Measuring Australia's Digital Divide.

Australian Digital Inclusion Index 2023

Acknowledgements

Citation

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

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Note

This is a summary report. Further details, including methods, definitions of key terms, and Index data, are available at www.digitalinclusionindex.org.au

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What is digital inclusion?

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 services: to manage their health, access education, find work, participate in cultural activities, organise their finances, follow news and media, and connect with family, friends and the wider world.

What is the Australian Digital Inclusion Index?

The Australian Digital Inclusion Index (ADII or "Index") uses survey data to measure digital inclusion across three dimensions of Access, Affordability and Digital Ability. We explore how these dimensions vary across the country, across different social groups, and over time.

Why is the Index important?

A detailed measure of digital inclusion for Australia allows us to identify critical barriers to inclusion. These may be related to accessing networks, the costs of devices or data, or skills and literacies. Through these measures, the Index can inform initiatives to increase digital inclusion in Australia.

Simon Butler, Warakurna community WA

Welcome to the 2023
Australian Digital Inclusion Index

The COVID-19 pandemic accelerated digital transformation across many aspects of our lives, including work, education and healthcare. Now, more than ever, the ability to access, afford and effectively use digital services is not a luxury — it is a requirement for full participation in contemporary social, economic and civic life.

The 2023 ADII continues our longstanding reporting of digital inclusion through the measures of Access, Affordability, and Digital Ability. Building on previous iterations of the Index, the 2023 ADII offers insight into the distribution of digital inclusion for different groups and areas of Australia over time, allowing us to pinpoint which indicators have improved, where, and for whom. From here, more tailored policies and programs can inform responses to help those experiencing digital inequalities and ensure gains from previous years are maintained. Since our 2021 report, research has offered increasing evidence that digital inequalities are both sequential and compounded, meaning the three dimensions of digital inclusion must be understood and addressed together.[1]

The 2023 report is based on data from the Australian Internet Usage Survey collected between June and December 2022.[i] This round of data collection saw a larger sample than 2020 and 2021, with a total of 5,132 respondents. Additional samples for Northern Territory, Tasmania, Queensland and remote First Nations

communities offer greater insight into the distribution of digital inclusion across these states, territories, and communities. This allows a deeper understanding of the barriers to Access, Affordability, and Digital Ability and what needs to be done to better respond to persistent digital inequalities, particularly among remote Aboriginal and Torres Strait Islander communities. This report refers to the Aboriginal and Torres Strait Islander peoples of Australia as First Nations Peoples.

First Nations digital inclusion is a crucial issue, recognised as an outcome and target in the Closing the Gap framework. Outcome 17 of this framework is that:

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

Target 17 tracks this outcome:

'By 2026, Aboriginal and Torres Strait Islander people have equal levels of digital inclusion'.[2]

However, until this year's ADII there was insufficient data collection to adequately map progress against this outcome.

Recognising that measuring digital inclusion within and across First Nations communities requires engagement with communities themselves, their organisations, and leaders, the Mapping the Digital Gap project, also in partnership with Telstra and conducted by the ARC Centre of Excellence for Automated Decision-Making and Society, aims to make a significant contribution to the evidence base in this area.[3] Over a four-year period (2022-2024), the project team is working with ten remote communities to track changes in digital inclusion over three years of data collection, and inform the development of local digital inclusion strategies and programs.

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i   Local government area scores in this report are based on Small Area Estimates modelling. State scores are based on aggregated Small Area Estimates modelling. All other scores are calculated as weighted averages. For more detail on these methods and why they are used, please see the SRC Technical Report available for download at www.digitalinclusionindex.org.au/download-reports

Key findings

73.2
ADII score

Digital inclusion at the national level continues to steadily improve. Recent years have seen an increase in Australia's average Index score from 67.5 (2020), to 71.1 (2021), to 73.2 (2023).

7.5
First Nations digital gap

There is a considerable digital gap between First Nations and non-First Nations people in Australia. The digital gap in 2023 is 7.5. The gap is particularly pronounced between First Nations and non-First Nations people living in remote (21.6 points) and very remote (23.5 points) locations, although it exists across most areas regardless of remoteness. Access is a critical issue in remote First Nations communities.

9.4%
Highly excluded

The number of Australians who are highly excluded has declined but remains substantial. 9.4% of the Australian population is highly excluded, registering an Index score of 45 or below. This is down from 10.6% in 2021. However, some groups — particularly people over 75 years of age and those who did not complete secondary school — continue to experience higher levels of digital exclusion.

72.0
Access score

Access scores are increasing at the national level, but these improvements are not evenly shared. While the national Access score has increased from 70.0 in 2021 to 72.0 in 2023, several groups remain well below the national average. These include First Nations Peoples living in remote and very remote communities (over 37 point gap), people over 75 years of age (18.0 point gap), and those in the lowest income quintile (14.7 point gap).

5.0
Capital city gap

The persistent divide between capital cities and other parts of the country continues to narrow. However the Digital Ability gap, in particular, remains considerable. Areas outside capital cities recorded a 2023 Index score of 69.8. This is 3.4 points less than the national average, and 5.0 points less than capital cities. The Affordability gap between capital cities and other parts of the country remains narrow (0.4 points), however the Digital Ability gap remains considerable, and has increased from 7.0 to 7.7 points.

95.0
Affordability score

Affordability has improved at a national level since 2021, however some groups experience much greater levels of affordability stress. The Affordability score has improved nationally, from 93.1 to 95.0. However, substantial numbers of Australians continue to experience affordability stress, meaning they would need to pay more than 5% of household income to maintain quality, reliable connectivity. These include people with disability (55.1%, down from 72.0%), people living in public housing (64.1%, down from 80.2%), people over the age of 75 (65.2%, down from 80.7%), and people who are currently unemployed (69.4%, up from 62.0%).

Key findings

continued

64.9
Digital Ability score

Digital Ability has improved nationally, although not for everyone. The national Digital Ability score has increased slightly from 64.4 points in 2021 to 64.9 in 2023, and people with high levels of digital inclusion are seeing steady gains in their Digital Ability levels. However, those with lower scores are not experiencing such gains, with some groups seeing declines in Digital Ability scores over the past three years, including people in the lowest income quintile (43.5; down 2.2 points) and Australians aged over 75 (23.3; down 3.9 points).

48.5
Age 75+

Digital inclusion remains closely linked to age. The gap between younger and older Australians has grown slightly, especially for Digital Ability. Despite gains in overall scores between 2021 and 2023, people aged over 65 maintain lower scores than the national average. Those aged 65-74 record scores 12.1 points below the national average, while those over 75 record scores 24.6 points below. For people over the age of 75, disparities in Digital Ability (41.6 points below the national average) and Access (18.0 points below the national average) are considerable.

28.8
Income gap

Digital inclusion increases with education, employment, and income. Australians with a bachelor's degree or higher recorded an Index score of 79.9, 23.6 points higher than those who did not complete secondary school (56.3). Employed Australians registered an Index score of 79.5, 12.7 points higher than those presently unemployed (66.8). In 2023, there was a gap of 28.8 points between people in the lowest and highest 20 percent of household income. This gap has increased over the past three years — jumping from 25.3 in 2020, to 26.5 in 2021, to 28.8 points.

80.2
Couples with children

The composition of the household matters. Households with children continue to have higher total Index scores. Couples with children are the most digitally included household type, recording an Index score of 80.2 (7.0 points above the national score). Australians who live alone are comparatively much less digitally included, registering an Index score of 64.0. This is 16.2 points lower than couples with children, and 9.2 points below the average national score.

61.6
People living in public housing

Housing tenure matters. People living in public housing recorded an Index score of 11.6 points lower than the national average, with digital inclusion scores among this group growing more slowly than the rest of the population.

10.5%
Mobile-only users

The number of mobile-only users has slightly increased, from 9.6% in 2021 to 10.5% in 2023. In general, mobile-only use is associated with lower levels of digital inclusion. Some groups, including people in very remote areas (32.6%), First Nations people (21.3%), and those on the lowest incomes (20.7%) continue to be overrepresented in their reliance on mobile-only access.

Digital inclusion:
the Australian context in 2023

What does digital inclusion look like across Australia in 2023?

The national Index score in 2023 is 73.2, up 2.1 points from the 2021 score of 71.1. This increase appears across all Australian states. The past year has seen a narrowing in differences between states and territories, with all states and territories recording overall scores between 69 and 78. The Northern Territory records the lowest score (69) and the Australian Capital Territory continues to record the highest (78). However, there remains significant variation within states, territories and communities, and a continuing divide between capital cities and the rest of the country.

Nationally, there is a 7.5 point gap in digital inclusion between First Nations and non-First Nations people. In remote and very remote parts of Australia, the digital gap widens. Remote First Nations Peoples have digital inclusion scores 21.6 points lower than non-First Nations Peoples in the same areas, and in very remote areas, this gap widens to 23.5 points. These disparities are particularly notable in terms of Access scores. We are only beginning to map the substantial differences in digital inclusion across First Nations communities and cultural contexts.

The divide between capital cities and the rest of Australia persists but is narrowing. In 2023, metropolitan areas recorded an average Index score of 74.8, compared to the Index score in non-metropolitan areas of 69.8. The capital city gap has narrowed to 5.0 (from 5.5 in 2021), with progress particularly pronounced in the Access dimension.

However, the divide in Digital Ability between capital cities and the rest of Australia remains considerable, increasing from 7.0 to 7.7 points. This reflects a different socioeconomic and demographic profile between cities and the rest of Australia, with a generally older population in non-metropolitan areas.

Within cities and towns, housing tenure and composition matters for digital inclusion. Private renters have the highest average Index score of all housing tenure types. However, this may be because young adults are more likely than older adults to rent,[4] and Digital Ability and Access scores correlate strongly with age, with young Australians generally receiving higher scores. People living in public housing recorded an Index score 11.6 points lower than the national average, with digital inclusion scores among this group growing slower than the rest of the population. These inequalities are particularly marked for Digital Ability and Access scores, which have fallen over the past two years for this group.

There is growing evidence of the complex relationship between housing and digital inclusion, with certain construction materials (such as concrete), housing types (high-rise blocks), and hazardous materials used in older buildings complicating the installation and maintenance of the telecommunications infrastructure necessary to establish a quality, reliable internet connection.[5] Responding to these issues will require multiple sectors working collaboratively to ensure digital inclusion is not contingent on housing type, tenure, or composition.

Digital inclusion varies both across and within states and territories, with capital cities recording higher scores

All Australian states and territories record overall Index scores between 69 and 78, with the Northern Territory recording a score of 69 and the Australian Capital Territory receiving a score of 78.

Across all states and territories, there is a gap between the capital city and the rest of the state or territory. The Northern Territory is the state or territory with the largest capital city gap (8.3). Access, in particular, is an issue in Northern Territory areas outside Darwin, with a 12.8 point gap between Darwin and the rest of the territory.

Within states and territories, digital inclusion declines with remoteness, illustrating a persistent capital city gap. States and territories with large areas classed as remote and very remote, and those with smaller capital cities, such as the Northern Territory and South Australia, record lower scores than more populous states or states with larger capital cities, such as New South Wales and Victoria. Higher scoring Local Government Areas (LGAs) tend to be located in inner-city metropolitan areas, with the highest scoring LGAs being the City of Melbourne (80.0), the City of Yarra (79.7), both located in Victoria, and the City of Sydney (79.5), in New South Wales. The lowest scoring LGAs are located in remote parts of the country, such as Belyuen Community (50.4) and East Arnhem Regional Council (52.8) in the Northern Territory, and Aurukun Shire in Far North Queensland (52.1). This disparity reflects the vastly different demographics and geographies that exist across Australia, as well as different levels of investment in telecommunications infrastructure and opportunities for digital support and learning.

Figure 1: 2023 National ADII scores

Above National average
Below National average

National average
73.2 Index score
72.0 Access
95.0 Affordability
64.9 Digital Ability

NT
69 Index score
64 Access
94 Affordability
63 Digital Ability

QLD
73 Index score
72 Access
95 Affordability
65 Digital Ability

WA
73 Index score
72 Access
95 Affordability
65 Digital Ability

SA
72 Index score
70 Access
95 Affordability
62 Digital Ability

ACT
78 Index score
75 Access
96 Affordability
71 Digital Ability

NSW
73 Index score
72 Access
95 Affordability
65 Digital Ability

Capital city avg
74.8 Index score
73.3 Access
95.2 Affordability
67.4 Digital Ability

VIC
74 Index score
73 Access
95 Affordability
66 Digital Ability

Rest of Australia avg
69.8 Index score
69.3 Access
94.4 Affordability
59.7 Digital Ability

TAS
70 Index score
69 Access
95 Affordability
61 Digital Ability

Digital inclusion declines with remoteness, with particularly strong declines in Access and Digital Ability

For the first time, we can measure digital inclusion across five levels of remoteness.[ii] Table 1 reveals the continuing divide in outcomes between major cities and the rest of Australia. However, there are also variations in scores according to level of remoteness. In 2023, major cities recorded an average Index score of 74.6 (1.4 points above the national average). Areas designated as inner regional sit 1.9 points below the national average (71.3), whereas outer regional areas sit 6.9 points below the average (66.3) — lower than remote (70.0) areas. One reason for this may be that these areas tend to have an older and more economically disadvantaged population — two key indicators for lower levels of digital inclusion.[6]

Table 1: 2023 ADII scores and dimensions by remoteness level

Remoteness	Index score	Access score	Affordability score	Digital Ability score
Major cities	74.6	73.3	95.2	66.9
Inner regional	71.3	70.4	94.6	62.0
Outer regional	66.3	66.5	93.5	54.6
Remote	70.0	67.0	95.3	61.3
Very remote	62.6	55.1	93.8	56.6
National average	**73.2**	**72.0**	**95.0**	**64.9**

The capital city gap is particularly acute in terms of Access and Digital Ability. The Access score for people in very remote areas is 16.9 points below the national average. Very remote areas often lack the infrastructure and services required to achieve a quality and reliable connection — until recently, the only means of access has often been through a single telecommunications provider or NBN's Sky Muster satellite service.[7] Furthermore, there are well documented problems with the access, speed, cost, and maintenance of satellite services, as well as limited competition and patchy mobile services, meaning people in regional, rural, and remote areas often pay more than those in metropolitan areas.[8] This has a particularly negative impact on people on lower incomes, many of whom rely on more expensive pre-paid services. Since the 2022 data collection, new developments may address these inequalities,

including the increased roll-out of low earth orbit satellites. Impacts of these initiatives are likely to be apparent in future ADII reports.

People in very remote areas are also more likely to have mobile-only internet access, which, as Case Study 1 describes, hinders their ability to effectively access digital education, work, healthcare and some government services. In 2023, 32.6% of people in very remote areas have only mobile access, compared with 10.5% nationally. The negative impact of mobile-only access on digital inclusion is illustrated by mobile-only users recording an overall score 16.2 points below the national average, with significant disparities in Access (26.8 points below the national average) and Digital Ability (11.9 points below the national average) dimensions. Mobile-only access also impacts Affordability, with mobile data often significantly more expensive per gigabyte than fixed broadband.

ii In the 2022 ADII collection, the Australian Statistical Geography Standard (ASGS) Remoteness Structure developed by the Centre for Housing at the University of Adelaide and the ABS was matched to survey respondent postcodes. The Remoteness Structure enables a more nuanced geographical measure to supplement our previous State and Rest of State classification. The Remoteness Structure is divided into five broad areas indicating relative access to services and amenities: Major Cities, Inner Regional, Outer Regional, Remote and Very Remote. For more information, see https://www.abs.gov.au/statistics/standards/australian-statistical-geography-standard-asgs-edition-3/jul2021-jun2026/remoteness-structure

This is particularly pronounced in remote First Nations communities, where the vast majority of people are mobile-only users. In these communities, affordability is a major issue — over half (51.1%) of people surveyed as part of the Mapping the Digital Gap project 'sometimes', 'often' or 'always' have to sacrifice other essentials (such as food or bills) to afford internet costs. While the Mapping the Digital Gap project provided a deliberate oversampling of very remote First Nations respondents, the weighted population results indicate that overall scores decline with remoteness.

The variation of scores across and within Australian states and territories illustrates the complex mix of factors that continue to constrain digital inclusion, including access to infrastructure, a capacity to pay, the quality and regular availability of devices and services, confidence and motivation, and digital abilities and skills. Efforts to alleviate these compounding and sequential barriers must be grounded in the actual experiences and circumstances of people in regional and remote Australia and disadvantaged groups in metropolitan centres.

The number of highly excluded Australians has declined but remains substantial

The number of highly excluded Australians (those with an Index score of 45 or below) has decreased from 10.6% in 2021 to 9.4% in 2023. The number of excluded Australians (those with an Index score above 45 and below 61) also decreased from 16.6% in 2021 to 14.2% in 2023.

Taken together, the number of excluded and highly excluded Australians in 2023 is substantial, totalling 23.6% of the national population. While the percentage of highly excluded and excluded Australians continues to decline, almost a quarter of Australians still lack the required resources to participate fully in economic, social, and civic life, presenting and compounding barriers to education, work, and vital services.

Highly excluded Australians are more likely to have a disability (24.5% highly excluded), live in public housing (28.2% highly excluded), have not completed secondary school (32.5% highly excluded), or be over 75 years of age (42.3% highly excluded). The majority of those who did not complete secondary school and/or are over 75 years of age are digitally excluded, with over half experiencing exclusion to high exclusion.

Digitally excluded Australians are increasingly concerned about privacy and scams. Given the increasing prevalence of online scams and high-profile data breaches in both the public and private sectors, this is perhaps unsurprising.[9] Consistent with international evidence, such concerns are reinforcing internet avoidance among the digitally excluded.[10] For example, 30.3% of highly excluded people have reduced their internet use because of their concerns about privacy and scams, compared with 7.9% of highly included people.

There is a growing number of digitally excluded Australians reporting that using the internet is not a priority for them, that they lack the confidence to use it, or that it is too expensive. This is despite a decline among highly excluded Australians in reporting they have no need to use the internet, reflecting that digital technologies have become increasingly embedded in more and more aspects of social, economic, and civic life.

Digital exclusion is compounded by disparities in Digital Ability

The ability to access, afford, and effectively use digital services is not a luxury — it is a requirement for full participation in contemporary social, economic, and civic life. In this context of 'compulsory computing',[11] digital inclusion is more important than ever.

Digital exclusion is strongly related to other markers of social disadvantage. There are significant digital inequalities between the employed and unemployed, between younger and older Australians, between those who completed secondary school and those who did not, and between those on higher and lower incomes. Groups recording greater levels of digital exclusion include low-income single adult households, those in the lowest income quintile, those aged 75 years and older, and those who did not complete secondary school. Low levels of digital inclusion among these groups are central in reproducing social inequalities, underpinning what researchers have called an 'inequality loop'.[12]

This gap between digitally included and digitally excluded Australians is clearly seen when looking at longer-term trends in Digital Ability scores. Between 2020 and 2023, Digital Ability scores among employed Australians rose 2.4 points to 74.2, while scores among unemployed people fell 4.9 points to 61.3. This pattern in Digital Ability score change is repeated when comparing those with a bachelor's degree and higher (rising 1.2 points to 75.9) with those who did not complete secondary school (falling 1.2 points to 38.5); those on the highest income quintile (rising 1.8 points to 79.1) with those on the lowest quintile (falling 3.5 points to 43.5); and 18-34 year olds (rising 0.7 points to 82.9) with those 75 years and older (falling 1.2 points to 23.3). Figures 2 and 3 show the key age and income thresholds between those for whom Digital Ability is increasing over time and those for whom it is falling.

The gap in Digital Ability is also illustrated by differences in how different social groups use the internet, with a greater range of economic, administrative, social, and cultural activities undertaken by younger people and those with higher levels of income and educational attainment. 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 for groups already experiencing disadvantage over the long-term. Digital Ability is a moving target and skills must keep pace with rapidly evolving technologies and their applications, meaning gains in previous years cannot be taken for granted.

Given the complex and evolving nature of digital inclusion in Australia, ensuring that everyone can make full use of digital technologies and the benefits they bring, while avoiding their potential negative consequences, will remain an ongoing task.

Figure 2: 2023 Digital Ability scores by age groups and changes between 2020 and 2023 scores

Age group	Score	Change
18-34	82.9	+0.7
35-44	77.2	+1.7
45-54	69.4	+8.2
55-64	55.1	+1.9
65-74	42.3	+1.3
75+	23.3	-1.2
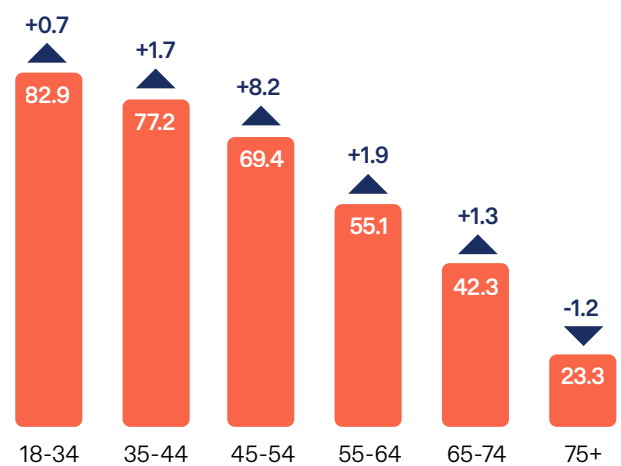
Figure 3: 2023 Digital Ability scores by income quintile and changes between 2020 and 2023 scores

Annual household income quintiles

Q1 = Quintile 1 (less than $33,800)	
Q2 = Quintile 2 ($33,800 - $51,999)	
Q3 = Quintile 3 ($52,000 - $90,999)	
Q4 = Quintile 4 ($91,000 - $155,999)	
Q5 = Quintile 5 (more than $156,000)	

Quintile	Score	Change
Q1	43.5	-3.5
Q2	55.0	-4.5
Q3	69.1	+3.8
Q4	74.4	+1.3
Q5	79.1	+1.8
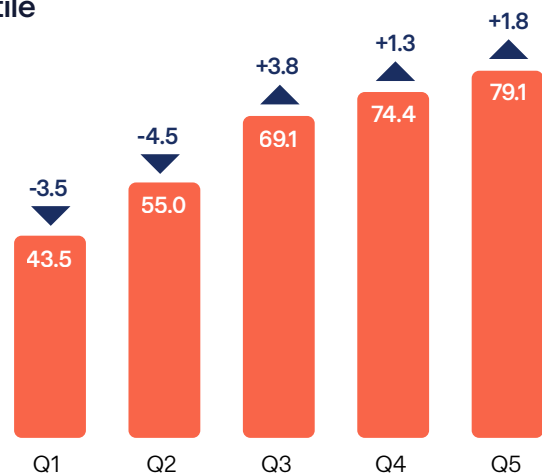
Next steps
for digital inclusion

Ongoing measurement of digital inclusion is vital for planning responses and solutions on the ground

The 2023 ADII reveals the evolving and multifaceted nature of digital inclusion in Australia. The findings reveal persistent evidence of digital inequalities, alongside changing patterns of internet use, and some widening gaps between digitally included and digitally excluded Australians.

While overall Index scores are improving, and the percentage of digitally excluded Australians continues to fall, a substantial gap remains between people with low and high incomes, older and younger people, and unemployed and employed people, particularly in terms of Digital Ability.

The increasing shift towards digital services and the demands for faster connections and more data for work, learning, and entertainment create new pressures. These pressures are experienced unevenly, with mobile-only internet users, and regional, remote and very remote communities at particular risk of falling behind.

Improving Affordability in the context of inflationary pressures and the cost of living crisis will be a key challenge

Positive improvements in Affordability reflect reductions in the price of a quality internet bundle. Nevertheless, affordable internet remains a challenge for lower income Australians, including people with disability, public housing residents, those over 75 years old, those who are unemployed, and those living in remote parts of Australia (see Case study 2). Access presents an ongoing digital inclusion challenge, especially for those outside major population centres. More work will be required to support equitable outcomes and better access for those regional and remote communities most in need.

Detailed findings from the Mapping the Digital Gap project will inform the targeted measures needed to make a difference for remote First Nations communities

In 2023 we can provide the first reliable measure of the digital gap for remote First Nations Peoples through detailed sampling of ten communities, and boosted sampling in metropolitan areas. This boosted sample provides a valuable baseline to track progress on the target of equal levels of digital inclusion for remote First Nations Peoples (see Case study 1).

Beyond the results reported here from the Mapping the Digital Gap project in remote and very remote communities, there is a need for expanded data collection across regional and urban First Nations populations to adequately measure national progress on Closing the Gap Target 17. We believe the best way to achieve this will be in partnership with First Nations communities, individuals, and organisations.

We will continue to refine and update the way we measure digital inclusion to account for emerging automated systems, including those using artificial intelligence

Digital services continue to change rapidly. 2022 saw the introduction of accessible generative Artificial Intelligence (AI) tools that are already changing the face of information navigation, content creation, education, learning and many work practices. The increasing pace of innovation in automated services, including those built upon artificial intelligence, is creating important new digital capabilities. Emerging technologies such as generative AI have many potential benefits, but they also entail risks, including the entrenchment of existing inequalities, and the creation of new patterns of disadvantage.

In this context of rapid change, programs that effectively address inequalities in digital skills and capabilities are more important than ever. Many not-for-profit organisations, educational institutions, public sector agencies and communities have taken up this challenge. However, the evidence shows that despite the tangible gains that have been made, we will need to do more. A more digitally inclusive Australia will require renewed commitment from all levels of government, private industry, education, the not-for-profit sector, and the broader community.

Case study 1
Mapping the Digital Gap:
Digital inclusion in remote First Nations communities

Djarindjin and Lombadina at sunset

Digital inclusion outcomes and access to services are critically important to ensuring informed decision-making and agency among Australia's First Nations Peoples.

However, there is a gap between the digital inclusion of First Nations Australians and other Australians. Recognition of this has led to the establishment of the National Agreement on Closing the Gap Outcome 17 — that 'Aboriginal and Torres Strait Islander people have access to information and services enabling participation in informed decision-making regarding their own lives'.[13] People living in Australia's 1,100 remote First Nations communities are among the most digitally excluded Australians. Apart from two ADII case studies undertaken in 2018 (Ali Curung, NT) and 2019 (Pormpuraaw, Queensland), there has been limited data to measure the scale and nature of this digital gap.[14] The 2021 ADII national sample was not sufficient to generate a score for First Nations populations, and therefore a separate approach was required to measure and respond to digital exclusion in remote communities.

About Mapping the Digital Gap

The Mapping the Digital Gap project is the first comprehensive study of remote First Nations communities' participation in, and access to, the digital economy. It is a supplementary ADII project run in partnership with Telstra, and forms part of the ARC Centre of Excellence for Automated Decision-Making and Society research program. The project objectives are to:

1. Generate a detailed account of the distribution of digital inclusion and the uses of digital services, including news and media, across ten 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.

The project methodology follows NHMRC and AIATSIS guidelines for ethical research with Aboriginal and Torres Strait Islander peoples and communities, with input from a First Nations Expert Advisory group.[15] This 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. Detailed outcomes are provided back to each community in the spirit of Indigenous Data Sovereignty.

What does the Digital Gap look like in 2023?

The digital gap between First Nations and other Australians nationally is 7.5. However, the scale of the gap increases significantly with remoteness (see Table 2).

Table 2: 2023 ADII scores and dimensions by remoteness and First Nations status

Remoteness Category		Index score (gap)	Access score (gap)	Affordability score (gap)	Digital Ability score (gap)
Major Cities of Australia*	Non-First Nations	74.7	73.4	95.3	66.9
	First Nations	71.6	69.2	89.0	69.6
	Relative Gap (National Gap)^	3.1 (1.8)	4.2 (3.0)	6.3 (6.1)	-2.7 (-4.6)
Outer Regional Australia*	Non-First Nations	66.7	66.2	94.3	55.0
	First Nations	61.4	70.4	85.0	48.3
	Relative Gap (National Gap)^	5.3 (12.0)	-4.2 (1.7)	9.3 (10.1)	6.7 (16.7)
Remote Australia	Non-First Nations	70.6	67.9	95.3	62.0
	First Nations	49.0	34.6	94.7	42.2
	Relative Gap (National Gap)^	21.6 (24.4)	33.3 (37.6)	0.6 (0.4)	19.8 (22.7)
Very Remote Australia	Non-First Nations	71.5	67.9	97.0	63.0
	First Nations	48.0	34.1	88.7	46.1
	Relative Gap (National Gap)^	23.5 (25.3)	33.9 (38.1)	8.3 (6.4)	16.9 (18.9)
Total	Non-First Nations	73.4	72.1	95.1	65.0
	First Nations	65.9	64.0	89.0	60.7
	National Gap	7.5	8.2	6.1	4.3

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

^ Relative Gaps show the gap between First Nations and non-First Nations people living within the same remoteness category. National Gaps show the gap between First Nations people living within a remoteness category, and the national average for non-First Nations people.

First Nations people living in remote and very remote communities have overall ADII 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 25.4 respectively against the national results. This substantial disparity demands dedicated attention to address its underlying causes.

The nature of the digital inclusion gap changes dramatically with remoteness, and is most pronounced for Access and Digital Ability. The scale of the Access gap in remote (37.5) and very remote (38.1) areas points to limited telecommunications infrastructure. Furthermore, in these areas, there is a high preference for pre-paid mobile services and limited take-up of postpaid home broadband services such as NBN's Sky Muster satellite service. Unlike postpaid services, pre-paid services do not require credit checks and multiple forms of ID, and people are more in control of managing their mobile costs. However such plans cost more per gigabyte. While there is generally a high uptake of digital technologies among First Nations Peoples, there is a gap in Digital Ability for remote (22.7) and very remote (18.9) peoples due to high levels of mobile-only use, lower levels of formal education, limited digital training or support, and English often being a second or third language.

While the gap in Affordability appears relatively low, this result should be treated with caution. Affordability is calculated based on household income, and remote and very remote First Nations Peoples have low individual incomes and large shared households — the median individual disposable income in remote communities is $292/week.[16] Furthermore, First Nations

Peoples in remote and very remote communities tend to access the internet via pre-paid mobile, and survey data shows that 53.3% of First Nations Peoples 'sometimes', 'often' or 'always' sacrifice essentials such as food or bills to stay connected.

In the ten remote and very remote First Nations communities included in the Mapping the Digital Gap project, there is a wide variation in digital inclusion levels ranging from 39.0 in Gäṉgaṉ and Wadeye (Northern Territory), to 59.6 in Wilcannia (New South Wales), and 60.2 in Erub (Torres Strait Islands) (see table 3). Factors impacting digital inclusion levels include the size of the community, distance from regional centres, types of communications access, and the socio-economic, cultural, and linguistic context. The community sites can be seen on the First Nations dashboard on the ADII website, which includes digital inclusion scores and basic information about each community.

More in-depth accounts of the communication and media services available and usage patterns and challenges for each of these ten communities are available in the Community Outcomes reports on the Mapping the Digital Gap webpage. These reports provide context around the range of factors impacting digital inclusion for each community, drawing on the surveys and qualitative research, with suggestions for local digital inclusion plans to address community-specific challenges. These case studies are intended to inform local strategies, and government and industry investment for other communities with similar characteristics.

Table 3: 2023 ADII scores and dimensions for the ten remote First Nations communities in the Mapping the Digital Gap project

Community	Index score	Access score	Affordability score*	Digital Ability score
Djarindjin / Lombadina, WA	**47.4**	42.2	78.6	46.1
Erub, Torres Strait, Qld	**60.2**	40.6	88.8	70.0
Gäṉgaṉ, NT	**39.0**	25.3	92.2	28.9
Galiwin'ku, NT	**46.0**	26.6	95.8	41.0
Kalumburu, WA	**49.2**	30.4	91.6	49.8
Tennant Creek, NT	**46.6**	29.2	84.0	52.6
Wadeye, NT	**39.0**	28.6	93.0	24.8
Wilcannia, NSW	**59.6**	42.3	91.3	63.9
Wujal Wujal, Qld	**47.0**	31.4	94.5	41.2
Yuelamu, NT	**45.2**	29.4	93.1	39.8
Average score	48.0	33.9	89.1	45.8

* Note: Affordability scores are affected by the large size of households in remote communities which increases household income, thereby boosting Affordability scores despite low individual incomes.

Developments and challenges

Improving household and individual broadband access is a critical element in addressing the digital inclusion gap for remote and very remote First Nations Peoples. However, this is complicated by limited backhaul infrastructure and competition in remote areas. While access to mobile and broadband services in remote areas has improved over the last decade, with more mobile coverage and the rollout of NBN's Sky Muster satellite service, targeted funding programs are needed to provide reliable services in small outstations and homelands. The quality and reliability of mobile and broadband services were identified as an issue in the case study sites, with infrastructure upgrades required to manage increasing demand on the network.[17]

Affordability is an ongoing issue, with over 90% of remote mobile users on pre-paid services, typically paying $2-$4 per gigabyte for data. Despite increasing data usage, there is little transition from pre-paid mobile to postpaid or fixed broadband services, which tend to have lower price points. With ongoing government transition to online government service delivery, free connectivity options through public Wi-Fi and hub facilities are needed to ensure community access to essential services. Affordability can also be addressed through aggregated or shared broadband services, such as Wi-Fi mesh networks, as well as more affordable mobile plans. Device costs are also a critical issue, with high turnover of mobile devices in remote communities.

While Digital Ability is relatively high among most young First Nations people, other cohorts have low usage or don't access the internet at all, including elderly people, people with disability, people with low English literacy, and people without broadband access. Targeted and locally delivered programs, with local digital mentors, are needed to support engagement. Programs need to be engaging to increase digital literacy and the use of relevant tools and applications. Trust in the digital world also needs to be built, including awareness of scams and online safety concerns, and education on how people can protect themselves online.

Next steps

There is still much to do to ensure targets are met for Closing the Gap Target 17:

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

A more detailed Mapping the Digital Gap annual report will be released in August 2023, providing results of quantitative and qualitative research across the 10 communities. The project will continue in 2023 and 2024, with individual community reports being updated annually.

While the Mapping the Digital Gap project is, for the first time, providing data for remote communities, more data is needed for urban and regional First Nations Peoples to track digital inclusion progress. The ADII team is proposing an expanded version of Mapping the Digital Gap for regional and urban sites nationally.

The Mapping the Digital Gap research outcomes are informing policy development in relation to Closing the Gap Outcome 17, with members of the team represented on the First Nations Digital Inclusion Advisory Group and Expert Panel, established by Communications Minister Michelle Rowland MP. The team has also contributed to the development of the First Nations Digital Inclusion Plan and other policy and program reviews.

Co-researcher Guruwuy Ganambarr doing survey with Alissia Wirrpanda at Gän̲gan̲, NT

Closing the Gap Target 17:
By 2026, Aboriginal and Torres Strait Islander people have equal levels of digital inclusion

Figure 4: First Nations digital gap snapshot

73.4
National average
(exc. First Nations)

65.9
-7.5
First Nations
(national average)

71.6
-1.7
First Nations
(major cities)

61.4
-12.0
First Nations
(outer regional)

49.0
-24.4
First Nations
(remote)

48.0
-25.3
First Nations
(very remote)
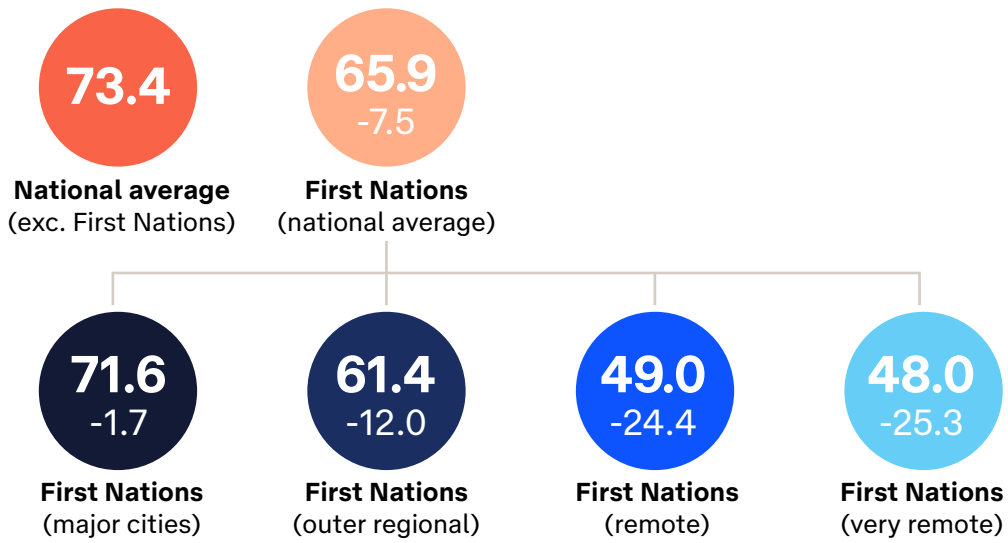
Figure 5: First Nations digital gap research at a glance

Erub (Darnley) Island

Galiwin'ku

Gäṉgaṉ

Kalumburu

Wadeye

Wujal Wujal

Djarindjin / Lombadina

Tennant Creek

Yuelamu

Wilcannia

10
communities visited

530
surveys conducted
(495 First Nations)

130
interviews conducted

21
community
co-researchers
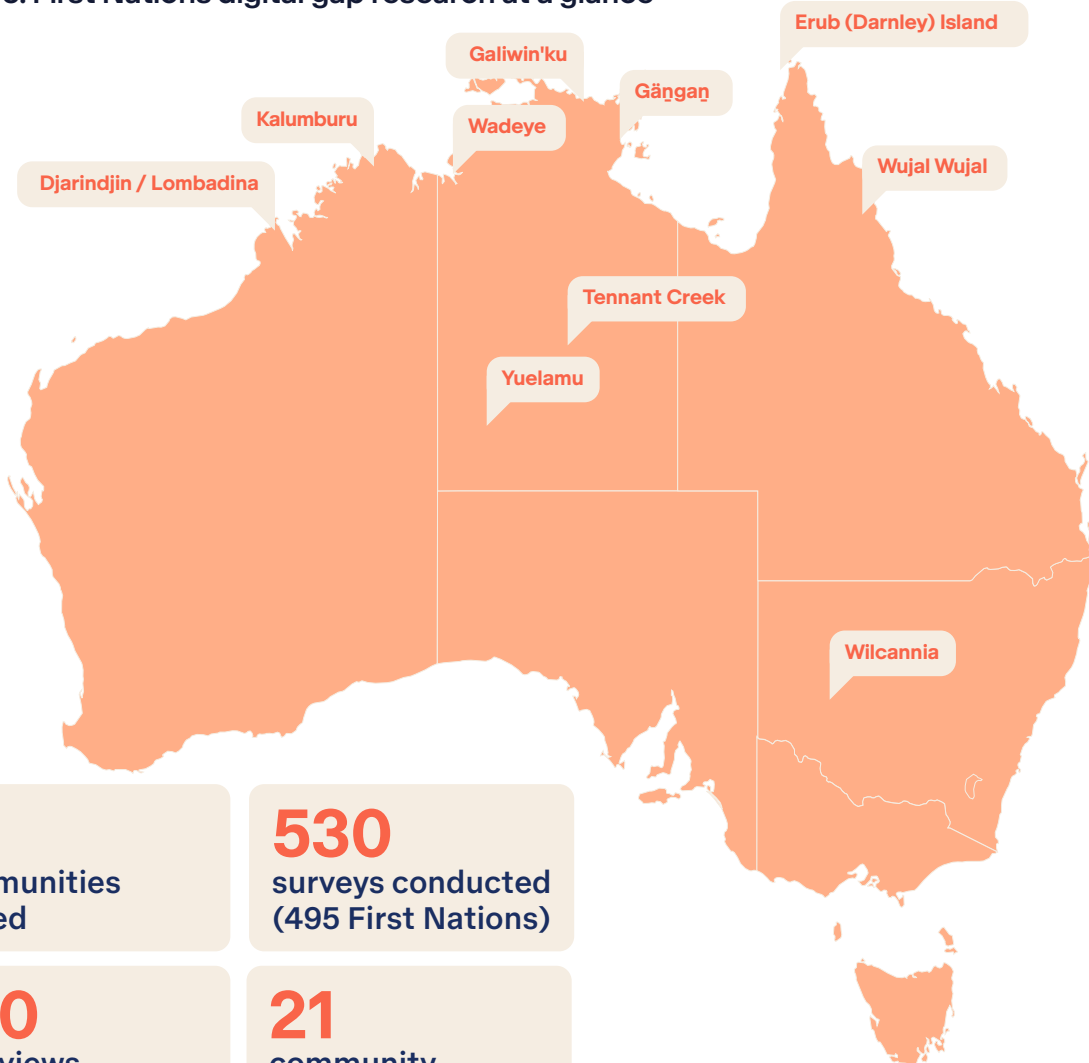
Case study 2
Breaking the inequality cycle:
Examining affordability barriers to digital inclusion

As digital services evolve and become ever more embedded in social, economic and cultural life, the ability to afford a reliable, quality internet connection and the devices required for social participation has never been more critical.

Since 2014, the Australian Digital Inclusion Index has measured the affordability of internet services across the Australian population. The results have shown that those who experience social and economic disadvantage persistently face an affordability barrier to digital inclusion. Affordability, for these people, is another barrier, in addition to limitations in access to infrastructure and data, and a lack of confidence and capabilities in using digital services.

Some organisations and researchers describe people unable to afford a quality internet connection as experiencing 'digital poverty'.[18] The effect of digital poverty is that the costs of online connection and digital devices present major barriers to education, work, and vital services, and compound existing inequalities. We refer to this as affordability stress. This may arise where a person is unable to use the internet at home or where opportunities to use the internet may be severely limited by a lack of access

to data or a suitable device. These challenges can hinder the development of digital skills and literacies, compounding barriers to social and economic participation and leading to what some researchers have called an 'inequality loop'.[19]

Affordability is a cross-cutting issue in digital inequalities research, often aligned with Access.[20] In the ADII, we treat these two dimensions separately to isolate the impact of economic inequality on digital inclusion. Our Affordability dimension 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. This ideal internet bundle enables both quality and reliable connectivity through a fast internet connection (such as that provided through a cable HFC service, NBN 50 or above, or 5G wireless service), an unlimited monthly data allowance through a fixed broadband service, and a mobile broadband or mobile phone data allowance above 61 GB per month.

A person with the highest Affordability score would pay 2% or less of their household income for this internet bundle. This is based on an international standard that suggests households ideally should not be paying more than 2% of their income for access.[21]

What is affordability stress?

The affordability stress score describes the percentage of household income required for a family or single-headed household to gain access to a defined internet bundle. Affordability stress occurs when lower income groups (typically defined as those in the lowest 40% of the income distribution) must pay a relatively large proportion of their income to access the internet bundle.

The affordability stress score categorises expenditure on the ideal internet bundle in four categories: up to 2% of household income; up to 5% of household income; up to 10% of household income; and more than 10% of household income. Households that would have to pay more than 5% of their household income to access the internet bundle are considered to have 'low Affordability' and would be experiencing affordability stress.

Paying more than 5% of their household income on their internet bundle would tip many lower income households into affordability stress, compromising their capacity to pay for other essential household items. To avoid this, many lower-income households buy cheaper and lower quality services, and devices that limit the quality of connections and opportunities for internet use.
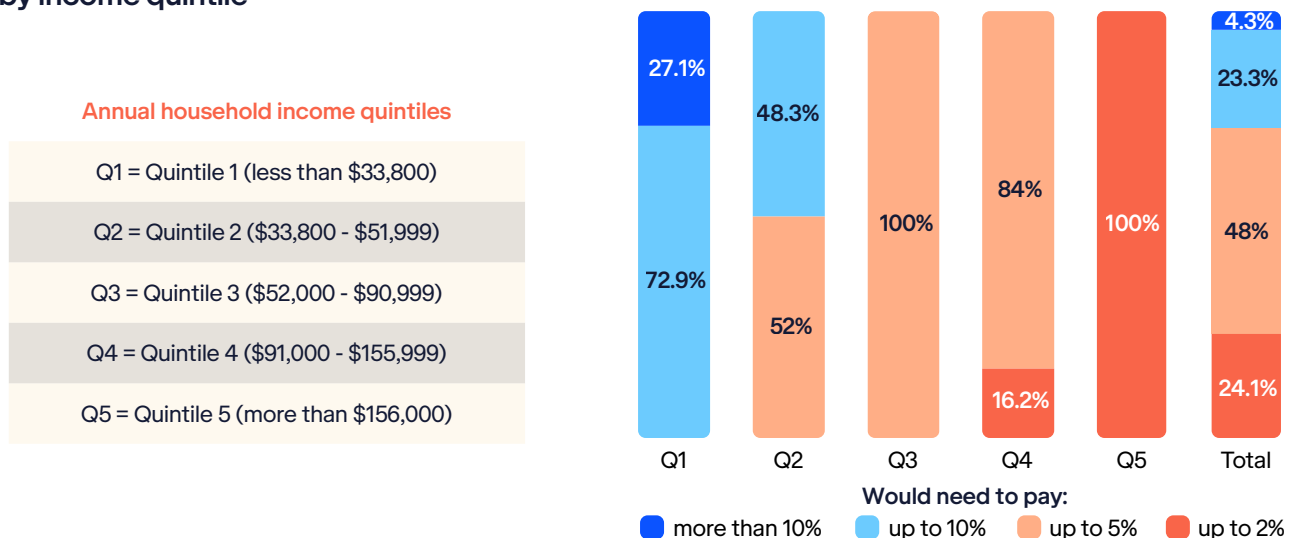
What does Affordability look like now?

Between 2021 and 2023, Affordability scores have seen significant shifts compared to previous years. These shifts are positive, with improvements in Affordability scores across most regions and social groups, including for those on the lowest incomes. However, while Affordability has improved at a national level, some groups continue to experience high levels of affordability stress. Results for Affordability have fluctuated in previous Index reports, and we will continue to track the data to judge whether we are seeing the beginnings of a long-term improvement in 2023 or a shorter-term change related to the unusual economic and market conditions of the pandemic period.

Based on our Affordability measure, 4.3% of Australians would need to pay more than 10% of their household income to gain quality, uninterrupted connectivity, falling from 14.1% in 2021. This improvement is the result of reductions in the cost of our bundle of internet services. Nevertheless, 27.6% of Australians experience affordability stress, meaning that accessing a quality internet connection and necessary devices would compromise their capacity to pay for other essential household items. While this figure has fallen from 39.2% in 2021, it remains an important issue for understanding digital inequality in Australia.

Recent affordability gains are not evenly distributed (see Figure 4). For Australians in the lowest income quintile, most (72.9%) would have to pay more than 10% of their household income to gain a quality internet connection. All Australians in the lowest income quintile, and 48.3% of those in the second lowest, would have to pay more than 5% of their household income to gain quality, uninterrupted connectivity. The situation for those in the second lowest quintile has improved since 2021, when 84.1% would have had to pay more than 5% of their household income for a standard internet bundle.

Figure 6: Percentage of household income needed for a standard internet bundle, by income quintile

Annual household income quintiles

Q1 = Quintile 1 (less than $33,800)

Q2 = Quintile 2 ($33,800 - $51,999)

Q3 = Quintile 3 ($52,000 - $90,999)

Q4 = Quintile 4 ($91,000 - $155,999)

Q5 = Quintile 5 (more than $156,000)

Would need to pay:
- more than 10%
- up to 10%
- up to 5%
- up to 2%

Who is affected by affordability stress?

Some Australians are particularly sensitive to affordability stress, including people with disability (55.1%), living in public housing (64.1%), over 75 years old (65.2%) and currently unemployed (69.4%). Table 4 shows groups where at least half would have to pay more than 5% of their household income to obtain and maintain quality, reliable connectivity. As in other dimensions of the Index, we continue to see that digital inequalities relate strongly to socio-economic inequalities.

Table 4: Groups where at least half have would have to pay more than 5% of their household income to maintain quality, reliable connectivity

Subgroup	Affordability score	%
Income Q1 (<$33,800)	84.6	100%
Unemployed	86.7	69%
75+ years	92.7	65%
Rent from public housing authority	90.5	64%
Receive income support	92.3	63%
People with disability	91.5	55%
Did not complete secondary school	91.7	55%
Not in labour force	92.3	53%
First Nations	89.0	52%

The impact of cost on internet access and use

In addition to measuring affordability stress, we also consider whether the cost of the internet may be a reason for limiting internet use. Some groups report experiencing internet costs as prohibitive. For example:

- 18.6% of First Nations respondents reported cost as a reason for limiting internet use, compared to 5.7% of other Australians.

- 15.3% of unemployed respondents reported the cost of internet access as inhibiting use, compared to 4.9% of employed respondents.

- 27.1% of respondents in very remote areas reported the cost of internet access as inhibiting use, compared with 5.7% of respondents in major cities, 4.2% in inner regional Australia, 11.7% in outer regional Australia, and 7.1% in remote Australia.
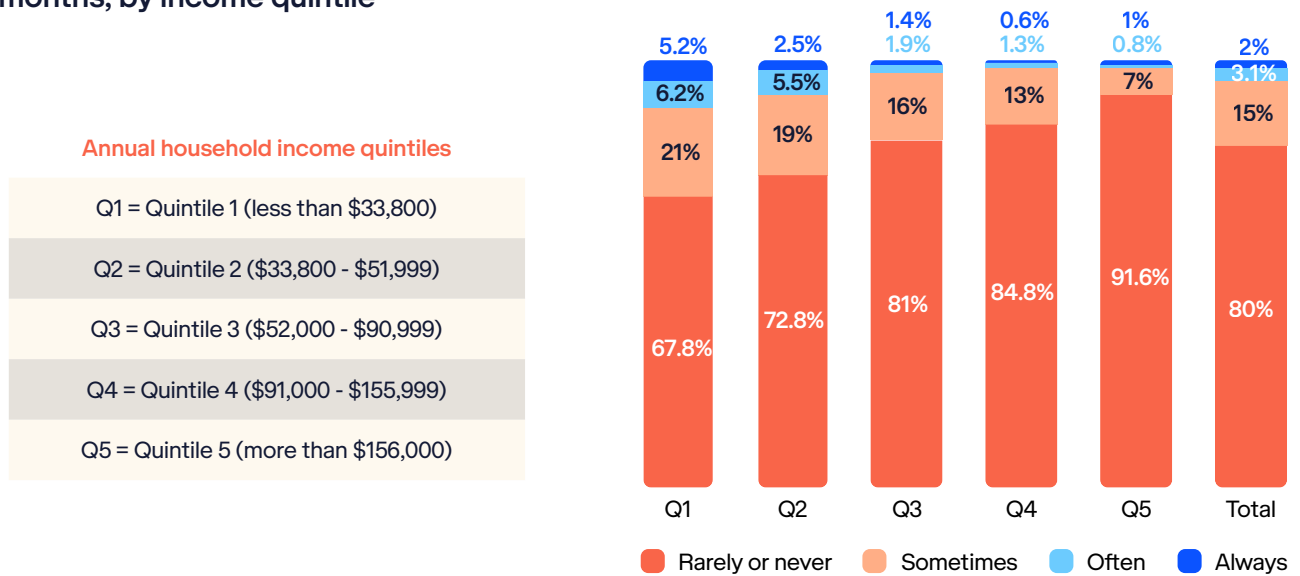
Compared to households in cities, rural households often have to pay more for less (in terms of data, speed, reliability, and service) due to a range of factors, including a lack of both competition and infrastructure.[22] While a range of government and public-private initiatives have sought to improve access in rural areas in recent years, particularly on transport corridors, a clear geographic affordability divide persists.

We also asked participants how often they had to sacrifice or cut back on essential household costs (such as food or utilities) to be able to afford personal or household internet access. Some groups were more likely than others to have to cut back to afford connectivity:

- Nationally, 11.7% of First Nations respondents had to 'often' or 'always' sacrifice on essentials to afford internet access, compared with 4.9% of other respondents.

- 18.6% of unemployed people had to often or always cut back, compared to 4% of employed people.

- As illustrated in Figure 5, a larger number of those on lower incomes had to cut back on essentials to remain connected, compared to those on higher incomes.

Figure 7: How often respondents had to sacrifice or cut back on essential household costs (e.g. food or bills) to be able to afford personal or household internet access in the past six months, by income quintile

Annual household income quintiles

Q1 = Quintile 1 (less than $33,800)	
Q2 = Quintile 2 ($33,800 - $51,999)	
Q3 = Quintile 3 ($52,000 - $90,999)	
Q4 = Quintile 4 ($91,000 - $155,999)	
Q5 = Quintile 5 (more than $156,000)	

	Q1	Q2	Q3	Q4	Q5	Total
Always	5.2%	2.5%	1.4%	0.6%	1%	2%
Often	6.2%	5.5%	1.9%	1.3%	0.8%	3.1%
Sometimes	21%	19%	16%	13%	7%	15%
Rarely or never	67.8%	72.8%	81%	84.8%	91.6%	80%

● Rarely or never   ● Sometimes   ● Often   ● Always

Our approach of measuring income at a household level has limitations. Figure 5 shows that people, especially those on lower incomes, may need to make difficult choices to prioritise internet connectivity. Households with a large number of adult occupants on low individual incomes can artificially push up household incomes. Meanwhile, groups with higher numbers of mobile-only users (including people in very remote areas and those on low incomes) tend to pay for internet connectivity as individual subscriptions, rather than as shared home fixed broadband. For this reason, understanding lived experience and people's skills, strategies, and priorities in the face of inequalities remains critical.[23]

There is often substantial labour involved in managing connectivity and data use. For example, research has shown that households with limited access to the internet use a range of practices to manage and extend their data, such as making use of free public Wi-Fi or library internet services, or toggling their data connection on and off throughout the day.[24] Others limit their phone use as much as possible when not connected to Wi-Fi. Some avoid activities they know use a lot of data, such as streaming or using social media platforms, when they are nearing data limits. Many low income households further manage affordability stress by cutting back on groceries and petrol, postponing payment of bills, postponing replacement of digital devices or cancelling subscription services.

Next steps

Affordable internet access is essential for the use of an increasing range of basic services. Positive improvements in Affordability are encouraging, but continued close attention needs to be given to the pricing of such services given the levels of affordability stress reported here, together with rising cost pressures for other basic household goods and services. Ongoing data collection and reporting will determine whether the 2023 results represent a short or long-term improvement.

It is important that we continue to understand affordability in relation to people's household circumstances, rather than seeing internet access as a personal service. For most households, mobile services do not provide an alternative to fixed broadband connections; these different modes of access are better understood as providing complementary capabilities. It is therefore important that we understand affordability generally in terms of the costs of both mobile and fixed broadband, rather than one or the other in isolation. Pricing for both mobile and fixed services should be recognised as critical concerns for low income Australians.

A range of initiatives, from community Wi-Fi to the provision of free devices to unconnected families, can contribute to relieving affordability pressures. There is scope to extend and expand these initiatives. However, affordability is a continuing challenge. Further action directly addressing the needs of low income Australians for both fixed and mobile services will be necessary to disrupt cycles of digital disadvantage.

Project partners

Telstra

telstra.com.au

Telstra is Australia's leading telecommunications and technology company, offering a full range of communications services and competing in all telecommunications markets. In Australia, Telstra provides 19.5 million retail mobile services and 3.6 million retail bundle and data services (as of July 2022). Telstra's purpose is to build a connected future so everyone can thrive, which recognises the fundamental role the company plays in enabling social and economic inclusion. Telstra has provided products, services, and support to enhance digital inclusion for more than a decade through its Access for Everyone and Everyone Connected programs, reducing the barriers to inclusion such as age, income, skill level and location. Telstra's Sustainability Centre of Excellence vision is captured in two parts — with technology at the centre — a healthier planet and a more inclusive world. These two ambitious goals are grounded in our foundational commitment to do business responsibly.

The ARC Centre of Excellence for Automated Decision-Making and Society

admscentre.org.au

The ARC Centre of Excellence for Automated Decision-Making and Society (ADM+S) is a cross-disciplinary, national research centre, which aims to create the knowledge and strategies necessary for responsible, ethical, and inclusive automated decision-making. Funded by the Australian Research Council from 2020 to 2026, ADM+S is hosted at RMIT University in Melbourne, Australia, with nodes located at eight other Australian universities, and partners around the world. The Centre brings together leading researchers in the humanities, social and technological sciences in an international industry, research, and civil society network. Its priority domains for public engagement are news and media, transport and mobilities, social services, and health.

The Australian Digital Inclusion Index is a collaboration between the RMIT and Swinburne nodes of ADM+S.

Project collaborators

The Social Research Centre

srcentre.com.au

The Social Research Centre provides government, academia, and the not-for-profit sector with access to world-class research and evaluation services including research design, data collection, statistical consulting, and analysis and reporting. The Social Research Centre is a wholly owned subsidiary of the Australian National University and has a well-earned reputation as one of Australia's pre-eminent social research organisations.

Dassier

dassier.com.au

Dassier provides custom built data visualisations, data dashboards, and online reporting platforms. Established in 2012, the team at Dassier has worked with a variety of Australian organisations across the private, public, government and not for profit sectors to deliver both internal and public facing data dashboards and online reporting tools.

Community partners

Regional Enterprise Development Institute Ltd (REDI)
redie.org.au

Wilcannia, NSW

Julalikari Aboriginal Corporation
julalikari.org.au

Tennant Creek, NT

PAW Media
pawmedia.com.au

Yuelamu Community, NT

Yalu Marnggithinyaraw Indigenous Corporation
yalu.org.au

Galiwin'ku, NT

Laynhapuy Homelands Association
laynhapuy.com.au

Gäṉgaṉ, NT

Wujal Wujal Aboriginal Shire Council
wujalwujalcouncil.qld.gov.au

Wujal Wujal, QLD

Torres Strait Islanders Media Association
tsima4mw.org.au

Erub (Darnley Island), QLD

Thamarrurr Development Corporation
thamarrurr.org.au

Wadeye (Port Keats), NT

Kalumburu Aboriginal Corporation
kalumburu.org

Kalumburu, WA

Djarindjin Community Council
djarindjin.org.au

Djarindjin / Lombadina, WA

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