (52.5 per 100,000 population) were 3.9 times as likely as non-Indigenous Australians aged 15–24 years (13.6 per 100,000 population) to die from suicide in NSW, Qld, WA, SA and the NT, which was the leading cause of death in this age group (Australian Bureau of Statistics, 2016a). In 2014, Indigenous Australians aged 25–34 years (60.3 per 100,000 population) were three times as likely as non-Indigenous Australians aged 15–24 years (20.4 per 100,000 population) to die from suicide in NSW, Qld, WA, SA and the NT, which was the leading cause of death in this age group (Australian Bureau of Statistics, 2016a).

RFDS data

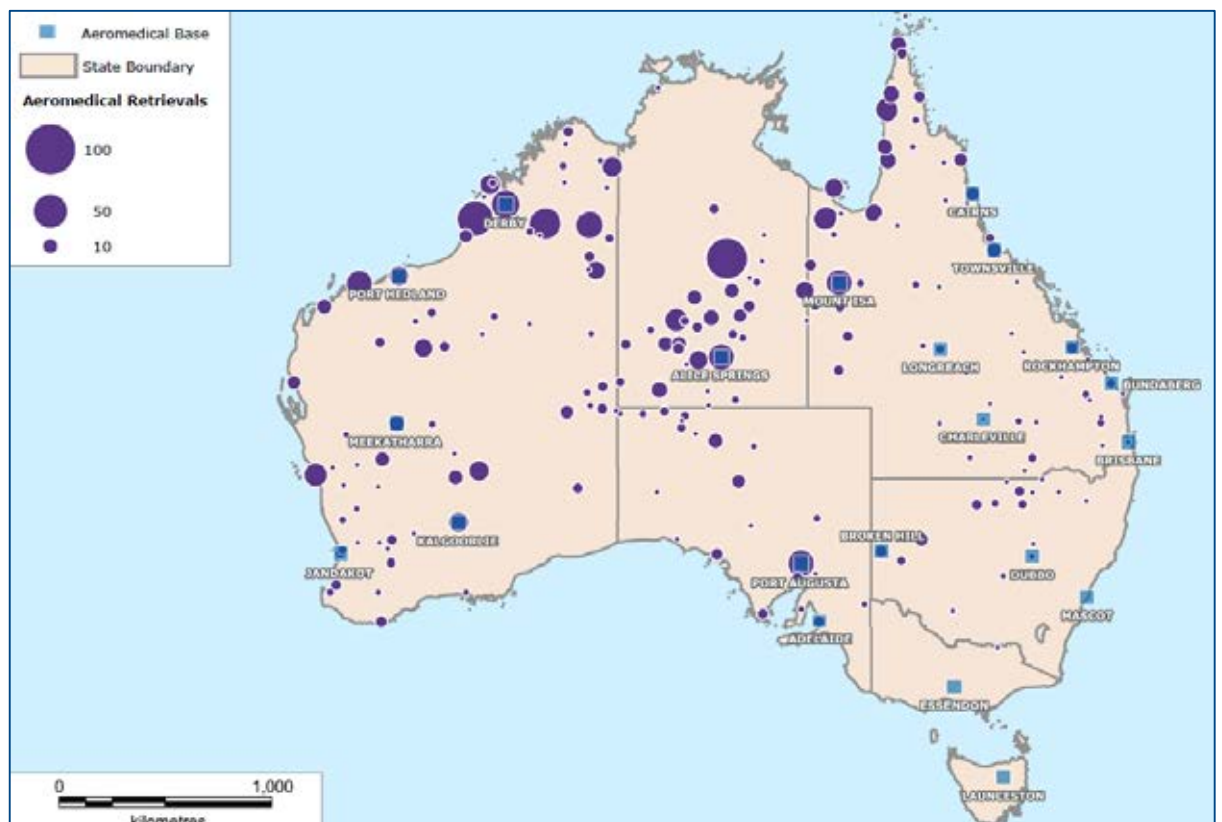
Injury, poisoning and certain other consequences of external causes accounted for almost one in five (17.9%) Indigenous aeromedical retrievals by the RFDS between July 2013 and December 2015 (Figure 5.43). Injury, poisoning and certain other consequences of external causes was the top reason that Indigenous Australians required an aeromedical retrieval during this period. Indigenous males were 1.2 times as likely as Indigenous females to require

an aeromedical retrieval for injury, poisoning and certain other consequences of external causes. Retrieved patients ranged in age from under one year of age to 94 years. Indigenous Australians with injury, poisoning and certain other consequences of external causes were most likely to come from WA (42.6%). The demand for aeromedical retrievals by Indigenous Australians for injury, poisoning and certain other consequences of external causes for the 12 months from January to December 2015 (Figure Figure 5.41) demonstrates the main areas within each state and territory where aeromedical retrievals took place.

Figure 5.40. Demographic data for aeromedical retrievals of Indigenous patients with injury, poisoning and certain other consequences of external causes, July 2013–December 2015

Percentage of total patient retrievals	17.9%
<hr/>	
Number of patients retrieved	
Total	3,146
Per week	24.2
<hr/>	
Gender of patients retrieved	
Male	54.1%
Female	45.9%
<hr/>	
State of retrieval	
NSW	4.4%
Qld	22.8%
SA	9.3%
NT	20.9%
WA	42.6%

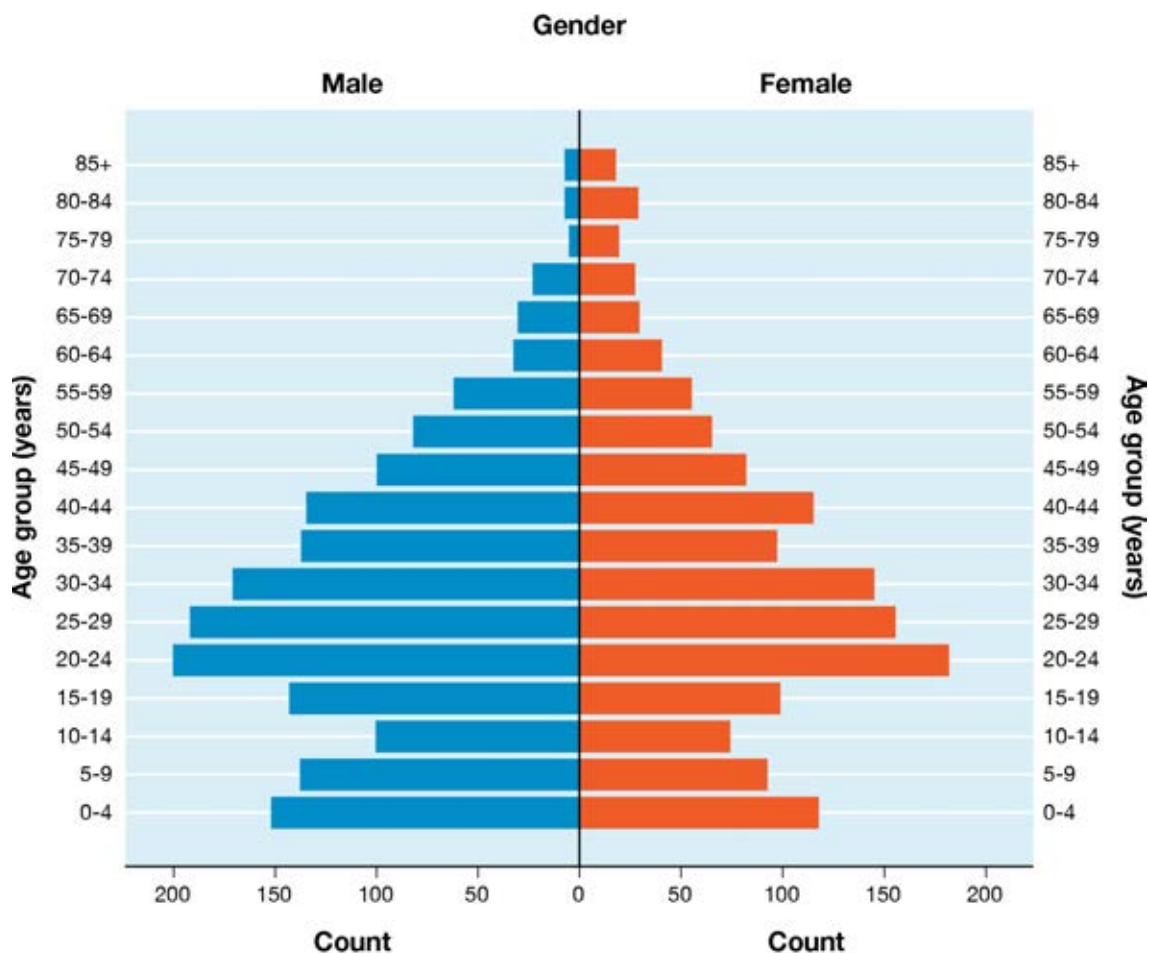
Figure 5.41. Demand for aeromedical retrievals by Indigenous Australians for injury, poisoning and certain other consequences of external causes, January to December, 2015



Source: Developed by ORH (2016).

Indigenous Australians aged 20–24 years (12.2%), 25–29 years of age (11.0%) and 30–34 years (10.0%) were the groups most likely to require an aeromedical retrieval for injury, poisoning and certain other consequences of external causes (Figure 5.42). Children aged 0–4 years (8.5%) also accounted for a significant proportion of Indigenous retrievals for injury, poisoning and certain other consequences of external causes.

Figure 5.42. Gender of Indigenous patients by age who underwent an aeromedical retrieval for injury, poisoning and certain other consequences of external causes, July 2013–December 2015



Injury, poisoning and certain other consequences of external causes—target groups for interventions

- > Indigenous Australians aged 20–34 years.
- > Indigenous children aged 0–4 years.
- > Parents/carers of Indigenous children under 5 years of age.

5.5.20 ICD-10-AM Chapter 20—External causes of morbidity and mortality

External causes of morbidity and mortality permits the classification of environmental events and circumstances as the cause of injury, poisoning and other adverse effects (World Health Organization, 2016). Where applicable, it is used in addition to a code from another chapter of the ICD-10-AM, which has indicated the nature of the condition (World Health Organization, 2016). Most often, the condition will be classifiable to chapter 19, injury, poisoning and certain other consequences of external causes (World Health Organization, 2016). Whenever a patient has a principal or additional diagnosis of an injury or poisoning, an external cause code should be recorded (Australian Institute of Health and Welfare, 2016a). For example, this chapter allows the clinician to code the type of accident a patient has sustained, such as: a motor cycle rider that was injured in transport accident; intentional self-harm; assault; or a fall. It also provides codes for the place of occurrence of the external cause, such as: home; school; or sports area, for example.

External causes of morbidity and mortality are indicated by ICD-10-AM codes V01–Y98.

Deaths

In 2014, 15.5% of Indigenous deaths in NSW, Qld, SA, NT and WA were due to external causes of morbidity and mortality, such as accidents, assaults and intentional self-harm (Australian Bureau of Statistics, 2016a). Indigenous males were more than twice as likely as Indigenous females to die from external causes of morbidity and mortality (Australian Bureau of Statistics, 2016a).

Age-standardised death data demonstrated that Indigenous Australians (75.2 per 100,000 population) in NSW, Qld, SA, NT and WA were twice as likely as non-Indigenous Australians (38.2 per 100,000 population) to die from external causes of morbidity and mortality in 2008–2012 (Australian Institute of Health and Welfare, 2015a), which accounted for 15.2% of Indigenous deaths during this period (Australian Institute of Health and Welfare, 2015a).

Intentional self-harm (suicide) (X60-X84) was the fifth leading cause of Indigenous deaths in 2014, and accounted for around 5% of all Indigenous deaths (Australian Bureau of Statistics, 2016a). Specifically, Indigenous Australians (23.0 per 100,000 population) were twice as likely as non-Indigenous Australians (11.7 per 100,000 population) to die from suicide in 2014 and Indigenous males were 2.5 times as likely as Indigenous females to die from suicide (Australian Bureau of Statistics, 2016a).

Hospitalisations

In 2014–2015, 29,237 Indigenous Australians were hospitalised due to external causes of morbidity and mortality (Australian Institute of Health and Welfare, 2016a). No age-standardised data are available to permit a comparison with non-Indigenous hospitalisations for external causes of morbidity and mortality. However, the data indicated that falls (20%) and assault (19%) were the most commonly reported external cause of injury and poisoning for hospitalisations for Indigenous Australians, accounting for almost two-fifths (39%) of all reported external causes of injury (Australian Institute of Health and Welfare, 2016a). Transport accidents accounted for 9% of Indigenous hospitalisations during this period (Australian Institute of Health and Welfare, 2016a).

Children

In 2008–2012, external causes of morbidity and mortality accounted for more than half (53%) of all deaths of Indigenous children aged 1–4 years and half (50%) of all deaths of Indigenous children aged 5–14 years in NSW, Qld, SA, NT and WA (Australian Institute of Health and Welfare, 2015d). Transport accidents (18% of deaths), and accidental drowning or accidental threats to breathing (17%) were the main types of external causes of morbidity and mortality for children aged 1–4 years, while transport accidents (22%), intentional self-harm/suicide (11%) and accidental drowning or threats to breathing (7%) were the main types of external causes of morbidity and mortality for children aged 5–14 years (Australian Institute of Health and Welfare, 2015d).

In 2008–2012 young Indigenous males aged 15–24 years were almost three times as likely as both Indigenous females and non-Indigenous males to die due to external causes of morbidity and mortality.

RFDS data

RFDS have not used previously coded external causes of morbidity and mortality, therefore no data are reported for this diagnosis chapter.

5.5.21 ICD-10-AM Chapter 21—Factors influencing health status and contact with health services

Factors influencing health status and contact with health services are used when circumstances other than a disease, injury or external cause classifiable to categories A00–Y89 are recorded as ‘diagnoses’ or ‘problems’. This can arise in two main ways:

- > When a person who may or may not be sick encounters the health services for some specific purpose, such as to receive limited care or service for a current condition, to donate an organ or tissue, to receive prophylactic vaccination or to discuss a problem which is in itself not a disease or injury.
- > When some circumstance or problem is present which influences the person’s health status but is not in itself a current illness or injury. Such factors may be elicited during population surveys, when the person may or may not be currently sick, or be recorded as an additional factor to be borne in mind when the person is receiving care for some illness or injury (World Health Organization, 2016).

Factors influencing health status and contact with health services include health services for examination and investigation, reproduction, specific procedures, renal dialysis, potential health hazards related to communicable diseases, socioeconomic and psychosocial circumstances, family and personal history.

Examples of factors influencing health status and contact with health services:

- > Persons encountering health services for examination and investigation—such as medical observation and evaluation for suspected diseases and conditions;
- > Persons with potential health hazards related to communicable diseases—such as contact with and exposure to communicable diseases;
- > Persons encountering health services in circumstances related to reproduction—such as supervision of high-risk pregnancy;
- > Persons encountering health services for specific procedures and health care—such as prophylactic surgery;
- > Persons with potential health hazards related to socioeconomic and psychosocial circumstances—such as exposure to radiation; and
- > Persons with potential health hazards related to family and personal history and certain conditions influencing health status—such as family history of malignant neoplasm (World Health Organization, 2016).

Care involving dialysis and other medical care, such as chemotherapy, is also included in factors influencing health status and contact with health services (Australian Institute of Health and Welfare, 2016a).

Factors influencing health status and contact with health services are indicated by ICD-10-AM codes Z00–Z99.

Hospitalisations

In 2014–2015, Indigenous Australians (552.1 per 1,000 population) were 5.5 times as likely as non-Indigenous Australians (100.6 per 1,000 population) to be hospitalised for factors influencing health status and contact with health services (Australian Institute of Health and Welfare, 2016a).

Indigenous Australians often require extensive hospital services for chronic kidney disease (CKD) and end stage kidney disease (ESKD), such as kidney replacement therapy (KRT) in the form of a kidney transplant or dialysis (Stumpers & Thomson, 2013). In 2008–2009, Indigenous Australians in NSW, Vic, Qld, WA, SA and NT were 10.8 times as likely as non-Indigenous Australians to be hospitalised for regular dialysis (ICD-10-AM codes Z491, Z492) (Australian Institute of Health and Welfare, 2011a). During this period, Indigenous Australians in remote and very remote areas were 84 and 76 times (respectively) as likely as other Australians to be hospitalised for regular dialysis (Australian Institute of Health and Welfare, 2011a).

RFDS data

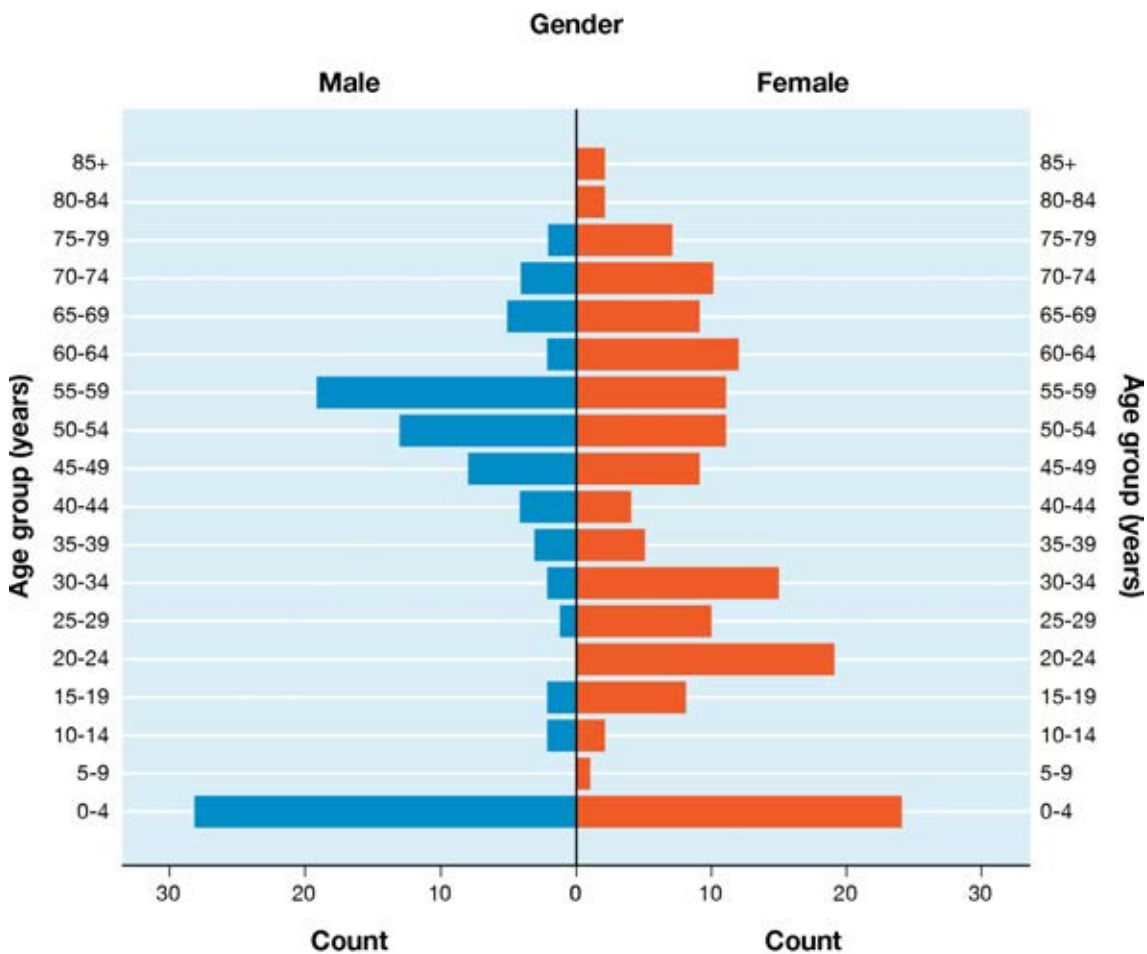
Factors influencing health status and contact with health services accounted for 1.5% of Indigenous aeromedical retrievals by the RFDS between July 2013 and December 2015 (Figure 5.43). Indigenous females were 1.7 times as likely as Indigenous males to require an aeromedical retrieval for factors influencing health status and contact with health services. Retrieved patients ranged in age from under one year of age to 91 years. More than two-thirds (67.3%) of Indigenous Australians with factors influencing health status and contact with health services came from Qld.

Figure 5.43. Demographic data for aeromedical retrievals of Indigenous patients with factors influencing health status and contact with health services, July 2013–December 2015

Percentage of total patient retrievals	1.5%
<hr/>	
Number of patients retrieved	
Total	257
Per week	2.0
<hr/>	
Gender of patients retrieved	
Male	37.0%
Female	63.0%
<hr/>	
State of retrieval	
NSW	1.2%
Qld	67.3%
SA	6.6%
NT	8.9%
WA	15.6%
Vic	0.4%

Indigenous children aged 0–4 years (20.3%) were more likely than Indigenous Australians from other age groups to require an aeromedical retrieval for factors influencing health status and contact with health services (Figure 5.44). Children under one year of age were overrepresented, accounting for 17.6% of aeromedical retrievals for factors influencing health status and contact with health services. Indigenous adults aged 50–59 years (11.7%) were the second most likely group to require an aeromedical retrieval for factors influencing health status and contact with health services.

Figure 5.44. Gender of Indigenous patients by age who underwent an aeromedical retrieval for factors influencing health status and contact with health services, July 2013–December 2015



Factors influencing health status and contact with health service—target groups for interventions

- > Indigenous females.
- > Indigenous children aged 0–4 years, especially those under one year of age.
- > Parents/carers of Indigenous children under 5 years of age.
- > Indigenous adults aged 50–59 years.
- > Indigenous Australians from Qld.

5.5.22 ICD-10-AM Chapter 22—Codes for special purposes

Codes for special purposes allows the clinician to code new diseases of uncertain aetiology, such as the zika virus, and to code resistance to antimicrobial and antineoplastic drugs, such as resistance to penicillin or other antibiotics (World Health Organization, 2016).

Codes for special purposes are indicated by ICD-10-AM codes U00–U85.

RFDS have not used previously used codes for special purposes, therefore no data are reported for this diagnosis chapter.

5.5.23 Ill-defined conditions

In order to accurately capture all of the data around RFDS aeromedical retrievals for Indigenous Australians, ill-defined or unknown conditions were included as a separate category. Ill-defined or unknown conditions represent conditions where the clinician was unable to provide a definitive diagnosis, but the patient was sick enough to require transport by the RFDS to receive definitive care in a tertiary hospital.

RFDS data

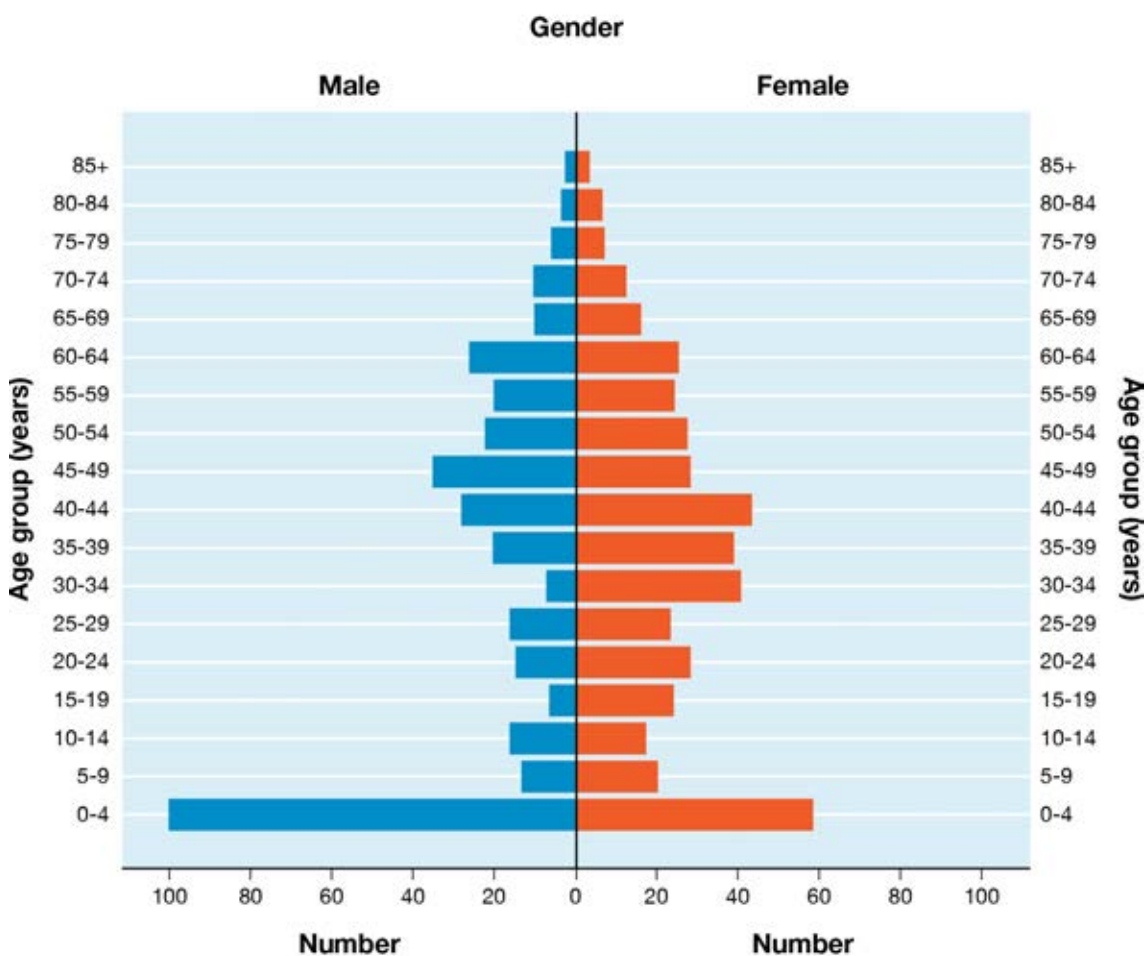
Ill-defined conditions accounted for 4.5% of Indigenous aeromedical retrievals by the RFDS between July 2013 and December 2015 (Figure 5.45). Indigenous females were 1.2 times as likely as Indigenous males to require an aeromedical retrieval for ill-defined conditions. Retrieved patients ranged in age from under one year of age to 93 years. The majority (70.5%) of Indigenous Australians with factors influencing health status and contact with health services came from the NT.

Figure 5.45. Demographic data for aeromedical retrievals of Indigenous patients with ill-defined conditions, July 2013–December 2015

Percentage of total patient retrievals	4.5%
<hr/>	
Number of patients retrieved	
Total	798
Per week	6.1
<hr/>	
Gender of patients retrieved	
Male	44.7%
Female	55.3%
<hr/>	
State of retrieval	
NSW	10.9%
Qld	0.1%
SA	17.4%
NT	70.5%
WA	1.0%
Vic	0.1%

Indigenous children aged 0–4 years (19.8%) were more likely than Indigenous Australians from other age groups to require an aeromedical retrieval for ill-defined conditions (Figure 5.46). Within the 0–4-year age group, Indigenous males (12.6%) were 1.7 times as likely as Indigenous females (7.3%) to require an aeromedical retrieval for ill-defined conditions.

Figure 5.46. Gender of Indigenous patients by age who underwent an aeromedical retrieval for ill-defined conditions, July 2013–December 2015



Ill-defined conditions—target groups for interventions

- > Indigenous children aged 0–4 years, especially those under one year of age.
- > Parents/carers of Indigenous children under 5 years of age.
- > Indigenous Australians from the NT.

5.6 Leading ICD-10-AM diagnoses triggering an aeromedical retrieval for Indigenous Australians, by 5-year age groups

This section presents the number, proportion and ranking of diagnoses resulting in Indigenous Australians requiring an aeromedical retrieval between July 2013 and December 2015 by the top three ICD-10-AM diagnosis chapters and 5-year age groups (Table 5.2).

Table 5.2. Leading three reasons Indigenous Australians required an aeromedical retrieval, by 5-year age group, July 2013–December 2015*

ICD-10-AM Diagnosis chapter

Age group (years)	Number	Mental and behavioural disorders	Diseases of the circulatory system	Diseases of the respiratory system	Diseases of the digestive system	Diseases of the skin and subcutaneous tissue	Diseases of the musculoskeletal system and connective tissue	Pregnancy, childbirth and the puerperium	Certain conditions arising in the perinatal period	Injury, poisoning and certain other consequences of external causes
0–4	2,464			34.7%					8.9%	10.9%
5–9	711				8.0%	10.5%				32.3%
10–14	592				11.0%		7.9%			29.2%
15–19	927	9.1%						22.2%		26.0%
20–24	1,389	8.9%						27.2%		27.5%
25–29	1,371	8.8%						23.3%		25.3%
30–34	1,265		9.2%					15.5%		24.9%
35–39	1,199		16.6%	10.2%						19.4%
40–44	1,441		19.4%	10.5%						17.2%
45–49	1,375		24.6%	11.5%						13.2%
50–54	1,283		32.2%	12.2%						11.4%
55–59	1,063		27.0%		10.3%					10.9%
60–64	809		27.9%	12.6%	9.3%					
65–69	575		27.3%	11.3%						10.1%
70–74	419		30.3%	13.8%						11.9%
75–79	264		29.2%	12.2%						8.7%
80–84	182		26.4%	13.7%						19.2%
85+	102		14.7%	14.7%						23.5%

Key: ■ 1st ■ 2nd ■ 3rd

These data demonstrate that between July 2013 and December 2015:

- > Injury, poisoning and certain other consequences of external causes was one of the top three reasons that most age groups (except 60–64-year-olds) required an aeromedical retrieval. It was the leading reason that Indigenous Australians aged 5–39 years (responsible for up to one-third of retrievals in each 5-year age group) and 85 years of age or older required an aeromedical retrieval;
- > More than one-third (34.7%) of Indigenous children aged 0–4 years underwent an aeromedical retrieval due to diseases of the respiratory system;
- > Diseases of the respiratory system were one of the top three reasons for requiring an aeromedical retrieval for people of almost all 5-year age groups from 35–85 years of age or older, except for people aged 55–59 years. Aeromedical retrievals due to diseases of the respiratory system were responsible for between 10.2% and 14.7% of Indigenous retrievals in each of these age groups;
- > The proportion of aeromedical retrievals for diseases of the circulatory system increased with increasing age from 35 years of age. Diseases of the circulatory system were the leading reason for an aeromedical retrieval for Indigenous Australians aged 40–84 years. Almost one-third of aeromedical retrievals of 50–54 (32.2%) and 70–74 (30.3%) year-old Indigenous Australians were due to diseases of the circulatory system;
- > Pregnancy, childbirth and the puerperium was the second most common reason that Indigenous Australians, aged 15–34 years, required an aeromedical retrieval. Pregnancy, childbirth and the puerperium accounted for 27.2% of aeromedical retrievals for Indigenous Australians aged 20–24 years and more than one in five retrievals of 25–29 (23.3%) and 15–19 (22.2%) year-olds;
- > Mental and behavioural disorders featured in the top three leading reasons for an aeromedical retrieval for Indigenous Australians aged 15–29 years, and accounted for almost one in 10 aeromedical retrievals for 15–19 (9.1%), 20–25 (8.9%) and 25–29 (8.8%) year-olds; and
- > Diseases of the digestive system were one of the top three reasons for an aeromedical retrieval of Indigenous Australians aged 5–9, 10–14, 55–59 and 60–64 years.

5.7 Discussion

RFDS data demonstrated that between 1 July 2013 and 31 December 2015, Indigenous Australians accounted for 28.3% of RFDS aeromedical retrievals. Each day, around 19 Indigenous patients, comprising nine males and 10 females, were transported by the RFDS to receive definitive care in a tertiary hospital. This is unsurprising, since Indigenous Australians are more likely than non-Indigenous Australians to live in remote and rural areas (Australian Institute of Health and Welfare, 2014a), and would be expected to be overrepresented in aeromedical retrievals in line with their overrepresentation in the remote and rural population.

Injury, poisoning and certain other consequences of external causes was the leading reason Indigenous Australians required an aeromedical retrieval, comprising 17.9% of all Indigenous aeromedical retrievals. These data are consistent with national data indicating that injuries are a significant health issue for Indigenous Australians in remote and rural Australia. Specifically, injury, poisoning and certain other consequences of external causes was the second leading cause of hospitalisation for Indigenous Australians in 2012–2013 and Indigenous Australians were hospitalised for injury, poisoning and certain other consequences of external causes at 1.8 times the rate of non-Indigenous Australians in 2013–2014 (Australian Institute of Health and Welfare, 2015b).

Diseases of the circulatory system and diseases of the respiratory system were, respectively, the second and third most common reasons Indigenous Australians required an aeromedical retrieval. These were closely followed by diseases of the digestive system and pregnancy, childbirth and the puerperium. These data are also consistent with national hospitalisation data which demonstrated that almost half of all overnight acute separations in 2013–2014 had a principal diagnosis from one of the following five ICD-10-AM chapters: diseases of the circulatory system; injury, poisoning and certain other consequences of external causes; diseases of the respiratory system; diseases of the digestive system; and pregnancy, childbirth and the puerperium (Australian Institute of Health and Welfare, 2015a).

Indigenous patients of all ages from newborn to 95 years of age were transported by the RFDS for illnesses and injuries, suggesting that remote and rural Indigenous Australians of all ages experience illnesses and injuries that require treatment in a hospital. The age pattern of injury retrievals showed that remote and rural Indigenous children, aged 0–4 years (14.1% of Indigenous aeromedical retrievals) accounted for the greatest proportion of retrievals. The overrepresentation of young Indigenous children in aeromedical retrievals, compared with other age groups, suggests that illness and injury prevention and intervention messages that target young children, their parents or carers, and health professionals serving these communities may be helpful in reducing the incidence, or mediating the impacts of, illnesses and injuries for young Indigenous children.

In addition, the data demonstrated that Indigenous aeromedical retrievals for all illnesses and injuries were conducted across multiple Australian states and territories, but that the majority of retrievals were undertaken in WA, Qld, the NT, and SA. These states and territories comprise large areas of remote and rural Australia that are either difficult to access by road, or too remote to enable timely hospital transfer by road ambulance. Consequently, in these situations, aeromedical retrieval is the most effective way of transporting patients to receive timely definitive care in a tertiary hospital. The variety of remote and rural locations from which sick and injured Indigenous patients were retrieved, and the volume of Indigenous patients transported to major tertiary hospitals by the RFDS, suggests that the “RFDS is an important part of the trauma system across Australia” (Margolis & Ypinazar, 2009, p. 367).

5.8 Future opportunities—RFDS Indigenous data

The RFDS has an opportunity to review its own data collection processes to ensure all relevant data around aeromedical retrievals are collected. It is especially important that Indigenous status is recorded for all patients, to enable the RFDS to gain a more complete picture of the nature of illnesses and injuries impacting both Indigenous and non-Indigenous Australians.

The RFDS has recently commenced systematically digitising Indigenous and non-Indigenous patient data around illnesses and injuries. Since 2013, illness and injury data have been consistently entered into RFDS electronic databases, enabling the RFDS to gain a national overview of the clients it serves.

Systematic collection of data around the causes of illnesses and injuries and the settings in which they occur will facilitate more comprehensive analyses of aeromedical retrieval data in the future. Data linkage between the RFDS and state, territory and national medical datasets (such as hospital data) has commenced in some Sections and Operations within the RFDS. As linkages are established, longitudinal data on patients initially transported by the RFDS, and treated in hospital, will enable the RFDS to access comprehensive information on a patient’s prognosis, treatment, recovery, and rehabilitation service use. Data linkage with local service providers that operate in areas where the RFDS delivers services, such as local GPs, ACCHOs or local hospitals would also assist in providing a more complete picture of the health outcomes of sick and injured remote and rural Australians.

Of particular value would be the mapping of the health and demographic factors of the populations within the RFDS footprint to provide a comprehensive picture of the populations the RFDS serves. This local knowledge will enable the RFDS to draw conclusions regarding whether its retrieval data is representative of the population “on the ground” or whether there are significant differences between the population it transports, and the true population composition of an area. Specifically, it will enable the RFDS to describe for which causes, and which population groups (by age, gender, Indigenous status, geographical area), the largest problems exist, and then develop strategies and programs to address these problems.

5.9 Summary

The RFDS plays a vital role in transporting sick and injured remote and rural Indigenous Australians to major tertiary hospitals to receive definitive care. With other sophisticated medical services often unavailable in remote and rural Australia, the RFDS is an integral part of the medical system. The RFDS transports patients for a range of illnesses and injuries, and provided aeromedical retrievals to 17,606 Indigenous Australians from 1 July 2013 to 31 December 2015. Indigenous Australians comprised 28.3% of the aeromedical retrievals during this period.

The following section proposes evidence-based recommendations and solutions that could be implemented to reduce, or minimise the impact of illnesses or injuries on remote and rural Indigenous Australians served by the RFDS.

6.0 Conclusion

The current report has made Indigenous RFDS aeromedical retrieval data available for the first time. It provides strong evidence around the main illnesses and injuries impacting Indigenous Australians that are served by the RFDS.

These data contribute to the national dataset and provide robust information to assist federal, state and territory governments, as well as Indigenous and non-Indigenous organisations, including the RFDS, make decisions regarding the development and delivery of Indigenous health care services. These data can assist in identifying illnesses and injuries that have the greatest impact on Indigenous Australians and where 'best bet' prevention and early intervention strategies could be targeted to improve Indigenous health outcomes.

The data specifically demonstrated that Indigenous Australians comprised more than one-quarter of RFDS aeromedical retrievals between July 2013 and December 2015. Each day, 19 Indigenous Australians, of all ages, required an aeromedical retrieval from remote and rural Australia for an illness or injury that required definitive care in a tertiary hospital.

Injury, poisoning and certain other consequences of external causes was the most common reason that Indigenous Australians underwent an aeromedical retrieval, and was responsible for 17.9% of Indigenous aeromedical retrievals between July 2013 and December 2015.

Diseases of the circulatory system, diseases of the respiratory system, diseases of the digestive system, and pregnancy, childbirth and the puerperium, respectively, were the five main reasons Indigenous Australians required an aeromedical retrieval during this period.

However, some diseases were especially prevalent among particular age groups of Indigenous Australians that underwent an aeromedical retrieval. For Indigenous Australians between the ages of 5–39 years, injury, poisoning and certain other consequences of external causes was the leading reason for an aeromedical retrieval, accounting for around 30% of retrievals for each 5-year age group up to 34 years and around 20% for Indigenous Australians aged 35–39 years. A previous RFDS report on injuries in remote and rural Australia by Bishop et al. (2016) called for the development of a new national injury prevention plan incorporating evidence-based strategies aimed at reducing injuries. The RFDS reiterates its call for the development of a national injury plan, and further recommends that this plan incorporate specific strategies for injury prevention for Indigenous Australians. The plan should incorporate broad-based and targeted approaches to address injuries in remote and rural areas, for both Indigenous and non-Indigenous Australians, and such strategies must include measurable outcomes (Bishop et al., 2016). Additional research that improves understanding of why injury disparities between remote and rural Indigenous and non-Indigenous Australians and those who live in major cities, exist, is needed to ensure interventions to reduce injuries are targeted and resourced appropriately (Bishop et al., 2016).

Diseases of the respiratory system were a significant reason that many Indigenous Australians required an aeromedical retrieval. Children aged 0–4 years were especially vulnerable to diseases of the respiratory system, with more than one-third of retrievals amongst 0–4-year-olds the result of diseases of the respiratory system. Similarly, aeromedical retrievals for diseases of the circulatory system were a significant reason Indigenous Australians over the age of 40 years required an aeromedical retrieval, with almost one-third of aeromedical retrievals of 50–54 and 70–74-year-old Indigenous Australians due to diseases of the circulatory system. Pregnancy, childbirth and the puerperium were common reasons that Indigenous Australians aged 15–34 years required an aeromedical retrieval, while mental and behavioural disorders were an important reason for an aeromedical retrieval for Indigenous Australians aged 15–29 years.

The age pattern of Indigenous aeromedical retrievals showed that remote and rural Indigenous children, aged 0–4 years, accounted for the greatest proportion of all aeromedical retrievals, with almost one in seven Indigenous aeromedical retrievals for a child aged under five years. The overrepresentation of young Indigenous children in aeromedical retrievals, compared with other age groups, suggests that illness and injury prevention and intervention messages that target young children, their parents or carers, and health professionals serving these communities may be helpful in reducing the incidence, or mediating the impacts of, illnesses and injuries for young Indigenous children.

These data clearly demonstrate that Indigenous Australians are impacted by different illnesses and injuries at various stages throughout their life and that any efforts to improve Indigenous health outcomes should take a life-course approach. In addition, an integrated approach to improving the health of Indigenous Australians, which considers the social determinants of health, health risk factors and other factors impacting Indigenous Australians is required. Such an approach should include “the strengthening of community functioning, reinforcing positive behaviours, improving educational participation, regional economic development, housing and environmental health, and spiritual healing,” (Department of Health, 2013). Any interventions must be evidence-based and should be underpinned by the principles that characterise effective programs (Osborne et al., 2013).

A comprehensive review of the characteristics of effective programs that take a social determinants approach to Indigenous health by Osborne et al. (2013) identified 10 principles that characterised effective programs. These RFDS recommends that the principles identified in that review are incorporated into any future health programs for Indigenous Australians. These principles include:

- > Holistic approaches which work with Indigenous people in ways which take into account the full cultural, social, emotional and economic context of their lives, including an awareness of the ongoing legacy of trauma, grief and loss associated with colonisation;
- > Active involvement of Indigenous communities in every stage of program development and delivery, in order to build genuine, collaborative and sustainable partnerships with Indigenous peoples, and build capacity within Indigenous communities;
- > Collaborative working relationships between government agencies and other relevant organisations in delivering services and programs, acknowledging the interrelatedness of key social and economic determinants across multiple life domains for Indigenous Australians;
- > Valuing Indigenous knowledge and cultural beliefs and practices which are important for promoting positive cultural identity and social and emotional wellbeing for Indigenous Australians;
- > Clear leadership and governance for programs, initiatives and interventions. This includes commitment from high level leadership of relevant organisations and agencies to the aims of reducing Indigenous disadvantage and addressing determinants of health and wellbeing;
- > Employing Indigenous staff and involving them fully in program design, delivery and evaluation, and providing adequate training, where necessary, to build capacity of Indigenous staff;
- > Developing committed, skilled staff (Indigenous and non-Indigenous) and providing diversity and cultural awareness training;
- > In cases where programs demonstrate success, it is important to provide adequate, sustainable resources for long-term, rather than short-term funding;
- > Adopting a strengths-based perspective which builds and develops the existing strengths, skills and capacities of Indigenous people; and
- > Clear plans for research and evaluation to identify successful aspects of programs, provide a basis to amend and improve, demonstrate success and build an evidence base to justify allocation of ongoing resources (Osborne et al., 2013, pp. 2–3).

In addition to taking a social determinants approach, services delivered to Indigenous Australians must be delivered in a culturally competent manner and take a 'cultural determinants of health' approach. There is strong evidence that inequitable access to quality healthcare, based on ethnicity, contributes to health disparities for Indigenous Australians (Bainbridge, McCalman, Clifford, & Tsey, 2015).

The National Aboriginal and Torres Strait Islander Health Plan 2013–2023 (Department of Health, 2013) sets a goal that all healthcare, be it government, community, or privately run, is free of racism. This goal was established in recognition that historical and existing barriers prevent many Indigenous Australians from accessing healthcare or receiving optimal clinical care. These barriers are recognised in the Plan as contributing to poor and ultimately avoidable health outcomes.

Consequently, it is important to “increase efforts to improve the ability of all systems, services and practitioners to work with the diversity of patients” (Bainbridge et al., 2015, p. 4). This can be achieved in part through cultural training of health workers. A number of different models, through which cultural training can be conceptualised, have been developed. These models centre on cultural awareness, transcultural care, cultural safety, cultural security, cultural respect, and cultural competence (Downing, Kowal, & Paradies, 2011). Each of these has an emphasis on either individual or behavioural change (Downing et al., 2011).

Of these different models, there is evidence that supports cultural competence as a “key strategy for reducing inequalities in healthcare access and improving the quality and effectiveness of care for Indigenous people” (Bainbridge et al., 2015, p. 2). Cultural competence extends beyond cultural awareness and describes “the set of behaviours, attitudes, and policies that come together to enable a system, agency, or professionals to work effectively in cross-cultural situations” (Bainbridge et al., 2015).

“The word culture is used because it implies the integrated pattern of human behaviour that includes thoughts, communications, actions, customs, beliefs, values, and institutions of a racial, ethnic, religious, or social group. The word competence is used because it implies having the capacity to function effectively. A culturally competent system of care acknowledges and incorporates—at all levels—the importance of culture, the assessment of cross-cultural relations, vigilance towards the dynamics that result from cultural differences, the expansion of cultural knowledge, and the adaptation of services to meet culturally-unique needs” (Bainbridge et al., 2015, p. 6; Cross, Bazron, Dennis, & Isaacs, 1989, p. iv/7).

Cultural competence “works to enhance the capacity and ability of health service systems, organisations and practitioners to provide more responsive health care to diverse cultural groups” (Bainbridge et al., 2015, p. 4).

The Aboriginal Community Controlled Health Services (ACCHSs) movement has played a significant role in driving change and in providing culturally appropriate services to Indigenous Australians (Bainbridge et al., 2015). ACCHSs have employed a model of comprehensive primary health care and community governance, and “have reduced unintentional racism, barriers to access to health care, and are progressively improving individual health outcomes for Aboriginal people” (Panaretto, Wenitong, Button, & Ring, 2014).

However, resourcing constraints limit the reach and capacity of the ACCHSs to provide services to all Indigenous Australians, which means that the balance of services are provided by mainstream health systems (Bainbridge et al., 2015). Many of these systems do not provide clinical services that are congruent with Indigenous culture or Indigenous holistic notions of health (Bainbridge et al., 2015).

Clinical cultural competence has been prioritised by some organisations who are committed to improving the health outcomes of the diverse populations they serve. The National Heart Foundation of Australia recently recognised the need to develop and embed a patient-oriented clinical cultural competence framework for the diagnosis and management of acute coronary

syndromes (ACS) in Indigenous Australians (Ilton, Walsh, Brown, Tideman, Zeitz, & Wilson, 2014). They found that when compared with non-Indigenous Australians, Indigenous Australians with ACS experienced poorer clinical outcomes (Ilton et al., 2014) and that there were a number of barriers to Indigenous patients including issues of fear, institutional racism, cultural misunderstandings, waiting times, transport issues, financial constraints and poor health literacy (Ilton et al., 2014). These barriers meant that Indigenous Australians who experienced a heart attack delayed presenting to hospital, were more likely to discharge themselves early from hospital against medical advice, were less likely to participate in cardiac rehabilitation programs, and were less likely to attend follow-up care or implement secondary prevention strategies (Ilton et al., 2014). The implementation of a properly structured, clearly defined patient-oriented clinical pathway with appropriate human, pharmacological and equipment resources was essential for the delivery of evidence-based, high-quality care for Indigenous Australians (Ilton et al., 2014). Coordinated pathways of care—involving Indigenous cardiac coordinators, facilitated by designated provider clinical networks and supported by Aboriginal Liaison Officers, and developed in collaboration with all involved in the patient pathway, including patients, families, Aboriginal health practitioners, primary care teams, retrieval services, emergency and cardiology services and health educators provided cultural support throughout the process so that patients and families were engaged and adequately informed (Ilton et al., 2014, p. 643).

A review of the effectiveness of culturally competent practices and frameworks in providing health care benefits for Indigenous Australians identified approaches and strategies that were effective in improving cultural competence among health services staff (Bainbridge et al., 2015). The RFDS recommends that these approaches and strategies, and other evidence-based strategies around cultural competence, be considered by the RFDS and other organisations that serve Indigenous Australians. For example:

- > Bringing together the cultures of health care organisations with Indigenous communities improves access to health care for Indigenous Australians. This involves health care organisations:
 - consulting with Indigenous Australian health services and communities;
 - tailoring service delivery to the needs and preferences of specific communities;
 - embedding cultural competence within the health care organisational culture, governance, policies and programs;
- > Education for health care students that incorporates cultural perspectives and experiences to facilitate health students' preparedness for working in Indigenous health and their future commitment to working for change.
 - It can lead to more open attitudes, increased awareness, more effective advocacy, a preparedness to engage with Indigenous people, and a better understanding of Indigenous health issues.
 - Field experience can make an important and positive contribution to health students' perspectives;
- > Several studies suggested that reductions in health disparities for Indigenous populations were observed when health care workers developed partnerships, eliminated bias through self-reflection, and built relationships with Indigenous people;
- > Embedding cultural competency principles within legislation or policy (as has been done in the United States and New Zealand); and
- > Internationally validated instruments that measure health service access and use, service quality, perceived discrimination, language barriers and trust of practitioners could be useful if tailored to Indigenous Australian health services (Bainbridge et al., 2015, pp. 2–3).

In summary, improvements in the health situation of Indigenous peoples will only occur if there is a “fundamental shift in the concept of health so that it incorporates the cultures and world views of indigenous peoples as central to the design and management of state health systems” (United Nations, 2009, p. 156).

To improve outcomes for remote and rural Indigenous Australians, the RFDS, and other organisations delivering healthcare to Indigenous Australians, must embrace cultural competency and embed it within clinical service delivery, ensuring clinical cultural competency. There exists the potential for cultural competencies expected of health workers providing clinical care to Indigenous Australians in mainstream health settings to be articulated in a new national framework, designed and overseen by Indigenous lead clinical experts. Just as other clinical standards of care are designed, implemented and monitored by authorised bodies, the potential for cultural competencies of health workers to also be monitored by an appropriate authorised national body warrants further consideration for the potential of such an initiative to lead to better clinical and health outcomes.

In conclusion, specific, culturally appropriate, evidence-based illness and injury prevention strategies should be reviewed, developed, adopted, and evaluated for remote and rural Indigenous Australians, taking into account the state-based services in which Indigenous Australians reside. Strategies should specifically address: injury, poisoning and certain other consequences of external causes for Indigenous Australians of all age groups; respiratory diseases in young children; pregnancy, childbirth and the puerperium in 15–34-year-old Indigenous women; diseases of the circulatory system for Indigenous Australians aged over 30 years; and mental and behavioural disorders for 15–29-year-old Indigenous Australians. Strategies should take a life-course approach, address the social determinants of health, health risk factors and other factors impacting Indigenous Australians and be delivered in a culturally competent manner. The RFDS, like other service delivery organisations, now has the opportunity to work more closely with ACCHS around cultural competency in the delivery of clinical services.

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