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Indigenous people's mobility and its impact on remote infrastructural needs: an exploratory study

Authored by

Megan Moskos, University of Adelaide
Linda Isherwood, University of Adelaide
Mike Dockery, Curtin University
Daphne Habibis, University of Tasmania
Liam Grealy, Menzies School of Health Research
Richard Benedict, University of Sydney
Mark Harris, Curtin University
Ranjodh Singh, Curtin University
Tess Lea, Macquarie University

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Megan Moskos, University of Adelaide
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Using high quality, independent evidence and through active, managed engagement, AHURI works to inform the policies and practices of governments and the housing and urban development industries, and stimulate debate in the broader Australian community.

AHURI undertakes evidence-based policy development on a range of priority policy topics that are of interest to our audience groups, including housing and labour markets, urban growth and renewal, planning and infrastructure development, housing supply and affordability, homelessness, economic productivity, and social cohesion and wellbeing.

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Acronyms and abbreviations used in this report

ABS	Australian Bureau of Statistics
AGM	Annual General Meeting
AHURI	Australian Housing and Urban Research Institute Limited
AIHW	Australian Institute of Health and Welfare
APONT	Aboriginal Peak Organisations Northern Territory
APY	Anangu Pitjantjatjara Yankunytjatjara
ARIA	Accessibility and Remoteness Index of Australia
CDP	Community Development Program
CTG	Closing the Gap
ICCH	Indigenous community-controlled housing
FIFO	Fly-in fly-out
ILOC	Indigenous Location
Legacy housing	Housing from a prior policy era
NACCHO	National Aboriginal Community Controlled Health Organisation
NBN	National Broadband Network
NSW	New South Wales
NT	Northern Territory
PWC	Power and Water Corporation
R & M	Repair and Maintenance
RAES	Remote Areas Energy Supply
SA	South Australia
SAHA	South Australia Housing Authority
SAPOL	South Australia Police
SCRGSP	Steering Committee for the Review of Government Service Provision
WA	Western Australia

Glossary

A list of definitions for terms commonly used by AHURI is available on the AHURI website ahuri.edu.au/glossary.

Statement on terminology

Throughout this report, unless referring to a type or name of an organisation or the specific words of a respondent in a quote, we have used the terms 'Indigenous Australians' or 'Indigenous peoples'. We acknowledge that the terminology used in this space is contested and that the terms 'First Nations peoples' or 'Aboriginal and Torres Strait Islander peoples' may be preferred by some individuals and groups. Further work is being undertaken to ascertain the most appropriate terminology for future use.

Executive summary

Key points

- The Indigenous population is predicted to grow by 10.4 per cent between 2021 and 2026 in outer regional, remote and very remote Australia.
- Drivers influencing temporary mobility include participation in cultural business or attendance at funerals, travel due to school holidays and seasonal weather patterns, participation in sport and leisure activities or to access alcohol outside the community. During the COVID-19 pandemic, border closures and lockdowns contributed to increased temporary mobility back to remote communities.
- Factors affecting longer-term mobility include access to housing, infrastructure, services and employment; family conflict and violence; and community unrest.
- The frequency and length of mobility is strongly influenced by policy changes enacted by government.
- Long-term mobility away from remote communities has implications for the future availability of vital housing, infrastructure and services and, ultimately, the sustainability of remote communities. Likewise, the availability of key infrastructure and services in these communities influences population movement.
- Improvements to housing, essential infrastructure, education, healthcare, aged care and employment are required to accommodate anticipated population growth.
- Increased self-determination, greater joint working, place-based approaches and needs-based funding are essential in the future development and operation of remote infrastructure and services.

Key findings

The research generates enhanced understanding of current and changing mobility patterns of Indigenous people living on Country, and improved policy strategies for Indigenous organisations, government agencies, non-government organisations, and other stakeholders in relation to housing, social services delivery and infrastructural needs in remote communities.

The findings are based on a detailed literature review, population trends and projections of ABS Census data, stakeholder consultations and qualitative evidence arising from detailed case studies of three remote communities.

Indigenous population trends and projections

Australia's Indigenous population is growing rapidly, with very high growth rates in the major cities of Australia and inner regional Australia, but with rates declining with remoteness. In outer regional and remote areas, the growth rates slow and become more concentrated in the older cohorts.

Our population projections to 2026 suggest the Indigenous population will continue to grow strongly in outer regional, remote and very remote Australia (by 10.4% between 2021 and 2026). The predicted growth in regional and remote Australia is concentrated in the older cohorts (from age 45—49 years and older), indicating a rapidly ageing Indigenous population.

Patterns and drivers of Indigenous people's mobility

Drivers influencing levels of temporary mobility include participation in cultural business or attendance at funerals, travel due to school holidays and seasonal weather patterns, participation in sport and leisure activities or to access alcohol outside the community. During the COVID-19 pandemic, measures such as border closures and lockdowns also contributed to increased temporary mobility back to remote communities.

Factors affecting longer-term population mobility include access to housing, infrastructure, services and employment; family conflict and violence; and community unrest.

The frequency and length of mobility was found to be strongly influenced by policy changes enacted by the Australian Government and state and territory governments.

Infrastructure and service delivery needs of remote communities

A two-way relationship exists between Indigenous people's mobility and remote community infrastructure and service provision. Population movement has an impact on the funding and provision of vital housing, infrastructure and services in remote communities. Long-term mobility away from communities, therefore, has implications for the future availability of these and, ultimately, the sustainability of remote communities. Likewise, the availability of key infrastructure and services—such as sufficient housing, adequate supply of water and power, and access to healthcare, aged care and community services—influences population movement.

However, the relationship between population mobility and remote infrastructure and service delivery is made more complex due to the central role that governments play in the resourcing of remote communities and how they choose to exercise this role. Despite the pivotal role of policy in shaping mobility, the population data that supports decision-making about the funding and provision of infrastructure and services may not be accurate or reflective of short-term mobility patterns.

Policy development options

The findings from our research have several implications for the future provisioning of remote community infrastructure and services.

Increased housing

The first and most obvious area required for many remote communities is more and improved housing. Proposed measures include the construction of new dwellings and temporary accommodation, the expansion of existing homes and improvements to repair and maintenance programs. Consideration of housing design, the model for remote housing, and land tenure requirements is needed. Additional staff housing is also necessary to enable remote community services to operate at full capacity.

Essential infrastructure

Improvements to the supply of power, water and telecommunications are required to support new housing development and enable people to remain in community.

Supporting ageing populations

As the population projections show, the ageing of the Indigenous population in remote communities is a critical area of need. Improvements to aged care provision and funding would support older residents to continue living in community as they age. Infrastructure should include housing provision that accords with principles of universal design, as well as provision for both respite care and residential aged care for those that are no longer able to be supported in their home.

Improved access to healthcare

It is vital to address the limited healthcare provision available within remote communities. This means improved access to chronic disease programs, maternal and child health and mental health programs. Skills development for non-Indigenous workers is necessary in the areas of cultural appropriateness and safety. Skills development and training is also required within communities to develop a local Indigenous workforce and to reduce dependence on Fly-In Fly-Out (FIFO) staff and locums. Health services in communities undertake a large amount of emergency care, but are only funded for primary care. As such, there is a need to review the funding model of healthcare provision in remote communities.

Supporting educational outcomes

Children's schooling can be interrupted by periods of mobility away from their home community. Enhanced collaboration between schools could enable students to continue with their education even when they are away from their home community. Moreover, due to high levels of student mobility, schools in remote communities are often adversely affected by current attendance-based funding models and revisions to these funding models are needed.

Employment opportunities and support

Work opportunities for remote community residents are currently limited and access to employment is a key driver of permanent mobility away from community. The development of employment and training programs would support local Indigenous people to upskill, take on employment and enable them to remain living in community if desired. Consideration is also needed regarding the reinstatement of Community Development Program (CDP) work requirements to support job training and provide additional incentive to remain in community.

Enhanced community facilities and services

Improvements to community facilities and services such as recreational activities and youth programs could provide greater engagement and incentives for people to remain in community, especially young people. Ensuring that the funding and infrastructure is available to allow for the operation of such services is an important factor for durable impact.

Temporary accommodation facilities

Both residential and temporary mobility generate a need for temporary accommodation that is safe, culturally appropriate, and which can meet the needs of diverse Indigenous groups. Short-stay accommodation is also needed for FIFO workers to support health and social service delivery.

Transport

Improvement in transport services is a critical need for remote communities. The lack of appropriate transport has implications for health and safety, affecting access to health services and transport-related morbidity and mortality. Access to transport to return to community is especially important because of its implications for urban homelessness for Indigenous populations when visitors to towns and cities lack the means to return home.

Resourcing and governance of remote community infrastructure and services

Our research highlighted the underlying resourcing and governance arrangements that are necessary to support the development and provision of appropriate housing, infrastructure and services within remote communities.

Self-determination

Greater self-determination would support the implementation of more appropriate infrastructure and services in remote communities. However, the most appropriate model for self-determination will need to be determined by each individual community and capacity building provided.

Joint working

The relationship between communities and government requires strengthening. Government agencies and services need to work in a less siloed manner to better address community issues and support transient people. Some of the difficulties are structural in the sense that different legislative frameworks make cooperation challenging, while others relate to political or funding conflicts. The range of government agencies involved in service provision, as well as efforts to provide holistic responses, make this especially relevant to the provision of infrastructure and services to remote Indigenous communities.

As well as inter-agency coordination there are cross-jurisdictional issues that need to be addressed, since substantial cross-border geographical movement occurs. Different legislative, funding, management and service delivery frameworks can create challenges, for example, in relation to information sharing. It is important to develop strategies to improve cooperation and coordination between government agencies, both within and between jurisdictions and also across different levels of government.

Strength-based approach and use of culturally appropriate language

In order to better recognise the differing needs of remote communities, a flexible and individualised approach to the planning of infrastructure and services is needed that includes active on-the-ground engagement and focuses on community strengths. It is also essential to ensure communication with Indigenous individuals and communities is undertaken in a culturally appropriate way.

Adequate funding of infrastructure and services

Future remote community funding needs to be allocated according to assessments of local need and with the extensive participation and empowerment of the Indigenous community-controlled organisation sector. In addition, longer-term approaches to the funding of remote infrastructure and services are required to ensure sustainability and improved outcomes.

Evidence-based policy that prioritises local experience

Evidence-based policy is key for the future planning and provision of remote community infrastructure and services. Policy development and implementation in this sphere must be accompanied by strong accountability and this requires systematic evaluation. Without a solid evidence base to assess progress against goals, there is a risk that inappropriate solutions will be adopted and resulting issues will become entrenched and difficult to reverse.

Data requirements and sovereignty

Accurate and more detailed information about population mobility is an essential requirement for evidence-based infrastructure and service provision in remote communities. This includes the collection of data that can capture shorter-term mobility patterns. Achieving appropriate levels of service integration within community also requires a degree of information sharing between agencies. However, the collection and use of data must be undertaken in keeping with principles of Indigenous data sovereignty. This includes ensuring data collection and use is conducted according to national standards of ethical practice for Indigenous research.

The study

This research was conducted as a standalone project: Indigenous mobility and its impact on remote infrastructural needs: an exploratory study. The research aimed to explore changes to Indigenous mobility and its impact on the planning of housing, infrastructure and services within remote communities. This work was motivated by an acknowledgement that current and future housing, infrastructure and service delivery needs of Indigenous communities are greatly affected by settlement and geographical mobility patterns.

Utilising both quantitative and qualitative research methods, this research explored changes to Indigenous people's mobility (both to and from remote communities) and the implications of this for the provision of infrastructure and services within these communities.

The research was undertaken in two sequential stages and utilised both qualitative and quantitative research methods.

Stage one comprised:

- a literature review
- quantitative population projections based on ABS Census data
- consultations with key stakeholders.

The literature review focused on patterns of Indigenous mobility and associated infrastructure needs, including a review of 'Return to Country' initiatives to contextualise recent changes to remote community populations.

Australian Census data from 2011, 2016 and 2021 was used to model population changes and generate projections for all remote Indigenous communities across Australia to 2026. We also consulted with key stakeholders to identify demographic shifts that have occurred in remote communities and the associated impacts on infrastructure needs.

In the stage two research, the findings from stage one were used to select three remote communities for detailed case study analysis of mobility patterns and demographic shifts and associated housing, service delivery and infrastructure needs. The case study approach involved interviews with key stakeholders including Australian Government and state and territory government representatives, service providers, Traditional Owners and community members. A total of 55 respondents informed this element of the research.

1. Introduction

- Current and future housing, infrastructure and service delivery needs of remote Indigenous communities are greatly affected by settlement and geographical mobility patterns.
- COVID-19 acted as a significant disruptor to patterns of Indigenous people's mobility. Prior to the pandemic, there was limited but emerging evidence of population movement away from remote communities, potentially accelerating Australian Government and state and territory government disinvestment in service delivery and infrastructure in remote communities. With the pandemic, a policy of returning to community was encouraged with new value attributed to the health benefits and cultural safety provided by remote communities.
- To plan appropriately for the future housing, infrastructure and social service needs of remote communities, better understanding of contemporary Indigenous mobility patterns is critical.
- This research adopted a mixed methods approach to examine current and projected mobility of Indigenous people from and to remote communities and the implications of this for the provision of infrastructure and services within these communities.
- Chapter two of this report presents the findings of the literature review examining recent evidence on remote population mobility and associated infrastructure and service needs.
- Drawing from an analysis of ABS Census data, chapter three then describes the results of small area population modelling and projections.
- Chapter four outlines the key themes identified from in-depth case studies of three remote Indigenous communities.
- Chapter five is the concluding section and reflects on the implications of the research findings for policy and practice development.

1.1 Mobility, infrastructure and services in remote Indigenous communities

Current and future housing, infrastructure and service delivery needs of remote and very remote Indigenous communities are greatly affected by settlement and mobility patterns. Prior to the COVID-19 pandemic, there was limited but emerging evidence of population movement away from remote communities to regional centres, alongside Australian Government and state and territory government disinvestment in service delivery and infrastructure in remote communities (Grealy 2022a; Guerin and Guerin 2018; Markham and Biddle 2018). However, within these longer-term trends in mobility, a generational distinction has been suggested. Younger people from remote communities, while wanting to maintain connection, are more likely to move to urban centres to access education and employment or to escape community regulations (Stead and Altman 2019; Taylor 2009). In contrast, older people are more likely to want to return to live on Country as they age (McGrath 2007; Prout 2018).

Long-term population change taking place in some remote communities is accompanied by shorter-term population fluctuation (Dockery and Colquhuon 2012; Habibis, Birdsall-Jones et al. 2011; Prout 2008).[1] People temporarily move both to and from remote communities, regional centres and major cities for family visits, entertainment, access to services and shops, and to meet cultural obligations (Dockery 2014; Memmott, Long et al. 2006; Memmott, Birdsall-Jones et al. 2012). In various regional centres people from remote communities may visit and remain for extended periods because their homes are inaccessible due to weather events such as flooding and cyclones (Habibis, Birdsall-Jones et al. 2011).

Short-term influxes of people into remote communities can cause considerable strain on existing infrastructure and services (Habibis, Birdsall-Jones et al. 2011). However, little is known about visits to remote communities by Indigenous people who primarily reside in urban environments or travel from other remote areas (Guerin and Guerin 2018). It is therefore difficult to predict the resource and service requirements caused by changing population numbers within remote communities (Kainz, Carson et al. 2012; Prout 2018).

Accurately measuring the long- and short-term mobility patterns of Indigenous people from and between remote communities is challenging. Accurate estimations of population numbers and, therefore, of current and future resource and service requirements are difficult (Dockery 2014; Kainz, Carson et al. 2012; Prout 2018). For example, the planning of remote infrastructure and services often relies on the use of population data drawn from the Australian Bureau of Statistics (ABS) Census. However, the ability of the Census data to fully capture patterns of population movement is limited (Guerin and Guerin 2018; Morphy 2007; Taylor, Bell et al. 2011).

1 We consider short-term (or temporary) mobility to occur when a person is absent from their usual place of residence for a period of up to six months (ABS 2021a; Goldsmith, Campbell et al. 2022). Longer-term mobility occurs when a resident is away from their usual residence for a period of over six months and is considered to be permanent if the person does not have an intention to return to their previous location.

Many remote communities have been subject to long-term underinvestment and do not have adequate infrastructure and social services to meet the needs of existing populations. Any increase in population, whether temporary or longer-term, has the potential to increase pressure on existing infrastructure and services. Large numbers of visitors can exacerbate crowding, in contexts already characterised by housing undersupply and inadequate repairs and maintenance (Clifford, Pearson et al. 2015; Fitts, Russell et al. 2020; Lowell, Maypilarna et al. 2018).

In some remote communities these issues are compounded by inconsistent and inadequate access to other essential infrastructure, such as safe drinking water, affordable energy, transportation and communications services (Clifford, Pearson et al. 2015; Drane, Vernon et al. 2020; Grealy and Howey 2020; Howey and Grealy 2021). Likewise, access to social services such as healthcare, aged care and education is often inadequate relative to need. The quality of available services is also compromised by a high dependence on FIFO workers and locum employment, high staff turnover, understaffing and inadequate funding (Arnold, Tideman et al. 2020; Bailie, McDonald et al. 2011; Fitts, Russell et al. 2020).

As the available essential infrastructure and social services are critical contributors to the social determinants of health for remote residents, 'infrastructural inequalities' (Grealy, Brooks et al. 2019) help explain why health and wellbeing indicators for remote community populations are often substantially lower than national rates (AIHW 2020). While this is recognised in Closing the Gap (CTG) targets, particularly Target 9b,[2] progress in improving health, housing and other relevant outcomes is slow. Improving responses to both temporary mobility and longer-term changes in community demographics is therefore a vital, but largely overlooked, area of policy development.

1.1.1 COVID-19 and Indigenous mobility

The COVID-19 pandemic was a significant disruptor to patterns of Indigenous people's mobility. Indigenous populations are at risk of higher rates of infection and more serious disease than non-Indigenous populations (NACCHO 2022; Stanley, Langton et al. 2021). To minimise this risk, a policy of returning to remote communities (i.e. Return to Country) was encouraged during the pandemic. Urgent efforts were made to encourage people currently away to return to their home communities, especially those sleeping rough or in crowded housing in urban and regional centres (Wyatt 2022). To protect the health of Indigenous Australians, various Return to Country programs were established or strengthened, and external access to remote Indigenous communities was restricted (Brown 2020; Crooks, Casey et al. 2020; Smith 2020).

The COVID-19 pandemic has thrown into sharp relief a contradiction in policies governing remote Indigenous communities. In the context of the pandemic, new value was attributed to the health benefits and cultural safety provided by remote Indigenous communities and homelands. Yet this urgent referencing of remote communities as key to protecting people's health (Fitts, Russell et al. 2020) occurred in the context of longer-term state and territory government withdrawal from infrastructure provision and maintenance and the provision of social services at many homelands and outstations in the Northern Territory and Western Australia. This process of 'slow withdrawal as managed retreat' (Grealy 2022a: 173) has resulted in passive encouragement by state and territory governments to residents to vacate homelands and outstations (Altman 2011; APONT 2016; Habibis, Birdsall-Jones et al. 2011) and heightened concerns about remote community residents arriving in urban centres without accommodation, exacerbating demand for existing services (Pearson, Tually et al. 2021).

2 CTG Target 9b includes the goal that: "By 2031, all Aboriginal and Torres Strait Islander households within discrete Aboriginal and Torres Strait Islander communities receive essential services that meet or exceed the relevant jurisdictional standard" (Commonwealth of Australia 2023).

The experience of COVID-19 also provided a powerful illustration of what happens when communities that have experienced long-term underfunding of housing and infrastructure face a sudden increase in demand. Prior to the pandemic, many remote communities were already struggling to meet the needs of their residents. The policy of returning to Country led to high expectations for remote communities to also meet the often diverse and complex needs of returnees, placing further strain on existing remote community infrastructure and services.

If the demography of a community changes, even in relatively small ways and for limited periods, it can quickly add or reduce demand for housing and related services (Biddle and Prout 2009; Dockery 2014; Zander, Taylor et al. 2016: 3). COVID-19 exposed how little capacity many remote communities have to cope with future population increases, whether temporary or permanent, especially the rapid increase associated with pandemics or severe weather events.

1.2 Why this research was conducted

To plan appropriately for the housing, infrastructure and social service needs of remote communities, greater understanding of Indigenous people's mobility patterns and an accurate profile of the different groups that are temporarily mobile (such as visitors and the chronically homeless) are critical (Dockery 2014; Habibis 2011; Kainz, Carson et al. 2012).

Our research sought to provide such an understanding by examining Indigenous people's mobility (both to and from remote communities) and the implications of this for the provision of infrastructure and services within these communities. Using a mixed methods approach, this study also explores how Indigenous people with connections to remote communities can be best supported to live in locations of their choosing, in particular remote communities, asking:

- What changes have occurred to Indigenous mobility patterns (both pre-and post-the commencement of the COVID-19 pandemic)? What factors are driving these changes? How has this changed the demographic profiles of remote communities?
- What are the key infrastructure and service delivery needs of remote communities? What are the current and future infrastructure and service delivery implications of changing mobility patterns and demographic distributions?
- What types of programs and resourcing are required to ensure the future adequacy of remote infrastructure and service delivery? What governance requirements will be needed?

1.3 Research methods

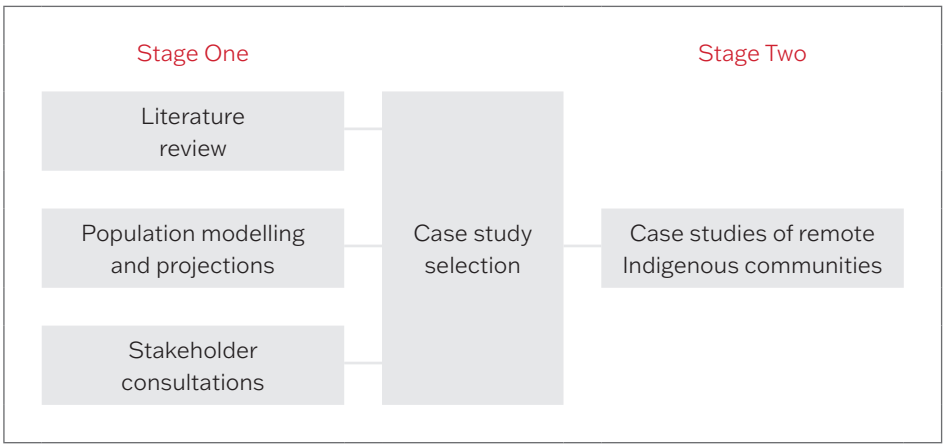
The project was undertaken across two sequential stages using both quantitative and qualitative research methods.

Stage one incorporated three research activities:

- a literature review
- population modelling and projections
- consultations with key stakeholders.

Informed by the findings from stage one, three remote Indigenous communities were purposively selected for in-depth case study in a second stage of the research. Figure 1 below shows the overall research design.

Figure 1: Overview of research



A brief description of each research activity is outlined below, with further detail provided in the relevant chapters.

1.3.1 Literature review

The literature review collated and critically examined previous research on Indigenous mobility and remote community infrastructure and service needs. Databases including Informit, Scopus, ProQuest and Google Scholar were reviewed for relevant academic research and grey literature. The key aims of the literature review were to identify:

- drivers of Indigenous mobility and any changes that have occurred to mobility patterns in and from remote communities
- demographic shifts in remote Indigenous communities
- service delivery and infrastructure needs of remote communities.

The review also examined literature pertaining to Return to Country initiatives operating in Australia. These programs play a role in supporting forms of mobility desired by remote residents while minimising the pressure of this mobility on services in regional and urban centres (Habibis, Birdsall-Jones et al. 2011). Finally, the literature review also contextualised recent changes to remote community populations and supported the selection of the three case study communities.

1.3.2 Population modelling and projections

Expanding on a method to generate population projections for small areas by age and gender (Dockery, Harris et al. 2021), a panel-specification was developed using 2011, 2016 and 2021 ABS Census data to identify key trends and generate population projections to 2026 for all remote Indigenous communities across Australia.

The data underlying the projections was also used in the selection of three case study communities (see below). Estimated trends and projections were aggregated to relevant geographical levels to inform the subsequent stakeholder consultations and interviews. A detailed explanation of the methodology used for the population modelling and projections is provided in Appendix 1.

We acknowledge limitations in the use of Census data to estimate Indigenous resident populations, and ensured that estimates and projections were treated with caution and interpreted only through corroboration with local knowledge and consultation. We also recognise that the COVID-19 pandemic impacted on population movements, which complicated the population modelling and the reliability of projections. In the first instance, this was partly controlled for by including time-specific effects (i.e. 2021 Census interaction terms with key variables).

1.3.3 Stakeholder consultations

Consultations with key stakeholders were undertaken to understand demographic shifts that have occurred in remote communities (including as a result of COVID-19) and subsequent impacts on service delivery and infrastructure needs. The research team consulted with state and territory housing departments, housing providers, and Indigenous community-controlled organisations in the early phase of the project to ensure that current on-the-ground knowledge informed the research and the selection of case study sites.

Additional aims of the stakeholder consultations were to:

- ensure that the nominated communities provided support and permission for the research to be conducted
- advise on the case study methodology (such as who we should consult with about key infrastructural concerns at the local level).

1.3.4 Remote community case studies

Informed by the results of stage one of the research, three remote communities were purposively selected to serve as detailed case studies of the mobility patterns and demographic shifts occurring within specific remote communities and associated housing, infrastructure and service delivery needs.

Case study communities were selected based on agreement across multiple sources of evidence of the changes that had been occurring to their populations over the previous decade (from 2011 to 2021). One community was selected where the population had increased, one where the population had decreased, and one where the population was considered stable.

The case studies involved interviews with key stakeholders and community members in each community with a purposive sampling approach used to identify relevant stakeholders to inform the research. Respondents included Australian Government and state and territory government representatives, service providers, Traditional Owners and community members. A total of 55 respondents informed the research including:

- Community A – 26 respondents
- Community B – 13 respondents
- Community C – 16 respondents.

The case study interviews aimed to understand:

- perceptions of past and projected mobility patterns
- drivers behind mobility patterns
- existing infrastructure and service provision (including any gaps) and how population change has affected service delivery
- future infrastructure and service needs.

With the consent of respondents, interviews were recorded and transcribed verbatim by a professional transcription service. Nvivo 12 was used to assist with the management, organisation, coding, retrieval and analysis of the qualitative data.

The analysis of the interview data was conducted using the Framework approach, a form of qualitative thematic analysis particularly suitable for applied social policy research (Ritchie and Spencer 1994). Following familiarisation with the data through the reading of the transcripts, a thematic framework was developed and agreed upon jointly by the research team. The interview transcripts were then coded according to this thematic framework. Key themes were developed and refined throughout the data analysis to enable further emergent categories to be identified. Following the completion of the qualitative data analysis, the research team met again to discuss and confirm the veracity of the identified key themes. We were then able to compare each of the three communities to identify similarities and differences in experiences pertaining to mobility, infrastructure and services.

Ethical approval for the study was received from The University of Adelaide Human Research Ethics Committee.

1.4 Structure of the report

The following three chapters outline the main findings from the research. Chapter two presents the findings of the literature review examining remote population mobility and associated infrastructure and service needs. Drawing from an analysis of ABS Census data, chapter three then describes the results of the population modelling and projections. Chapter four outlines the key themes identified from the in-depth case studies of three remote Indigenous communities. Finally, chapter five integrates the key findings from the various research activities to answer the three research questions posed by the project. In addition, the implications of the research for policy and practice development are discussed along with potential areas for future research.

2. Literature Review

- Existing evidence on patterns of Indigenous mobility suggests that while the relative proportion of Indigenous people living in remote communities is declining, substantial numbers of the Indigenous population will sustain their affiliations to and continue to live on Country.
- Housing, healthcare, education, employment opportunities and internet access all impact long- and short-term mobility but there is relatively little information on the direction of the relationship.
- The most commonly used dataset for enumerating population change is the Australian Census. However, its accuracy in relation to Indigenous populations is compromised by a number of factors, especially in remote areas.
- There is a need for better understanding of the demographic shifts occurring in remote Indigenous communities so that capital works and other infrastructure programs can be based on an objective assessment of current and future demand, rather than on ideological criteria. History shows that the dominance of the latter in policy decision making has been detrimental for remote Indigenous communities, resulting in the sub-optimal use of valuable resources.

2.1 The policy and service delivery context

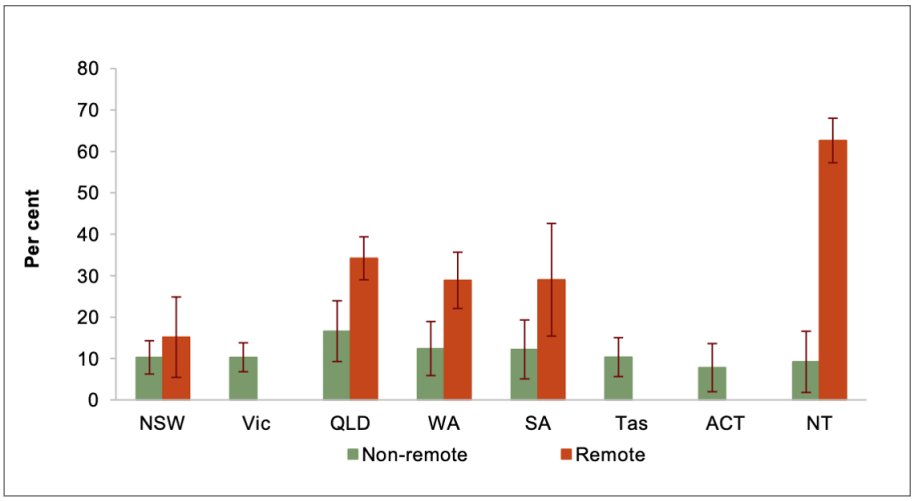
Recurrent failure to recognise the distinctive features of remote communities is key to the history of inadequate and under-serviced housing in these locations (Habibis, Phillips et al. 2019; Lea 2020). As well as issues relating to small, dispersed populations, distance and harsh climates, this underservicing of remote communities is related to waxing and waning histories of policy attention and neglect, high service delivery costs, inadequate program funding and poor service coordination. Many communities are also characterised by crowded housing, poorly maintained essential infrastructure, fluctuating household compositions, and intersecting problems of unemployment and chronic health conditions. The extraordinary resilience and determination of residents to maintain their connection to Country and kin is also held in common.

2.1.1 Crowding and housing infrastructure

According to the 2021 Census, 15.4 per cent of the total Indigenous population in Australia lives in a remote or very remote location, comprising 150,800 individuals (ABS 2021a). Most of these communities are in northern Australia (see Figure 4), with many located in the arid zones of central Australia and tropical areas of the Far North, both of which are considered susceptible to climate change. While land repossession was supported by Australian Government policies from the 1970s, there was little systematic attention given to planning for ongoing housing and infrastructure funding and maintenance regimes. Governments were ill-prepared for the additional costs of remote service provision (Patterson 2017), resulting in significant government neglect and underfunding. As well as inadequate, inappropriate, and substandard housing and infrastructure, most remote communities lack facilities for visiting kin that we would expect to find in other Australian country towns, such as short-term accommodation options catering to tourism. This places pressure on homes that may already be crowded (Lowell, Maypilarna et al. 2018; Memmott, Birdsall-Jones et al. 2012).

Approximately 20 per cent of Indigenous individuals live in crowded homes, rising to around 40 per cent in remote areas (see Figure 2). Rates are highest in remote Northern Territory communities, followed by remote areas in Queensland, Western Australia and South Australia (SCRGSP 2020: 10.6). While efforts to reduce crowding in remote communities has had some success (SCRGSP 2020), improvements are slow and incremental.

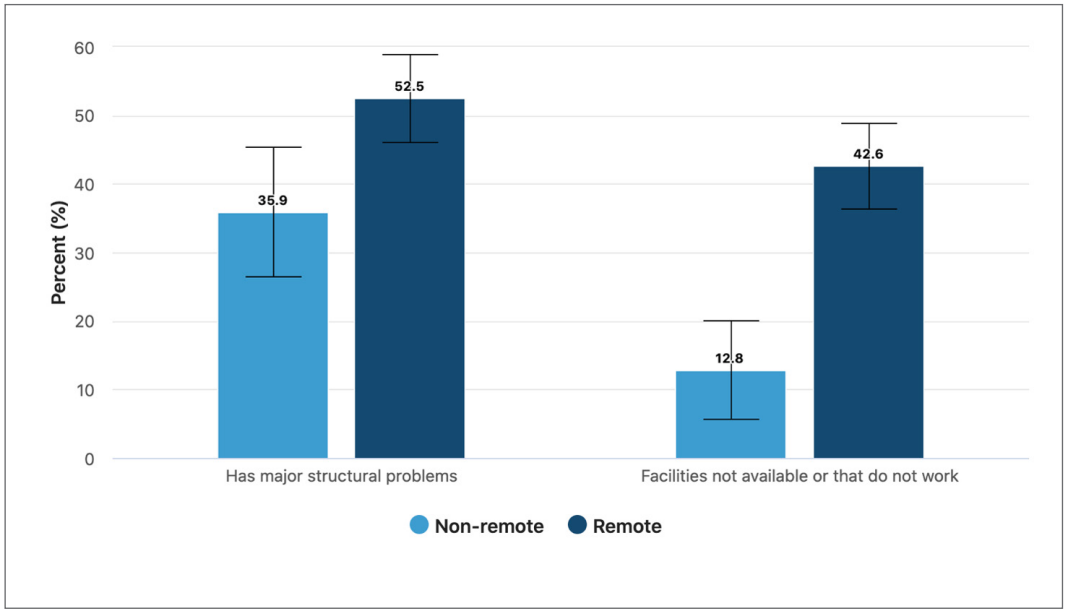
Figure 2: Rates of overcrowding for Indigenous people by jurisdiction and remoteness area, 2018–19



Source: SCRGSP 2020: 10.6

In addition to health, safety and welfare impacts, crowding places stress on buildings and domestic health hardware. This adds to the disproportionate number of dwellings with major structural problems in remote communities. Approximately one-third of households in remote communities, and over half of overcrowded households in remote communities, live in dwellings with major structural problems, with such problems becoming more prevalent in recent years (see Figure 3). Structural issues include rising damp, sinking or moving foundations, major cracks in walls or floors, dysfunctional plumbing and walls that are not straight (ABS 2022; SCRGSP 2020: 10.25).

Figure 3: Proportion of overcrowded Indigenous households with major structural problems by remoteness, 2018–19



Source: SCRGSP 2020: 10.25

As well as the wear and tear that results from crowding, the deteriorated condition of housing results from poorly-built legacy housing, housing which is poorly designed for the geographical conditions, and inadequate repair and maintenance programs which frequently operate at chronically suboptimal levels (Lea, Grealy et al. 2021; Grealy, Su et al. 2023).

Housing infrastructure includes clean drinking water, adequate waste and sanitation facilities and safe and affordable energy, all of which are essential for health and wellbeing (Clifford, Pearson et al. 2015; Grealy and Howey 2020; Drane, Vernon et al. 2020). Housing maintenance programs typically attend to domestic health hardware within the fence line and from the water and electrical meters to the house. Beyond those boundaries, but also within them in areas such as yards, environmental health programs may attend to the maintenance of house function (Grealy, Lea et al. 2022). In remote communities, funding for housing maintenance programs is typically inadequate, with most repairs undertaken in a reactive mode, and environmental health programs are inconsistently present (Grealy 2021; Lea and Pholeros 2010). This contributes to a lack of safe and reliable housing. There has been no national survey of infrastructure on remote communities since 2006 (SCRGSP 2020: 10.22), but there is evidence of significant problems (Department of Housing and Community Development 2017). In 2018–19, approximately 15 per cent of households had inadequate facilities for washing clothes and bedding, while eight per cent had inadequate facilities for washing people. Over 20 per cent had inadequate food storage and preparation facilities (ABS 2022; SCRGSP 2020: 10.22-10.23).

There are also problems with power supply due to disconnections and high costs (Lea, Grealy et al. 2021). A recent survey found more than 90 per cent of households in Alice Springs town camps had experienced power cuts over a 12-month period (Longden, Quilty et al. 2022). In South Australia, the prepayment of household electricity has recently been introduced in the Anangu Pitjantjatjara Yankunytjatjara (APY) Lands and other Far West Coast Aboriginal communities in South Australia, generating concerns about the normalisation of energy poverty and household disconnection (Grealy 2022b).

In Western Australia, a 2015 audit of essential infrastructure to 84 of the larger remote Indigenous communities (Office of the Auditor General Western Australia) found:

- Drinking water often does not meet Australian Drinking Water Guidelines.
- One in five communities exceeded safe levels for nitrates or uranium in drinking water.
- Testing of wastewater systems was irregular and incomplete, with 37 overflows reported between July 2012 and June 2014.
- Poor service coordination was adversely affecting the health and safety of communities.[3]

This audit was only conducted on larger communities serviced by Western Australia's Department of Communities. Smaller remote communities, reliant on more ad hoc servicing arrangements, probably have significant problems but remoteness and size means these are hidden from public attention (Grealy and Howey 2020).

2.1.2 Implications for climate change risks

The inadequacy of housing and infrastructure in remote communities is especially concerning in the context of climate change. Remote Indigenous communities are at the frontline of the destructive impacts of rising global temperatures and are experiencing its effects early and disproportionately. Current housing and infrastructure are already unable to provide consistently safe and comfortable indoor environments, let alone cope with higher temperatures sustained over longer periods (Lea, Grealy et al. 2021; Longden, Quilty et al. 2022). Few houses have domestic solar power systems, most are poorly insulated, and some have only ceiling fans. Those with air-conditioning units face difficulties related to energy supply and maintenance, where such systems have been supplied by governments and not purchased at the direct expense of residents (Grealy and Lea 2021). The combination of low income, low quality, poorly insulated houses and energy instability are a major health risk with people often having to choose between power and food (Quilty, Frank et al. 2022).

3 For example, an Australian Government funded solar system had been installed but could never be connected because it was incompatible with the available power system. Other agencies sometimes carry out capital works but poor coordination with the Department of Housing means the essential services required to support them are often inadequately planned (Office of the Auditor General Western Australia 2015).

There is scant research on how climate change will impact on both long- and short-term population mobility in remote Australia. Qualitative research in northern Australian communities, including Ngukurr and Maningrida in the Northern Territory, found some perceptions of changing climate patterns amongst local Indigenous residents, including unseasonal growth patterns and an increase in cyclone activity and droughts although this was not always attributed to climate change (Bird, Bell et al. 2013). Young people are likely to be more adaptive to climate change so that populations with a higher proportion of young, unpartnered men are more likely to experience outward movement, while those with higher proportions of older, partnered individuals, especially women, are likely to maintain more stable populations. Analyses of data from Maningrida and Ngukurr showed that Maningrida's relatively young population mean environmental stress is associated with higher levels of outward migration, while Ngukurr's older population is associated with higher levels of stability, although local mobility between the township and surrounding communities was common (Bird, Govan et al. 2013). Wujal Wujal in the Cape York region of Queensland has a young age profile similar to Maningrida and is predicted to experience more outward migration in the face of climate change. Broome, on the other hand, is likely to grow in significance as a regional centre, attracting migrants and visitors from smaller communities across the Kimberley region of Western Australia (Bird, Govan et al. 2013).

2.1.3 Impact on health and wellbeing

Indigenous people living in remote areas have a life expectancy that is six to seven years lower than Indigenous residents of major cities. The housing, infrastructure and social services typical of remote communities is a partial explanation for this discrepancy (AIHW 2020: 21). Approximately 50 per cent of adult Indigenous people in Australia experience a high burden of cardiovascular disease, kidney disease or cancer, with almost one-quarter experiencing two or more of these chronic conditions (Smith 2020). Indigenous people are one-and-a-half times more likely to die from environmental health diseases than non-Indigenous people, and despite efforts to address the causes of this, rates remain largely unchanged (SCRGSP 2020: 10.14). Hospitalisation rates for some environmentally-based diseases, including bacterial disease, influenza and pneumonia, have increased by nearly 40 per cent since 2010–11 (SCRGSP 2020: 10.16).

This disparity also occurs because of poor access to health and mental health services, with access to other essential social services such as education also limited. Service access and quality is compromised by high staff turnover, understaffing, a reliance on FIFO workers and inadequate funding (Arnold, Tideman et al. 2020; Bailie, McDonald et al. 2011; Fitts, Russell et al. 2020). Limited access to culturally appropriate service provision, including Indigenous workers, is a further barrier to improved health and wellbeing outcomes (NACCHO 2022).

2.2 Policies affecting remote communities

Communities benefit and suffer in different ways and unequally from government interventions. The geographic remoteness of many Indigenous communities in Australia from mainstream economies, alongside challenging environmental conditions associated with their locations, increases the potential impact of state and territory government interventions. Governments both create and impede sustainable development in remote communities, and the history of arbitrary intervention, political short-termism and policy turnarounds demands careful scrutiny (Lea, Grealy et al. 2021; Grealy 2022a). This section examines how policy has shaped the establishment of housing and infrastructure in remote communities and the impact this has on settlement and mobility patterns of Indigenous people living in remote communities.

The problem of inadequate housing and infrastructure has long been recognised in Australian Government policy. A 2017 government review of the effectiveness of efforts to improve housing and infrastructure in remote communities found that at least 5,500 additional dwellings would be needed by 2028 (Commonwealth of Australia 2017). However, support for housing and infrastructure in remote communities has been characterised by significant periods of neglect, alongside limited and patchy government investment. The period 2008–18 saw the National Partnership Agreement on Remote Indigenous Housing undertake a major capital works program to reduce crowding on remote communities under a partnership between the Australian Government and state and territory governments. This resulted in a reduction in crowding in remote Indigenous communities from 48 per cent to 38 per cent between 2008 and 2014–15 (ABS 2016). However, the program was limited in scope, directing investment into a number of larger population centres, with the aim of drawing people in from smaller communities to live there. Consequently, new builds and refurbishments were not always delivered where they were most needed or desired (Habibis, Phillips et al. 2016).

The period from 2015 to 2020 also saw the Australian Government attempt to withdraw from its historical role in supporting remote Indigenous communities, making the argument that housing and essential infrastructure are a state and territory government responsibility. In 2015, Australian Government funding for the supply of municipal services and power and water infrastructure to remote communities in a number of jurisdictions ended (Office of the Auditor General Western Australia 2015). In 2018, the Australian Government announced it would limit capital works and refurbishment funding for housing to the Northern Territory, with no commitment beyond 2023. This led to concerns that some smaller communities in Western Australia and the Northern Territory would be effectively shut down (Habibis, Phillips et al. 2016; Wahlquist 2016; Grealy 2022a).

The previous two decades have seen the severe run-down of the Indigenous community-controlled housing (ICCH) sector, as state and territory governments introduced a 'public-housing like' model of service delivery. Today, New South Wales and Victoria are arguably the only jurisdictions with a sizeable ICCH sector (Joint Council on Closing the Gap 2022).

This period of neglect changed somewhat in 2022 with the election of a Labor government and changes to CTG targets. Improving housing is now one of 19 national socio-economic targets. The goal is for people to secure appropriate, affordable housing aligned with their priorities and need, with a target of 88 per cent of the Indigenous population to be living in appropriately sized housing by 2031 (Joint Council on Closing the Gap 2022). An additional target is to have all Indigenous householders receive essential services that meet or exceed the relevant jurisdictional standard or that which applies to the town they live near (Joint Council on Closing the Gap 2022). The Australian Government has also renewed its commitment to remote communities, including homelands, with funding of $200 million for the repair, maintenance and refurbishment of housing. In addition, the intensity of need in the Northern Territory has been recognised with a $1.1 billion investment under the National Partnership for Remote Housing Northern Territory, for housing upgrades, extensions and new builds (Joint Council on Closing the Gap 2022).

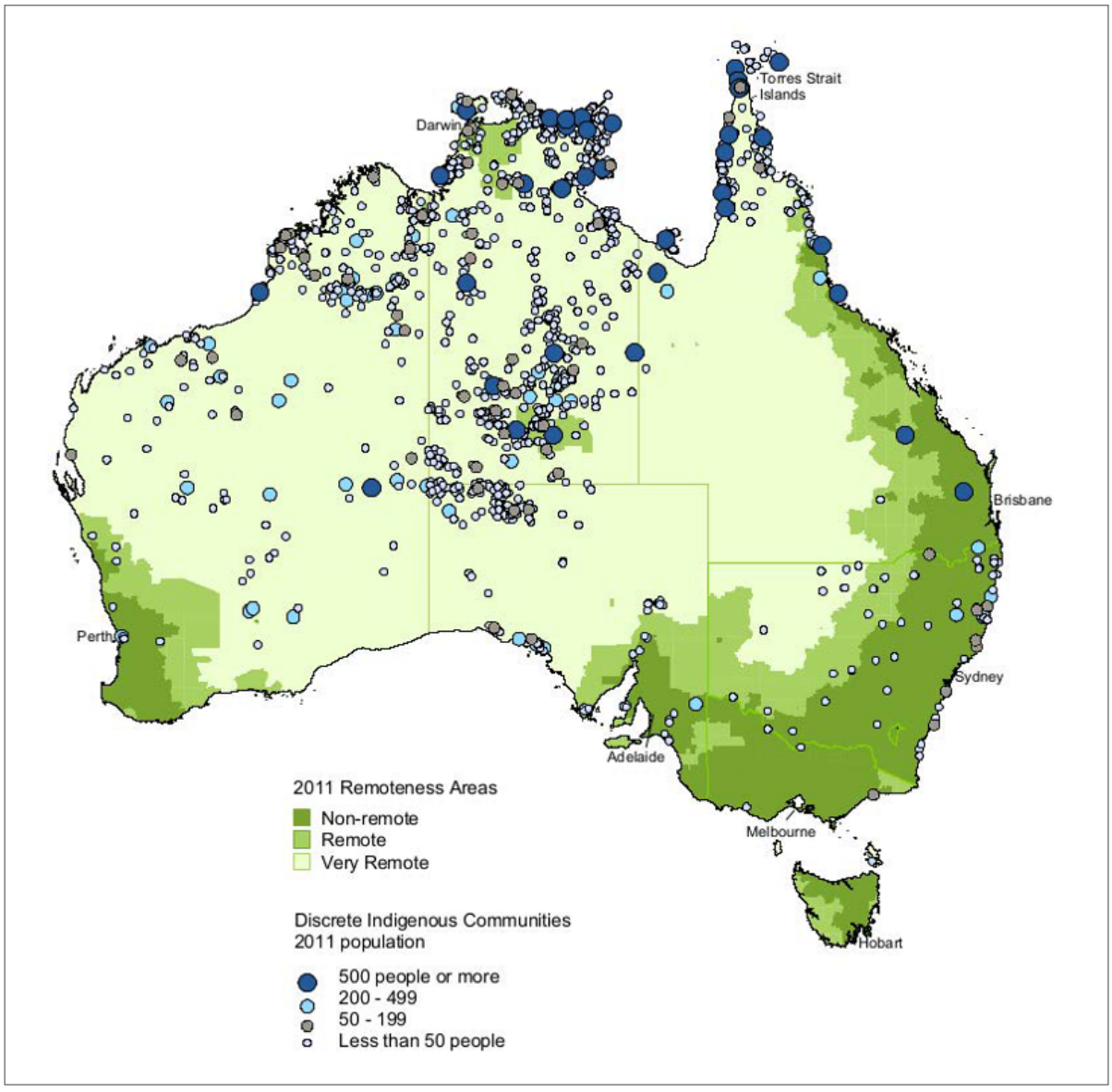
The location of many remote Indigenous communities in areas most likely to receive the earliest impacts of climate change also demands policy attention. Despite this, there has been little policy development in this area (Lea, Grealy et al. 2021). The CTG Aboriginal and Torres Strait Islander Housing Strengthening Plan acknowledges the need for funding to reflect this risk and the higher costs of housing supply, design, maintenance and enabling infrastructure (Australian Government 2022), but this is not reflected in partnership agreements with the state and territory governments, and there seems little acknowledgement at state and territory level.

Growing the Indigenous community-controlled service sector is also a key policy plank of the current Australian Government, including greater Indigenous control of housing and infrastructure. However, progress is slow, with concerns about the speed and extent of transfer to community control (Dick 2022; Gooley 2022). These developments require substantial structural and systemic change in how services are delivered and managed but there is little evidence that this is occurring. Unless this is managed well by both governments and Indigenous community organisations, and also funded appropriately, there is a risk that promised improvements will not materialise, and current issues may even become more entrenched (Grealy and Howey 2020; Grealy 2022a).

2.3 Demographic changes in remote Indigenous communities

In any location, effective housing provision requires an accurate account of how population movement impacts on need, both now and into the future. Remote communities vary considerably according to factors including the extent and quality of service provision, population size, language and family group, land tenure and governance arrangements, community capacity and distance from service centres. While most communities are permanent, some are temporary, occupied seasonally or according to the requirements of ceremony and law. Figure 4 shows the distribution of discrete Indigenous communities, including their location predominantly in coastal and desert regions of central and northern Australia.

Figure 4: Discrete Indigenous communities by size and remoteness, 2011

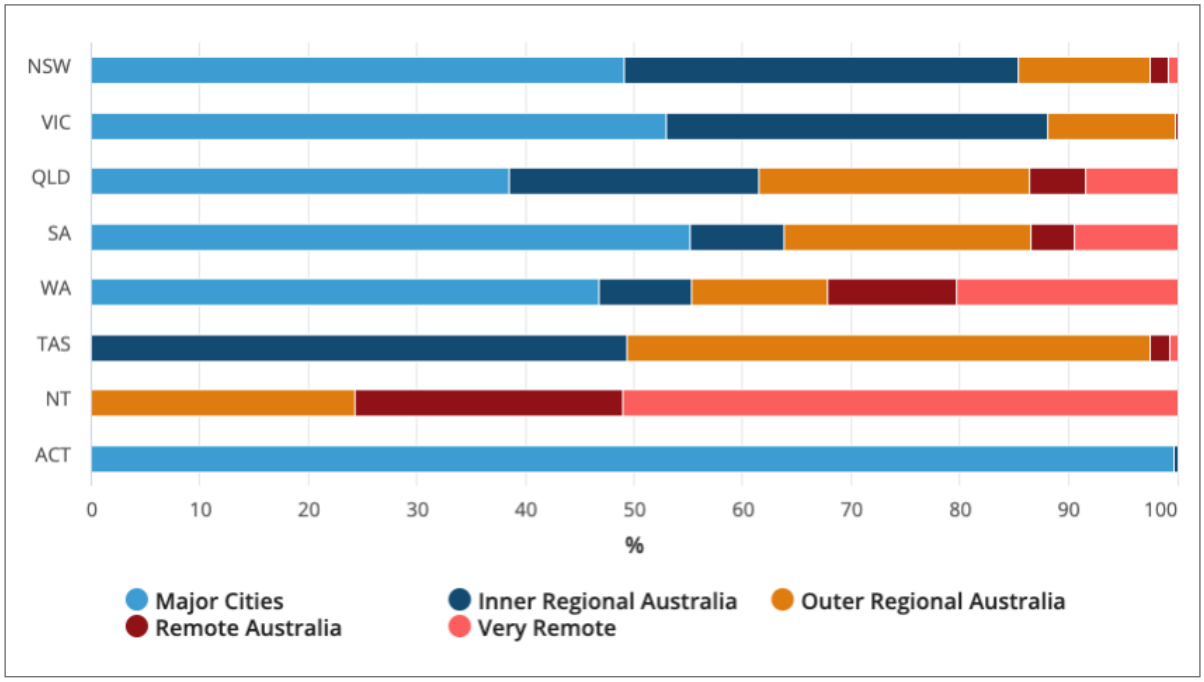


Source: Productivity Commission (2017: 267)

Queensland communities are geographically concentrated in the Cape York Peninsula and include relatively few very small remote communities. The Northern Territory has the highest percentage of Indigenous people living in remote areas (see Figure 5) and also the largest number of communities, dispersed across the jurisdiction, featuring a high proportion of legacy housing. South Australia has similar problems with legacy housing and although there are fewer remote communities than in the Northern Territory, those that exist are very small, and located in extremely remote areas, with long travel times between them.

Like places everywhere, remote Indigenous communities are dynamic entities, changing in size and characteristics, partly in response to changing policy environments but also due to demographic shifts. The most commonly used dataset for enumerating population change is the Australian Census. However, its accuracy in relation to Indigenous populations is compromised by a number of factors, especially for those residents in remote areas (Dockery and Colquhuon 2012; Taylor, Wilson et al. 2021).

Figure 5: Indigenous population distribution by state and territory by remoteness, 2021 (%)



Source: ABS (2021b)

Nationally, the Indigenous population in Australia is projected to grow at a substantially higher rate than the non-Indigenous population, from 798,000 in 2016 to 1.89 million in 2051. This is due to higher rates of fertility, increasing levels of identification as Indigenous, and high rates of Indigenous and non-Indigenous partnering (with high rates of the children born in these relationships identifying as Indigenous). Most of this growth will take place in cities, with Indigenous populations following the same trajectory as non-Indigenous populations in their long-term trend towards urbanisation (Markham and Biddle 2018).

Census data also indicates a shift in the geographical distribution of the Indigenous population from north and west to southern and eastern Australia. Areas with the largest growth are Brisbane, the New South Wales central and north coast, and Sydney-Wollongong, with Kununurra (Western Australia) and Alice Springs (Northern Territory) showing the largest declines. In some locations, there has also been a decline in the smallest communities, including homelands and outstations in the Northern Territory (ABS 2018; Markham and Biddle 2018; Taylor and Dyrting 2019). This may be the result of pull factors following recent improvements to infrastructure and service provision in larger population centres, as well as the result of uncertainties about continued funding for smaller communities (APONT 2017; Habibis, Phillips et al. 2015; Grealy 2022). At the same time, because natural population growth more than offsets net migration, the Indigenous population is set to rise considerably in remote areas, especially in semi-arid and savannah zones (Dockery 2014).

2.4 Temporary population mobility: patterns and motivations

2.4.1 Temporary mobility and homelessness

Indigenous relationships to place are distinctive and include voluntary, culturally sanctioned geographical movement, as well as movement that is the result of less voluntary push factors (Dockery and Colquhuon 2012; Habibis 2011; Prout 2008). While this distinction can be empirically blurred, it is useful to understand the wide range of motives and circumstances associated with these activities (Memmott, Long et al. 2003b). Voluntary movement reflects both traditional and contemporary practices. This includes journeys to visit family and socio-ceremonial activities such as caring for Country and cultural ceremony (Memmott, Long et al. 2004; Morphy 2007; Prout 2008). Less voluntary movement includes travel to escape crowded homes and weather events such as cyclones, fires, heat waves and flooding as well as incarceration and its after-effects (Taylor, Payer et al. 2018). The limited services available in remote communities also necessitate travel to access health and social services, to pursue work and education and for entertainment (Taylor and Bell 2004).

The term 'temporary mobility' describes geographical movements that are short-term and do not involve a change of usual residence. Some of this movement is predictable, such as that related to seasonal flooding and excessive heat, while some is irregular and unpredictable such as travel away from communities experiencing conflict or to visit relatives. While journeys can range from days to months, the relatively short absence is one of the characteristics that distinguish temporary mobility from residential mobility where travel is long-term and results in a change of usual residence (Zander, Taylor et al. 2016).

In their efforts to sedentarise Indigenous populations, Australian governments have framed Indigenous mobility practices through discourses that construct temporary mobility as problematic because of its association with vulnerability (Dockery 2014; Donohue and McDowall 2021). However, government policies are a key driver of mobility. Low income, housing exclusion, inadequate transport infrastructure and racism can result in population movement and subsequent homelessness and other inequitable outcomes for remote Indigenous residents (AIHW 2022; Cunningham 2022; Habibis, Birdsall-Jones et al. 2011; Kinchin, Jacups et al. 2016). The high visibility of homeless Indigenous people in urban centres is also associated with moral panics due to perceptions of public nuisance and disorder (Palmer 2022). The destabilisation of social housing tenancies that can occur as a result of visitors is partly due to restrictive tenancy rules that facilitate penalties and eviction (Habibis 2011; Moskos, Isherwood et al. 2022).

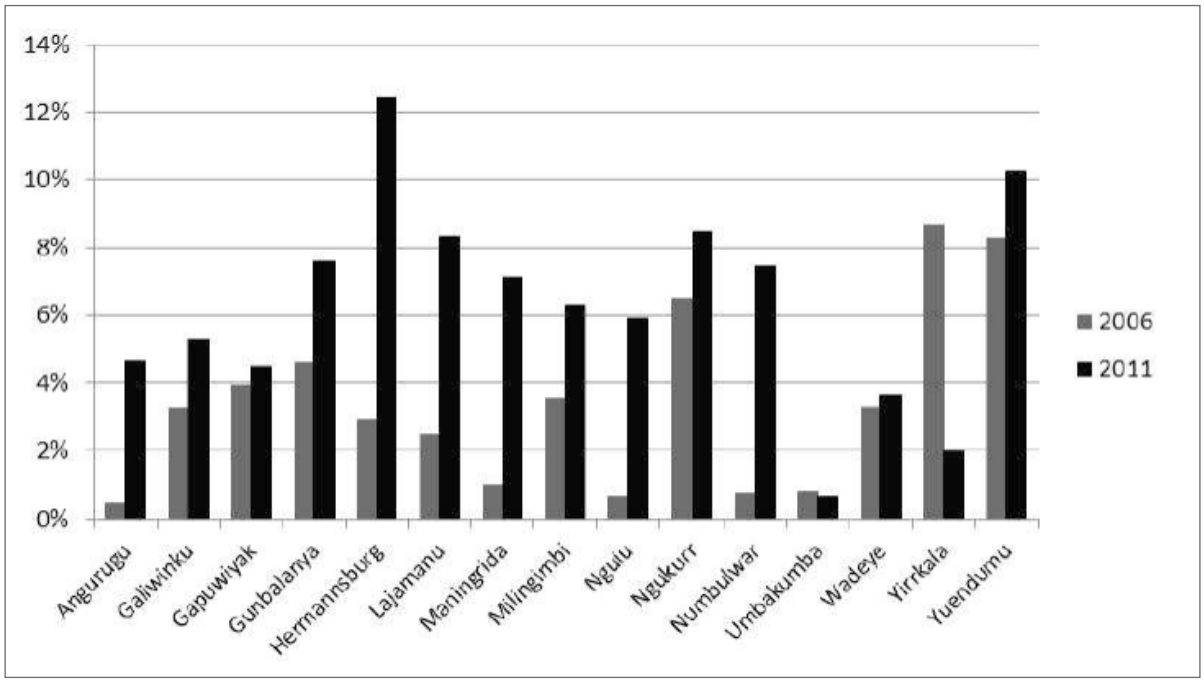
The association between Indigenous temporary mobility and homelessness is complex, resulting in diverse views on what the problem is and what the solutions should be (Pearson, Tually et al. 2021). For example, within non-Indigenous populations public space dwelling is seen as a form of homelessness, but for some Indigenous people it may be understood as normal practice (Memmott, Long et al. 2003). There is a similar subjective element to experiences of crowding, with some commentators arguing crowding measures should take subjective experience into account (Dockery, Moskos et al. 2022). Memmott, Long et al. distinguish four different groups of public space dwellers, defined according to how long they stay, whether their residence is voluntary, whether they are able to return to home communities, and whether their intention is to stay in the city or return home (Memmott, Long et al. 2003a). Policy responses must be calibrated to the varying needs of these different groups. However, while there is some recognition of temporary mobility as a policy issue, it has resulted in little responsiveness or adaptation within mainstream housing and homelessness systems (Habibis 2011).

2.4.2 Patterns of temporary mobility

Gender and age are the main demographic characteristics determining who is most likely to be away from home. Young people, especially young men, single people and women are the most mobile demographic categories. Older women and men, as well as babies, are among the least mobile groups, although older men travel away more than older women (Taylor, Bell et al. 2011; Zander, Taylor et al. 2016).

Nationally, almost seven per cent (6.9%) of the Indigenous population was away from home on the night of the 2011 Census, compared with 4.4 per cent of the non-Indigenous population (Zander, Taylor et al. 2016). There is considerable variation between communities. In the Northern Territory, the proportion of individuals absent ranged from 12.5 per cent for Hermannsburg to less than 1 per cent for Umbakumba (see Figure 6) (Zander, Taylor et al. 2016). Levels of mobility also change over time, with the same study showing that between the 2006 and the 2011 Census dates mobility increased in all but one location. Most of this movement occurred within the Northern Territory, with about 1 per cent involving movement to another state (Taylor and Dyrting 2019).

Figure 6: Proportions of Indigenous people away from home on Census night 2006 and 2011 in 15 Northern Territory communities



Source: Zander, Taylor et al. (2016)

Analysis of Census data shows that while migration is predominantly from smaller communities to larger, urbanised population centres, there are also movements back to remote areas amongst older age groups (Dockery and Colquhuon 2012).

An important, although largely unrecognised, contribution to the temporary mobility of remote Indigenous populations is that of incarceration. One study estimates that, on average, between 4 per cent and 14 per cent of Indigenous men may be away from their community in prison at any point in time (Taylor, Payer et al. 2018). The population churn this creates is further increased because sentences tend to be relatively short, there is a high rate of re-incarceration and individuals generally wish to return home after imprisonment (Taylor, Payer et al. 2018). However, limited resources, distance and interpersonal issues create barriers, placing individuals exiting custodial institutions at high risk of homelessness.

2.5 The relationship between population mobility and access to service and infrastructure provision

Governments play a critical role in infrastructure and service provision in Australia, especially for remote communities. Nationally, state and territory governments have primary responsibility for land use and services, with high levels of planning, regulation and control of infrastructure, as well as essential service provision. How they exercise this role directly affects population change since inadequate provision will limit growth, while sufficient supply ensures housing and service infrastructure is adequate and can also encourage movement to the area (Mulder 2006).

Small populations, remoteness from regional centres, the enhanced role of the Australian Government, the absence of housing markets and the politicisation of Indigenous affairs make the situation in remote communities more complex. Population thresholds used to estimate need are based on assumptions that may not be relevant, such as the availability of alternative sources of supply in nearby towns. There are also complications associated with increasing the supply of remote housing, such as land tenure arrangements and the high costs and challenges of remote construction and maintenance.

There are many questions about the relationship between the supply of housing and infrastructure on remote communities that are not well understood. Analysis of survey data found that housing and family were the most significant reasons for population movement (Taylor and Kinfu 2006 in Dockery and Colquhuon 2012). However, relatively little is known about the impact of increased, decreased or inadequate housing supply or changes in infrastructure, on either long-term or temporary mobility.

There is some evidence that improved housing reduces temporary mobility. Analysis of 2011 Census data for 15 Northern Territory communities that had been prioritised for new houses found that the more new houses a community obtained, the less likely people were to be away on Census night. For example, for the community of Hermannsburg, if 100 new houses were built, overall mobility was predicted to decrease by 46 per cent (Zander, Taylor et al. 2016). Given the long-term nature of public housing rental tenancies in remote communities, and the level of unmet demand, this is arguably in accord with Mulder's finding that home ownership decreases residential mobility (Mulder 2006).

The same study found that quality healthcare, access to government-subsidised community employment and good internet access were all associated with higher levels of mobility (Zander, Taylor et al. 2016). Explanations include the possibility that the availability of well-paid jobs within the community increase access to private vehicles so larger numbers of individuals travel, people are healthier and more able to travel. Alternatively it is possible the communities studied had a high level of health need resulting in more people away receiving treatment. The availability of government-subsidised community jobs was also correlated with absence from home, although the reasons for this are not clear. One well established factor promoting mobility is internet access due to increased knowledge about opportunities for social connection with distant family and friends (Zander, Taylor et al. 2016).

Surprisingly, beyond these factors, differences in service provision were found to have no impact on temporary mobility. This includes education and employment services, which demonstrated no effect on temporary mobility in either direction. This is supported by other research (Kinfu 2005 in Dockery and Colquhuon 2012) and, while further research is needed, it may be that expanding these services will not impact temporary mobility in either direction (Zander, Taylor et al. 2016).

2.6 The impact of COVID-19 on population mobility and housing and infrastructure needs

The inadequacy of housing and service infrastructure in remote communities was brought into sharp relief by the experience of the COVID-19 pandemic (Australian Government 2022). The outbreak brought an immediate response from Indigenous individuals and Indigenous community-controlled organisations due to their experience of the 2009 H1N1 influenza epidemic. Under the National Action Plan there was inadequate attention given to the higher risks of infections and serious disease within Indigenous populations with the result that their death rate was more than four times that of non-Indigenous Australians (Crooks, Casey et al. 2020; NACCHO 2020).

In early March 2020, a meeting between the peak Indigenous health organisation, the National Aboriginal Community Controlled Health Organisation (NACCHO), and the Australian Government resulted in the establishment of a national Indigenous advisory group based on principles of shared decision-making and co-design (NACCHO 2020; Smith 2020). An Australian Government funding commitment of $123 million over two years followed shortly thereafter. As well as enhancing health, education and social support programs to reduce the need for unnecessary travel, Northern Territory Land Councils were provided with $10 million to address immediate infrastructure needs and to support residents to return to communities. This included help with travel expenses, additional temporary accommodation and portable water tanks (NIAA n.d.; NACCHO 2020).

While remote communities were safe havens in the protection they provided from the risks of COVID-19, the inadequacy of service delivery and infrastructure in remote communities was rapidly apparent. Increased numbers of residents meant increased crowding, making quarantine and isolation difficult. It compromised biosecurity measures due to pressure on washing, bathing and ablution facilities. Communities lacking safe, potable water faced an increased risk of infections (NACCHO 2022).

The high burden of chronic disease in remote communities means primary healthcare services typically operate at full capacity (Australian Government 2020). Increased populations in remote communities highlighted the inadequacy of remote healthcare services, especially the limitations of a FIFO workforce and substandard transport services (NACCHO 2022; Follent, Paulson et al. 2021). Similar concerns applied to mental health services which were placed under severe pressure as a result of heightened rates of psychological distress due to COVID-19 and the increase in remote community populations (Dudgeon, Derry et al. 2020).

Domestic and family violence support was also lacking. An online survey of 15,000 Australian women about their experience of domestic violence during the initial stages of the pandemic found it coincided with an escalation of violence and abuse (Boxall, Morgan et al. 2020). Women visiting communities and who are vulnerable to family violence were especially at risk because they were away from their usual support networks. Many remote communities have limited phone coverage, little access to emergency services and shelters may be many miles away (Brown 2020; Boxall, Morgan et al. 2020).

The dependence of remote communities on transport of food and other essential supplies such as blankets, nappies and sanitary products was also an issue. Many households do not have working fridges or freezers so stockpiling food is not possible. During the pandemic and associated community lockdowns, there was a high dependence on community stores. However, groceries at community stores are often expensive, creating problems of food poverty and nutritional deficiency (Donohue and McDowell 2021; Parliamentary Library 2020; NACCHO 2022).

Inadequate information technology (IT) services were another area of concern highlighted by the pandemic. Communities without broadband found managing the COVID-19 virus especially difficult (Smith, Kearney et al. 2020). In emergency scenarios, communities depend on IT services for communication and to coordinate responses so communities that lack this are at risk (Crooks, Casey et al. 2020; Fitts, Russell et al. 2020; NACCHO 2022).

2.7 Return to Country initiatives

A final focus of this literature review is consideration of Return to Country initiatives across Australia. Return to Country programs provide transport and financial assistance to support people to return to remote communities, but access is patchy and intermittent as this need is not recognised in public policy (AIHW 2022; Habibis, Birdsall-Jones et al. 2011; Prout 2008).

Groups for whom Return to Country programs are especially important include individuals attending towns and cities for health-related services, such as kidney treatment and other chronic health conditions, young women requiring pre- and neo-natal services, women escaping domestic violence, individuals exiting prison or youth detention centres, young men and women attending rehabilitation services and frail elderly who are no longer able to live independently at home (Habibis, Birdsall-Jones et al. 2010). Programs such as Purple House in Alice Springs, which supports individuals requiring dialysis treatment to travel to and from remote communities for treatment, are the exception rather than the rule.

There are strong arguments that Return to Country programs should be a key feature of homelessness strategies. One study showed a 9.6 per cent reduction in homelessness in the area in which it operated. It also demonstrated 'overwhelmingly positive' cost-effectiveness, with cost savings of $2,714,460 in the two years in which it operated in Cairns (Kinchin, Jacups et al. 2016: 69). Return to Country programs offer substantial value for money, generating significant whole-of-government savings through reductions in the use of health, justice and homelessness services. As well as financial benefits, there are individual and community benefits through the provision of shelter, reconnection to family and traditional Country, reductions in urban antisocial behaviour, and in the crowding and potential destabilisation of other Indigenous households (Habibis, Birdsall-Jones et al. 2010; Kinchin, Jacups et al. 2016; Richards 2021; Rogerson, Jacups et al. 2013).

While informal and ad hoc arrangements exist in some locations, there are few well-established programs. Larrakia Nation's Return to Country program, for example, has operated for almost 20 years, and helps to book plane tickets to return home. Short-term loans are provided to enable payment for airfares; the loans are then repaid through an agreement with Centrelink to arrange fortnightly deductions. The program also has a shop front in Casuarina that offers a culturally safe space for clients. In 2021 it provided 4,623 one-way plane tickets. Despite this level of need, and the program's longevity, it is dependent on one-off government grants, resulting in periods when a lack of funding has meant it was unable to operate (Hope 2014).

In Alice Springs, Tangentyere Council provides limited support on an emergency basis for individuals to return to home communities, and through a contract with recipients for airfares to be repaid via Centrelink deductions. In Adelaide, the Kurlana Tampawardli program operated by the South Australian Government through Uniting Communities provides Return to Country supports for visitors from remote communities (SA Government 2022).

The lack of transport options for visitors to return home from urban population centres was obvious at the start of the COVID-19 pandemic when Indigenous community-controlled organisations began to introduce a range of measures to protect their clients (APY 2020). This included services focused on getting homeless individuals into safe, secure housing and away from public spaces where the risk of infection was especially high, and limiting opportunities for infection by reducing travel between larger population centres and remote communities (Brown 2020; Crooks, Casey et al. 2020; Smith 2020). Returning people from cities and towns to their home community was a key strategy with collaborations between Indigenous community-controlled organisations and state and territory government agencies facilitating this (Brown 2020).

In South Australia, a collaboration between the South Australian Department of Community Services, the Kaurna Yerta Aboriginal Corporation and the APY Lands executive board resulted in short-term programs operating in Port Augusta and Adelaide. Adelaide's program operated through the Puti on Kaurna Yerta (Bush in the City) hub, which operated for short periods in 2021 and 2022 in the city's parklands. This was a multi-agency outreach and case management program originally designed to provide a safe place for remote living Anangu from the APY Lands communities, who had nowhere to stay after remote community lockdowns left them stuck in town. It provided primary healthcare and isolation in a culturally safe way and a Return to Country program that met the requirements of COVID-19 biosecurity measures (Boisevert 2021). Media reports suggest it was successful in its goals of returning people home, with reductions in emergency department presentations and in reports of antisocial behaviour (Richards 2021).

While it is important to note that individuals who have been away for prolonged periods may have difficulty in re-establishing themselves back in home communities (Pearson, Tually et al. 2021), all the evidence is that these programs provide multiple benefits including reductions in homelessness. Despite this, it remains the case that even well-established programs operate with a degree of precarity since funding is dependent on governments and few, if any, receive recurrent funding (Fewster 2022). Even the funding for the Return to Country programs operating during the height of the pandemic were funded from the Aboriginal Benefits Account, rather than from mainstream government sources (NACCHO 2022).

2.8 Summary and policy implications

Indigenous peoples in settler colonial states are vocal in their commitment to Country and have demonstrated their determination to retain their links whenever these have been threatened. This view is supported by the literature which suggests that, while the relative proportion of Indigenous people living on remote communities is declining in Australia, substantial numbers of Indigenous people will sustain their affiliations to and continue to live on Country. The experience of COVID-19 demonstrated the accuracy of Indigenous assertions that although there may be changes in the way people use and relate to remote communities, it remains an imperative to ensure that housing and related infrastructure are made sustainable and adapted to the populations living there.

It is also vital for capital works programs to be based on an objective assessment of current and future demand, rather than on ideological criteria. The dominance of the latter in policy decision making has been detrimental for communities, resulting in the sub-optimal use of valuable resources.

It is also essential to improve understanding of how mobility patterns impact on service needs and provision. Improved housing, healthcare, employment opportunities and internet access will all impact on long- and short-term mobility but there is relatively little information on the direction of the relationship. There is also a need for better analysis of the needs arising from demographic shifts such as the ageing of the population, and changing levels of education. While some communities are declining it is uncertain how much is due to urban drift, especially amongst younger, more educated age groups, and how much is the result of declining investment.

The successful management of COVID-19 by Indigenous community-controlled organisations, in partnership with the Australian Government and state and territory governments, provided some hard-earned lessons that are essential to capitalise on. Remote communities remain at higher risk than many other locations from potential pandemics and the disruptions of climate change. It is therefore likely economic and social disruptions and challenges will occur in the future (NACCHO 2022). To ensure the needs of long-term community residents are met, the housing and infrastructure shortfalls need to be addressed.

Our literature review has identified several specific implications for future remote community infrastructure and service delivery, including the need for:

- increased and improved community housing (including temporary accommodation facilities)
- better access to health and aged care services
- improvements to transport and Return to Country programs
- the development of housing policy and programs that assist in mitigating the risks of climate change
- improved strategies to ensure the safety of women
- enhanced food security.

Finally, the literature review has provided evidence regarding the governance requirements needed to support the future implementation of remote community infrastructure and services. Service provision should maximise cultural safety and enable the participation and leadership of Indigenous people. Moreover, the adoption of a strengths-based approach and the use of culturally appropriate language is needed by agencies and service providers when working with remote Indigenous communities and peoples. Likewise, improved inter-agency coordination in government responses and the adequate funding of the Indigenous community-controlled organisation sector is required. Finally, the literature review highlighted the need for evidence-based policy that prioritises local experience and Indigenous data sovereignty.

3. Remote community population modelling and projections

- **There is a need for population projections at the remote community level as an input into infrastructure planning for those communities. However, current methods are not suited to projecting populations at such disaggregated levels.**
- **This chapter builds on a proposed methodology for generating projections of the Indigenous population by five-year age cohorts for regional and remote Australia using Census data, including for individual remote Indigenous communities. Population projections are generated to 2026.**
- **Census data show very high rates of growth in the number of Indigenous Australians living in urban Australia from 2006 to 2021, but growth rates declining with remoteness. The Indigenous population in very remote Australia is estimated to have declined between 2016 and 2021, resulting from an ongoing fall in the number of young people living remotely.**
- **The modelling projections are for the Indigenous populations in remote Australia to stabilise between 2021 and 2026, including for small, very remote communities, but for those populations to continue to age rapidly.**

Planning for essential infrastructure and service delivery for remote Indigenous communities is inevitably based on assumptions regarding trends in the populations of those communities, irrespective of whether those population assumptions and projections are explicitly stated or formally incorporated into planning processes. As highlighted above, prior policies based on a misguided belief that investment in larger population centres would draw people out of surrounding smaller communities has led to periods of under-investment in those communities. This has resulted in a shortfalls in housing supply and household crowding. Further, the age structure of individual communities is critical in determining the mix of services required, such as for childcare, schools, aged care and health services.

However, projection approaches typically rely on methods and assumptions based on large population counts and cannot be applied to small or sparsely populated areas (Taylor 2014; Taylor, Brown et al. 2006). To our knowledge, there are no formal sets of population projections used by the Australian Government or state and territory governments to guide infrastructure funding or other policies toward remote communities. Dockery et al. (2021) proposed a method to generate such population projections by age and gender, and apply the method to estimating Indigenous populations at the Indigenous Location (ILOC) level[4] for outer regional, remote and very remote Australia.

That methodology is further developed and updated to include the 2021 Census data in this chapter. Key trends in the Indigenous population by remoteness and age are presented and population projections generated to 2026. This demonstrates how the methodology can be applied to generate population projections that could be used as an explicit input for planning at the level of individual remote communities. Broader implications of the results at the aggregate level are also discussed.

3.1 Overview of the population modelling and projections

Responding to a recognised need for population modelling at the remote community level, Dockery et al. (2021) propose a methodology for generating projections for sparse populations by locality, age cohort, and gender. This method is applied to estimating Indigenous populations at ILOC level for outer regional, remote and very remote Australia. For a number of reasons, existing projection methods cannot be applied to the small population counts typical of remote communities. Generally, large population counts are required to meaningfully apply standard components of those models, such as assumptions for fertility, mortality and migration rates. Models are specified in growth rates, which cannot handle components with zero counts, and proportional errors in projections tend to increase as the size of the units analysed decline.

Dockery et al.'s (2021) model is based on changes from one time period to the next, but with those changes expressed in levels rather than growth rates. A regression-based variant of the cohort-replacement model, the model was estimated using 2006 and 2011 Census data. The model was used to project Indigenous populations by ILOC, age and gender to 2016 in regional and remote Australia. Covering 618 ILOCs, that modelling marked the first attempt to project the growth of Indigenous populations at such a granular geographic level, let alone disaggregated projections by age and gender.

Actual Census data for 2016 were then used to test the 'out-of-sample' predictive performance of the model. The within-sample fit of the model was good: in this instance, 'within-sample' refers to the 2006 and 2011 data used to fit the model, while 'out-of-sample' refers to a time point for which data was not used in the model development (2016). Out-of-sample prediction is the critical test of the methodology, since the purpose is to make projections for a future period for which no data are available (in this case 2026).

4 Developed under the ABS 'Indigenous geography', ILOCs are aggregates of one or more Statistical Areas (Level 1). While spatially covering all of Australia, ILOCs generally represent small Aboriginal and Torres Strait Islander communities with a minimum population of 90 Indigenous usual residents. ILOCs are designed to allow the production of Census statistics that are spatially relevant for Indigenous Australians while maintaining the confidentiality of individuals (Dockery, Harris at al. 2021).

As shown in Table 1, the Census estimate of the total Indigenous population grew by 20.5 per cent from 2006 to 2011, by 18.4 per cent from 2011 to 2016, and by 25.2 per cent in the most recent inter-censal period to 2021. However, there was substantial variation in population growth by region. Across outer regional, remote and very remote Australia the Indigenous population grew by 14.0 per cent between 2006 and 2011. This represents the sample upon which the initial Dockery et al. (2021) model was developed, and consequently the model projected forward a similar rate of growth for 2011–16. However, actual growth to 2016 turned out to be much lower at around 5.0 per cent.[5] Hence, the model tended to over-predict populations at the aggregate level, but performed well in terms of predicting the relative pattern of growth across age-by-gender-by-ILOC categories. Replicated from Dockery et al. (2021), Figure 7 shows the 'actual' 2016 Census counts for all 19,766 ILOC-by-gender-by-age cases plotted against the model's corresponding predictions. The tight clustering along the 45-degree line demonstrates the goodness of fit, or predictive accuracy, of the model.

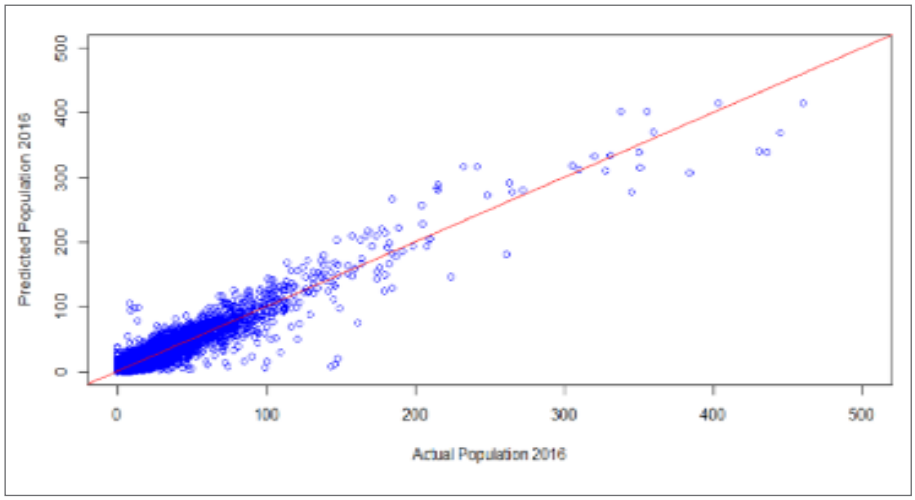
Table 1: Indigenous population by remoteness: 2006 to 2021

	2006	2011	2016	2021
Indigenous population				
Major Cities of Australia	147,296	188,533	242,525	334,266
Inner Regional Australia	99,317	121,293	155,598	203,880
Outer Regional Australia	98,646	118,477	127,888	150,121
Remote Australia	39,419	39,756	40,214	44,070
Very Remote Australia	68,758	77,486	79,369	74,135
Total	**455,026**	**548,366**	**649,169**	**812,730**
Per cent growth since previous Census		%	%	%
Major Cities of Australia		28.0	28.6	37.8
Inner Regional Australia		22.1	28.3	31.0
Outer Regional Australia		20.1	7.9	17.4
Remote Australia		0.9	1.2	9.6
Very Remote Australia		12.7	2.4	-6.6
Total		**20.5**	**18.4**	**25.2**

Source: ABS Census of Population and Housing, 2006, 2011, 2016, and 2021. Accessed via ABS on-line TableBuilder facility.

5 The figures reported in Table 1 include external territories (e.g. Norfolk Island) and a small number of other ILOCs which were excluded from the sample used in Dockery et al. (2021). For the exact sample of ILOCs used in that estimation, the Indigenous population grew by 13.4 per cent between 2006 and 2011; and by 3.2 per cent between 2011 and 2016 (Dockery, Harris et al. 2021: Table 3).

Figure 7: 2016 Indigenous populations by ILOC, age (five-year groups) and gender: actual versus predicted



Source: Dockery, Harris et al. (2021), Figure 3

3.2 Developing projections to 2026

Data from the latest (2021) Census reveal even more variation in Indigenous population growth by remoteness over the preceding five years. There was a 37.8 per cent increase in the major cities, and a population decline of 6.6 per cent in very remote Australia. Growth across outer regional, remote, and very remote Australia in total picked up slightly from the previous inter-censal period, from 5.0 per cent to 8.4 per cent. An analysis by the Australian Bureau of Statistics (ABS) of the change in the count of Indigenous people in the 2021 Census indicates that over half of the population increase was due to non-demographic factors, namely a higher propensity of people to identity as Aboriginal or Torres Strait Islander. Almost one-third of this non-demographic change occurred in the five to 14 year-old cohort (ABS 2023).

To generate projections of the Indigenous population in remote communities for this report, further development of the model reported in Dockery et al. (2021) was undertaken. The new analysis is based on data from the most recent three Censuses: 2011, 2016 and 2021. Population counts by five-year age group and gender were provided by the ABS for all spatial ILOCs using a concordance by mesh-blocks (the smallest geographic collection unit used by the ABS). The concordance adjusts the estimates for any boundary changes to the ILOCs over time to ensure the estimates are for a consistent area over time (in this case the 2016 defined ILOC boundaries). It was not possible for the ABS to provide a concordance to the 2006 Census data, as the geographical unit for aggregating to ILOCs in 2006 was ‘collection districts’, which have been superseded by mesh-blocks.

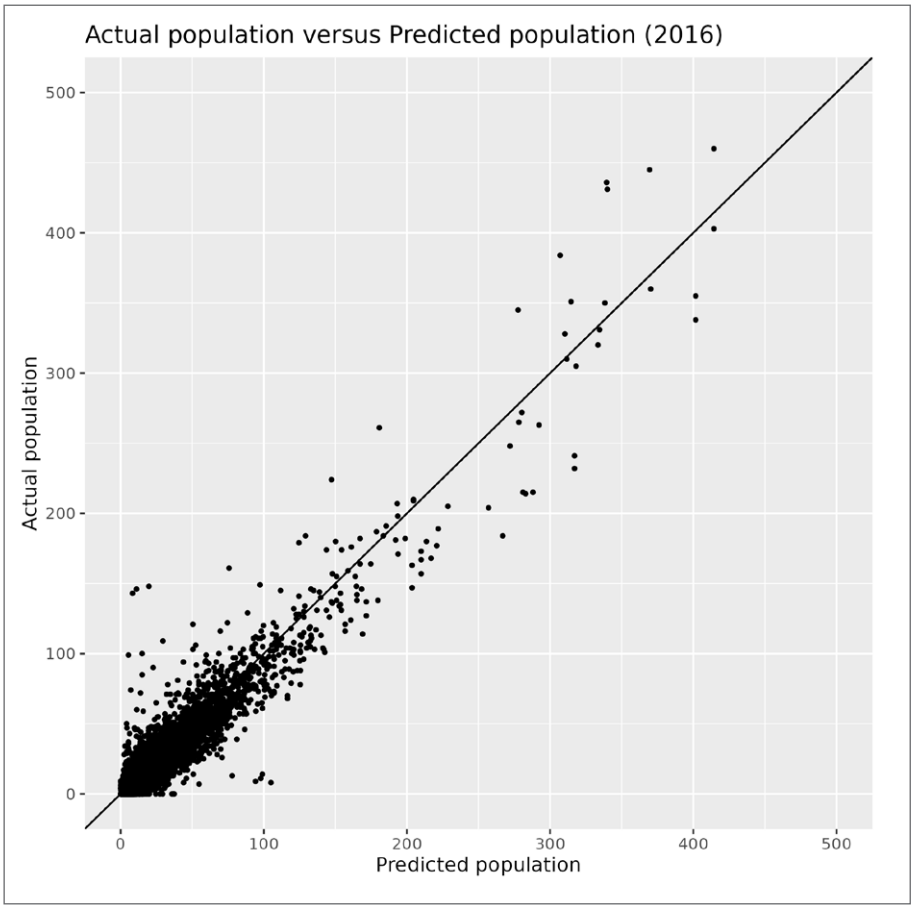
Details of the methodological approach used for the population modelling are provided in Appendix 1. Here we summarise the results and draw out key implications for infrastructure planning for remote communities. However, important features of the current model, and some key differences and innovations to the model estimated in Dockery et al. (2021), should be noted:

- First, the initial model was based on changes in cohort populations from 2006 to 2011. As there was only one observation of change for each cohort (i.e. $\Delta P = P_{t=2011} - P_{t=2006}$), the fitted model was based on a single cross-sectional regression, albeit one that utilised information from two time periods. Out-of-sample predictions were generated for 2016 and compared against actual 2016 Census data. For this report, that process is repeated using a cross-sectional model based on changes between 2011 and 2016, with out-of-sample predictions made to 2021 and performance tested against actual 2021 Census results.
- Having two observations on changes for every ILOC-by-gender-by-age cohort cell (corresponding to changes from 2011 to 2016 and from 2016 to 2021) allowed estimation of a panel version of the model. However, the model performed marginally better when treating the data simply as pooled observations than when imposing ILOC-specific random-effects. Thus, while the modelling exploits the availability of panel data (repeat observations), the preferred model turned out not to be a panel model as such. The coefficients from the preferred model are used to generate predictions for remote community populations to 2026.

Dockery et al. (2021) used only data from the sample of ILOCs in outer regional, remote and very remote Australia. Development of the current model was undertaken using data on spatial ILOCs across all five Accessibility and Remoteness Index of Australia (ARIA) levels. That is, ILOCs within the major capital cities and inner regional areas were initially included. However, pooling the remote and non-remote areas together led to substantially poorer results. This indicates that the processes of population growth are fundamentally different for urban and regional areas. The means and variance of changes in population differed significantly across ARIA categories 1 and 2 compared to ARIA categories 3, 4, and 5. From the ABS analysis noted above, it also appears that population changes in urban Australia were most affected by non-demographic factors, namely propensity for people to identify as Aboriginal or Torres Strait Islander, or to be identified as such by their parents in the case of children. As the main objective of the model in the context of this research is to project populations in remote communities, we follow Dockery et al. (2021) in restricting the sample to ILOCs in outer regional, remote and very remote Australia.

From the model developed using pooled observations for changes from 2011 to 2016 and from 2016 to 2021, Figure 8 shows how well the model estimates fit the data. Again, the clustering along 45-degree line indicates good within-sample fit, particularly for smaller population cohorts for which existing population projection methods cannot be applied.

Figure 8: Model performance – within sample fit, based on 2011–16 and 2016–21 data

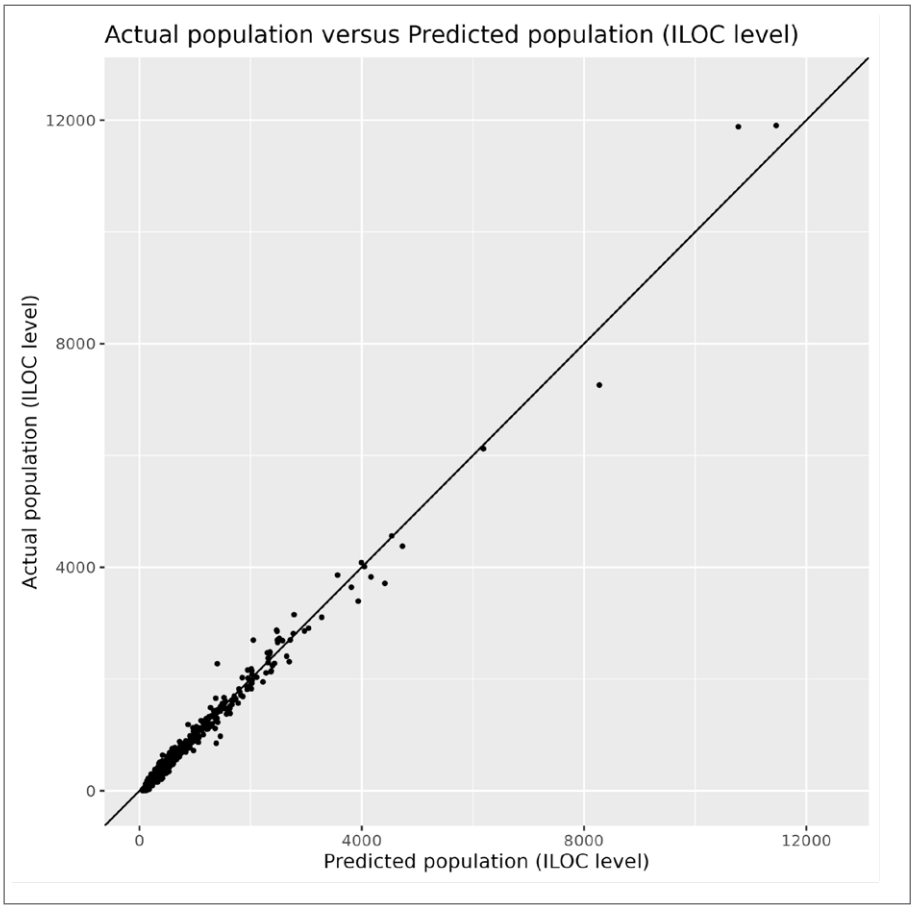


Source: Authors' calculations based on customised ABS data from 2011, 2016, and 2021 Census of Population and Housing (see Appendix 1).

The model performance is further exemplified when looking at the fit at the aggregate ILOC level. Each data point in Figure 8 corresponds to the count of persons with a single five-year age cohort for a specific gender and ILOC. There are 34 of these age-by-gender data points for each ILOC. When these are aggregated for each ILOC, Figure 9 shows the correspondence between the actual ILOC total populations in 2021 and the total populations inferred from the model estimates.[6]

6 A further sensitivity analysis to test the benefit of a longer panel dimension was proposed by including data for 2006 for ILOCs with a close concordance with the existing ILOC geographical structure being used. This was not pursued for several reasons: (1) as noted above, testing indicated a panel model was not the preferred specification that it was initially expected to be; (2) there is limited scope to improve on the fit of the existing model, given greater than 95 per cent concordance; and (3) there would be a likely bias in the ILOCs retained in the sensitivity analyses as they would, by definition, be ILOCS that have not been subject to significant population change.

Figure 9: Model fit: 2021 actual versus predicted population aggregated at the ILOC level



Source: Authors' calculations based on customised ABS data from 2011, 2016, and 2021 Census of Population and Housing (see Appendix 1).

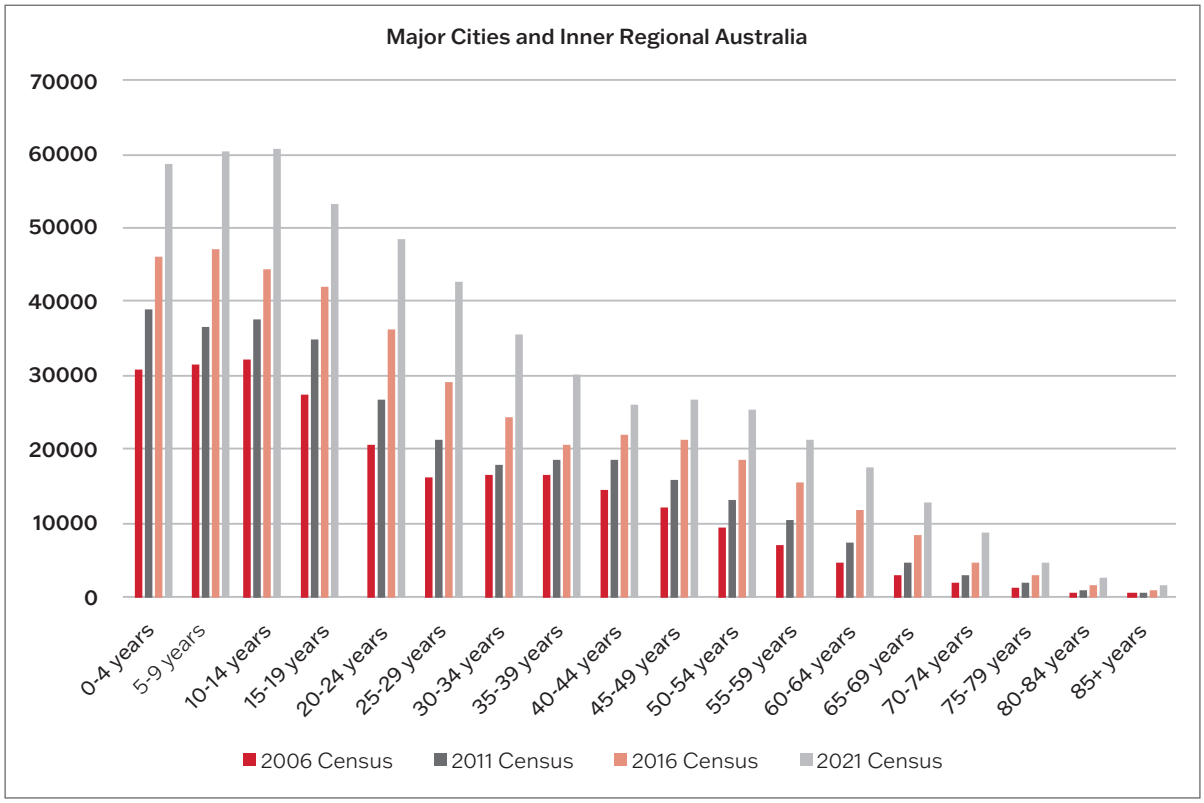
3.3 Indigenous population trends and projections

As set out above, recent Census data show the Indigenous population growing rapidly, with very high growth rates in the major cities of Australia and inner regional Australia, but with rates declining with remoteness. Much of that growth has been attributed to changes in the propensity for identification as a person of Indigenous descent (ABS 2023). The four panels in Figure 10 show population growth in each ARIA remoteness category by age. High rates of growth in the major cities and inner regional Australia are evident across all age groups, but are particularly pronounced for the younger cohorts. The role of identification in these areas is clear: the number of Indigenous persons aged 10–14 years in 2021, for example, is far higher than the number aged 5–9 years in 2016.

As we move to outer regional and remote areas, the growth rates slow and become more concentrated in the older cohorts. The number of Indigenous persons living in remote Australia has stagnated for the cohorts aged 0–4 years to 20–24 years, and in very remote Australia have actually declined substantially for the cohorts aged 0–4 years and 5–9 years. It is cohorts from age 45–49 years and older that have been growing in remote Australia and in very remote Australia.

While the contrasting demographic trends in remote and non-remote Australia are important, the remainder of this section focuses on developments in outer regional, remote and very remote Australia, in line with our focus on infrastructure for remote communities.

Figure 10: Indigenous population by five-year age groups and remoteness: 2006, 2011, 2016 and 2021



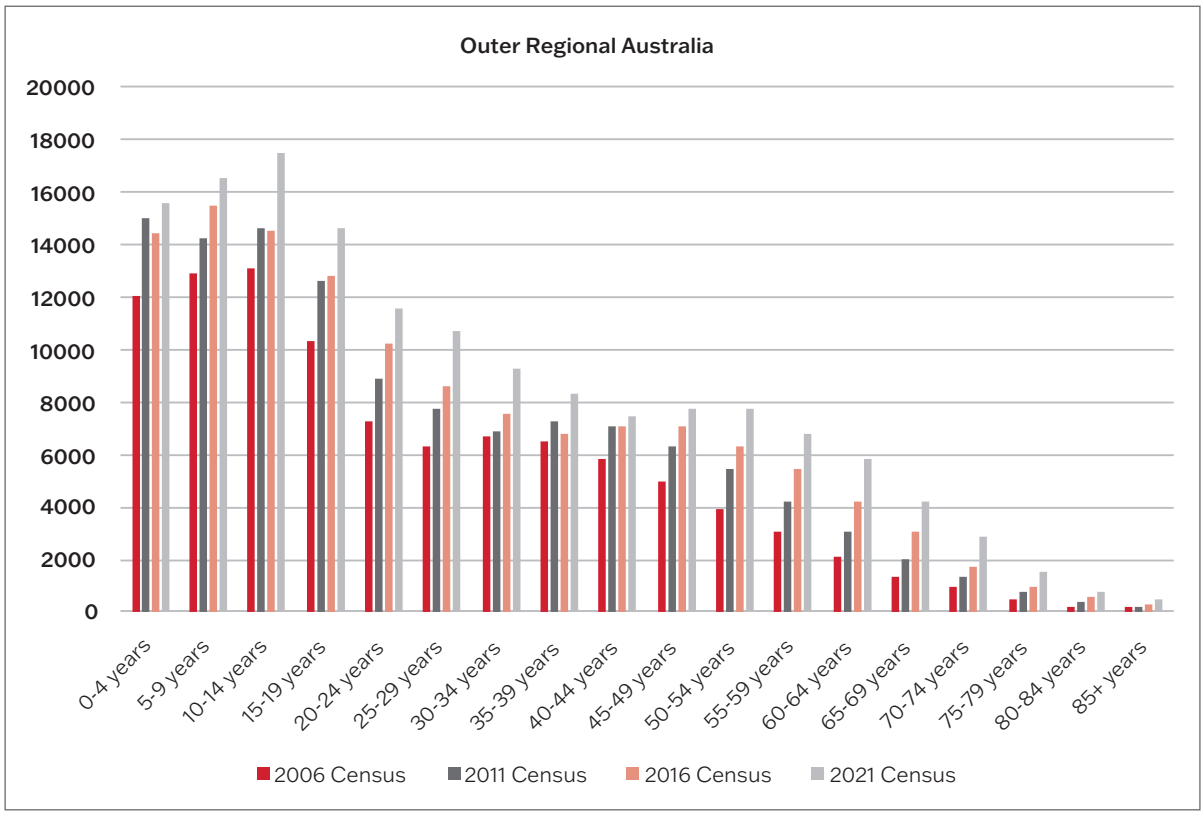
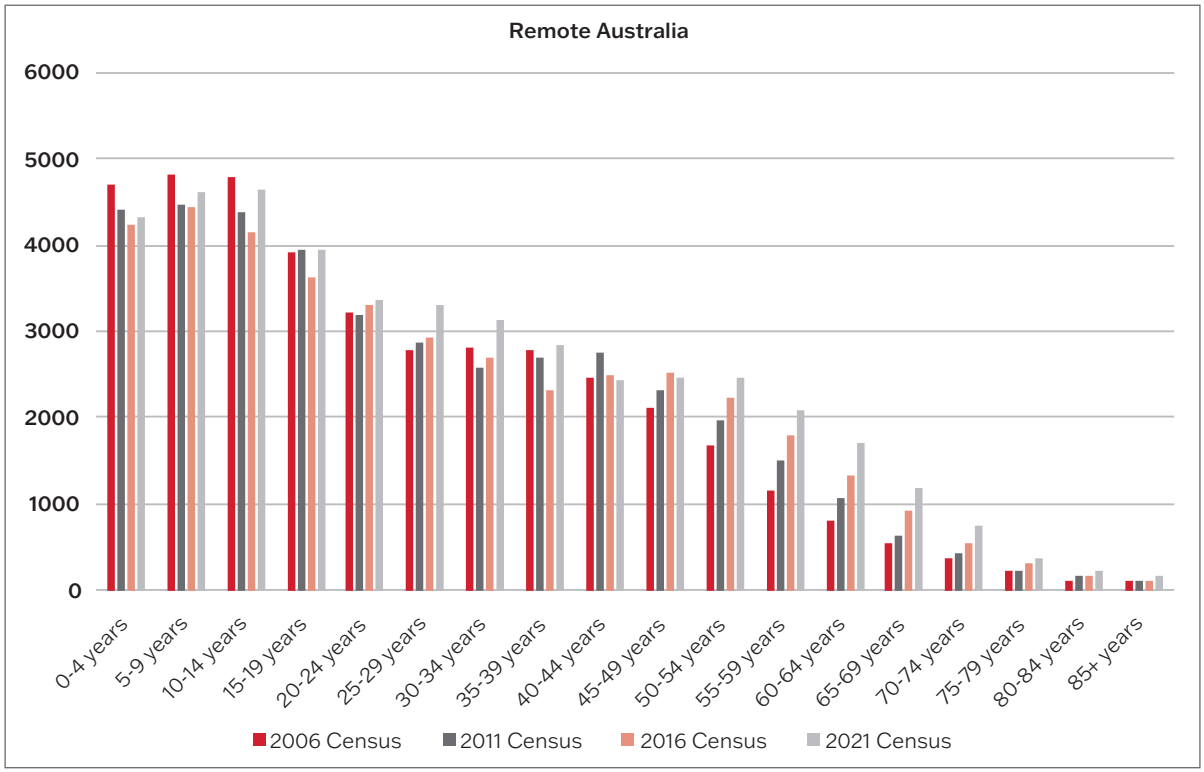
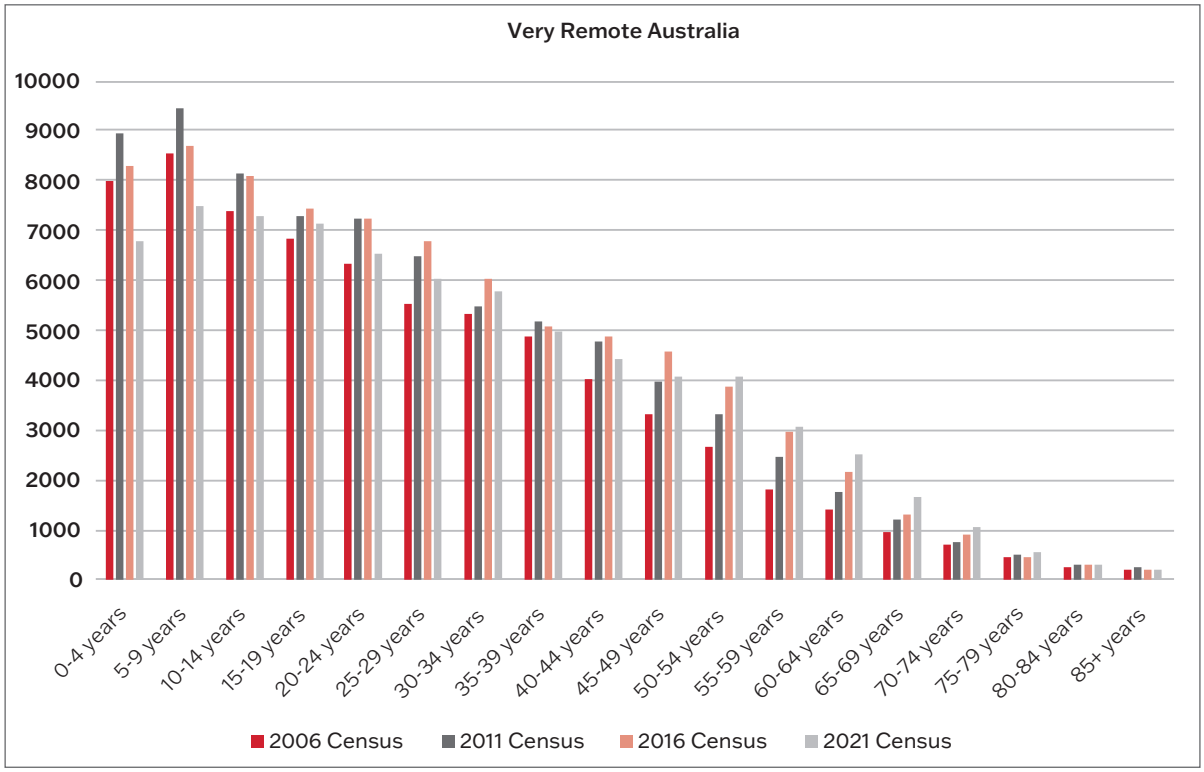


Figure 10: Indigenous population by five-year age groups and remoteness: 2006, 2011, 2016 and 2021 (continued)





Source: ABS Census of Population and Housing, 2006, 2011, 2016, and 2021. Accessed via ABS on-line TableBuilder facility.

3.4 Population trends and projections in regional and remote Australia

In aggregate across outer regional, remote and very remote Australia, the Indigenous population is predicted to grow by 10.4 per cent between 2021 and 2026, a stronger increase than the 8.8 per cent observed for the 2016–2021 intercensal period (see Table 2). Again, growth is expected to be higher in outer regional Australia (15.0%) and to decline with remoteness (7.8% in remote Australia and 2.3% in very remote Australia). However, the predicted positive growth for very remote Australia marks a turnaround from the declining Indigenous population observed in the 2016–2021 period. The predicted growth in regional and remote Australia is concentrated in the older cohorts, indicating a rapidly ageing Indigenous population. This is in contrast to more urban Australia, where population growth has been very high for younger cohorts, driven largely by changes in identification rather than fertility as discussed above.

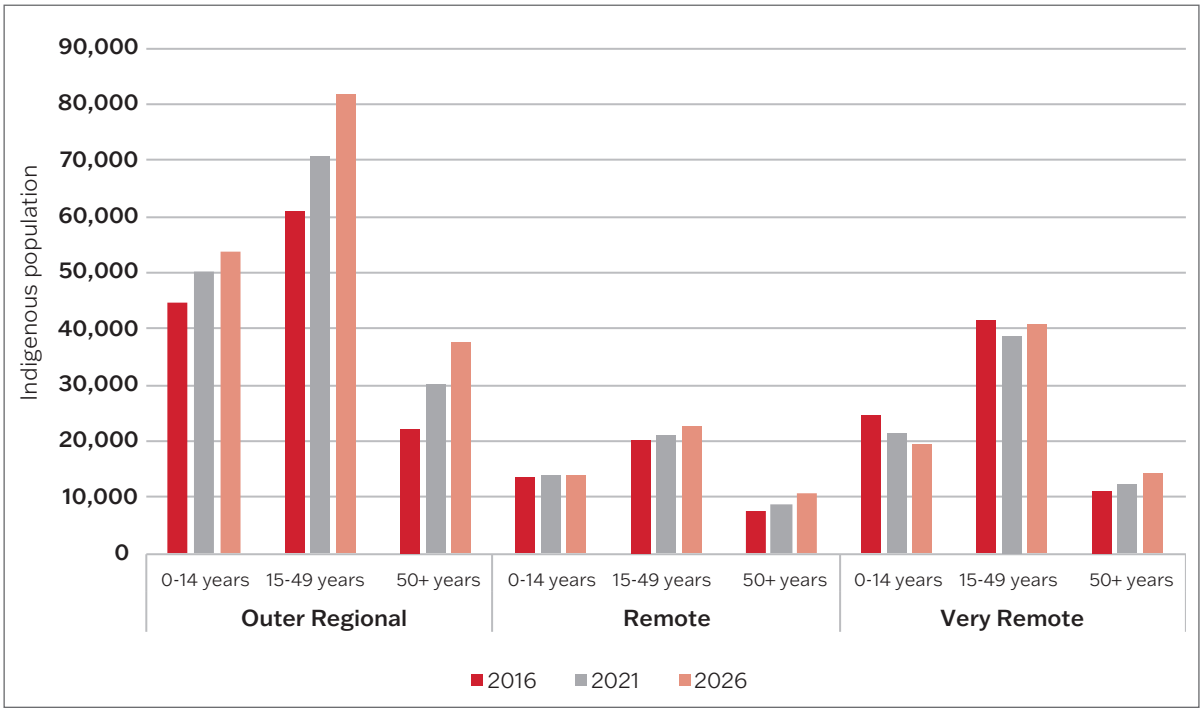
Table 2: Predicted Indigenous population by age and remoteness: 2026

ARIA	0–14 years	15–49 years	50+ years	Total
2026 predicted population				
Outer Regional	53,637	81,953	37,700	173,290
Remote	14,051	22,587	10,533	47,170
Very Remote	19,455	40,614	14,095	74,164
Total	**87,143**	**145,154**	**62,328**	**294,625**
Predicted growth, 2021–2026				
Outer Regional	7.1	16.0	26.1	15.0
Remote	2.4	7.0	18.2	7.8
Very Remote	-9.0	4.9	14.0	2.3
Total	**2.3**	**11.2**	**21.8**	**10.4**

Source: Authors' calculations based on customised ABS data from 2011, 2016, and 2021 Census of Population and Housing (see Appendix 1).

As shown in Figure 11, continued large increases in the Indigenous population in outer regional Australia are predicted across the broad age groups. In remote Australia, the model also predicts modest increases in the number of young and adult persons, and faster growth for persons aged 50 and above. These patterns contrast with predictions for very remote Australia. Here the prediction is for the population of young Indigenous people (aged 0–14 years) to continue to decline to 2026, with predicted growth evident only in the older population (50 years+).

Figure 11: Population growth in outer regional, remote, and very remote Australia, by broad age group



Source: Authors' calculations based on customised ABS data from 2011, 2016, and 2021 Census of Population and Housing (see Appendix 1).

3.4.1 Projections by community size and remoteness

Critically, the model predictions are for a growing but rapidly ageing population in very remote Australia. Table 3 presents more detailed projections by ILOC size and remoteness. Within remoteness areas, ILOCs have been classified as small, medium or large, with the population ranges selected such that each 'size' classification contains around one-third of ILOCs within each ARIA. Note that ILOC size is based on the total population in 2016, including Indigenous and non-Indigenous persons. A feature of Indigenous population shifts from 2016 to 2021 was that they favoured the larger communities in outer regional and remote Australia. The projections to 2026 are for a substantial change from this pattern, possibly a legacy of COVID-19. In outer regional Australia, population growth from 2021 to 2026 is projected to be very even across small, medium and large ILOCS. Critically, the population in small communities in very remote Australia (with total populations of 200 persons or less in 2016) is predicted to increase by 11.9 per cent, reversing a strong decline seen between 2016 and 2021.

Table 3: Predicted Indigenous population growth 2021 to 2026, by remoteness and community size

ARIA/ILOC size in 2016	Number of ILOCS	Indigenous population		Per cent change	
		2021	2026	2016-21	2021-26
Outer Regional					
Small (0–2,750)	77	16,138	18,608	2.8	15.3
Medium (2,751–6,500)	72	30,878	35,691	14.9	15.6
Large (6,501+)	96	103,618	118,992	22.2	14.8
Remote					
Small (0–700)	35	4,973	4,785	-6.7	-3.8
Medium (701–2,000)	19	6,837	7,119	-6.4	4.1
Large (2,000+)	41	31,936	35,266	13.2	10.4
Very Remote					
Small (0–200)	102	8,639	9,665	-8.8	11.9
Medium (201–500)	94	21,565	20,815	-3.8	-3.5
Large (501+)	83	42,269	43,684	-6.2	3.3

Source: Authors' calculations based on customised ABS data from 2011, 2016, and 2021 Census of Population and Housing (see Appendix 1). Note: ILOC size based on total Indigenous plus non-Indigenous populations in 2016.

3.4.2 Projections by state or territory and remoteness

In absolute numbers, the largest increases in the Indigenous populations in regional and remote Australia between 2021 and 2026 are projected for Queensland, New South Wales and the Northern Territory (Table 4). Tasmania and Victoria are projected to have the fastest growth rates, but this can be largely attributed to the concentration of their regional and remote Indigenous populations in the less remote outer regional areas, which are growing relatively quickly when compared to remote populations.

The projected growth in the Indigenous population in very remote Australia is largely accounted for by the Northern Territory. The very remote Indigenous population in the Northern Territory is predicted to increase by just over 1,000 persons, representing around 60 per cent of the projected increase in very remote areas.

Queensland is predicted to experience the largest increases in the Indigenous population overall and in the remote and outer regional areas. In remote Queensland, the Indigenous population is projected to increase by 1,397 persons, representing 41 per cent of the projected increase in remote Australia. The Indigenous population in outer regional Queensland is projected to increase by 8,093 persons, or 36 per cent of the increase in outer regional Australia.

At 17.1 per cent, high rates of growth are projected for South Australia's Indigenous populations in both outer regional and remote areas of that state, but much lower growth in very remote South Australia (3.8%).

Western Australia stands out as the state with the lowest projected increase in its regional Indigenous population between 2021 and 2026. This is attributable to that state having a relatively high share of the Indigenous population in more remote areas relative to other states and territories, compounded by low projected growth in those remote populations. Western Australia is in fact the only state to see a projected decline in the Indigenous population in the very remote parts of the state, albeit a minor one (down by 54 persons, or 0.4%).

Table 4: Predicted 2021–26 change in Indigenous population, by state or territory and remoteness

State/Territory	Outer Regional	Remote	Very Remote	Total
Predicted 2026 Indigenous population				
New South Wales	45,235	4,163	2,106	51,503
Victoria	7,634	n.a.	n.a.	7,634
Queensland	66,209	15,130	19,623	100,963
South Australia	11,255	1,793	3,896	16,944
Western Australia	12,208	13,178	14,548	39,934
Tasmania	13,882	648	189	14,719
Northern Territory	16,868	12,258	33,802	62,928
Total	**173,290**	**47,170**	**74,164**	**294,625**
Predicted change from 2021 (persons)				
New South Wales	5,604	288	88	5,979
Victoria	991	n.a.	n.a.	991
Queensland	8,093	1,397	470	9,961
South Australia	1,644	261	144	2,049
Western Australia	1,612	862	-54	2,420
Tasmania	2,268	107	39	2,414
Northern Territory	2,445	509	1,004	3,958
Total	**22,656**	**3,424**	**1,691**	**27,772**
Per cent change (2021–26)				
New South Wales	14.1	7.4	4.3	13.1
Victoria	14.9	n.a.	n.a.	14.9
Queensland	13.9	10.2	2.5	10.9
South Australia	17.1	17.1	3.8	13.8
Western Australia	15.2	7.0	-0.4	6.5
Tasmania	19.5	19.7	25.9	19.6
Northern Territory	17.0	4.3	3.1	6.7
Total	**15.0**	**7.8**	**2.3**	**10.4**

Source: Authors' calculations based on customised ABS data from 2011, 2016, and 2021 Census of Population and Housing (see Appendix 1). Notes: Victoria does not contain any ILOCS classified as remote or very remote, and the ACT does not contain any ILOCs classified as outer regional, remote or very remote.

3.4.3 Population ageing in outer regional and remote Australia

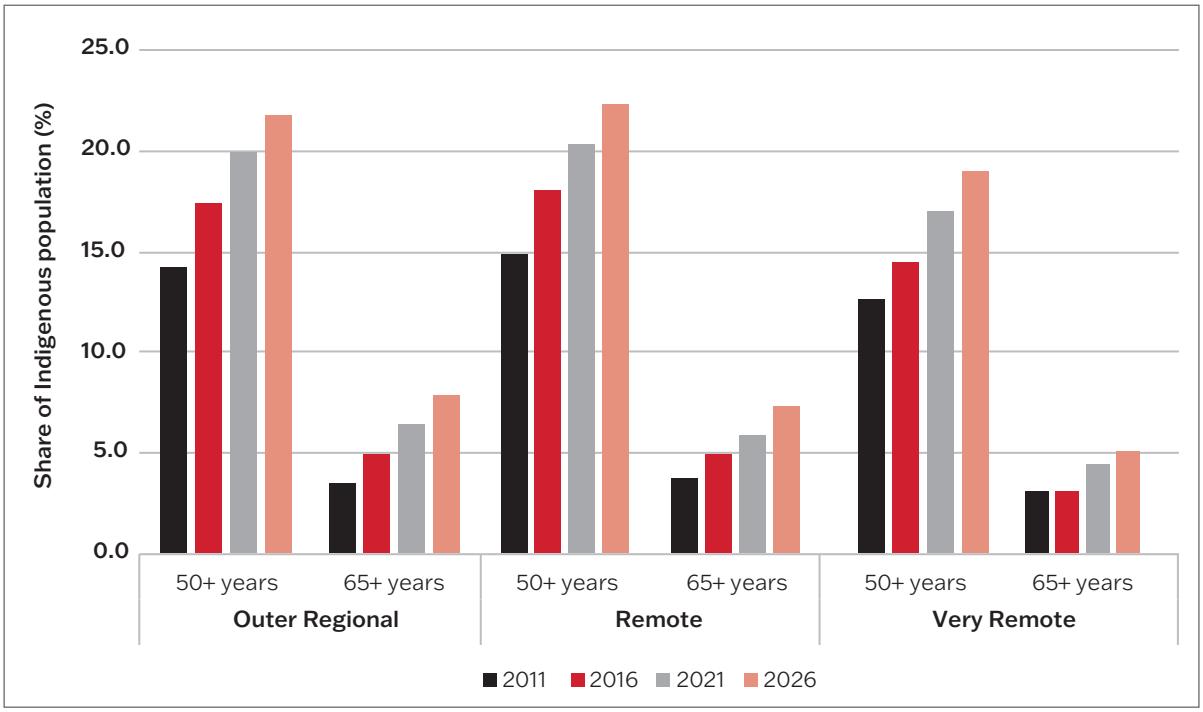
From the historical Census data presented in Figure 10 and the population predictions discussed above, a key feature of the changing Indigenous demography is the ageing of the population living outside of the major urban and regional population centres. In each of the ARIA categories of outer regional, remote, and very remote, the estimated mean age of the Indigenous population is close to 30 years, and has been increasing by just over one year every Census since 2011. Figure 12 shows the rapid increase in the aged Indigenous population in regional and remote Australia. In very remote Australia in 2026, the number of Indigenous persons aged over 50 years (the age at which Indigenous Australians qualify for aged care) is predicted to have increased around 4,500 persons, or almost 50 per cent, since 2011.

The comparative figures, expressed as a share of the total Indigenous population in each ARIA region, are shown in Figure 13.

Figure 12: Trend in Indigenous population aged over 50 and over 65 years, by remoteness

Source: Authors' calculations based on customised ABS data from 2011, 2016, and 2021 Census of Population and Housing (see Appendix 1).

Figure 13: Trend in share of Indigenous population aged over 50 and over 65 years, by remoteness



Source: Authors' calculations based on customised ABS data from 2011, 2016, and 2021 Census of Population and Housing (see Appendix 1).

3.4.4 Remote Indigenous communities

Finally, our analysis looks specifically at demographic trends in remote Indigenous communities. These are identified from the Census data as communities located in remote Australia or in very remote Australia, and in which Indigenous persons comprised 80 per cent or more of the total population in 2016. There are 176 such communities, with all but 23 in very remote Australia. They are located primarily in the Northern Territory (92 remote Indigenous communities), Western Australia (41) and Queensland (31), with a further eight communities in South Australia and four in New South Wales. Just over 50 per cent of the Indigenous population in remote and very remote Australia live in such Indigenous communities.

Table 5 summarises key demographic trends in these remote Indigenous communities. While their aggregate population declined between 2016 and 2021, projections are for only a marginal further decline by 2026. The broader trend for the Indigenous population in remote Australia of declining youth populations and growing elderly populations is equally apparent in these communities. The proportion of the population aged 50 years and over is predicted to reach 17.6 per cent by 2026, compared to 11.9 per cent in 2011.

Table 5: Remote Indigenous communities: population trends by age, 2011–2026

	Actual			Predicted
	2011	2016	2021	2026
Age group				
0–14 years	20,528	19,940	16,976	15,076
15–49 years	31,768	33,330	31,357	31,861
50+ years	7,043	8,397	9,164	10,011
Total persons	**59,339**	**61,667**	**57,497**	**56,948**
Inter-censal growth (%)				
0–14 years		-2.9	-14.9	-11.2
15–49 years		4.9	-5.9	1.6
50+ years		19.2	9.1	9.2
Total persons		**3.9**	**-6.8**	**-1.0**
Population share (%)				
Aged 50+ years	11.9	13.6	15.9	17.6
Aged 65+ years	2.8	2.9	3.9	4.4

Source: Authors' calculations based on customised ABS data from 2011, 2016, and 2021 Census of Population and Housing (see Appendix 1).

3.5 Summary and policy implications

Census data from 2006 to 2021 reveal very significant shifts in the demography of the Indigenous population by region. While overall the Indigenous population is growing rapidly, rates of growth are lower in more remote areas of the country. Further, an important change in the age structure of the population by region has been occurring, with the number of young persons in more remote areas declining and leading to a rapid ageing of the Indigenous population in very remote Australia.

Our population projections to 2026 suggest the Indigenous population will continue to grow strongly in outer regional Australia (by 15.0% between 2021 and 2026), by 7.8 per cent in remote Australia, and by 2.3 per cent in very remote Australia. So while growth rates are projected to decline with remoteness, the Indigenous population in very remote Australia is still projected to increase, partially reversing a decline observed from 2016 to 2021. Importantly, the number of people living in smaller remote Indigenous communities is predicted to increase, albeit with a continued decline in the number of persons aged under 15 years. Approximately 60 per cent of the projected growth in the Indigenous population in very remote Australia (or around 1,000 persons) is accounted for by the Northern Territory.

These trends have important implications for funding for essential infrastructure, for housing demand, and for the mix of services required in those communities. Most obviously, there will be a rapid increase in demand for aged care in remote communities, both in terms of infrastructure and support services. At the same time the number of people available to provide that support, whether as family or through formal employment, will be shrinking.

We fully acknowledge there are significant limitations to the population projections, and indeed to the original Census counts upon which they are based. However, existing models of funding for infrastructure and services in remote communities, and other policies relating to those communities, must be based on some assumption of future populations.

The methodology developed here demonstrates that it is possible to make such projections readily available, and tests so far indicate relatively good predictive performance. We argue there is a clear need for such projections to be informing policy and planning now, in tandem with on-the-ground engagement to determine community aspirations for future infrastructure and service provision. The projections suggest policy should not be assuming remote communities are disappearing. However, there is a very important conversation that needs to be had about the implications of the changing age structure of remote communities for their viability, quality of life and for issues relating to cultural continuity. This is particularly so given that existing policies relating to childcare, education and employment are likely to be major drivers of those population trends.

4. Remote community case studies

- **The ABS Census is unable to accurately estimate the population size of Indigenous remote communities due to its inability to capture short-term population mobility, use of culturally inappropriate methodologies, and reliance on English. More detailed qualitative and quantitative data is needed to understand the true extent of mobility and appropriately plan for infrastructure and services.**
- **The relationship between mobility and remote community infrastructure and services is two-way. Mobility into and out of a community impacts upon the funding, provision and sustainability of infrastructure and services. Likewise, the level and type of infrastructure and services present within remote Indigenous communities influences mobility.**
- **Remote communities are anticipated to grow into the future. Improvements to housing, power, water, telecommunications, education, health, aged care and employment are required to accommodate this growth.**
- **Increased self-determination, greater joint working, place-based working and needs-based funding is essential in the future development and operation of infrastructure and services in remote Indigenous communities.**

4.1 Overview of the case study research

The second stage of the research comprised of a detailed case study analysis of three remote Indigenous communities. These case studies sought to understand:

- perceptions of past and projected mobility patterns
- drivers behind these mobility patterns
- the impact of mobility on existing infrastructure and service provision in remote communities
- future infrastructure and service needs of remote communities.

The case studies involved in-depth interviews with key stakeholders and community members from each of the three communities. This chapter outlines how the case study communities were selected and a description of each of the participating communities is presented. The key findings from the in-depth case studies are then outlined.[7]

4.2 Selection of the case studies

Informed by the findings from stage one of the research, three remote communities were selected to serve as detailed case studies. With a focus on the Northern Territory, South Australia and Western Australia, population data by Indigenous locations (ILOC) was derived using the 2011, 2016 and 2021 Census. The change in population that had been experienced over this time for each Indigenous community was analysed. The literature review and stakeholder consultations (also undertaken during stage one) further informed the selection of the case study communities.

Three case study communities (one for each jurisdiction) were then purposively selected. One community was selected where the population was considered to be fairly stable over time ('Community A' in South Australia), one where the population has been increasing ('Community B' in Western Australia), and one where the population has been decreasing over time ('Community C' in the Northern Territory). Permissions to undertake the case study research was sought and obtained from the Indigenous corporation or local authority responsible for each community.

4.3 Description of the case study communities

A brief description of each of the three case study communities is provided below.

4.3.1 Community A – South Australia

Community A is a small remote community in South Australia located approximately a two-hour drive from the nearest regional centre. It is closed to the public and situated on a sealed road off a major highway. Community A is governed by an Indigenous corporation and community interests are represented by a Board of Directors.

The population of the community has remained fairly stable over the past decade. The smallest of the three case study communities, Community A is classified as being a medium-sized ILOC (i.e. between 201 to 500 residents). In 2021, the median age of residents was 28 years old (compared to the Australian median age of 38 years). The average household size is around 3.8 persons (compared to the Australian average of 2.5 people).

7 In order to maintain confidentiality, we do not identify either the communities or interview respondents by name but instead use an ID code when providing quotes. This code identifies which case study community the respondent was part of (i.e. 'A', 'B' or 'C') and their interview number.

Community A has a range of facilities located on-site including a store, police station, health clinic, church, school (pre-school to Year 12), arts centre, swimming pool, child-parent learning centre, a Centrelink agent, mechanical workshops and an airstrip. It has two facilities off-site catering to tourists.

Municipal services provided by the community's Indigenous Corporation include waste collection and the maintenance of the airstrip, community parks and streetscapes. The Corporation is also responsible for land management with rangers undertaking conservation activities and patrolling fishing and hunting areas. Other services provided by the Indigenous Corporation include recreational activities (such as a social club, gym, youth shed, women's centre and sporting facilities) and oversight of the community store.

Private dwellings in the community are managed and maintained by the South Australian Housing Authority (SAHA). Community A is not connected to the main electricity grid; energy is instead generated locally through a power station that is the responsibility of Cowell Electric Supply under the South Australian Government's Remote Areas Energy Supply (RAES) scheme. Under RAES, community residents previously received free electricity but since July 2022, prepaid electricity meters are located in all homes. SA Water (a statutory corporation owned by the South Australian Government) is responsible for delivering essential water and sewerage services to Community A and 12 other Indigenous communities across the state. Telecommunications access in Community A is via NBN satellite and the Telstra 4G mobile network.

4.3.2 Community B – Western Australia

Community B is a remote Indigenous community located in Western Australia. Approximately a two-hour drive from the nearest large town, the community is accessible via a major highway. Like Community A, Community B is a closed community that is managed by an Indigenous community council (Incorporated body).

The community has been growing over the past decade and is the largest of the three case study communities. Under the ILOC classification system, Community B is considered a medium-sized ILOC (i.e. between 201 to 500 residents). The median age of the community is approximately 26 years old and the average household size is 4.2 persons.

The community has increased its infrastructure over recent years and currently has a community-owned roadhouse and community shop, cultural centre, arts centre and airstrip. It also has a recreation and sports centre, oval, swimming pool, childcare centre, remote area health service, elder care centre (currently not used), school (kindergarten to Year 10), telecentre, multi-functional police facility and two workshops (mechanical and machinery).

Community B receives infrastructure and services from their own community council, the regional council and the Western Australian Government. Community services provided by the community council include early childhood education and care, aged care services, youth and employment services, and drug and alcohol programs. The regional council also provides municipal services such as waste collection and management, roads maintenance, and parks and recreation maintenance.

Private dwellings in Community B are managed by the Western Australian Department of Communities. Electricity in the community is supplied by Horizon Power (Western Australia's regional energy provider) with prepaid arrangements in place for home use. Responsibility for water services lies with the Water Corporation (the principal supplier of water, wastewater and drainage services in Western Australia). Options for telecommunications are limited in the community, with Telstra the only network.

4.3.3 Community C – Northern Territory

Community C is located in the Northern Territory approximately three hours' drive from the nearest large urban centre. Governed by a Local Authority with elected community members, Community C is situated on a sealed road off a major highway and is a closed community with permits required from the relevant land council in order to visit.

According to the ABS Census, Community C has experienced a decline in population over the past decade. At the time of the 2021 Census, the community was classified as being a medium-sized ILOC. The median age of the community is around 23 years old and the average household size is 4.5 persons.

Infrastructure and services at Community C are typical of a mid-sized remote community in the Northern Territory. The community has a store (which also sells fuel), an unsealed air strip, primary healthcare clinic, school (kindergarten to Year 12), police station, art centre, and music and sports facilities.

Community C receives infrastructure and services from both the Northern Territory Government and the regional council. Community services provided by the regional council include animal management, aged care and disability support, night patrol, youth sport and recreational activities. Municipal services are also provided by the regional council and include cemetery, road and parks maintenance, and waste collection and management.

Private homes in Community C are managed by the Northern Territory Government with support from a local housing reference group of community members. As elsewhere in the Northern Territory, essential infrastructure is supplied by Indigenous Essential Services, the private proprietary limited company and subsidiary of the Territory-owned Power and Water Corporation (PWC). Telecommunications services in Community C are provided via the Telstra network.

4.4 Remote community population trends

A first aim of the case studies was to understand perceptions of past and future expected population trends within each of the three communities. We also sought to explore views as to the accuracy of ABS Census data when measuring remote Indigenous community populations.

4.4.1 Past population trends

Perceptions of past population trends differed markedly in each of the three communities. Respondents in Community C largely agreed that the trends observed in the ABS Census data of a declining population were accurate. This broader population data was also considered by several service providers to be consistent with their client numbers over time in Community C. However, several respondents noted that changes in the demographic composition of their community were occurring with an increasing proportion of single and older people.

> *2011 we had a lot of people, four tribes used to live here before and there was people everywhere. But now, it's maybe few people not here in our community. C06-09*

In contrast, respondents in Community B held mixed perspectives on their community's population trends. Some agreed with the observations in the Census of a growing population. However, others considered the population to have been stable or to have declined over the longer-term from a high point in the period from the 1960s to 1980s.

> *It's grown quite a lot, especially over my lifetime…people I grew up with…I would say they're all generally here. I think in my age group probably one or two that don't live here. B02*

Respondents in Community A agreed that population numbers had been fairly stable over time (notwithstanding a temporary increase during the COVID-19 lockdowns), but noted recent marked changes in population mobility. While still considered to be reflective of temporary mobility rather than permanent population change, stakeholders suggested that around one-quarter of residents had been absent from the community over the previous six to 12 months. The reasons for this population movement are discussed below.

> *People are just away for long periods of time…There is around 200 here at the moment and…it is probably the lowest it's been. A25*

4.4.2 Future population trends

Despite divergent views regarding past population trends in their respective communities, many respondents anticipated that their communities would grow into the future. While Community B was perceived to be attracting young families to return (in part due to the perceived harmony and closeness of the community), Communities A and C were considered more likely to experience an ageing of their populations in the future.

> *You could probably see [Community B] growing a bit more…It's [a] very tightknit community here. B07*

However, it was noted – especially in Community A – that continued improvements to infrastructure were required to encourage people to either remain living in the community or to want to move back.

> *But it goes to show you once you start improving the infrastructure in a community…people do want to return back to Country. And that's what the resounding message is. We want to return to Country. Particularly the older people. A01-02*

4.4.3 Accuracy of ABS Census data

Stakeholder respondents in all three communities questioned the accuracy of the ABS Census in determining population size within remote Indigenous communities. Firstly, many respondents suggested that the Census underestimated the true number of residents living in each of the communities. This was considered to be due in part to people being unwilling to list the real number of people living in a household for fear of potential repercussions (such as a loss of tenancy or increased rent). Moreover, as English was not a first language for many Indigenous people in remote communities, full understanding of Census questions was queried.

> *Housing for example with the recent Census…No Aboriginal family with 15 people living in their house is going to put 15 on the Census form. The Department of Housing might say that, take the house off them or increase the rent so of course they're going to put four people on there. All of those types of things. B01*

> *How it's captured causes us some consternation…And whether or not there's a true understanding, always with some of the questions that are asked, given it's done in English and English may or may not be the fifth, sixth or seventh language for some of the people that they're trying to deal with and get information from. C16*

Secondly, respondents reported that the Census did not capture sufficient detail regarding population mobility including shorter-term fluctuations in population size that can impact greatly on remote Indigenous communities. As such, in its current format, the Census was considered to have limited usefulness for service planning and funding within remote communities.

> *We've been working off the 2016 data, as a baseline in terms of working out our overcrowding [in Community C]…The missing link has always been mobility for us…how do we factor mobility into that future looking program. C14*

In order to counteract these issues, stakeholders in Communities A and B stated that their community was collecting internal data (via surveys, audits and registrations at the community AGM) in order to understand the true extent of their respective populations. It was hoped that this information could then be used to enable more accurate funding of community services and infrastructure.

> *[Organisation] is doing an audit of each house and actually how many people are in there. And it reflects the true indication of how many people actually are living in each house or the lack of housing. B01*

> *The true population if everyone had have been here was sitting at around 495. So those numbers have never been captured [in the Census], this was more [from] our surveys and stuff that we did as well. A25*

4.5 Drivers of population mobility

The case study interviews also sought to understand the drivers of population mobility in remote Indigenous communities. Respondents identified both temporary and permanent drivers of mobility, as well as factors that drive mobility towards and away from remote communities.

Similar drivers of temporary mobility were identified across all three communities and were considered by respondents to be either seasonal (i.e. occurring at similar times each year) or unanticipated in nature. It was also noted (particularly in Communities B and C) that not all families were mobile. Some tended to remain in community all year round, whilst others moved around to different communities during the year.

> *We have our kids who are local, who we know live here, they don't really move too much…You've then got your other kids who quite regularly show up in your community, but they move around to a lot of different communities. C01*

Cultural business (such as ceremony, and men's and women's business) was described as often leading to large temporary influxes of people both into and out of the three case study communities. Likewise, sorry business and funerals contributed strongly to short-term mobility between neighbouring communities and towns.

> *Culturally, there's movement of people regularly. We have people of many a given community here at different times. B06*

> *Then due to cultural business and sorry business and general family business, there's just always a lot of movement…There might be hundreds of people who descend on [COMMUNITY A] because there's a significant funeral there. And so that can often cause us a lot of stress on the community to sort of manage so many people in such a short period of time…The events that lead to the movement, you can't predict when and where they will happen. A09*

School holidays and seasonal weather patterns also impacted upon population movement on an annual basis as people visited their families across each region. Indeed, it was reported by respondents in Community A that a pattern of mobility commonly occurred between different remote communities in South Australia and into regional centres over the hot summer months. It was also noted in Communities B and C that the wet season and associated flooding events could leave people stranded away from community for long periods of time.

> *The numbers do wax and wane a lot, like in the summer months, the communities tend to empty out, and people sort of go to regional centres, like the communities in the Far West come to Ceduna or even to Port Augusta and Adelaide. And during that time, say from November to February, people from the APY Lands go to Alice Springs or down to Port Augusta or Adelaide. A09*

Leisure activities such as attending sporting events and shows, or going to urban centres for shopping trips were further drivers of temporary mobility that occurred on a frequent basis throughout the year.

> *There's a bit of a circuit of these Bush sport competitions where they go out and they play football and…they often have a concert with it and they played softball and…there's a few sports I mean basketball some people kind of drop what they're doing for that. C12*

Moreover, respondents from Communities A and C reported that short-term mobility occurred from dry communities (such as their own) into towns due to some people seeking access to alcohol. In Community A, the frequency and length of such absences were considered to have increased considerably as a result of recent Australian Government policy changes, including the ending of Community Development Program (CDP) compulsory activity requirements. As some adults travelled to regional centres to access alcohol, children and older people were reported as sometimes being left behind with little familial support.

> *And so the normal lifestyle cycle in the community…is that they work hard during the week for the committed hours…Then they would go off, like everybody else, have a great weekend, drink hard, play hard, come back. Now we've got no commitment to come back…because there's no obligation [with the CDP], no checking, nothing. So what we are noticing is larger numbers in [TOWN]. A11*

At the height of the COVID-19 pandemic, border closures, lockdowns and associated Return to Country programs had encouraged people to move back to community at least temporarily. At this time, many community members were said to have felt safer living in a remote community than being based in a larger town or city and, as a result, population numbers increased in all three communities.

> *A lot of the impact with COVID was it brought people home…Because I think if shit hits the fan or if someone got sick, people want to die on Country…People [were] incentivised to return home to Country...I think there was funding so people were able to get home…And a lot of people did. Said they wanted to go home to Country. Because everyone was very, very scared of COVID. C10*

A factor which was identified as influencing mobility on a more permanent basis within remote communities was access to employment. A lack of work opportunities for local residents was perceived to sometimes force people to leave their home community in order to obtain employment elsewhere.

> *Out here, where're you going to get a job? There's…no jobs out here…We're trying to create our own. A14-21*

Family conflict and violence was also considered to lead to both short-term and long-term mobility. Respondents suggested that some people were forced to move between communities after being sent away from their home community due to antisocial behaviour; or that people may choose to leave a remote community in order to escape situations of family violence or community unrest.

> *There's also a transient component that has people moving around. And we seem to be increasingly seeing that…I think there's elements of less acceptance of behaviours, and people moving because of that, or people moving on because of that…We're seeing people, less welcomed back to their own communities who have been behaving in that manner, or through fights. C16*

> *Family violence can be why people want to leave the region…to get away from their partner, whoever the perpetrator is…So they might go somewhere else where they feel like there's another safe house there and there'll be more opportunities to get more services. B10*

In contrast, respondents from Community B spoke of their community being stable and that strong family connections encouraged people to either remain living there or to move back after time away.

> *Mostly they're married, married to a woman or man so they come here and stay, you know. We're a peaceful place. B05*

Finally, a lack of access to adequate housing, essential infrastructure and social services was a further key factor that contributed to both temporary and permanent mobility in all three communities. These issues are discussed in more detail in the following section.

4.6 Relationship between mobility, infrastructure and services in remote communities

The relationship between mobility and remote community infrastructure and services was perceived by many respondents as being two-way. Hence, mobility into and out of a community impacted upon the funding, provision and sustainability of infrastructure and services. Likewise, the level and type of infrastructure and services present within remote Indigenous communities was considered to influence population movement. Examining each key infrastructure and service type in turn, this section explores this two-way relationship in more detail.

4.6.1 Housing

Community housing

Household overcrowding was described as being a common issue in all three case study communities. Even in Community C, which according to the ABS Census had experienced a decline in population size over recent years, there were considered to be insufficient dwellings to adequately house the current number of community members. Overcrowding and a lack of available accommodation was considered to deter people from returning to live in remote communities and to act as a driver for community members to move elsewhere.

> *Overcrowding is absolutely an issue. You might have two or three, four families living in one house. B04*

> *They should be coming home but it comes down to housing. People are still crowded. A14-21*

While programs to replace or extend existing homes had occurred in each of the communities, stakeholders in Communities A and B noted there had been no additional dwellings constructed to meet population need in recent years. Respondents also described a need to be equitable across communities and this presented challenges in prioritising the case study communities even if their housing needs were particularly pressing.

> *Competing priorities is a big issue. There is an existing stock of housing that has been built, which needs money to be maintained and upgraded and refurbished and the like. And also potentially some communities that missed out on housing under the previous Commonwealth round as well. So there's almost like a pecking order of priorities suspending funding before you even get to what's the current need and the current population, unfortunately. B11*

Due to a shortage of dwellings, people returning to community had to live with family members as no other homes were available. Additionally, visiting family members, staying for weeks or months at a time, increased household numbers and levels of overcrowding. Within Community C, respondents reported that homelessness services in the Northern Territory were typically based in urban settings and a lack of such services in remote areas also contributed to overcrowding.

> *There's a huge housing list here as well and sometimes some people are waiting three, four, five years for a house…Unfortunately, it's just the way it goes…I think it's just overcrowding in houses. B07*

> *So most of our remote community homelessness doesn't receive a heap of funding…A lot of our homelessness services are urban based, and it's why a lot of our remote [communities] have spaces [that] are overcrowded I guess because people will generally find a space to stay. C16*

Household crowding was noted to contribute to increased risk of property damage, family strain and antisocial behaviour that could place tenancies at risk. In order to address these issues, housing organisations were described as having to provide additional tenancy management services. Overcrowding could adversely impact upon household members with regard to health, employment, education, child protection issues and domestic violence, all of which then impacted local service provision.

> *Another reason might just be to come down and stay with family. And this results in pressures on tenancies of course, overcrowded tenancies, antisocial behaviour…and the tenancies become at risk. And so, what I've noticed is a great effort from [ORGANISATION] to help people manage those problems. A09*

> *When we talk about population growth, there's no infrastructure growth as well, so you have a lot of overcrowding, which leads to health problems, child concern problems. B04*

Within Community A, it was also noted that mobility away from the community had implications for the provision of housing and accommodation within the neighbouring regional hub. Due to a lack of sufficient temporary accommodation, many visitors to the town from Community A were either sleeping rough or residing with family members with resulting issues for their tenancies.

> *There's so many more Lands people here in town…So not only are they rough sleeping, but the people that do have housing tenancies in [TOWN] are being overcrowded, which is causing issues and damages and whatever, and then that's when it's causing them to get evicted. A03*

Staff housing

Insufficient availability of staff housing for permanent, FIFO and locum employees was reported in Communities A and C.

> *We've got a housing problem here. I don't have enough houses. I've got four units…[and] at any given time, I'm juggling the four units that I've got between [ORGANISATION] staff and outreach people...like the specialist services. C10*

This affected the capacity of these communities to accommodate the full number of staff required to operate community-based services such as the health clinic and police station. A lack of staff housing, therefore, had a detrimental impact on the availability of on-the-ground services, with organisations said to be unable to fill vacancies and ease workload pressures experienced by current staff members.

If I want to hire someone else from outside with experience, I can't; I have no room. We've got not enough housing for workers…You've got problems there because like SAPOL, we're one cop short. But we're a house short, so we can't put a cop in. That really causes us problems and it causes the health of the officers too, because they could have had time off. A24

4.6.2 Essential infrastructure

Challenges with essential infrastructure, such as water, power and telecommunications, were reported in all three communities. These challenges were considered to constrain the ability of each community to meet current population need and to potentially expand in the future.

Communities A and C are located in arid areas, and issues with the supply of water were noted by respondents. These limitations impacted upon the capacity to build and service new homes as water supply to the rest of the community would potentially be compromised. Issues with the quality of the water supply was also noted in Communities B and C.

If I've got a program of 20 houses and it's going to place stress on the existing essential services, then it's [ORGANISATION'S] responsibility to try and augment the existing services to support the new housing. So whether it be water, sewerage, power. C14

The water could be improved. The water's not great quality. It's high in calcium but it meets the standards. B06

Likewise, respondents suggested that the availability of power in remote communities could be problematic when planning for the construction of new dwellings. This was particularly so for locations such as Community A that has to generate their own power supply. Moreover, issues with the back-up power generator were raised in Community C; this generator was said to be ageing and the community unable to turn it on themselves if the main power system failed (instead requiring an outside agency to operate it). Power outages within the community also impacted upon the provision of telecommunications and the supply of water.

So also going to [DEPARTMENT] and understanding from them where the power limitations are given it's all off-grid power supply into these remote communities. A01-02

Relatively poor telecommunications connectivity was reported for all three communities. Access to a reliable and fast internet service could be challenging and this issue was felt to contribute to younger people wanting to leave the community.

Every kid…they like to have their iPhones on. They like to watch the latest video. We can't here because we don't have enough Telstra signal. The teens would leave because they want to go down and get online…I've spoken to people in [TOWN] and they say, "You've got a lot of the teens down here." I say, "What do your kids want to do? What would happen if your teenager couldn't get online?". Well, they'd be really pissed. A24

4.6.3 Services

Population mobility was also considered to impact upon the demand, funding and provision of services in remote communities. Conversely, the availability of locally-based services affected mobility including the ability of community members to remain living in community.

Education

Mobility was perceived as being a key factor that affected school attendance in all three remote communities. If away from community, children often did not attend school at all; this had implications for educational outcomes with students falling behind with their schooling and unable to subsequently catch up.

> *But the problem is they get behind and they keep getting behind and they can never, it's very hard to catch that up…And there was a couple of little kids…[that were away] for three months and haven't been to school, when they come back, they're way, way back, they've gone backwards. A12*

Respondents in Communities B and C considered this issue to be heightened by a lack of collaboration between schools in the region to identify and support children who were away from their home communities.

> *Schooling, for example, there might be a family member that's sick or extremely sick in another community and it's not just one person that goes, it's a family group that goes. So you know, that's why a lot of school attendance might be down. And it's not schools talking together as well, everyone is in their silos…There's no communication anywhere in relation to that. B01*

Respondents also reported that mobility and associated absences made teaching more difficult due to behavioural challenges observed in some of the remaining children and missed class time and content for those who were away. In Community C, the mobility of Indigenous assistant teachers was also considered to adversely affect school operations at times.

> *A lot of teachers struggle with that…all of a sudden they've got kids you know, jumping out different times of the day. And again, different days having different kids and they're just oh my God, it's just a completely different world. C01*

Population mobility was reported to adversely impact upon school funding and associated staffing levels. School funding in each of the communities was allocated according to attendance levels during a set time period at the start of the year. If children were absent (such as for family visits or ceremonies) this had a detrimental effect on funding for the rest of the year. This was considered to be less of an issue in Community B as funding for the local faith-based school was reported to be more flexible with top-up funding available when required.

> *The school is funded by participation numbers, and if you've got parents trotting off…When it's long-term…that affects the school, its ability to give good education because if the numbers drop, they drop the number of teachers. A24*

Respondents reported that older children living in remote communities often attended boarding school (either due to local schools not catering for higher grades or perceptions that schools in urban areas offered higher standards of education). As a consequence, these students were absent from their community during term times.

> *I know a lot of the high school kids, they go away from schooling…They go up to Year 10 here. They don't cater for Year 11s and 12s, so they have to go away schooling after all those years…So during the school terms, a lot of the high school, bigger kids and all that, they're all away. And then during the school holidays and Christmas time, usually it's quite busy, everyone's here. B07*

Within Community A, respondents noted that parental absences resulted in children sometimes being left behind in community and not properly cared for. This led to the local school having to step in to provide food and clean clothes to some of their students.

> *Just the change in the transiency…and the fact that kids are left here to virtually fend for themselves…There's a group of 10 kids that are always here. Always come for breakfast, always come for [a] feed Monday morning, they're here, knocking on the gate to get in in the morning to get fed. So that's definitely a lack of food. Obviously, the kids most of the time are pretty clean. But sometimes…you've got to wash them, put some clean clothes [on them]. A12*

Healthcare

Access to healthcare services was considered a key driver of both temporary and permanent mobility away from remote Indigenous communities. Although each of the three case study communities had a health clinic, the services offered were mostly nurse-led primary healthcare services and somewhat limited in scope. In addition, a dormant dialysis unit was present in Community C; the equipment unable to be used for several years due to a lack of ongoing maintenance funding and staffing.

> *The nurses, you know, they do a great job and stuff, but sometimes you need to see the doctor. B02*

> *We've got a dialysis unit with two seats there, that hasn't been used for years. It's just the building out the back, we've got hundreds of thousands of dollars' worth of equipment in there…Family members have been approaching us. They know they've got two seats there and they want to know why their family members can't come back. C10*

While some health-related services (such as medical, allied health, mental health and drug and alcohol services) were available on an outreach basis to the communities, access to these was considered to be too infrequent and insufficient to meet population need.

> *[We have] outreach people…like the midwife, the chronic conditions educator, the diabetes educator, podiatry, you know, the services that we can't deliver. The doctors come luckily for us from [TOWN], usually twice a week…But because everything has to be constantly caught up, we've got people that are missing out on an essential service. C10*

In addition, many specialist medical services were only available in urban centres. This meant that people with serious chronic conditions, such as heart issues or kidney disease, were forced to relocate to receive necessary care. Respondents noted that often family members accompanied the person who was receiving external healthcare, contributing to greater levels of population mobility away from community.

> *There's health reasons, too. So when people are transported into major regional centres to undertake health treatments, more often than not a lot of family members do migrate as well. Follow the family, if you like. C14*

Ongoing challenges were reported in Communities A and C with attracting and retaining healthcare professionals to work in the local clinics. This led to services being short-staffed, existing staff experiencing high workloads and challenges faced in providing essential healthcare services. As discussed above, insufficient staff accommodation impacted upon the ability of community health clinics to employ new workers.

> *It's definitely affecting the viability of workers coming to [COMMUNITY A]…And whilst you have a lot of, I guess, goodwill and there is a lot of good people working, there comes a point where you can only take so much. A06-08*

Furthermore, population mobility was identified as adversely impacting the ongoing funding and provision of healthcare services in remote communities. Respondents in Community A, for example, expressed concerns that the current high levels of mobility away from that community would affect future healthcare funding with negative implications for service delivery and staffing. Moreover, as illustrated by the unused dialysis equipment in Community C, funding for healthcare infrastructure was at times provided in response to population need without provision for ongoing funding (e.g. equipment maintenance, staffing and employee housing).

> *So that's probably the biggest impact and it certainly has impacted some decisions on there is no point us going for funding for this particular program and having a full-time employee here if the population isn't here to actually service, so you can't justify it. So it has had impacts on what type of additional services coming in through us for community…It means that the ones that are here miss out because it's not enough to justify the resource. A25*

As discussed above, respondents noted that insufficient housing, household overcrowding and limited access to hygiene facilities in remote communities contributed to greater health issues. The prevalence of infectious diseases (such as skin and eye infections) was said to be particularly high when cultural events brought an influx of people into a community and exacerbated household crowding. This then impacted upon demand for on-the-ground healthcare services within that community.

> *So when we had events, so like our sporting carnival or sorry business and a whole range of things, there was actually those peaks and positive trachoma [eye infection] transmission. Which was overcrowding the houses, there was a whole heap of things happened at that time and we would have up to one thousand people here for a full week period…So it was definitely a mobility issue. A25*

Finally, for Community A, mobility into urban centres for the purpose of accessing alcohol contributed to poorer health for some community members. Consequently, the local community health clinic was described as having to deal with serious and acute health issues as people returned home following a period of sustained alcohol misuse.

> *It means that people are just away for long periods of time where they can access stuff for bad behaviours and certainly not look after their health…Our acute presentations and emergency response have just skyrocketed because they're typically coming back home to dry out or because they're not well and so then it is at an acute point and so they are getting air vacced out. And so that has changed the pattern of health which is really difficult. A25*

Aged care

In each of the case study communities, limited aged care support was available for older community residents. For example, within Communities A and C, a day centre provided assistance with meals, showering, laundry and social support. However, a lack of residential aged care services in all three communities meant that some older people requiring more intensive support were forced to move to facilities in urban centres. Respondents in Community B noted that while a facility had been built with the intention of providing community-based residential aged care, it was not currently being used due to insufficient funding for its ongoing operation.

> *That big building, our aged care, it's not working…Apparently they ran out of funding. So they didn't get any workers in to finish it off…it's just never been used. They built it because our elderly [are] getting sent off to other towns. B03*

Employment services

As outlined above, a lack of local employment opportunities was recognised as being a driver of mobility away from remote Indigenous communities. Respondents also felt that the recent ending of CDP mutual obligation requirements had reduced incentives to participate in community-based employment programs; for Community A, this was contributing to greater outbound mobility. Stakeholders in Community B noted that if jobs were unavailable within community, the local employment service could provide training and financial support to assist people to relocate. Mobility was also considered to impact upon the employment support services offered within Community C, affecting caseloads, client engagement and job outcomes.

> *It's a bit limited [the number of paid positions]…We do have that option that we can actually help people relocate and we do help them with costs of relocating if they want to…We've had people that have done training here. We actually ran a 26 week civil construction course last year…We did have about 15 that did graduate and finish…I probably reckon I've got only maybe two left here. The other 13 have all moved on, so they've got jobs. B07*

Community services

The availability and operation of remote community services was also considered to be impacted by population mobility in Communities A and C. Within Community A, concerns were raised that current mobility and lower population numbers could have a detrimental effect on several community services. This included the funding and provision of Council services and the future viability of the community store. If these services were forced to cease operating, community sustainability was imperilled.

> *The store is a real critical one because the ability to feed itself is critical, it's essential…Now, to have a store, you've got to have staff. To have staff, you've got to have income to pay the staff. You've got power costs, you've got water costs, you've got goods costs, you've got transport costs…Very critical. If we lose that, we're dead. We can't survive. Very, very serious; any major loss of population. Whether it be short-term or long-term, it impacts. A24*

Meanwhile, the art centre in Community C was perceived as playing a key role in the social fabric of that community. As well as providing opportunities for employment (discussed further in the following section) and activities pertaining to art and culture, the centre provided a social space and contributed to reasons why residents wished to continue living in the community.

> *It's somewhere for people to come…a calm space, a social space…So I see it as a place for them to get a break. People's lives at home are pretty busy, people living in houses that have a lot of people in them…I like to have a space where you're there, away from that a little bit. C12*

Transportation

Options for public transportation were reported to be very limited in all three communities, and often a car was the only means of transport to and from the community. At times this meant that visitors remained in community or people were forced to stay away from community for longer periods than anticipated as they were unable to move easily (e.g. due to waiting for someone to drive them home, high petrol cost or cars needing repairs).

Services in regional centres

Finally, some respondents considered that population mobility from Community A was impacted upon by the availability of welfare services in the nearby regional centre. These respondents suggested that the provision of supports (e.g. food and accommodation) provided an incentive for people to stay away from community.

> *We're constantly getting backlash from [TOWN] services that [COMMUNITY A] people are the problem…Well, why would they come back to our community when they can be under the influence of alcohol and access alcohol with their own money…And they can binge for weeks and yet they know that they can go into [ORGANISATION 1] or they can go into [ORGANISATION 2]. And they'll give them accommodation and they will give them food and they will put them up…So it's this continued cycle. The issue that we have in [TOWN] has been a service-centred created problem. A06-08*

4.7 Implications for remote community infrastructure and service funding and delivery

The case studies sought to understand the implications of population mobility on future infrastructure and services in each of the three remote case study communities. They highlight gaps and needs relating to infrastructure and service delivery, and the data and governance requirements to support the future development and operation of infrastructure and services.

4.7.1 Future remote community infrastructure and service needs

Housing and accommodation

To address remote community housing needs, including long waiting times for housing and high rates of overcrowding, respondents suggested a need to build new dwellings and expand existing homes. By increasing and improving community housing stock, respondents suggested that this would encourage people to live in the case study communities. The high costs of building new homes in remote communities was acknowledged, and respondents called for the provision of greater levels of funding to support housing construction programs.

> *We're actually in the process of upgrading all the housing stock there and a lot of people who haven't resided at [COMMUNITY] for many years are now coming back, former community members, and saying well we want to put our name down for a house…People do want to return back to Country…So you build it, they will come sort of attitude. A01-02*

It was also recognised that new housing should be designed to better meet community needs and changing socio-demographic population trends, by considering, for example, the appropriate size of dwellings and the provision of options for communal living.

> *It's also not just a lack of housing. It's a model of housing. It's suitable housing. I mean, a three-bedroom house does not suit many Aboriginal families. A04-05*

Respondents suggested that consideration needed to be paid as to the best approach for the development of new housing in their communities, such as whether housing should continue to be the responsibility of state and territory governments or instead could be managed by the community itself. Recommendations relating to the governance of remote community housing are discussed in further detail below.

> *And then the question being, if housing is going to be built, is a social housing model the best and most empowering model or is some kind of social or affordable housing run by Aboriginal community housing organisations a better model of doing things? B11*

The potential to build temporary accommodation to alleviate current housing pressures was discussed by respondents in Communities A and C. Some of these respondents envisaged this as being an appropriate way of easing overcrowding both for visitors and community members awaiting their own property. Moreover, the washing facilities offered within temporary accommodation was seen as providing a way to improve hygiene, reducing the risk of infections and associated demand for health services. In contrast, other respondents questioned whether this type of accommodation would be utilised, suggesting that visitors and extended family would continue to choose to live together.

> *Housing is the main thing. Good housing, quickly. Even if we did...the temporary stuff. When you've got people with...13 people in one building, temporary housing isn't going to faze them. Do you know what I mean?...Not necessarily dormitory, but duplex type living, something to just ease the pressure. A24*

> *They wouldn't stay in them [temporary accommodation]. Because they'll come and stay with the family in their place. C06-09*

Improvements to remote housing repair and maintenance programs were also seen as being required to enable dwellings to be brought up to standard and, if empty, to be reallocated as quickly as possible. Current high costs associated with outsourcing repairs and maintenance were noted in all communities. With funding and support to build internal capacity, respondents hoped that these programs could be provided in-house within their community in the future.

> *The lack of contractors going out to houses…these builders go out and most of the time they're only there for three days if that doing minimal repairs and then charging exorbitant fees for it… What Aboriginal communities and smaller centres want to do is have their own repairs and maintenance [program]. B01*

Respondents recognised that the expansion of housing supply within remote Indigenous communities necessitated consideration of land tenure requirements. For instance, Community A is situated upon Aboriginal Lands Trust (ALT) land and, therefore, ongoing collaboration was required over the use of community land for any new purposes.

> *It's not a matter of just providing houses, okay? So, the land tenure has to be sorted out first. B08*

> *We do meet with them [the ALT] regularly and have a good relationship. But I think it's more about making sure that they're party to any kind of initiatives or changes that we look to undertake that might have an influence over the lease arrangement. So how we utilise property we want to make building arrangements, etc. A22-23*

Finally, improvements to staff accommodation was identified as being required in Communities A and C to enable organisations to operate at full capacity and provide quality services. This included the construction of new dwellings and the repair and upgrading of current properties.

> *If we had more government employee housing…we would actually put child protection workers out bush…which I think would really improve the quality and accessibility of our services. C13*

Essential infrastructure

To support the development of new remote community housing, respondents suggested a need to ensure that adequate essential infrastructure was in place. However, it was acknowledged that this would require large amounts of additional funding due to the high cost of infrastructure development within remote areas.

> *One of the things that has always been missed is the augmentation or the addressing [of] infrastructure services to support housing. C14*

Improved access to telecommunications and internet services in remote communities was also recommended, a benefit of which may be to encourage younger people to stay in community. Respondents in Community C additionally identified that their existing back-up power generator needed replacing to reduce the likelihood of future power outages.

Education

In order to better support children whose schooling was impacted upon by mobility, respondents suggested that enhanced collaboration between schools in their region was required. For example, schools could notify each other when children were travelling from community and put measures in place to enable these students to still attend school. Respondents in Communities A and C also recommended that attendance-based funding models for remote community schools be revised to prevent any detrimental impacts due to high levels of temporary student mobility.

> *So they introduced a [funding] model…and we went from six teachers down to four teachers, based on the numbers…If its [the] first four weeks of the school year…and what you're averaging attendance is for that, which, again, is not great, because that's when we have ceremony at the start of every year. And so we've got kids…on the passive list, you don't get funding for them…It's a very unfair system, to be honest…we can't control attendance, we can't control mobility. C01*

A need to build new school facilities in Community C was also highlighted. This would give the school more space and also opportunities to provide culturally appropriate educational activities.

> *When they removed all these classrooms, they only gave us the three tiny classrooms over there… and we've lost a lot of extra rooms, so we don't have an art room, science room, you know, music, any of that stuff [that] is actually really culturally appropriate. We don't have space anymore… Hopefully, they'll allocate the money for the build. C01*

Healthcare services

Respondents in all three communities stated that improvements to healthcare services were required that would allow more provision within community and reduce the need for people to relocate to larger centres. Suggested improvements included the provision of additional locally-based services (such as a general practitioner, mental health, and drug and alcohol support), as well as more frequent outreach services.

> *Everything from mental health – anything you can poke a stick at, it's a gap. There's services that go out but they're only funded to deal with 12 people. What about the other 35 people that need their assistance?...Those are the ones who are falling through the gaps. B01*

Specific measures relating to population mobility and the future funding and provision of healthcare services were noted in each of the case study communities. As the health service in Community A was currently providing some acute medical care, recognition and funding by the state government was considered to be needed to allow this service to continue.

> *We get very little state funding for anything and the biggest gap for us is that from a Commonwealth point of view, Aboriginal Community-Controlled Health services right across Australia are funded for primary health. In very remote communities you [also] take on an acute emergency response. Emergency services is a state responsibility and APOs aren't recognised in that so we get no funding support from an emergency response point of view. Yeah, it's huge, it's a nightmare. A25*

Respondents called for the existing—but currently unused—dialysis equipment in Community C to be made operational and a renal nurse employed to provide active dialysis services within community. Meanwhile, respondents in Community B suggested that addressing household overcrowding could potentially reduce the prevalence of chronic and acute health conditions along with the associated implications for healthcare and population mobility.

> *I think it's the housing situation [that is the main priority] and that impacts a lot of other social issues…and health issues as well. Sharing towels, everyone in close proximity to each other. So one person gets the flu or something and it spreads like wildfire in that house. So yeah, the overcrowding in the housing I think is one of the main points that impacts or cascades a lot of those other issues. B01*

Aged care

Improvements to aged care provision in Community B were also suggested. However, respondents had mixed perspectives as to whether the vacant aged care facility should be updated and put into operation or repurposed for other means, such as community accommodation or a work facility.

> *[Older people] don't want to go to [TOWNS]. They want to be here at home…It's a good, good building. Oh I think, you know, run properly and proper management. That's why we need training, see…Well we figured put it back together again and this, so respite stuff, like they can take them there during the day, let them have a rest and go back home. Try something little first, small stuff first and then trial care. B05*

Employment support

In order to support people to remain living in remote communities if preferred, respondents highlighted the need for more locally-based employment opportunities. Suggested approaches included the development of employment and training programs to support local residents to upskill and take on roles in their community (rather than these being outsourced), such as in aged care, housing maintenance and municipal activities. Further recommended measures included the creation of new local businesses and community-based services setting targets for the employment of local residents. Within Community C, the extension of an employment program trial that enabled community residents to work in the art centre and earn an income was also recommended.

> *Well that's part of our strategic plan, part of our drive is about that community development… And we have a reporting ratio, so set ourselves targets around Indigenous employment, there is obviously targets around trying to build capacity. A25*

To further support job training and employment opportunities, respondents in Communities A and B advocated that the work requirements of the CDP be reinstated. Within Community A especially, this proposed measure was considered to provide incentive for people to remain in community, thus reducing short-term population mobility. However, it was also recognised that jobs were needed within remote communities that could provide a proper living wage rather than the lower rates offered on the CDP.

> *At the moment we've actually got CDP consultations happening here…Now a lot of people… preferred the old CDP model and that's when they had their own builders trained up, the repairs and maintenance trained up and all that. B01*

Community facilities and services

Various improvements to community facilities and services were suggested by respondents as a way to provide greater incentives for people to remain in community. This included the development of services that promoted community engagement such as recreational activities and youth programs. Within Community C, the need for a new and larger community centre was proposed that would allow programs to be run more effectively.

> *They've obviously dismantled the old [community] building…but apparently when they put in a design…the plan for it actually exceeded the space. So apparently had to go back and the design is coming soon. It's been quite a few years now…It's not really happening. So I can't wait for them to get this beautiful facility that would be really great. C01*

In Community A, respondents suggested additional measures to directly address drivers of mobility (such as community unrest and access to alcohol) and stabilise population movement. To address unrest, respondents called for appropriate service responses to be put in place (including by the police and child protection services) to ensure that residents felt safe.

> *There has got to be change to that because community members aren't protected so why would they come back home…Things that occur, that are deemed it's just part of community when it's not…There needs to be some review of the authority model such as SAPOL and Child Protection. A25*

In order to lessen population mobility for the purpose of accessing alcohol and provide greater incentive to remain in community, two measures were suggested. First, respondents recommended that access to services in the neighbouring town be tightened and service providers could instead start delivering services within community. Second, the continuation of Community A as a dry community was questioned as this was perceived to encourage population movement. Instead, it was suggested that alternative models, such as a wet camp on the edge of the community, could be considered.

> *I say to the board, ''Okay, how do we get our people back?" They said close the services in [TOWN]. That's what basic, that's just simple. A11*

> *There has got to be change in regards to some of the influencing things that have kept people off community for long periods of time…It's deemed [a] dry community, it's never been a dry community in the sense that people will sneak alcohol in…and so I think there are successful models that are out there around wet camps and stuff like that that could start to change some of that. A25*

4.7.2 Data and governance requirements

Data requirements

Despite the recognised relationship between population mobility, infrastructure and services in remote communities, respondents felt that mobility was not sufficiently taken into account when planning for infrastructure and service provision. This was considered to be, in part, due to a lack of comprehensive information on remote community population mobility.

> *It's [mobility] not factored into anything: into housing, into schooling, anything like that. B01*

Respondents spoke of a need for more detailed data to properly understand the true extent of mobility in remote Indigenous communities. The population data provided every five years via the ABS Census was not considered to be sufficiently nuanced and, as described above, the veracity of this data was questioned. In particular, respondents stated that the Census data did not capture the shorter-term mobility that occurred to and from remote communities. Further quantitative and qualitative data collections were seen as being invaluable for more strategic policy development and the planning of appropriate infrastructure and services to better meet remote community needs.

> *I would love it, that our central agencies actually come up with some fairly detailed information around…what were the changes like previously, for the last five to 10 years? What were they projected to be the next 10 years? But not just about data, but the analytics and the voice of residents? Because I'm not sure we really understand…I also think we need more factual information around population mobility…If we had population projections, we could then plan that around infrastructure for needs. C13*

Self-determination

Many respondents saw a need for greater self-determination regarding the planning and implementing of infrastructure and services. This was considered vital to ensure that provision met the true needs of a community.

> *We've got to work with and for Aboriginal communities…We've got to listen to the community and then be guided by what they think. A09*

> *[It's] one thing just actually having the infrastructure but secondly, designing the appropriate infrastructure, which goes to the heart of the profile of the population. C13*

In particular, respondents supported the need for more active Indigenous involvement in the planning and management of housing within their community. The Closing the Gap policy framework was considered to be a facilitator of deeper partnerships between governments and Indigenous people, organisations and communities.

> *With the advent of Closing the Gap, there's now a stronger focus on priority reform to close the gap, of making decisions on policy and partnership with Aboriginal people. So that's really been stressed in the decision making on housing alike. B11*

Respondents welcomed the growth of the Indigenous Community Controlled Housing (ICCH) sector and a focus on returning housing to community control. However, it was recognised that the most appropriate model for devolution (including the level of self-determination taken) would need to be determined by each individual community. To facilitate greater self-determination, capacity building within remote communities was also highlighted as being needed.

> *Longer term…each community will have its own decision making to do about what pace it takes and what component of how housing and services etc, that [it] wishes to be involved in. So some are moving more quickly than others…Some remote locations will want none of that and will just want status quo…So the model itself in the remote space under Community Housing is very liquid…It will be at the pace of each of the remote communities and each of their housing organisations as they aspire to work out what their path is. C16*

> *And that's where SAHA is moving down…starting to engage with the regions, with community to say okay what are the specific needs to address here in this region and how can we partner and work with you to come up with a solution or to invest future in that space. A01-02*

Joint working

Respondents in all three communities called for the strengthening of community relationships with government departments (both the Australian Government and state and territory governments), agencies and mainstream organisations and to reduce current bureaucratic processes.

> *We just need the bureaucracy out of it. This is real people, this is real life stuff. And it's not a game…But you know what I mean? Take the shit out…It's their land. Talk to them. A11*

In addition, respondents recognised that government departments and agencies needed to work in a less siloed manner. A more joined-up approach to discussing and addressing community issues would allow future infrastructure and service needs to be better met. Respondents in Community A also noted that improved collaboration between agencies would enable services to more effectively support people who were mobile between communities and urban centres.

> *State government agencies…should really come together collectively to talk through this issue to say okay for the community…what is the long-term vision and plan. Like what is the sustainability of injecting X number of houses into that community? And when we do that, what's the associated effect on the school, the store, the clinic, because when you start putting in new housing you invariably will increase the population. A01-02*

Specific recommendations were also made for greater joint working within the Indigenous housing sector. For example, respondents in Community C called for a joint approach to future housing policy and program development that involved the Australian Government and state and territory governments, as well as Indigenous housing peak bodies and land councils. Respondents in all three communities stressed that to support the construction of new community housing, state and territory governments needed to work more collaboratively with agencies responsible for water and power in remote communities.

Approaches

Respondents noted that a mismatch was often apparent between the self-identified needs of remote Indigenous communities and government priorities. This had, at times, contributed to inappropriate infrastructure being funded and installed. Active on-the-ground engagement was required to ensure that the planning and funding of remote infrastructure and services addressed actual needs rather than being driven by the prevailing policy focus of government.

Respondents advocated for politicians and policymakers to come out to their community to see the issues for themselves and properly understand community aspirations around infrastructure and service delivery.

> *There are a number of examples where infrastructure has gone in and have probably not been based on the appropriate evidence, aka what community needs are and population growth where it's under-utilised…What I have observed over the years, is that it almost becomes like the dominant policy paradigm of the day, which determines the type of infrastructure and direction. C13*

> *We need them to help us…They need to come to our town and not their town and start listening to us. See our issues are here…All they see is the issues on the computers and everything, data, but they should come here…Start speaking up for the people…Only time the government comes out here is when they want something from us. A14-21*

Respondents also noted that a flexible and individualised approach to infrastructure and service planning should be adopted to account for the differing needs of each remote community. In addition, longer-term strategic planning was required which went beyond electoral cycles and incorrect assumptions that urban policies could be successfully replicated in remote communities. Respondents in Community A further suggested that to improve outcomes, agencies operating in their community needed to adopt a more creative mindset around how services could be delivered in the future.

> *The people in those communities are so connected to their Country that they must be supported to stay there. It's just government has got to somehow do a bit better…get smarter with the provision of services, and listen to the community, find out what's required. Because we've got a tendency to apply urban solutions in remote situations, and that's often not going to work. A09*

> *Real services though [are needed]…Still not pleased with the responses. It's all box ticking stuff at the moment…this is what we've always done. I want people to look outside that, just rub it all out and reimagine…because there's always another way. A24*

Respondents spoke of the role that strong local governance plays in encouraging people to remain living in a remote community. However, it was recognised that effective governance arrangements may necessitate capacity building and flexibility to adapt to changing circumstances. In Community B, respondents also called for community members to have a greater say in the hiring process for leadership roles within the local council in the hope this would contribute to greater overall stability.

> *Governance is always a big thing with me as well and that's our continuous improvement thing. They can't be just we've got a governance structure and that's it. Everything changes so your governance has to change as well with certain things. B01*

Funding

Many respondents considered that the current funding of infrastructure and services in remote Indigenous communities was inadequate and too short-term. Given the challenges in accurately measuring short- and long-term mobility in remote communities, the appropriateness of using population-based funding models was questioned. In its place, some respondents suggested that a needs-based funding approach should be adopted.

> *For remote communities it's often just sort of year-by-year scenario. That's about the best we can do it based on limited funding…In 20 years' time, I think things are going to look much the same as they do now. I can't sort of foresee a radical change in the infrastructure. A09*

Particular recommendations were made for the future funding of housing in remote communities. Current funding commitments by the Australian Government and state and territory governments were considered to be insufficient to appropriately account for the high cost of building homes in remote areas, to address essential infrastructure needs (such as water, sewerage, power), and to meet current population needs.

> *So we've got a $532 million program to build around 1,600 homes around the Territory. That is nowhere near what we need to meet the demand of new housing…We estimated more than 4,500 homes were required to meet the overcrowding in remote communities. So we're not even a third of that way there. So we wouldn't have a third of the funding to do it. So it's significant…And we are talking billions for infrastructure in remote communities…It is a lot when you're talking about entire new subdivisions, sewerage ponds, power? It is an expensive exercise. C14*

Finally, the funding of specific community infrastructure and services was highlighted in each of the three case study communities. Respondents in Communities A and B, for example, called for new services and programs that facilitated engagement and incentives to remain on community. A future desire for their respective communities to become more self-sustainable and reduce reliance on outside agencies was also noted. In addition, respondents in Community C described instances where the Australian Government had provided funding for infrastructure but not for its future operation.

> *But the problem we find is…often the Feds [Australian government] will come in and provide infrastructure, but none of the enabling funding, but then we're stuck with lemons. So infrastructure that's in the wrong community, not fit for purpose. But once the infrastructure is there, the expectation is the service continues where the real kind of hidden costs are. C13*

4.8 Summary and policy implications

In-depth case studies were undertaken of three remote Indigenous communities to assist understanding of population mobility patterns and the key drivers of mobility.

Remote community population trends

The accuracy of the ABS Census in estimating the population size of remote communities was questioned. In particular, the Census was considered to underestimate the true number of community residents and was unable to capture shorter-term population mobility. To compensate, remote communities were collecting their own internal data on population and mobility and advocated for further quantitative and qualitative data collection.

Drivers of population mobility

Similar drivers of population mobility were identified in all three communities, including:

- access to housing, infrastructure and services
- employment opportunities
- cultural business, sorry business and funerals
- school holidays and seasonal weather patterns
- leisure activities and access to alcohol
- family issues and community functioning
- measures during the COVID-19 pandemic.

The frequency and length of mobility was also found to be strongly influenced by policy changes enacted by the Australian Government and state and territory governments.

Relationship between mobility, infrastructure and services in remote communities

A two-way relationship between mobility and remote community infrastructure and services was observed. Population mobility impacted upon the funding and provision of infrastructure and services in community, whilst the availability of on-the-ground infrastructure and services influenced population movement.

Key findings included:

- Housing – a shortage of dwellings deterred community residency. Overcrowding can place tenancies at risk and affect the health and wellbeing of residents; this also had implications for local services. Insufficient staff housing affected the ability of local service providers to operate at full capacity.
- Essential infrastructure – limitations in the supply of water and power impacted upon the capacity to build and service new homes. Poor telecommunications connectivity acted as a driver away from community.
- Education – the mobility of students negatively impacted upon educational outcomes and school funding. Parental absences from community sometimes resulted in local schools stepping in to provide food and clean clothes.
- Healthcare – health services were fairly limited in community and this acted as a key driver of mobility away from community. Population mobility affected demand for, and the ongoing funding of, community-based healthcare services.
- Aged care – limited aged care services were available and older residents requiring more intensive support were forced to move to residential facilities in urban centres.
- Employment services – a lack of local employment opportunities and the ending of CDP mutual obligation requirements acted as a driver away from community.
- Community services – while playing an important role in the sustainability of remote communities, long-term population mobility threatens future funding and availability of key community infrastructure and services.

Implications for future remote community infrastructure and services

The case study research highlighted several key implications for the future provision of infrastructure and services in remote Indigenous communities:

- Housing – proposed measures include the construction of new dwellings and temporary accommodation, the expansion of existing homes and improvements to repair and maintenance programs. Consideration of housing design, the model for remote housing, and land tenure requirements is needed. Additional staff housing is also needed to enable services to operate at full capacity.
- Essential infrastructure – improvements to the supply of power, water and telecommunications are required to support new housing development and enable people to remain in community.
- Education – enhanced collaboration between schools could assist students whose schooling is impacted by mobility. Revisions to attendance-based funding models are needed to prevent schools from being adversely affected by population mobility.
- Healthcare services – enhanced healthcare provision (such as locally-based services and more frequent outreach services) is required to meet current population needs and reduce the need for relocation to larger urban centres.
- Aged care – improvements to aged care provision and funding would support older residents to continue living in community as they age.
- Employment – the development of locally-based employment opportunities would reduce mobility. Proposed approaches include programs and training to support upskilling, the creation of new local businesses, organisational targets for the employment of local residents, and the reinstatement of CDP work requirements.
- Community services – the development of services that promote community engagement would provide greater incentive to stay in community. The implementation of additional measures to directly address specific drivers of mobility could also be considered, such as service responses to enhance community safety.

Finally, the research identified the data and governance requirements which are necessary to support the future planning of remote infrastructure and services:

- Data requirements – more detailed data is needed to understand the true extent of mobility in remote communities and support more strategic policy development and planning of infrastructure and services that meets community needs.
- Self-determination – greater self-determination would support the implementation of more appropriate infrastructure and services in remote communities. However, the best model for self-determination needs to be determined by each individual community and capacity building provided.
- Joint working – the relationship between communities and government requires strengthening. Government agencies and services need to work in a less siloed manner to better address community issues and support transient people.
- Approaches – more active on-the-ground engagement, the adoption of flexible and individualised approaches, and longer-term strategic planning is required to ensure that community aspirations around infrastructure and services are realised.
- Funding – to support necessary improvements to remote community infrastructure and services, greater levels of funding and the adoption of longer-term approaches to the provision of this funding are needed.

5. Conclusions and policy implications

Enhanced understanding of Indigenous mobility patterns is critical in order to appropriately plan and resource the housing, infrastructure and service needs of remote communities. Our research contributes to this knowledge by ascertaining the changes that have occurred in Indigenous population movement over the past decade, the factors driving this mobility, and the impact this has for the future resourcing, provision and governance of remote community infrastructure and services.

5.1 Indigenous population trends and projections

Australia's Indigenous population is growing rapidly, with very high growth rates in the major cities of Australia and inner regional Australia, but with rates declining with remoteness.

In outer regional and remote areas, the growth rates slow and become more concentrated in the older cohorts. It is cohorts from age 45–49 years and older that have been growing in remote Australia and in very remote Australia.

Our population projections to 2026 suggest the Indigenous population will continue to grow strongly in outer regional, remote and very remote Australia (by 10.4% between 2021 and 2026).

However, the predicted growth in regional and remote Australia is concentrated in the older cohorts, indicating a rapidly ageing Indigenous population.

5.2 Patterns and drivers of Indigenous people's mobility

Our research identified both temporary and permanent (short-term and long-term) drivers of mobility, as well as factors that drive mobility towards and away from remote communities. Similar drivers of population mobility were identified in all three case study communities.

Drivers influencing levels of temporary mobility include participation in cultural business or attendance at funerals, travel due to school holidays and seasonal weather patterns, participation in sport and leisure activities or to access alcohol outside the community. During the COVID-19 pandemic, measures such as border closures and lockdowns also contributed to increased temporary mobility back to remote communities.

Factors affecting longer-term population mobility include access to housing, infrastructure, services and employment, family conflict and violence, and community unrest.

The frequency and length of mobility was found to be strongly influenced by policy changes enacted by the Australian Government and state and territory governments.

5.3 Infrastructure and service delivery needs of remote communities

A two-way relationship exists between Indigenous people's mobility and remote community infrastructure and service provision. Population movement has an impact on the funding and provision of vital housing, infrastructure and services in remote communities; long-term mobility away from communities, therefore, has implications for the future availability of these services and ultimately the sustainability of remote communities. Likewise, the availability of key infrastructure and services (such as sufficient housing, adequate supply of water and power, and access to healthcare, aged care and community services) influences population movement.

However, the relationship between population mobility and remote infrastructure and service delivery is made more complex due to the central role that governments play in the resourcing of remote communities and how they choose to exercise this role. In other words, population mobility is not simply an expression of individual decision-making but is shaped by policy. Yet despite the pivotal role of policy in shaping mobility, the population data which supports decision-making about the funding and provision of infrastructure and services may not be accurate or reflective of short-term mobility patterns.

The findings from our research have several implications for the future provisioning of remote community infrastructure and services which are discussed below.

Increased housing

The first and most obvious area required for many remote communities is more and improved housing. In addition to reducing existing levels of crowding, communities experiencing population growth need to be more clearly identified alongside greater forecasting about the demographic structure of the population now and for future years. Given what we know about the impact of crowding on health and wellbeing, Closing the Gap targets cannot be met unless adequate housing is available in these locations.

Essential infrastructure

To support the development of new community housing, the supply of essential infrastructure such as power and water must also be improved.

Supporting ageing populations

As the population projections show, the ageing of the Indigenous population in remote communities is a critical area of need. While an increase in the number of older individuals available to support younger age groups is beneficial, there are obvious implications for health and welfare, given the limited access to aged care services that exists in remote communities.

Ageing will increase kinship responsibilities for younger family members and the need for culturally appropriate aged care programs, including an Indigenous aged care workforce. If these are not provided the level of need will impact more severely on the healthcare system as the burden of care increases. Infrastructure should include housing provision that accords with principles of universal design, as well as provision for both respite care and residential aged care for those that are no longer able to remain in their home.

Improved access to healthcare

It is vital to address the limited healthcare provision available within remote communities. This means improved access to chronic disease programs, maternal and child health, and mental health programs. Skills development for non-Indigenous workers is necessary in the area of cultural appropriateness and safety. Skills development and training is also required within communities to develop a local Indigenous workforce and to reduce dependence on FIFO staff and locums. Housing is needed for these workers. Service organisations also need to develop strategies to ensure cultural safety in areas including health, mental health, and environmental health services. This would significantly strengthen community resilience and disaster responsiveness. The case study research also showed that health services in remote communities undertake a large amount of emergency care, but are only funded for primary care services. As such, there is a need to review the funding model of healthcare provision in remote communities.

Supporting educational outcomes

Children's schooling can be interrupted by periods of mobility away from their home community. Enhanced collaboration between schools could enable students to continue with their education even when they are away from their home community. Moreover, due to high levels of student mobility, schools in remote communities are often adversely affected by current attendance-based funding models. This is a vexed issue, where the rationing of services compounds sub-par education delivery and related costs associated with poor education attainment (such as under-employment, enhanced morbidity and higher exposure to carceral systems).

Employment opportunities and support

Work opportunities for remote community residents are currently limited and access to employment is a key driver of permanent mobility away from community. The development of employment and training programs would support local Indigenous people to upskill, take on employment, and enable them to remain living in community if desired. Consideration is also needed regarding the reinstatement of CDP work requirements to support job training and provide additional incentive to remain in community.

Enhanced community facilities and services

Improvements to community facilities and services such as recreational activities and youth programs could provide greater engagement and incentives for people to remain in community, especially young people. Ensuring that the funding and infrastructure is available to allow for the operation of such services is an important factor for durable impact.

Temporary accommodation facilities

Both long- and short-term mobility generates a need for temporary accommodation that is safe, culturally appropriate, and which can meet the needs of diverse Indigenous groups. Short-stay accommodation is also needed for FIFO workers to support health and social service delivery. Although there is provision for this in some communities, it is in high demand, indicating greater levels of need.

Establishing temporary facilities for Indigenous groups is challenging, partly due to a reluctance from local populations in urban and regional areas and partly due to the strategic complexities in the provision of safe, culturally appropriate accommodation to diverse Indigenous groups. In fact, the number of facilities that have been established may well be equalled by the number that have been planned but not built (DPLG 2020; Macklin 2010). There is a need to develop innovative models for temporary accommodation facilities that do not end up as substandard permanent housing.

Transport and Return to Country programs

In all three case study communities, public transport was limited. This presented challenges for visitors to leave or residents to return home. Improvement in transport services is a critical need for remote communities. The lack of appropriate transport has implications for health and safety, affecting access to health services and transport-related morbidity and mortality.

Access to transport to return to community is especially important because of its implications for urban homelessness for Indigenous populations when visitors to towns and cities lack the means to return home. To support travel back to remote communities, there is a need for greater and more consistent funding of Return to Country programs.

5.4 Resourcing and governance of remote community infrastructure and services

Our research highlighted the underlying resourcing and governance arrangements that are necessary to support the development and provision of appropriate housing, infrastructure and services within remote communities.

Service provision that maximises cultural safety and the participation and leadership of Indigenous people

The role of the Indigenous community-controlled sector in successfully managing the COVID-19 pandemic has provided a powerful example of what can be done when principles of self-determination and community empowerment are enacted. The leadership of Indigenous organisations and the grassroots community response during the pandemic provided a nuanced, locally- and culturally-informed approach that is easily contrasted with the top-down, one-size-fits-all response that so often characterises policy making for remote Indigenous communities.

This model, alongside the current policy shift towards increased Indigenous self-determination, provides an opportunity to reimagine how governments respond to the mobility of Indigenous populations so that they are genuinely responsive to Indigenous aspirations about where and how individuals wish to live. Given the limited success of the past, and the history of state control in which mobility has been framed by governments to justify containment and oppression, this is a vital development in how policy makers can support planning for the futures of remote Indigenous communities.

Joint working

Inherent in this policy approach is a ‘spirit of partnership’ in which governments work closely with Indigenous community-controlled organisations. The partnership model provided by the experience of COVID-19 shows there is much to learn in relation to the continuing work required to achieve Closing the Gap targets and improve remote community outcomes, including ensuring policy is informed by local, grassroots perspectives.

Government agencies and services need to work in a less siloed manner to better address community issues and support transient people. Some of the difficulties are structural in the sense of different legislative frameworks that make cooperation challenging, while others relate to political or funding conflicts. The range of government agencies involved in service provision, as well as efforts to provide holistic responses, make this especially relevant to the provision of infrastructure and services to remote Indigenous communities.

As well as inter-agency coordination there are also cross-jurisdictional issues that need to be addressed, since substantial cross-border geographical movement occurs. Different legislative, funding, management and service delivery frameworks can create problems, for example in relation to information sharing. It is important to develop strategies to improve cooperation and coordination between government agencies, both within and between jurisdictions and also across different levels of government.

Strength-based approach and use of culturally appropriate language

The use of discourses of vulnerability and deficit has been very damaging for Indigenous populations, including those living in remote communities. The response to COVID-19, including the involvement of the Indigenous community-controlled sector, challenged this discourse by identifying the diversity of remote living Indigenous people and their qualities of strength, resilience and self-sufficiency. This focus on the strengths of communities provides an important model for future policy relating to remote infrastructure and service delivery.

In order to better recognise the differing needs of remote communities, a flexible and individualised approach to the planning of infrastructure and services is needed that includes active on-the-ground engagement. It is also essential to ensure communication with Indigenous individuals and communities is undertaken in a culturally appropriate way.

Adequate funding of infrastructure and services

No matter how well-meaning intentions for improving remote communities are, if funding is not provided at levels commensurate with need, with adequate resourcing to achieve policy goals, they cannot succeed.

Future remote community funding needs to be allocated according to assessments of local need and with the extensive participation and empowerment of the Indigenous community-controlled organisation sector. In addition, longer-term approaches to the funding of remote infrastructure and services are needed to ensure sustainability and improved outcomes.

Evidence-based policy that prioritises local experience

One of the recommendations of the Group of Eight Taskforce that informed the Government's *Roadmap to Recovery* from COVID-19 is for evidence-based policy that draws on quality research which prioritises local experience. This need is also key for the future planning and provision of remote community infrastructure and services. Policy development and implementation in this sphere must be accompanied by strong accountability and this requires systematic evaluation. Without a strong evidence-base to assess progress against goals there is a risk that inappropriate solutions will be adopted and resulting issues will become entrenched and difficult to reverse.

Data requirements and sovereignty

Accurate and more detailed information about population mobility is an essential requirement for evidence-based infrastructure and service provision in remote communities. This includes the collection of data that can capture shorter-term mobility patterns. Achieving appropriate levels of service integration within community also requires a degree of information sharing between agencies. However, the collection and use of data must be undertaken in keeping with principles of Indigenous data sovereignty. This includes ensuring data collection and use is conducted according to national standards of ethical practice for Indigenous research.

We acknowledge the limitations that are present in the use of Census data to estimate Indigenous resident populations and, as such, the estimates and projections included in this report should be treated with caution. Guided by the principles of Indigenous data sovereignty, we have ensured that the estimates and projections presented have been interpreted through corroboration with local knowledge. Original population estimates were provided to stakeholders within potential case study communities and were also discussed in the subsequent case study fieldwork. Population projections and research recommendations have additionally been provided back to case study communities to allow local use of the population projections.

5.5 Final remarks

Across outer regional, remote and very remote Australia, the Indigenous population is predicted to grow by 10.4 per cent between 2021 and 2026. However, remote communities have been subject to long-term under-investment by governments and do not have adequate infrastructure and social services to meet the needs of existing populations, let alone an expanding and ageing population of the future.

This research generates enhanced understanding of current and changing mobility patterns of Indigenous people living on Country, and improved policy strategies for Indigenous organisations, government agencies, non-government organisations and other stakeholders in relation to housing, social services delivery and infrastructural needs in remote communities.

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Appendix 1: Detailed methodology for the population modelling and projections

This study uses historical Indigenous population data available at ILOC level (ABS-defined geography of Indigenous Locations) for Census years 2011, 2016 and 2021. There are approximately 1,100 ILOCs that cover the whole geographic region of Australia. The data captures the number of Indigenous persons in each age group or category (a total of 17) across both genders for all ILOCs.

The modelling approach is based on the cohort component approach, where for a given ILOC *i*, the number of Indigenous persons in age category *j* at time *t* is equal to the number of Indigenous persons in age category *j-1* at time *t-1* minus deaths, net migration and net changes associated with identification of Indigenous status. This can be written as

$$P_{ijt} = f\left(P_{i,\,j-1,\,t-1},\ deaths,\ net\ migration,..\right)$$

However, modelling current population levels as a function of past levels raises econometric concerns such as endogeneity and/or non-stationarity that would result in biased estimates and/or spurious regression. One way to address these concerns is to model the change in population for each age group over time and across all ILOCs. Thus, the change variable can be defined as

$$c_{ijt} = P_{ijt} - P_{i,j-1,t-1}$$

Here c_{ijt} represents the change in age category *j* over time (*t-1* to *t*) for ILOC *i*. The data used for developing the model contains change across two periods; change from 2011 to 2016 and from 2016 and 2021 for all age groups and ILOCs. Based on this definition, change can take negative or zero values. However, there is an actual limit to how much the population can decrease within the age category. This limit is equal to the number of individuals in the previous age category (*j-1)* and the previous time (*t-1*). Given this, change is a censored variable with a known lower limit. Hence, a modelling framework that reflects this censoring is required. The model for estimating change can be written as

$$c^{*}_{ijt} = \alpha_i + x_{ij,\,t-1} + \varepsilon_{ijt}\ where\ \varepsilon_{ijt} \sim N(0, \sigma^2)$$

Here, c^{*}_{ijt} denotes the latent underlying change in ILOC *i* for age category *j* at time *t*. However, this cannot be fully observed since the change cannot be less than the current population. In other words, there is lower tail censoring such that only c_{ijt} is observed. Hence,

$$c_{ijt} = \max\left(L_{ijt}, c^{*}_{ijt}\right)\ where\ L_{ijt} = -P_{i,\,j-1,\,t-1}$$

In contrast to the standard Tobit model in which the lower limit is assumed to be a fixed value for all *i* and *j*, the proposed framework contains the previous Census population (at age category level) as a varying lower limit for each observation. The explanatory variables consist of log of total population at ILOC level, survival probability for each age category and gender, dummy variables for time, gender, age categories, state, and remoteness area (outer regional, remote and very remote – major cities and inner regional areas have been excluded) and interactions between age categories and total population as well as age categories and remoteness area.

Given the model specification, the estimation procedure is required to take into account the panel nature of the data. Like the panel linear model, the panel Tobit model can be estimated assuming either random or fixed effects, although the latter will suffer from the well-known incidental parameters problem, if the dimension over which these are constant is 'small'. Also, estimating fixed effects for many ILOCs (over 600) is problematic. When comparing the results from the random effects model to the pooled model, it was evident that the pooled Tobit model provided a slightly better fit. Especially since cohort effects were incorporated into the explanatory variables. The parameter estimates were obtained by maximising the log-likelihood function using standard nonlinear optimisation methods. These are readily available in LIMDEP/NLogit version 6 and in R.

The model presented so far cannot be used to predict the changes in the first age group (zero to four). As such, we require a separate fertility model to model the number of persons in the first age group. After testing various specifications, it was found that the number of children in the same ILOC was a strong indicator for predicting the number of children in the first age group. For example, the number of children aged five to nine as well those aged between 10 to 14. Furthermore, this was interacted with remoteness area to differentiate the effect of remoteness. This appears to be intuitive since existing levels of family households in the area would influence the formation of new family households. Finally, as with the previous model, the dependent variable in the fertility model (number of children in the zero to four age category) is subject to censoring i.e., it cannot be less than zero. As such, a Tobit model with a fixed lower limit (0) was used to estimate the number of individuals in the zero to four age group. The estimates for each ILOC were then split into two to allocate an equal number of children to both genders.

The model diagnostics from both the main model as well as the fertility model were examined to ensure that the model assumptions were satisfied. These include ensuring that the censoring requirement was satisfied and that the predictions were sensible. The predicted changes for each age group across all ILOCs were converted to population numbers by adding the predicted change for a given age group and ILOC to the existing population number for that age group and ILOC. This resulted in a set of predicted population numbers. Next, both models' in-sample performance was assessed by comparing the actual population numbers with the predicted population numbers. This was done at the individual (ILOC-age group) level and the aggregate level (ILOC with all age groups aggregated). Plots illustrating these comparisons have been provided in the results section of the report. Given the good in-sample predictability of both models, they can be used to obtain future population predictions/ projections. To do this, the latest population numbers (2021) were inputted to the models to predict 2026 population changes for each age group and ILOC. As before, these predicted changes were then used to generate population projections for 2026 across all age groups and ILOCs.

Australian Housing and Urban Research Institute
Level 12, 460 Bourke Street
Melbourne VIC 3000
Australia
+61 3 9660 2300
information@ahuri.edu.au
ahuri.edu.au
twitter.com/AHURI_Research
facebook.com/AHURI.AUS
Australian Housing and Urban Research Institute