Analysis of B4BA Survey assessing the availability, quality, reliability and affordability of internet and telecommunications services in Australia: an evidence-based approach.
Survey Report

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Front cover photo: Aerial view of Alice Springs. B4BA was established in Alice Springs through the cooperation of a number of organisations to host the first Broadband for the Bush forum in 2012.

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Figure 1. Gilat satellite (mining-grade) satellite in remote East Arnhem Land.

This non-NBN satellite system was deployed at three community-controlled health clinics in the Laynhapuy Homelands, East Arnhem. At the commencement of the project (February, 2017) NBN Interim Satellite solution was deemed to be inadequate for telehealth requirements. Remote telecommunications services can vary in reliability. Recognising this, the project partners chose to invest in highly reliable (and expensive) satellite systems to determine if telehealth could be done over satellite internet. The project has demonstrated telehealth can be done via satellite and is "Closing the Gap" in remote Indigenous health in this very remote area. Satellite installation contractor for eMerge Kim Winter, Comcat is pictured with the Gilat satellite.

Executive Summary of key findings.

This document analyses the data obtained through the Broadband for the Bush (B4BA) national survey investigating the availability, quality, reliability and affordability experienced by respondents from alliance member organisations and associated networks. The survey also investigated how consumers use their telecommunications services. In-depth case studies with volunteer consumers (second phase of the research) will provide a much richer data set of consumers' stories in the use of telecommunications services. This research addresses specific research needs identified by B4BA's Strategic Business Plan, B4BA Indigenous Focus Day (2016, 2017, 2018) and B4BA Fora V, VI and VII.

The survey ran from 16/3/18 – 8/6/18 and 3/7/18 – current. This report is based on a total of 283 responses, data downloaded on 6th September, 2018.

Key findings include:

The majority of survey respondents (235, 83%) came from Regional, Rural and Remote (RRR) locations.

Survey respondents:

- Were well distributed across Australian States with the exception of the NT (larger than expected proportion of respondents were from the NT).
- Generally used three or more major forms of internet connectivity.
- Mobile phone services are the most used service (203 respondents), followed by landlines (165 respondents) and fixed line (95 respondents).
- The most frequently services accessed by internet were: Banking (212), Keeping in touch with family and friends (212), business (202), accessing information (194) ad news (185), social media (180), booking travel (177), accessing government services
- (176), shopping (174), education (167), entertainment (138), community communications (137) and health/medical 108).
- Video conferencing is widely used (71%) with many people using multiple devices for video conferencing. More RRR respondents reported not using video conferencing (43%) than Urban (15%). Skype (104) and FaceTime (95) were the most commonly used video conferencing systems.
- The most sought after activity people would like to access via the internet is entertainment (90), followed by education (38), health/medical (36), keeping in touch with family and friends (33), business (33), accessing government services (29), social media and community communications (25), shopping (24), news and banking (23).
- The main internet service used at home was fixed internet (102) and satellite (61).
- Over 30% of respondents did not have NBN, with 69 having satellite and fewer accessing other services.
- The most used devices were laptops (123), smart phones (121) and tablets (91).
- The most urgently needed services were mobile (32%), fixed line (29%) and fixed wireless (27%).
- Mobile phone (98%) and fixed internet (84%) were the most important telecommunications service.
- There was a trend for services to be considered less affordable by RRR respondents.
- There was a trend for Urban to consider speed of internet services to be good, whereas RRR tended to report speeds being poor.

- There was a trend for Urban to consider services to be more reliable than their RRR counterparts.

Telehealth.

Almost all (98%) respondents indicated telehealth consults should be billable to Medicare.
Most people knew about telehealth (74% but only 64% knew they could access telehealth.
Only 25% of respondents indicated they have used telehealth.
Approximately half (53%) would like to know more about telehealth and 48% of respondents would like to access telehealth services.
Barriers to telehealth included:

- Inadequate internet (most frequently cited barrier).
- Inadequate data allowances
- Consultations not billable to Medicare,
- Some clinicians not willing to use telehealth.

Figure 2. Roads viewed from the air in remote East Arnhem Land, NT.

Remote and very remote people often need to drive long distances to gain access to services and in some instances (eg the wet season in the tropical North) travel is only possible via air transport or barge. Variable quality roads are the norm in Rural, Regional and Remote (RRR) Australia.

Figure 3 John Kelly, GP/Physician doing a simulated Telehealth consultation at his workplace in Sydney

He often uses the video conferencing equipment to share images and videos with patients and staff in the Laynhapuy Homelands to address diagnostic and treatment issues. He has the clinical database open on his laptop (test patient) and the hand is a picture obtained from the internet. He has used video clips to demonstrate to staff examination and treatment techniques.

Introduction.

The Broadband for the Bush Alliance (B4BA) is a group of organisations that are committed to the digital inclusion of regional, rural and remote (RRR) Australia. The Alliance brings together a range of stakeholders with expertise in communications, remote service delivery and community engagement. For the last seven years the B4BA have held an annual Forum initially based in the NT. In 2016 B4BA moved to a more national focus by taking the forum and Indigenous Focus Day interstate (Queensland) and in 2017 to Fremantle, WA. The annual Forum offers regional, rural and remote (RRR) stakeholders' opportunities to engage with key decision makers to build collaboration, assisting in driving the best possible policy outcomes and to expand access to telecommunications services for rural, regional and remote (RRR) people.

The 2017 B4BA Forum Communiqué identified specific research required:
• Expand the data collection for the Digital Inclusion Index
(Digital Inclusion Alliance, 2018) to include remote and Indigenous Australia and the development of a Social Capital metric.
• Improved data collection is needed to measure digital inclusion in remote and rural Australia including Indigenous communities. (B4BA 2017).

There are a number of surveys that have, or are being done, (e.g. by Better Internet for Rural, Regional and Remote Australia (BIRRR), Regional, Rural and Remote Communications Coalition (RRRCC)). To increase the validity of this work B4BA, with the assistance of ACCAN has entered into a rigorous, Ethics Committee approved data collection and analysis covering the range of issues already identified anecdotally. This project aims to provide base line data collected within the auspices of a university approved research design ethics method. Many investigations are based in urban areas and there is a distinct lack of scientific investigation into telecommunications services in the rural, regional and remote (RRR) areas.

A number of organisations are actively highlighting issues raised by consumers (individual, families, businesses and communities (e.g. NFF: https://www.farmers.org.au/getinvolved/campaigns/rrrcc-data-drought.html, Better Internet for Rural, Regional and Remote Australia: https://birrraus.com/, and B4BA: http://broadbandforthebush.com.au/)). Bandias and Ram Vemuri (2005) identified that telecommunications in rural and remote Australia impact more disproportionately on regional communities particularly in the delivery of education and health services. Services such as telehealth have been difficult to implement in the Northern Territory due to a lack of adequate infrastructure and connectivity (Murtagh, et al, 2017).

The next few years will see a significant number of changes to internet and communications services throughout Australia. It will be important to establish a baseline service quality index to help measure the impact of programs (e.g. the NBN and the mobile phone Blackspot initiative) have on quality, cost and effectiveness of internet and communications services to the Australian public.

The overall aim of this research is to provide a scientifically based data set and report on consumers' experiences of internet and telecommunication services, including telehealth. Data regarding the current status of internet and telecommunications availability, quality, reliability and affordability as well as how consumers currently use, and how they would like to use, the services were collected. This research will inform priorities for future research as well as policy and strategic activities of B4BA, Indigenous Remote Communications

Association (IRCA), Australian Communications Consumer Action Network (ACCAN), Northern Institute – Charles Darwin University (NI – CDU) and Regional, Rural and Remote Communications Coalition (RRRCC).

Although the research has been designed to cover Australia wide internet quality and telecommunications services, B4BA is keen to compare internet quality, reliability and cost across remote and urban environments. It is anticipated there will be different types of internet users and an evaluation of how those types of users are being serviced across urban, regional and remote Australia was done.

Specifically, the research investigated consumers' experiences of communications services regarding:

- Availability.
- Quality.
- Reliability.
- Affordability.
- How consumers access internet.
- How consumers use internet.
- Access to telehealth services.
- How consumers would like to access internet and other telecommunications services.
- How consumers would like to use the internet.

The second phase of this research will include case studies and their analysis, provide quantitative and qualitative analyses of consumers' access to internet, telecommunications services, reliability of these services, how consumers use these services and affordability of services. Case studies commenced in mid-September and are in a separate report.

This research has been generated from discussions with B4BA Directors, participants of the B4BA Indigenous Focus Day (2016, 2017, 2018) and B4BA Forum V, VI and VII, a range of Industry stakeholders and is specifically in line with recommendations from the B4BA Forum and Strategic Plan (B4BA 2017). This research will inform future research to be undertaken by B4BA and NI, CDU in collaboration with a range of organisations.

This project has been supported by a grant of $51,005 from ACCAN

This project has been undertaken as a collaboration between B4BA and the Northern Institute, Charles Darwin University.

Figure 4. Welcome to Country by Ali Mills.

Ali Mills welcomes delegates to the Broadband for the Bush Indigenous Focus Day Showcase. Broadband for the Bush (B4BA) is an alliance of organisations advocating for improved digital resources for regional, rural and remote (RRR) Australia.

Figure 5. Delegates at the Indigenous Focus Day, Darwin, 2018.

B4BA convenes an Indigenous Focus Day (IFD) every year to discuss specific telecommunications and associated issues related to RRR Aboriginal Australians. This year the IFD was held at Charles Darwin University, Casuarina Campus, Darwin in June, 2018.

Methods.

The first phase of the project produced data about consumers' experiences with telecommunications services, how they use the services and how they would like to use the services. The survey was developed in collaboration with B4BA, IRCA, ACCAN and RRRCC (see Appendix A). The survey is based on a range of issues that have been identified by the B4BA and its member organisations. The survey was loaded into Survey Monkey 16/2/18 and 27/6/18. The first survey was done using Aboriginal Medical Service Alliance NT Aboriginal Corporation's (AMSANT's) Survey Monkey Account. However, with changes to staffing at AMSANT, the project team purchased their own Survey Monkey account and reloaded the survey which went live on 3/7/18.

The survey was initially distributed through the B4BA Network and associated industry networks. The survey was also sent to networks such as the Australian Women in Agriculture, Seafood Industry networks, National Farmers Federation, RRRCC, Isolated Children's Parent's Association (ICPA), Aboriginal Medical Service Alliance NT Aboriginal Corporation (AMSANT), Australian College of Remote and Rural Medicine (ACCRM), Aboriginal Community Controlled organisations and regional business networks (e.g. Regional Development Northern Territory, Regional Development North Western Queensland), etc. This survey was designed to be anonymous and the Survey Monkey settings were installed that did not permit a respondent to complete the survey twice from the same computer using the same browser. Every effort was made to de-identify respondents' answers, so information provided would be private and confidential, i.e. if data indicated a particular location specifically, that data set would be pooled. Survey respondents were asked to self-identify their locality in various ways to avoid the use of physical residential addresses and postcodes.

The survey included a section where respondents could self-identify as a volunteer for case studies as well as identifying if the respondent would like to receive updates or reports on the survey.

This project has been discussed at a number of industry meetings and a number of B4BA Network people/organisations volunteered to be case study subjects and distribute the survey through their networks.

The project activities have been overseen by a project steering committee comprising of ACCAN staff, the B4BA Chair (Mrs Apolline Kohen) and Deputy Chair (Dr Rob Starling).

All data, drafts, etc were continuously backed-up to a secure data centre.

A total of 100 surveys were completed during the first phase of the survey (AMSANT's account) and 183 at the time of collection in the second phase of the survey. These data were pooled on the 24th September and data cleaned to harmonise a number of data inconsistencies (e.g. missing spaces and slight variations of spelling between the two surveys). The data were then imported into Microsoft Power BI and graphs prepared. Some additional graphs were prepared using Excel.

This report is based on the data generated prior to the 24th September with a total sample size of 283 responses. The survey was closed on the 21st December, 2018. Additional data can be imported into graphs in future research reports. One medical based organisation only sent

the survey out in its newsletter at the end of September but has requested that responses be included in the research as a result of the newsletter be included.

Figure 6. Panel session at B4BA Forum 2018.

B4BA hold an annual Forum each year to discuss ways to improve access to telecommunications services particularly for RRR people, digital engagement and empowerment.

Figure 7 NBN updates from 2014 – 2018.

NBN Co continue to support B4BA activities in a number of ways, including sending Gavin Williams each year to present at the B4BA Forum. Each year Gavin provides Forum delegates an update on the NBN Co's progress and the positive messages he delivered this year in Darwin were very well received by delegates. This year NBN Co has been working closely with B4BA and sponsored the evening networking session in 2018.

Results and Discussion.

General notes regarding results and graphs.

Abbreviations - RRR and Urban: The combined categories of regional, rural and remote have been abbreviated to RRR throughout this document.

Indicators of locality and remoteness: A series of four questions were developed to gain an understanding of respondents' location and remoteness whilst also maintaining confidentiality and anonymity about location. A number of surveys have used postcode as an indication of location. Many people use post boxes or other postal services that are not indicative of their place of residence. Additionally, many people in remote areas (eg in the Katherine region) have private mail bags at the local (eg Katherine) Post Office. This postcode is the postcode associated with the post office and does not necessarily reflect where the people live. Mail can be sent out once a week by plane or truck as some of the people maybe over 700 kms from the township. Therefore, post code is not a reliable indication of remoteness. Some of the remote Australian postcodes cover areas larger that some countries and therefore do not give a clear sense of remoteness and can cross over between multiple remoteness categories (Jones, et al 2003).

The graphs generated in this report are primarily exported from Power BI to PDF format. Power BI uses numerical and alphabetical characters to determine the order of axes, that is, there is little control over the order the data are presented. Blank responses were removed from the data set so the sample size is different for each of the graphs, reflecting the number of respondents to that particular question.

Design of survey questions and extended analysis through data analytics tools.
The project team used an additional data analysis tool (i.e. Microsoft Power BI). Survey Monkey's internal reports functionality was used to validate initial single dimension analysis and respondents demographic classification eg Rural, Regional and Remote (RRR). Graphs presented in this report are a combination of survey respondents' initial individual question response and early question responses. The survey was designed to build on multiple question analysis and presentation.

A number of recommendations made by survey respondents will inform future survey design. Key suggestions include refining question series to allow questions to be ignored when previous questions are answered to negate further need for respondents input. (e.g. Have you used Telehealth? Multiple questions could be skipped once a respondent has answered this question negatively.)

NBN vs other satellite services: This survey was primarily aimed at home not business services, so it is assumed satellite services were NBN and not mining grade satellite. The current satellite internet market has very few providers an cost differences are considerable. However, individual responses were checked for the final analysis to determine if any respondents have indicated they are using non-NBN satellite services. There are 3 respondents who claim to have satellite internet but did not say they had NBN satellite (i.e. Skymuster). This may indicate their use of another satellite provider or just an oversight when completing the survey. There are a number of cross referenced questions throughout the survey which have revealed other inaccuracies in survey responses. Future surveys should attempt to build internal integrity in such "If, then" questions.

Sample size: This report is based on the sample size of 283 for all graphs. However the survey was designed to allow respondents to choose which questions they responded to, that is, all questions were optional. Therefore there are a number of blanks responses to some of the questions. This may be due to the question not being relevant to the respondent or possibly "survey fatigue" (Egleston et al., 2013). In some cases, blanks have been omitted from the data set. The sample sizes for each graph (n values) are included in all graphs.

Figure 8 Telstra payphones are still used and required in remote communities.

Many people in remote Aboriginal communities do not have access to fixed voice or internet and use the payphones extensively. It is important that these phones are maintained and continue to be available to these very remote people as part of the Universal Service Obligation. It is a great relief the Regional Telecommunications Review has recommended these services be continued.

Demographics of respondents compared to the Australian population.

The distribution of respondents was similar to that of the Australian population (ABS, 2018) with the exception of the NT. The initial distribution of the survey was through the B4BA Network which consists of a range of state and national organisations but there may be more NT based members due to the B4BA being formed in the NT and many B4BA activates are also held in the NT. This may have contributed to an increased response rate from the NT. Additionally, the survey was distributed twice by the College of Indigenous Futures, Arts and Society with some staff spread across Australia and overseas. However, most of the staff are based in the NT and this may have also contributed to the additional proportion of responses from the NT. The distribution plan developed included a number of state based organisations (e.g. Aboriginal Medical Services Alliance NT, Kimberly Aboriginal Medical Services, Isolated Parents and Children's Association NT branch, Charles Darwin University, etc) but primarily comprised of mostly national organisations.

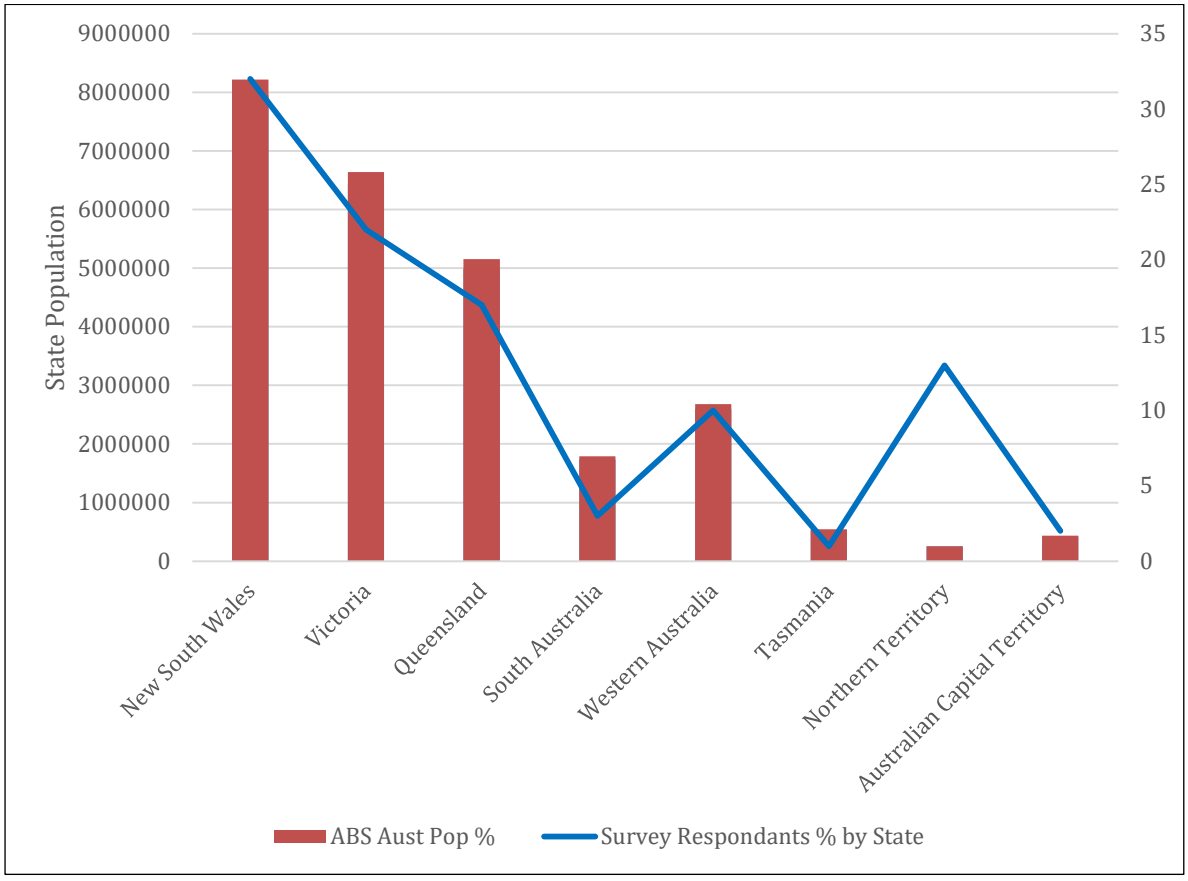

Figure 9. Distribution of respondents compared to the Australian population.

The distribution of respondents by state/territory compared to that of the Australian population (ABS, 2018). Note the increased percentage of respondents in the NT. This may be due to the initial distribution being done through the B4BA Network which has a number of key member organisations based in the NT.

Demographics of respondents including remoteness.

Question 1. Which State do you live in?

The distribution of respondents from each state or territory is indicated in the figure below. There is a larger than expected proportion of respondents from the NT (as discussed above). Of the NT respondents 10 indicated they were from the Urban/Capital City category and 17 were from the combined Rural/Regional/Remote (RRR) category (Regional 5, Rural 10 and Remote 12). As there was not a separate category in the survey for Very Remote, it is assumed that respondents that knew they were categorised as being Very Remote by the ABS Classification would have responded to this question as being Remote. Additionally, the 10 Urban/Capital City respondents from the NT are Outer Regional by the ABS Classification.

Given the population of the NT based on the 2006 Census was approximately 210,000 and with over 50% being defined as being Outer Regional, over 21% from the Remote and over 23% Very Remote (as defined by ABS) it would be expected that approximately half of respondents would be from the Urban/City category if they deemed themselves to be based in one of the major cities (Darwin and Palmerston). There are no areas in the NT defined by the ABS as being Major Cities or Inner Regional. Many Territorians are aware of the ABS classification and may have answered the question as being in the Rural or Regional category. In future research it may be useful to add ABS Classifications and ask respondents to identify which ABS Category they live in.

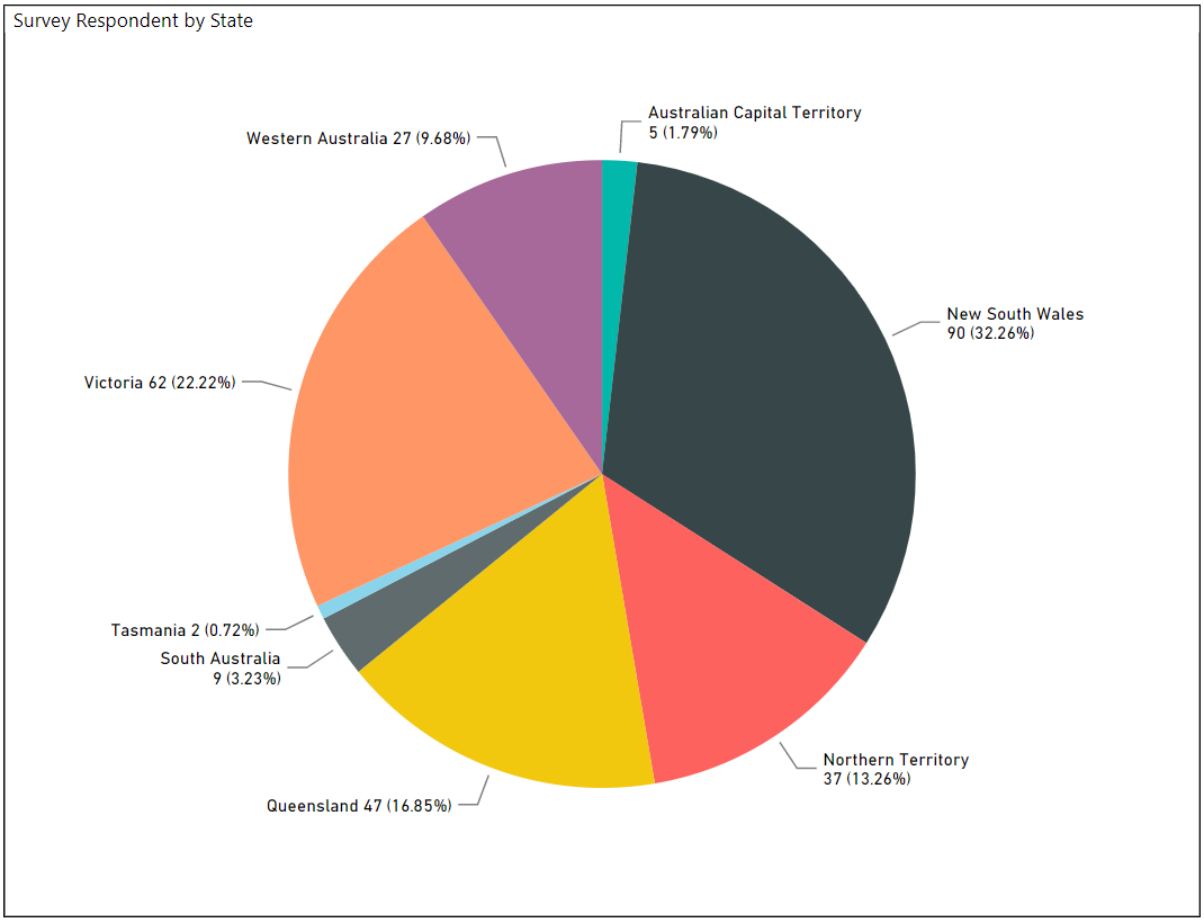

Figure 10. Distribution of survey respondents by state/territory, n = 283.

The distribution of survey participants by state, n = 279. Note that there is a disproportional response from the Northern Territory. This may be due to B4BA being initially based in the NT and many of the B4BA activities (including the 2018 Forum) were based in the NT.

People's perceptions of their remoteness.

Question 2. How would you best describe the area in which you live? (Options: Urban/Capital City; Capital City Fringe; Rural/Out of Town; Regional Area; Remote Area; Other (please specify).

Gaining an understanding of respondents' remoteness whilst maintaining their privacy meant the survey used a number of survey questions to gain a sense of individual respondent's remoteness. The graph below indicates the preponderance of respondents living in the RRR categories in Australia. There were 235 (83%) respondents from the RRR category and less than 17% identifying themselves as being from the Urban/Urban Fringe Category. The percentage of RRR is probably an underestimate as a number (10) identified themselves as being Urban/capital city. The assumption has been made that these people are from the Darwin area (capital city of the Northern Territory) and therefore would be classified as Outer Regional. B4BA is a rural, regional and remote based alliance of organisations and it is possible that respondents to this survey came predominantly from these locations and interest groups.

Note: For the remainder of this report Rural, Regional and Remote have often been combined and labelled RRR. Urban and Urban Fringe have been combined and referred to as urban.

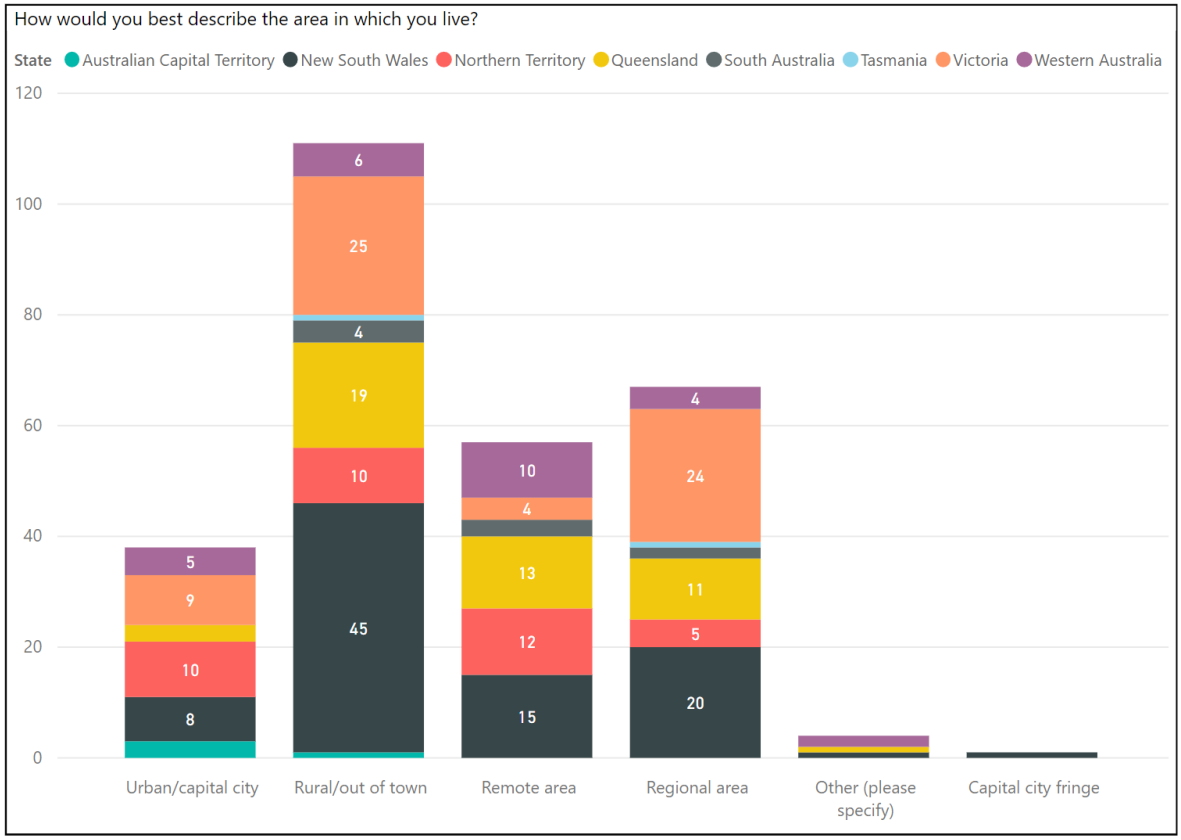

Figure 11. Survey respondents' perception of their remoteness, n = 278.

A large percentage (83%) of the total survey respondents (283) identified themselves as being either Rural/out of town, Regional or Remote (RRR). These 3 categories have been combined and referred to as RRR. Less than 17% of respondents identified themselves as being Urban/capital city or capital city fringe. We combined Urban/capital city and Capital city fringe were combined throughout this document and are referred to as Urban.

Distance to nearest centre.

Question 3. Do you live near: (Range of options based on the size of the nearest city/town/community)?

From the graph below, it can be seen that RRR people live in varying distances from the nearest city, town or community. Respondents live in various localities from major cities (e.g. over 200,000 people), cities (with between 100,000 and 200,000 people such as Darwin) and many respondents living near smaller communities down to a size of under 30 people.

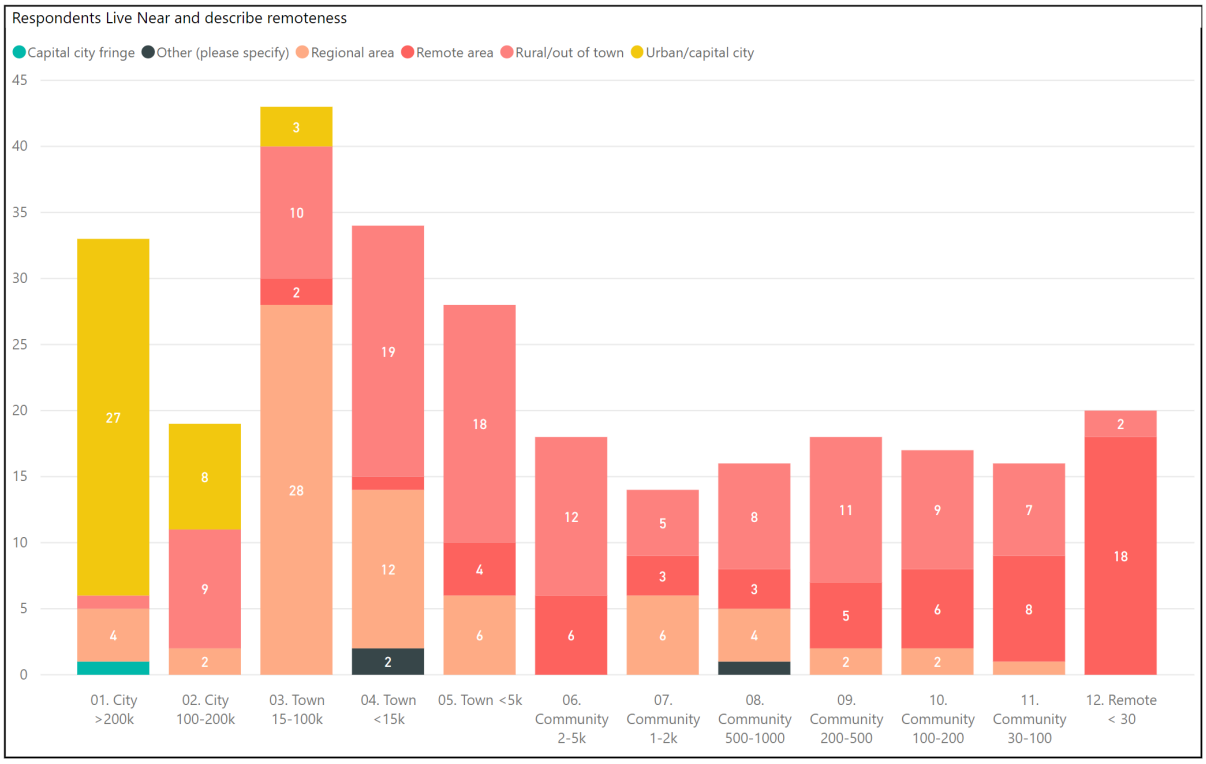

Figure 12. Distance from nearest city, town or community.

This graph cross matches remoteness with distance from city town or community. It validates respondents' answers showing Urban respondents living near cities and a gradual reduction of Regional respondents as the community sizes reduce, n = 276.

Distance from Major Centre.

Question 4. How far are you away from a major centre that has most of the services you need.

More than half (54 %) of survey respondents live more than 50 kms from a major centre. Some of these people may have identified themselves as being Regional or Rural. Eighteen respondents identified as being greater than 500 kms from a major centre with one of these identifying as being from a regional area and another as being Rural/out of town.

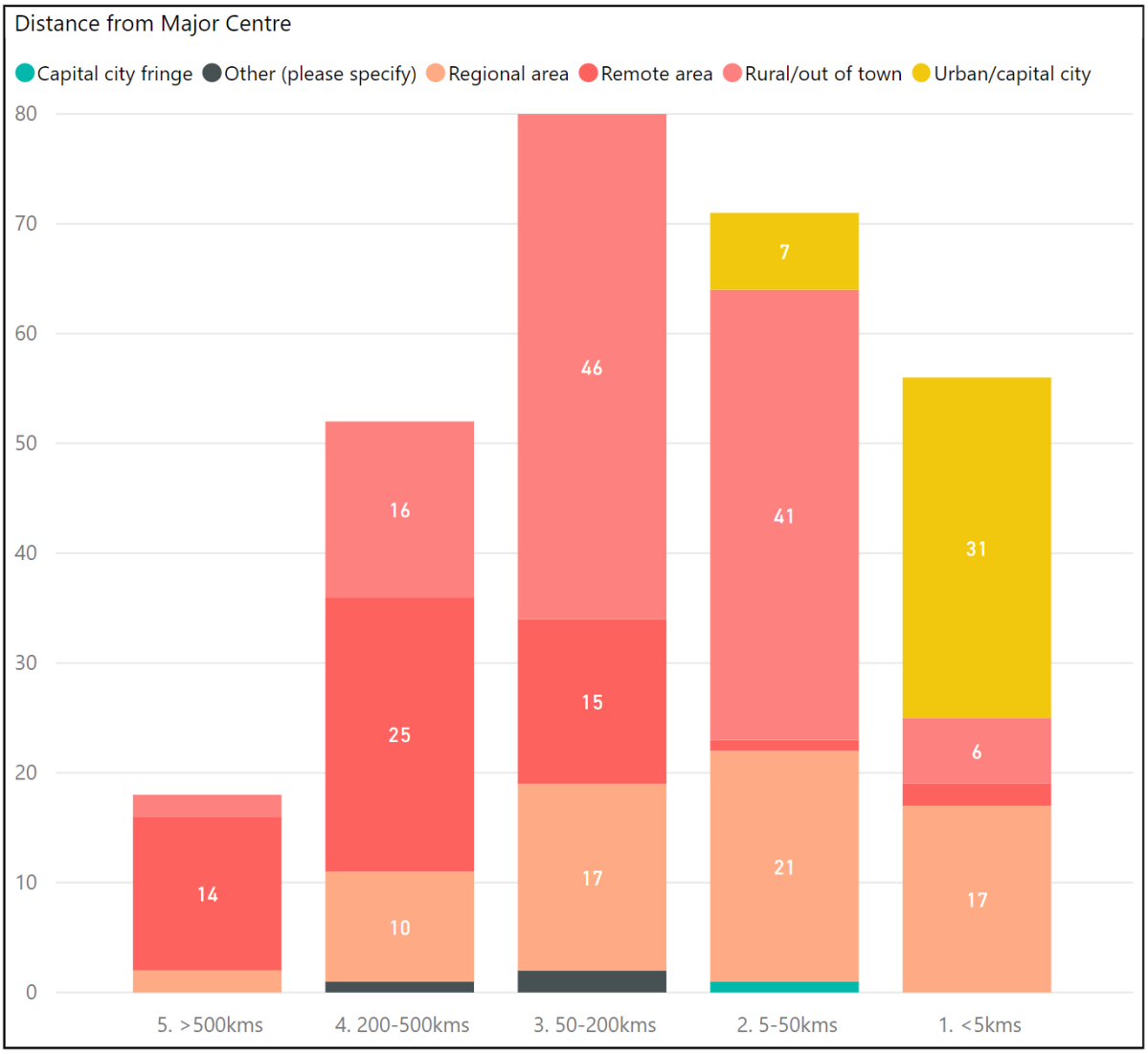

Figure 13. Distance from major centre.

More than 54% of respondents were located greater than 50 kms from the nearest major centre and 25% greater than 200 kms. Eighteen respondents identified as being greater than 500 kms from a major centre, n = 277.

About internet and telecommunications services.

Which telecommunications services are used.

Question 5. Which, if any of the following types of telecommunications services do you have?

A large proportion of survey respondents are from the RRR categories (83%) and only 25% use satellite services. Given the NBN satellite services are reported to be more stable in the last 18 months it is surprising that more RRR do not use satellite services. This may point to the lack of consumer knowledge regarding the availability and performance of NBN

SkyMuster satellite in the remote parts of Australia. Additionally, the survey did not differentiate between fixed landline or radio phone (ie HCRC). In future work, these two voice services should be differentiated.

There is anecdotal evidence to suggest that satellite internet is being deployed at sites that could access Fixed Wireless. Further investigation comparing type of internet access (e.g. how many respondents had access to Fixed Wireless or Satellite) for those respondents between 5 and 50 kms from a major centre may show if satellite is being deployed in areas where fixed wireless would be the preferred option. It is estimated that most of the respondents from greater than 50 kms from a major centre would be using satellite, fixed wireless or mobile internet.

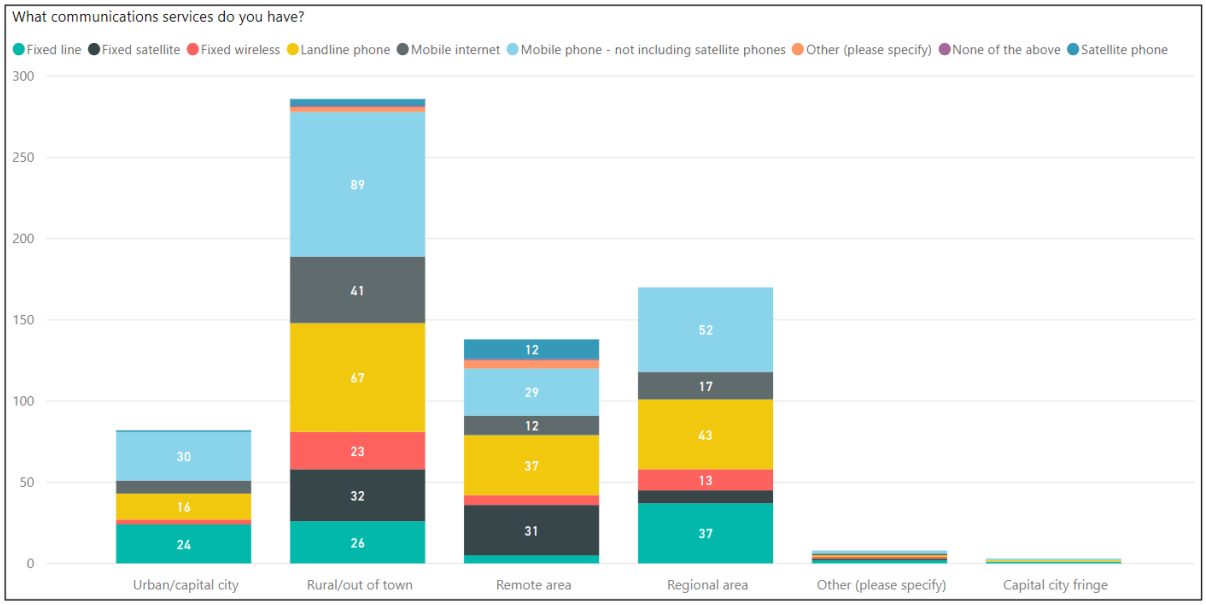

Figure 14. Types of telecommunications used.

This graph describes internet connectivity of survey respondents from different regional areas have, n = 279. It is possible that some respondents use fixed satellite internet as well as a satellite phone.

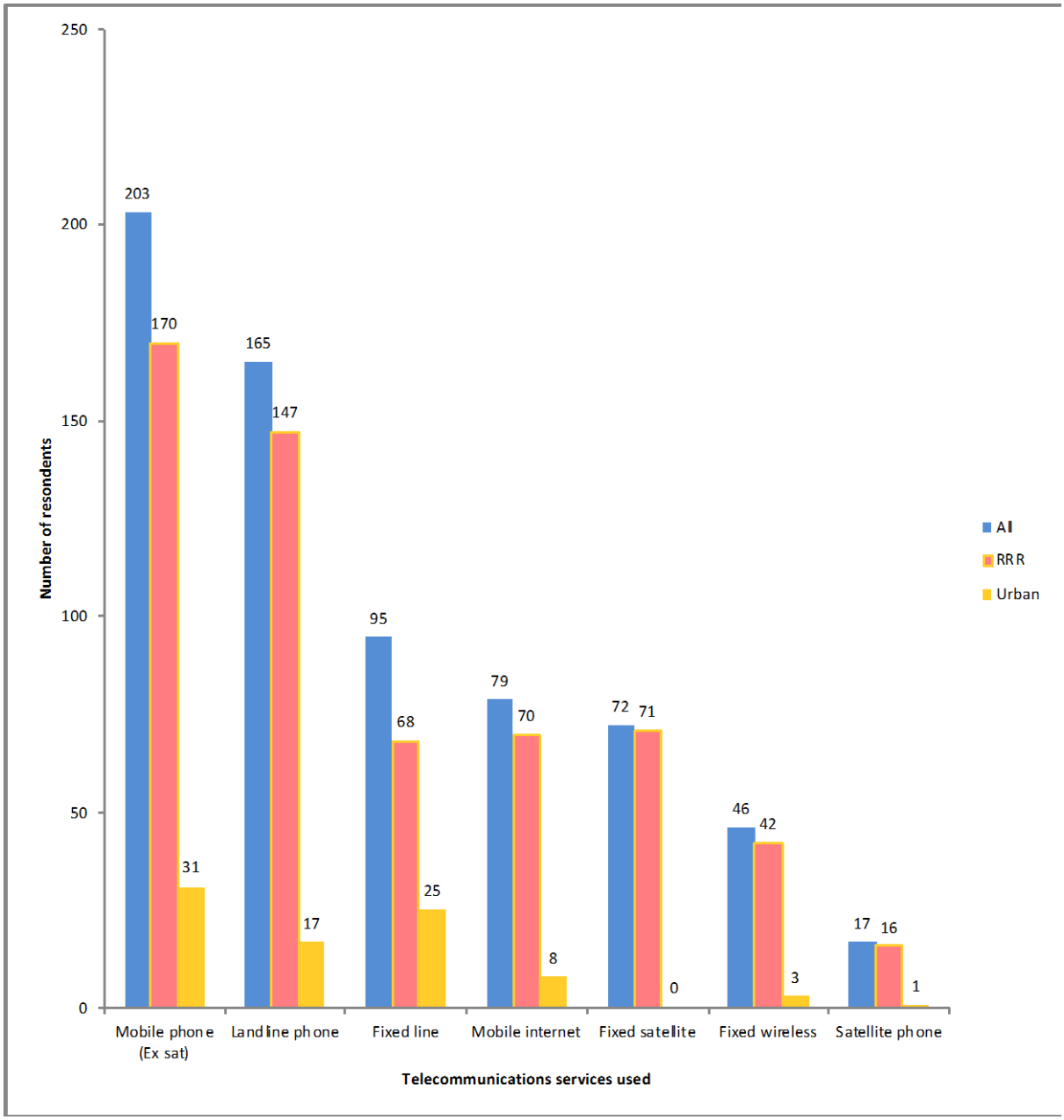

Figure 15. Summary telecommunications used.

Telecommunications services not currently accessed but urgently needed.

Question 6. What telecommunications services do you currently not have but most urgently need?

Mobile phone (excluding satellite phone), fixed line and fixed wireless services are the primary telecommunications services needed by RRR. Urban respondents indicated they did not need additional services. Generally, The figure below indicates consumers' lack of intent to pursue access to satellite services, with only 3.5% of respondents indicated they need satellite services. These data also suggest potential improvement in the survey question. The question could have been expanded to include: 1) My internet access is satisfactory and meets my requirements; and 2) There are no internet services in my area that would satisfy my requirements. There are a number of people (27) in the RRR category that indicate they wish to access fixed wireless. There are 32 people in the RRR category wanting access to mobile phone service. Fixed line service has been identified as a need by 29 people in the RRR category.

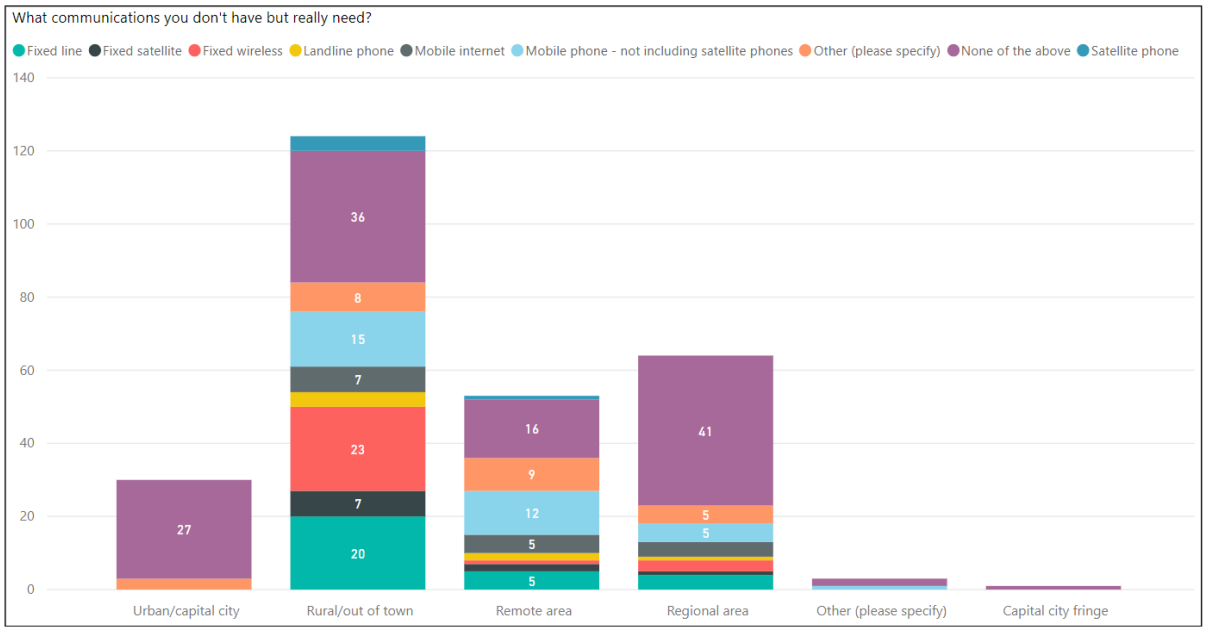

Figure 16. Telecommunications services most urgently needed.

This figure indicates there are a range of services that people believe they need access, n = 279.

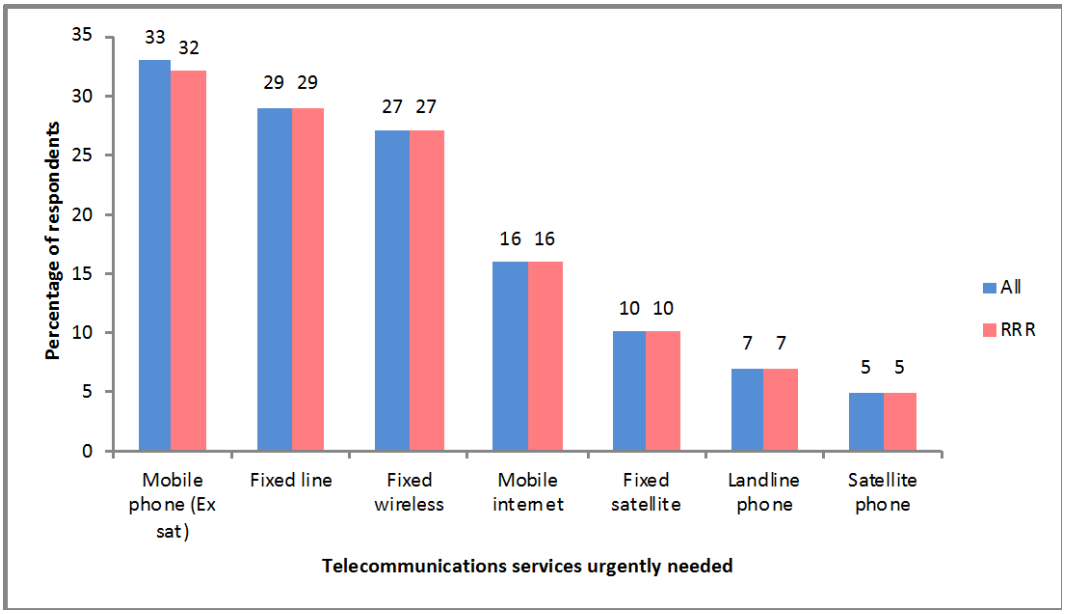

Figure 17. Telecommunications most urgently needed by RRR.

Importance of services.

Question 7. For each of the following services, please indicate how important it is for you to have them available in your home:

- Fixed phone (eg landline or VoIP).
- Fixed internet (eg ADSL, NBN).
- Mobile phone service.
- Mobile internet using dongle or 3G/4G modem.
- Satellite service.
- Pay TV.

Importance of Fixed Internet.

It is clear from the graph below most respondents indicated fixed internet is a critical component of their communication needs: Fixed internet is seen as an important service to access with 223 respondents answering this question: 84% of all respondents consider fixed internet as important or very imported and 82% of RRR respondents indicated that fixed internet was important or very important.

Note: In the remainder of this report the Very important (5) category and the Important (4) categories or similar (eg Very affordable, affordable) have been combined. Similarly, the Not very important (2) category and Not important at all (1) categories (and similar) are combined. These are referred to as "important", "affordable", "not important", "not affordable, etc.

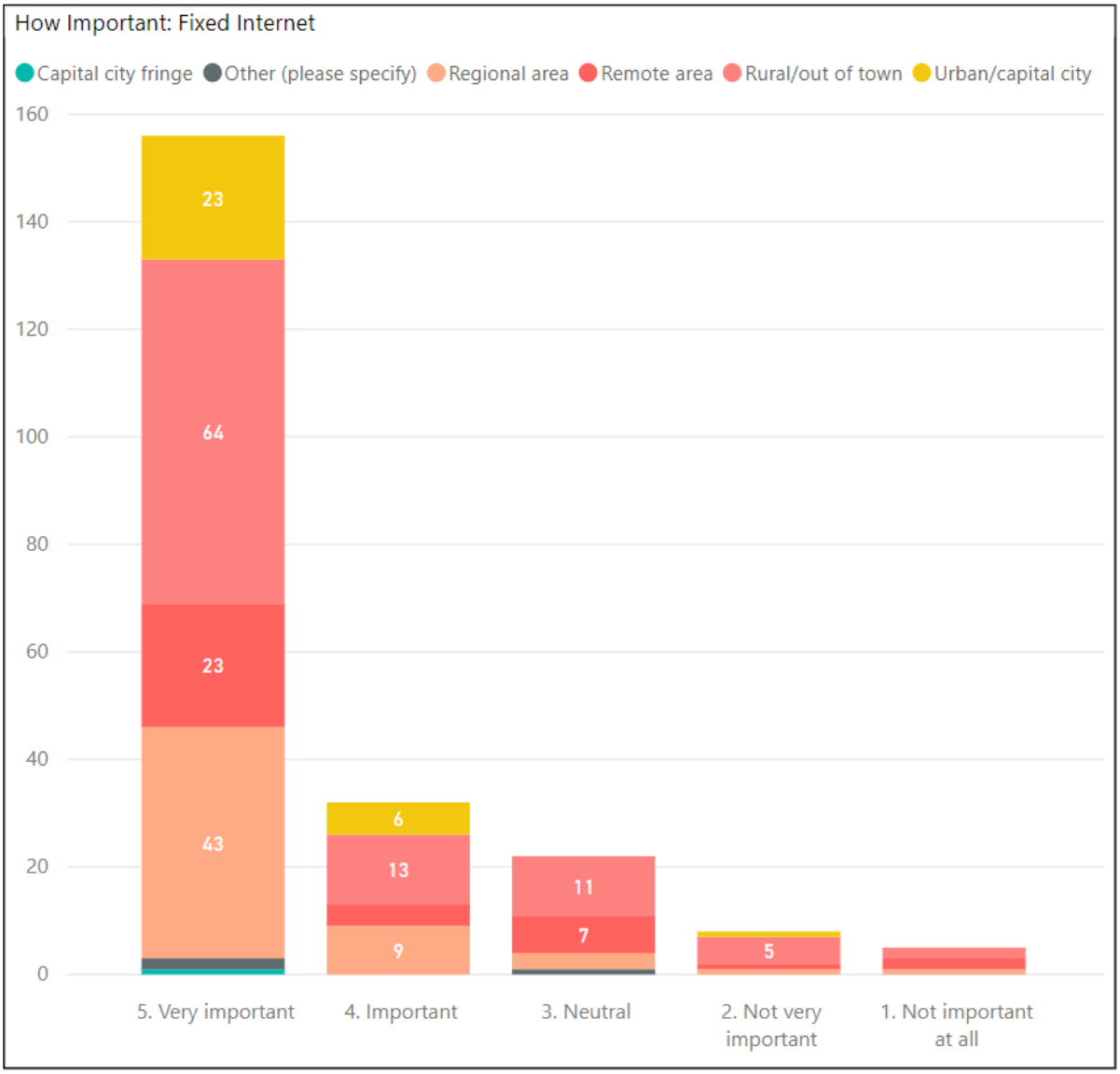

Figure 18. Importance of fixed internet.

A large proportion (84%) of all respondents and a large proportion of of RRR (82%) respondents report that Fixed internet is important, n = 223.

Importance of mobile phone.

It is clear from the graph below, most respondents (including RRR's) felt the mobile phone is a critical component of their communication needs, with 79% indicating that mobile phone services are very important and 19% felt they are important and only one survey respondent felt they were not very important. This may indicate mobile phone service in Australia has become more important than fixed line phones. All 30 Urban respondents indicated that mobile phone was either important or very important. That is, 98% of respondents indicated mobile phone was important or very important. 227 people responded to this question.

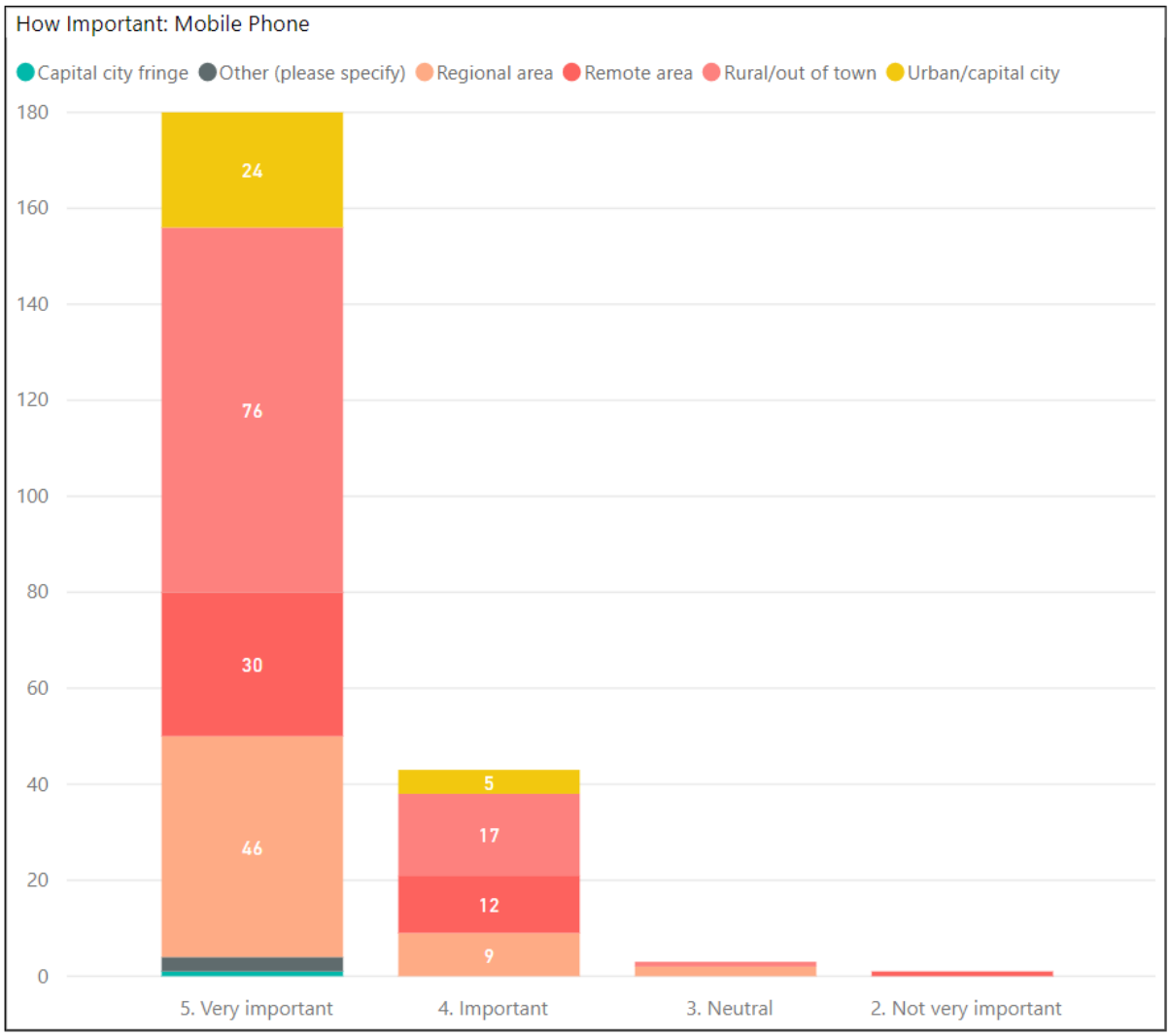

Figure 19. Importance of mobile phone.

Most survey respondents (98%) have indicated that mobile phone is important or very important, n = 227.

Importance of fixed phone.
Fixed phone services seem to be less important to Urban respondents, with 215 people responding to this question. More than half (62%) of RRR indicated that a fixed phone services is important with 28% indicating that the service is not important. Similarly, more than half (66%) of Urban respondents indicated that a fixed phone was not important.

As the survey did not different between fixed landline and High Capacity Radio Concentrator (HCRC, ie radio phone) it may be that some remote respondents have included radio phones as a fixed phone service. In future surveys it would be useful to separate fixed landline phone services from radio phones. It may have also been useful to look at the importance of satellite phone to remote people or people that work in remote areas.

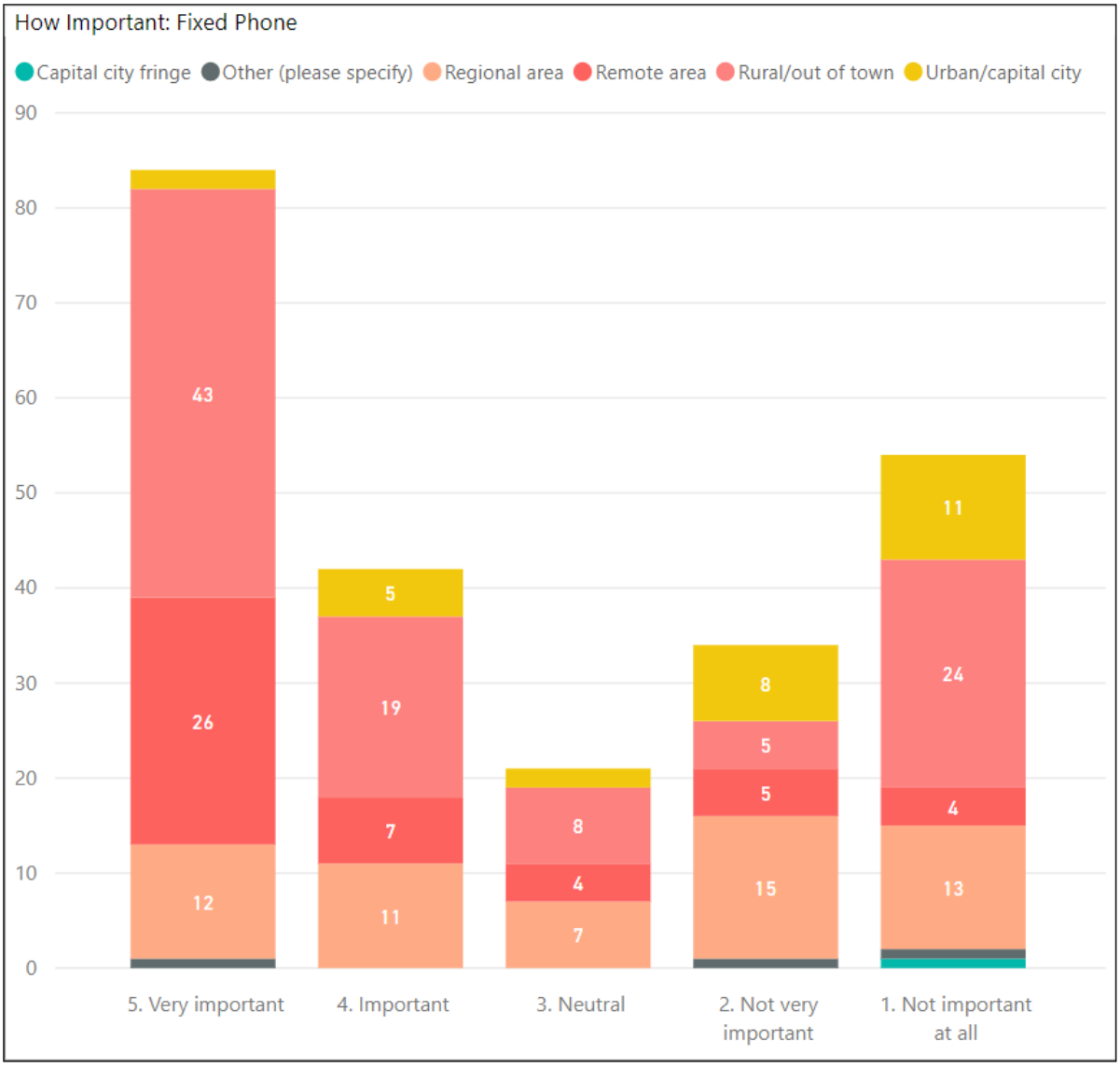

Figure 20. Importance of fixed phone.

Fixed phone services are important particularly for RRR, n =215.

Importance of pay television.
There were 205 responses to this question, 25% neutral and 55% of respondents reported pay TV was not important to them. Pay TV seems to be regarded as a "like to have" but not a priority for survey respondents. Given the competition from streaming media via internet, pay television services may be experiencing difficulty in maintaining a market share in the entertainment sector. Responses seem to be consistent across RRR and Urban categories.

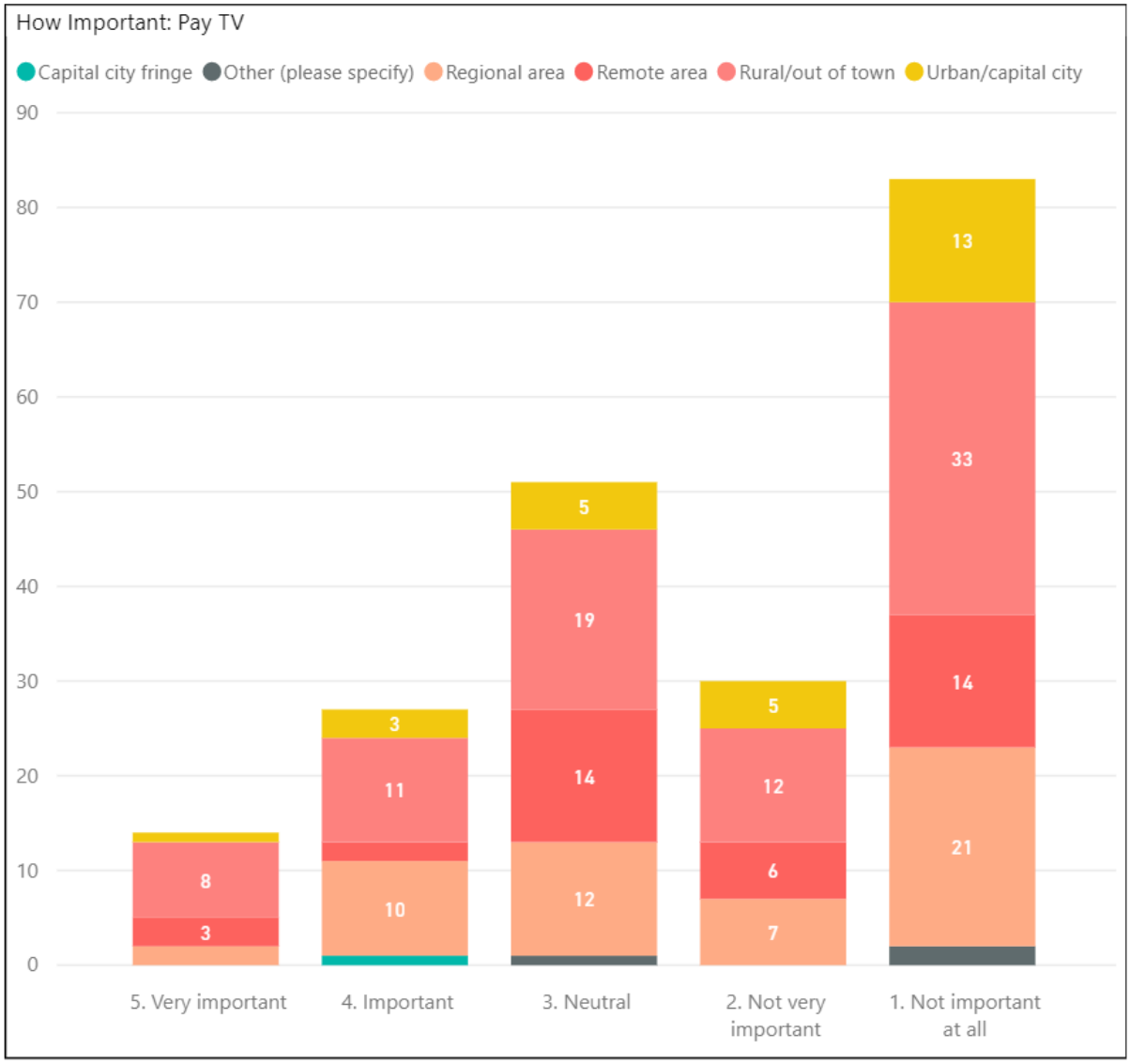

Figure 21. Importance of Pay TV.

Only 20% of respondents reported that Pay TV was important to them, n = 205. Pay TV may be reducing in importance due to availability of entertainment through streaming services.

Importance of satellite service.

There are some RRR respondents who indicated satellite service is very important but others do not with 193 responses to this question. This may be a reflection of their previous experience with other satellite services (including the nbn interim service) and a lack of awareness of improved SkyMuster service quality. 31% of respondents thought satellite internet is very important but 30% thought it was not important at all and 22% were neutral. 82% of Urban people reported that satellite was not important or important at all, 100% of Urban respondents regarded satellite as neutral or not important. 37% of RRR said that it was important and 41% indicated it was not very important or not very important at all.

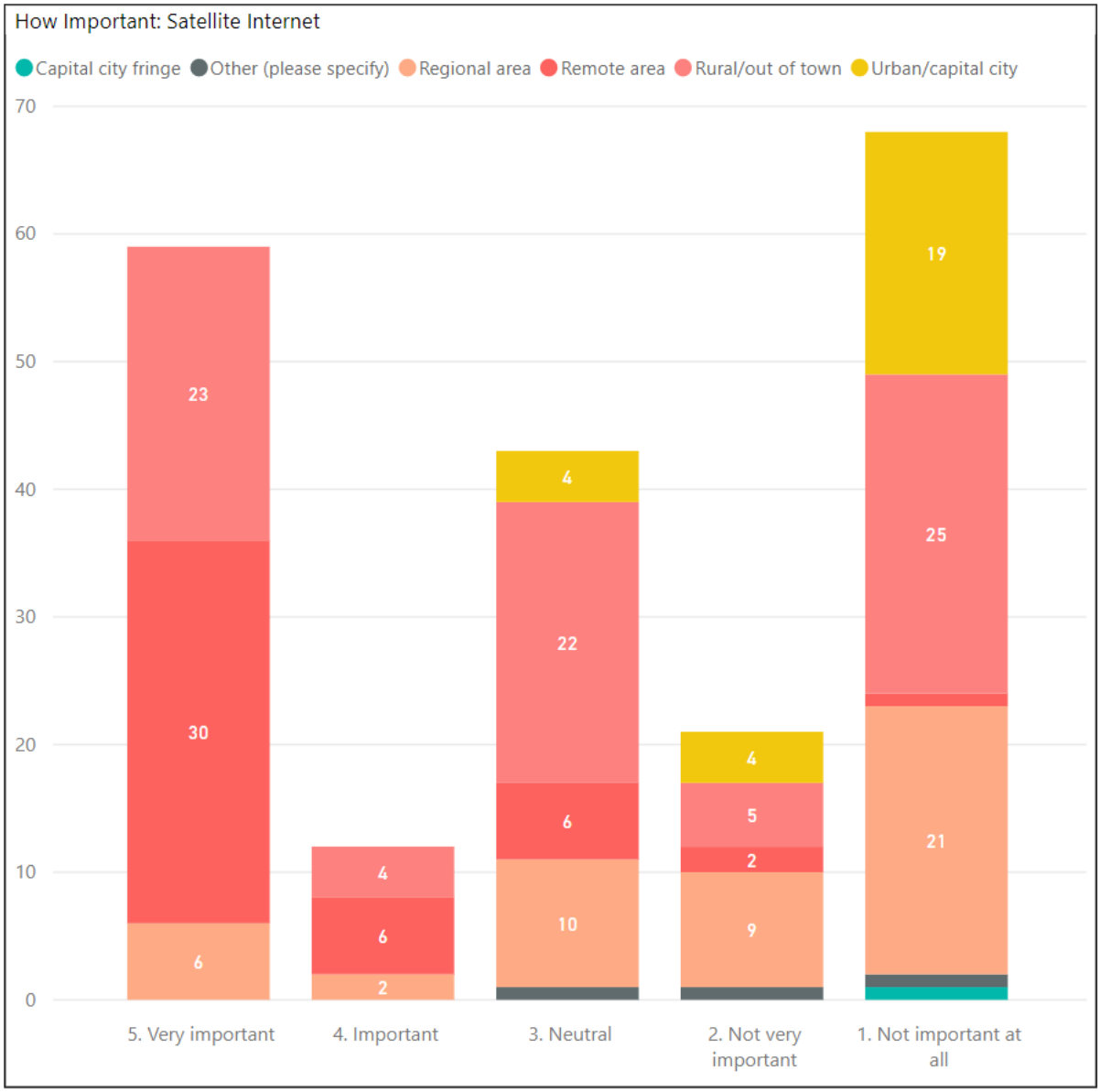

Figure 22. Importance of Satellite Internet.

Of the RRR (37%) said that satellite internet was important and 41% indicated it was not very important or not very important at all, n=193.

Importance of internet by phone

With 231 people responding to this question, 74% felt internet by phone was important with 79% Urban and 73% RRR reporting internet by mobile was important. 12% of RRR respondents indicated that internet by phone was not important which may be a reflection of the lack of access to mobile services.

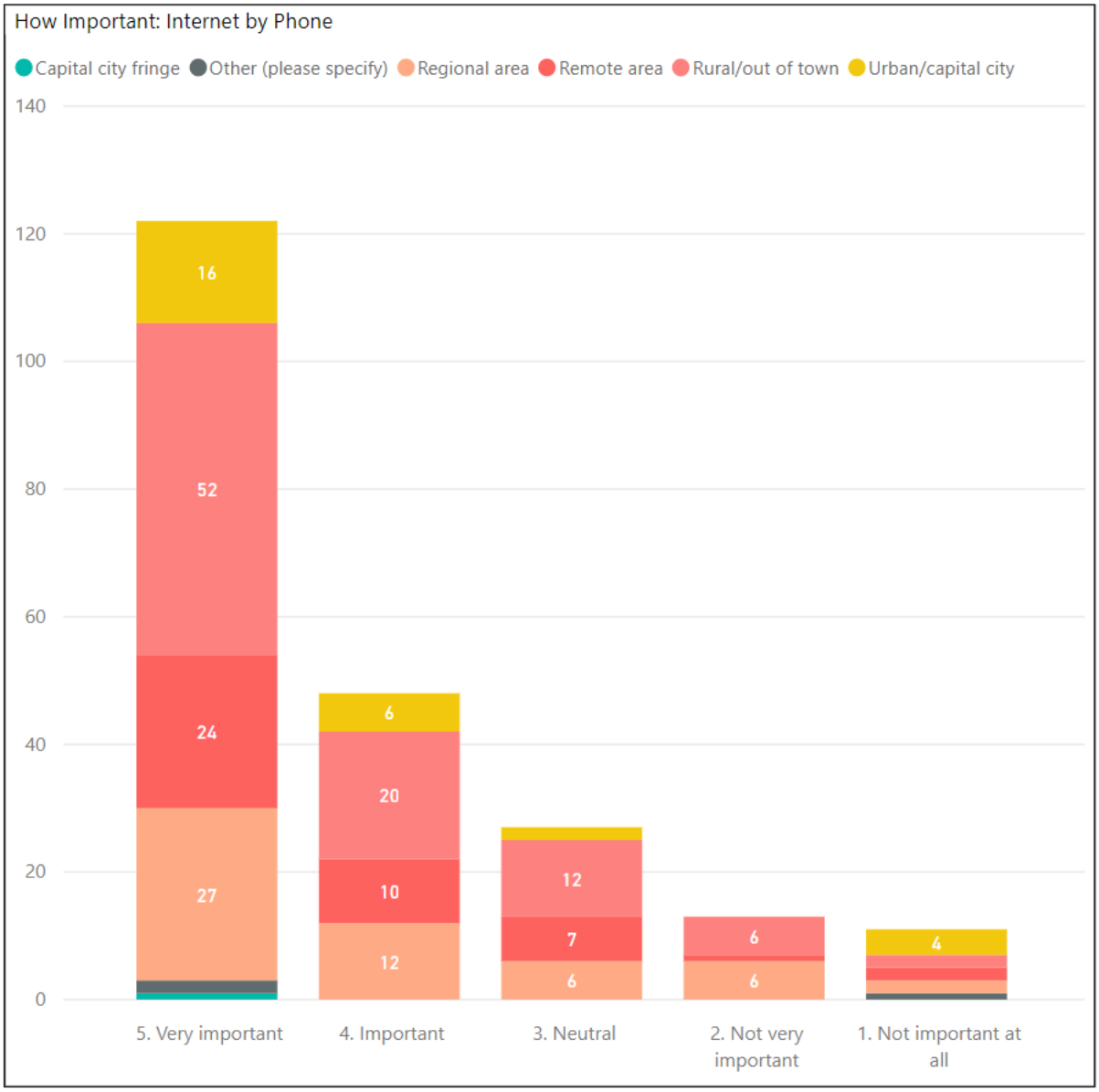

Figure 23. Importance of internet by phone.

Mobile internet by phone is important with 73% RRR and 79% Urban indicating that accessing internet by mobile phone is important, n = 231.

Importance of mobile internet by modem.
With 215 responses to this question, 57% indicated mobile internet by modem was important and 26% reported it as not important. Of the 30 urban respondents to this question, 23% felt mobile internet by modem was important and 43% felt it was not important: Of the RRR responses 63% indicated it was important and 23% not important. Overall, 17% of respondents indicated a neutral response.

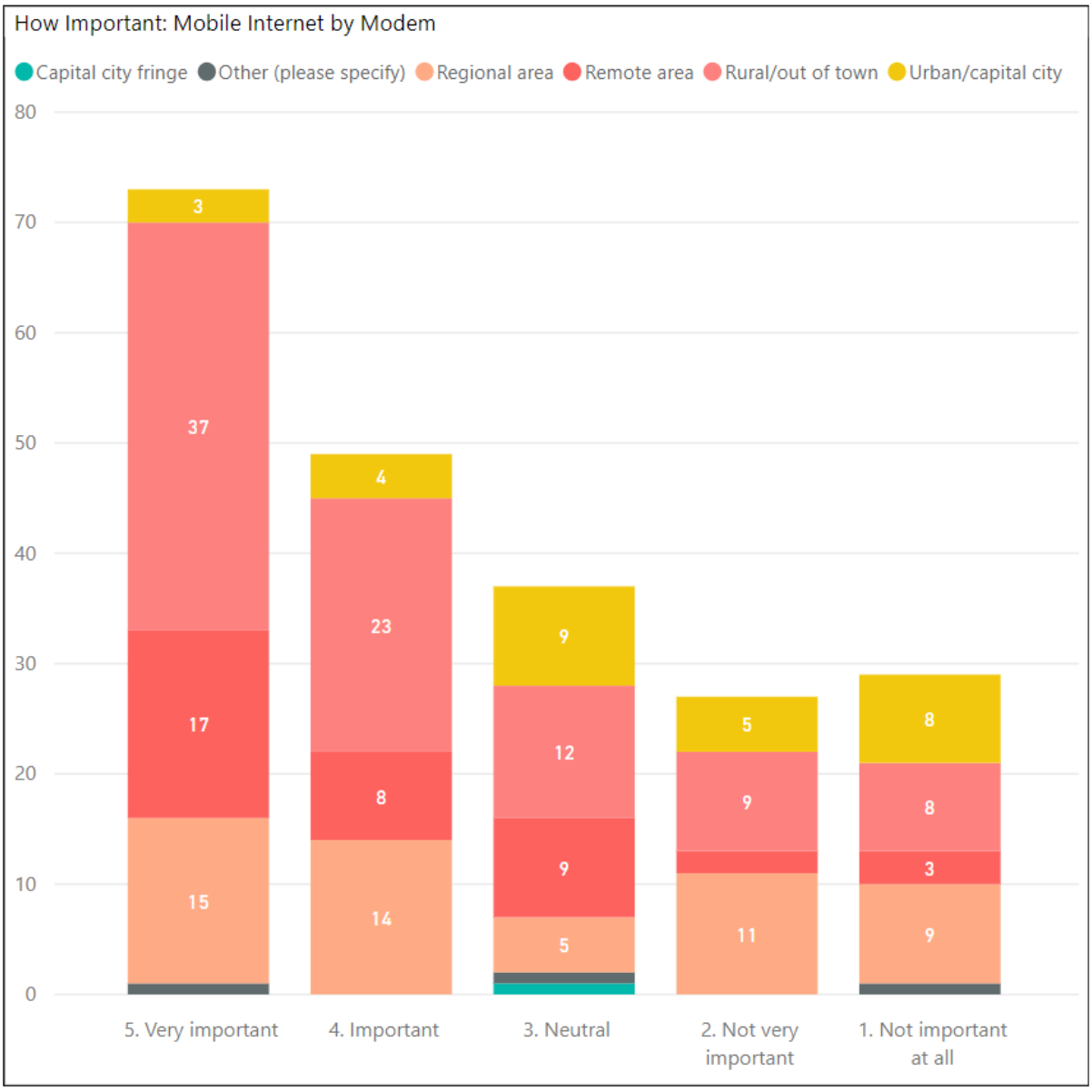

Figure 24. Importance of mobile internet by modem.

More than half of survey respondents (57%) indicated that mobile internet by modem was important, and a slightly higher proportion (63%) of RRR indicated it was important, n = 215.

Summary of importance of telecommunications services.

Important services: Mobile phone and fixed internet are considered important by all. There are differences between RRR and Urban for fixed phone services and internet by modem where RRR consider these services more important than their urban counterparts.

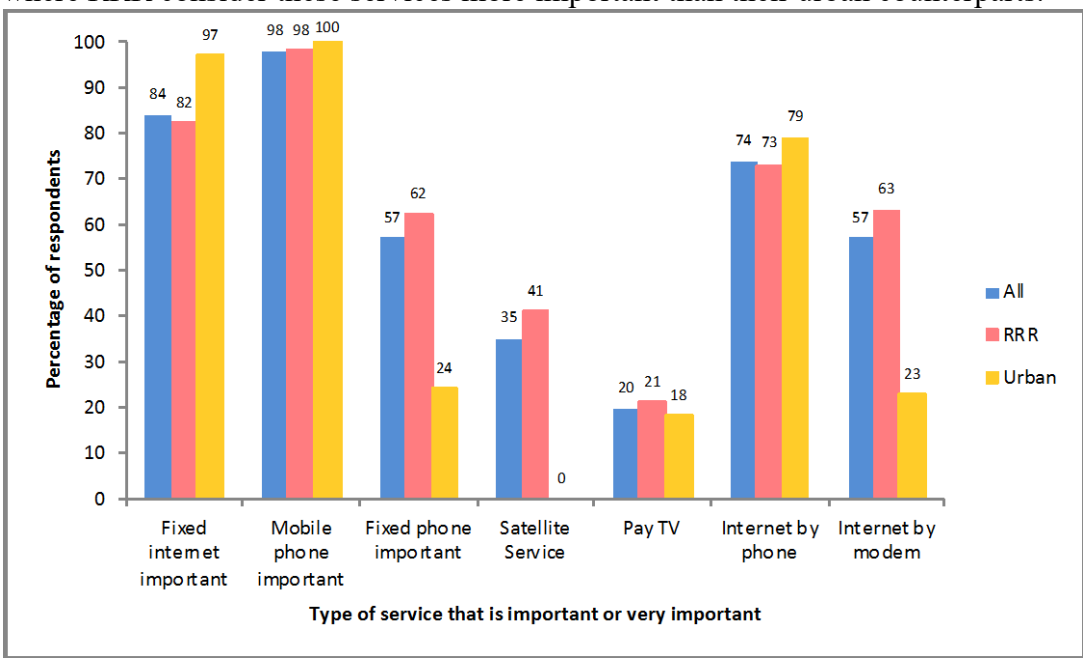

Figure 25. Summary of service importance.

Mobile phone and fixed internet are reported as the most important services. RRR consider fixed phone services more important than their urban counterparts.

Not Important services: Urban people generally indicated that services were less important to them – possibly due to the availability of a variety of services in urban areas. Satellite (as expected), fixed phone and Pay TV are considered less important by Urban.

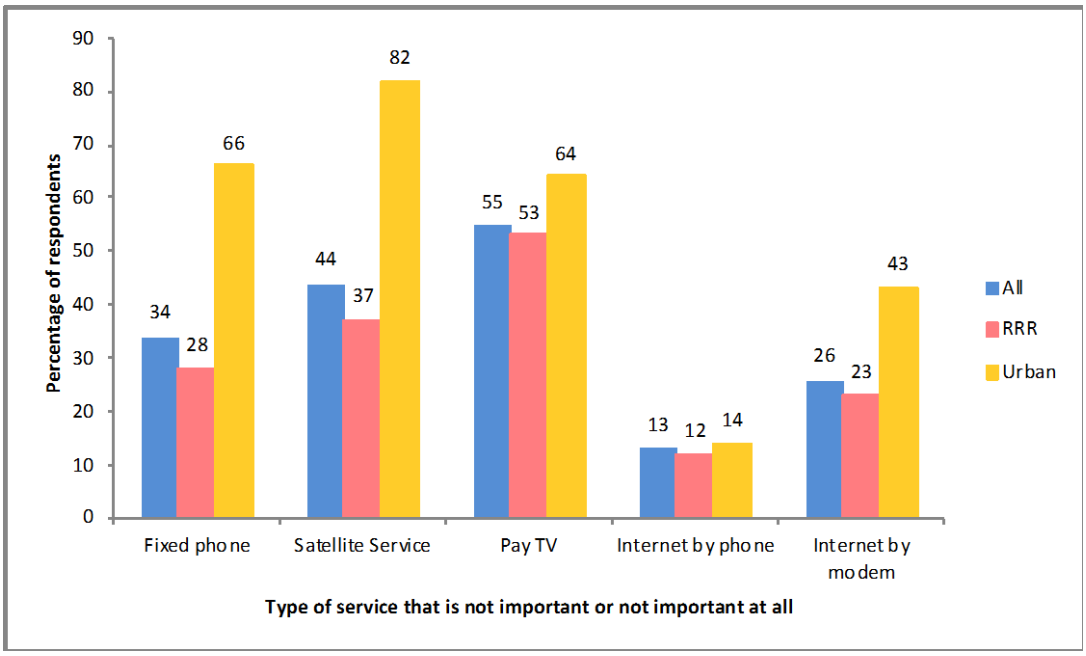

Figure 26. Summary of services not considered important.

Urban people generally indicated that services were less important to them – possibly due to the availability of a variety of services in urban areas.

Reliability of services

Question 8. For each of the following services, please indicate how reliable it is in your home:

- Fixed phone (eg landline or VoIP).
- Fixed internet (eg ADSL, NBN).
- Mobile phone service.
- Mobile internet using dongle or 3G/4G modem.
- Satellite service.
- Pay TV.

Reliability of Fixed internet.

Of the 29 urban respondents, 86% reported fixed internet was reliable. Of the 155 RRR responses, 40% of respondents reported it as reliable and 36% indicated fixed internet was not reliable. There were 186 people who responded to this question.

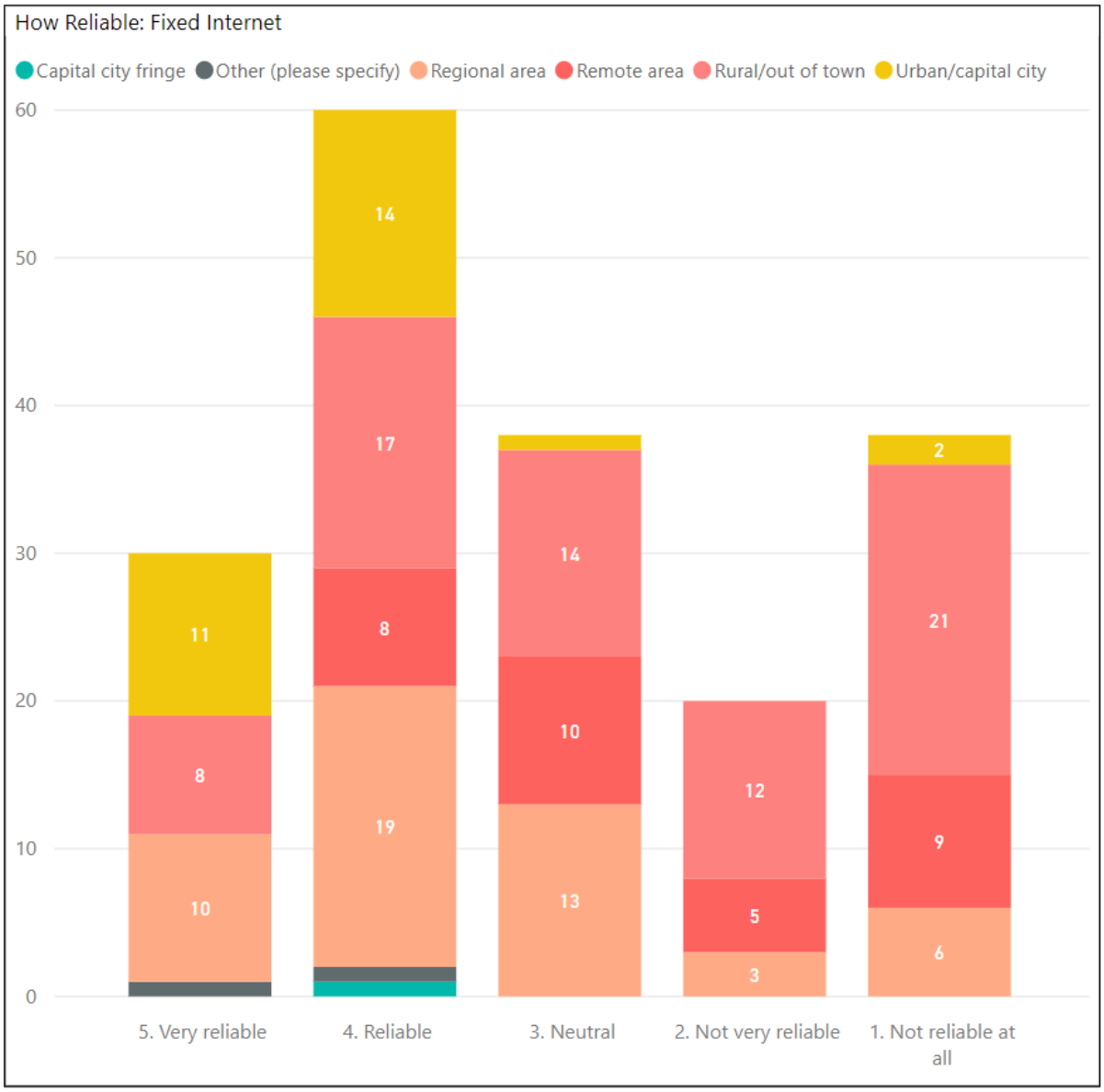

Figure 27. Reliability of Fixed internet.

Most Urban respondents (86%) reported fixed internet was reliable, however, less than half (40%) of RRR respondents reported it was reliable, n = 186, with 155 RRR respondents.

Reliability of fixed phone.
Overall, more than half of respondents (64%) indicated fixed phones were reliable and 18% of respondents indicated that fixed phones were not reliable. There were similar responses from the Urban and RRR categories, with Urban reporting 57% reliable and 17% unreliable and RRR 65% reliable and 17% unreliable: 215 people responded to this question.

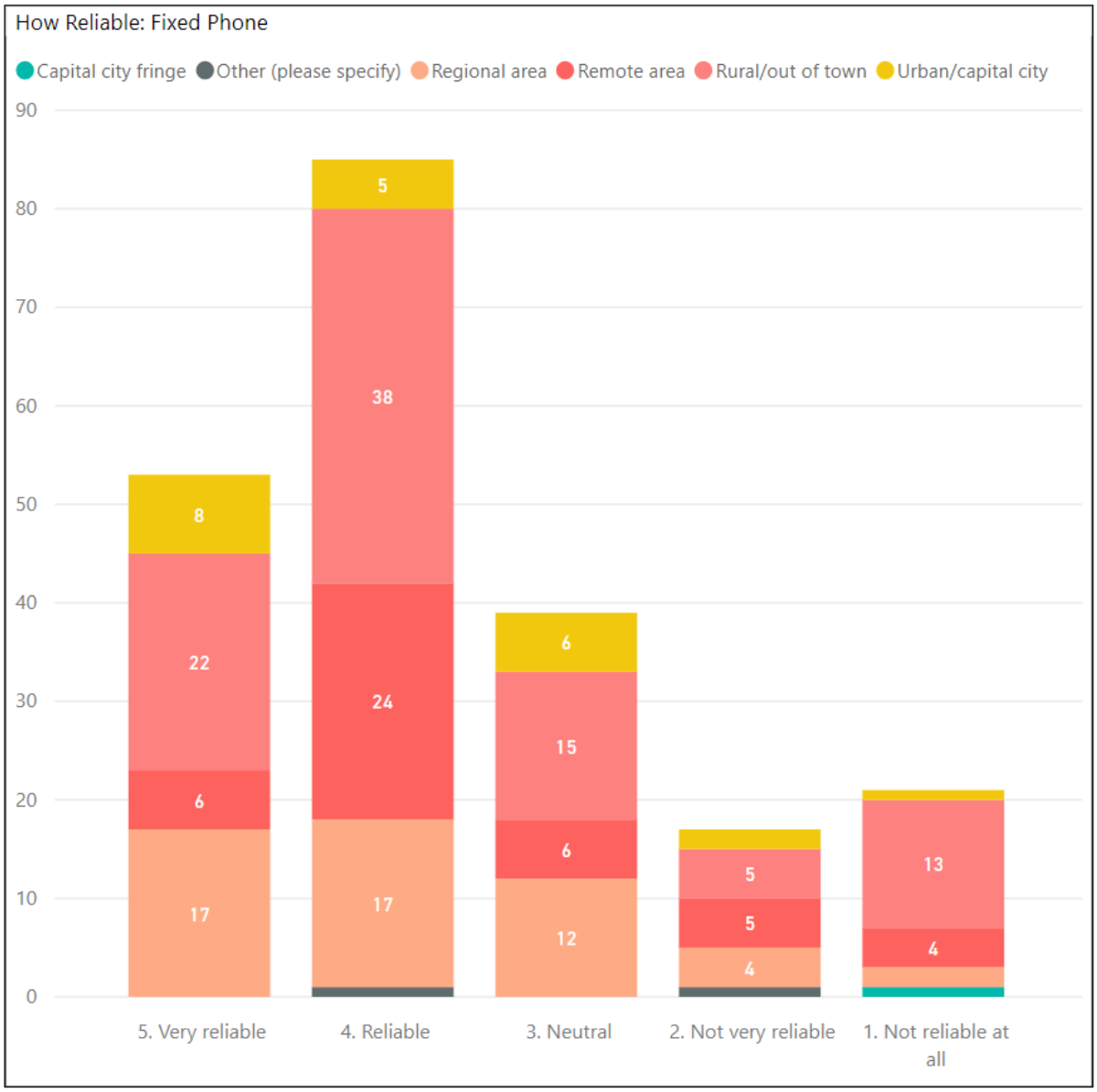

Figure 28. Reliability of fixed phone.

More than half of respondents (64%) indicated fixed phones were reliable and 18% of respondents indicated that fixed phones were not reliable, n = 215. Responses from Urban and RRR were similar.

Reliability of internet by phone.
For all respondents 39% reported internet by phone was reliable and 39% not reliable with 22% responding neutrally. Of the 25 urban respondents 20 (ie 80%) indicated internet by phone was reliable and none indicated internet by phone was not reliable. However, there were differences between RRR and Urban categories. Of the 174 RRR respondents, 34% indicated internet by phone was reliable and 44% indicated internet by phone was not reliable. There were 201 respondents to this question. Internet by mobile phone data reliability may be related to reception at home and this may vary in RRR areas.

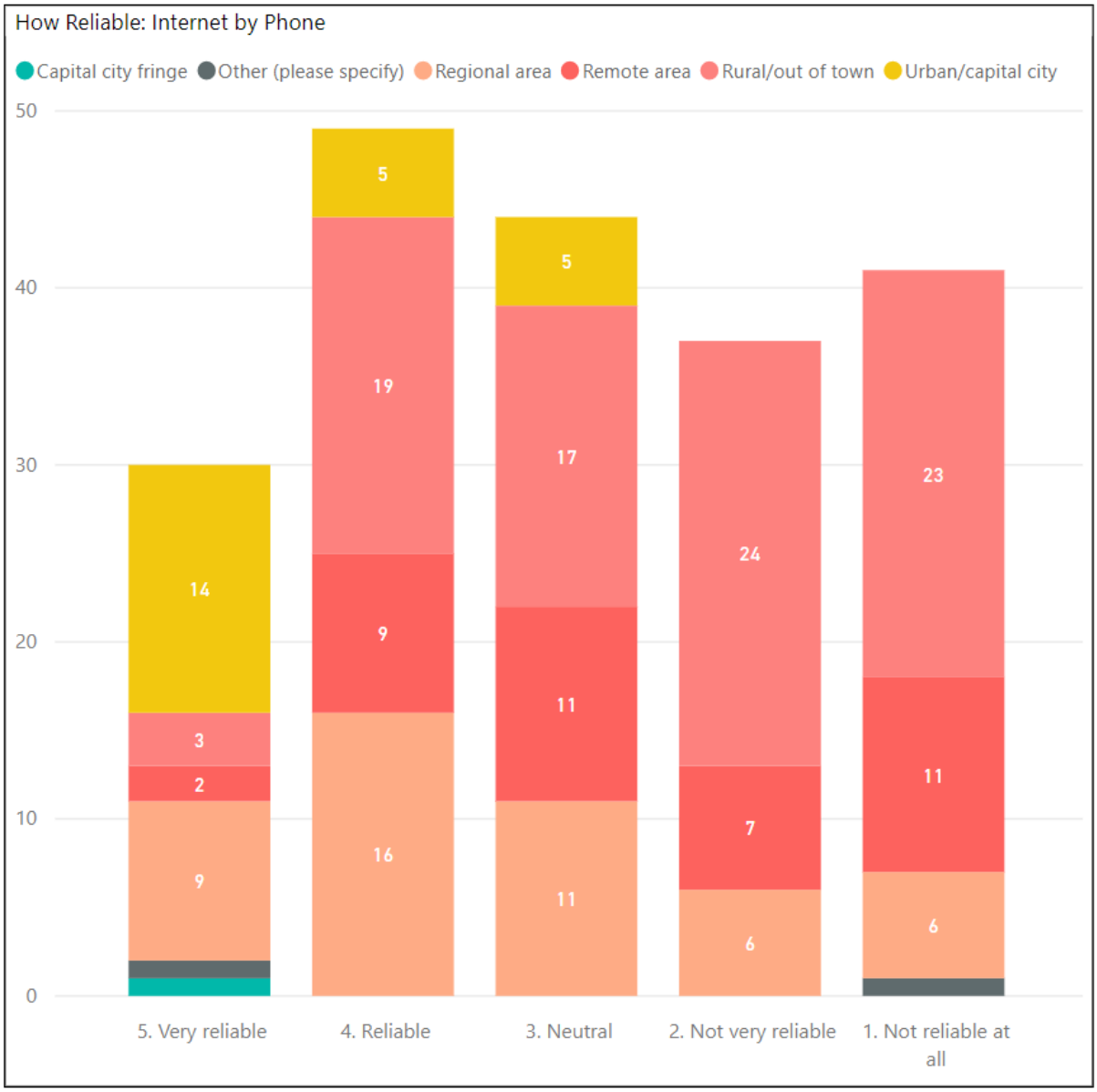

Figure 29. Reliability of internet by phone.

There were differences between Urban and RRR categories in their responses regarding reliability of internet by phone, n = 201. Most urban respondents (80%) reported that internet by phone was reliable and none indicated it was not reliable. However, 34% RRR respondents indicated it was reliable and 44% indicated internet by phone was not reliable.

Reliability of mobile internet using modem.
There were 178 responses to this question and 156 of these were from RRR locations. Approximately a quarter of respondents (26%) indicated that mobile internet by modem was reliable, and 40% unreliable. Almost half (45%) of RRR respondents indicated mobile internet by modem was not reliable and 23% of RRR respondents reported mobile internet by modem was reliable. Of the 20 Urban respondents to this question, 45% indicated mobile internet by modem was reliable and none indicated mobile internet using modem was not reliable. There is a trend for internet by mobile modem to be reliable in urban areas and varied for RRR areas. This is similar to mobile phone and may be associated with mobile phone services varying on RRR areas.

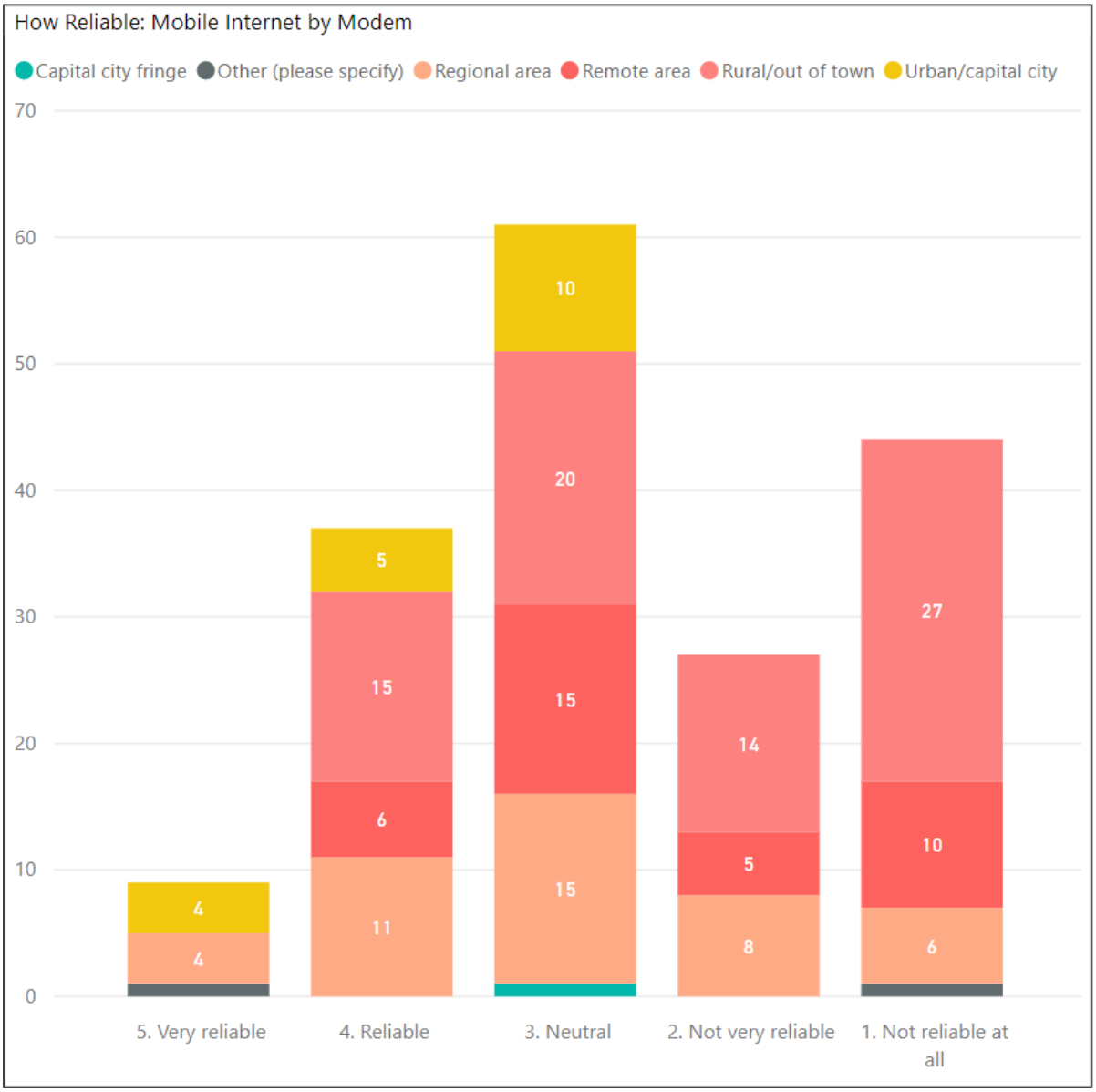

Figure 30. Reliability of mobile internet using modem.

Approximately a quarter of respondents (26%) of respondents indicated that mobile internet by modem was reliable, n = 156. Almost half (45%) of RRR respondents indicated mobile internet by modem was not reliable. Of the 20 Urban, 45% indicated mobile internet by modem was reliable and none indicated mobile internet using modem was not reliable at all.

Reliability of mobile phone.
There were 219 responses to this question. Overall, 48% of respondents indicated the mobile services were reliable and 36% unreliable with 16% responded neutrally. Of the 28 Urban respondents, 86% indicated mobile phone services were reliable, and no Urban respondents indicated that it was unreliable. Of the 188 RRR respondents to this question, 42% indicated mobile phone services were reliable and 41% indicated mobile phone services were not reliable. There is a trend for mobile phone services seem to be perceived as reliable in urban areas and the RRR experience is varied.

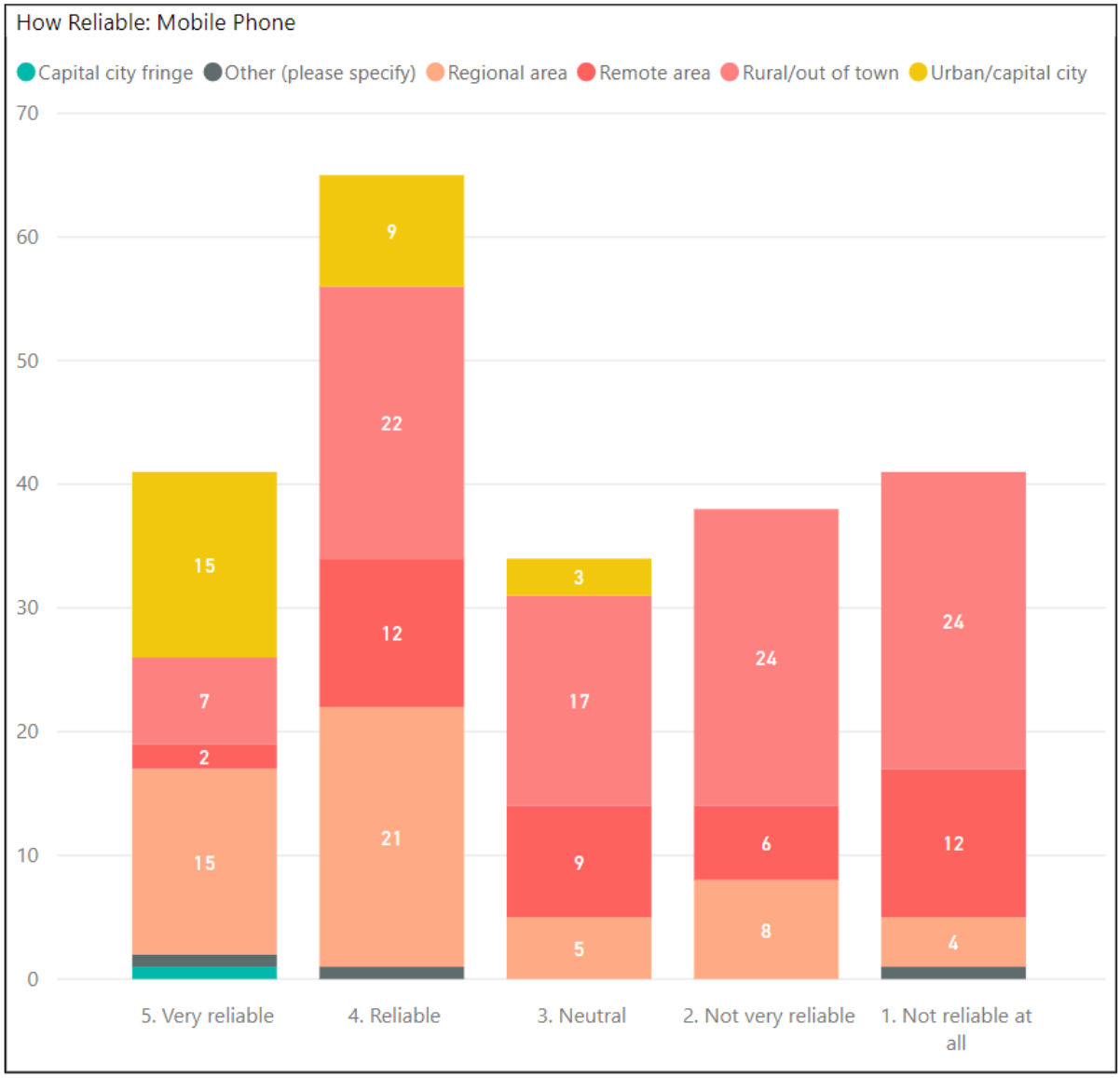

Figure 31. Reliability of mobile phone.

Mobile phone services seem to be perceived as reliable in urban areas (86%) and the RRR experience is varied (42% reliable, 41% unreliable), n = 219.

Reliability of satellite internet.
With 161 respondents, 31% of respondents reported satellite internet was reliable and 29% of respondents reported satellite internet was not reliable. There seems to be mixed experiences for RRR people with 31% reporting satellite as not reliable and 33% reliable. This may indicate satellite services are variable with possibly neutral respondents in transition from an early version (that is the interim NBN solution) to more reliable services in recent times through SkyMuster and not being confident enough in the service to report it as reliable.

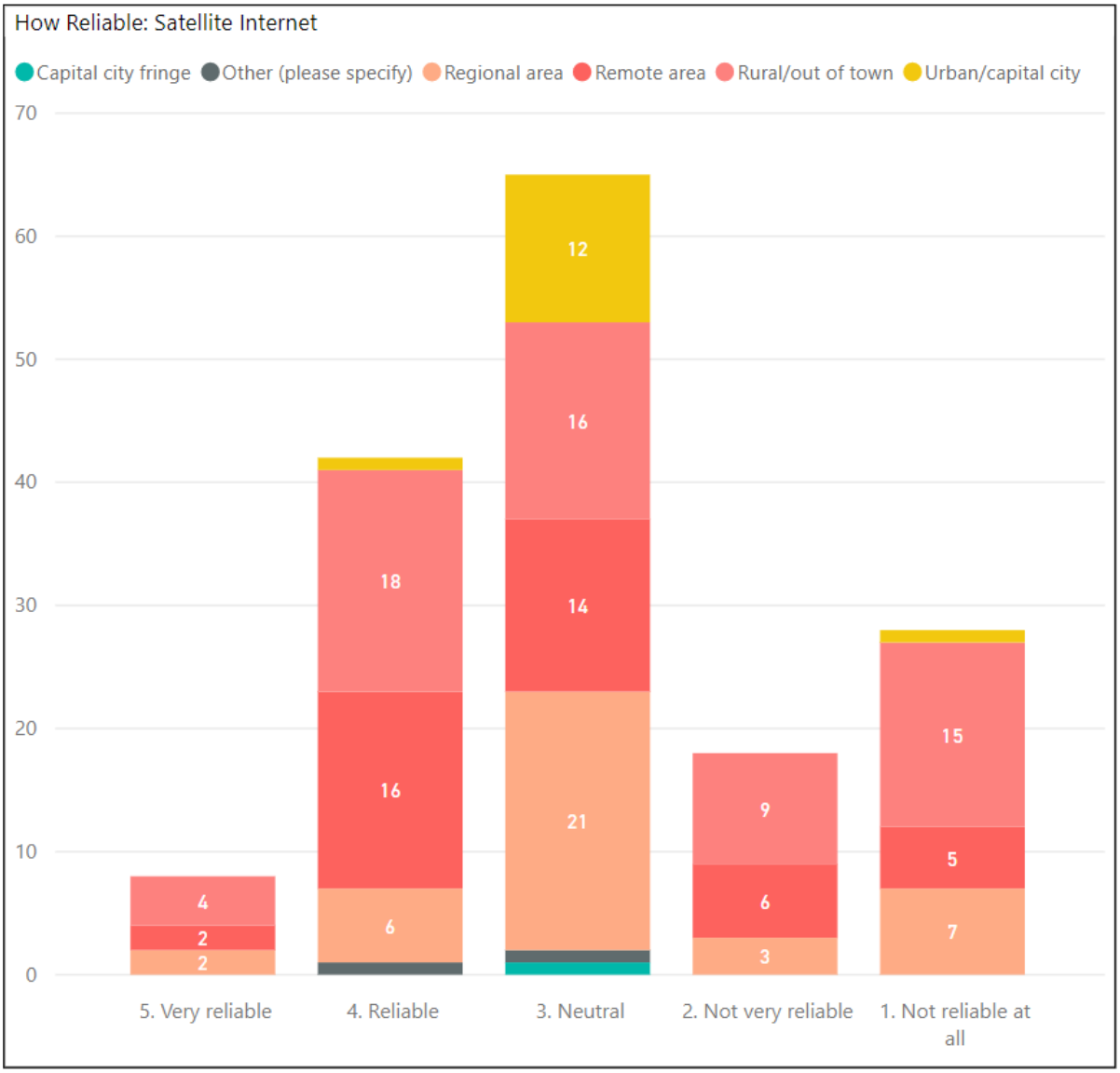

Figure 32. Reliability of satellite internet.

There are mixed responses regarding the reliability of satellite internet: 31% of respondents believed satellite internet was reliable and 29% of respondents indicated satellite internet was not reliable, n = 161.

Reliability of pay TV.
Pay TV does not seem to be very important with 80% of respondents to the previous question about importance of services indicating a neutral response or that pay TV was not important.

There were 144 responses to this question and 43% of these responded with a neutral response that reinforces the previous assertion that Pay TV is not seen as important to survey respondents. About a third (35%) of respondents indicated Pay TV was reliable and 22% indicated Pay TV was not reliable with similar proportions for RRR and Urban.

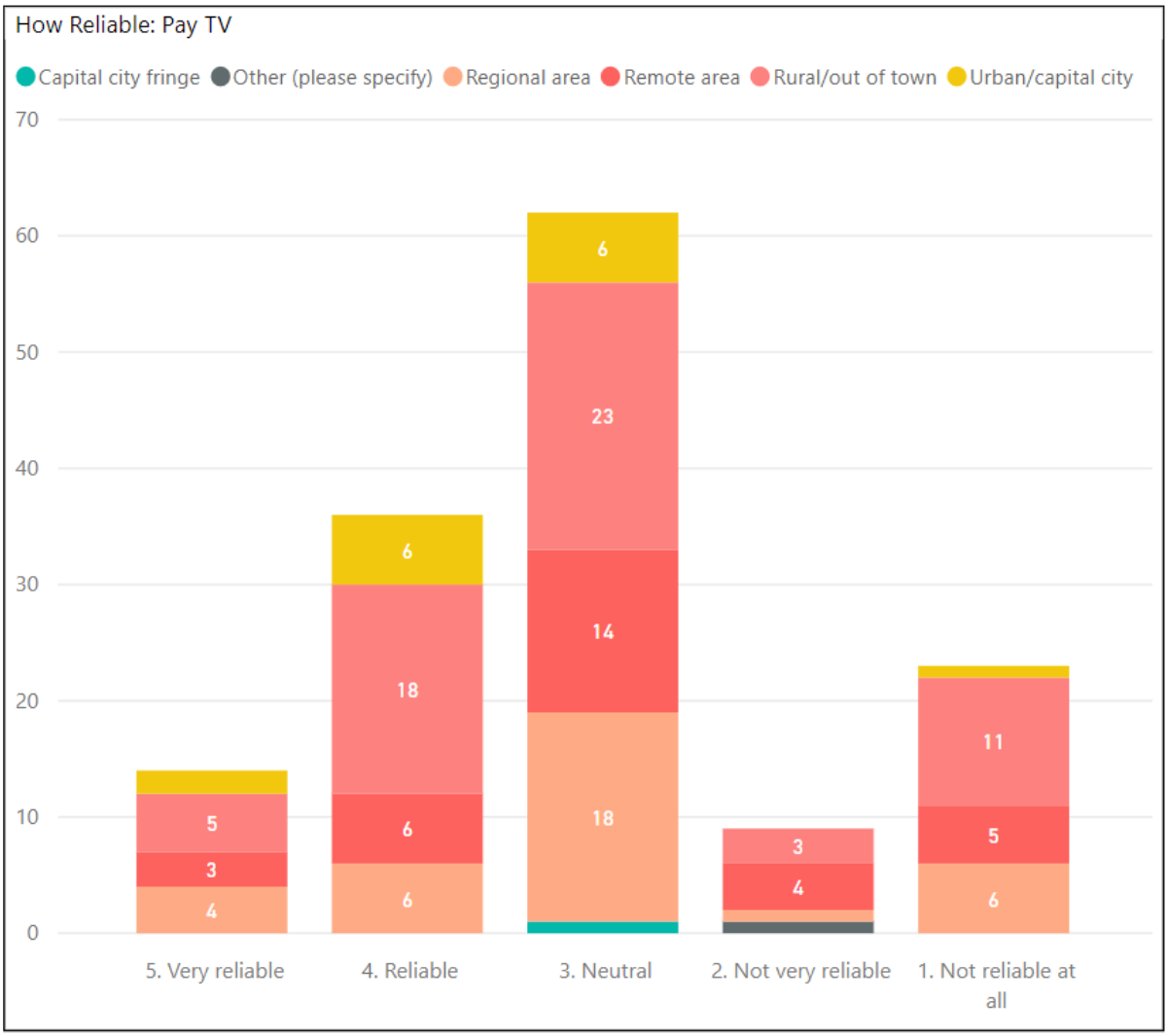

Figure 33. Reliability of pay TV.

About a third of respondents indicated Pay TV was reliable and 22% indicated Pay TV was not reliable with similar proportions for RRR and Urban, n = 144.

Summary of reliability.

Generally, survey respondents indicated telecommunications services are mostly reliable in the Urban areas and unreliable in RRR areas. The figures below clearly indicate there are differences between perceptions of reliability between RRR and Urban respondents.

Reliable

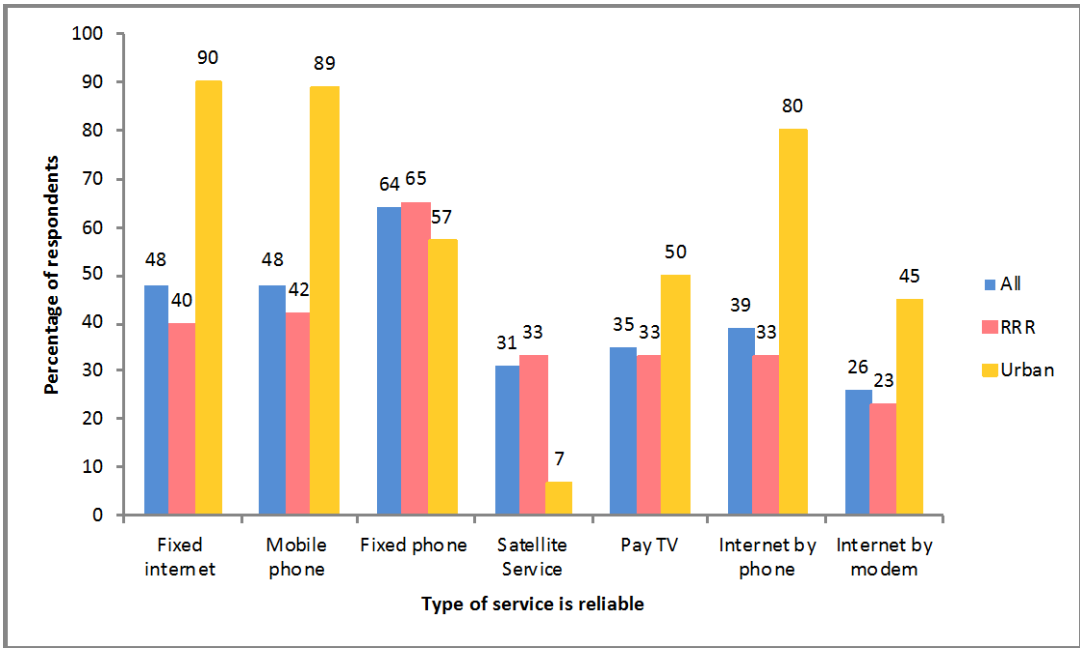

Figure 34. Services perceived as reliable.

Not Reliable.

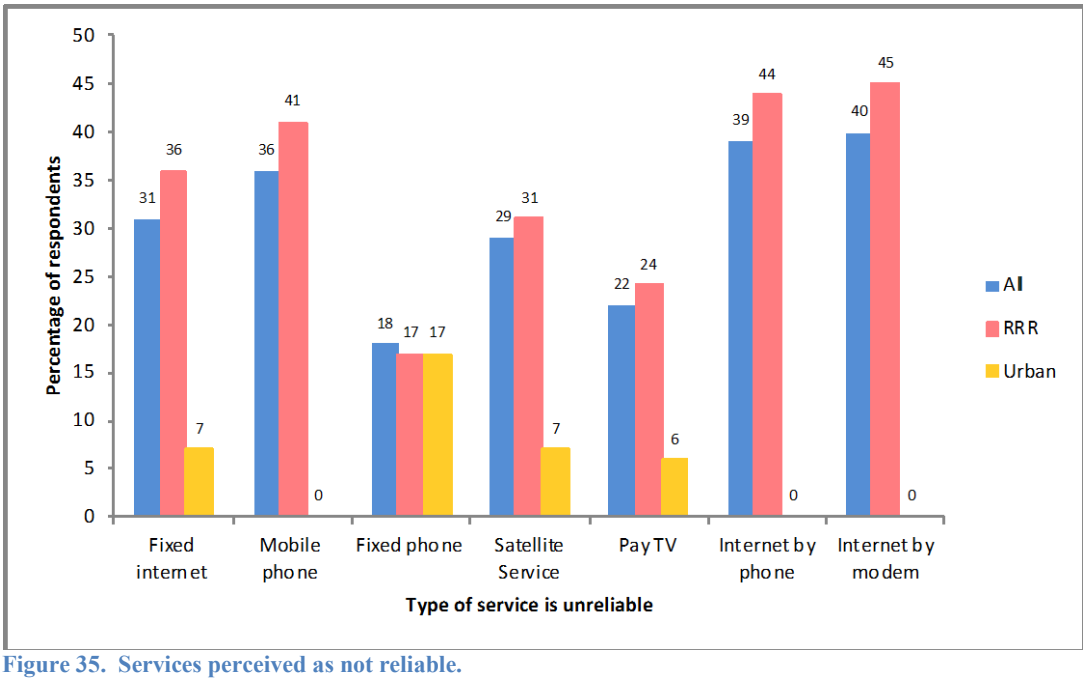

Figure 35. Services perceived as not reliable.

Affordability of services.

Question 9. For each of the following services, please indicate how affordable it is in your home:

- Fixed phone (eg landline or VoIP).
- Fixed internet (eg ADSL, NBN).
- Mobile phone service.
- Mobile internet using dongle or 3G/4G modem.
- Satellite service.
- Pay TV.

Affordability of Mobile Internet by phone.

Overall, 38% respondents indicated that mobile internet was affordable, 21% neutral and 41% not affordable with 193 people responding to this question. Urban respondents tended to indicate that mobile internet was affordable (71%) with only 33% of RRR respondents reporting it as affordable. Nearly half (45%) of RRR respondents indicated that mobile internet was not affordable and only 17% of Urban respondents indicated it was not affordable. There is a trend for Urban people to perceive the services as affordable but RRR are mixed in their responses.

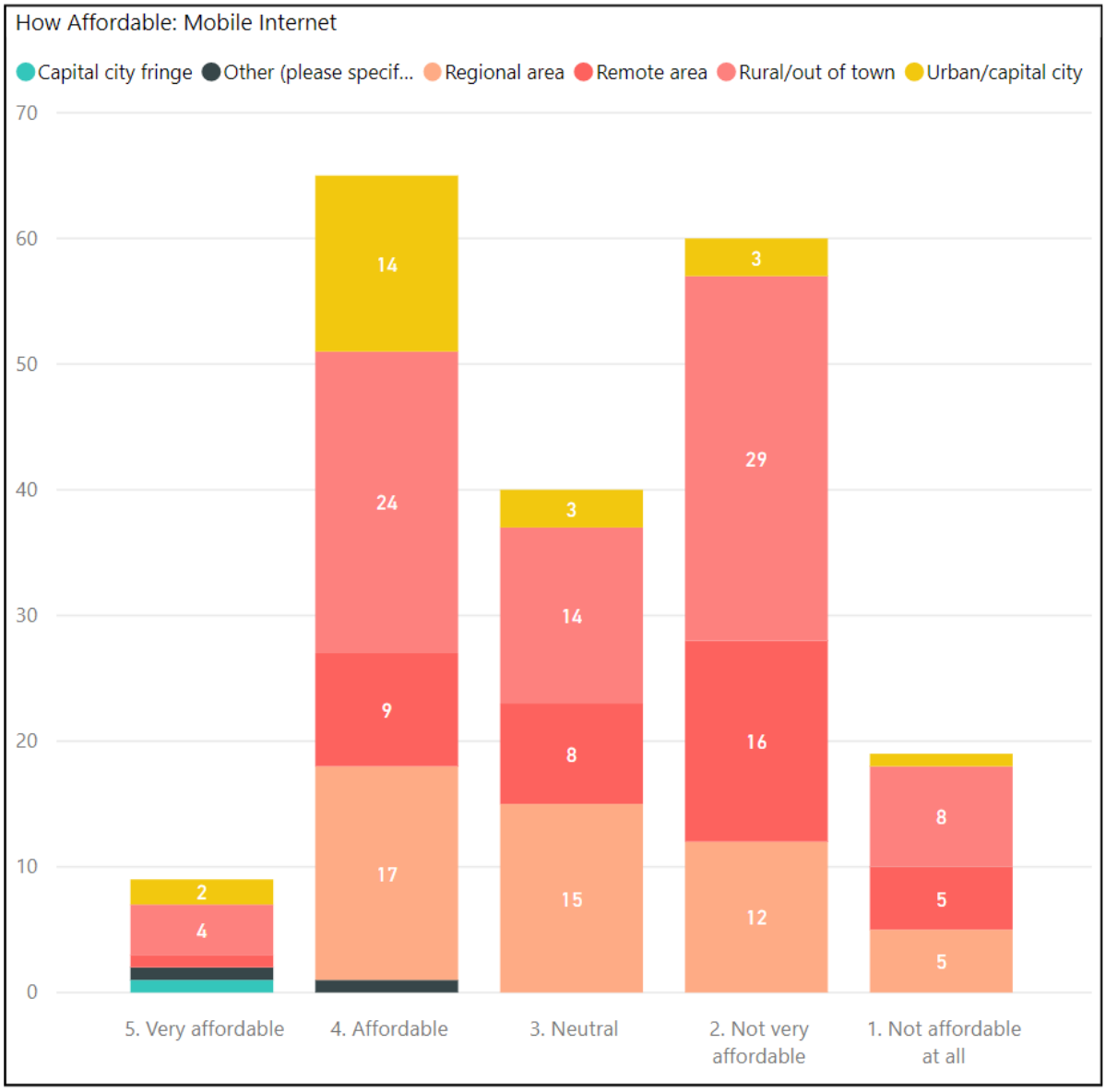

Figure 36. Affordability of Mobile Internet.

There is a trend for Urban people to perceive the services as affordable but RRR are mixed in their responses, n = 193.

Affordability of Fixed phone.

Approximately half (52%) of respondents indicated that fixed phone services were affordable, with 31% being neutral and 17% not affordable. The number of respondents to this question were 208. Results were similar between RRR and Urban for affordability with RRR reporting 51% being affordable and Urban reporting 52% affordable. There were slight differences between RRR and Urban with respect to reporting the fixed phone service was not affordable with 18% RRR and 5% Urban indicating that these services were not affordable. This maybe an artefact of fixed phone services being provided by a larger number of vendors in urban areas and there being more competition and plans with more competitive prices.

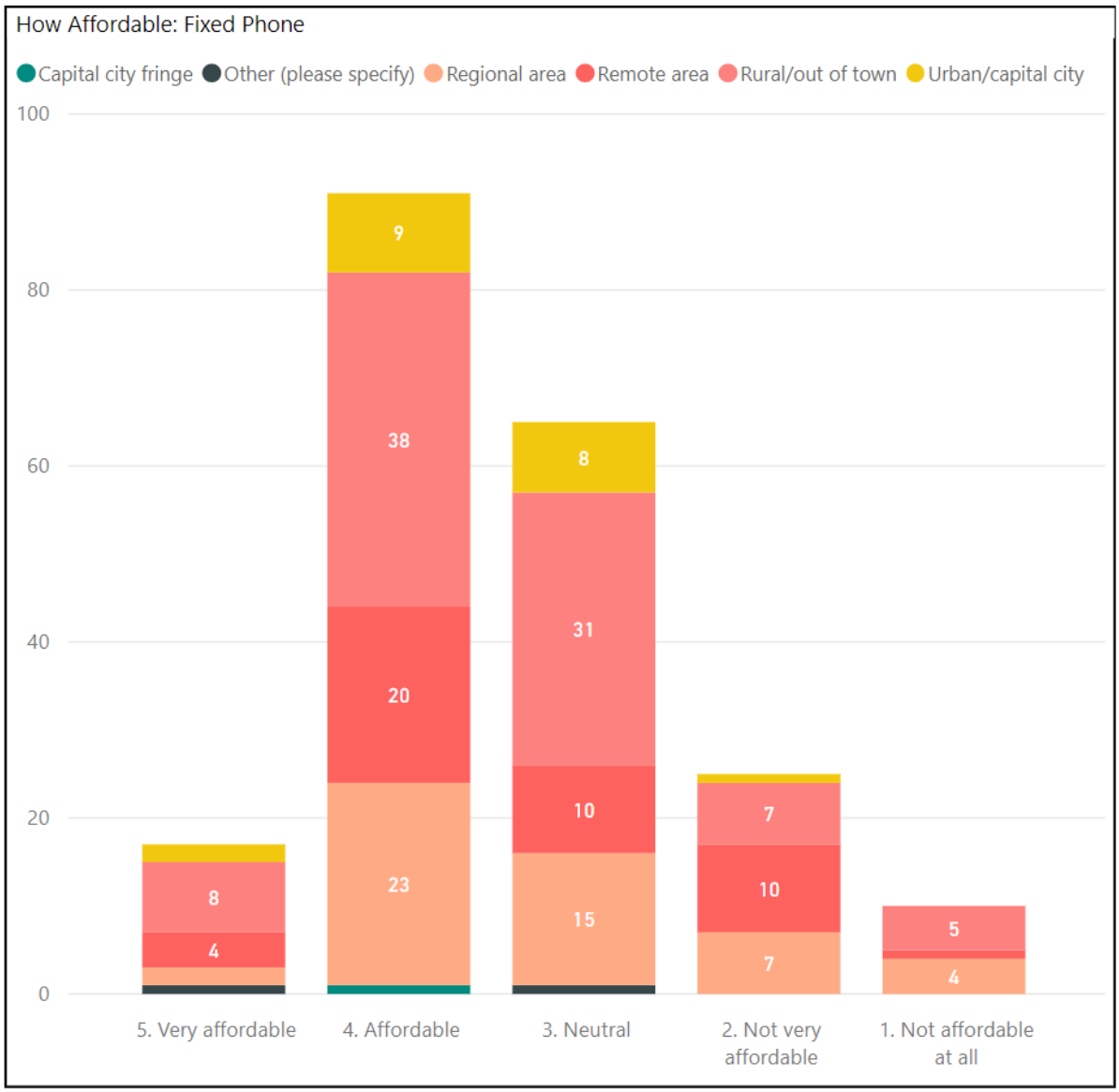

Figure 37. Affordability of Fixed phone.

Approximately half (52%) of respondents indicated that fixed phone services were affordable, n = 208. There were slight differences between RRR and Urban with respect to perceived affordability with more (18%) of RRR indicating that fixed line services were not affordable as opposed to 5% Urban.

Affordability of mobile internet by modem.

Nearly half (43%) of respondents reported that mobile internet by modem was not affordable, with 37% being neutral and only 20% indicating it was affordable. There were differences between the RRR and Urban categories. Nearly half (47%) of RRR people reported that mobile internet by modem was not affordable and only 17% of Urban people indicating it was not affordable. There were slight differences between perceptions of affordability as well with 28% of Urban and only 18% of RRR reporting that mobile internet by modem was affordable. There were 171 responses to this question. Generally, internet by mobile modem is not seen as affordable. Additionally, it may be than more people are accessing internet by tethering to their smart phone and therefore not requiring the additional expense of a mobile modem service.

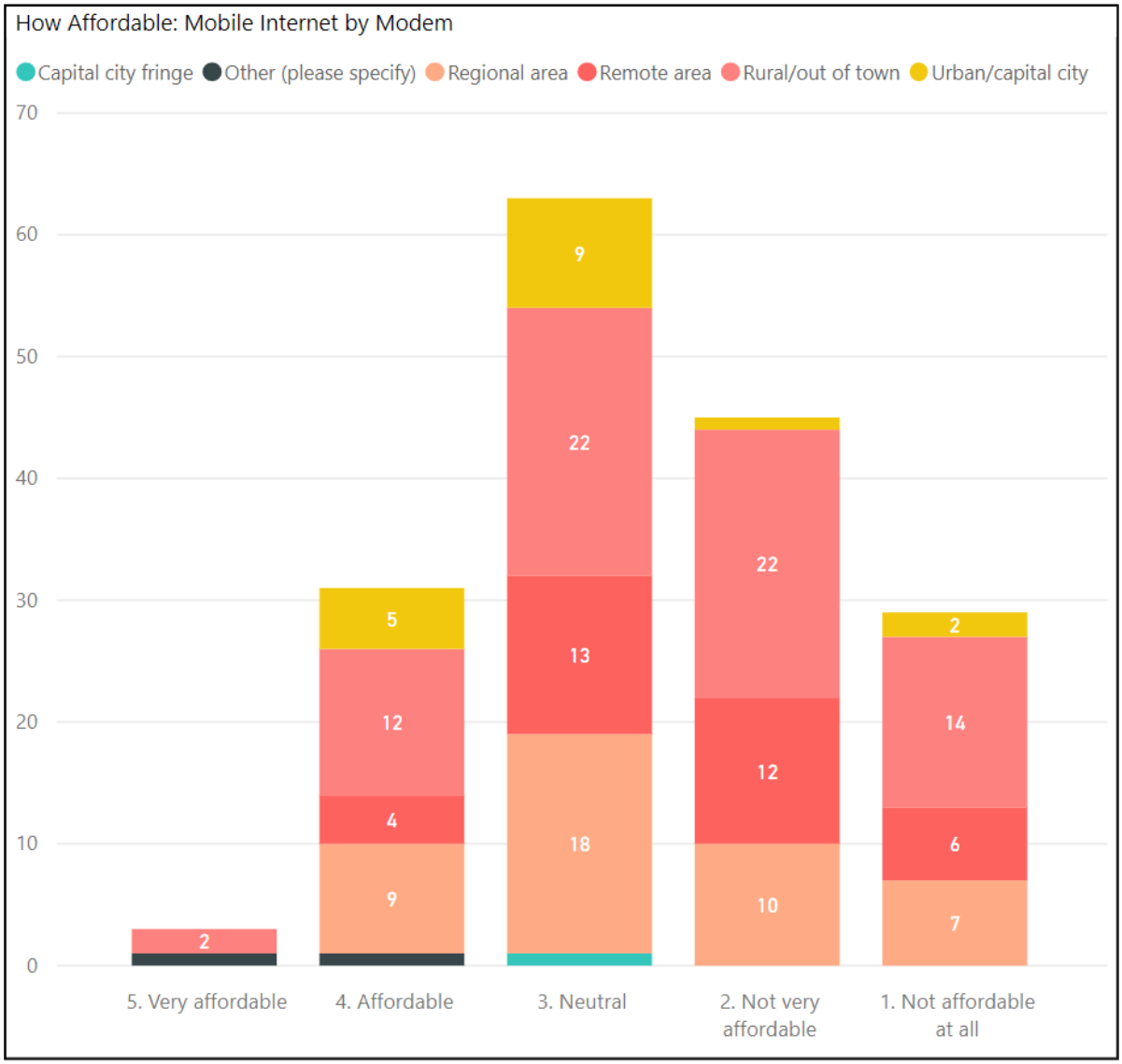

Figure 38. Affordability of Mobile internet by modem.

Only 20% of respondents indicated that mobile internet by modem was affordable. , n = 171. Nearly half of RRR people reported that mobile internet by modem was not affordable in contrast to only 17% of Urban people.

Affordability of mobile phone.

Over half (55%) of all respondents to this question (n = 212) indicated they perceived mobile phone services were affordable, with 22% being neutral and 23% indicating mobile phone services were not affordable. There were differences between RRR and Urban with 74% of Urban and only 52% of RRR indicating these services were affordable. Additionally, 25% of RRR indicated that mobile phones were not affordable contrasting with only 11% for Urban.

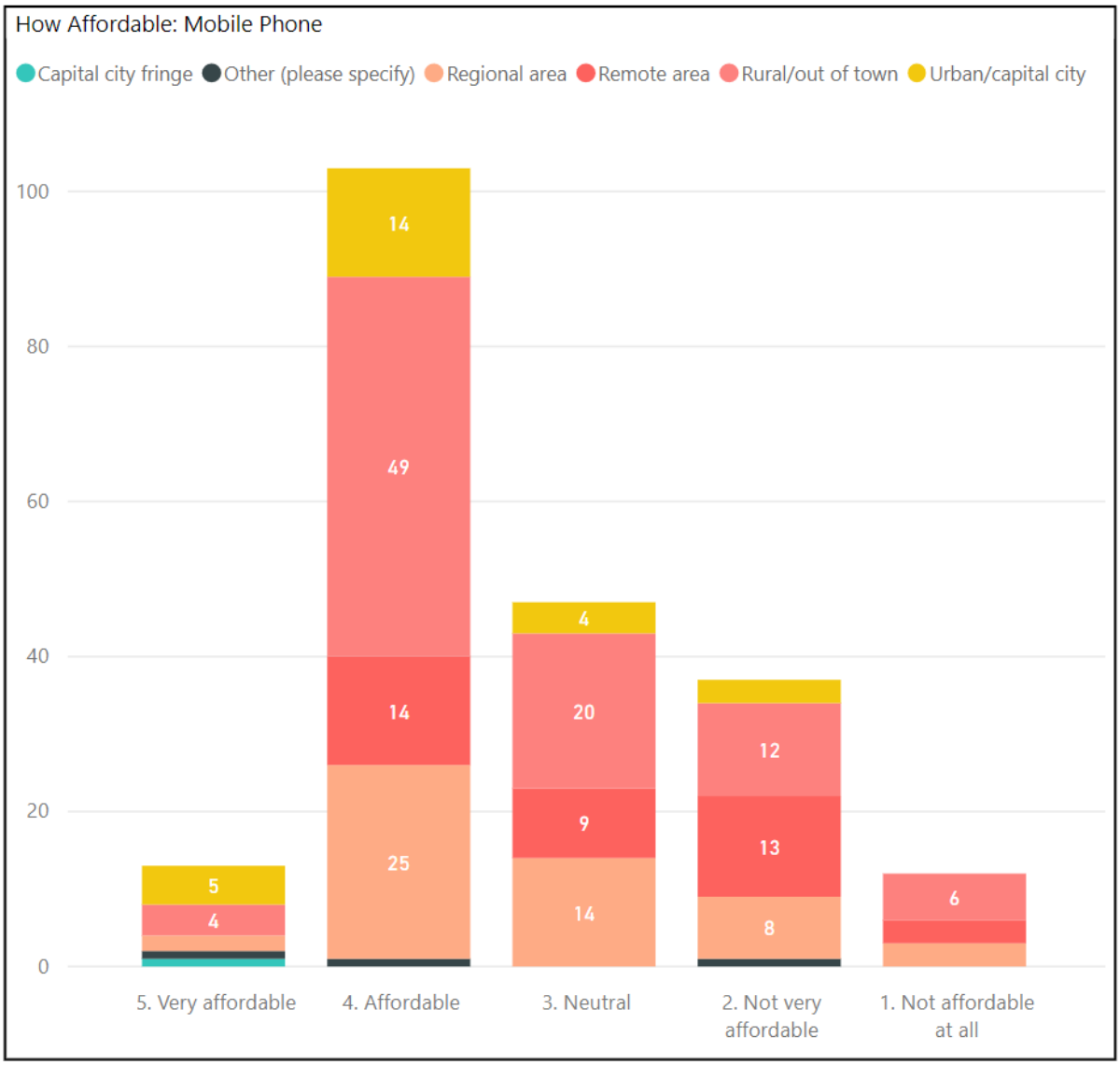

Figure 39. Affordability of mobile phone.

Over half (55%) of survey participants indicated that mobile phone services were affordable and approximately a quarter (23%) indicated they were not affordable, n = 212.

Affordability of fixed internet.
Approximately half (48%) of respondents indicated that fixed internet was affordable, 23% were neutral and 28% indicated it was not affordable. There were 155 respondents to this question. There were differences between RRR and Urban with 73% of Urban and 43% of RRR indicating these services were affordable. Additionally, 30% of RRR indicated that fixed internet was not affordable and 19% for Urban.

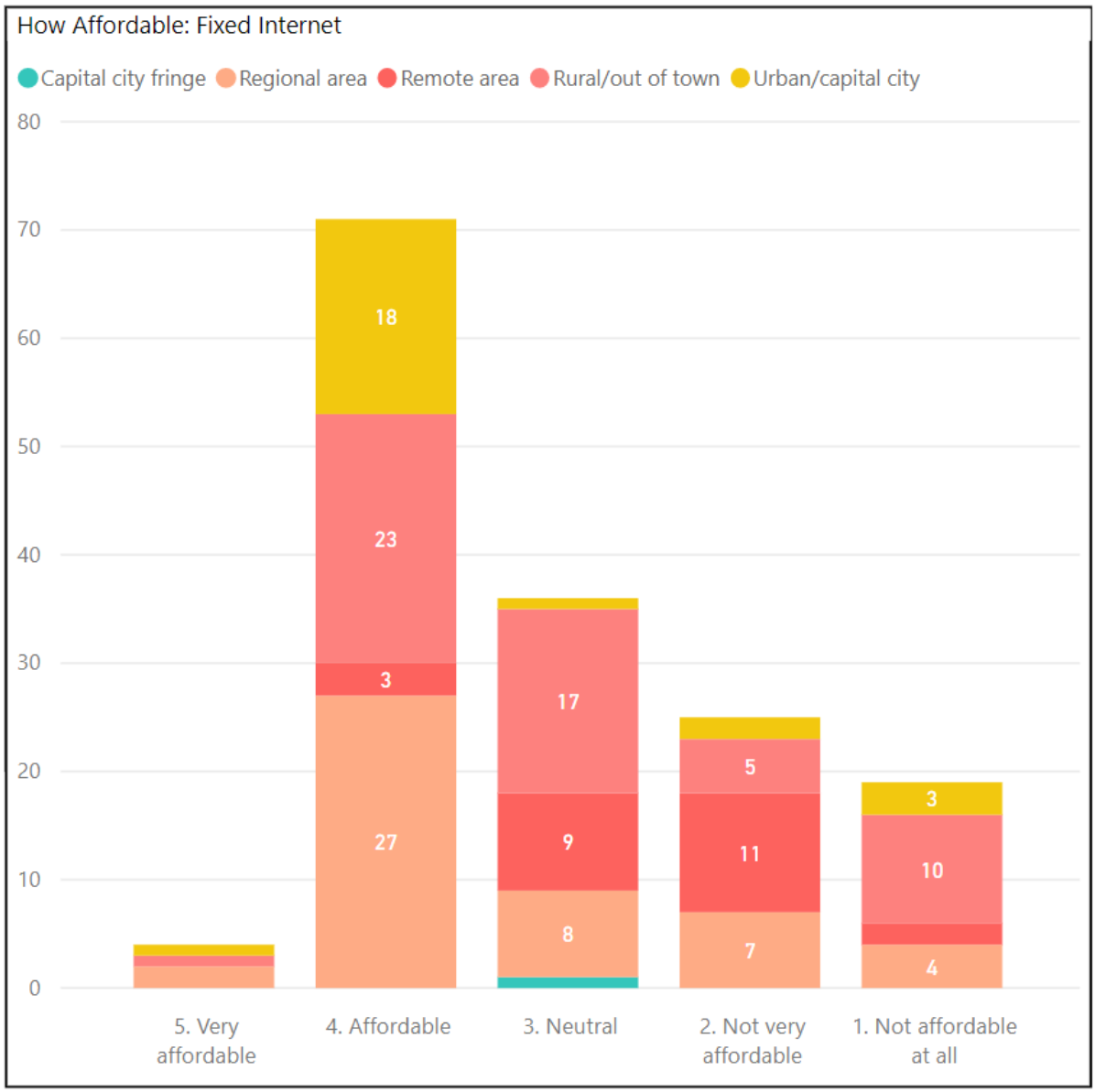

Figure 40. Affordability of fixed internet.

Approximately half (48%) of respondents indicated that fixed internet was affordable and 28% indicated it was not affordable, n = 155. There were differences between RRR and Urban with 73% of Urban and only 43% of RRR indicating these services were affordable.

Affordability of satellite internet.

Only 20% of respondents indicated that satellite internet was affordable, with 40% responding neutrally and 40% indicating it was not affordable. There were 161 respondents to this question including 145 RRR respondents. Both RRR (41%) and Urban (33%) indicated that satellite services were not affordable with 21% of RRR and 7% of Urban people indicating satellite internet was affordable. This question did not differentiate between NBN satellite services such as SkyMuster or high-quality internet services offered by companies such as Gilat.

Figure 41. Affordability of satellite internet.

Only 20% of respondents indicated that satellite internet was affordable and 40% indicated it was not affordable, n = 161. There was no differentiation between types of satellite services in the question so satellite services could have included NBN SkyMuster but also commercially available high grade satellite services such as that offered by Gilat.

Affordability of pay TV.

Only 16% of respondents indicated that Pay TV was affordable, with 36% being neutral and approximately half of respondents (48%) indicating Pay TV was not affordable with 148 people responded to this question. Only 13% of RRR respondents indicated Pay TV was affordable, but 41% of Urban respondents indicated it was affordable. About a third of Urban respondents (29%) indicated that Pay TV was not affordable with 41% indicating it was not affordable. There were fewer respondents indicating they accessed Pay TV than many of the other services which is consistent with the indication of low levels of importance associated with Pay TV.

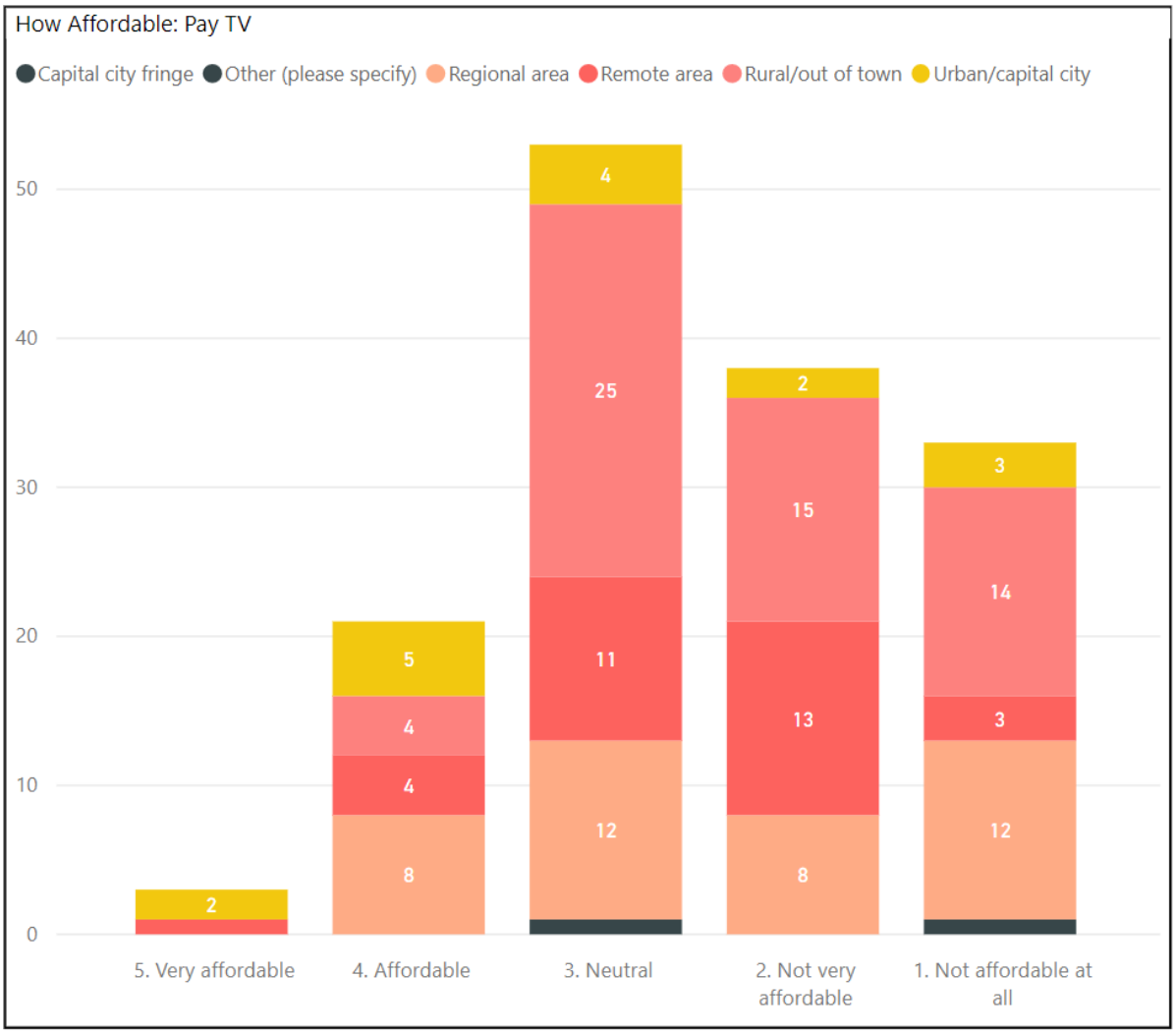

Figure 42. Affordability of pay TV.

Only 16% of respondents indicated that Pay TV was affordable and nearly half (48%) indicated it was not affordable, n = 148. Only 13% of RRR reported that Pay TV was affordable but 41% of Urban respondents indicated it was affordable.

Summary of affordability

Urban respondents tended to perceive that most services (fixed internet, mobile phones, internet by phone and internet by modem) were affordable. In contrast to this, RRR respondents tended to indicate that some services were not affordable (internet by modem, internet by phone and pay TV). A number of RRR respondents may have been outside of the mobile services range at home but used these services when away from base. Satellite services were considered affordable by 21% of RRR, but unaffordable by 41% RRR.

Affordable

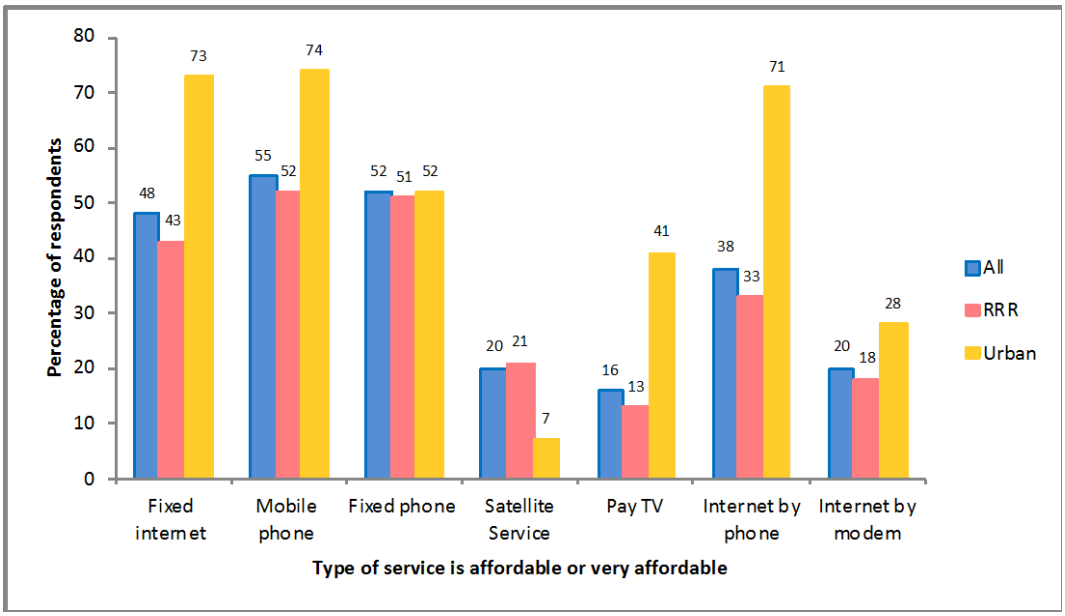

Figure 43. Services perceived as affordable.

Not Affordable

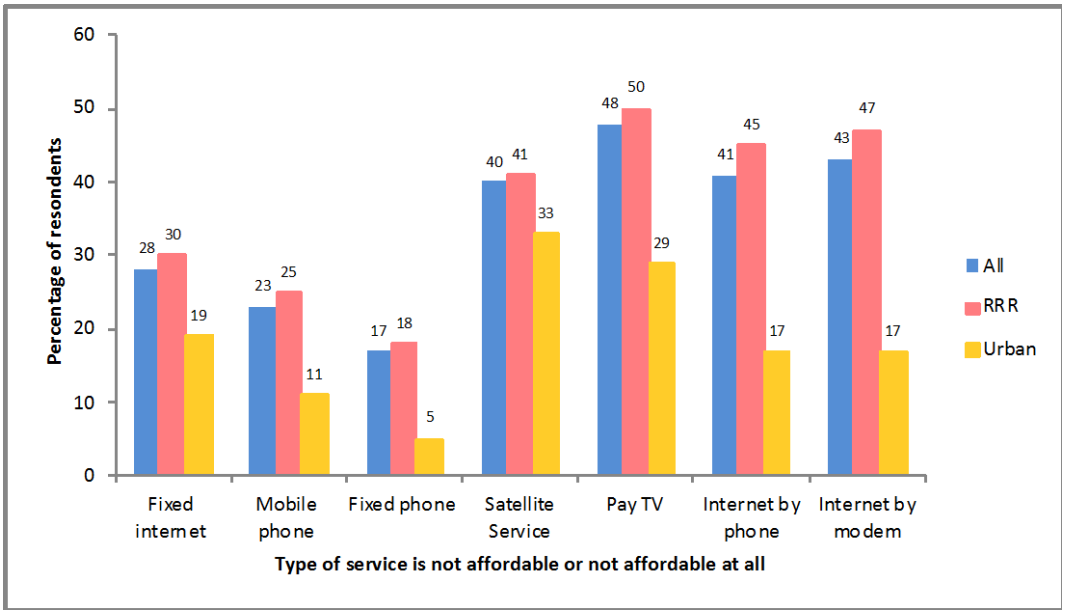

Figure 44. Services perceived as affordable.

Speed of internet services.

Question 10. How would you rate the speed of your internet services? home:

- Fixed internet service (eg ADSL, NBN, dial up, etc).
- Mobile phone service using mobile phone data.
- Mobile internet using dongle or 3G/4G modem.
- Satellite service.

Participants of the survey were not asked to measure their internet speed so this question asked about the respondent's perception of speed. With speed of internet varying throughout the day based on the number of people accessing the internet at that time (contention), a 'one of' speed test does not provide an accurate measure of overall speed of an internet service. People's expectations may also be variable.

There are a number of internet speed test tools as described below. These tools can provide variable results depending on what assumptions are made when creating a web based or script driven test.

- Ookla speedtest.net
- Speedof.me
- speedtest.telstra.com
- measurementlab.net

Additionally, internal networking, firewall or security system may affect internet speed and perceived bandwidth.

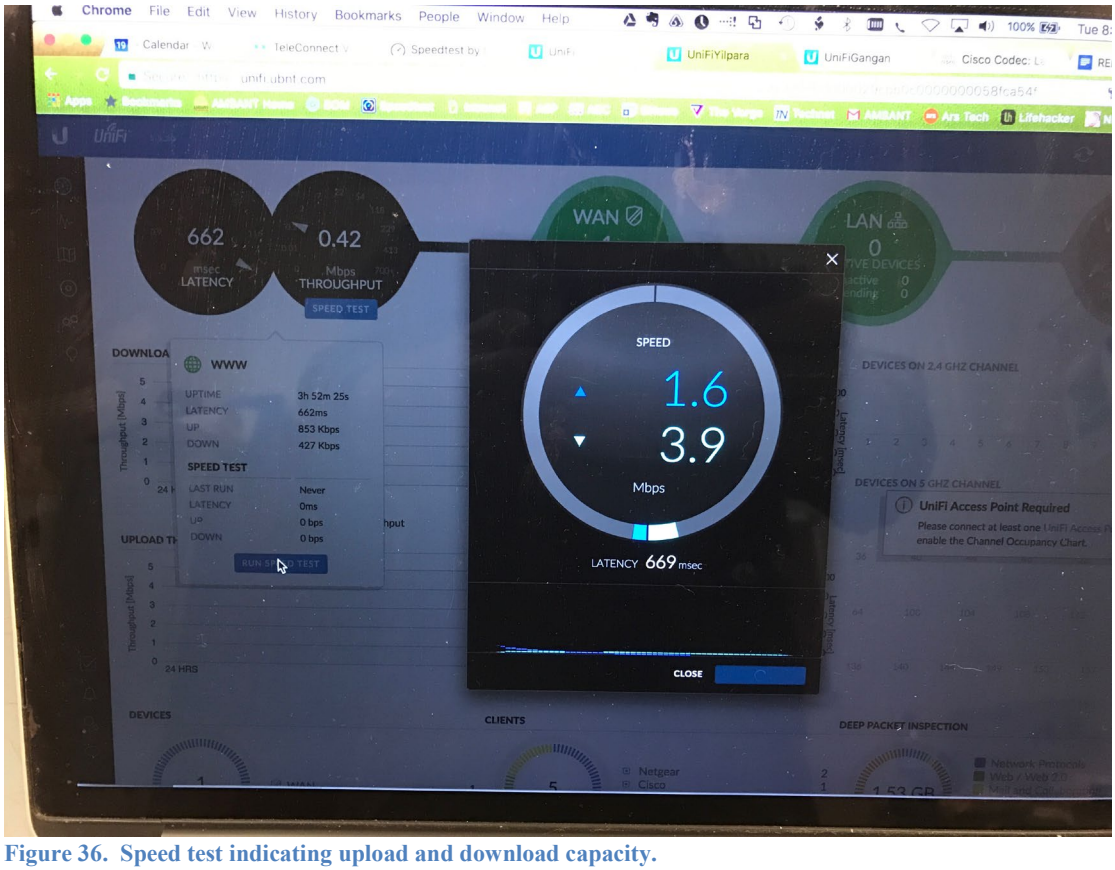

Figure 36. Speed test indicating upload and download capacity.

Speed testing of internet showing 1.6 megabits per second (mbps) up and 3.9 mbps down with a possible threshold of maximum 2 mbps up and 4 mbps down. There is a latency (ping) of 669 msec, which is typical of a satellite internet.

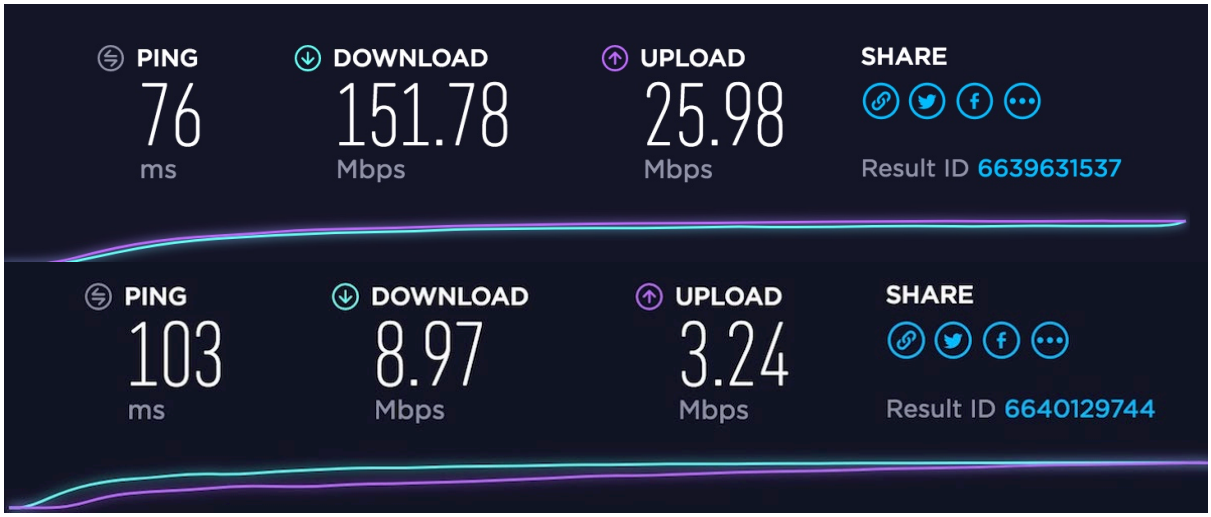

Figure 45. Other speed tests showing contention at peak times.

These two speedtest.net results were measured on the same day in the same 4G coverage area (remote East Arnhem). The second result occurred during mid evening when a greater number of people were accessing the internet.

Figure 46. Telecommunications tower in rural Australia.

Telecommunications towers are now seen throughout urban and rural Australia. This photo is taken just outside the small township of Clayton Bay in South Australia.

Speed of mobile internet by modem.
Nearly half (47%) of respondents indicated that speed was poor, with 26% responding neutrally and only 27% reporting that speed was good, with 182 respondents. There were differences between RRR and Urban with only 19% of RRR reporting good speeds contrasting with Urban (75%). More than half (54%) of the RRR respondents indicated their speed was poor and no Urban people reported poor speed. This suggests that services in Urban areas are generally quicker than RRR. Overall the data indicate there are differences between the perception of speed between Urban and RRR areas.

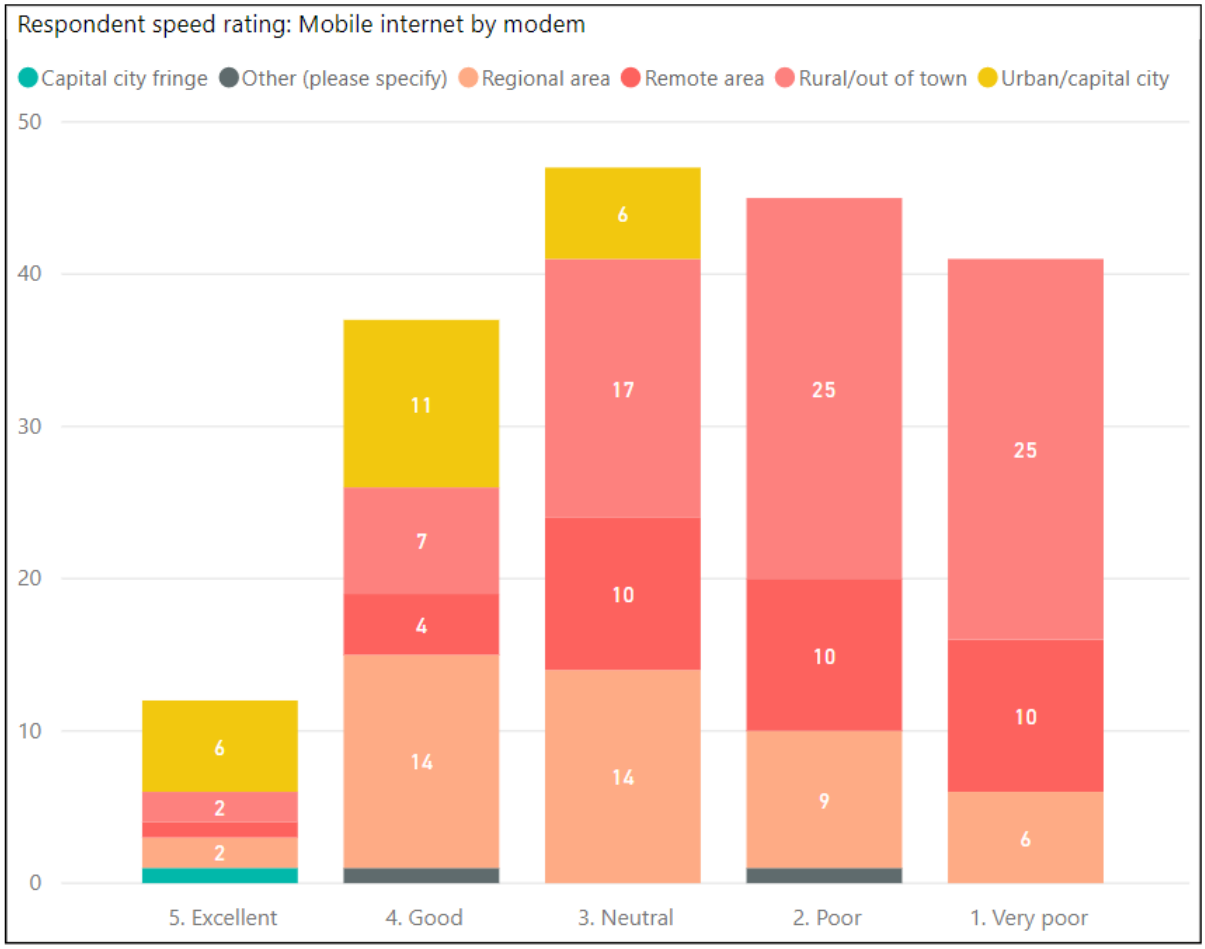

Figure 47. Speed of mobile internet by modem.

Nearly half (47%) of respondents indicated that speed was poor, n = 182. There were differences between Urban and RRR: 19% of RRR reported good speeds contrasting with Urban (75%). More than half (54%) of the RRR respondents indicated their speed was poor and no Urban people reported poor speed.

Speed of Fixed internet – ADSL, cable. Fixed wireless.

Nearly half (47%) of respondents reported that the speed of fixed internet was poor, with 172 people responding to this question. Only 28% reported that speed was good and 25% indicated a neutral response. There were difference between RRR and Urban with 71% Urban people indicating good speed contrasting with RRR which reported only 19% with good speeds. More than half (55%) of RRR people reported poor speeds and only 11% of Urban reported poor speeds. Overall the data indicate there are differences between the perception of speed between Urban and RRR areas.

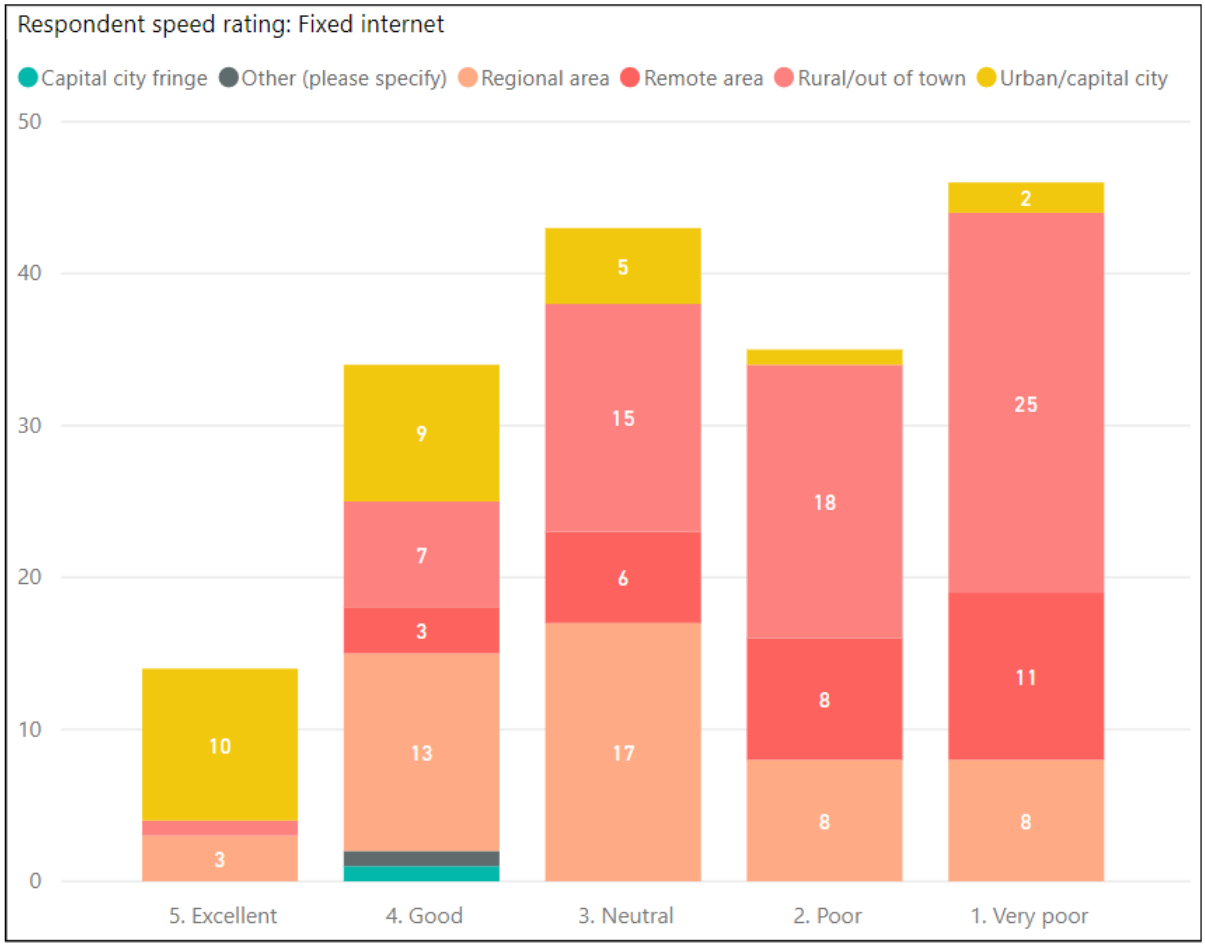

Figure 48. Speed of Fixed internet – ADSL, Fixed wireless.

Nearly half (47%) of respondents reported that the speed of fixed internet was poor, n = 172. More than half (55%) of RRR people reported poor speeds contrasting with only 11% of Urban reported poor speeds and 71% Urban with good speeds contrasting with only 19% RRR.

Speed of mobile internet by phone.
Nearly half (48%) of respondents reported the speed of mobile phone internet was poor, with 170 people responding to this question. Only 31% reported that speed was good and 22% indicated a neutral response. There were differences between RRR and Urban with 74% Urban people indicating good speed contrasting with RRR which reported only 21% with good speeds. More than half (54%) of RRR people reported poor speeds and only 19% of Urban reported poor speeds. Overall the data indicate there are differences between the perception of speed between Urban and RRR areas.

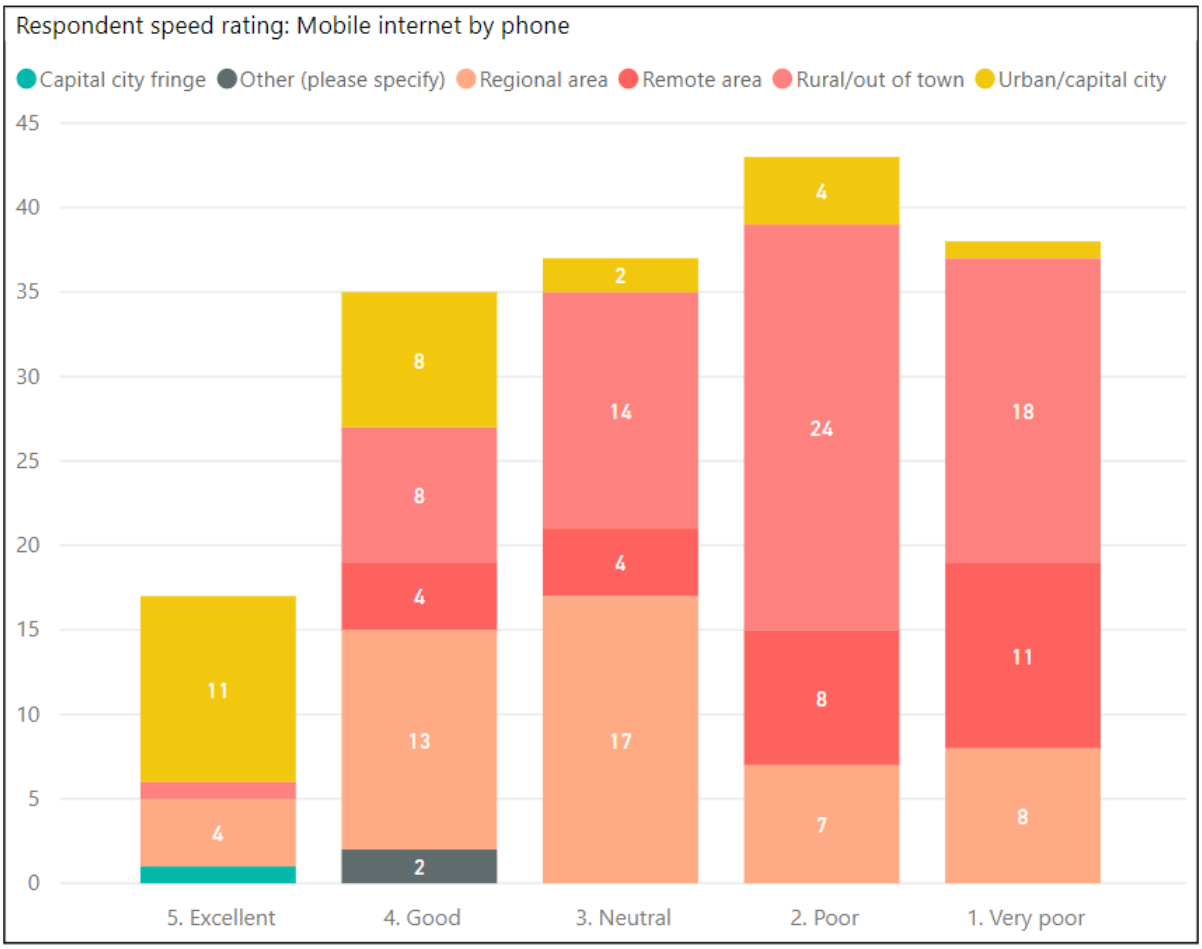

Figure 49. Speed of mobile internet by phone.

Nearly half of respondents reported that the speed of mobile phone internet was poor, n = 170. There were differences between RRR and Urban: 74% Urban people indicated good speed but only 21% RRR. More than half (54%) of RRR and only 19% of Urban reported poor speeds.

Speed of satellite services.

Nearly half (43%) of respondents reported that the speed of satellite internet was poor, with 150 people responding to this question. Only 19% reported that speed was good and 37% indicated a neutral response. The high neutral response may indicate uncertainty either because the service fluctuates or people have cut over to the SkyMuster service but are not confident with reporting good speeds due to variability of speeds. Nearly half of RRR respondents (47%) RRR indicated poor speeds. This is possibly because there would be few people in urban areas using satellite internet at home and there could possibly less contention. It is possible that some RRR people, particularly in regional cetres such as Darwin had access to other satellite services. Only 4 people (3 RRR, 1 Urban) reported satellite speed as being excellent. It is also possible that some participants misunderstood the question or reported being in an urban area when they were possibly in rural or regional areas. For example, in the rural areas around Darwin, a number of people have been directed to obtain satellite rather than fixed wireless. It is also possible that some participants were reporting on the Stars Network – a service provided by the Northern Territory Education Department for remote students.

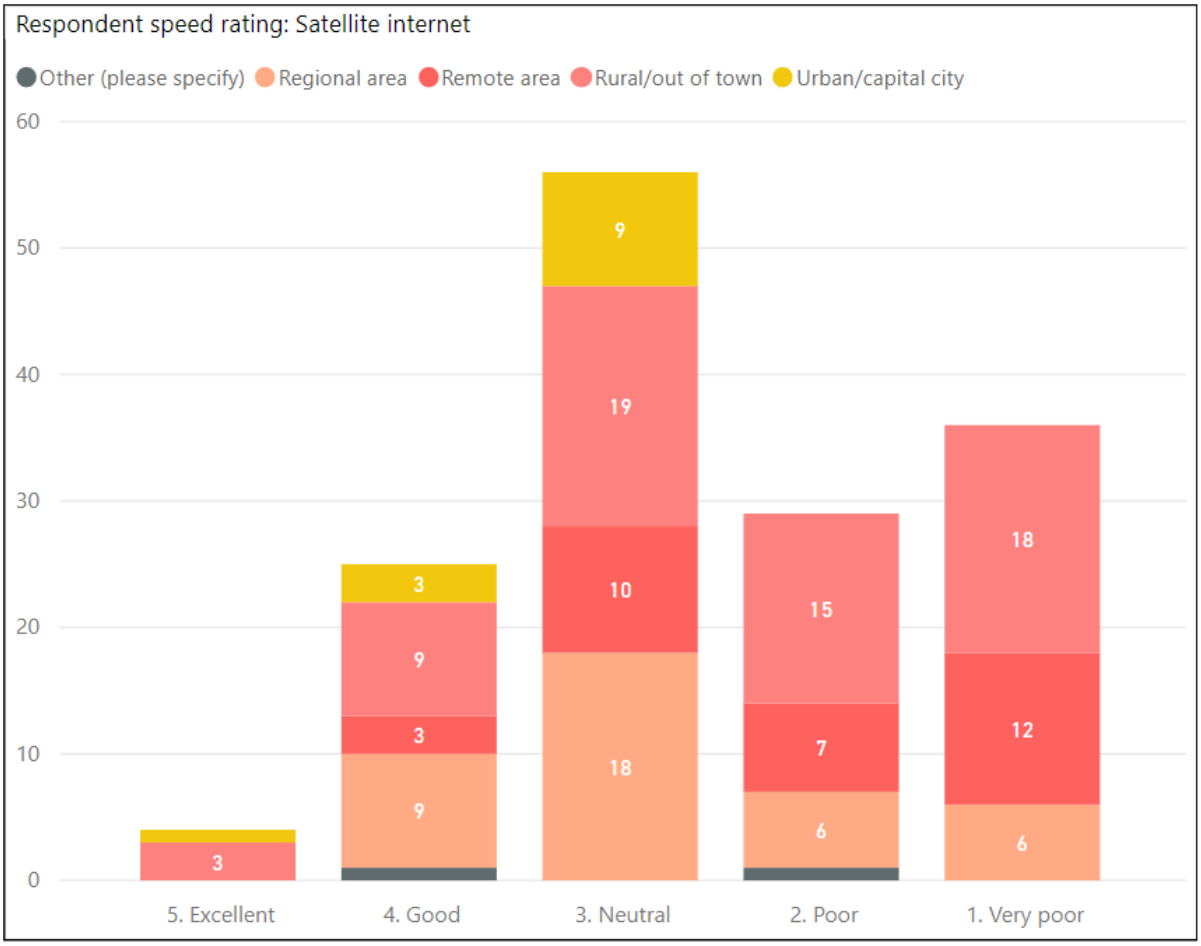

Figure 50. Speed of satellite services.

Nearly half (43%) of respondents reported that the speed of satellite internet was poor, with 47% of RRR reporting satellite internet speed being poor, n = 150.

Summary of perceived speed.

Survey respondents were asked: "How would you rate the speed of your internet services?" Urban respondents indicated they were satisfied with the speed of their services (fixed internet 71%, mobile phone 74%, internet by modem (75%)). The exception was satellite service. From question 5 of the survey, there were no Urban respondents who indicated they had satellite. Therefore, the Urban respondents indicating that speed of satellite was good may be related to their experience of this service in other locations eg work, friend's homes, etc. Generally, RRR respondents were not satisfied with the speed of their internet services. RRR respondents tended to indicate the speed of their internet service was poor (fixed internet 55%, mobile phone 54%, satellite 47% and internet by modem 54%).

Good speed

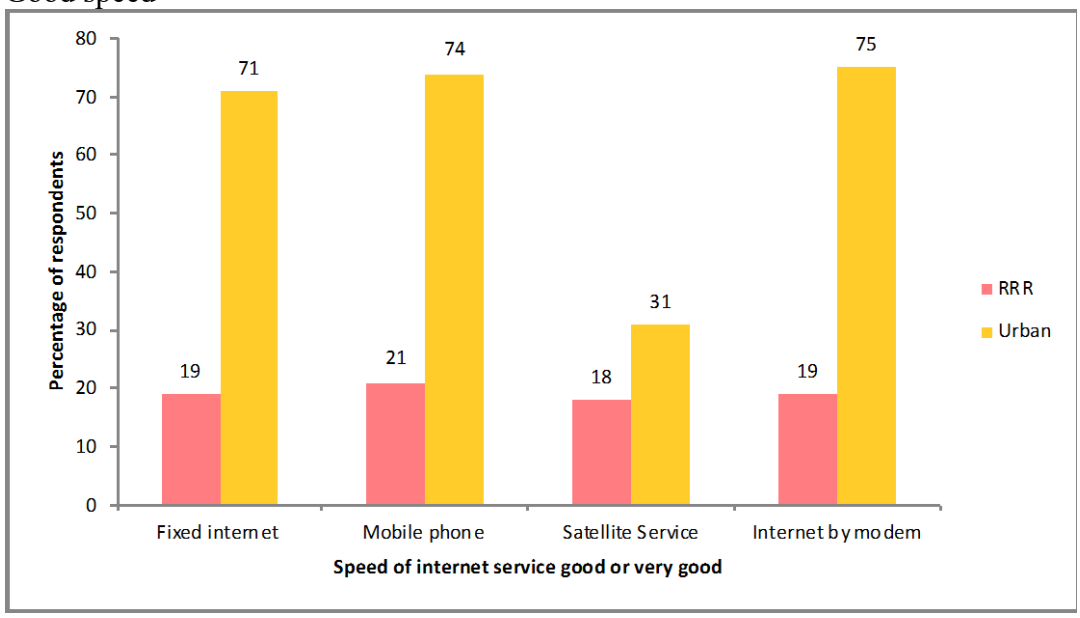

Figure 51. Perceived good speed.

Poor speed.

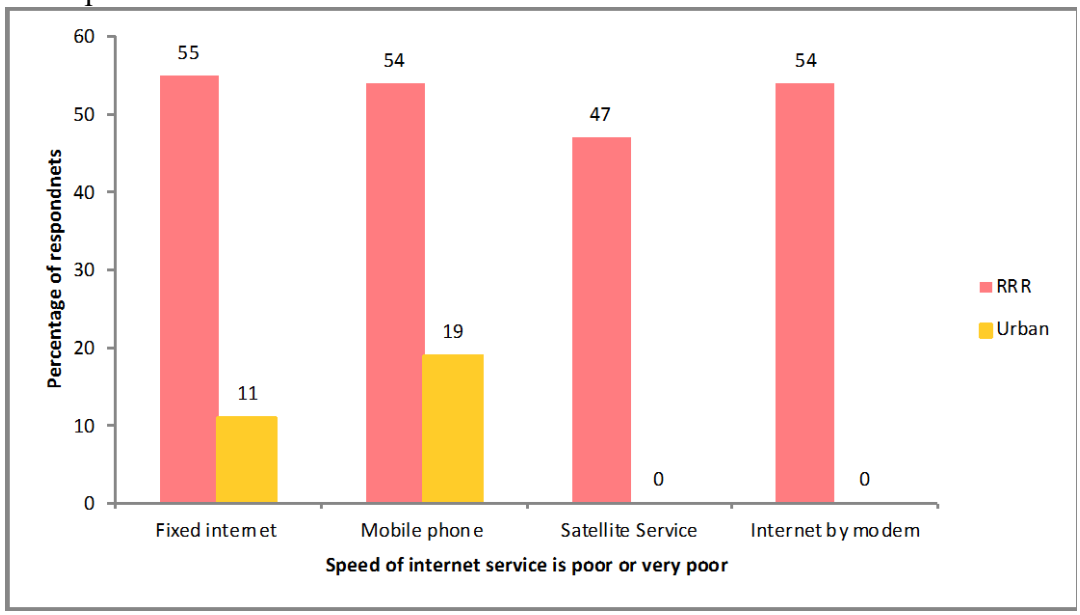

Figure 52. Perceived poor speed.

NBN Access.

Question 11. Do you have NBN? If so, what type?

Of the 226 responses to this question, 89 (just over 39%) had no NBN and 3 people (just over 1%) did not know.

The following list indicates the number of people and percentages of the total (n = 226) having the different types of NBN:

- NBN Satellite 69 (31%) – all RRR.
- Fibre to the node 27 (12%) – includes 20 RRR.
- Fixed wireless 25 (11%) – 3 Urban, 22 RRR.
- Fibre to the premise/business 11 (5%).

It is possible that some of the respondents identifying as Urban may live in regional areas in the NT and have access to Fixed wireless or fibre to the premise.

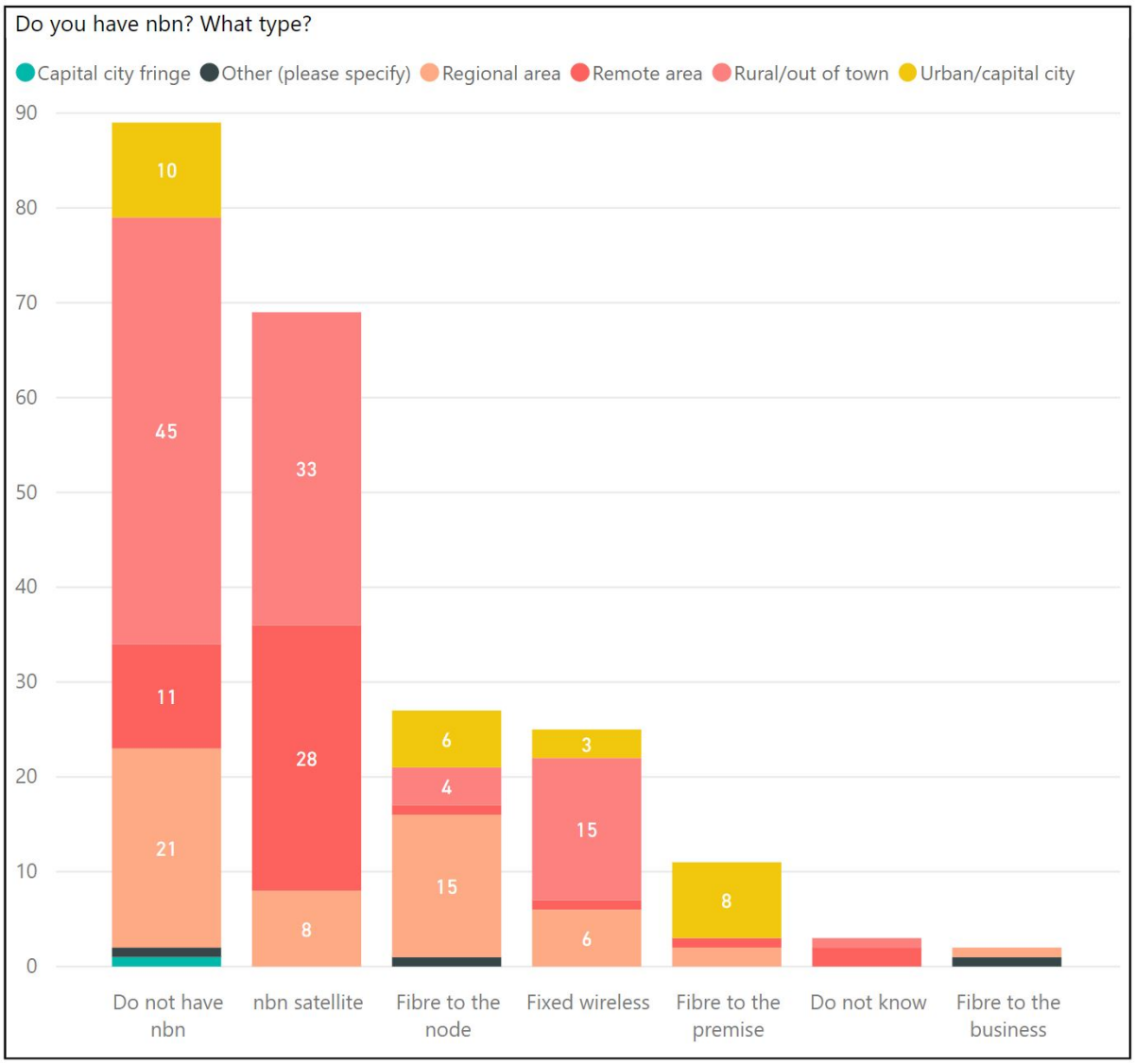

Figure 53. Do you have NBN and what type?

Over 39% of respondents did not have NBN, 31% had satellite, 12% had fibre to the node, 11% had fixed wireless and 5% had fibre to the premise/business, n = 226.

Video Conferencing.

With the introduction of Skype in August 2003, high end video conferencing companies were ‘put on notice’. Until that time expensive corporate video conferencing systems were hard to use, unintuitive, costly and unreliable but were the only way to implement a video conference with staff, business colleges, family or friends. In the past few years, the general population has been given access to easy to use video conferencing systems including Skype, Facetime and Zoom. With video conferencing skills in the general population increasing, a consultation with a health provider over the internet is becoming a reality.

Video conferencing for telehealth.

Video conferencing has allowed face to face consultations with a diverse array of different clinicians ranging from specialists to psychologists. Most video conferencing systems used in a telehealth setting have a scheduling function which allows for pre-booked appointments in line with regular face to face consultations. In RRR areas there can be extensive travel times to visit health professionals. Telehealth can help to reduce these ‘long trips to town’. Telehealth will not completely eliminate trips to see the clinician but can help to reduce travel.

Figure 54. Video conferencing equipment in a remote clinic.

The video conferencing equipment at Gan Gan Clinic in remote East Arnhem Land. Note the camera at the top of the screen. The network box housing the router, firewall and UPS and the control panel (iPad looking device) mounted on the pin board. Video conferencing has been a positive impact on telehealth services by providing increased diagnostic ability and increasing access to a range of specialist and other clinical services.

Question 12. What video conferencing do you use?

Of the 279 respondents who answered this question 28% (78) had not used video conferencing: 15% of Urban respondents had not used video conferencing and 43% of RRR respondents had not used video conferencing. There where 15 different types of video conferencing systems mentioned by survey respondents. Facetime (95) and Skype (104) are the most frequently used video conferencing tools amongst the survey respondents.

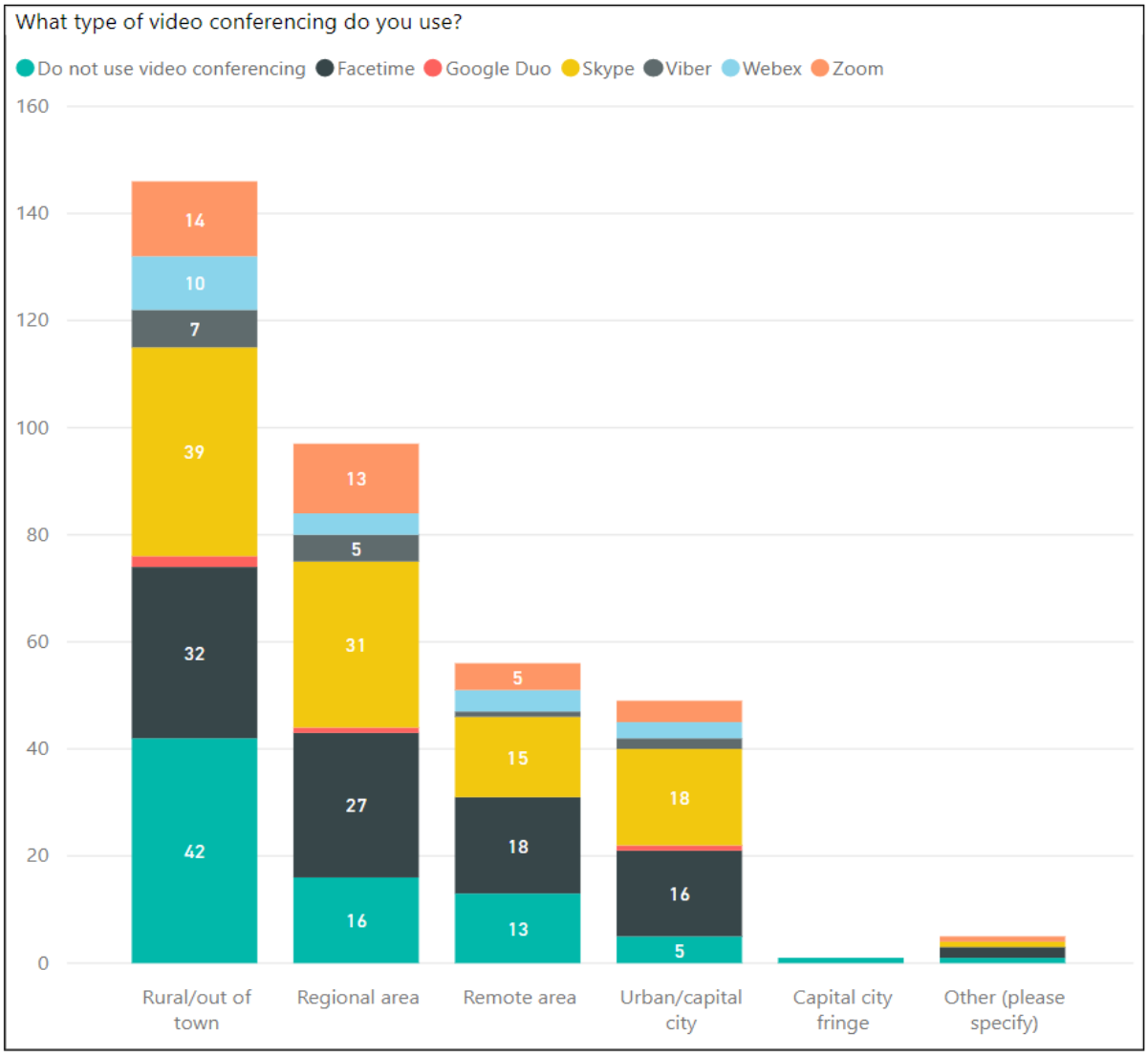

Figure 55. Types of Video Conferencing tools used.

Approximately a quarter of respondents 28% (78) had not used video conferencing including 15% of Urban and 43% of RRR respondents, n = 279. Skype (104) and FaceTime (95) were the most frequently used video conferencing platforms.

Devices used for video conferencing.

Question 13. If you use video conferencing, which devices do you use?

There was a maximum of 283 respondents to this question. Respondents indicated that they used more than one device to use video conferencing. Of the 421 responses, 29% (123) use Laptops, 23% (95) use iPhones, 19% (78) use iPads and 17% (70) use desktop computers. Only 8% (35) use other smart phones and 5% (20) use other tablets. The distribution of device types does not seem to be affected by respondent's remoteness. The respondents show the use of all the major internet enabled devices which could be argued demonstrate a representative market distribution of video conferencing enabled technology devices. There does seem to be a preference for iPhones and iPad to other smart phones and tablet devices.

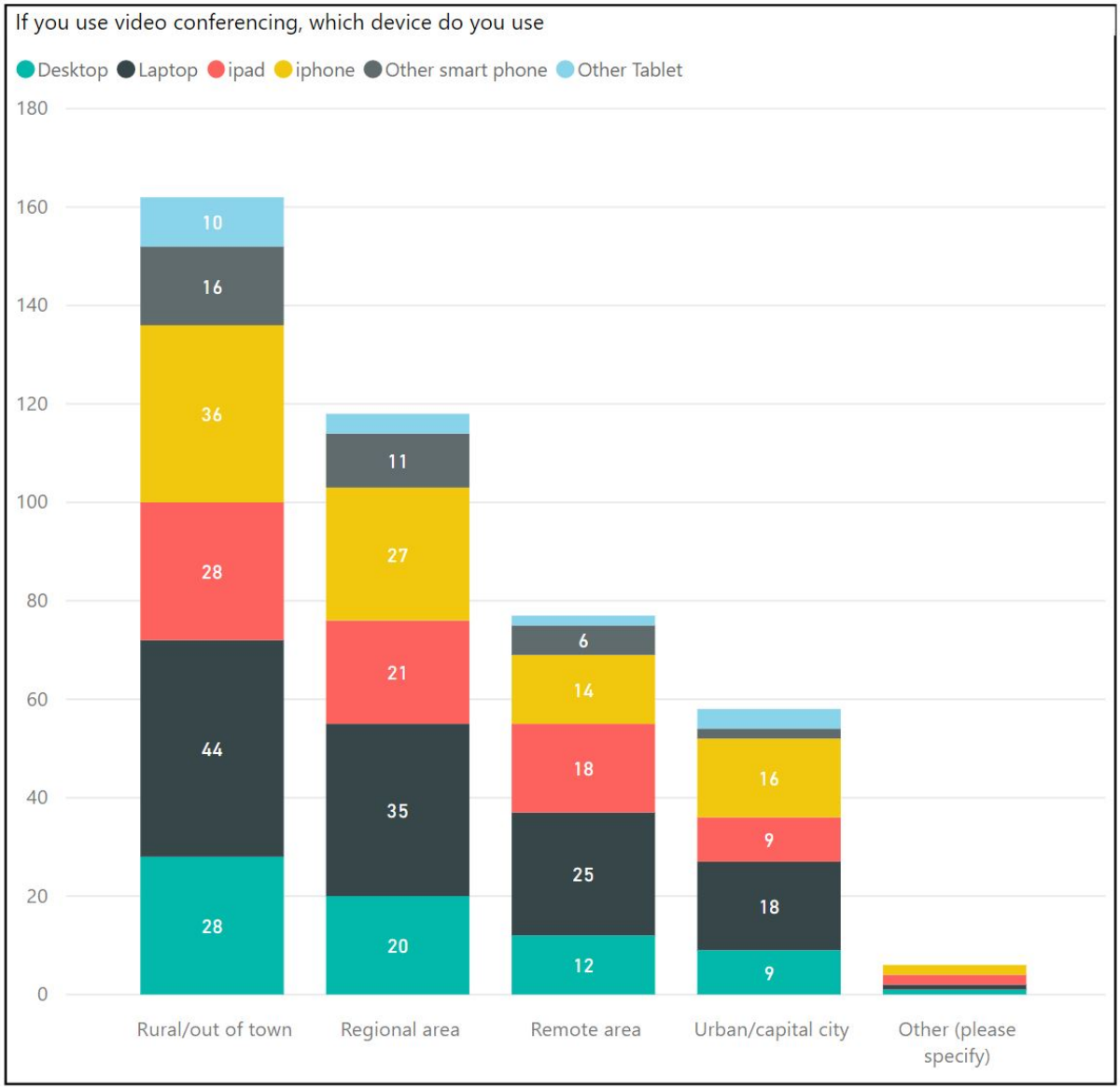

Figure 56. Devices used for video conferencing.

People use multiple devices for video conferencing: 29% (123) use Laptops, 23% (95) use iPhones, 19% (78) use iPads and 17% (70) use desktop computers. Only 8% (35) use other smart phones and 5% (20) use other tablets, n = 421.

Summary of Video Conferencing.

Type of video conferencing used.

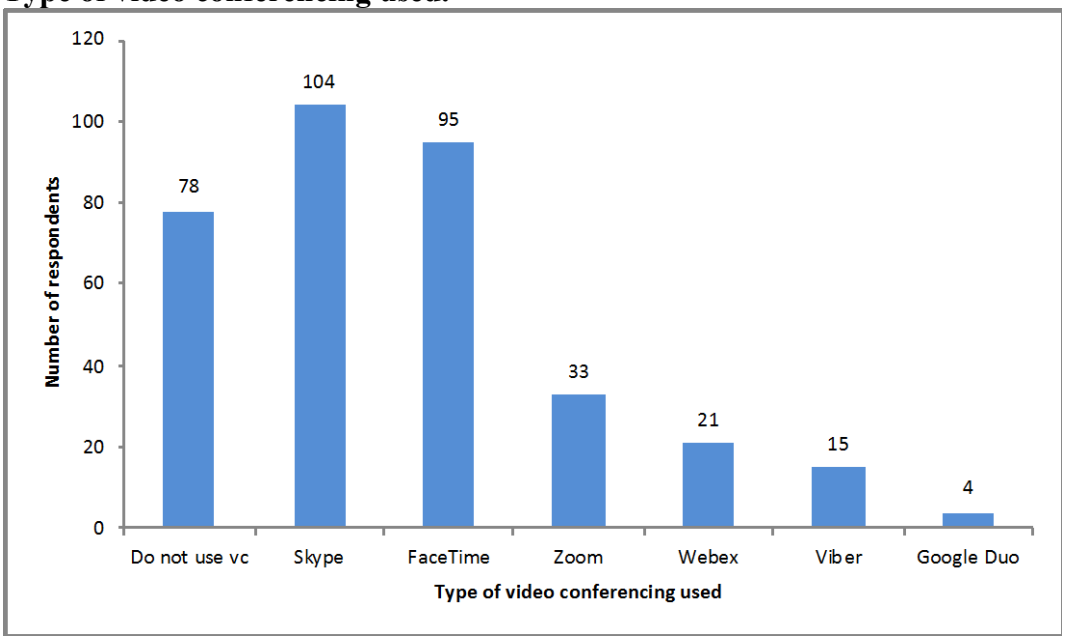

Figure 57. Summary of video conferencing used.

Devices used for video conferencing.

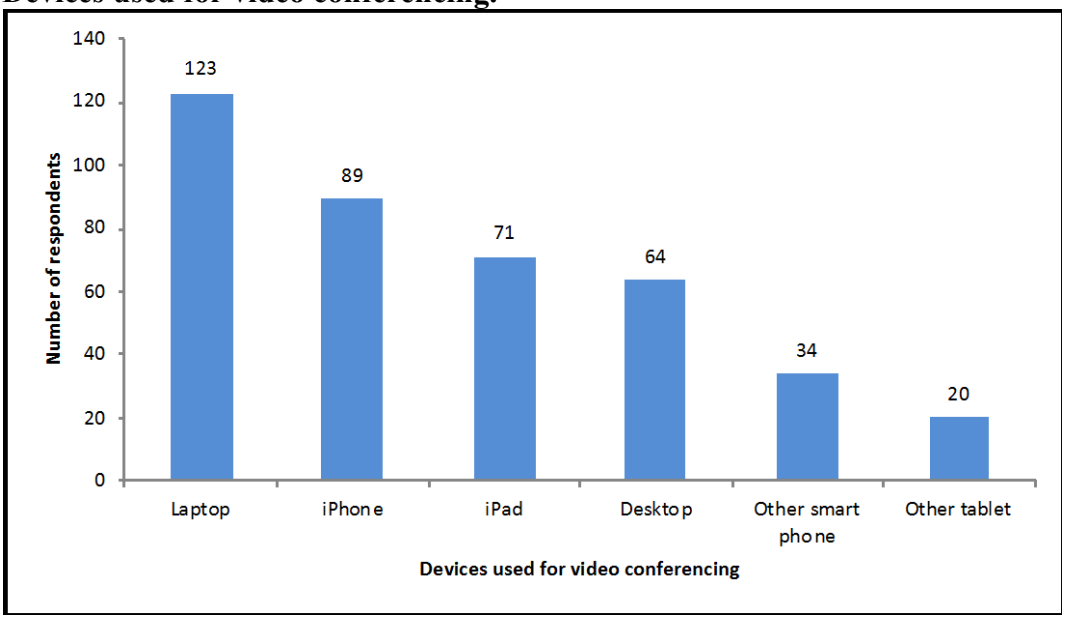

Figure 58. Summary of devices used for video conferencing.

Internet Uses

Question 14. Which is the main internet service used at home?

Of the 211 respondents to this question 48% (101) use fixed internet at home, 29% (61 – all RRR) use satellite, 12% (25) use mobile internet by modem and 11% (23) use mobile internet by phone.

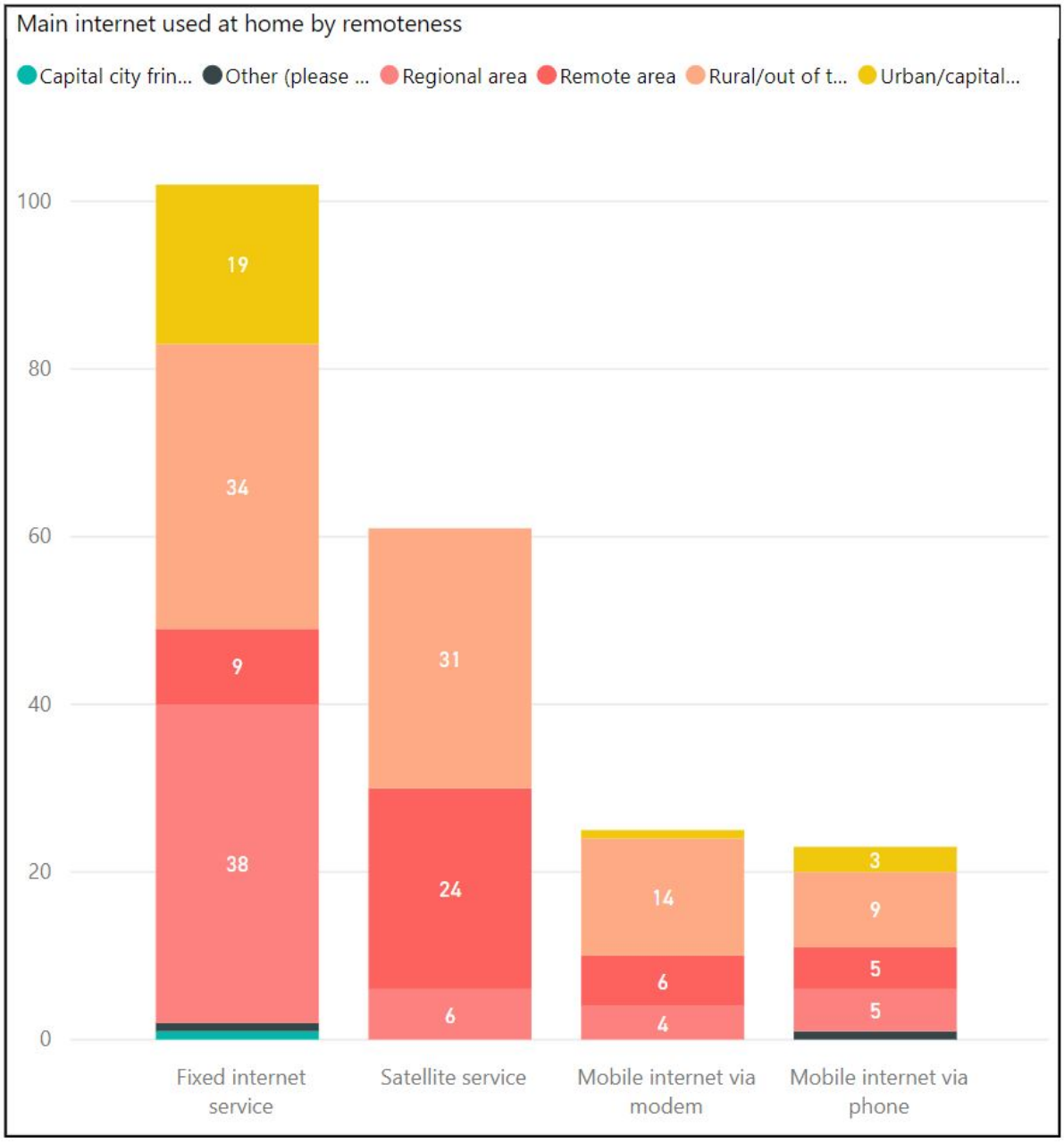

Figure 59. The main internet service used at home, n = 211.

Activities on the internet.

Question 15. What types of activities do you use the internet for?

The most frequently used are outlined in the table below:

Banking	212
Keeping in touch	212
Business	202
Information	194
News	185
Social media	180
Booking travel	177
Govt services	176
Shopping	174
Education	167
Entertainment	138
Community	137
Health/medical	108

Only 14 people reported to using the internet for online gambling.

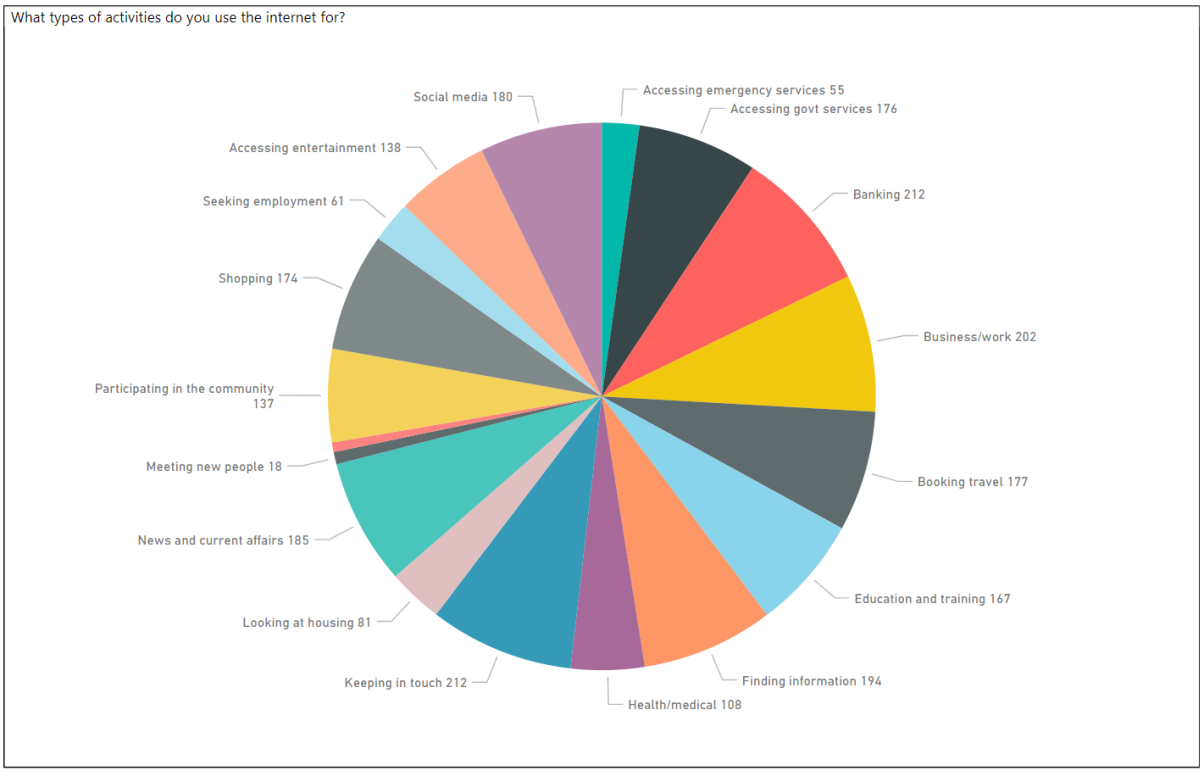

Figure 60. Activities access using the internet.

The most frequently used activities are: Government services, social media, banking, business work, booking travel, finding information, keeping in touch, news and current affairs, shopping, education and training. Only 14 people used the internet for online gambling.

Activities respondents' internet is not yet able to support.

Question 16. What types of activities would you like to use the internet for, but cannot with your current services?

Accessing online entertainment is the most needed service currently not available to survey respondents (90 respondents). In a previous question, respondents did not consider Pay TV as high priority. In future research, it may be useful to investigate the difference between Pay TV and Online Entertainment accessed by the internet.

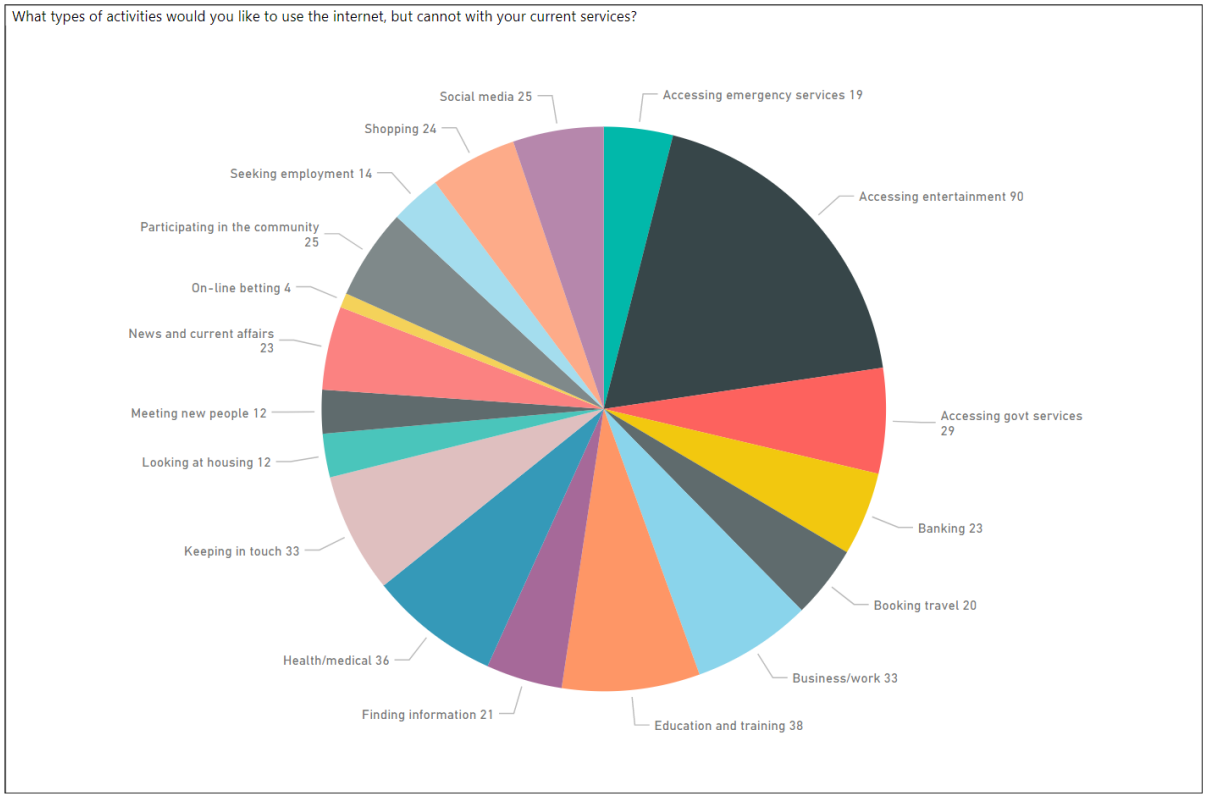

Figure 61. Activities unable to be accessed by current internet service.

Entertainment is the main activity respondents were unable to access with their current internet service.

Telehealth.

Background to telehealth services.
Telehealth services use information and communications technologies (ICTs) to deliver health services. It is possible to use video-conferencing to talk remotely to a doctor, therapist or other clinician. Instead of having to travel to a major city to see a doctor or therapist, an increasing number of patients are using video-conferencing.

The facility may be offered by a local GP or local healthcare clinic. It uses cameras and diagnostic tools to transmit sound, images and information from the patient to a clinician somewhere else. In this way people in remote locations can access specialist diagnostic and treatment services without having to travel long distances.

There are a variety of Australian, internet based, and Medicare funded health services available.

Figure 62. Video conferencing in use in local health clinic.

David Murtagh video conferencing with the Acting Clinic Manager in the main office in the Laynhapuy Homelands. Video conferencing in this instance was used to trouble shoot telecommunications issues.

Question 17. Did you know you about telehealth before this survey?

There seems to be good knowledge about Telehealth with 75% of respondents claiming to know about this service prior to the survey. This may be a larger percentage than the general public as the survey was distributed through the B4BA Network who have had regular updates about telehealth work. With a fundamental improvement in internet connectivity being experienced in the past several years, services like Telehealth should be made available and encouraged by funding bodies because it has been demonstrated (St Clair et al., 2018) Telehealth is a significant cost saver and clinical service improver in the delivery of healthcare, n = 224.

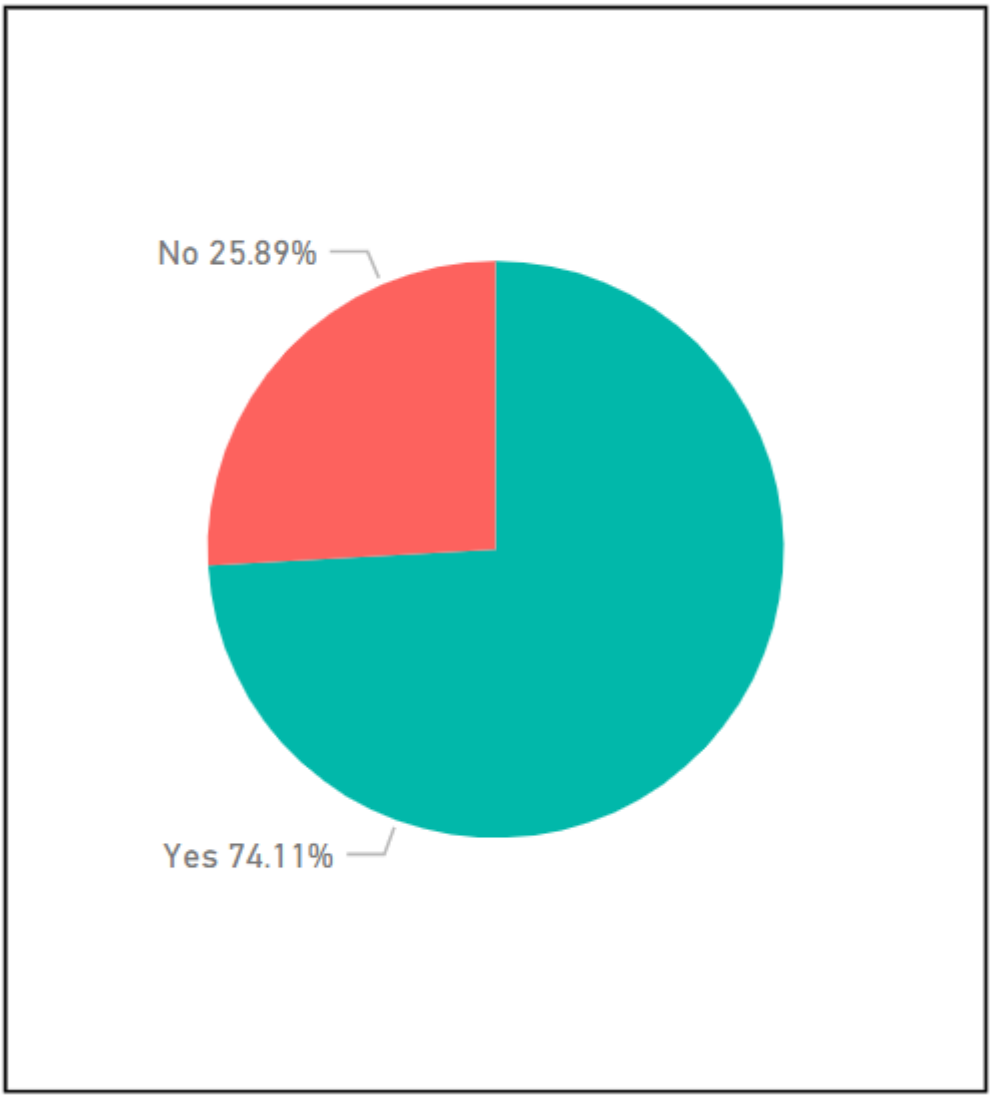

Figure 63. 75% of respondents reporting knowing about telehealth, n = 224.

Question 18. Did you know you can see a medical practitioner, specialist and therapists by telehealth?

Over one third of respondents did not know they could access a range of health services via telehealth and over 60% were aware of this access, n = 220. This contrasts considerably with preliminary work done by the researchers.

A discussion at the Women's Industry Network Seafood Community Conference in 2016 about this research indicated that only a very small number of other delegates (2) knew what telehealth was. It is suggested that, with the implementation of the My Health Record and other eHealth work being done by the Australian Digital Health Agency over the last 2 Years, and the associated media coverage awareness of accessing services by telehealth has increased in the public arena. Additionally, the B4BA Network has been exposed to a series of Telehealth workshops over the last 3 years and a number of other communications about telehealth, so may be more informed than the average public.

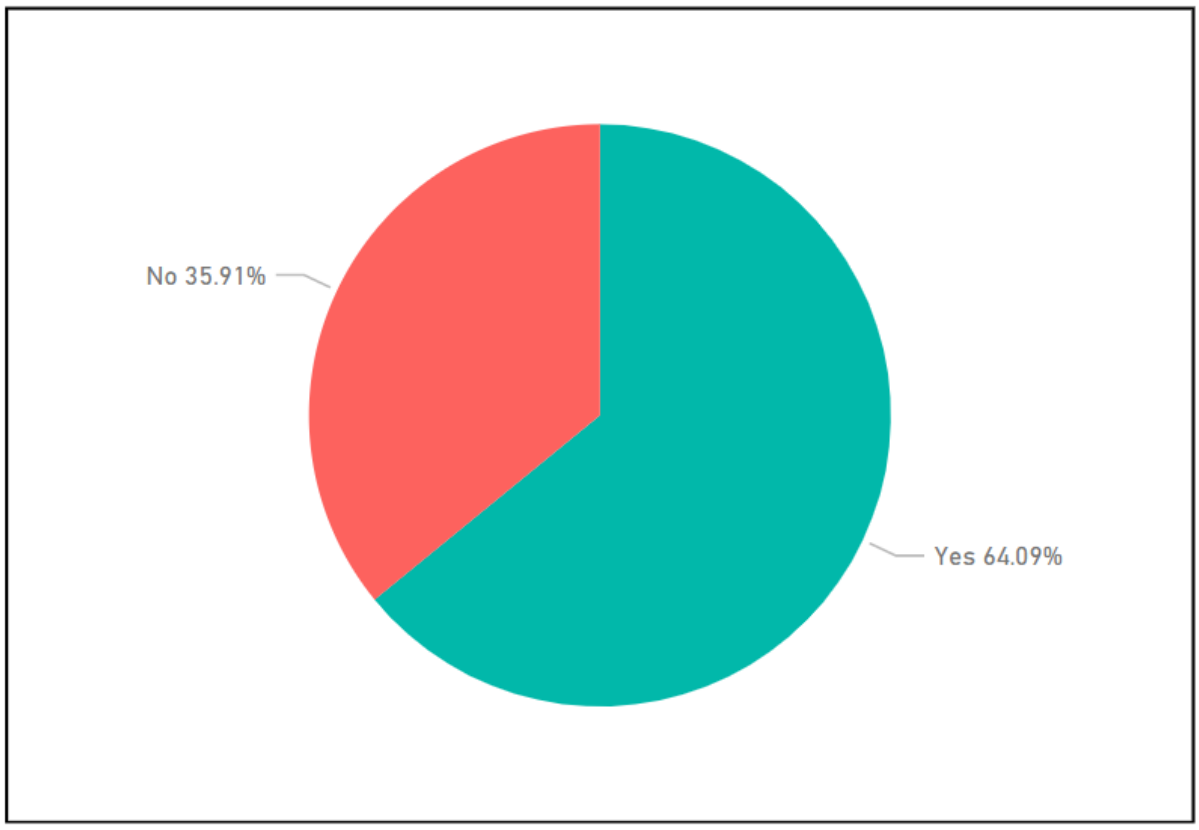

Figure 64. Many respondents were aware of telehealth.

Over one third of respondents did not know they could access a range of health services via telehealth and over 60% were aware of this access, n = 220.

Question 19. Would you like to know more about telehealth?

Of the 214 respondents to this question 53% (113) indicated they would like to know more about Telehealth and 47% (101) did not want to know more about Telehealth.

It is suggested that more information be provided to the general public and through the B4BA, RRRCC and ACCAN networks about Telehealth to increase awareness of options available about accessing clinical services via telehealth for those who would like to access these services.

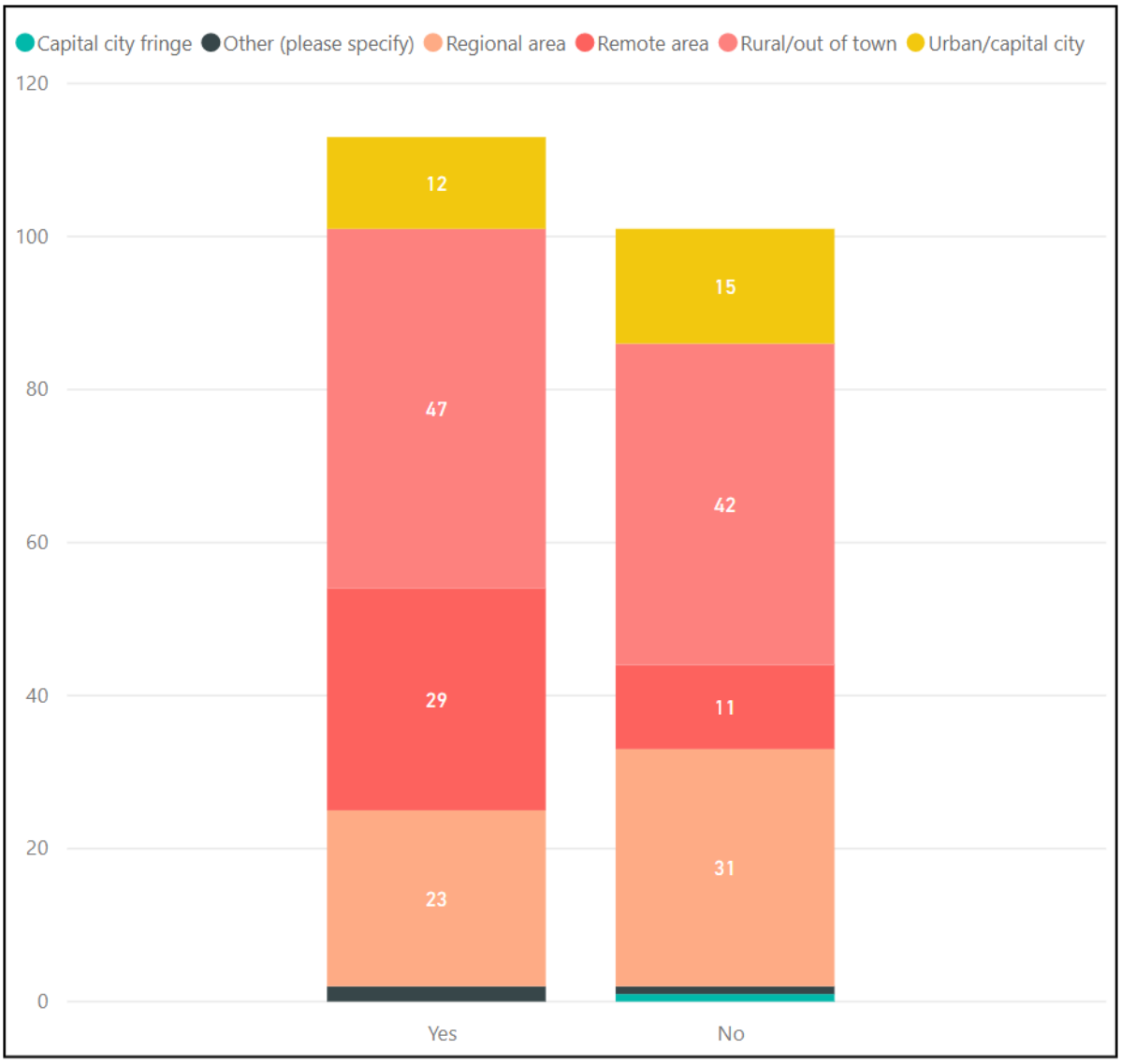

Figure 65. Further information requested about Telehealth.

Approximately half of the respondents would like more information about telehealth.

Question 20. Would you like to access telehealth services?

There were 213 responses to this question. Approximately half (48%)would like to access telehealth with 20% not wishing to access telehealth and 32% not sure. There is a higher proportion of Urban based respondents who are unsure or not keen to access Telehealth (ie 74% of Urban based respondents). Of the RRR respondents 44% wish to access Telehealth services.

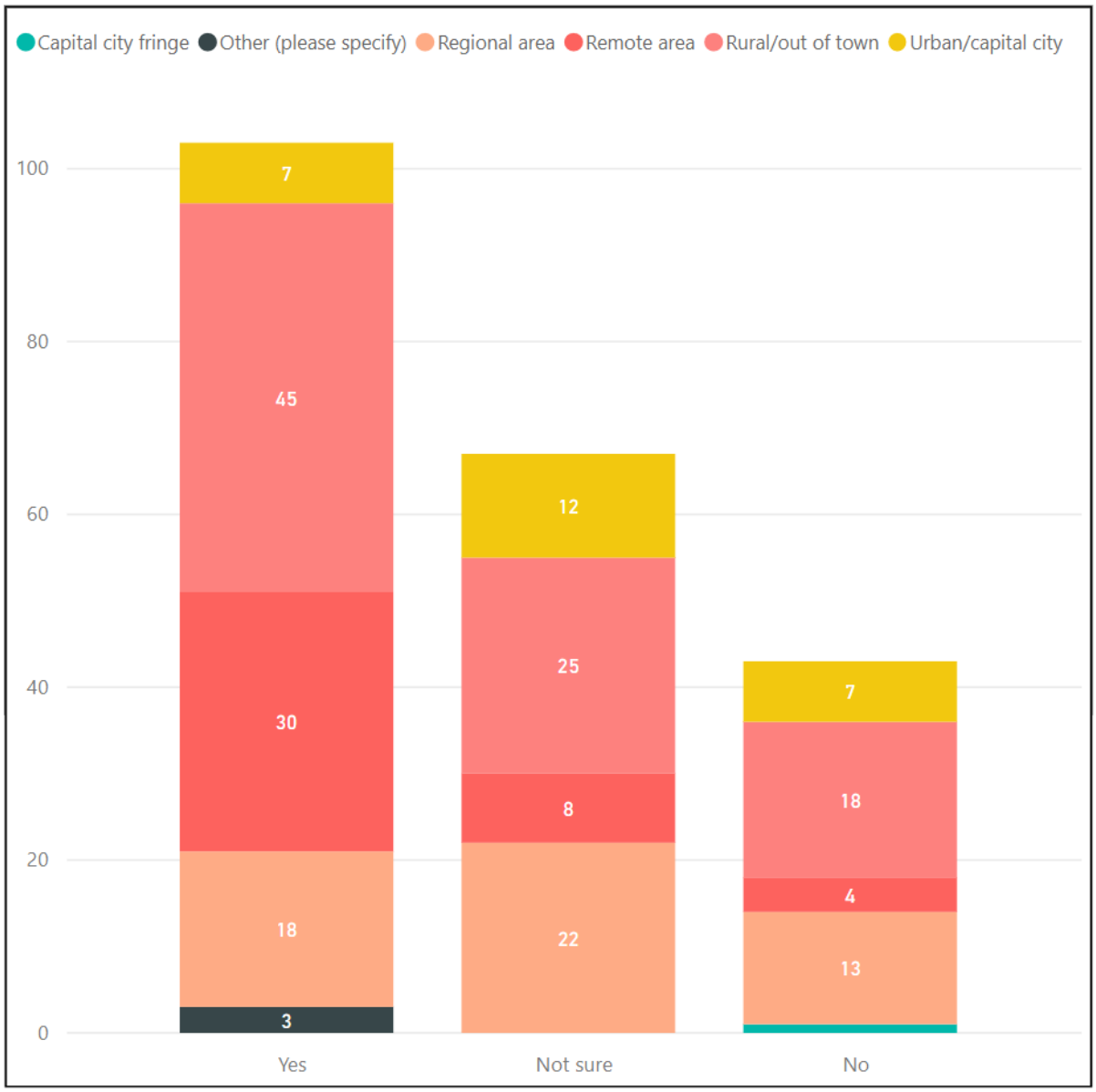

Figure 66. Percentages of respondents wishing to access telehealth.

Approximately half (48%) of respondents would like to access telehealth n = 213. These are predominately from RRR areas.

Question 21. Have you used telehealth?

There were 221 respondents to this question. A quarter of (25%) of respondents indicated they had used telehealth. Of these, 52 were from RRR locations representing 95% of respondents who had used Telehealth, n = 221

A number of comments made by respondents have indicated their internet connection was not adequate, they did not have adequate download allocations for video and Telehealth based clinical services. Additionally, a number indicated these services were not available from their local provider. This last group of comments indicated local based RRR clinical services do not tend to provide Telehealth as part of their 'business as usual' practice.

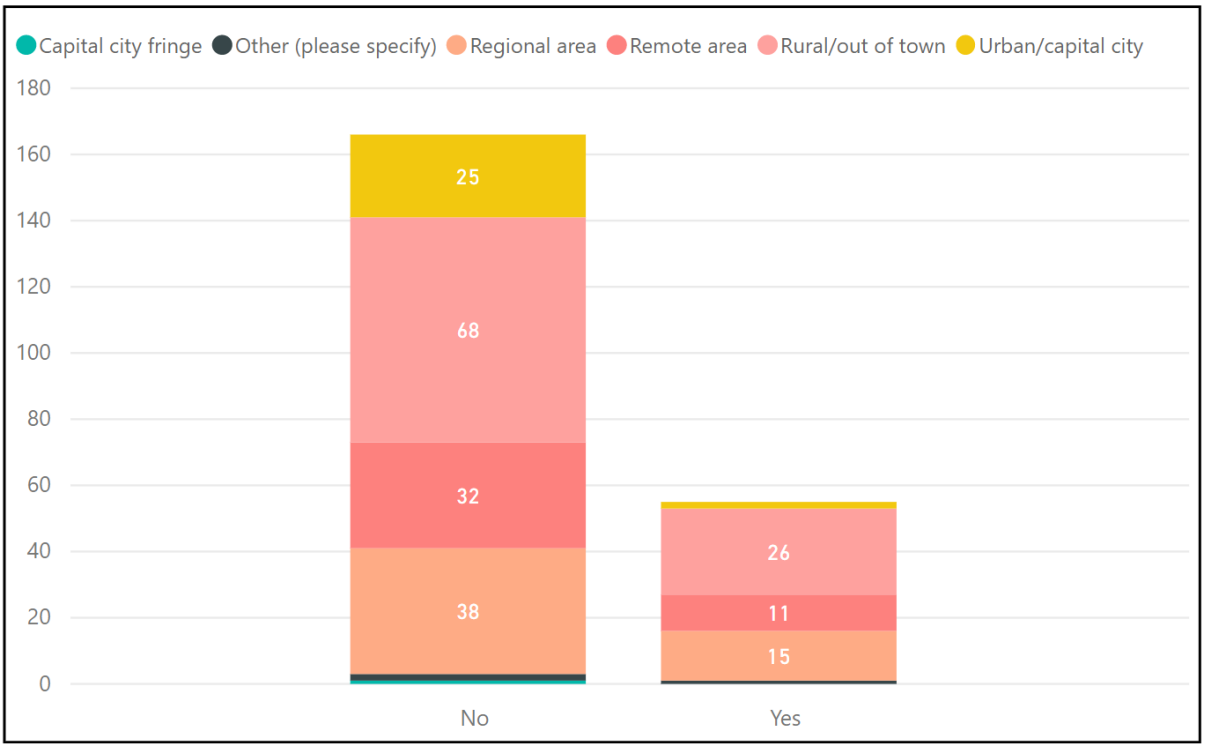

Figure 67. Have you used telehealth?

A quarter of (25%) of respondents have used telehealth, with 24% from RRR locations representing 95% of respondents who had accessed telehealth, n = 221.

Question 22. If you have used telehealth where did you access it?
There were a variety of telehealth locations reported by respondents. Respondents provided the comments below.

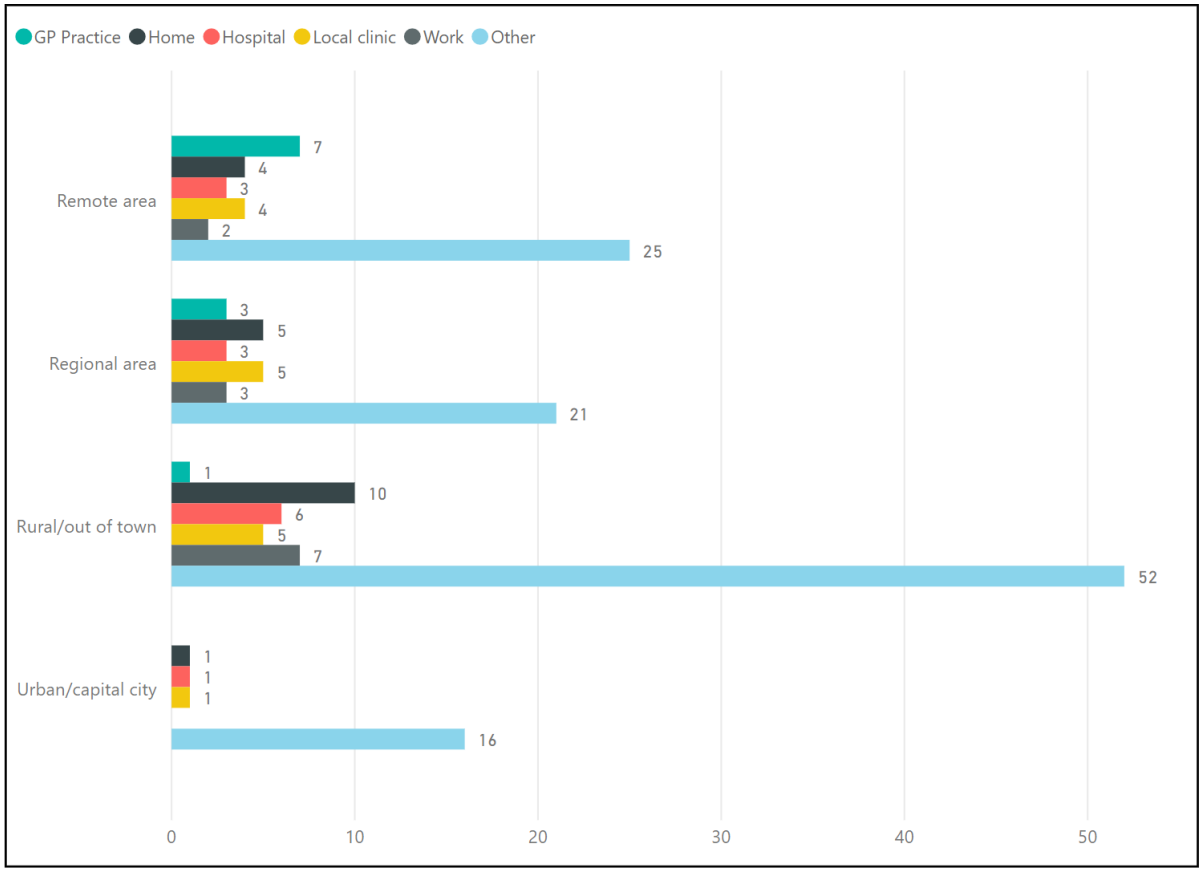

Figure 68. Locations of telehealth consultations.

The following is a list of comments made about this question by survey respondents:

- I provide this service for my patients.
- I am a doctor so have used it in various places as a doctor.
- Not able to access from home due to internet speed.
- Less reliable now due to change in internet services to NBN.
- Community health service.
- We have asked several specialists if we can use telehealth and been told that their hospital/practise (in a metro area) is not set up for telehealth even though our local hospital is.
- It was a physiology appointment, and it wasn't covered under my mental health plan so I am not sure if it counts.
- I was unable to feel comfortable the internet at home would be adequate. Using my own internet plan could have significant impact on my data as video is very bandwidth hungry.

Summary of comments:
Barriers identified in the comments from respondents include: Inadequate internet speed and data allowances and some clinicians (including specialists) not providing services via telehealth.

Question 23. If you have used telehealth was it easy to access, effective, protected privacy saved travel time and expenses, speeded up diagnosis, speeded up treatment?

Respondents indicated they had positive experiences with telehealth, however some indicated internet access was not adequate for telehealth, n = 152.

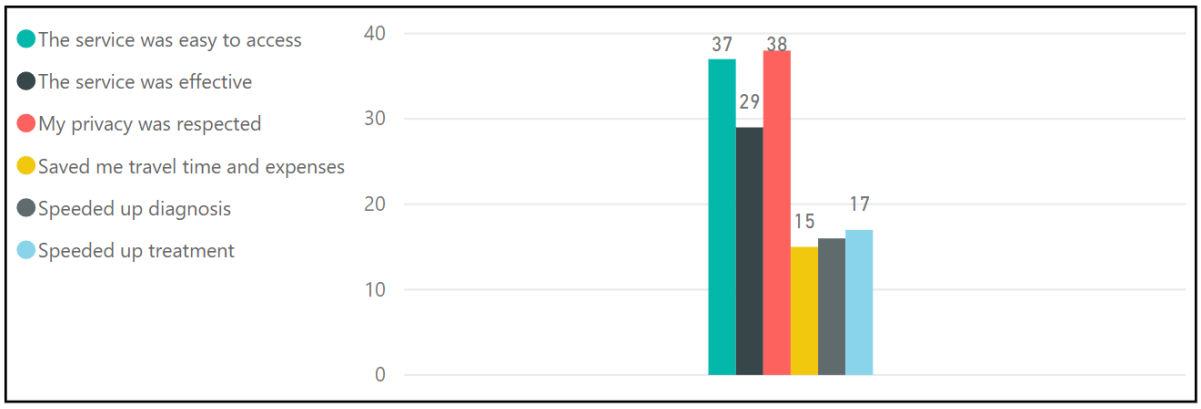

Figure 69. Benefits of Telehealth.

The following is a list of comments about this question made by survey respondents:

- Vital part of accessing care for patients in this community saving costs on travel and missed appointments
- It was for a check-up after surgery and saved a six hour trip to Brisbane. It was at the local hospital
- I worked at QLD Health when it was rolled and did fault finding when there was a problem.
- Did not save me expenses....
- When internet speeds were suitable.
- We spoke with a specialist in our capital city which saved us time, travel, money, energy; my husband was ill and he was assessed adequately by the specialist who had seen him previously.
- The bandwidth is very low at times, therefore making it hard to use telehealth as you cannot use video and voice at the same time.
- The perception is that telehealth means you can be seen earlier. But if the clinician you are referred to has a full clinic list and your triage does not mean you require immediate or urgent access, you will not be progressed up the wait list. Most smaller communities do not have the diagnostic equipment, eg, CT, MRI and the investigation still requires travel. It is the follow up appointments that may reduce travel and save time and money.

Conclusion: Telehealth can generate savings from reducing travel, reducing time away from home/work as well as other associated expenses. There is an issue about clinicians being able to charge telehealth services to Medicare, in some cases although savings were made in terms of travel and time, the cost of the consult was not billable to Medicare and therefore was an additional expense.

Question 24. If you have used telehealth, were there any barriers to accessing it?
There were few responses to this question and most of these reported the internet not being adequate. Further comments will be captured in the thematic analysis associated with the case study report.

The following is a list of comments about this question made by survey respondents:

- Sometime unreliable connections.
- Slow internet makes it very glitchy.
- Some clinicians still do not provide telehealth.
- Some services are unreliable.
- Some services are not billable to Medicare.
- Sometimes the internet is unreliable and distorts the voices so badly that we need to swap over to telephone consult.
- I would not have sufficient data to access telehealth.
- Unreliable internet is a major issue.
- Not applicable, poorly designed question.
- I wanted to use it to access a psychologist, but she believed it wasn't covered under Medicare. As well, I think she preferred to see her face to face.
- The barriers appear to be the paperwork side and actually getting the specialists to participate in telehealth.
- Telehealth for mental health phycology services are not covered under a mental health plan unless you live in certain postcodes or areas. While this is understandable, it does in some ways discriminate against those who wish to have a choice as to who they see.
- Internet speed.
- Still had to drive a considerable distance to access the GP that offered the facilities, however this was much preferable than travelling 1200kms to the east coast for a face to face follow up appointment.
- Not billable to Medicare. This is discriminatory to those people remote from specialist health care.
- Internet speed and accessibility beyond the primary broadband access point.
- The specialist found the technology a bit more difficult than expected but was very happy to consult. She and her staff found the camera difficult to organise at their end.
- The bandwidth is very low at times, therefor making it hard to use telehealth as you cannot use video and voice at the same time.
- Inadequate internet.
- Had to go to local hospital. Would have been more convenient to use at home - but nurse was available at hospital to ensure connection.
- Getting clinicians to use it, in our region there are blackspots so it can be problematic, Internet issues and conferencing program issues.
- In most instances the clinician does not offer telehealth as there is no financial incentive, MBS Item Number or the rule around distance between patient and clinician is applied. A patient can live less than 15kms from the clinician but could be bed bound or not readily mobile and yet is not eligible for Medicare. it is not funded for us in metro areas unfortunately so it is not available as an option - even though for many of us access to health services are also difficult due to family or work commitments or other limitations (traffic, time, etc)ADSL upload speeds of less than 0.5 MB restrict utility.
- Occasionally poor connection, but mostly works well to people at home.

- Can be difficult to get specialists to do, also specialists think its not Medicare billable and therefore I had to pay full fees.
- INADEQUATE INTERNET.
- Cost.
- Internet connectivity.
- Poor internet.
- GP surgery is still on slow ADSL making video a bit blocky.
- Sometimes the internet is too slow.....
- Some specialists eg dermatology will not participate in telehealth due to the nature of their speciality.
- Medico's didn't know about it and didn't know they could bill Medicare for the consult so charged full fees.

Conclusion: The primary barriers to telehealth are:

- Inadequate quality of internet.
- Inadequate data allowance.
- Consultations not billable to Medicare.
- Some clinicians do not offer telehealth consultations.

Question 25. Do you think Telehealth services (eg seeing GPs, specialists, therapists, health advisory services) by video conference should be made available to you?

Of the 212 responses to this question 84% of respondents would like access to Telehealth through video conferencing. Only 16% (34) respondents indicated they would not like access to Telehealth through video conferencing, including some Urban respondents.

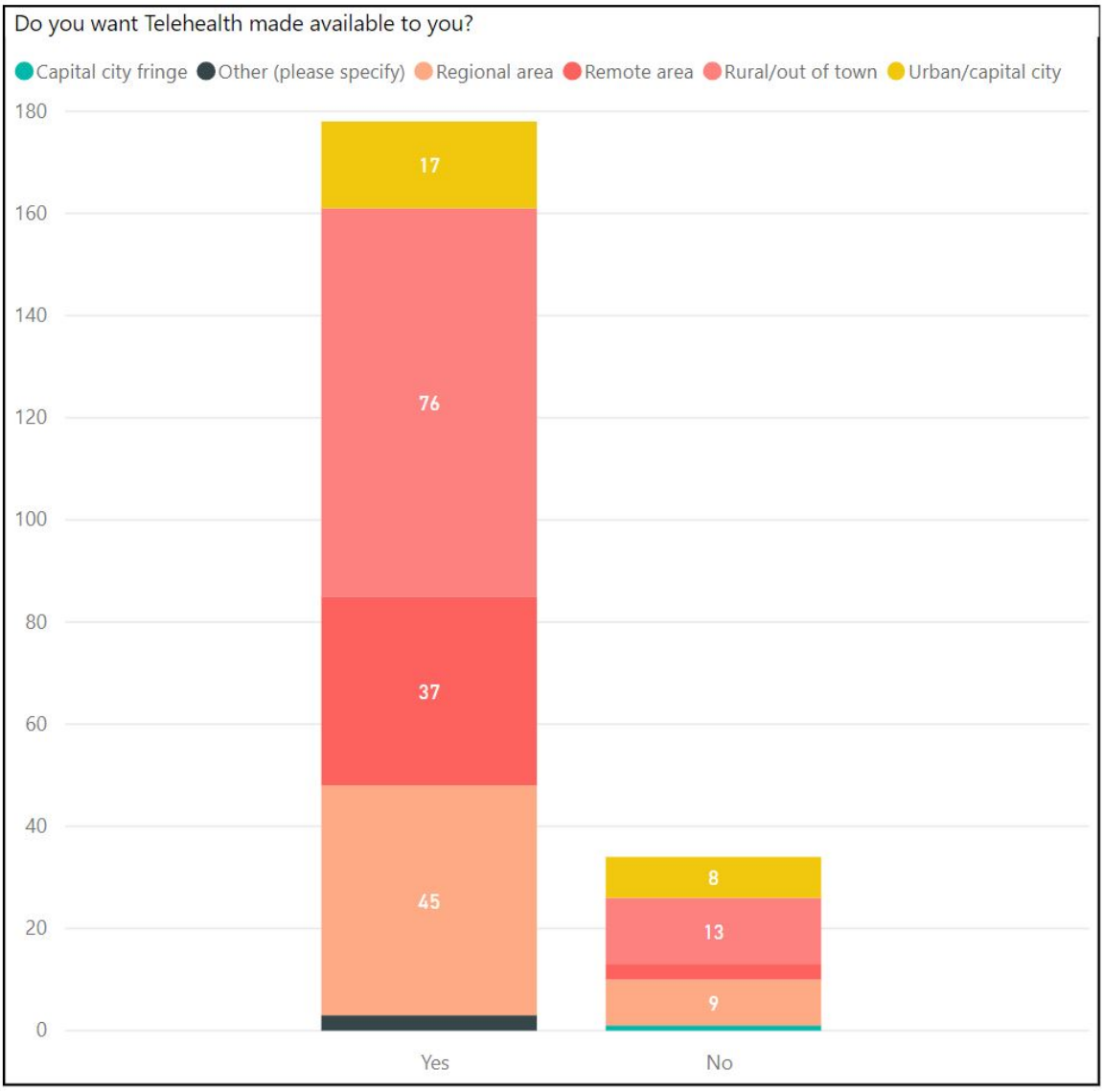

Figure 70. Most people would like to access teleheatlh.

Most respondents (84%) would like access to Telehealth through video conferencing, n = 212.

Question 26. Do you think telehealth services should be billable to Medicare?

Almost all respondents (98%) indicated telehealth should be billable to Medicare, n = 209. Of the 5 respondents that answered in the negative, 2 were from the Rural, 1 from Remote, 1 from Regional and 1 from Urban/Capital City categories.

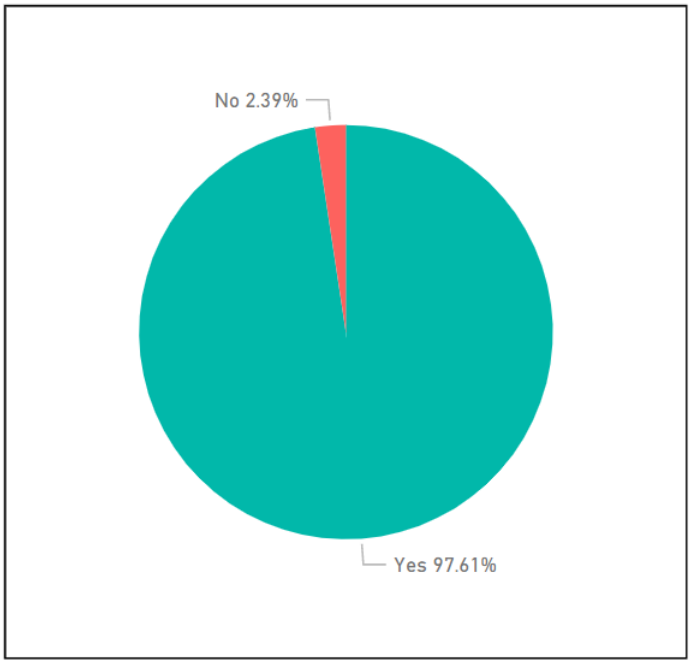

Figure 71. Telehealth services should be billable to Medicare.

Conclusion: It is clear that a lack of Medicare item numbers is a barrier to telehealth uptake and there is a need for more Telehealth Medicare item numbers.

Telehealth Summary

With the publicity surrounding the implementation of My Health Record it is not surprising that the public are becoming more aware of electronic health systems. Also, B4BA Network Members have been participating in the B4BA Fora and the last three Fora have had Telehealth Workshops as part of the forum, so generally, people involved in the B4BA network may be more aware of telehealth than the general public. Only 25% of respondents have used Telehealth.

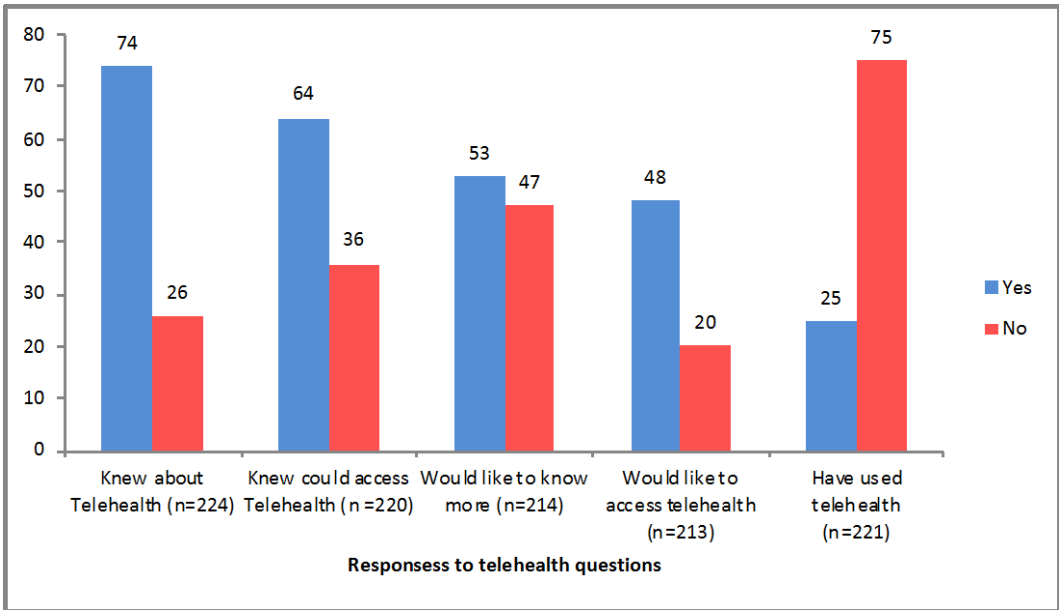

Figure 72. Summary of responses to Telehealth questions.

Future research into telecommunications and telehealth.

Telecommunications.

1. How can fault rectification processes be improved thereby improving services and reducing stress to consumers?
2. How reliable are NBN satellite services?

Telehealth.

1. Can NBN satellite be successfully used for telehealth?
2. Can affordable and reliable diagnostic smart tools (cameras, sensors) be developed and integrated into small, remote communities?
3. Can solar power improve telehealth reliability?
4. Can simple solutions be developed for secure messaging using existing email infrastructure?
5. How do telehealth consultations between primary health care providers and specialists improve health outcomes for remote patients?
6. How can we empower patients to create polite demand for telehealth access?
7. Can real jobs be funded on remote Aboriginal communities sustainably by re-directing savings made by implementing telehealth and existing funding?
8. What support mechanisms are needed to maintain workforce sustainability for locally based administrative support staff?
9. What is the unmet demand for health services in the bush and how can health services increase service to people in these areas without increasing costs?

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