MAPPING THE DIGITAL GAP

2023 OUTCOMES REPORT

We respectfully acknowledge the Baarkandji, Eastern Kuku Yalanji, Erubam Buaigiz, Warumungu, Anmatyerr, Yolŋu (Djambarrpuyŋu, Gupapuyŋu, Djinang, Dhuwala), Kwini, Kulari, Bardi, Dinnuman and other traditional owners for the lands on which Mapping the Digital Gap research was conducted. We extend that respect to all Aboriginal and Torres Strait Islander peoples today, and to their Ancestors and Elders, past and present. We also acknowledge the Traditional Custodians and their Ancestors of the lands and waters across Australia where we work, live and undertake our research.

Acknowledgements

Warning: Aboriginal and Torres Strait Islander people should be aware that this report may contain images and names of deceased persons.

Aerial view of Galiwin'ku in East Arnhem Land, NT

Aerial view of Gäṉgaṉ homeland in East Arnhem Land, NT

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EXECUTIVE SUMMARY

Digital inclusion is about ensuring that all Australians can access and use digital technologies effectively. We are experiencing an accelerating digital transformation in many aspects of economic and social life. Our premise is that everyone should have the opportunity to benefit from digital technologies: to manage their health, access education and services, participate in social and cultural activities, organise their finances, follow news and media, and connect with family, friends, and the wider world.

Digital inclusion outcomes and access to services are critically important in ensuring informed decision-making and agency among Australia's Aboriginal and Torres Strait Islander peoples – referred to as First Nations people in this report. However, there is a digital inclusion gap between First Nations Australians and other Australians, with those living in the 1,545 remote First Nations communities and homelands among the most digitally excluded people in Australia.[1]

Mobile tower in Wujal Wujal, QLD

CLOSING THE GAP OUTCOME 17

Recognition of this digital gap and the growing importance of digital inclusion led to Outcome 17 of the National Partnership Agreement on Closing the Gap:[2]

Aboriginal and Torres Strait Islander people have access to information and services enabling participation in informed decision-making regarding their own lives

Target 17 sets out an ambitious goal:

By 2026, Aboriginal and Torres Strait Islander people have equal levels of digital inclusion.

THE PROJECT

From 2022 to 2024, the Mapping the Digital Gap team is partnering with local First Nations organisations to undertake three annual research visits to 10-12 remote and very remote First Nations communities across Australia. This supplementary project of the Australian Digital Inclusion Index (ADII) addresses a lack of data to understand the scale and nature of the digital gap for First Nations people[3] and track progress toward Target 17.

In 2022, the team worked with 21 community co-researchers in ten communities to collect 530 surveys (495 with First Nations people) and undertake 140 interviews with residents, community leaders and local agencies. The team visited Djarindjin/Lombadina, Kalumburu (WA), Erub, Wujal Wujal (QLD), Gäṉgan homeland, Galiwin'ku, Tennant Creek, Wadeye, Yuelamu (NT) and Wilcannia (NSW). Detailed Community Outcomes reports were provided to each of these communities to support local planning and advocacy, along with suggestions for a local digital inclusion plan. The targeted data collection from this project has enabled the establishment of a dedicated First Nations data dashboard on the ADII website in 2023.

THE DIGITAL GAP

For the first time, we have a measure of the scale and nature of the digital gap for First Nations people nationally by remoteness categories – major cities, outer regional, remote and very remote – and across various demographic indicators. This provides a baseline to track progress toward Target 17 and identify key barriers and enablers to meet this target. The inclusion of First Nations data in the 2023 ADII provides a tool for policy makers, industry and First Nations organisations to identify key focus areas for policy and program delivery.

This first Mapping the Digital Gap outcomes report provides an overview of the first year findings from 2022 research visits. It covers key survey results and indicators of the digital gap; context and findings for each of the ten research sites; and analysis of results across the three ADII dimensions of digital inclusion – Access, Affordability and Digital Ability – as well as the crucial role of service delivery and news and media access in these communities. Case studies, photos and quotes from interviews highlight the on-the-ground experience for residents and service providers across the research sites.

10
sites visited

21
local co-researchers

530
surveys collected

140
interviews

Co-researcher Guruwuy Ganambarr on her phone in Gäṉgan homeland

First Nations data dashboard on the ADII website

AUSTRALIAN DIGITAL INCLUSION INDEX
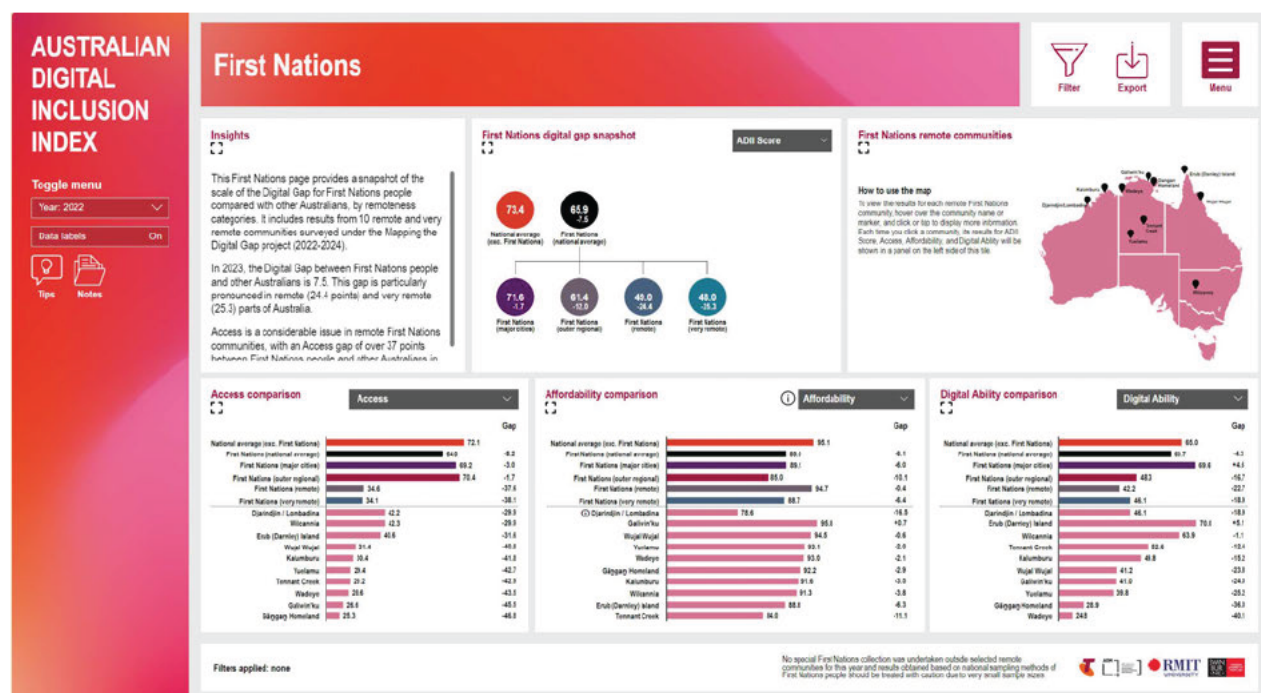
First Nations

MEASURING THE DIGITAL GAP

This report uses the term 'digital gap' to refer to the difference in levels of digital inclusion between First Nations people and other Australians. It references the Closing the Gap framework within the National Partnership Agreement, and Target 17 to close the digital gap by 2026. Accurate measurement of the digital gap is essential to understanding the current scale and nature of the gap and measuring progress towards Target 17.

Drawing on data from the Mapping the Digital Gap project, the 2023 ADII was able to provide a score for First Nations digital inclusion according to remoteness categories for the first time. **It found a considerable digital gap – 7.5 points on a 100 point scale – between First Nations people and other Australians.**

THE FIRST NATIONS DIGITAL GAP

National (non First Nations)
73.4

First Nations National Average
65.9
-7.5

Major Cities
71.6
-1.7

Outer Regional
61.4
-12.0

Remote
49.0
-24.4

Very Remote
48.0
-25.3
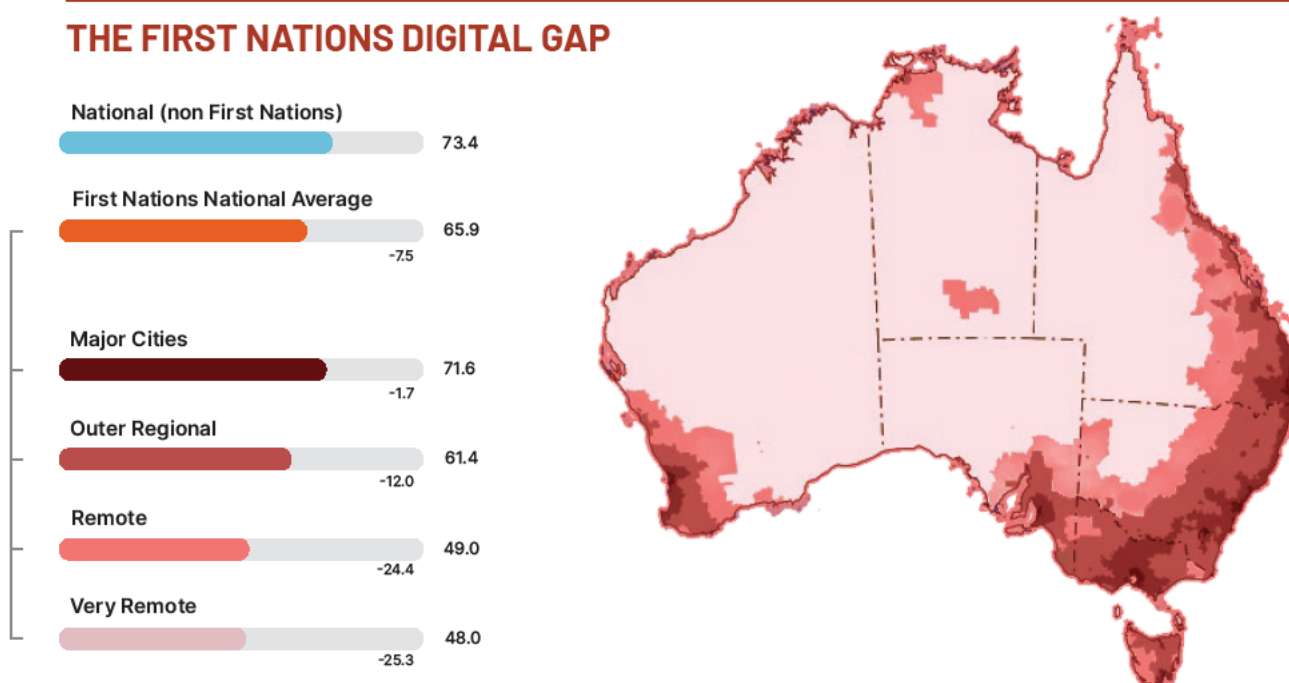
Figure 1: 2023 First Nations ADII scores by remoteness with gap against National Average (non-First Nations), based on 2022 surveys

Notes: Remoteness levels in relation to Australian Statistical Geography Standard (ASGS) Edition 3 Remoteness Areas

Inner Regional results have been excluded due to low sample numbers. No targeted First Nations collection was undertaken for urban and regional areas this year and results were obtained based on national sampling methods of First Nations people. Results should be treated with caution due to very small sample sizes.

REMOTENESS

The scale of the digital gap increases significantly with remoteness (see Figure 1). First Nations people living in remote and very remote communities have overall Index scores of 49.0 and 48.0 respectively. This is a gap of 21.6 and 23.5 compared with other Australians in the same areas and an overall gap of 24.4 and 25.3 respectively against the national results. This substantial disparity between First Nations people and other Australians demands dedicated attention to address its underlying causes.

Remote First Nations people have very high levels of digital exclusion compared with other Australians. 45.9% of survey respondents were rated as highly excluded by the ADII, compared with 9.2% of other Australians. Only 4.1% were considered highly included, compared with 45.9% of other Australians.

THE DIGITAL GAP WIDENS WITH REMOTENESS

Gap

	ADII Score	Access	Affordability	Digital Ability
National Average (non-First Nations)	73.4	72.1	95.1	65.0
First Nations (national average)	-7.2 / 65.9	-8.2 / 64.0	-6.1 / 89.0	-4.3 / 60.7
First Nations (major cities)	-1.7 / 71.6	-3.0 / 69.2	-6.0 / 89.1	+4.6 / 69.6
First Nations (outer regional)	-12.0 / 61.4	-1.7 / 70.4	-10.1 / 85.0	-16.7 / 48.3
First Nations (remote)	-24.4 / 49.0	-37.6 / 34.6	-0.4 / 94.7	-22.7 / 42.2
First Nations (very remote)	-25.3 / 48.0	-38.1 / 34.1	-6.4 / 88.7	-18.9 / 46.1

Figure 2: First Nations ADII scores and scores for Access, Affordability and Digital ability, by remoteness, showing gap when compared to the National Average (non-First Nations), based on 2022 surveys

Legend:
- ADII Score
- Access
- Affordability
- Digital Ability

Mobile tower at Galiwin'ku

ACCESS

Disparities in Access are particularly acute in remote First Nations communities. The scale of the Access gap in remote (37.6) and very remote (38.1) areas points to limited communications infrastructure and low household access.

While mobile coverage has improved, about 670 small communities and homelands (of 1,545) have no mobile service, including some with no communications access. There are low levels of fixed household broadband (14%) and telephones (7%).

The Access gap also reflects the patchy mobile coverage, network congestion and reliability factors in most remote communities, limiting when and how services can be used. Low levels of household television access further increase demand on mobile services for online content, adding to congestion.

Mobile phones and accessories at the Wilcannia store

AFFORDABILITY

There are significant affordability barriers faced by First Nations people, particularly in remote communities. Affordability barriers exist due to low incomes and relatively high costs for pre-paid mobile data, the predominant means of access.

However, ADII Affordability scores, based on estimated costs relative to household income, can be misleading for remote First Nations communities due to difficulty in quantifying income and expenditure for large and overcrowded households.

Survey results show **53.3% of First Nations people 'sometimes', 'often' or 'always' sacrifice essentials such as food or bills to stay connected, compared to 19.1% of non-First Nations people.** This highlights the considerable affordability challenges disproportionally faced by First Nations people, particularly in remote communities.

Marie Shipton using mobile phone near Wujal Wujal

DIGITAL ABILITY

Remote First Nations people are rapid adopters of digital technologies. However, the Digital Ability gap of 4.3 points at a national level increases significantly for remote (22.7) and very remote (18.9) First Nations people. Additionally, Digital Ability scores vary across different social groups.

Limited opportunities to connect, majority mobile-only usage, language barriers and limited support contribute to significant gaps in Digital Ability in terms in terms of use of the internet, online services and mobile apps, and in online safety. Older age, living with disability, low educational attainment and low incomes have significant impacts on Digital Ability.

As government and other services increasingly move online,[4] Digital Ability has become a critical life skill in remote Australia, with targeted funding for community-led efforts needed to address the ability gap.

PRE-PAID MOBILE

Remote First Nations people predominantly use pre-paid mobile services for voice and data. With most remote residents on low and unreliable incomes, 84% of respondents used or shared a mobile device, and 94% of these used pre-paid services. **75% are mobile only users** (i.e. don't access internet on computers or other devices), **compared with 10.5% nationally.** There is low take-up of the post-paid home broadband services available in remote Australia such as ADSL (1%) or nbn's Sky Muster satellite service (13%).

Pre-paid services do not require credit checks and enable more control over mobile costs. However pre-paid data can cost more per gigabyte, often leading to data rationing and periods without service.

These affordability constraints have a significant impact on access, illustrating the compounding nature of digital exclusion across different dimensions of the Index.

Discarded mobile prepaid recharge voucher in Galiwin'ku

Demographic and geographic factors that see ADII scores decline in the wider population – including remoteness, age, educational attainment and income – are exacerbated by social and digital inequalities faced by many First Nations people. Our research shows large disparities between younger and older First Nations people and gaps according to language, education and disability.
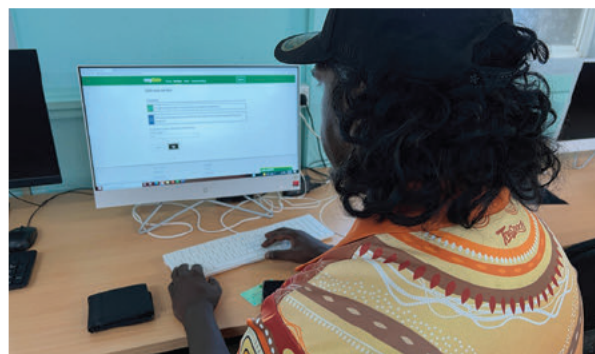
Damien Yunupingu using community access computer at Wujal Wujal Indigenous Knowledge Centre

Dr Lyndon Ormond-Parker doing a survey with Julalikari Chair Linda 'LT' Turner in Tennant Creek

The establishment of a Closing the Gap target specifically focused on digital inclusion has provided a focal point for policy and action by federal, state and territory governments, industry, and First Nations organisations and communities. A positive step has been the formation of a First Nations Digital Inclusion Advisory Group (including Dr Lyndon Ormond-Parker as Deputy Chair) and Expert Panel (including Dr Daniel Featherstone and Lauren Ganley of Telstra) to advise the Federal Minister for Communications Michelle Rowland MP on appropriate strategies for meeting Target 17. Additionally, the National Indigenous Australians Agency released the First Nations Digital Inclusion Plan in July 2023, which outlines a range of initiatives to address digital inclusion among First Nations people.[5] The ADII and Mapping the Digital Gap projects are providing timely data and community-led strategies to guide policy and program initiatives to help close the digital gap.

First Nations Digital Inclusion Advisory Group members

Back row: Mr Che Cockatoo-Collins, Mr Neil Turner, Dr Daniel Featherstone, Associate Professor Lyndon Ormond-Parker and Dr Scott Winch
Front row: Ms Lauren Ganley, The Hon Michelle Rowland MP, Dr Dot West (OAM) and Ms Talei Elu

MAPPING THE DIGITAL GAP

The Mapping the Digital Gap project, established through the ARC Centre of Excellence for Automated Decision-Making and Society (ADM+S) in partnership with Telstra in 2021, is the first comprehensive study of remote First Nations communities' participation in, and access to, the digital economy.

OBJECTIVES

1. Generate a detailed account of the distribution of digital inclusion and use of digital services, including news and media, across 10-12 remote First Nations communities

2. Track changes in measures of digital inclusion for these communities over time

3. Inform local strategies to improve digital inclusion capabilities and services and enable informed decision-making

4. Provide evidence to inform policy and resourcing by government and industry.

Working with local research partners and co-researchers in up to 12 remote and outer regional communities over three years (2022-2024), the Mapping the Digital Gap project enables comparison of First Nations results against the Australian Digital Inclusion Index (ADII), the key national measure of digital inclusion since 2016.

The project methodology follows NHMRC[6] and AIATSIS[7] guidelines for ethical research with Aboriginal and Torres Strait Islander peoples and communities, with input from a First Nations Expert Advisory group. The collaborative approach includes partnering with First Nations organisations and working with community co-researchers in each community to conduct qualitative research including annual face to face surveys. This partnership approach has been key to successful community engagement across all sites.

In the spirit of Indigenous data sovereignty[8] and to support local planning and programs, detailed outcomes reports are provided back to each community. These reports provide full survey and qualitative research findings, an infrastructure and services audit, analysis of the factors impacting digital inclusion, and suggested strategies to address identified challenges through local digital inclusion plans.

Co-researcher Dennis Charles doing a survey with Michael Briscoe in Yuelamu

Co-researcher Shaylin Whyman doing a survey with local resident Joanne Williams

Co-researcher Marcus Kinthari doing a survey with Thamarrurr DC staff member Alfred Thardim in Wadeye

Co-researcher Veronica Munar doing a survey with Rose Ninnal in Wadeye

Yuelamu
Community

THE AUSTRALIAN DIGITAL INCLUSION INDEX

The Mapping the Digital Gap first year results are detailed in a case study in the 2023 ADII report.[9] This research builds on two previous ADII case studies undertaken in remote communities in 2018 (Ali Curung, NT)[10] and 2019 (Pormpuraaw, Queensland).[11]

The ADII uses a score of 0 to 100 to compare the degree to which individuals can be considered more or less digitally across the three dimensions of Access, Affordability, and Digital Ability.

Mapping the Digital Gap uses an adapted version of the ADII's Australian Internet Usage Survey (AIUS) to enable comparison of Index scores between First Nations and non-First Nations populations, and to highlight key gaps. The adapted survey tool includes additional questions relating to offline modes of communication, such as direct and in-person, fixed line phones, and news and information access via television, radio, and print, including First Nations media sources. This enables data collection on how media and communications operate for households with affordability constraints and limited internet connectivity, and alignment to key indicators in Closing the Gap Outcome 17.

ACCESS

Access concerns opportunities to gain a reliable Internet connection and use various digital devices, alongside frequency of online access.

AFFORDABILITY

Affordability measures the percentage of household income required to gain a good quality service with uninterrupted connectivity. To do this, we consider the price of a bundle of goods and services required for a well-connected household.

DIGITAL ABILITY

Digital Ability measures skill levels: what people are able to do online, and their confidence in doing it.

MORE INFORMATION

More information about the project is available on the Mapping the Digital Gap website (mappingthedigitalgap.com.au), including a project Background Paper[12] detailing the research objectives, methodology, site selection and research and policy context. There are also links to the individual Community Outcomes reports. A dedicated First Nations interactive dashboard is available on the ADII website, providing detailed survey results for all Mapping the Digital sites.

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@MappingTheDigitalGap

linkedin.com/showcase/ mapping-the-digital-gap/

KEY FINDINGS

The research team worked with local agencies and community co-researchers in ten research sites between February and August 2022 (see figure 3, next page). The sites were selected to ensure a representative spread of communities by geographic location, size, remoteness and types of communications infrastructure available.

In each community, a Research Partnership Agreement established with a local agency (e.g. community council, media organisation, land council, shire or other relevant group) ensures local approval, community engagement, paid employment of community co-researchers, reciprocity of outcomes and trust in the project. The co-researchers play a central role in the research, liaising between the research team and the local community, providing cultural guidance, acting as language translators, facilitating research activities, identifying possible participants and communicating information to community members.

Gän̲gan co-researcher Guruwuy Ganambarr doing a survey with resident Alissia Wirrpanda

A RANGE OF BARRIERS

Across the ten research sites, the team observed a range of barriers to digital inclusion. In 2022, these included limited access to reliable phone, mobile and internet services, slow download speeds due to high levels of network congestion, relatively high data costs per gigabyte given the prevalence of pre-paid mobile use, and gaps in digital literacy, including online safety and use of online services. However, we also saw rapid uptake of digital technologies where available, and creative approaches to address obstacles and develop local media and communications solutions.

Each site had unique social, cultural, climatic, geographic and technological contexts and challenges to navigate. For example, two of the ten communities had no mobile access – Yuelamu in central Australia and Gän̲gan homeland in the East Arnhem region – and were reliant on public phone and limited Wi-Fi services for connectivity. Kalumburu in the northern Kimberley has only satellite backhaul for both mobile small cell service and broadband services, with a community-wide Wi-Fi network established to provide affordable household connectivity. The two island communities, Erub in the Torres Strait and Galiwin'ku in East Arnhem Land, have mobile and fixed line services delivered via microwave backhaul. The selection of sites with different types of connectivity infrastructure enables insights into other remote communities with similar modes of connectivity and contextualises the ADII results.

HCRC microwave tower in Gän̲gan homeland

Mel Langdon using the CAT Hotspot in Yuelamu

OVERALL RESULTS

Figure 3 below outlines the ADII digital inclusion scores for First Nations people in the ten research sites, and the scale of the digital gap compared with the average for non-First Nations Australians (73.4). These figures illustrate the considerable disparity in levels of digital inclusion among remote and very remote First Nations people. It also shows the wide variation among the ten research sites, with total Index scores ranging from 39.0 in Gäṉgaṉ homeland and Wadeye (Northern Territory) to 59.6 in Wilcannia (New South Wales), and 60.2 in Erub (Torres Strait Islands).

National Average
(non-First Nations)
73.4

First Nations
(national average)
65.9

Highest
score
60.2

Lowest
score
39.0

Galiwin'ku
46.0 (-27.2)

Erub (Darnley Island)
60.2 (-13.0)

Kalumburu
49.2 (-23.9)

Gäṉgaṉ
Homeland
39.0 (-34.2)

Djarindjin /
Lombadina
47.3 (-25.8)

Wadeye
39.0 (-34.1)

Wujal Wujal
47.0 (26.1)

Tennant Creek
46.6 (-26.6)

Yuelamu
45.2 (28.0)

Wilcannia
59.6 (-13.6)
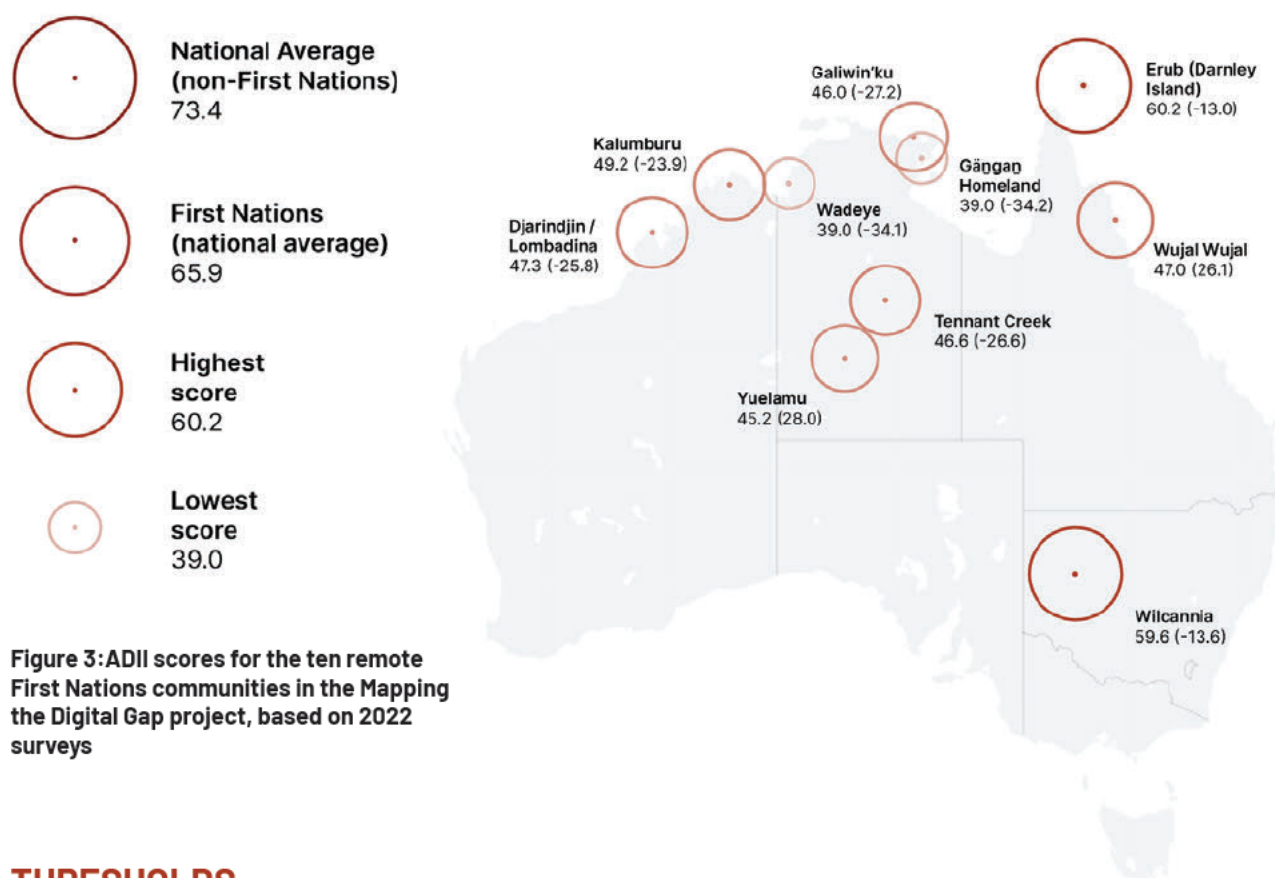
Figure 3: ADII scores for the ten remote First Nations communities in the Mapping the Digital Gap project, based on 2022 surveys

THRESHOLDS

The ADII assigns four key thresholds for understanding how people experience digital inclusion or exclusion: highly excluded (a score of under 45), excluded (above 45 and below 61), included (above 61 and below 80), and highly included (80 or above). People who are highly excluded lack the required digital resources to participate fully in economic, social, and civic life, compounding barriers to education, work, and vital services.

Figure 4 shows the distribution across the four ADII threshold categories for non-First Nations people, First Nations people nationally and at Mapping the Digital Gap sites, and the whole Australian population. 45.9% of remote First Nations participants are highly excluded, compared to 9.4% percent of the Australian population, illustrating the considerable disparities that need to be overcome to address the digital gap.

Figure 4: Threshold ADII scores for Mapping the Digital Gap samples compared to other Australians, based on 2022 surveys

	First Nations Mapping the Digital Gap Sites	National Average (non-First Nations)
Highly excluded	45.9%	9.4%
Excluded	22.3%	14.2%
Included	27.7%	30.7%
Highly included	4.1%	45.6%
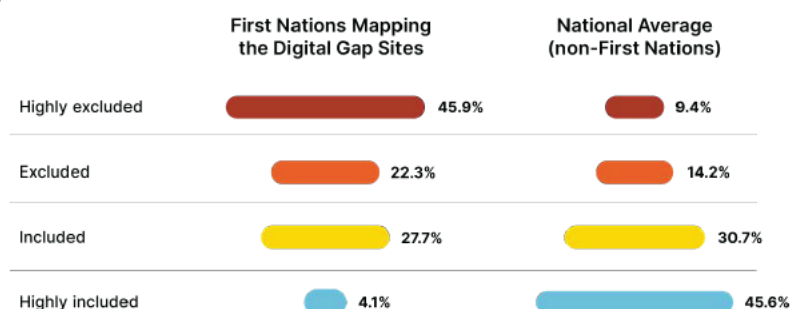
DEMOGRAPHIC GAPS

Digital inclusion levels vary within communities, depending on age, gender, language spoken at home, educational attainment, and disability and employment status. In line with national figures, digital inclusion declines with age, with 18-34 year olds across the ten research sites recording an Index score of 55.0. This score declines incrementally with age, with 65-74 year olds recording a score of 31.7.

There are considerable gaps between participants who speak a language other than English at home (45.6) and those that do not (56.1), those who did not complete high school (28.3) and those who did (50.0), people with disability (39.5) and those without (49.8) and those currently unemployed (44.4) and those in employment (53.6). These figures show the social segmentation of digital inclusion, and illustrate more broadly the considerable and overlapping social and digital inequalities that exist between First Nations people and other Australians, particularly in remote communities.

Figure 5: Comparative ADII scores for demographics groups across Mapping the Digital Gap sites, showing gap when compared to higher score, based on 2022 surveys

Figure 5 data:

Category	Group	Gap	Score	Difference
Age	18-34 year olds	-18.4	55.0	
	65-74 year olds	-41.7	31.7	-23.3
Disability	Does not have a disability	-23.6	49.8	
	Has a disability	-33.9	39.5	-10.3
Education	Completed high school	-23.4	50.0	
	Did not complete high school	-45.4	28.3	-21.7
Employment	Employed	-19.8	53.6	
	Unemployed	-29.0	44.4	-9.2
Language	Speaks English at home	-17.3	56.1	
	Language other than English at home	-27.8	45.6	-10.5

Trina Nunggumajbarr with daughter in Gäṉgaṉ homeland

Remote media pioneer and Bush Mechanics star Francis Jupurrurla Kelly on phone at PAW Media in Yuendumu

Bloomfield River State School in Wujal Wujal

Geoff Evans, former Julalikari Community Programs Manager in Tennant Creek, described access to the internet as a 'basic human right' and summed up the link between social and digital exclusion:

"It's like a data justice issue ... If you're already marginalised [for] all kinds of reasons – age, disability, poverty, class – you're not necessarily accessing the potential that's out there. ... Digital isolation is a part of **social isolation**, in that way."

DIMENSIONS

The Digital Gap exists across all three dimensions of digital inclusion – Access, Affordability and Digital Ability.

Figure 6: Access, Affordability and Digital Ability scores across Mapping the Digital Gap research sites, compared against National Average (non-First Nations) scores, based on 2022 surveys

Gap

Access	-38.2	33.9
Affordability	-6.0	89.1
Digital Ability	-19.1	45.8
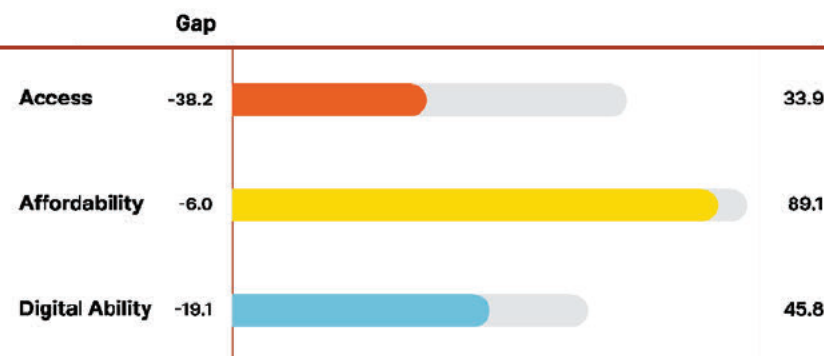
Co-researcher Lala Gutchen searches for mobile reception while out fishing near Erub

The **Access** gap is most pronounced across all ten research sites with an average score of 33.9, less than half the national average. Gäṉgaṉ homeland, Galiwin'ku and Wadeye received the lowest Access scores for different reasons, as outlined in the Access section.

There are also considerable **Affordability** challenges in remote First Nations communities. The average Affordability score was 89.1 across the ten case study sites, 6.0 points below the nat—ional average. While this seems to imply that the Affordability gap is relatively small, this is a considerable disparity when comparing the gap among different social and geographic indicators. Additionally, the method of calculating Affordability does not always reflect the lived reality for remote consumers (see the Affordability section). This is illustrated by our finding that 15.2% of participants across the ten communities 'always' or 'often' had to sacrifice or cut back on essential household costs (such as food and bills) to pay for internet access, compared with 5.1% at the national level. Affordability also affects Access, with 44% of those with limited or no internet use identifying cost as a barrier, compared with 6.1% nationally.

Similarly, there is a considerable **Digital Ability** gap, though scores for this dimension vary widely across the ten research sites. On average, the Digital Ability score is 45.8 across the ten sites (see the Digital Ability section) – 19.1 points below the national average. Digital Ability scores range from 24.8 in Wadeye to 70.0 in Erub Island. This variation means the unique social, cultural, geographic and technological situations in each community, and the interplay between Digital Ability, Access and Affordability need to be taken into account. This is discussed in detail in our findings for each of the ten sites. However, overall, we see sites with the higher Access and Affordability scores also receiving higher Digital Ability scores, illustrating that the development of digital skills and literacies is highly contingent on access to and capacity to pay for the internet and digital technologies.

Megan Yunupingu on the computer at the art office in Elcho Arts Centre in Galiwin'ku

RESEARCH SITES

Galiwin'ku

Erub (Darnley Island)

Kalumburu

Gängan
Homeland

Djarindjin /
Lombadina

Wadeye

Wujal Wujal

Tennant Creek

Yuelamu

Wilcannia
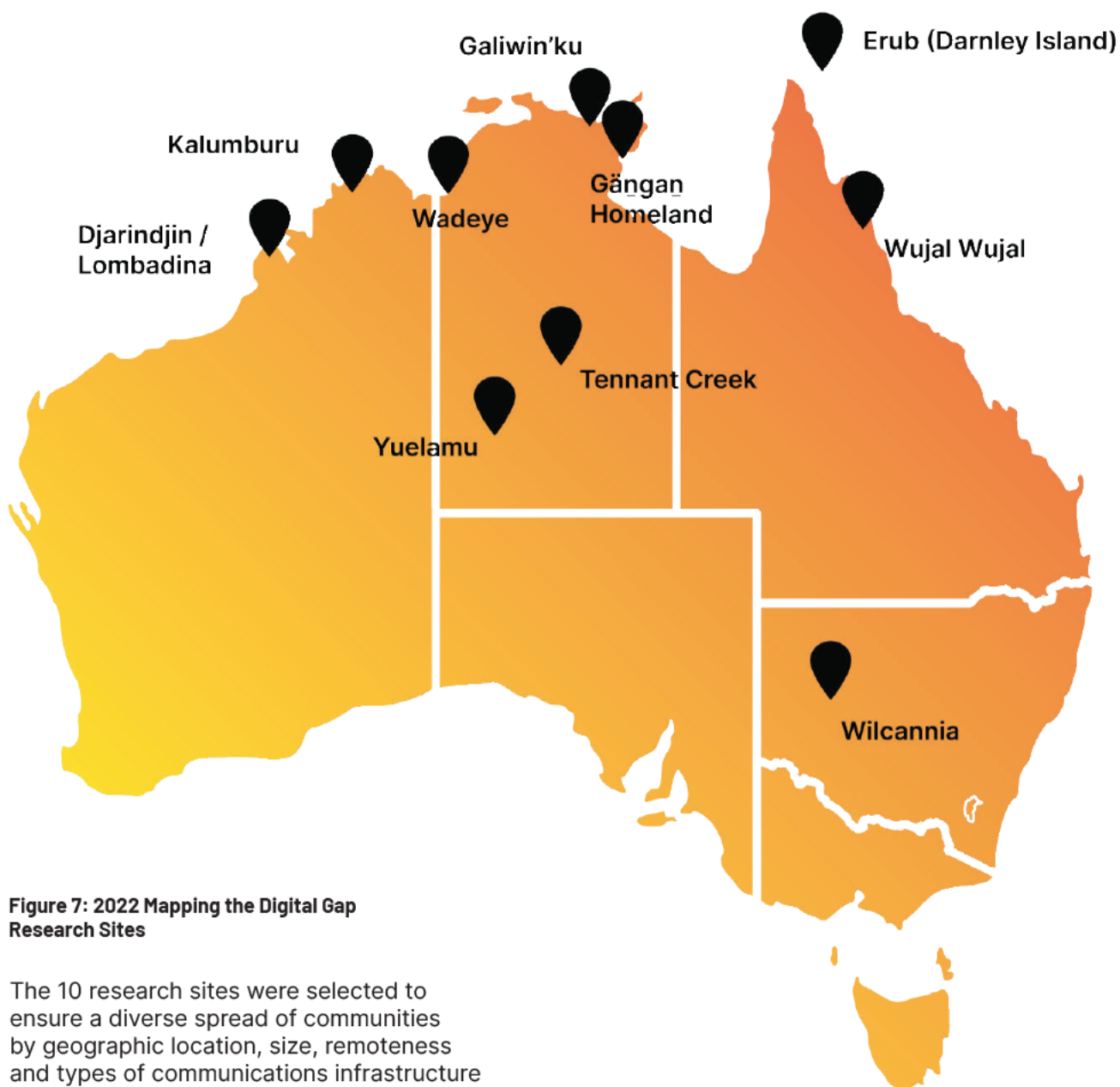
**Figure 7: 2022 Mapping the Digital Gap
Research Sites**

The 10 research sites were selected to
ensure a diverse spread of communities
by geographic location, size, remoteness
and types of communications infrastructure
available.

Signs
on the
road to
Yuelamu

Dinghies
tied up at
jetty at
Erub Island

COMMUNITY PARTNERS

Djarindjin Aboriginal Corporation

Djarindjin/ Lombadina
djarindjin.org.au
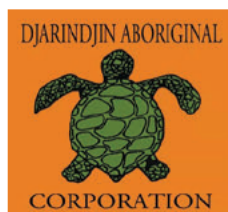
Julalikari Council Aboriginal Corporation

Tennant Creek
julalikari.org.au

Kalumburu Aboriginal Corporation

Kalumburu
kalumburu.org

Laynhapuy Homelands Aboriginal Corporation

Gäṉgan
laynhapuy.com.au

Pintubi Anmatjere Warlpiri Media and Communications

Galiwin'ku
pawmedia.com.au

Regional Enterprise Development Institute Ltd

Wilcannia
redie.org.au

Thamarrurr Development Corporation

Wadeye
thamarrurr.org.au

Torres Strait Islanders Media Association Inc

Erub
tsima4mw.org.au

Wujal Wujal Aboriginal Shire Council

Wujal Wujal
wujalwujalcouncil.qld.gov.au

Yalu Aboriginal Corporation

Yuelamu
yalu.org.au

DJARINDJIN / LOMBADINA, WA

ABOUT

While Djarindjin and Lombadina had a range of communications services, there were very low rates of First Nations household internet access, with pre-paid mobile phones the primary means of phone and internet access. nbn Sky Muster and ADSL uptake was primarily by local agencies and staff houses. Mobile coverage was patchy and congested, with low penetration inside houses. A new 4G small cell tower was being installed in June 2022, providing improved coverage and speeds for most Djarindjin households.

Affordability was a major concern, with many residents on Centrelink payments or low incomes. The free Wi-Fi near the community store (on 6am to 6pm weekdays) was well utilised. There was demand for community access computers and mentor support, with agency staff describing describing regular demand for assistance with online services.

AT A GLANCE

Distances	**196km**	to Broome
	1990km	to Darwin
Population	**253**	81.4% Aboriginal and/or Torres Strait Islander[13]
Dwellings	**111**	private dwellings
	3.3	people per ATSI household
Language	**43.2%**	ATSI people who speak an ATSI language
Income	**$360**	median ATSI personal income

Djarindjin and Lombadina are discrete communities, located adjacent to each other on the Dampier Peninsula in Western Australia's Kimberley region. The traditional owners are the Bardi people.

Communications and media services (at time of visit)

Mobile services	Backhaul	ADSL	Public phones	nbn service
Telstra 3G/4G	Fibre optic	Available	3/4 working	Sky Muster

Public computers	Public Wi-Fi	Radio services	TV Services	First Nations Radio
1 (Centrelink)	Near community office (6am-6pm weekdays)	2	VAST satellite	PAKAM (RIBS inactive)

"The Telstra Small Cell Tower is up and operational. This is a giant leap into the 21st century for Djarindjin. [We can now] get 4G reception inside our houses. No more missing phone calls and messages, no more braving the weather and mozzies just to make and receive calls." (Nathan McIvor, Djarindjin AC CEO, 2022)

Aerial view of Djarindjin

RESULTS

73.4 National (non-First Nations)

48.0 −25.3 First Nations Very Remote

47.3 −25.8 Djarindjin / Lombadina

Figure 8: Djarindjin / Lombadina ADII scores compared to National Average (non-First Nations) and Very Remote First Nations scores, based on 2022 surveys

Access **42.2** −29.7
Affordability **78.9** −16.2
Digital Ability **46.1** −18.8

Figure 9: Djarindjin / Lombadina ADII dimension scores compared to National Average (non-First Nations), based on 2022 surveys

KEY FINDINGS

Weighted analysis of surveys with respondents who identified as Aboriginal and/or Torres Strait Islander:

ACCESS

89% own or share a mobile phone

89% of mobile phone users have pre-paid services

89% have no form of fixed home internet

10% have a fixed line home telephone (12% use the public phone)

3.2 average phones per household

11% have an nbn Sky Muster service

AFFORDABILITY

$218 avg monthly household communications expenditure

26% of households paid over $200/month for mobile data

66% cut back on essential household costs to afford internet in past 6 months

62% compromise on connection speed or quality due to cost

25% of regular users cited cost as reason for not using internet more

DIGITAL ABILITY

90% used the internet in the last three months (regular users); 79% in the past week; 9% never

78% of regular users use online banking

73% of regular users keep in touch with family & friends online

66% of regular users can send and receive emails (very or mostly true)

71% of regular users had used online entertainment in the last 6 months

MEDIA SERVICES

48% listen to First Nations radio (PAKAM) each week

84% had the VAST TV service working at their house

52% watch streaming services daily

40% get daily news direct and in-person

45% get emergency information from ABC radio

Research partner	Djarindjin Aboriginal Corporation
Trip date	16–22 June 2022
Surveys	95
Interviews	6

Photo of research team

Left to right: Dr Julian Thomas, Bernadette Angus, co-researcher Audrey Shadforth, and Dr Daniel

ERUB, TORRES STRAIT, QLD

As an outer Torres Strait island, Erub (Darnley Island) faces unique communications challenges, with 3G/4G mobile and ADSL services delivered via a regional microwave repeater network from Cape York. Due to hilly terrain, the 4G mobile coverage only reaches three of the 19 villages on the island. There is heavy reliance on 3G access from nearby islands in some villages, when fishing or during inter-island travel, with concerns about the impending 3G switch-off in mid 2024. Beyond 4G, the only internet access was via nbn Sky Muster. However service providers reported rain fade issues in the wet season and latency impacts for some applications (e.g. videoconferencing). With high costs of travel and freight, Erub faces significant cost of living pressures, exacerbated by primary use of pre-paid mobile. Despite this, the Digital Ability levels of residents are very high, with extensive use of online services and platforms.

AT A GLANCE

Distances	**196km**	to Horn Island
	1990km	to Darwin
Population	**326**	90% Torres Strait Islander (6% not stated)
Dwellings	**80**	occupied dwellings
	3.5	people per ATSI household
Language	**91.8%**	ATSI people who speak an ATSI language
Income	**$387**	median ATSI personal income

Erub (Darnley Island) is located in the eastern island group of Zenadth Kes (Torres Strait), near the Great Barrier Reef. The traditional owners are the Erub Mer people.

Communications and media services (at time of visit)

Mobile services
Telstra 3G/4G

Backhaul
Microwave repeater network

ADSL
Available

Public phones
None

nbn service
Sky Muster

Public computers
1 (Centrelink/ IKC)

Public Wi-Fi
Centrelink/ DHS Wi-Fi for govt services only

Radio services
2 AM, 1 FM

TV Services
VAST satellite

First Nations Radio
TSIMA 4MW/ RIBS 4DI

Aerial view of Erub

"We want the [mobile] service right round our island [so] when we go out the back of the island [or] out to the reef, we have good service right round [and] safety for the fishermen. I want a good service for my children, my grandchildren, [so they can] live on country [and learn] our cultural knowledge." (Florence Gutchen, Artsworker/ Artist/Elder, Erub 2022)

RESULTS

73.4

National
(non-First Nations)
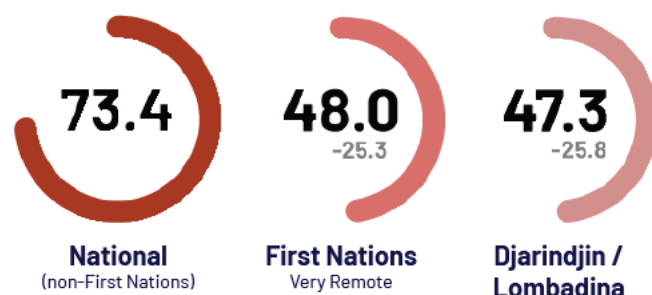
48.0
−25.3

First Nations
Very Remote

60.2
−13.0

Erub

Figure 10: Erub ADII scores compared to National Average (non-First Nations) and Very Remote First Nations scores, based on 2022 surveys

Access
40.6
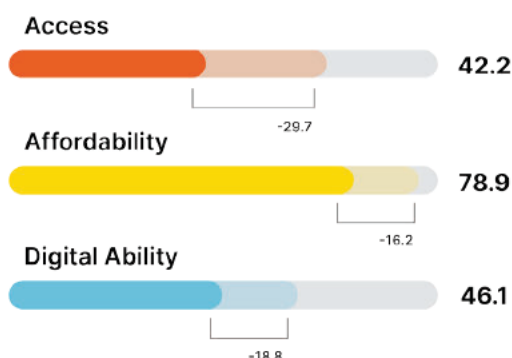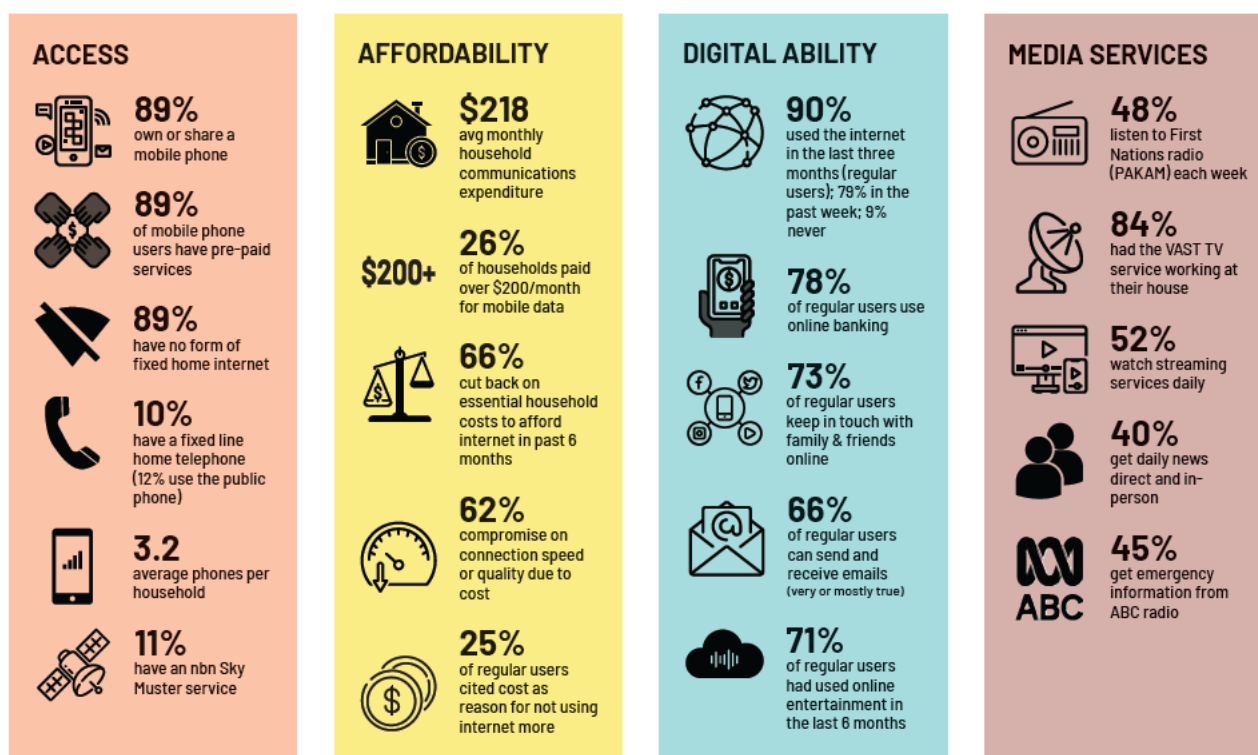−31.6

Affordability
88.8
−6.2

Digital Ability
70.0
+5.2

Figure 11: Erub ADII dimension scores compared to National Average (non-First Nations) scores, based on 2022 surveys

KEY FINDINGS

Weighted analysis of surveys with respondents who identified as Aboriginal and/or Torres Strait Islander:

ACCESS

95% own or share a mobile phone

94% of mobile phone users use pre-paid services

4.4 average phones per household

82% have no form of fixed home internet

18% had an nbn Sky Muster service; 20% use a 4G modem

64% of regular users said lack of good access reduced internet use

AFFORDABILITY

$220 avg monthly household communications expenditure

$200+ **37%** of households paid over $200/month for mobile data

42% cut back on essential household costs to afford internet in past 6 months

35% compromise on connection speed or quality due to cost

42% of regular users cited cost as reason for not using internet more

DIGITAL ABILITY

90% used the internet in the last three months (regular users); 84% in the past week; 0% never

95% of regular users use online banking

95% of regular users keep in touch with family and friends online

93% of regular users can send and receive emails (very or mostly true)

90% of regular users had used online entertainment in the last 6 months

MEDIA SERVICES

30% listen to First Nations radio (4DI, 4MW) each week

74% had the VAST TV service working at their house

56% watch YouTube daily, followed by commercial TV daily (47% daily)

43% get daily news via Facebook, 40% direct and in-person

61% get emergency information direct and in-person; 59% via noticeboards

Research partner	Torres Strait Islander Media Association
Trip date	4–8 Apr 2022
Surveys	44
Interviews	14

Photo of research team

Left to right: Dr Indigo Holcombe-James, Co-Researcher Nixon Mye, Co-Researcher Lala Gutchen, Dr Lyndon Ormond-Parker, Dr Daniel Featherstone

GALIWIN'KU, NT

Galiwin'ku is a large island community, with microwave backhaul from the mainland for all Telstra services (4G, ADSL, phones). With high levels of congestion throughout much of the day, and limited coverage to outlying suburbs, residents have called for upgrades for several years. Extended outages have had significant impacts in recent years. Few residents' homes have fixed internet or phone services, with primary reliance on pre-paid mobile. However affordability is a key issue. Over 30% of residents rarely or never use the internet, with demand for more public access computers, free Wi-Fi and mentor support for using online services and developing digital skills. 80% of households do not have free-to-view TV services working, with news and entertainment primarily accessed via mobile. This increases congestion and household costs, and restricts reliable sources of news and information.

AT A GLANCE

Distances	**150km**	west of Nhulunbuy
	550km	north east of Darwin
Population	**2199**	94% Torres Strait Islander
Dwellings	**369**	occupied dwellings
	6.3	people per ATSI household
Language	**96.9%**	ATSI people who speak an ATSI language
Income	**$338**	median ATSI personal income

Galiwin'ku is the largest Yolŋu community in the East Arnhem region. The traditional owners are the Djambarrpuyŋu, Gupapuyŋu, and Djinang people.

Communications and media services (at time of visit)

Mobile services	Backhaul	ADSL	Public phones	nbn service
Telstra 3G/4G	Microwave link from fibre	Available	5/8 working	Sky Muster

Public computers	Public Wi-Fi	Radio services	TV Services	First Nations Radio
2 (ALPA Higher Education Centre)	At public library	4	VAST satellite	TEABBA/ Yolngu Radio/ RIBS

Aerial view of Galiwin'ku

"The internet here in Galiwin'ku past 10 am is hopeless. [It] further marginalises people already living in an isolated community. You cannot look up information in an emergency [or] access internet banking [or send] emails. ... Often there are unexplained internet outages." (Survey comment, Galiwin'ku 2022)

RESULTS

73.4
National
(non-First Nations)

48.0
−25.3
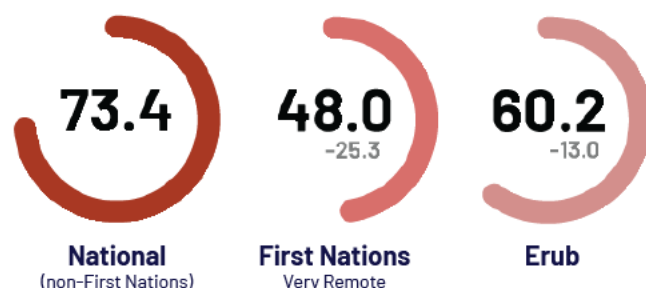**First Nations**
Very Remote

46.0
−27.2
Galiwin'ku

Figure 12: Galiwin'ku ADII scores compared to National Average (non-First Nations) and Very Remote First Nations scores, based on 2022 surveys

Access
26.6
−45.5

Affordability
95.8
+0.8

Digital Ability
41.0
−23.9

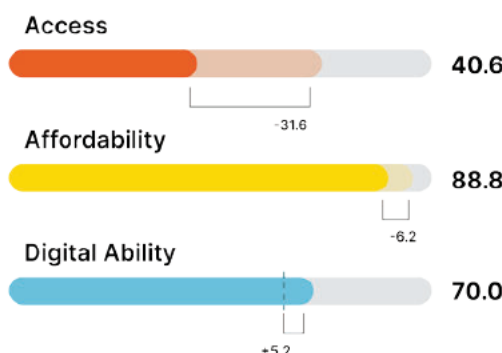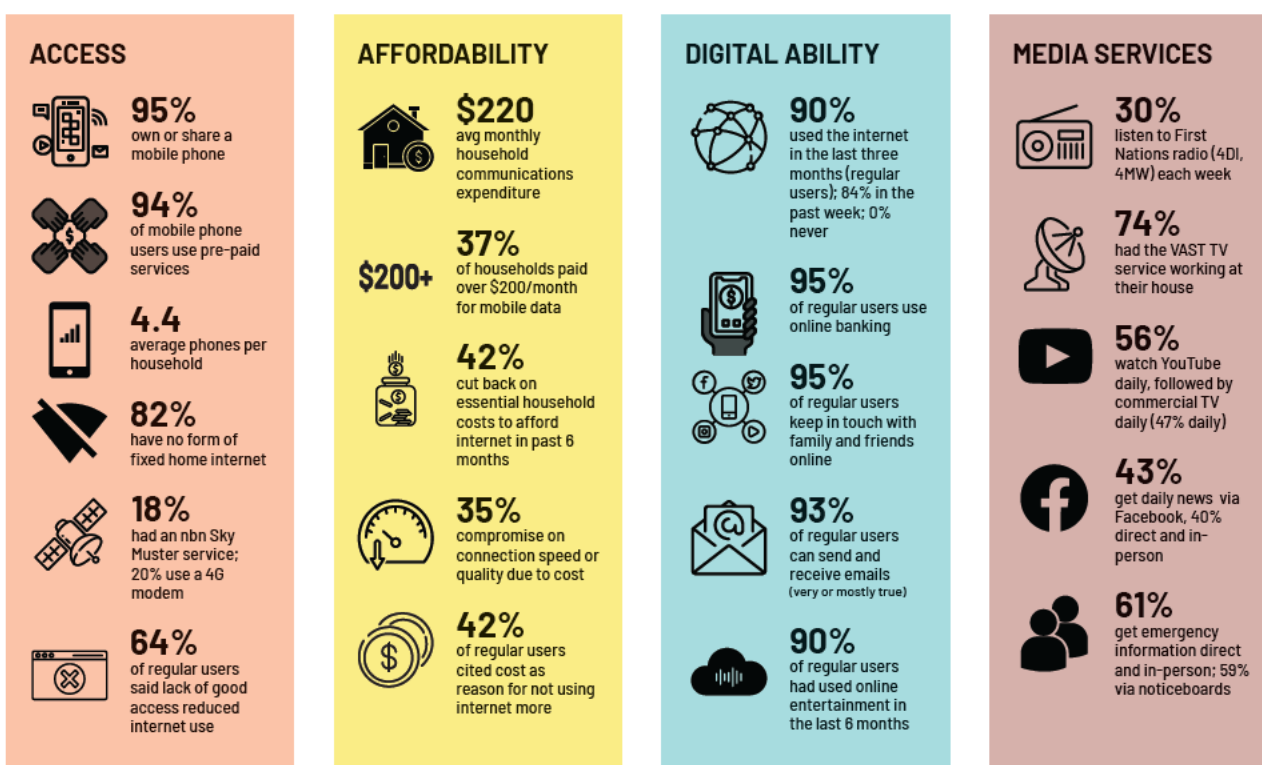Figure 13: Galiwin'ku ADII dimension scores compared to National Average (non-First Nations) scores, based on 2022 surveys

KEY FINDINGS

Weighted analysis of surveys with respondents who identified as Aboriginal and/or Torres Strait Islander:

ACCESS

74% own or share a mobile phone

95% of mobile phone users use pre-paid services

94% have no form of fixed home internet

6% had an nbn Sky Muster service; 4% have a fixed line home telephone

12% use the public phone regularly, 50% sometimes

80% of non-users cited limited access for not using the internet

AFFORDABILITY

$237 avg monthly household communications expenditure

$200+ **40%** of households paid over $200/month for mobile data

45% cut back on essential household costs to afford internet in past 6 months

42% compromise on connection speed or quality due to cost

53% of regular users cited cost as reason for not using internet more (53% of non-users)

DIGITAL ABILITY

68% used the internet in the last three months (regular users), 22% never

81% of regular users use online banking

79% of regular users keep in touch with family and friends online

77% of regular users can send and receive emails (very or mostly true)

62% of regular users can complete online forms

MEDIA SERVICES

40% listen to First Nations radio (Yolngu Radio, TEABBA) each week

32% had the VAST TV service working at their house

36% watch YouTube daily, followed by streaming services (21% daily)

73% get daily news and information direct and in-person, then First Nations Radio (26%)

76% get emergency information direct and in-person, then PA system (48%)

Research partner	Yalu Aboriginal Corporation
Trip date	16–20 May 2022
Surveys	46
Interviews	11

Photo of research team

Left to right: coresearcher James Bayung, Yalu Program Manager Alice McCarthy, coresearcher Yuŋgirrŋa Bukulatjpi, Dr Lyndon Ormond-Parker (below), Dr Daniel Featherstone, and co-researcher Cyril Bukulatjpi

GÄNGAN HOMELAND, NT

Gängan homeland is one of 30 Laynhapuy homelands in the East Arnhem region. There is no mobile coverage and no fixed internet in the 13 households. Primary communications is via the public phone and a free Wi-Fi hotspot at the local store available from 2–8pm daily, using nbn Sky Muster. There is high mobile phone ownership, used for data and Wi-Fi calling during Wi-Fi hours (2–8pm) and when visiting regional centre Nhulunbuy and nearby communities. All services in Gängan (school, pre-school, clinic, shop and ranger base) are locally run, with visiting support staff during the week. There is no TV access in any of the houses, one radio service: Yolŋu Radio, and most news and information is conveyed by word of mouth.

AT A GLANCE

Distances	**206km**	south of Nhulunbuy
Population	**100**	100% Aboriginal people (6% not stated)[14]
Dwellings	**13**	occupied dwellings[15]
	7.8	people per ATSI household[16]
Language	**100%**	ATSI people who speak an ATSI language
Income	**$282**	median ATSI personal income (Laynhapuy–Gumatj homelands)

Gängan homeland is a small, community-managed homeland located in the East Arnhem region. The traditional owners are the Yolŋu / Dhuwala people.

Communications and media services (at time of visit)

Mobile services None	**Backhaul** HCRC[17] microwave repeaters	**ADSL** Unavailable	**Public phones** 2	**nbn service** Sky Muster
Access computers None	**Public Wi-Fi** Free hotspot at Gängan Store 2pm –8pm daily	**Radio services** 1	**TV Services** VAST satellite, but no houses have TV working	**First Nations Radio** Yolŋu Radio

Aerial view of Gängan homeland

"It's crucial that Yolŋu that live out here have access to all the things that other people in town have access to [such as] internet banking, news, reporting to Centrelink. ... But it has to be done in a really careful way [to not have] a negative impact upon the way of life out here." (Rachel Godley, Laynhapuy Homelands Aboriginal Corporation [LHAC] Youth Program Manager, Gängan homeland 2022)

RESULTS

73.4
National (non-First Nations)

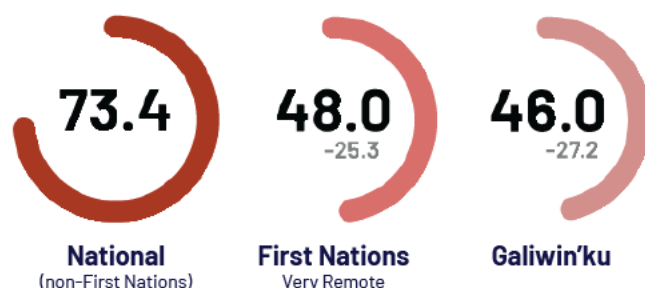**48.0** −25.3
First Nations Very Remote

39.0 −34.2
Gäŋan

Figure 14: Gäŋan ADII scores compared to National Average (non-First Nations) and Very Remote First Nations scores, based on 2022 surveys
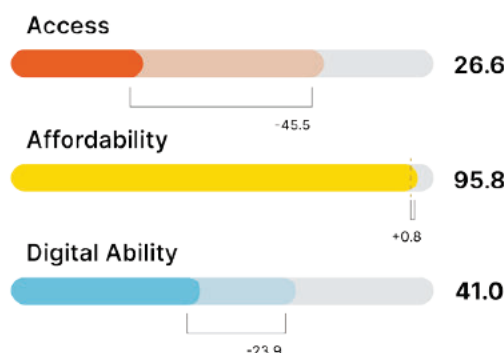

Access 25.3 −46.7

Affordability 92.2 −2.8

Digital Ability 28.9 −35.9

Figure 15: Gäŋan ADII dimension scores compared to National Average (non-First Nations) scores, based on 2022 surveys

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KEY FINDINGS

Weighted analysis of surveys with respondents who identified as Aboriginal and/or Torres Strait Islander:

ACCESS

84% own or share a mobile phone

100% of mobile phone users use pre-paid services

0% have fixed home internet

91% use the public phone for phone calls (21% use a home phone)

81% use the free public Wi-Fi for internet access

74% of regular users said lack of good access reduced internet use

AFFORDABILITY

$180 avg monthly household communications expenditure

32% $200+ of households paid over $200/month for mobile data

56% cut back on essential household costs to afford internet in past 6 months

72% compromise on connection speed or quality due to cost

43% of regular users cited cost as reason for not using internet more (72% non-users)

DIGITAL ABILITY

90% used the internet in the last three months (regular users); 58% in the past week; 10% never

78% of regular users use online banking

59% of regular users keep in touch with family and friends online

54% of regular users can send and receive emails (very or mostly true)

85% of regular users had used online entertainment in the last 6 months

MEDIA SERVICES

33% listen to First Nations radio (Yolŋu radio) each week

0% had the VAST TV service working at their house

35% watch YouTube daily, followed by streaming services (22% daily)

79% get daily news direct and in person, followed by Facebook (31% daily)

87% get emergency information direct and in-person, followed by Yolŋu radio (53%)

Research partner	Laynhapuy Homelands Aboriginal Corporation
Trip date	23–27 May 2022
Surveys	31
Interviews	7

Photo of research team

Left to right: Coresearcher Djamika Ganambarr, Dr Lyndon Ormond-Parker, Co-researcher Guruwuy Ganambarr, community leader and senior ranger Yinimala Gumana, and Dr Daniel Featherstone

KALUMBURU, WA

Being located near the northern Kimberley coast, Kalumburu is reliant on satellite delivery for most communications – internet, TV, radio and the 3G/4G small cell mobile service. This results in regular service dropouts during wet season (November to April/May), and congestion and latency on the mobile service. With pre-paid mobile the primary mode for voice and data use, residents were frustrated at the quality and reliability of the mobile service, with some agencies using UHF radio for staff communications. In 2021, a new Wi-Fi mesh network was installed in Kalumburu using nbn Sky Muster backhaul, providing pre-paid household Wi-Fi and VoIP phone services into 128 dwellings. While usage was high initially, the network was not fully functional during our visit following lightning damage (this was repaired shortly afterwards). Data access and affordability issues had reduced since the Wi-Fi network was introduced. Kalumburu community staff provide support in the use of online services and identification records, but there was demand for more digital skills and cybersafety training and computer access.

AT A GLANCE

Distances	279km	north west of Kununurra
Population	388	87.6% Aboriginal people
Dwellings	85	occupied dwellings
	4.4	people per ATSI household
Language	14.9%	ATSI people who speak an ATSI language
Income	$296	median ATSI personal income

Communications and media services (at time of visit)

Mobile services
Optus 3G/4G

Backhaul
HCRC microwave network

ADSL
Unavailable

Public phones
2/5 working

nbn service
Sky Muster

Public computers
2 (Centrelink/ CRC ($5/hr))

Public Wi-Fi
Centrelink, Activ8me hotspot, Wi-Fi mesh to houses

Radio services
2

TV Services
VAST satellite

First Nations Radio
PAKAM radio (RIBS inactive)

Aerial view of Kalumburu

Kalumburu is a very remote community situated on the banks of the King Edward River in the Wyndham-East Kimberley Shire. The traditional owners are the Kwini and Kulari people.

"We got Activ8me here, we've got Optus and we've got some Telstra [land lines]. [We don't need another] broadband network. ... We need [the] community Wi-Fi [fixed], we need [better] Optus [and] we need a proper upgrade for Telstra." (Ashlyn Hassett, Resource Mentor, Kalumburu AC, 2022)

RESULTS

73.4
National
(non-First Nations)

48.0 −25.3
First Nations
Very Remote

49.2 −24.0
Kalumburu
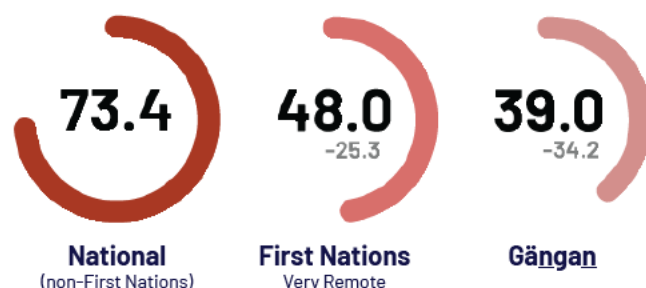
Figure 16: Kalumburu ADII scores compared to National Average (non-First Nations) and Very Remote First Nations scores, based on 2022 surveys

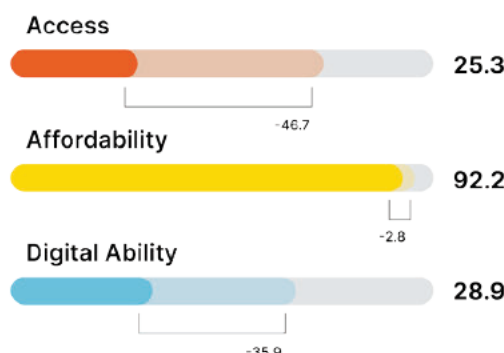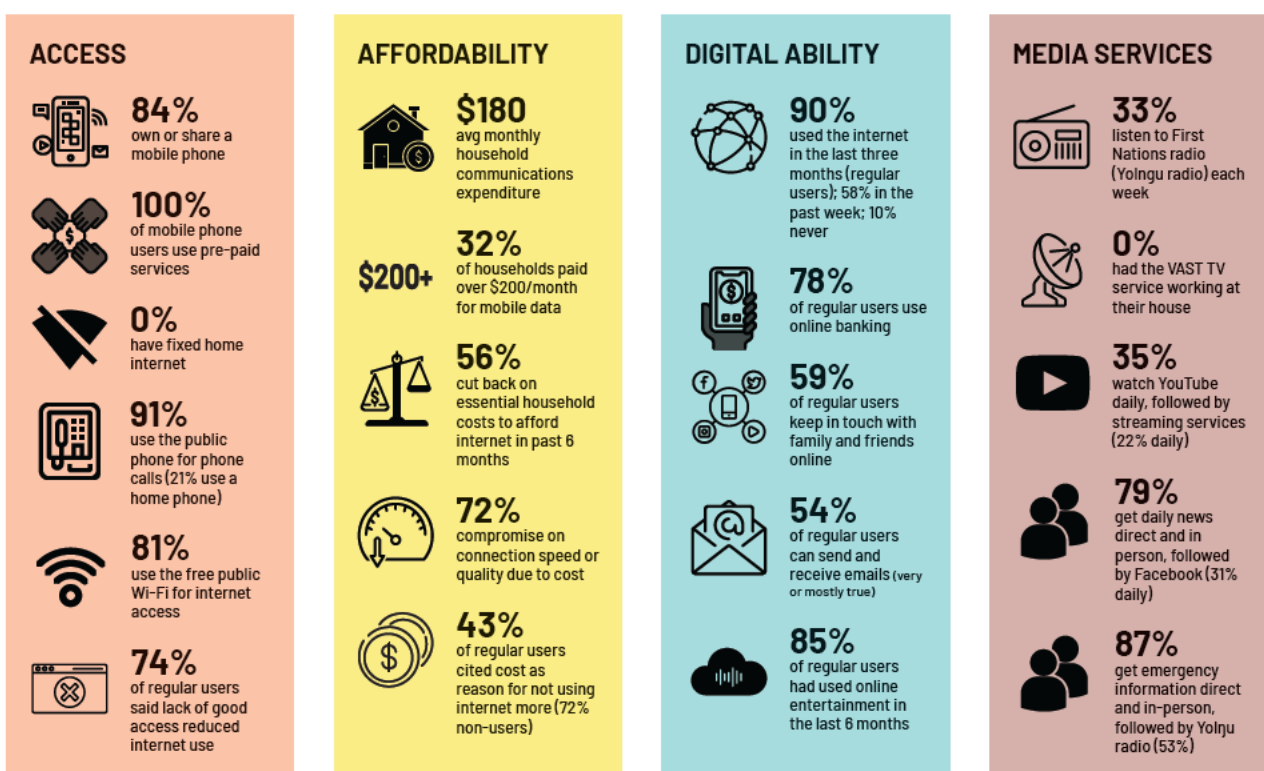**Access**
30.4
−41.6

Affordability
91.6
−3.3

Digital Ability
49.8
−15.1

Figure 17: Kalumburu ADII dimension scores compared to National Average (non-First Nations) scores, based on 2022 surveys

KEY FINDINGS

Weighted analysis of surveys with respondents who identified as Aboriginal and/or Torres Strait Islander:

ACCESS

77% own or share a mobile phone

98% of mobile phone users use pre-paid services

57% use the public telephone for calls

58% use the public Wi-Fi hotspot for internet access

20% had an nbn Sky Muster service (separate to mesh)

81% of non-users cited limited access for not using internet (56% of regular users)

AFFORDABILITY

$116 avg monthly household communications expenditure

$200+ **4%** of households paid over $200/month for mobile data

44% cut back on essential household costs to afford internet in past 6 months

70% compromise on connection speed or quality due to cost

49% of regular users cited cost as reason for not using internet more (52% non-users)

DIGITAL ABILITY

82% used the internet in the last three months (regular users); 72% in the past week; 16% never

90% of regular users use online banking

71% of regular users keep in touch with family and friends online

78% of regular users can send and receive emails (very or mostly true)

84% of regular users had used online entertainment in the last 6 months

MEDIA SERVICES

64% never listen to the radio

61% had the VAST TV service working at their house

28% watch commercial TV daily

77% get daily news direct and in-person, followed by community noticeboards (24%)

88% get emergency information direct and in-person, followed by ABC TV (29%)

Research partner	Kalumburu Aboriginal Corporation
Trip date	8–13 June 2022
Surveys	49
Interviews	10

Photo of research team

Left to right: co-researcher Leanne Kelly, Dr Lyndon Ormond-Parker, Kalumburu CEO Madeline Gallagher-Dann, Ashlyn Hassett, Julia Campbell and Dr Daniel Featherstone

TENNANT CREEK, NT

Tennant Creek is the regional centre of the Barkly Region, and has seven Community Living Areas (CLAs) encircling the town. Tennant Creek had the best quality 4G mobile service and broadband access of all sites visited, including having nbn fixed line services. However, while nbn fixed line services are available, there was very low fixed home internet uptake, with the majority of First Nations residents using pre-paid mobile for voice and data. A locally managed Wi-Fi mesh network planned for the town's seven CLAs aims to provide safe Wi-Fi access for young people near their homes rather than having them congregate in the town centre. Two 3G/4G mobile towers provided good coverage to most of the town, with a third tower planned. However there is limited broadband availability across the Barkly region, with 4G coverage in the six larger communities and most homelands dependent on a public phone and some Wi-Fi services. In Tennant Creek, digital ability is relatively low, however online banking and social media use were high. With limited free Wi-Fi and public access to computers, affordability constrains internet access and use of digital services.

AT A GLANCE

Distances	**508km**	north of Alice Springs
Population	**3080**	1707 (55.4%) Aboriginal and/ or Torres Strait Islander people
Dwellings	**943**	occupied dwellings
	3.7	people per ATSI household
Language	**44.8%**	ATSI people who speak an ATSI language
Income	**$336**	median ATSI personal income

The traditional owners of the Tennant Creek area are the Warumungu people.

Communications and media services (at time of visit)

Mobile services Telstra/Optus 3G/4G	**Backhaul** Fibre optic cable	**ADSL** N/A - nbn fixed line location	**Public phones** 6/10 working	**nbn service** FTTN, FTTP for service facilities
Access computers 2 (Centrelink)	**Public Wi-Fi** None; projects in development	**Radio services** 10 FM, 2 AM	**TV Services** Broadcast	**First Nations Radio** 8KIN FM

Aerial view of Tennant Creek

"When I started ... we worked on typewriters, everything was paper formed. [Now] kids cannot be without their phones. [Some] can text and talk at the same time. [We are] more reliant on the digital format than reading a book [or] newspaper ... we are changing to a digital age." (Karen Hayward, CEO, Papulu Apparr-Kari Language and Cultural Centre, Tennant Creek 2022)

RESULTS

73.4
National
(non-First Nations)

48.0
−25.3
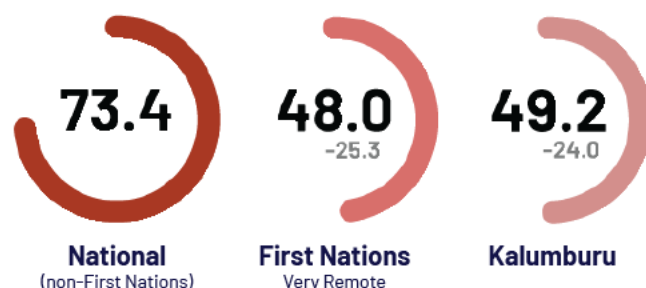**First Nations**
Very Remote

46.6
−26.6
Tennant Creek

Figure 18: Tennant Creek ADII scores compared to National Average (non-First Nations) and Very Remote First Nations scores, based on 2022 surveys
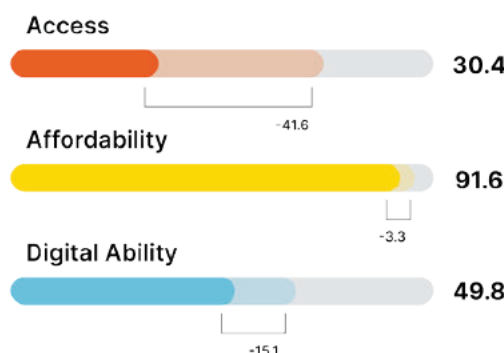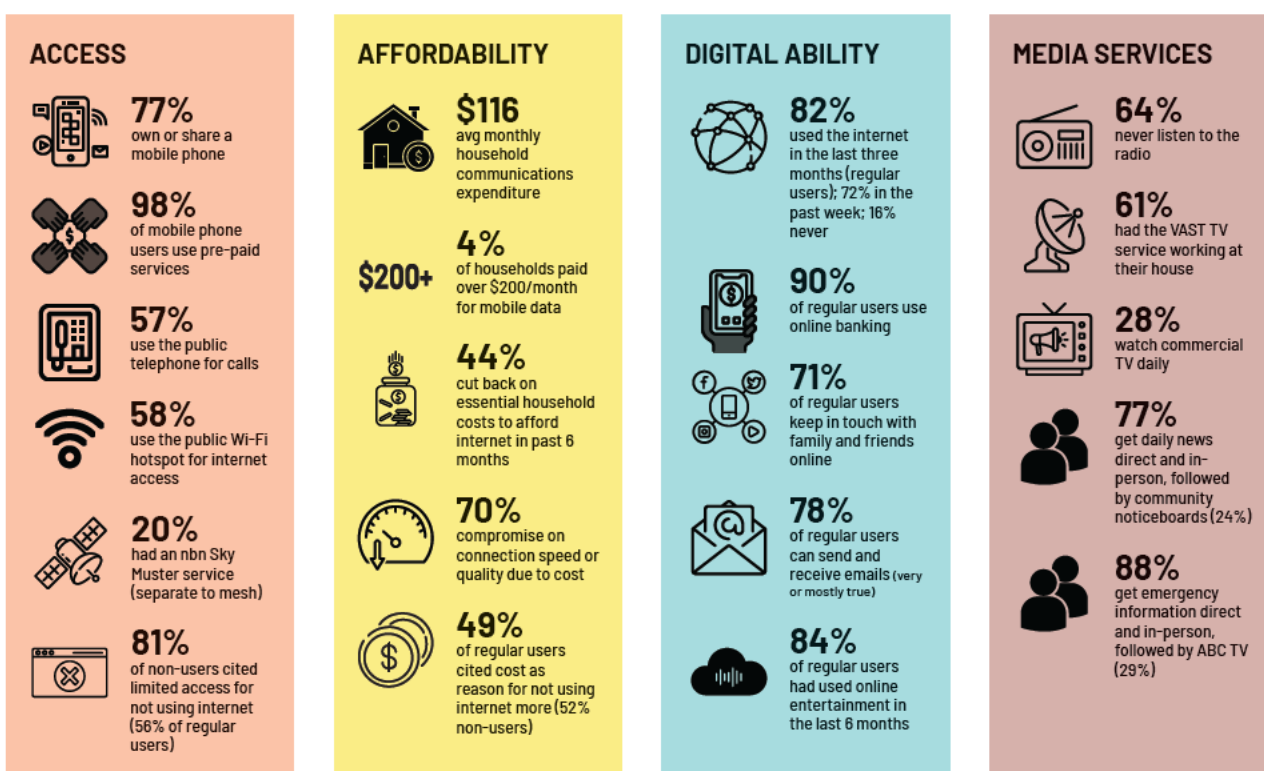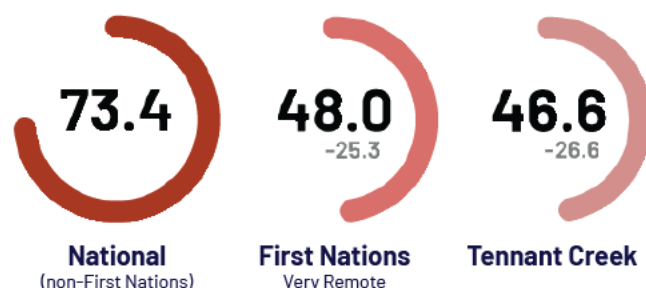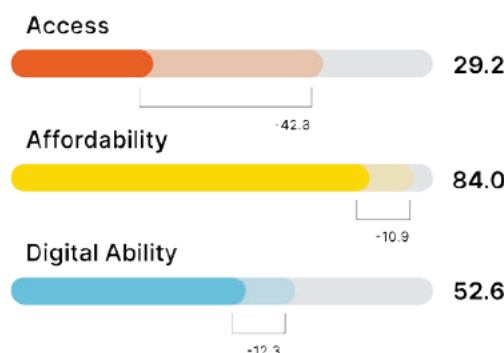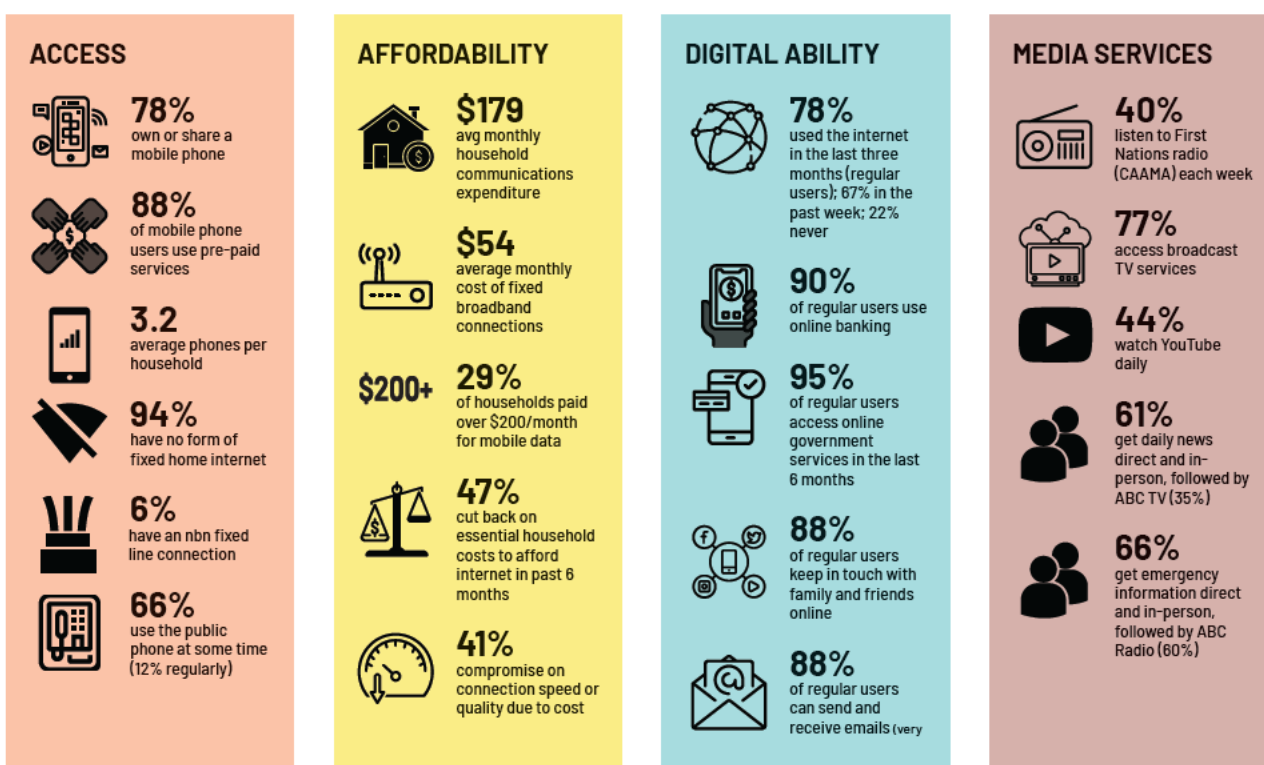
Access
29.2
−42.8

Affordability
84.0
−10.9

Digital Ability
52.6
−12.3

Figure 19: Tennant Creek ADII dimension scores compared to National Average (non-First Nations) scores, based on 2022 surveys

KEY FINDINGS

Weighted analysis of surveys with respondents who identified as Aboriginal and/or Torres Strait Islander:

ACCESS

78% own or share a mobile phone

88% of mobile phone users use pre-paid services

3.2 average phones per household

94% have no form of fixed home internet

6% have an nbn fixed line connection

66% use the public phone at some time (12% regularly)

AFFORDABILITY

$179 avg monthly household communications expenditure

$54 average monthly cost of fixed broadband connections

$200+ 29% of households paid over $200/month for mobile data

47% cut back on essential household costs to afford internet in past 6 months

41% compromise on connection speed or quality due to cost

DIGITAL ABILITY

78% used the internet in the last three months (regular users); 67% in the past week; 22% never

90% of regular users use online banking

95% of regular users access online government services in the last 6 months

88% of regular users keep in touch with family and friends online

88% of regular users can send and receive emails (very

MEDIA SERVICES

40% listen to First Nations radio (CAAMA) each week

77% access broadcast TV services

44% watch YouTube daily

61% get daily news direct and in-person, followed by ABC TV (35%)

66% get emergency information direct and in-person, followed by ABC Radio (60%)

Research partner	Julalikari Aboriginal Corporation
Trip date	27 Apr–4 May 2022
Surveys	44
Interviews	13

Photo of research team

Left to right: JCAC Chair Linda Turner (LT), co-researcher Sheana Sampson, Fungisai Siggins, Dr Lyndon Ormond-Parker, JCAC Executive Manager David Curtis, and Dr Daniel Featherstone

WADEYE, NT

Wadeye is a large community made up of 22 traditional owner groups, surrounded by 30 homelands and outstations within the Thamarrurr region. Wadeye has a range of Telstra services (3G/4G, ADSL, phones) provided via fibre optic cable from Darwin. However there were reports of congestion and reliability issues, especially during the wet season when road access is closed. Extended outages in the prior year had created significant issues of food insecurity and social issues, with few redundancy options in the town. Most residents' homes have no fixed internet or phone services, with primary reliance on pre-paid mobile. Affordability is a key issue. While there is Wi-Fi at the library, there was demand for more public access Wi-Fi and computers, as well as digital mentor support and cyber-safety training. Following recent unrest, many people relocated to outstations, with demand for improved communications services and some temporary solutions provided.

AT A GLANCE

Distances	403km	south-west of Darwin
Population	1960	86-89% Aboriginal and/or Torres Strait Islander
Dwellings	339	occupied dwellings
	5.4	people per ATSI household
Language	95.5%	ATSI people who speak an ATSI language
Income	$161	median ATSI personal income

Communications and media services (at time of visit)

Mobile services Telstra 3G/4G

Backhaul Fibre optic cable

ADSL Available

Public phones None working

nbn service Sky Muster

Public computers 7 (Centrelink/ TDC Office, Mens Shed)

Public Wi-Fi WDRC Library

Radio services 3

TV Services VAST satellite

First Nations Radio TEABBA (RIBS inactive)

Wadeye is a large coastal community in the West Daly region formerly known as the Port Keats mission. The traditional owners are the Dinnuman people, with 22 traditional owner groups in the Thamarrurr region.

"With the community unrest, we had about 700 people became displaced [to homelands, most without] internet services. ... It's been really [difficult] just trying to communicate with people about really basic things." (Tracey Leo, Corporate Services Manager, Thamarrurr D.C., Wadeye 2022)
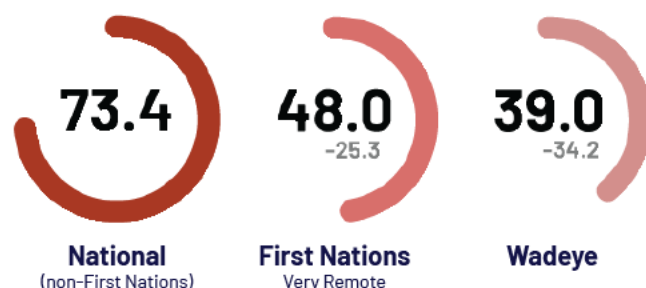
Aerial view of Wadeye town centre

RESULTS

73.4
National (non-First Nations)

48.0 −25.3
First Nations Very Remote

39.0 −34.2
Wadeye

Figure 20: Wadeye ADII scores compared to National Average (non-First Nations) and Very Remote First Nations scores, based on 2022 surveys

Access
28.6
−43.4

Affordability
93.0
−2.0
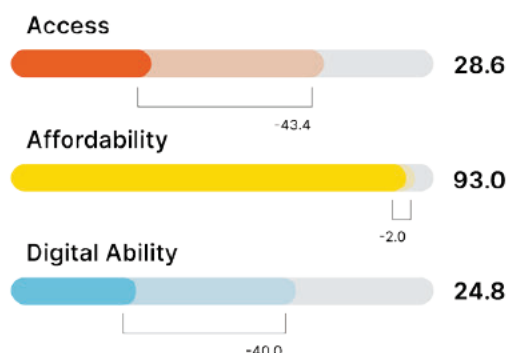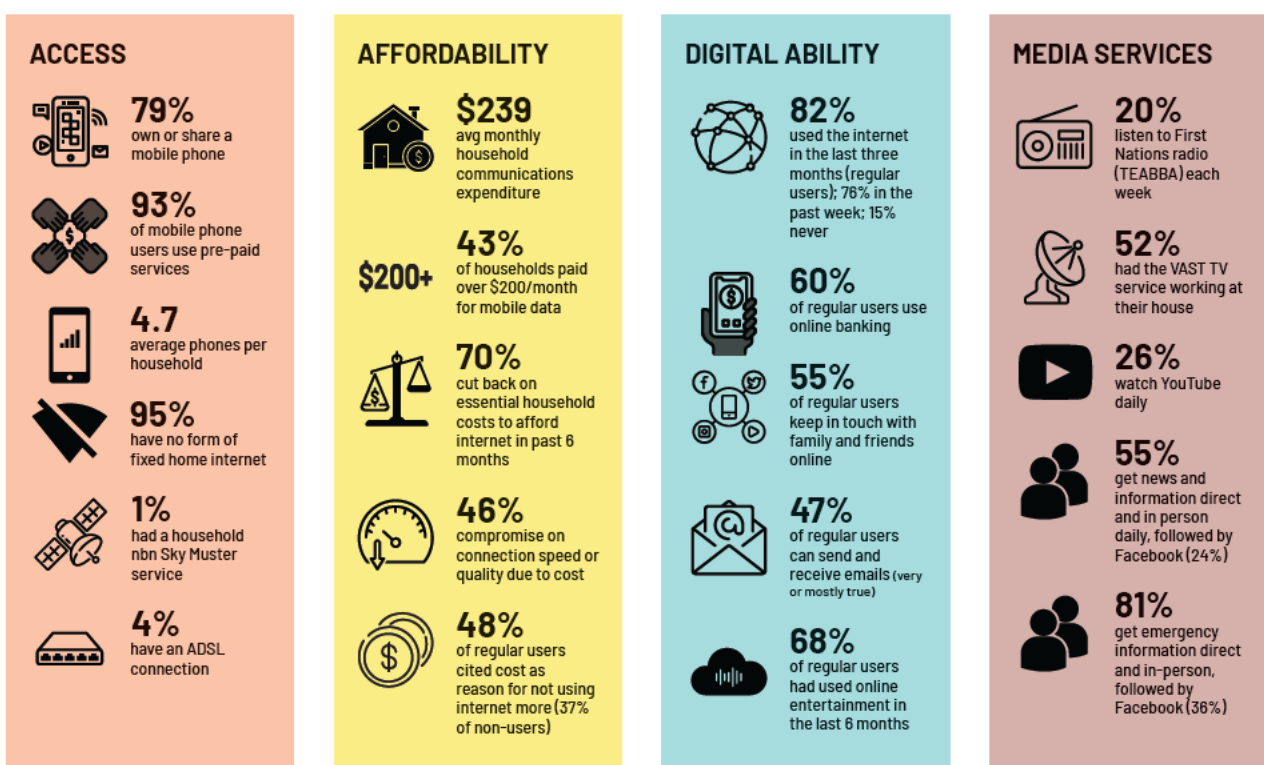
Digital Ability
24.8
−40.0

Figure 21: Wadeye ADII dimension scores compared to National Average (non-First Nations) scores, based on 2022 surveys

KEY FINDINGS

Weighted analysis of surveys with respondents who identified as Aboriginal and/or Torres Strait Islander:

ACCESS

79% own or share a mobile phone

93% of mobile phone users use pre-paid services

4.7 average phones per household

95% have no form of fixed home internet

1% had a household nbn Sky Muster service

4% have an ADSL connection

AFFORDABILITY

$239 avg monthly household communications expenditure

$200+ **43%** of households paid over $200/month for mobile data

70% cut back on essential household costs to afford internet in past 6 months

46% compromise on connection speed or quality due to cost

48% of regular users cited cost as reason for not using internet more (37% of non-users)

DIGITAL ABILITY

82% used the internet in the last three months (regular users); 76% in the past week; 15% never

60% of regular users use online banking

55% of regular users keep in touch with family and friends online

47% of regular users can send and receive emails (very or mostly true)

68% of regular users had used online entertainment in the last 6 months

MEDIA SERVICES

20% listen to First Nations radio (TEABBA) each week

52% had the VAST TV service working at their house

26% watch YouTube daily

55% get news and information direct and in person daily, followed by Facebook (24%)

81% get emergency information direct and in-person, followed by Facebook (36%)

Research partner	Thamarrurr Development Corporation
Trip date	8–12 August 2022
Surveys	75
Interviews	14

Photo of research team

Left to right: co-researcher Marcus Kinthari, Dr Daniel Featherstone, Lyndon Ormond-Parker, and co-researcher Veronica Munar

WILCANNIA, NSW

Access to and affordability of communications services are key barriers to digital inclusion in Wilcannia, with most residents reliant on pre-paid mobile for voice and data.

While 4G mobile is the primary means of access, the service was highly congested, patchy, and described as unreliable, with low penetration inside houses. A mobile cell-on-wheels and household Wi-Fi network improved connectivity temporarily during COVID-19 restrictions, following a major outbreak in 2021. A low-range 4G tower, installed near the hospital in late 2021, only services a small part of town. There are calls for improved coverage, as well as more access computers, Wi-Fi and digital skills support.

Sign on entry to Wilcannia

AT A GLANCE

Distance	**197km**	to Broken Hill
	557km	to Dubbo
Population	**735**	75% Aboriginal and/or Torres Strait Islander
Dwellings	**189**	occupied
	3.3	people per ATSI household
Language	**3.8%**	ATSI people who speak an ATSI language
Income	**$442**	median ATSI income

Wilcannia is located in the Central Darling Shire. The traditional owners are the Barkindji people.

Communications and media services

Mobile services	Backhaul	ADSL	Public phones	nbn service
Telstra 3G/4G	Fibre optic cable	Available	2/3 working	Sky Muster

Public computers	Public Wi-Fi	Radio services	TV Services	First Nations Radio
2 (Centrelink)	Yes (Centrelink)	5	Broadcast	Wilcannia River Radio

Aerial view of Wilcannia

Photo credit: NITV

"We are now at a stage where digital exclusion is part of poverty and we can't continue to manufacture systems that are further excluding people that are already marginalised ... just because of where they are geographically situated. ... Closing the gap is a great way of trying to bring everybody forward because certainly in the remote communities, digital exclusion is the reality." (Nola Whyman, Maari Ma Health, Wilcannia 2022)

RESULTS

73.4
National
(non-First Nations)

48.0
−25.3
First Nations
Very Remote

59.6
−13.6
Wilcannia
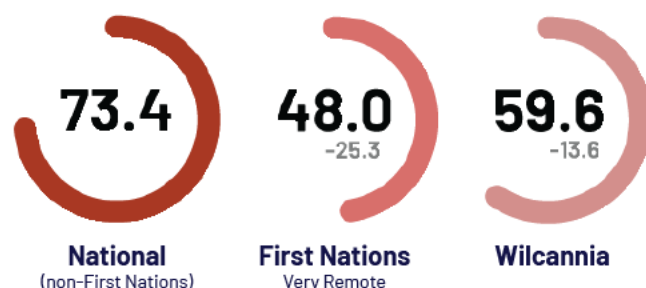
Figure 22: Wilcannia ADII scores compared to National Average (non-First Nations) and Very Remote First Nations scores, based on 2022 surveys

Access
42.3
−29.7

Affordability
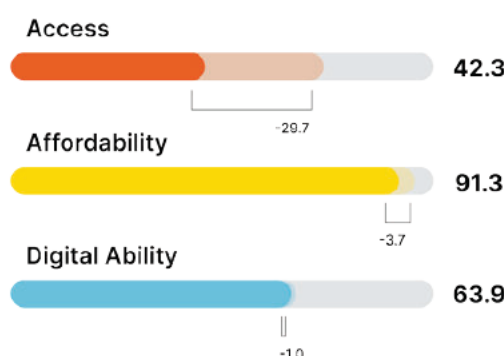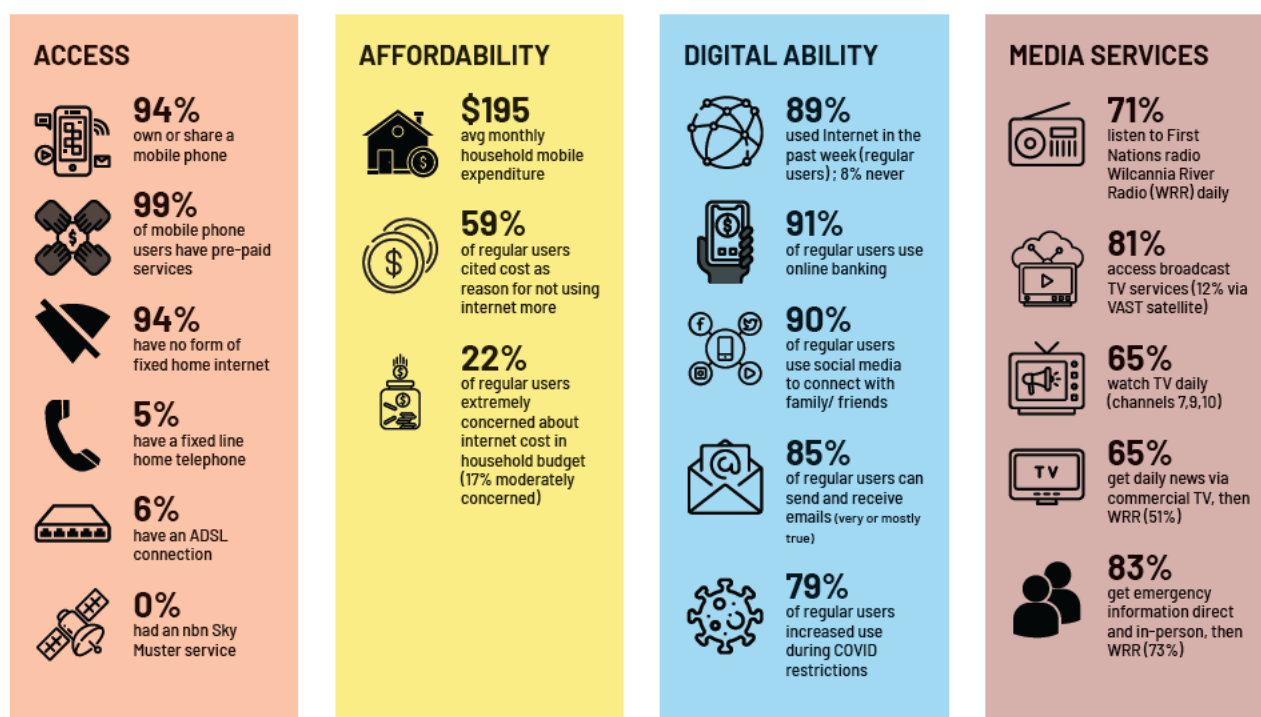91.3
−3.7

Digital Ability
63.9
−1.0

Figure 23: Wilcannia ADII dimension scores compared to National Average (non-First Nations) scores, based on 2022 surveys

KEY FINDINGS

Weighted analysis of surveys with respondents who identified as Aboriginal and/or Torres Strait Islander:

ACCESS

94% own or share a mobile phone

99% of mobile phone users have pre-paid services

94% have no form of fixed home internet

5% have a fixed line home telephone

6% have an ADSL connection

0% had an nbn Sky Muster service

AFFORDABILITY

$195 avg monthly household mobile expenditure

59% of regular users cited cost as reason for not using internet more

22% of regular users extremely concerned about internet cost in household budget (17% moderately concerned)

DIGITAL ABILITY

89% used Internet in the past week (regular users); 8% never

91% of regular users use online banking

90% of regular users use social media to connect with family/ friends

85% of regular users can send and receive emails (very or mostly true)

79% of regular users increased use during COVID restrictions

MEDIA SERVICES

71% listen to First Nations radio Wilcannia River Radio (WRR) daily

81% access broadcast TV services (12% via VAST satellite)

65% watch TV daily (channels 7,9,10)

65% get daily news via commercial TV, then WRR (51%)

83% get emergency information direct and in-person, then WRR (73%)

Research partner	Regional Enterprise Development Institute (REDI.E)
Trip date	5–12 Feb 2022
Surveys	67
Interviews	25

Photo of research team

Left to right: co-researchers Anthony Wiltshire, Shaylin Whyman, REDI.E Partner Brendon Adams, Dr Daniel Featherstone, Dr Lyndon Ormond-Parker, and Dr Indigo Holcombe-James

WUJAL WUJAL, QLD

While 3G/4G mobile is the primary means of phone and internet access for Wujal Wujal residents, coverage is patchy and was described as unreliable, slow and having low penetration inside houses. There were calls for improved mobile services to improve reliability and safety for those areas without coverage. About a quarter of First Nations households, and most agencies and staff houses, use nbn Sky Muster services for internet access. However some users reported issues of slow speeds, insufficient data and dropouts during the wet season. COVID-19 restrictions increased the use of videoconferencing for meetings, training and telehealth by agencies, with ongoing high data usage. Affordability is a major concern, with most residents on Centrelink payments or low incomes. Digital ability is relatively high among regular users, however 30% of residents do not use the internet and rely on family or service providers, particularly among Elders. The Indigenous Knowledge Centre provides digital support, public access computers and free Wi-Fi, with some support also at the Centrelink office.

AT A GLANCE

Distances	**170km**	north of Cairns (338 km by road)
Population	**276**	94% ATSI population
Dwellings	**73**	occupied dwellings
	3.4	people per ATSI household
Language	**39.9%**	ATSI people who speak an ATSI language
Income	**$332**	median ATSI personal income

Communications and media services (at time of visit)

Mobile services	**Backhaul**	**ADSL**	**Public phones**	**nbn service**
Telstra 3G/4G	Fibre optic cable	Available	1	Sky Muster

Access computers	**Public Wi-Fi**	**Radio services**	**TV Services**	**First Nations Radio**
4 (Centrelink/ Indigenous Knowledge Centre)	Centrelink for govt services only, IKC by voucher	1 AM, 1 FM	VAST satellite	Black Star, RIBS

Aerial view of Wujal Wujal

Wujal Wujal is an Aboriginal community located on the Bloomfield River in Cape York, North Queensland. The traditional owners are the Eastern Kuku Yalanji people.

"We'd like to see greater connectivity where people [can] stay connected to the world, [do] their personal online banking or [for] communications to family. [We need] reliability and efficiency [and] competition [to] drive those costs down so that people have options." (Stephen Wilton, CEO Wujal Wujal Aboriginal Shire Council, 2022)

RESULTS

73.4

National
(non-First Nations)

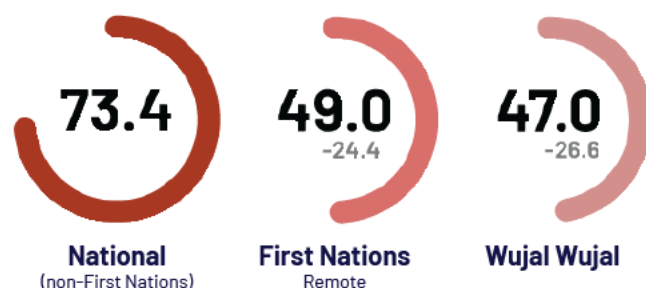**49.0** −24.4

First Nations
Remote

47.0 −26.6

Wujal Wujal

Figure 24: Wujal Wujal ADII scores compared to National Average (non-First Nations) and Remote First Nations scores, based on 2022 surveys
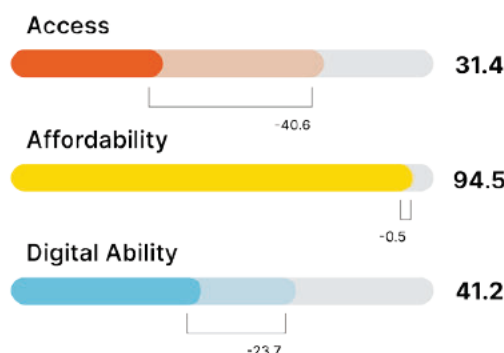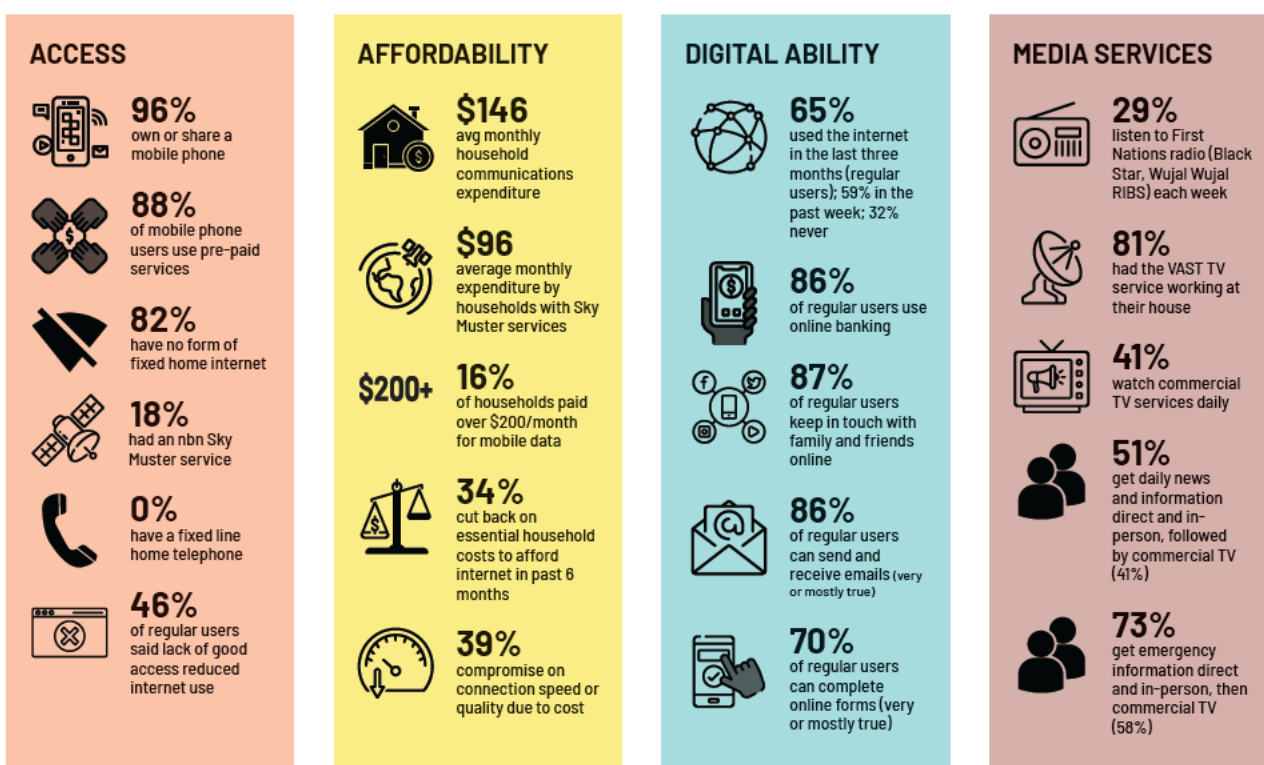
Access
31.4
~40.6

Affordability
94.5
−0.5

Digital Ability
41.2
−23.7

Figure 25: Wujal Wujal ADII dimension scores compared to National Average (non-First Nations) scores, based on 2022 surveys

KEY FINDINGS

Weighted analysis of surveys with respondents who identified as Aboriginal and/or Torres Strait Islander:

ACCESS

96% own or share a mobile phone

88% of mobile phone users use pre-paid services

82% have no form of fixed home internet

18% had an nbn Sky Muster service

0% have a fixed line home telephone

46% of regular users said lack of good access reduced internet use

AFFORDABILITY

$146 avg monthly household communications expenditure

$96 average monthly expenditure by households with Sky Muster services

$200+ **16%** of households paid over $200/month for mobile data

34% cut back on essential household costs to afford internet in past 6 months

39% compromise on connection speed or quality due to cost

DIGITAL ABILITY

65% used the internet in the last three months (regular users); 59% in the past week; 32% never

86% of regular users use online banking

87% of regular users keep in touch with family and friends online

86% of regular users can send and receive emails (very or mostly true)

70% of regular users can complete online forms (very or mostly true)

MEDIA SERVICES

29% listen to First Nations radio (Black Star, Wujal Wujal RIBS) each week

81% had the VAST TV service working at their house

41% watch commercial TV services daily

51% get daily news and information direct and in-person, followed by commercial TV (41%)

73% get emergency information direct and in-person, then commercial TV (58%)

Research partner	Wujal Wujal Aboriginal Shire Council (WWASC)
Trip date	28 March–1 Apr 2022
Surveys	41
Interviews	21

Photo of research team

Left to right: Dr Daniel Featherstone, co-researcher Lexton Nandy, Dr Indigo Holcombe-James, coresearcher Marie Shipton, Dr Lyndon Ormond-Parker, Kylie Mills, and Tidja

YUELAMU, NT

In Yuelamu, there was no mobile coverage in 2022, with the community having waited two years for a funded mobile service to be installed. Despite the lack of mobile service, there is high uptake of mobile phones with residents accessing the internet via public Wi-Fi, a CAT hotspot dish concentrating the 4G signal from nearby Yuendumu, and Sky Muster services in about a quarter of First Nations households. The one working public phone gets regular use, with no fixed line phones in households and high use of Wi-Fi Calling. There is very low household access to VAST TV services and one FM radio service, PAW Radio. Most news and information is conveyed by word of mouth. Despite the limited access, there is a moderate level of digital ability and use of online services in Yuelamu. However, affordability is an issue, with low average incomes, and costs expected to increase once mobile is available.

AT A GLANCE

Distances	50km	east of Yuendumu
	300km	north west of Alice Springs
Population	149	94% Aboriginal and/or Torres Strait Islander
Dwellings	35	occupied dwellings
	4.8	people per ATSI household
Language	99%	ATSI people who speak an ATSI language
Income	$254	median ATSI personal income

Yuelamu community is a small community located in the Central Desert region of the Northern Territory. The traditional owners are the Anmatjerre people.

Communications and media services (at time of visit)

Mobile services	Backhaul	ADSL	Public phones	nbn service
None (Telstra 4G planned 2023)	HCRC microwave network	Unavailable	1/3 working	Sky Muster

Access computers	Public Wi-Fi	Radio services	TV Services	First Nations Radio
3 (Centrelink/ recreation hall)	Centrelink, Activ8Me hotspot, Wi-Fi at rec hall	2	VAST satellite	PAW Radio (RIBS inactive)

Aerial view of Yuelamu

"[The lack of digital support is] one of the obstacles. [For] people who've grown up without English as a first language, older people particularly, [they struggle with] logging on the internet, getting onto a bank account [or] government services online. [It's] just impossible!"
(Jeff Bruer, General Manager, PAW Media, Yuendumu 2022)

RESULTS

73.4
National
(non-First Nations)

48.0
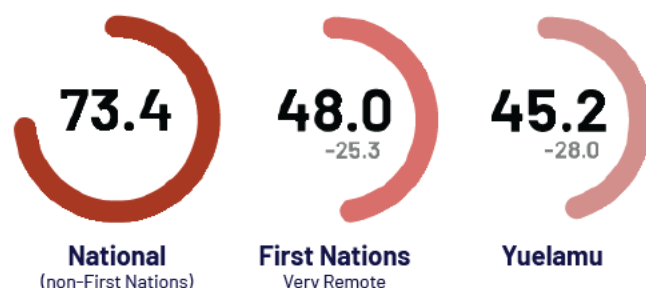−25.3
First Nations
Very Remote

45.2
−28.0
Yuelamu

Figure 26: Yuelamu ADII scores compared to National Average (non-First Nations) and Very Remote First Nations scores, based on 2022 surveys

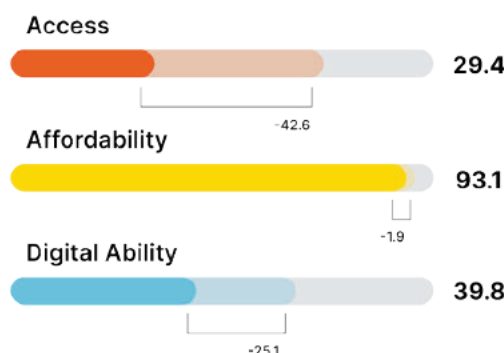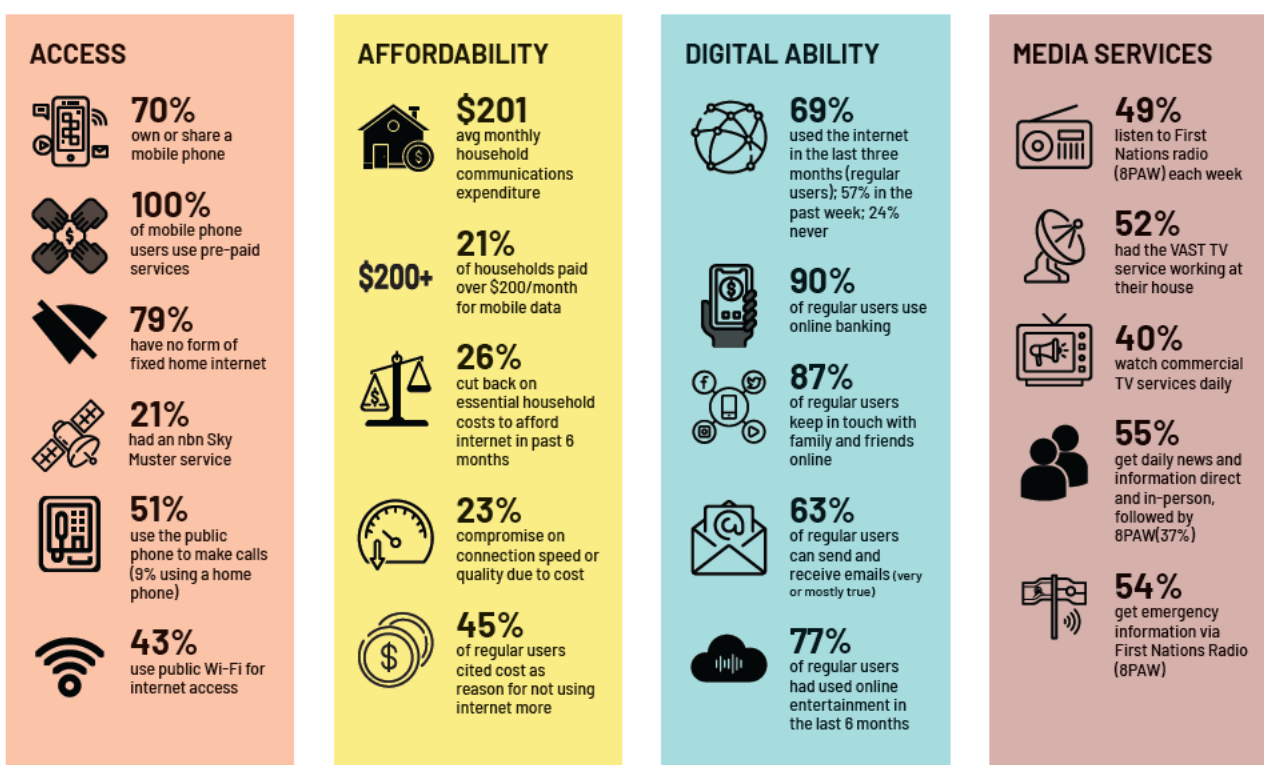**Access**
29.4
−42.6

Affordability
93.1
−1.9

Digital Ability
39.8
−25.1

Figure 27: Yuelamu ADII dimension scores compared to National Average (non-First Nations) scores, based on 2022 surveys

KEY FINDINGS

Weighted analysis of surveys with respondents who identified as Aboriginal and/or Torres Strait Islander:

ACCESS

70% own or share a mobile phone

100% of mobile phone users use pre-paid services

79% have no form of fixed home internet

21% had an nbn Sky Muster service

51% use the public phone to make calls (9% using a home phone)

43% use public Wi-Fi for internet access

AFFORDABILITY

$201 avg monthly household communications expenditure

21% of households paid over $200/month for mobile data

26% cut back on essential household costs to afford internet in past 6 months

23% compromise on connection speed or quality due to cost

45% of regular users cited cost as reason for not using internet more

DIGITAL ABILITY

69% used the internet in the last three months (regular users); 57% in the past week; 24% never

90% of regular users use online banking

87% of regular users keep in touch with family and friends online

63% of regular users can send and receive emails (very or mostly true)

77% of regular users had used online entertainment in the last 6 months

MEDIA SERVICES

49% listen to First Nations radio (8PAW) each week

52% had the VAST TV service working at their house

40% watch commercial TV services daily

55% get daily news and information direct and in-person, followed by 8PAW(37%)

54% get emergency information via First Nations Radio (8PAW)

Research partner	Pintubi Anmatjere Warlpiri Media and Communications (PAW Media)
Trip date	5–7 May 2022
Surveys	37
Interviews	13

Photo of research team

Left to right: Dr Lyndon Ormond-Parker, Dr Daniel Featherstone, Coresearchers Stephanie Lynch and Dennis Charles, and PAW Media General Manager Jeff Bruer

ANALYSIS

GENERAL COMMENTS AND OBSERVATIONS

Across the ten Mapping the Digital Gap research sites, Access, Affordability and Digital Ability barriers intersect and compound to significantly impact digital inclusion. This section describes the specific factors impacting these three dimensions. It also outlines the role of news and media access, including First Nations services, and the impacts of digital inclusion on service delivery in First Nations communities.

Across all sites, digital inclusion levels vary according to age, gender, language spoken at home, level of education, and disability and employment status. The following graphs demonstrate how various demographic factors impact digital inclusion for rural and remote First Nations communities.

AGE

As Figure 28 shows, digital inclusion levels diminish with age. The scale of the digital gap is relatively consistent across age groups but greatest for the 45–54 year age group. The gap between young and old is particularly pronounced in terms of Access, with older participants recording scores well below the national average.

Figure 28: Average Digital Inclusion and Access scores for Mapping the Digital Gap survey participants by age groups, with the gap relative to the same age group in the National Average (non-First Nations), based on 2022 surveys

Age group	Gap	ADII Score	Access
18-34 years	-27	55.0	
	-40.2		37.0
35-44 years	-30.7	49.7	
	-41.8		35.7
45-54 years	-34.8	41.0	
	-42.9		31.9
55-64 years	-27.7	39.6	
	-39.7		30.4
65-74 years	-27.9	31.7	
	-45.3		21.0
75 +	-25.5	21.1	
	-40.8		13.1
Average	-24.2	48.0	
	-38.3		33.9

Legend: ■ ADII Score ■ Access
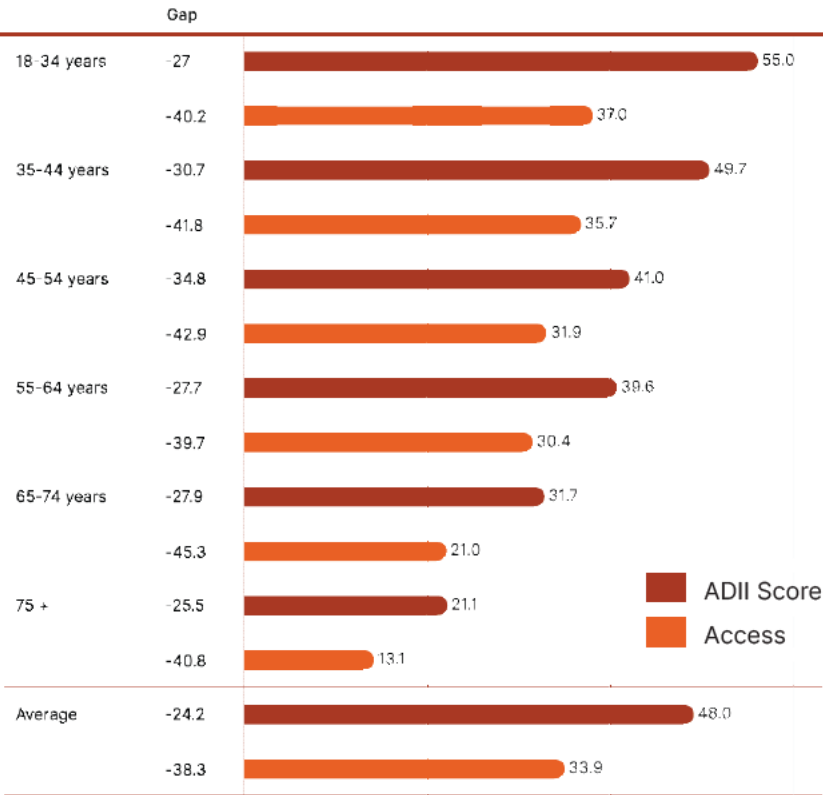
HOUSEHOLD SIZE

Figure 29 illustrates that larger households correlate with lower levels of digital inclusion. This points to issues of overcrowded housing, shared devices, and a lack of computers or other devices.

Figure 29: Digital inclusion average scores for all Mapping the Digital Gap participants according to household size, based on 2022 surveys

Gap

	Gap	Value
1 person	-49.1	44.3
2 people	14	59.4
3-5 people	-25.2	48.2
6-9 people	-25	48.4
10 people	-32.5	40.9
Average	-25.2	48.2
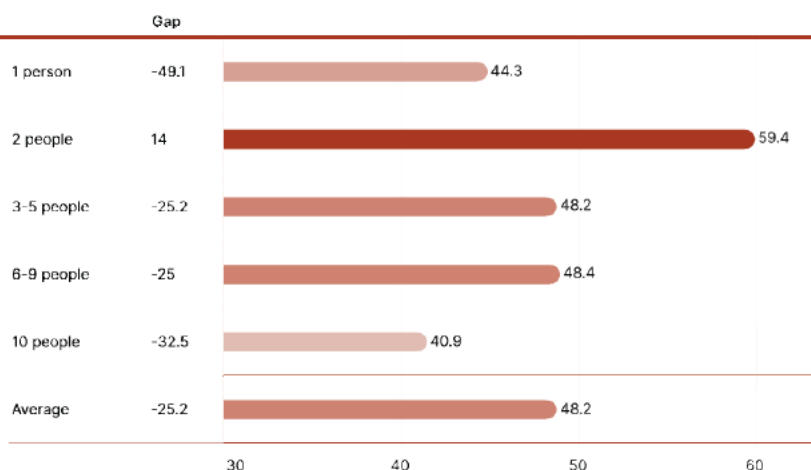
DISABILITY

Remote First Nations people living with disability could greatly benefit from effective digital connectivity. However, as seen in Figure 30, our surveys found a difference of 10.3 points in their digital inclusion scores compared with other remote First Nations respondents. This gap is highest in the Digital Ability dimension, reflecting the additional accessibility challenges in using digital technologies and online applications for remote First Nations people with disability. There is also an Access gap of 8.7 points, reflecting reduced access to the internet and digital devices.

Figure 30: Digital inclusion average and dimension scores for all Mapping the Digital Gap participants by (dis)ability status, based on 2022 surveys

- ADII Score
- Access
- Affordability
- Digital Ability

Gap

		Gap	Value
Average	ADII Score	-25.4	48.0
	Access	-38.2	33.9
	Affordability	-6.0	89.1
	Digital Ability	-19.3	45.7
Disability	ADII Score	-23.6	39.5
	Access	-36.6	26.8
	Affordability	-5.8	88.4
	Digital Ability	-16.3	32.1
No disability	ADII Score	-33.9	49.8
	Access	-45.3	35.5
	Affordability	-6.7	89.3
	Digital Ability	-32.9	48.7
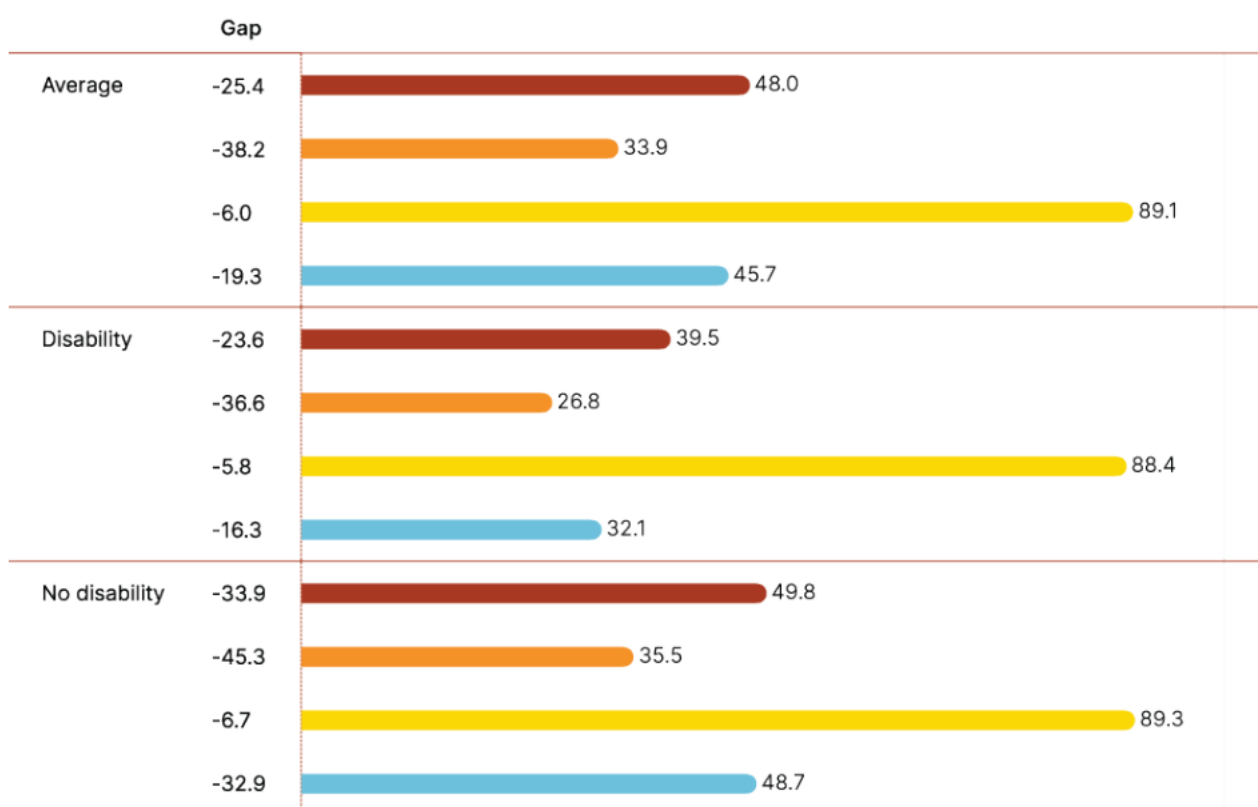
ACCESS

The average Access score across the ten research sites is 33.9, a significant 38.1 points below the national average (Figure 31). There is wide variation between sites, with the lowest Access scores in Gäṉgaṉ homeland (25.3) and the large communities of Galiwin'ku (26.6) and Wadeye (28.6) in the Northern Territory. The two sites with the highest Access scores, Wilcannia (42.3) and Djarindjin/Lombadina (42.1), are still nearly 30 points below national averages.

Figure 31: Access scores and gaps for Mapping the Digital Gap sites compared to ADII National Average (non-First Nations), based on 2022 surveys

		Gap	Score
Overall scores	National score (non-First Nations)		72.1
	First Nations (national average)	-8.2	64.0
	First Nations Mapping the Digital Gap sites	-38.1	33.9
Individual community scores	Djarindjin / Lombadina, WA	-29.9	42.2
	Erub, Torres Strait, Qld	-31.6	40.6
	Galiwin'ku, NT	-45.5	26.6
	Gängan, NT	-46.8	25.3
	Kalumburu, WA	-41.8	30.4
	Tennant Creek, NT	-42.9	29.2
	Wadeye, NT	-43.5	28.6
	Wilcannia, NSW	-29.9	42.3
	Wujal Wujal, Qld	-40.8	31.4
	Yuelamu, NT	-42.7	29.4
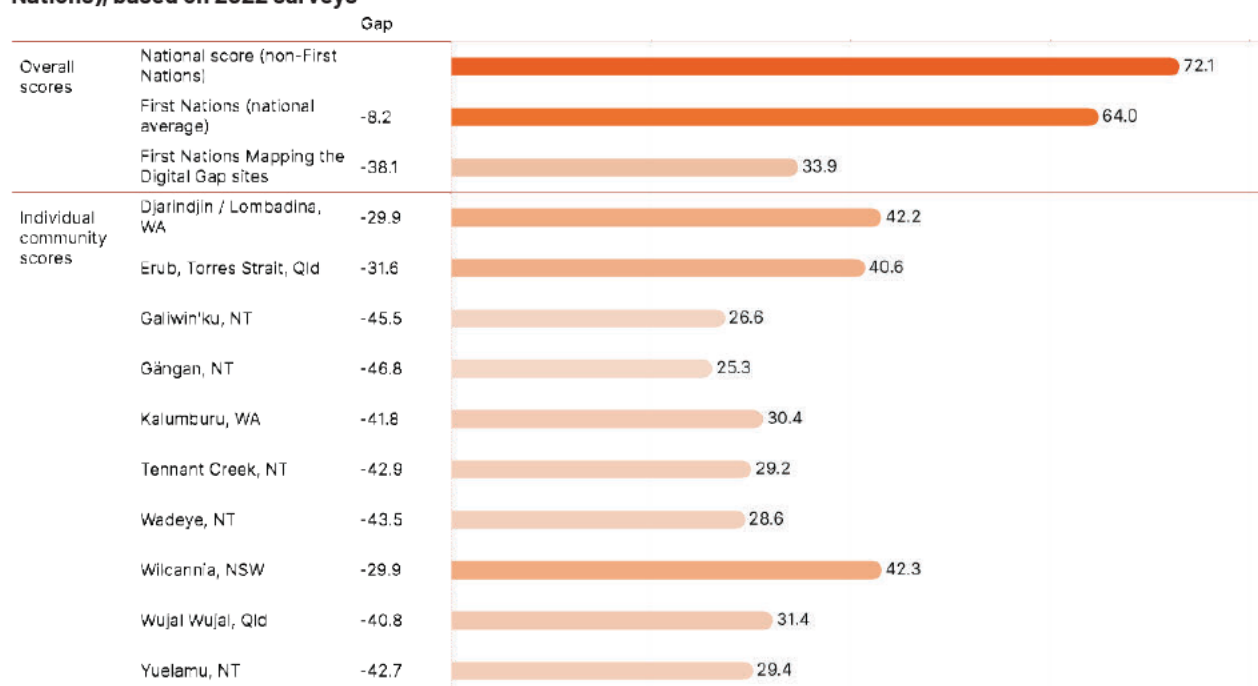
The Access measure in the ADII is based on personal internet use, including speed, data allowances, frequency of use, and connection type. A common impact on scores for all sites is the high use of pre-paid mobile, with 84% of respondents owning or sharing a mobile device, and 94% of these using pre-paid.

Limited backhaul infrastructure, particularly for small communities and homelands like Gäṉgaṉ and Yuelamu, contributes to low Access scores. While mobile coverage has increased substantially in the last decade due to a range of funding and co-investment programs,[18] services are not universally available or reliable.[19] An estimated 670 small communities and homelands, such as research sites Gäṉgaṉ and Yuelamu, still lack mobile access, with reliance on public phones and/or Wi-Fi in most sites.

Furthermore, in locations where mobile services are available, research participants report slow or unusable connections during peak use periods, patchy coverage, and unreliable service. With ever-increasing demand on mobile and broadband networks, and growing demand for online entertainment and gaming, congestion has become a major issue across remote and regional Australia. As Madeline Gallagher-Dann, CEO at Kalumburu Aboriginal Corporation, told us:

"When everyone [is] trying to get on the [mobile network it] crashes. [If] you wake up early enough, the kids will finally go to sleep and you might get it for a couple of hours, but other than that [it's] Kalumburu's only traffic jam."

In sites with mobile coverage, such as Galiwin'ku and Wadeye, Access scores are further impacted by factors such as reliance on a single connection type (mobile), and limited pre-paid data allowances. Similarly, the regional town of Tennant Creek, which has more reliable mobile services, has a lower score than sites with congestion and coverage issues, such as Djarindjin / Lombadina, Wilcannia and Erub. This indicates that low personal rates of phone ownership and internet use can play a more significant role on Access scores than the available infrastructure.

There is low household take-up of broadband services, with less than 15% using available broadband options. This is primarily due to a majority of residents in remote communities being on low and unreliable incomes. This creates a considerable barrier to signing up for and maintaining post-paid services, pushing respondents to rely on pre-paid mobile services.

Nevertheless, residents and service providers are increasingly reliant on having full-time access to effective communications, particularly in very remote locations without vehicle access to regional centres, and for communities isolated during wet season flooding or during emergency situations. Ongoing quality, reliable internet access is a critical need in remote communities.

In addition to service quality issues, resilience of mobile and broadband networks is a key issue. There have been regular media reports of extended outages in remote communities in recent years – sometimes up to two weeks without any service.[20] Outages have many causes – backhaul damage, transmission equipment failure, local power supply issues, extreme weather – and the services affected can vary accordingly.

Murrinhpatha Nimmipa Store in Wadeye

Nevertheless, there is significant impact in communities with people unable to use ATM or EFTPOS facilities, with related food security issues, community unrest, and inability for service providers to deliver services, access records or send reports. Tracey Leo, Corporate Services Manager at Thamarrurr Development Corporation, describes the social impacts of an 11-day internet and mobile outage in Wadeye in early 2022:

"People weren't able to access money from the shop [because] none of the ATMs were working, so cash around the community ran out very quickly. We saw [a] very quick escalation in people becoming frustrated and angry and hungry. [We had to] quickly set up a [system] for people to be able to get goods and services on credit."

Where there is no mobile coverage or ADSL, satellite communications is the only means of internet access. Under nbn zoning, the 3% of Australians living in remote Australia with no fixed line or fixed wireless option only have access to the Sky Muster satellite service. We found the highest Sky Muster take-up in communities without mobile coverage, such as Yuelamu where around a quarter of households had Sky Muster, as well as where coverage is limited, as in Erub, Wujal Wujal and Galiwin'ku.

However, there are well documented issues with speed, latency, download limits and cost of Sky Muster services.[21] As a result, since the phased introduction of the new Starlink low earth orbit (LEO) satellite service in 2022, there has been rapid uptake by agencies and staff who can afford the upfront equipment cost and high monthly rate ($139/month).

With limited connectivity options, and affordability barriers to internet access and use, 27.1% of participants reported connecting through public Wi-Fi services. The use of Wi-Fi services ranged from 3.4% in Wadeye to 81.5% of participants in Gängan homeland, where the free hotspot at Gängan Store is the only source of internet. However, such services are limited in terms of backhaul speeds, data limits, and available times. Community-wide Wi-Fi mesh networks can reduce Access and Affordability barriers, however require ongoing resources and maintenance (see our Wi-Fi case study).
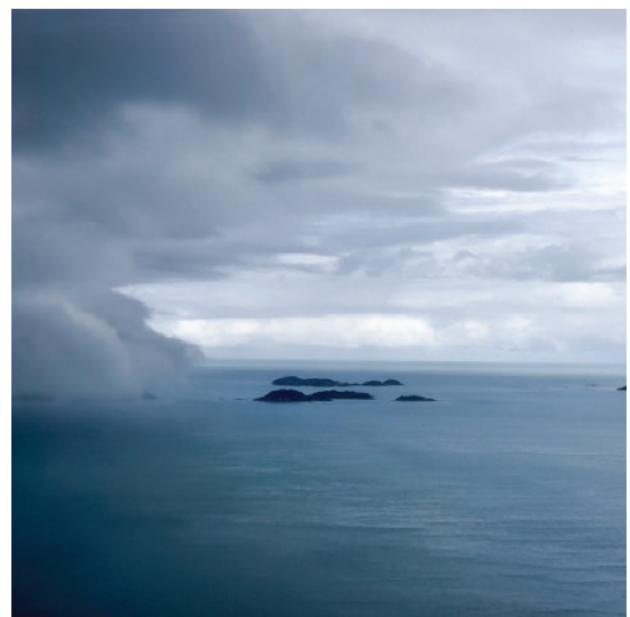
In remote communities with both First Nations and non-First Nations populations, there is a large relative gap in Access scores of 21.6 in remote and 23.5 in very remote Australia. While some staff housing has services included, the primary reason is higher incomes and income security for non-First Nations people, enabling access to post-paid services such as Sky Muster, ADSL and now Starlink, which offer faster and more reliable connectivity.

The relative gap within the same remoteness category points to a localised digital divide, and highlights the social and economic determinants of digital inclusion. These divides are primarily based on income, housing type and composition, and whether mobile is the only means of access. These point to the overlapping and compounding nature of social and digital inequalities that exist between First Nations people and other Australians.

With government services moving online by 2025,[22] access to the internet is increasingly being framed as a basic human right.[23] There is therefore an urgent need for the considerable Access disparities within and between remote First Nations communities to be rapidly addressed. With a 'patchwork quilt' of solutions in place,[24] there is a need for a coordinated approach to provide reliable services in small outstations and homelands, and to support communities who wish to install and control Wi-Fi mesh networks.

There is also a need for improved monitoring of mobile and broadband service quality and reliability in remote communities, including during northern Australia's wet season, as more providers enter the market with diverse technology solutions. Finally, communities must be consulted and involved in decision-making on the planning and installation of communication services, as well as removal of existing services (e.g. public phones, 3G). Improved awareness of options and local technical capability will build empowerment in this process.

Monsoonal rains in the Torres Strait

Residents using the public Wi-Fi hotspot at Gäṉgaṉ shop

THE IMPORTANCE OF WI-FI IN REMOTE FIRST NATIONS COMMUNITIES

With limited mobile access in many communities and affordability barriers to fixed home broadband for people on low incomes, public Wi-Fi is often a primary or supplementary means of internet access. Benefits of public Wi-Fi include affordable internet access (typically free or via pre-paid vouchers), access to critical online services when mobile credit is low, and use of Wi-Fi Calling or other apps for voice calls over a Wi-Fi connection.

In communities with a Centrelink agency, free 24/7 Wi-Fi access enables access to government apps and services, banking, job searches, community support and training.

Managed Wi-Fi networks provide the ability for community decision-making to restrict access times, block inappropriate sites, or allocate daily data limits for users. In some research sites, concerns were raised about the lack of local control over mobile services, including content filtering. This is particularly relevant for small homelands, where Traditional Owners want to extend the cultural governance over their homelands to communications services. Billy Gumana, Community Development Program Supervisor and Traditional Owner in Gäṉgaṉ homeland explained their key reason for restricting Wi-Fi hours:

> We like our kids to have better school[ing] instead of sitting down on Wi-Fi all the time. ... We don't want to see kids wake up all night. ... We want our community to live in peace, and to have respect [and] for the kids to learn the culture.

However, public Wi-Fi has some limitations, including short range (typically up to 200 metres), line of sight access and low penetration through metal structures and obstacles. To access Wi-Fi hotspots, residents often have to be outside in hot or wet conditions, with limited privacy. Congestion can also occur if multiple users are online at the same time. Some agencies and businesses have unlocked Wi-Fi access, however this can result in social issues when people congregate around a central hotspot, with some switched off after hours. Tennant Creek is setting up Wi-Fi in community living areas to reduce this issue.

Community-controlled Wi-Fi mesh networks can address some of the limitations of Wi-Fi hotspots. Mesh networks offer a resilient distributed network structure from a central broadband service that can be relatively cheaply deployed. By introducing redundancy into the system, mesh networks can address the congestion issues of a single Access Point.

Community Wi-Fi mesh networks are being increasingly rolled out in Western Australian communities. In Kalumburu, 128 dwellings have been fitted with a local Wi-Fi repeater and a VoIP[25] phone for affordable home internet and voice communications, networked from four Sky Muster satellite dishes on the community office. With free government and banking services, 1GB of free data per device per month, and additional data costing $2/GB, the network enables affordable community-wide connectivity. This system provides an effective model for aggregated data sharing and may provide a model for other communities with limited connectivity options.

AFFORDABILITY

Figure 32: Affordability scores and gaps for Mapping the Digital Gap sites in relation to ADII National Average (non-First Nations), based on 2022 surveys

		Gap	Score
Overall scores	National score (non-First Nations)		95.1
	First Nations (national average)	-6.1	89.0
	First Nations Mapping the Digital Gap sites	-6.0	89.1
Individual community scores	Djarindjin / Lombadina, WA	-16.5	78.6
	Erub, Torres Strait, Qld	-6.3	88.8
	Galiwin'ku, NT	0.7	95.8
	Gängan, NT	-2.9	92.2
	Kalumburu, WA	-3.5	91.6
	Tennant Creek, NT	-11.1	84.0
	Wadeye, NT	-2.1	93.0
	Wilcannia, NSW	-3.8	91.3
	Wujal Wujal, Qld	-0.6	94.5
	Yuelamu, NT	-2.0	93.1
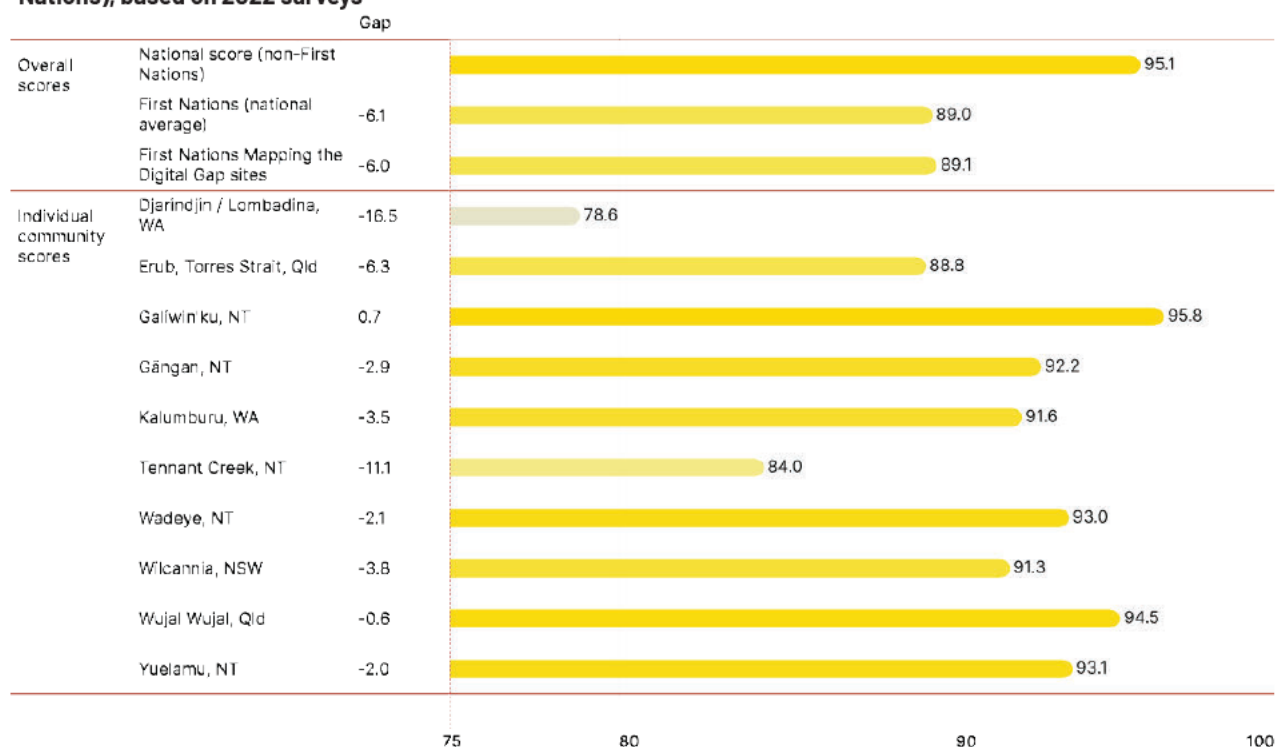
THE CHALLENGE OF MEASURING AFFORDABILITY IN REMOTE FIRST NATIONS COMMUNITIES

The average Affordability score across the Mapping the Digital Gap sites in 2022 was 89.1 – 6.0 points below the national average – with community scores ranging from 78.6 in Djarindjin and Lombadina to 95.8 in Galiwin'ku (Figure 32). However, because of the way Affordability is calculated in the ADII, these scores do not necessarily reflect the lived reality for people in these communities.

The Affordability dimension of the Index is calculated using the cost of a quality, reliable internet and mobile 'bundle' (a 50/10Mbps internet connection with unlimited downloads and 5G mobile) as a proportion of household income. However, this does not reflect the internet options available or usage profile in remote communities, where 90% of residents surveyed use pre-paid mobile subscriptions rather than shared household broadband. The best broadband service available to remote households in 2022 was nbn Sky Muster, with the best deals offering 25/5 Mbps peak speeds and 150 GB monthly data (these have since increased and Starlink is now available).

The Affordability score is also skewed by inflated household income due to a predominance of overcrowded households with multiple income earners, albeit on typically low personal incomes (ranging from an average of $161/week in Wadeye to $388/week in Djarindjin).[26] Thus, capturing the considerable Affordability challenges for remote First Nations communities requires an expanded analysis of survey data.

Across all sites, affordability barriers constrain internet access and the use of digital services. In particular, the cost of pre-paid data is a concern across all communities, with 93.6% of participants relying on pre-paid mobile access. Increasing demand for heavy data use services (such as streaming), especially by younger people, is exacerbating affordability issues, with nearly half of participants (49.1%) compromising on the speed or data allowance of their internet connection in order to afford it in the previous six months.

35.9% of participants 'sometimes' had to sacrifice or cut back on essential household costs (such as food or bills) to stay connected, with a further 15.2% 'often' or 'always' having to cut back – around three times the national rate. 18.6% of First Nations participants reported cost as a reason for limiting internet use, compared to 5.7% of other Australians. These results further illustrate the considerable affordability gaps between First Nations people and other Australians, particularly in remote communities.

Figure 33 below shows the average monthly household expenditure for each of the ten research sites across all connectivity types – pre- and post-paid mobile, fixed broadband, mobile broadband (e.g. 4G modems, USB dongles). Expenditure ranges from $116 in Kalumburu – possibly due to the Wi-Fi mesh network and limited mobile service – up to $237

in Galiwin'ku and $239 in Wadeye communities, despite congestion and patchy coverage in these sites. Residents in communities without mobile coverage – Gängan homeland and Yuelamu – still pay similar pre-paid mobile rates to those with coverage, to enable phone use when visiting neighbouring towns or communities, and Wi-Fi Calling. To contextualise these expenditure figures, 51% of remote residents surveyed pay more than 5% of monthly household income on communications, compared with 27% of other Australians.

Figure 33 also shows the relative expenditure on internet access by connectivity type, with an overall average 84% of expenditure for mobile phone services (pre- and post-paid), over four times the combined amount for fixed broadband (11%) and mobile broadband (5%). Yuelamu residents paid the highest proportion of expenditure on Sky Muster fixed broadband (21%) due to lack of mobile coverage. There is also relatively high expenditure on fixed broadband in Djarindjin (20%), Wujal Wujal (14%) and Wilcannia (13%). There is relatively low uptake of mobile broadband across sites, except in Wadeye (13%) and Wilcannia (9%), possibly for USB modems for content streaming on digital TVs.

Figure 33: Average monthly household expenditure on internet access across the ten research sites (left); in comparison with average expenditure ratio by connectivity type for each community (right), based on 2022 surveys

Legend:
- Total expenditure
- % of Expenditure – Mobile
- % of Expenditure – Fixed broadband
- % of Total Expenditure – Mobile broadband (e.g. 4G modems)

Site	Average monthly expenditure
Djarindjin / Lombadina, WA	$218
Erub, Torres Strait, Qld	$220
Galiwin'ku, NT	$237
Gängan, NT	$180
Kalumburu, WA	$116
Tennant Creek, NT	$179
Wadeye, NT	$239
Wilcannia, NSW	$195
Wujal Wujal, Qld	$146
Yuelamu, NT	$201
Total	$199
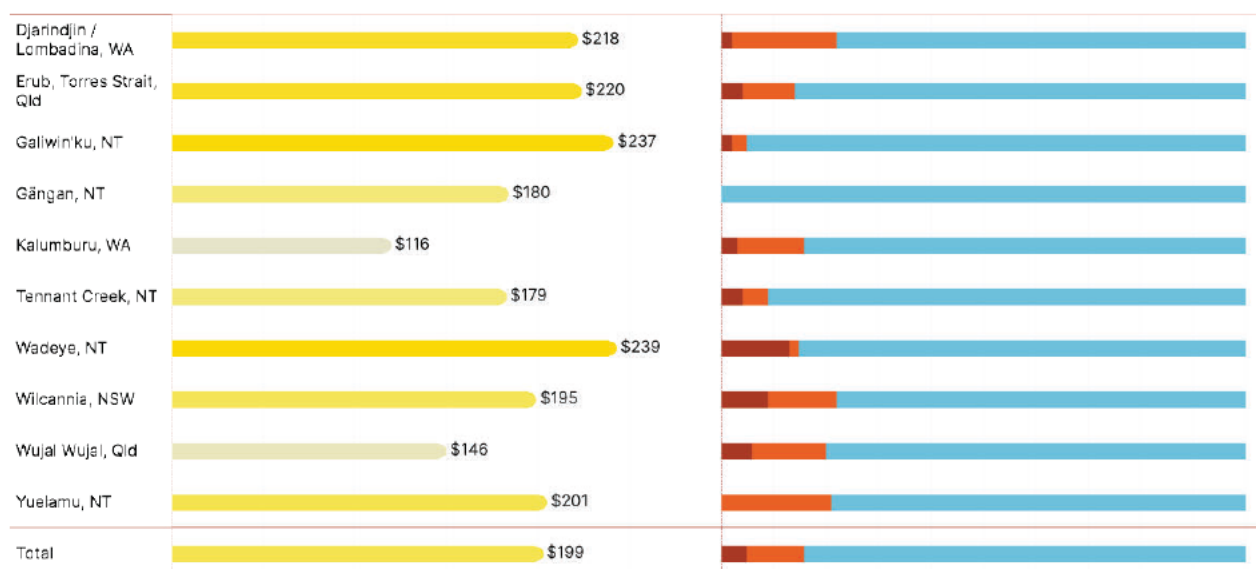
Affordability constraints often leave people without any form of internet connection, limiting access to essential services, including reporting to Centrelink. Jennifer McFarland from the Central Australian Youth Link Up Service in Alice Springs, described communications as a essential service for accessing education, health and welfare services:

> "In remote communities, [communications] should be a **service model, not a business model**. ... 50% of Aboriginal people in this region between 16 and 64 have no income [due to difficulties with] Centrelink [so they can't] afford to buy connectivity. When you've got to make a choice between getting mobile phone data, or a feed for your kids, it's a bit of a sad situation."

Likewise, a service provider in Wadeye conveyed the impact of affordability challenges on access to essential services, explaining that "clients [are] not able to ring us if they need assistance, because they can't afford the credit, or they have no phones." In some sites, such as Djarindjin, respondents experienced more acute affordability pressures because of the higher costs of household power.

Given services such as health, education and social services are increasingly delivered through automated digital services – and with a shift to entirely online government service delivery in Australia planned by 2025 – the ability to afford internet access is increasingly a requirement to secure basic economic, social and civic participation. In this context, there were calls from service providers and community organisations across the ten research sites for affordable pre-paid data and unmetered access to essential online services. These moves would begin to attend to the considerable affordability barriers facing those on low incomes, including those in remote First Nations communities.

In most communities, the cost of devices was another significant affordability issue, especially with rapid device turnover. There are many reasons for this high turnover. These include high use of mobile phones by children (partly due to lack of TV services) with regular damage, sharing or transfer of phones within families, a lack of availability of protective cases in stores, high wear and tear of any technology in remote communities, and damage during disputes. As a service provider in Wadeye explained:

> "Phones are quite expensive here. ... Because of the unrest, [people] don't keep their phones for a long time. [We often see people] going through domestic violence, their phones are being smashed by either their partners or another family member, and then they have to buy a new one. If someone is buying three to four phones throughout the year, that is a lot of money [that] they could spend on food."

A range of efforts are underway to address affordability at a local level. However, more support is needed. To improve basic online access and affordable use of online government and banking services, free connectivity options are offered in many sites through public Wi-Fi and hub facilities (see case study in Access section). However, with many Wi-Fi services limited to specific sites, located in central locations or only available during office hours, more general-use Wi-Fi located near residences will help address affordability and improve digital inclusion. Some sites such as Kalumburu have aggregated or shared broadband services to enable household access via Wi-Fi mesh networks, with low-cost pre-paid vouchers for data. A similar model by nbn will provide community-wide Wi-Fi to 40 discrete remote First Nations communities identified as digitally underserved.

Additionally, low incomes significantly constrain access, with most participants relying on pre-paid mobile. In light of these constraints, there need to be more affordable pre-paid options for remote First Nations people to access broadband where it is available, alongside subsidies for low-income households. A suite of basic services (such as government services and banking) should be freely available (i.e. their use should not count towards data caps). The high cost of regular device replacement could also be reduced through strategies such as the provision of refurbished phones, stocking of more robust devices, and protective cases being offered for sale with phones by community stores.

THE UBIQUITY OF PRE-PAID MOBILE IN REMOTE FIRST NATIONS COMMUNITIES

For many remote First Nations people, pre-paid mobile is the internet. Of the 86% of people using mobile phones as their primary mode of access to phone and internet, 90% were on pre-paid. This is primarily due to low and unreliable incomes making regular payment of post-paid services a challenge.

In 2022, pre-paid Telstra mobile options were primarily $20 (5GB data), $30 (10GB), $40 (20GB) and $50 (40GB), with 28 day limits on data use. While Optus has limited coverage in remote communities, Optus mobile pre-paid pricing options were similar, though with a range of data and time period options. More affordable pre-paid options such as Boost, which utilises the whole Telstra network, were not available in any communities visited.

The reliance on pre-paid mobile compounds affordability challenges as post-paid services – whether mobile or broadband – are typically cheaper per gigabyte than pre-paid. Pre-paid data costs about $3-4 per gigabyte for a $20 or $30 re-charge, while post-paid plans cost around $1-$1.50 per gigabyte for a $45-55 per month plan.[27] Fiona Jolley from the Yurrampi Child and Family Centre explained that:

> People don't have regular incomes, or their money's more uncertain, so they're caught into needing to use pre-paid, which is a safer way, but they get less access.

Our survey found only 14% of participants used post-paid ADSL or Sky Muster services, which provide cheaper data rates than individual pre-paid data. Many factors contribute to this, including the control that pre-paid offers in managing mobile costs and avoiding hard-to-pay bills, and the potential difficulty of satisfying the credit checks and provision of multiple forms of ID that may be required to sign up for a post-paid service. As Linda Turner, Chairperson at Julalikari Council Aboriginal Corporation explained:

> People have learnt their lessons over the years, including myself, of having plans and [getting] a big bill. ... Pre-paid's the way to go because you can only use what you've got.

The near ubiquity of pre-paid mobile as the primary or only means of internet access persists, despite recent changes to post-paid phone plans that reduce excess data costs (e.g. mobile providers reduce speeds instead of charging more for exceeding data caps). The ongoing affordability concerns in remote First Nations communities illustrate the need for more affordable pre-paid mobile services and options for pre-paid household broadband, along with improved awareness of new plan options and financial hardship support.

DIGITAL ABILITY

As digital devices and services become more embedded in daily routines, having the skills and literacies needed to navigate them effectively is crucial to ensuring fair, safe and equitable access to essential services and online opportunities. The ADII's Digital Ability dimension measures people's skill levels across six domains. These cover a broad spectrum of skills ranging from downloading and opening files and connecting to the internet to more advanced skills such as customising devices and connections and adjusting security settings, to the use of emerging technologies such as smart devices.

Digital Ability levels vary widely across the ten communities (see Figure 34). Some communities – such as Erub in the Torres Strait and Wilcannia in northwestern NSW – scored near or above the national average, while most other sites scored well below the national average. Wadeye in the NT, for example, recorded a Digital Ability score of 24.8 (40.1 points below the national average) and Gängan Homelands in Eastern Arnhem Land reported a score of 28.9 (36.0 points below the national average).

This wide disparity in Digital Ability shows the diversity of experience in remote First Nations communities and how access and affordability constraints impact on people's ability to gain, retain and upgrade the skills and knowledge required to effectively use digital technologies and services. Reece Tomey, the Principal of Bloomfield River State School in Wujal Wujal explained how a lack of access can constrain opportunities to develop Digital Ability:

"It's vital that our kids are digital learners and [are] competent with recent technology. [However our students are not] digitally literate up to the standard of other parts of Australia, not because the community doesn't want it, purely because they haven't had the opportunity to access it like other areas of Australia."

Tomey's quote highlights how efforts to improve digital ability in remote First Nations communities require a holistic approach to also address access and affordability barriers.

Figure 34: Digital Ability scores and gaps across the Mapping the Digital Gap sites, with the national First Nations and National Average (non-First Nations), based on 2022 surveys

		Gap	Score
Overall scores	National score (non-First Nations)		65.0
	First Nations (national average)	4.3	60.7
	First Nations Mapping the Digital Gap sites	-19.2	45.7
Individual community scores	Djarindjin / Lombadina, WA	-18.9	46.1
	Erub, Torres Strait, Qld	5.1	70.0
	Galiwin'ku, NT	-24.0	41.0
	Gängan, NT	-36.0	28.9
	Kalumburu, WA	-15.2	49.8
	Tennant Creek, NT	-12.4	52.6
	Wadeye, NT	-40.1	24.8
	Wilcannia, NSW	-1.1	63.9
	Wujal Wujal, Qld	-23.8	41.2
	Yuelamu, NT	-25.2	39.8

As well as variation across communities, there is also wide variation in Digital Ability within communities according to gender, language, age, disability and education. For example, respondents living with disability scored 16.1 points lower on Digital Ability than respondents without disability.

While most demographic factors reflect national trends, some are specific to remote First Nations communities, such as gender and language.

Figure 35: Digital ability scores by gender for each site, based on 2022 surveys
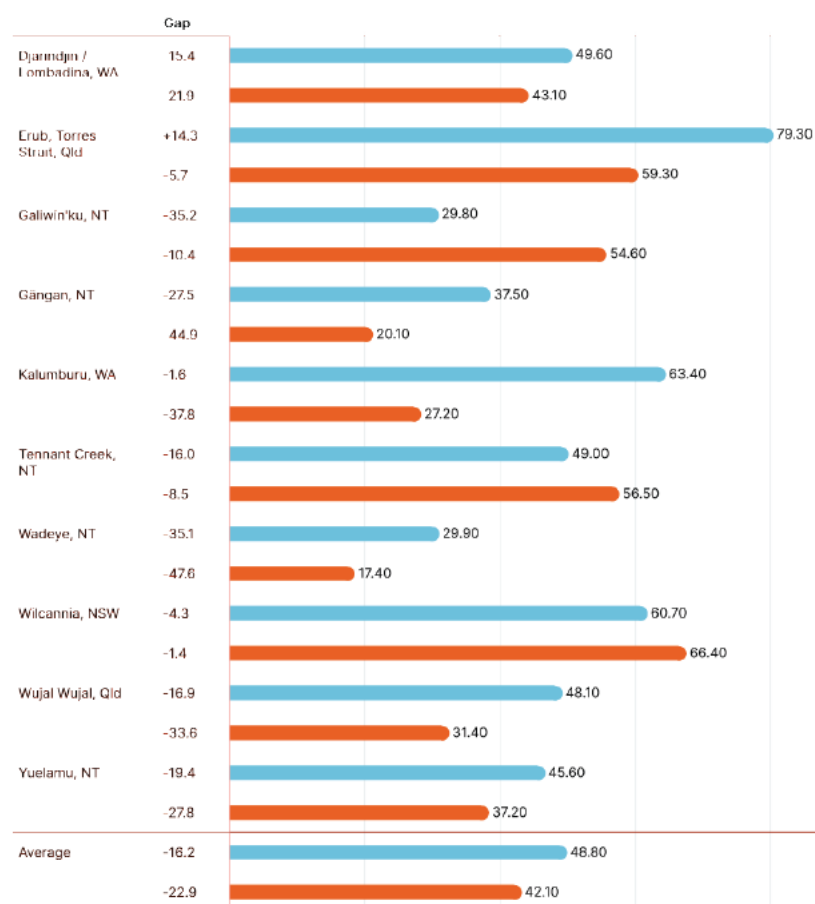
Note: Non-binary results have been excluded due to very low sample size

Site	Gap	Female	Gap	Male
Djarindjin / Lombadina, WA	15.4	49.60	21.9	43.10
Erub, Torres Strait, Qld	+14.3	79.30	-5.7	59.30
Galiwin'ku, NT	-35.2	29.80	-10.4	54.60
Gängan, NT	-27.5	37.50	44.9	20.10
Kalumburu, WA	-1.6	63.40	-37.8	27.20
Tennant Creek, NT	-16.0	49.00	-8.5	56.50
Wadeye, NT	-35.1	29.90	-47.6	17.40
Wilcannia, NSW	-4.3	60.70	-1.4	66.40
Wujal Wujal, Qld	-16.9	48.10	-33.6	31.40
Yuelamu, NT	-19.4	45.60	-27.8	37.20
Average	-16.2	48.80	-22.9	42.10

Legend: Female (blue), Male (orange)

LANGUAGE

Language spoken at home influences Index scores, with large gaps between those who speak a First Nations language at home and those who don't. This disparity is particularly evident in terms of Digital Ability, with a 17.1 point gap between those who speak a language other than English at home (42.0) and those who do not (59.1). The gap exists across all six skill domains, but is widest in basic operational skills (downloading and opening files, connecting to the internet, setting passwords) with a 22.6 point gap, and a 20.7 point gap in information navigation skills (searching and navigating, verifying trustworthy information, managing third party data collection).

Language also intersects with age to exacerbate digital exclusion, with older people without English as a first language facing considerable barriers to digital inclusion. As Jeff Bruer, General Manager at PAW Media in Yuendumu explained:

"People who've grown up without English as a first language, older people particularly, [face lots of obstacles] in logging on the internet, getting onto a bank account, getting onto government services online is just impossible!"

This illustrates the need to consider multilingual approaches to improving Digital Ability, particularly to support searching, navigating, and verifying information online. Use of local digital mentors and First Nations help desks could also help to reduce language barriers.

As seen at a national level, Digital Ability scores align closely with age. Scores drop from 61.3 for 18–34 year olds to a very low 16.7 for 65–74 year olds. Similarly, the Digital Ability gap between people with and without disability in First Nations communities is considerable, with the widest gaps in advanced operational skills (saving to the cloud, determining what is safe to download, customising devices and connections, and adjusting privacy settings) and basic operational skills (downloading and opening files, connecting to the internet, and

setting passwords). Disability likely intersects with age to compound digital exclusion.

These disparities illustrate the importance of taking an intersectional approach to improving digital inclusion and the need for further research on how factors such as age, disability, education, income, gender, and language, as well as access and affordability barriers, interact to limit Digital Ability. Given the need to adapt a range of skills and literacies to a changing set of technologies and applications, limited skills and literacies may compound inequalities over the long-term for groups already experiencing disadvantage.

TRAINING AND SUPPORT

In all sites, we heard demand for more training and support with mobile devices, online services and forms, online safety and more. Service providers reported regular requests for digital support, as Laura Crossfield from Wadeye Women's Safe House explains:

"We [help people] to activate Telstra SIM cards, [about] four a day. [People regularly ask for help] to 'set up my new phone', 'I need you to create an email for me' [or] 'the kids have turned on voice to text' and they can't now use their phones. [We help] because there's nowhere for them to go [for digital support]. [Most] services are having to support people in ways that [don't] really fall under their scope."

This places additional burden on busy staff, often at the expense of other tasks or waiting clients, as Remote Area Nurse Annalisa Denholm from Lombadina Clinic describes:

"We do offer [help but] we just don't have the time [to] sit down and show someone how to download an app and how to use it … I don't know if any services provide one on one time to teach people how to use digital."

With very low home computer ownership, IT access facilities are critical enabler for skills development, as described by Gän̲gan̲ traditional owner Billy Gumana:

"I would like to learn more about computer. But … we don't have an office to sit down and work. Without having a computer in this community [we can't learn]."

Where there is reliable access and skills development through peer learning in communities, there has been rapid adoption of digital technologies. This is seen in the high use of social media as a primary communications tool and online platforms for accessing media and entertainment. As Djarindjin resident and Centrelink officer Audrey Shadforth conveyed:

"[If you] want to know what's going on in the communities, just look on Facebook [or TikTok for] the younger ones. [If] you can't get in contact with that person [you just message them] on Facebook."

Additionally, where access is reliable and affordable, and skills are fostered, there is growing use of digital technologies for sharing language and cultural knowledge, land management, arts cataloguing and sales, media and music production. As Jennifer McFarland from CAYLUS/DotCom Mob in Alice Springs conveyed, where access and affordability barriers are lessened, many remote people have "become very savvy about using technologies in ways that suit them." These innovative uses of digital technologies point to their positive potential to support self-determination and social and economic development, further illustrating the need to foster digital inclusion in remote First Nations communities.

Digital Ability is a moving target – skills and literacies must keep pace with rapidly evolving technologies and their applications. Cybersafety, in particular, is a significant and growing issue in remote First Nations communities, with the growing use of digital technologies leading to new social problems, such as online bullying and stalking and the sharing of fight videos.[28] Haidee Dentith, Principal of Laynhapuy School, which services all Laynhapuy homelands in NT's East Arnhem Land, reflected on this changing technological landscape and how emerging technologies were creating and compounding social challenges:

"Every kid's got a device [now], everyone's listening to music, TikTok's a thing, Facebook. [Parents and teachers are] talking about cyber bullying and cyber safety. [It] wasn't on our radar [previously] because students didn't have their own devices."

The mixed state of Digital Ability across and within communities illustrates how digital technologies offer significant opportunities while posing new challenges for First Nations communities. Furthermore, trust in the digital world needs to be built amidst increasing scams and online safety concerns, through relevant support and targeted resources to help people be safe online. In this rapidly changing context, community-driven programs, supported by local digital mentors, can help remote First Nations people develop capacity to use technologies to pursue positive change in their lives and across the wider community.

THE POTENTIAL OF DIGITAL MENTORS IN REMOTE FIRST NATIONS COMMUNITIES

Digital skills development tends to be demand-driven, as people need to undertake a particular task such as accessing MyGov, doing online banking or completing an online form. Residents expressed a preference for one-on-one 'just in time' support with a local digital mentor rather than doing group skills workshops, or 'just in case' training.

Peer learning occurs within families, where young people with digital skills often help others to activate phones or use online services. Peer support is also provided informally by many First Nations staff in local agencies, such as Centrelink, health clinics and community offices, but is mostly outside of job roles. Accessing identification documents needed to set up online accounts is a particularly time-consuming task, often requiring multiple calls and the printing and signing of forms.

As services increasingly move online, the demand for support is increasing. Wilcannia resident Anthony Wiltshire explained the need for digital mentors to improve confidence and skills in digital technology use, especially among older people in the community:

> "[We need] someone on hand here in this community that can give the elderly people [and others] advice on how to use social media platforms, how to use the internet [and online services. Most] elder people would not have that knowledge."

Most digital inclusion plans include a suggestion of establishing a male and female digital mentor role to provide basic digital support and reduce demand on agency staff. Beyond providing just-in-time digital support to residents, a digital mentor could help promote awareness of scams and online safety, provide advice on apps, and help with local communications such as newsletters, funeral brochures or event posters.

Having dedicated digital mentor roles would reduce the burden of support from service providers and build capability through a culturally appropriate model of diffusion.

NEWS AND MEDIA SERVICES

As well as access to and use of digital and online technologies, the Mapping the Digital Gap project considers a wide range of news and media services accessed by remote households. Closing the Gap Outcome 17 aims for 'access to information and services enabling participation in informed decision-making regarding their own lives'. For those with limited broadband or mobile connectivity, channels such as radio, television, First Nations media, and local information channels provide a critical avenue for communications.

Our research found that the most common means of accessing news and information is via in-person communication (55%), followed by YouTube (38%), Facebook (31%) and commercial television (29%). First Nations television and radio services are an important source of news and information, with high levels of daily access via NITV (24.4%), ICTV (18.7%) and First Nations radio (23.5%). Other community channels also provide locally relevant information, including newsletters, noticeboards and PA announcements.

However, our research has found there is limited access to working Viewer Access Satellite Television (VAST)[29] in the majority of remote community households. This limits access to free-to-view services for entertainment, news and emergency information, adding a cost burden to access online content via pre-paid data (see case study below). Further, ABC radio is not available in many sites, with self-help retransmission sites ineligible for operational funding, limiting access to emergency information. This increases reliance on online platforms and social media for news and information, posing challenges for those without robust connectivity, and contributing to issues of mis- and disinformation.

Interviewees described how local Remote Indigenous Broadcasting Services (RIBS) and regional First Nations radio networks play a crucial role in providing trusted, locally relevant news and community updates, often in language. First Nations radio services were available in all ten research communities visited and were the only radio service in five of the sites.[30] Four sites had regular RIBS broadcasting from the local studio, but some RIBS were not operating during our visit due to staffing or technical issues. Demand for broadcasting remains strong, as does demand for support to produce and share local music, media, language and cultural content, and archive local media and cultural content.

First Nations radio had the highest listenership of available radio services (27.5% daily compared with 11.7% for ABC radio). The primary means of radio access was by car radio (72.9% average) with low rates of home radio listening (32.1%). Online radio streaming is increasing, with some users listening to live radio via an FM Radio app on Android phones.

Local First Nations radio services kept communities informed and connected during the COVID-19 pandemic, disseminating current community health information and countering misinformation. Tracey Leo, Corporate Services Managers at Thamarrurr Development Corporation outlined the important role of the Wadeye RIBS:

"[RIBS radio] distributes really important communications in language. We certainly saw that around the time of COVID and getting those messages out to people about hygiene [and] trying to stop people from moving around between regions."

Diverse media and communication channels continue to play an integral role in remote First Nations communities amidst a rapidly changing media environment. Despite changing media preferences to include online channels, there is an urgent and ongoing need for revitalisation of free access radio and TV services, and support for locally relevant media and communications channels in remote First Nations communities.

Community noticeboard in Wujal Wujal

LOW LEVELS OF TELEVISION ACCESS IN REMOTE COMMUNITIES

A recent housing survey in Galiwin'ku community found that nearly 90% of households were without television services, with that high rate verified by local agencies. In our survey, 69% of participants reported VAST TV not working at their house, with 58% of those due to the set-top box not working. While some satellite dishes were replaced following Cyclone Lam, 27% of those without VAST TV cited satellite dish or cabling damage, with community-wide calls for upgrades or return to local television broadcasting.

> *We need the TV satellite dishes fixed up or broadcast for Galiwin'ku. … We want access to news and information but have nothing. We can't afford to fix the TV so nobody has TV. TV was a good thing to give [the kids] something to do. (Survey comment, Galiwin'ku 2022)*

The lack of working television services was also a common issue in the other seven research sites reliant on VAST satellite services. Our survey found a wide variation in households without VAST services between sites, ranging from 17–19% in Djarindjin and Wujal Wujal to 48% in Yuelamu and Wadeye and 100% in Gäṉgaṉ homeland. With anecdotal reports from communities and peak agencies of failure rates between 50-80%, further research is needed to understand the full extent of this issue.

The replacement of local analogue TV broadcasting with VAST direct-to-home satellite delivery in remote Australia in 2013 left householders with the burden of ongoing equipment maintenance. In remote communities, the cost of technical support, which requires travel from regional centres, is prohibitive. Set-top boxes are prone to failure by power surges or smart card removal, and smart card activation is a significant obstacle. They are also expensive to replace (typically $450-$600 in local stores), as described by Kalumburu Aboriginal Corporation CEO Madeline Gallagher-Dann:

Rusted VAST satellite dish on house in Erub

> *The majority of the houses [don't have] TV working. The VAST box itself [costs] about $570 [which is] basically someone's fortnightly income.*

The lack of free-to-view television services has multiple impacts including increased costs to consumers to access media and entertainment online or via subscription services, increased congestion on mobile networks, and primary reliance on social media for news and information, with high incidences of mis- and disinformation.

For these reasons, a program to restore free-to-view television access in remote communities is needed, along with ongoing maintenance arrangements, with consideration of a return to digital TV broadcasting in medium to large communities. The suite of services should include First Nations services ICTV and NITV plus the return of local content broadcast capability where this is wanted.

SERVICE PROVISION

One measure of progress on Outcome 17 is the 'proportion of Aboriginal and Torres Strait Islander people using the internet to access government services'.[31] Digital inclusion is increasingly critical as government services – such as social security, health, taxation and payment of bills – transition to online delivery by 2025 under the Digital Government Strategy.[32] With banks, post offices, licensing and other face to face services being gradually removed from remote communities and towns, it is critical that First Nations people have reliable and affordable online access, requisite skills, and support when needed.

The Mapping the Digital Gap project has found that a high proportion of participants use online services such as Centrelink and MyGov (76% of regular users). However, we heard about numerous obstacles in setting up and using online services. These included frequently changing phone numbers, limited identification, lack of email addresses or street addresses and so on. As a result, there is currently high demand on local service providers to assist with online service use and identification needs. Tracey Leo from the Thamarrurr Development Corporation in Wadeye conveyed these challenges:

> "We find obstacles [in] trying to set up training and find jobs and [help people get] identification and tax file numbers. [It] falls back on service providers to try and assist with those things. [But when they're] under-resourced it becomes very difficult."

Centrelink has agencies in most communities, with Wi-Fi available and access to computers or phones.[33] However, Access issues can prevent the mandatory of income to Centrelink reporting using online services, leading to demerits and the cessation of payments. Furthermore, many online government services are not user friendly or optimised for mobile and are prone to dropout. Damien Tunmuck, Indigenous Language Officer at Centrelink in Wadeye explained that it can take an hour to get to the Centrelink service officer, as well as other issues that cut across access and affordability:

> "Some [people wait] on the mobile and just walk around with it [but if credit runs out they have to start again]. If somebody doesn't have phone credit, then they have to borrow from one of the families."

Currently, local providers play a key role in the provision of health and social services. The use of digital technologies and the internet to support or deliver these services rely on availability of reliable, high-speed, low-latency communication services. The Mapping the Digital Gap team undertakes interviews with services providers in each community to understand their use of communications services and technologies, obstacles in using online or cloud-based applications, and the experience of First Nations staff and clients.

Telehealth has been identified as a key way to overcome the shortage of health professionals and services in remote communities. However, videoconferencing with a health professional relies on a fast and reliable internet connection, as well as digital devices and basic digital skills. Limited internet access in many remote First Nations communities limits the availability and/or uptake of telehealth. Some clinics found voice calls or mobile apps like FaceTime to be easier and more reliable than videoconferencing software (e.g. Zoom or Teams). Depending on the health condition, limited access can pose risks for patients who are unable to receive appropriate and timely medical attention. Additionally, the high cost and limited availability of flights to metropolitan or regional hospitals compounds the health challenges faced by First Nations communities in remote Australia.

Videoconferencing is now seen by many as a normal part of work, service provision, and online learning post-COVID. However, platforms such as Zoom or Teams are not optimised for mobile, which is the dominant mode of access in remote communities. Because of unreliable internet and affordability constraints, the use of these platforms remains out of reach for many. This accentuates existing barriers to work, study, and healthcare, particularly when users lack consistent identification documents, email

addresses, street addresses, or phone numbers – factors which are commonly assumed during the design and delivery of digital platforms and services.

In sites with mobile coverage, service providers reported improved client communications but ongoing issues with poor or patchy services, changing mobile numbers, shared devices affecting privacy, and lack of credit. In sites without mobile coverage, communication with clients can be challenging due to a lack of home phones. NDIS agencies raised the need for reliable communications, with difficulty arranging client visits from regional centres compounding support challenges in sites without connectivity.

Reliability of communications creates an issue for service provision, with high reliance on online applications and cloud-based records systems. Health clinics reported issues with accessing cloud-based patient records systems during congestion periods, outages or rain, and having to return to paper-based records. With many agencies reliant on a single mode of communications, there is a need for redundancy options in times of outage. Emergency services require reliable communications and for redundancy to be built into the system. However, current delivery often has a high reliance on satellite systems, which can be unavailable during cyclones or weather events – times when reliable emergency communications mean the difference between life and death. Limited mobile coverage and unreliable connectivity mean there is still high usage of UHF radio systems for staff or vehicle communications by schools, health and community staff, with some use of VHF by rangers and emergency services for on-country and on-sea work.

In light of issues surrounding service provision through the use of digital technologies and the internet, there is a need for user-friendly and mobile-optimised government services, resilient and reliable communication networks, ongoing support to develop technical skills, and equitable access to essential services, including face-to-face options for those with limited skills or who face other barriers to access.

West Daly Regional Council Regional Service Centre in Wadeye

THE IMPACT OF COVID-19 RESTRICTIONS ON SERVICE DELIVERY

The COVID-19 pandemic in 2020 and 2021 highlighted the cross-cutting importance of all aspects of digital inclusion, especially in relation to the gap experienced by First Nations Peoples in remote communities. Digital inclusion impacted whether or not people had access to services, health, and schooling at a time when many First Nations communities closed their borders due to the increased vulnerability of First Nations people to COVID-19.

In combination with relatively low levels of digital inclusion, these border closures had a significant impact on the delivery of services such as Centrelink, as well as access to food. This was compounded by increased demand for connectivity in areas where networks were already insufficient to meet ordinary connectivity needs.

Wilcannia, one of the research sites, experienced a devastating COVID-19 outbreak which resulted in the closure of the only shop in the community selling fresh food[34] and people leaving their houses to get food faced significant fines.[35] Many remote First Nations communities experience overcrowded and poor-quality housing, compounding the risk of infection. In this context, communication, both for the provision of health information, and for communicating among community members, was crucial, with community radio playing a key role in Wilcannia during the outbreak.

The importance of news and media, alongside the traditional digital inclusion components of Access, Affordability and Digital Ability, was also highlighted throughout the pandemic, with vaccine hesitancy among First Nations communities being due – in part – to a lack of access to news services (particularly those created for and by community), leading to an overreliance on social media, which was rife with misinformation. In sites with local First Nations (RIBS) radio services, these were a primary channel of conveying locally specific information from trusted sources, in language where required. Some local radio stations, such as Wilcannia River Radio, also played a critical role in delivering school lessons and keeping families and communities connected during lockdown periods.

The COVID-19 crisis starkly revealed the impact of the digital gap on the lives of remote First Nations communities. It also revealed the ongoing importance of community-led communication channels for the provision of reliable and trusted information, particularly during times of crisis.

Community grocer in Wilcannia

REDI.E Site Manager Brendon Adams and broadcaster Maureen King on Wilcannia River Radio

POLICY IMPACT

The Mapping the Digital Gap research outcomes have provided baseline results on the scale and nature of the digital gap by remoteness for the first time, enabling tracking of progress towards the target date of 2026. The establishment of Closing the Gap Target 17 has resulted in specific policy focus on digital inclusion by federal, state and territory governments, as well as by industry and First Nations organisations and communities. Target 17 is a key enabler of other Closing the Gap targets, with improved remote communications infrastructure, services, and engagement critical for improvements in areas including health, education, employment and economic opportunity.

Dr Lyndon Ormond-Parker presenting alongside Minister Rowland at launch of First Nations Digital Inclusion Plan in Darwin

Photo courtesy of DITRDCA

The research team has also contributed to numerous policy and program reviews, including the development of the First Nations Digital Inclusion Plan released by National Indigenous Australians Agency in July 2023.[36] This Plan builds upon the ADII framework for digital inclusion and details existing activities and forward priorities to improve First Nations digital inclusion. The ADII and Mapping the Digital Gap projects aim to form part of this activity by providing timely data and supporting community-led strategies to guide policy and program initiatives to help close the digital gap.

This research is also informing policy development, with team members represented on the First Nations Digital Inclusion Advisory Group and Expert Panel established in early 2023 by Communications Minister Michelle Rowland MP. Along with Advisory Group

Chair Dot West, Deputy Chair (and Co-Investigator) Dr Lyndon Ormond-Parker has been involved in extensive government and industry engagement. Lead Investigator Dr Daniel Featherstone and Partner Investigator Lauren Ganley (Telstra) are on the Expert Panel and have contributed targeted initiatives. The group's initial report to Minister Rowland (August 2023) drew extensively on Mapping the Digital Gap project findings to identify key obstacles, priorities and strategies to progress Target 17.

One outcome of the First Nations Digital Inclusion Advisory Group's collaborative work with the Australian Government, building on Mapping the Digital Gap research, has been the establishment of a public facing map of communications and broadcast infrastructure and activities across Australia, compiling datasets from multiple sources in governments, industry and the community sector. This will enable, for the first time, a clear view of services available in each town, community and homeland, as well as infrastructure or service gaps. It is expected to be publicly available from October 2023.
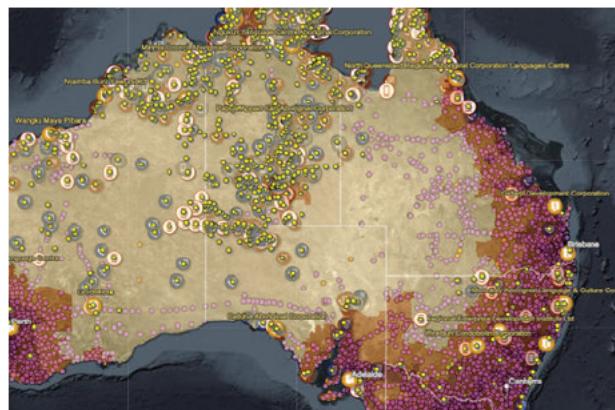
Screenshot of Australian Government public facing map of communications and broadcast infrastructure

The First Nations Digital Inclusion Plan outlines the need for improved mechanisms to collect national data on First Nations digital inclusion[37] and a proposed annual forum to bring together community organisations with government and industry stakeholders to share knowledge on appropriate solutions and strategies to address Closing the Gap Target 17. This forum would build upon the stakeholder network and discussions developed throughout this project and support policy and programs required to close the digital gap.

NEXT STEPS

The next rounds of Mapping the Digital Gap will be undertaken in 2023 and 2024, with updated community reports, annual summary reports and contribution to the Australian Digital Inclusion Index dashboard and reporting. A dedicated project website is underway to share research findings, community profiles, case studies, reports and publications, and links to relevant research. The team will continue to support participating communities to develop local Digital Inclusion Plans, with relevant resources provided on the website.

Beyond this initial four-year project, Telstra has committed to continue funding the Mapping the Digital Gap research for an additional three years. This will involve visiting new case study communities while continuing to engage with existing communities.

While the Mapping the Digital Gap research is providing digital inclusion data from remote communities for the first time, better measurement of digital inclusion levels for the 68% of First Nations people living in urban and regional Australia is also needed to enable tracking progress on Closing the Gap Target 17 for all First Nations people nationally.

A key recommendation of the First Nations Digital Inclusion Advisory Group's first report to Minister Rowland was for an expanded data collection project. To address this, the Australian Digital Inclusion Index team has developed a proposal for a regional and urban First Nations data collection project, building upon the Mapping the Digital Gap research and methodology.

Our research team will continue to share our findings in a range of conferences and forums, including with First Nations communities and peak agencies, governments, industry and the broader research community. We will also continue to contribute to public submissions and provide advice on policy and programs to address the identified obstacles to digital inclusion, with a focus on community-led strategies and capacity building. Further details of the project outcomes and impact to date are outlined in Appendix 1.

Through these initiatives, we hope to contribute to closing the digital gap and helping foster agency and self-determination across Australia's remote First Nations communities.

Phone box in Galiwin'ku

ENDNOTES

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Orientation signpost in Tennant Creek

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APPENDIX 1 – PROJECT OUTPUTS TO DATE

ADII 2023 REPORT AND DASHBOARD

Thomas, J, McCosker, A, Parkinson, S, Hegarty, K, Featherstone, D, Kennedy, J, Holcombe-James, I., and Ormond-Parker, L. *Measuring Australia's Digital Divide: Australian Digital Inclusion Index: 2023*. Melbourne: ARC Centre of Excellence for Automated Decision-Making and Society, RMIT University, Swinburne University of Technology, and Telstra, 2023. doi:10.25916/528s-ny91.

First Nations dashboard and case study on ADII Website 2023

COMMUNITY OUTCOMES REPORTS

Featherstone, D, Holcombe-James, I, and Ormond-Parker, L. *Mapping the Digital Gap: Wilcannia, NSW community outcomes report 2022*. Melbourne: ARC Centre of Excellence for Automated Decision-Making and Society, 2022. doi:10.25916/tkgz-bj76.

Featherstone, D, Holcombe-James, I, and Ormond-Parker, L, Hawkins, L. *Mapping the Digital Gap: Wujal Wujal, Queensland community outcomes report 2022*. Melbourne: ARC Centre of Excellence for Automated Decision-Making and Society, 2022. doi:10.25916/ah26-m948.

Featherstone, D, Holcombe-James, I, and Ormond-Parker, L, Hawkins, L. Mapping the Digital Gap: *Erub (Darnley Island), Zenadth Kes (Torres Strait), Queensland community outcomes report 2022*. Melbourne: ARC Centre of Excellence for Automated Decision-Making and Society, 2022. doi:10.25916/13hs-3h71.

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Featherstone, D, Ormond-Parker, L, Holcombe-James, I, Hawkins, L, Ganambarr, G, Ganambarr, D, Thomas, J and Kennedy, J. *Mapping the Digital Gap: Gängan, East Arnhem Land NT Community Outcomes report 2022*. Melbourne: ARC Centre of Excellence for Automated Decision-Making and Society, 2023. doi:10.25916/tqzj-wf36.

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WORKING PAPER

Featherstone, D, Thomas, J, Holcombe-James, I, Ormond-Parker, L, and Kennedy, J. *Mapping the Digital Gap Background paper: Project objectives, context and methods*. ADM+S Working Paper 005, 2022. doi:10.25916/fazn-eh86.

ARTICLES

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Featherstone, Daniel. "Dirt Tracks off the Superhighway: How COVID widened the digital gap for remote First Nations communities in Australia," in *Digital Inclusion*, eds. Simeon Yates and Elinor Carmi. Palgrave Macmillan, 2023.

POLICY SUBMISSIONS

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ACCC Regional Mobile Infrastructure Inquiry 2022 – in-person submission.

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Featherstone, D. "Mapping the Digital Gap coming to Erub." *Torres News*, 29 March 22.

REPRESENTATION

First Nations Digital Inclusion Advisory Group and Expert Panel: The FNDIAG was established by Communications Minister Michelle Rowland MP to provide First Nations leadership on Closing the Gap Target 17. Dr Lyndon Ormond-Parker is the Deputy Chair of the FNDIAG, with Dr Daniel Featherstone and Lauren Ganley (Telstra) are on the Expert Panel supporting the Advisory Group. (Website link: https://www.digitalinclusion.gov.au/)

Australian Communications Consumer Action Network (ACCAN): Dist. Prof. Julian Thomas is Chairperson; Dr Daniel Featherstone has been a member of the First Nations Steering Group since 2013. Daniel and Julian were on the ACCAN nbn Reference Group 2020-21.

Since 2021, Dr Daniel Featherstone has been a member of:

Data Development Reference Group, First Nations Media Australia/ Lowitja Institute 2021-22.

First Nations Digital Inclusion Advisory Group and Expert Panel (Expert Panel), 2023.

NIAA Indigenous Digital Inclusion Plan Stakeholder Working Group 2021-22.

NSW Closing the Gap Data Development Advisory Group, 2023.

Since 2022, Dr Lyndon Ormond-Parker has been a member of:

First Nations Digital Inclusion Advisory Group (Deputy Chair), 2023.

Indigenous Connections Committee, National Film and Sound Archive (Chair) 2022.

Low Earth Orbit Satellite Working Group (Member) 2023.

National Broadband Network (nbn) Low-Income & Digital Inclusion Forum (Member) 2023.

FORUMS AND PRESENTATIONS

Stakeholder Updates

Four virtual Mapping the Digital Gap stakeholder updates to date 2021-23.

Conferences

Presented at over 20 national and international conferences and forums, including:

Government and industry conferences: ACMA RadComms 2022, ACCC/ AER Regulatory Conference 2023, State Library of Queensland conference 2023.

Academic: ADII 2023 Report Launch; ADM+S News and Media Symposium 2021, 2023; Digital Inclusion for Low Income Families Symposium 2022; Digital Inequalities and ADM Workshop 2022; Understanding Inclusion and Exclusion: Perspectives on ADM in Australian Society, 2022; Digital Inclusion Policy and Research Conference 2021

First Nations forums: Indigenous Digital Leadership Forum 2021, 2022; CONVERGE 2021

Other: Digital Health for the Bush Network Forums 2021-23; Automation, Wellbeing and Harms in a COVID Age, 2022; Australian Digital Inclusion Alliance forum 2022; Community Network Exchange Asia Pacific conference 2021; Humanitech Network 2021.

The team have also delivered numerous presentations to federal and state government agencies, peak bodies, community organisations, land councils and service providers.

ONLINE PRESENCE

Websites

Project website: http://mappingthedigitalgap.com.au

ADII website: https://www.digitalinclusionindex.org.au

First Nations ADII Dashboard: https://www.digitalinclusionindex.org.au/dashboard/firstnations.aspx

Social media

LinkedIn: https://www.linkedin.com/showcase/mapping-the-digital-gap

Facebook: https://www.facebook.com/MappingTheDigitalGap

APPENDIX 2 – NEWS COVERAGE

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Research team meeting with TSIMA team

Left to right: TSIRC Councillor Jimmy Gela, Dr Lyndon Ormond-Parker, Co-researcher Lala Gutchen, TSIMA senior broadcaster Jenni Enosa, Co-researcher Nixon Mye, Dr Indigo Holcombe-James, and Dr Daniel Featherstone

Sarah Ougham doing a survey with co-researcher Audrey Shadforth in the Djarindjin Centrelink office

Dr Indigo Holcombe-James doing a survey with My Pathway CDP Supervisor Kapua Gutchen

Lyndon Ormond-Parker and co-researcher Leanne Kelly (right) doing survey with resident Martha Djanghara (left)

Research team at Elcho Island Arts: James Bayung, Dr Lyndon Ormond-Parker, Yuŋgirrŋa Bukulatjpi, Megan Yunupingu (arts worker), Polly Holt (Art Centre Manager) and Mitchell Garawirrtja

Dr Daniel Featherstone doing a survey with Taminya Councillor in Djarindjin

Dr Daniel Featherstone with the staff of the Kalumburu Community Resource Centre: Maggi Captain, Matilda Oxtoby and Marinda French

MAPPING THE DIGITAL GAP

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