

AT2030

Characterising mobile phone inclusion among Assistive Technology users:

An intersectional disability analysis of mobile phone access and use in Banjarmasin, Indonesia and Freetown, Sierra Leone

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(2022) *Characterising mobile phone inclusion among Assistive Technology users:*

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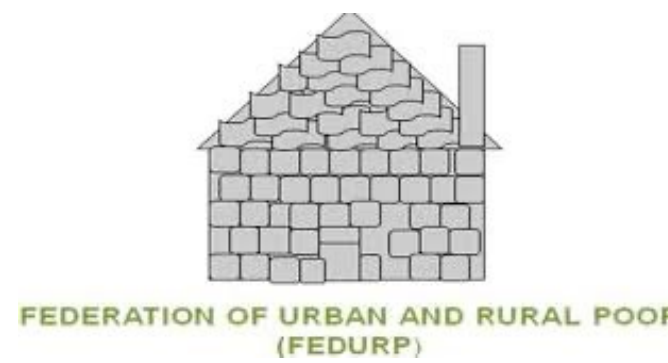
COLLABORATION PARTNERS



The **Bartlett Development Planning Unit of University College London (DPU)** conducts world-leading research and postgraduate teaching that helps to build the capacity of national governments, local authorities, NGOs, aid agencies and businesses working towards socially just and sustainable development in the global south.



The SHM Foundation works globally to bring about positive social change through projects in health, education and the arts, by providing communities and individuals with the practical tools they need to develop innovative solutions to challenges they face. The SHM Foundation has over a decade of experience in developing and implementing digitally-enabled interventions through participatory co-design processes, such as the Zumbido Health model of mobile phone-based support groups.



The **Federation of Urban and Rural Poor (FEDURP)** is a grassroots organisation that seeks to empower poor communities to improve their social, economic, and environmental conditions by creating spaces and opportunities through collaborative actions to champion their own transformative and development agenda. FEDURP is a member of Slum Dwellers International (SDI) network, a social movement of the urban poor across 30 countries.



The **Sierra Leone Urban Research Centre (SLURC)** based in Freetown, is a globally connected research centre created through a partnership between the DPU and the Institute of Geography and Development Studies at Njala University. The centre builds capacity and undertakes research on the wellbeing of residents of informal settlements in cities across Sierra Leone.



Yayasan Kota Kita is an Indonesian non-profit organization helping people make thoughtful and inclusive decisions about the development of their cities, by facilitating citizen participation and collective action. Their aim is to empower a generation of people by promoting democratic and participatory approaches to improve urban areas.

EXECUTIVE SUMMARY

This report shares the findings of a research project conducted in five informal settlements across the cities of Banjarmasin, Indonesia and Freetown, Sierra Leone, in 2020-2021. This research explored the attitudes, access to and use of mobile phones and other information and communication technologies amongst people with disabilities, carers, older people, and potential assistive technology users in these communities. This research was conducted as one strand of a sub-programme of the AT2030 Research Programme.

Background:

Context in AT2030

AT2030, led by the Global Disability Hub, focuses on “Life Changing Assistive Technology for All”. Its aim is to reach over 3 million people, in particular, people with disabilities. The objective is to develop new approaches which can transform access to assistive technology (AT) such as wheelchairs, prosthetics, hearing aids, glasses and digital assistance (including smart phones and accessible software) by creating partnerships to build and shape markets, strengthen public infrastructure and support community participation.

The AT2030 sub-programme from which this research report emerges is led by The Bartlett Development Planning Unit at UCL in partnership with Leonard Cheshire (UK), Sierra Leone Urban Research Centre (Sierra Leone), and Yayasan Kota Kita Surakarta (Indonesia). The overarching research question is “How can collective and community-led responses enable disabled people to access better life outcomes, through increasing the relevance and uptake of AT?” The first phase

of the project was undertaken in May-December 2019 in five informal settlements across the cities of Banjarmasin, Indonesia and Freetown, Sierra Leone, with the aim of mapping aspirations selected by people with and without disabilities in the partner communities, and the existing community-led responses that support the attainment of these.

The research shared in this report builds on those from the previous phase, with a specific focus on the role of mobile phones and other ICT in the day-to-day activities of people with disabilities and assistive technology users across both cities. It originated in part as a response to the need for socially distanced research during the Covid-19 pandemic as the research moved into its second phase. The study was conducted in two stages. The first stage involved a quantitative survey to develop an understanding of mobile phone usage patterns across users with and without disabilities. The second stage was a qualitative survey using creative tools to gain in-depth knowledge of the relationships and aspirations vis-a-vis mobile phones.

KEY FINDINGS

Regular mobile phone use is widespread in both settings, and mobile phones play an important role in people's lives, though use of other ICT hardware is rare. There is a huge variety in the ways and purposes for which phones are used, and the meanings they hold for different people. For some participants, phones are seen as objects of sociality and interaction; for others, they are objects of solitude, enabling entertainment and learning when they are alone. For some, their use is predominantly related to income-generating activities; for others, they're associated much more with care-giving and domestic labour. For some people they're seen as a vital part of their day-to-day life, whereas for others they are only used in emergencies, such as family health crises. For some, phones are associated with excitement, personal growth, connection and opportunity; for others they are associated with anxiety, frustration; a few are simply apathetic towards them.

For many participants, mobile phones are owned and used collectively rather than individually. Though the majority reported owning a phone, many borrow from or share with family members or neighbours. For those who own their own mobile phone, lending it regularly to others is commonplace, particularly in the Freetown settlements. This can sometimes put an economic strain on the mobile phone owner and a social strain of shame or guilt on the borrower, with both concerned about the cost of the data that gets used. Many participants, particularly those who are middle-aged or elderly, visually impaired or have a physical disability, get family members to help them navigate a mobile phone, teach them about different functions and remind them how to use them.

The cost of owning and using a phone is the biggest challenge for people in both settings, though it is more pressing for residents in the Freetown settlements than in Banjarmasin. Overall, the residents of the Banjarmasin settlements reported far fewer challenges associated with mobile phone use than those in Freetown, and also had access to more advanced hardware with a wider range of phone functions. The residents of the Freetown settlements on the other hand reported significant infrastructural challenges around connectivity, signal coverage and charging, as well as challenges such as the risk of theft, and low levels of literacy.

People with disabilities have lower access to mobile phones than non-disabled people and face more challenges, but disability is not the most significant determining factor. Infrastructural factors such as cost, network coverage, access etc. are compounded by intersecting demographic factors such as age, gender, socio-economic backgrounds, disability and technological literacy.

There are inequalities of access and capacity to use mobile phones between women and men, people with and without disabilities, and between elderly and working age residents are more stark in Banjarmasin than in Freetown.

Through analysis of the quantitative and qualitative data, we have identified six archetypal "characters" that recur across both settings, and have mapped out their archetypal characteristics of access, use, attitude and aspiration regarding mobile phones. In this way, we hope to embed their relationships with ICT within their day-to-day realities. These character profiles will serve as a useful framework for design, analysis, M&E to inform further thinking for all important stakeholders in the domain including researchers, implementers and mobile phone-based companies.

The insights gained from this research are being used to inform the final phase of this sub-programme: co-designing and implementing an intervention with the participants in Sierra Leone, utilising mobile phones to enable greater access to health information.

Additionally, we hope they can be useful in the following ways

For researchers

The insights in this research could inform future research directions. We hope that our analysis can contribute to a growing research interest around these topics, and ignite collaborations between researchers and programme designers to inform future interventions. This analysis has revealed the unequal nature of access and capacity to use mobile phones in both countries and has also recommended potential measures that can be implemented to address these gaps. Researchers can explore in future projects the impact of removing these barriers related to access and infrastructural challenges and how gender, disability and age come into play in those situations.

For implementers

Intersectional analysis of participant needs, capabilities and aspirations should be an essential first step of the process of designing any intervention that has a digital component, or indeed a digital product, in order to understand the capacity, needs and aspirations of your target participants or users.

For mobile phone and data providers

This research highlights some of the gaps in the service provision of mobile data providers and some of the opportunities for reaching new potential customers who may not currently be able to access or use products. It suggests how specially-designed data packages could benefit particular potential customer groups not being served by current market offerings.

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INTRODUCTION

The use and ownership of mobile information and communication technologies (ICTs) such as mobile phones and smartphones has grown rapidly around the world over the last two decades¹. ICTs have penetrated across high- and low-resource contexts, particularly as a result of the unprecedented spread of mobile phones. This has changed the ways that we navigate almost all dimensions of our lives, from managing interpersonal relationships to conducting livelihood activities, accessing services to handling finances.

Advances in the functionality, speed and availability of mobile devices and infrastructure, have generated significant interest in the use of mobile phones within both health and development. In the field of mobile health, known as mHealth, which involves the use of mobile phones to improve health knowledge, behaviours and outcomes, ICTs have been used to support service provision, to promote accurate health information, facilitate access to medication, provide appointment reminders and create peer support networks².

The field of Information and Communication Technologies for Development (ICT4D) utilises digital technologies to support social and economic development outcomes in low- and middle-income countries, particularly for disadvantaged or marginalised populations. In this broad field, ICTs have been incorporated into programmes related to livelihoods, financial inclusion, civic participation, education and women's empowerment, to name a few.

Inequalities faced by people with disabilities (PWD) are well documented, with their disproportionate experience of poverty - both a cause and a consequence of disability - having been characterized as a 'disability and development gap'³. The income inequalities faced by PWD are compounded by the 'accessibility gap' created by exclusionary institutions and spatial planning practices, which exclude PWD from using and experiencing spaces and services on an equal basis with non-disabled counterparts⁴.

ASSISTIVE TECHNOLOGY AND ICT

Appropriate assistive technologies (ATs) can play a crucial role in bridging this accessibility gap. Mobile phones and other ICTs have the potential - and indeed, have been used - to act as enablers in supporting people with disabilities to overcome some of these barriers to social, civic and economic participation. Mobile phones can provide access to and information about ATs, or act as ATs themselves.

However, there are four common problems with the ways mobile phones and other ICTs can be conceived of and used in these contexts:

- 1. There is an assumption that everyone has the capacity to use a mobile phone.** This fails to take account of how access and technical literacy to use mobile phones are unevenly spread in most settings, often following familiar economic, gendered and generational patterns of disparity.
- 2. There is an assumption that everyone uses mobile phones in the same way.** This fails to take account of diverse accessibility needs; cultural, gendered and generational preferences; lifestyles; resources; and aspirations.
- 3. There is an assumption that mobile phones and other ICTs can replace face-to-face services,** rather than extend, strengthen or integrate within them.
- 4. There is an assumption that mobile phones and other ICTs are, in themselves, solutions to particular challenges.** This fails to see that ICTs can only ever act as enablers - or indeed barriers - in solving those challenges. It is all about how they are designed, used and integrated within particular sociocultural and economic contexts.

Each of these assumptions results from a failure to situate mobile phones and other ICTs in particular contexts, and to take account of the nuances that surround their use in those contexts - in how they are perceived, by whom and along what axes of inequality. Different people access, use and value the mobile phone in vastly different ways, shaped by geography, gender, age, class and ability. Technology tends to amplify the levels of human capacity that already exist - it cannot substitute for a lack of capacity⁵.

If we don't contextualise mobile phone use, we end up making assumptions that essentialise or universalise digital experiences. This leads to poor design and implementation of both interventions and products, which can end up amplifying inequalities rather than undoing them, or even further exclude some groups.

INTRODUCTION

UNDERSTANDING THE CONTEXT

Leveraging the mobile phone to support positive outcomes for health and development therefore requires a deep understanding of the behaviours and motivations surrounding mobile phone use in particular contexts, in order to identify barriers, motivations, needs and solutions.

One needs to understand areas such as:

- Generational and gendered behaviours
- Accessibility needs
- Literacy levels, related to both technology and language
- Household decision-making and spending behaviours
- Patterns of ownership and borrowing in households and communities
- Communications preferences
- And financial constraints

Qualitative research is paramount to understanding the nuances and interrelations between these factors.

We argue that there is a need for a more nuanced understanding of the patterns, behaviours and capacities surrounding mobile phone use. This is particularly necessary for disadvantaged people including people with disabilities and their carers, women and the elderly. The need for this nuanced perspective is even greater as we design post-pandemic health interventions that might assume digital is better in the context of ongoing Covid-19 transmission. In order to achieve this, better qualitative methods are needed to understand patterns of use; and participatory methods are needed to inform intervention design. If this occurs, we will be able to leverage the full potential of the mobile phone, and unlock its value as an assistive

technology. We will also be able to approach digital infrastructures systematically, layering them with the appropriate face-to-face services, and providing adequate training and trouble-shooting to ensure use.

This report shares the insights gained through research conducted by the Bartlett Development Planning Unit of University College London and the SHM Foundation, in partnership with the Sierra Leone Urban Research Centre (SLURC), & Yayasan Kota Kita, Indonesia.

Focused on five case study communities in Banjarmasin, Indonesia and Freetown, Sierra Leone, this research explores the attitudes, access to and use of ICTs, chiefly mobile phones, amongst disabled people, carers, older people and potential AT users, and seeks to situate these behaviours and perceptions within their day-to-day realities.

The insights from this research are being used to inform the next stage of activity within this sub-programme of AT2030.

METHODOLOGY

STUDY DESIGN

The aim of this research was to gain a diagnostic overview of the attitudes, access to and use of ICTs, particularly mobile phones, by a mixed group of residents in five informal settlements across two cities: Banjarmasin, Indonesia and Freetown, Sierra Leone. It was a mixed-methods study that involved a survey with a large sample (n=112) and semi-structured interviews with a smaller sample (n=12).

CONTEXT OF THE STUDY

In Freetown, Sierra Leone, the research was conducted in two informal settlements: Dworzark and Thomson Bay. Dworzark is a hillside settlement approximately 5km from the city centre, with a population of approximately 16,500 residents, of whom 65% are under the age of 30⁶. Since the 1980s, rapid urbanisation has outstripped investments in infrastructure. The settlement is characterized by poorly constructed housing, together with poor road networks and lack of sanitation facilities. Thompson Bay is a relatively small and recently populated coastal settlement situated around a lagoon on a mangrove swamp that has been banked up over the years to allow the construction of homes. Most of the land is used for residential purposes and is characterised by mixed dwellings, with some concrete, well-designed housing, as well as poorly constructed housing made out of tin and other

materials. Overall, sanitation in the settlement is poor and there are no council-designated waste dumps.

In Banjarmasin, Indonesia, this research was conducted in two informal settlements: Kelayan Barat and Pelambuan. Kelayan Barat is part of the South Banjarmasin sub-district and has a population of 6,754 inhabitants. Kelayan Barat is categorised as a slum area by the Government of Banjarmasin due to its density, arbitrariness of the settlement, and the lack of infrastructure. Pelambuan is part of the West Banjarmasin sub-district, and has a population of 30,827 inhabitants in 2020. Historically, most of the residents in Pelambuan were settlers attracted by high economic activity in the port.

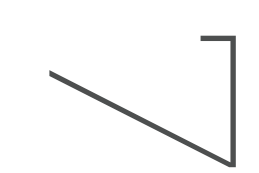
STUDY SAMPLE

A total of 112 participants from five informal settlements took part in this research: 45 participants in Banjarmasin, Indonesia; and 67 participants in Freetown, Sierra Leone. The principal inclusion criterion was that all participants had already taken part in a previous phase of research as part of the Community-Led Solutions sub-programme of AT2030. As a result, they had existing relationships with the on-the-ground teams.

The sample included people with disabilities, older people, carers and potential AT users who had been involved in previous phases of research in this AT2030 sub-programme. The disability status of all participants were identified through a rapid Assistive Technology Assessment (rATA) survey conducted in September 2019.

The rATA tool was developed by the WHO to understand questions of health and disability in relation to assistive technology needs and access. 12 participants were purposively sampled from across the study sites for the qualitative component of the research.

The sampling strategy sought to identify individuals who typified different demographic characteristics (gender, age, occupation) and patterns of ICT access, usage and behaviour that emerged from the survey. The research team met together to decide on the sample based on survey findings. In settings both selected a mixture of participants with high, medium and low phone access and use.



METHODOLOGY

DATA COLLECTION

Data collection involved two stages: an initial survey (n=112), followed by in-depth interviews (n=12). The purpose of the project was explained to participants through the AT2030 project information form and video. Their due permission for participation was recorded through signed consent forms. The different accessibility needs of participants were taken into account by: using clear and simple language in the survey and interview design and including an additional explanatory background for each question; ensuring that those who needed had a carer or interpreter present to provide support if required; and following established guidelines and best practice for interviewing persons with disabilities.

Survey

The survey was designed by the SHM Foundation and DPU with input from FEDURP and Kota Kita. It included questions related to the access to, ownership patterns and use of mobile phones and other ICTs, including frequency of use, associated challenges and barriers, preferences for communication, data, connectivity and functionality, what they were used for and aspirations for ideal use (the full list of questions can be found in the appendix).

The survey was translated into Indonesian by Kota Kita representatives, for use in Indonesia. In Sierra Leone it was largely delivered in English and translated verbally into Krio as required.

The survey was administered in person by representatives for FEDURP and Kota Kita, using a survey guide. Prior to data collection, these representatives attended an online workshop to receive training in the data collection approach, and to ensure everyone understood the purpose and context of each question.

Data was collected and stored using KoBoToolbox, a suite of tools for data collection and analysis, designed for use especially in challenging environments. Kota Kita representatives translated responses to open-ended questions from Indonesian into English.

Interviews

12 semi-structured interviews were conducted in person, with six purposively sampled participants in each country, by data collectors in Banjarmasin and Freetown. The interview questions explored how mobile phones figure in participants' daily lives; emotional relationships and associations with mobile phones; aspirations for whether and how they would prefer to use mobile phones in an ideal situation; and particular patterns of use or access that were reported in the survey. The data collectors were trained in the interview approach via an online workshop. The interview audio was recorded, and data collectors transcribed notes and additional ethnographic observations, such as participants' living situations, afterwards. For Banjarmasin interviews, data collectors took the additional step of translating their notes into English.

METHODOLOGY

	Banjarmasin, Indonesia		Freetown, Sierra Leone		
Case study sites	Kelayan Barat	Pelambuan	Dworzark	HEPPO	Thompson Bay
Number of participants surveyed	20	25	30	9	28
Number of participants interviewed	1	5	6	0	0

DATA ANALYSIS

Survey Analysis

Survey results were analysed using Excel. Frequencies and percentages were used to summarise the demographic characteristics of the participants involved in the survey. Percentages and graphs were used to summarise the patterns of the way the participants answered the questions. The data analysis team met to discuss any emergent patterns and discrepancies.

Interview Analysis and development of “character profiles”

Following a method of thematic analysis, interview transcripts were divided between a group of four investigators who coded them. Investigators then met to discuss core themes, and developed a coding framework. Investigators agreed that this coding framework should be structured according to the profiles for use of mobile phones. Investigators then went back to their transcripts and re-coded them according to the agreed framework. The coding framework agreed was focused on patterns of mobile phone use and intersectional aspects of identity. They met again to agree on the final “character profiles”.

RESULTS

PARTICIPANT DEMOGRAPHIC INFO

	Banjarmasin, Indonesia		Freetown, Sierra Leone	
Total Participants	45 Participants		67 Participants	
Disability Status	28 people with disabilities (<i>including 10 AT users</i>) 16 non-disabled 11 unknown		47 people with disabilities (<i>including 2 AT users</i>) 11 non-disabled people 5 carers 4 unknown	
Gender	33 women 12 men		29 women 34 men 4 unspecified	
Age	<20	3	<20	5
	20-40	9	20-40	25
	40-60	19	40-60	17
	60+	5	60+	7
	Not mentioned	9	Not mentioned	13
Disability	<i>Visual impairment is the most common disability, usually accompanied by communicating or mobility challenges</i> Seeing (8) Seeing, Communicating (3) Seeing, Mobility (5) Communicating (4) Physical/Mobility (6) Seeing, Mobility, Remembering (1)		<i>Mobility is the most common disability</i> Mobility (31) Communication (4) Seeing (9) Remembering (3)	

MOBILE PHONE ACCESS & OWNERSHIP

The vast majority of participants in both cities (80% in Banjarmasin and 84% in Freetown) reported that they use a mobile phone at least once a week, including all non-disabled participants. All of those who reported rarely using a mobile phone have a disability, making people with disabilities 21% less likely in Freetown and 30% less likely in Banjarmasin to have regular phone access than non-disabled residents of their settlements. In Indonesia, mobile phone use is more prevalent among men than women.

There is quite a divergence in how frequently mobile phones are used in the two settings: in Freetown, 79% of people reported using a phone multiple times a day, while in Banjarmasin only 55% reported such high levels of use. In both settings, there are relatively few people who reported using their phone what we might term a ‘medium’ amount - from once a week to once a day - with only 7% in Banjarmasin and 3% in Freetown reporting to fall into these categories.

The divide that emerges is between the majority of participants using phones frequently, and a significant minority who use phones only rarely, with few people falling in-between. This divide is particularly stark in Freetown.

My mobile phone makes life easier

AT User, Banjarmasin

OWNERSHIP, SHARING & BORROWING

The phone I normally use the owner always collects it when I am not yet done using it. And he also taxes me for using his phone

Woman with a physical disability, 66, Freetown

Most people who don't own mobile phones will always come to us to beg for free calls and that is costing us huge money too; especially when the person has an emergency issue you just have to help out

Female teacher with a visual impairment, 47, Freetown

The vast majority of those who use a phone regularly in both countries (83% in Banjarmasin and 89% in Freetown) own their own phones. Unsurprisingly, those who use a phone multiple times a day are more likely to own their own phone than borrow or share one. Sharing phones is the second most common option in Banjarmasin, whereas in Freetown it is borrowing, and for those who do own a phone it's common practice to lend it to other people.

In Banjarmasin, participants with disabilities were 20% less likely than non-disabled participants to own a mobile phone, whereas in Freetown there was little difference in ownership levels between the two groups.

By contrast, in Freetown men were 12% more likely than women to own their own phone, while women were more likely than men to borrow a phone from someone else.

In Banjarmasin, men and women had similar levels of phone ownership, though men were slightly more likely to report sharing a phone. In both settings, there is little difference in levels of ownership, borrowing, and sharing between age groups, though it's

notable that all participants under the age of 25 reported owning their own phone.

The sharing of phones is often supportive, practical and beneficial, with people with lower technological literacy or accessibility challenges able to rely on family members and neighbours to help them navigate the phone, or teach them how to use new functions. However, it can create social and economic stresses.

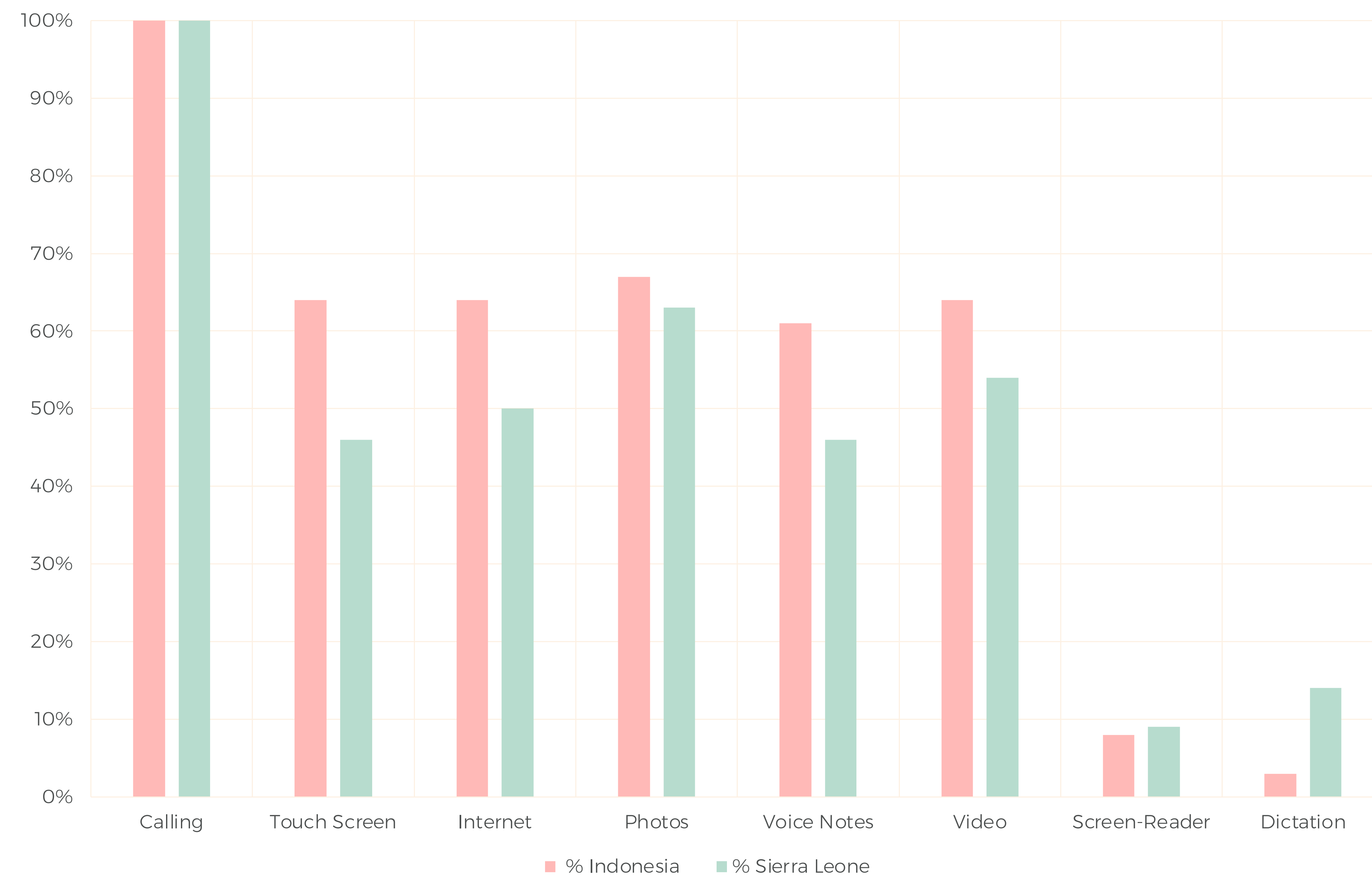
For those who regularly lend their phones, the financial cost of the data used can become a burden, which leads some people to charge for the use of their phone. For those who borrow, there can be a sense of shame and guilt in needing to ask, and in the knowledge of what it costs. Within households, sharing phones can also lead to anxieties over privacy or safeguarding. For example, one participant in Banjarmasin, who has an intellectual disability, regularly borrows the phone of his sister, his primary caregiver, and sometimes goes on her Facebook account and likes her friends' posts, which makes her uncomfortable.

MOBILE PHONE ACCESS & OWNERSHIP

HARDWARE, SOFTWARE & FUNCTIONALITY

Participants in Banjarmasin tend to use more sophisticated phone hardware, with a wider range of functions, than participants in Freetown. Android is the most common operating system (OS) among participants in Banjarmasin. Use of accessibility functions such as screen readers (text-to-speech) and dictation (speech-to-text) technology are low in both case study sites, although it is interesting to note that use of the dictation function is higher in Freetown. This low usage of accessibility functions may be due to a lack of awareness of these functions as well as to a lack of availability.

My Phone's Features



PATTERNS OF USE AND BEHAVIOURS

CREDIT, DATA, AND INTERNET ACCESS

When it comes to the credit and data packages purchased by participants, the two countries are quite different. In Banjarmasin, comprehensive packages (voice call, messaging and internet access) and internet-only packages account for two thirds of respondents, with 58% respondents purchasing data to use the internet. Voice call only packages are uncommon. In Freetown, comprehensive packages and voice call only packages are the equal most common, accounting for two thirds of respondents. Only 38% of respondents purchase data packages that allow access to the internet. Many participants top up their phone only rarely, or not at all, and only receive calls and texts rather than making them.

In Freetown the data and credit packages purchased by respondents with and without disabilities follow the same patterns, but in Banjarmasin, participants with disabilities

and AT users were far less likely than non-disabled participants to purchase data packages that allow access to the internet, and none reported purchasing comprehensive packages.

COMMUNICATING

Of the many functions participants reported using their phones for, **communicating with other people was by far the most common** and prominent in both settings. Voice calls are the most common mode of communicating across all demographic groups.

In Freetown, the second most common method of communication is via deliberate missed calls, which is useful for communicating while conserving data or credit. A missed call can be used to signal for someone to call you back, or to indicate another pre-arranged message, such as a reminder. Messaging and sending photos are also common. There are no significant differences in the preferred methods of communication for participants with disabilities compared to non-disabled participants or for women compared to men, although among both male and non-disabled participants, messaging makes up a larger proportion of overall communication.

Age is a more significant variable when it comes to choosing methods of communication: older people in Freetown are less likely than younger people to communicate via modes that involve reading and typing, such as messaging.

In Banjarmasin, messaging is the second most common method of communication. There are, however, much more noticeable differences in communication patterns across demographic groups. For female participants, missed calls are the second most common method, followed by sending photos and making video calls, whereas for the male participants, voice calling and messaging account for more than two thirds of communication and missed calls were only mentioned once.

It is easy for me to communicate with people. [The mobile phone] has helped so much over the years. Though I am disabled, I do feel I belong with mobile communication.

Participant with a disability, Freetown

I see my phone as important because it helps me get on to my family when I am sick and also important to me when something is wrong with any of my family both in the village and the city.

Participant with a disability, Freetown

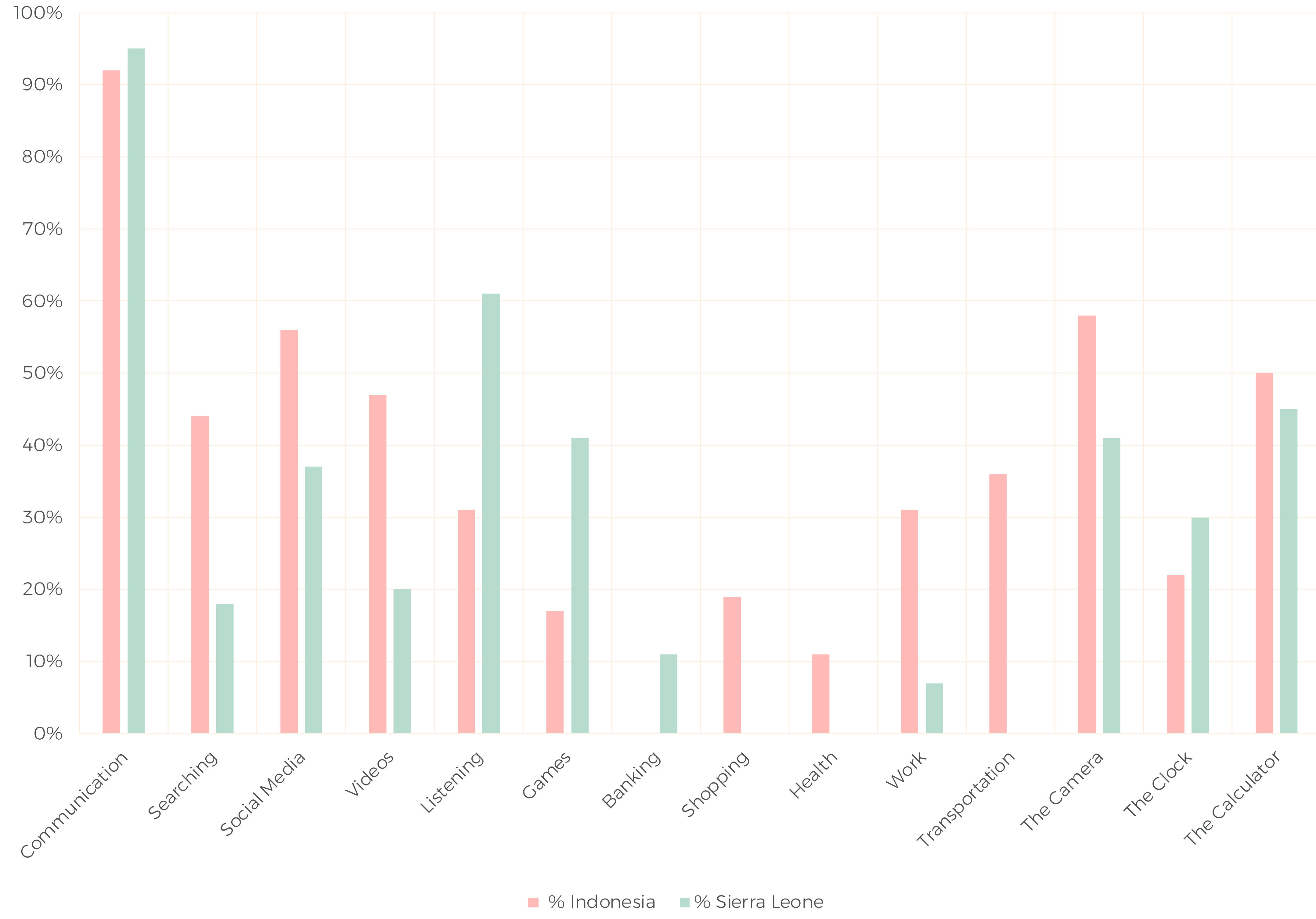
The perfect time to use a phone for me is when I'm alone. If I'm with other people, it's better to interact with them.

Participant with visual impairment, Banjarmasin

Among those who don't use mobile phones regularly, many had used a phone in the past during an emergency situation, such as a health crisis, to contact family members who live elsewhere.

PATTERNS OF USE AND BEHAVIOURS

How I Use My Phone



PATTERNS OF USE AND BEHAVIOURS

OTHER USERS

Aside from communicating, the most common uses of mobile phones among participants in Banjarmasin are taking pictures and videos, accessing social media and watching videos. In Freetown, the other most common uses are listening to audio, playing games and taking picture and videos. The calculator function was among the most common uses of mobile phones in both settings.

In both Banjarmasin and Freetown, people with disabilities are less likely to use mobile phones for functions other than communicating than non-disabled people. In Banjarmasin the difference is stark, with non-disabled people more than twice as likely to use phones for finding information, accessing social media, watching videos, shopping, gaming and transportation.

MOBILE PHONES AND LIVELIHOODS

It's notable that, when asked what they used a mobile phone for, very few participants in either setting explicitly mentioned using it for work or livelihood purposes. However, during the qualitative interviews it became clear that **mobile phones were often an important part of those activities**, with the other functions of communicating, taking pictures, finding information and calculating sums often being used in a livelihood context.

For participants who don't own a mobile phone, or have one that is damaged, the aspiration of owning their own phone or getting a new one was often linked to its utility in supporting their livelihood activities. Many had a clear vision for how a mobile phone could enhance their business, whether by enabling them to identify opportunities, promote their products or connect with customers.

My profession is carpenter and I used a phone [in the past] to look up furniture designs and to share my handiwork with customers... If I had [my own mobile phone] I could use it to advertise my work on social media platforms, to get more customers, but also to search for more furniture designs online.

Carpenter with mobility disability, Freetown

I use my phone to listen to music when I'm at work...I often feel bored [at work] and usually use my phone for gaming or watching video. But mostly I listened to music to kill the time...For my side job, I use my phone to call people

Night guard with visual impairment, Banjarmasin

CHALLENGES AND BARRIERS

In both settings, the biggest challenge associated with mobile phone use is cost.

There is a marked contrast between the two settings however, with participants in Freetown reporting far more challenges than those in Banjarmasin.

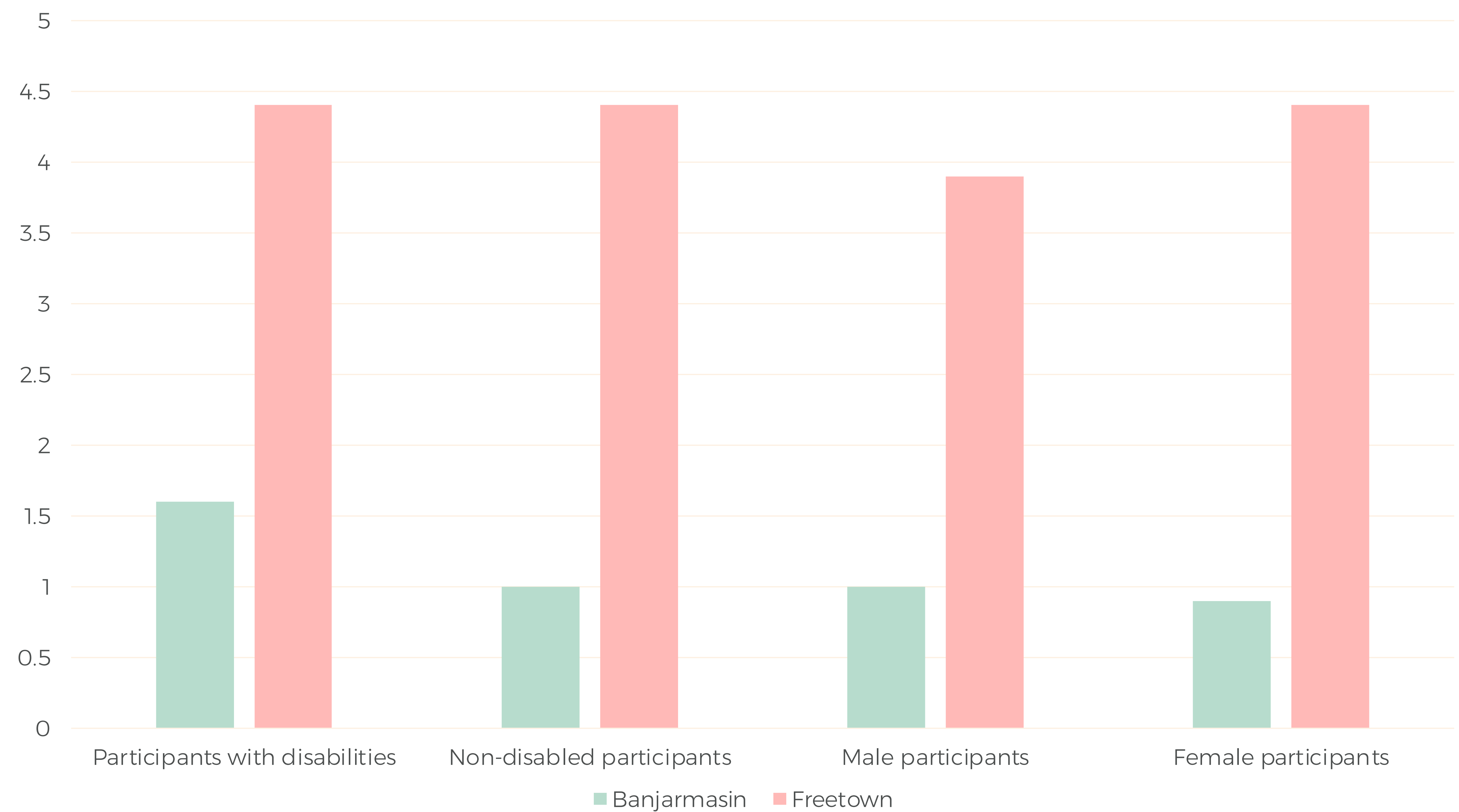
In Banjarmasin, 25% of participants reported that they did not have any challenges associated with mobile phone use, and no one reported any difficulties related to charging the battery or concerns over theft. After cost, connectivity and signal were cited as the second most common challenge, followed by difficulties reading and typing and understanding how to use the phone.

In Freetown, challenges associated with phone use were far more prevalent: both the average number of challenges per person and the proportion of participants

who experienced each challenge were higher. After cost, the most significant challenges are concerns over the phone getting stolen, difficulties with signal and connectivity and repairing the phone when it breaks.

Around half of all participants in Freetown who are regular phone users said that one challenge related to using mobile phones was that they could not use them for particular tasks which they wanted to use them for. The most common task they wanted to be able to use phones for, but couldn't, was managing health, with accessing social media and managing money being the next most common answers.

Mean Number of Challenges Reported



CHALLENGES AND BARRIERS

I don't understand how to use the mobile phone. But, when someone calls, I can at least pick it up

Female participant with a visual impairment, 64, Banjarmasin

I think it's quite easy to use the mobile phone. It takes about a week to learn. The thing is whether you have it or not.

Female participant with a physical disability, Banjarmasin

CHALLENGES & DISABILITY

In Banjarmasin, none of the participants explicitly mentioned disability as a barrier to mobile phone use, however participants with disabilities reported experiencing more challenges than non-disabled participants - an average of 1.6 challenges per person, compared with 1 for non-disabled participants. There were particularly marked differences in terms of the barriers presented by cost, signal, reading and typing and understanding how to navigate the phone. Of the participants who reported finding it hard to read and type, four have difficulty seeing and one has an intellectual disability.

In Freetown, participants with and without disabilities reported experiencing a similar number of challenges). However, the kinds of challenges reported by each group varied. More non-disabled participants reported challenges with repairs, theft, signal and cost; while participants with disabilities were twice as likely to report challenges with reading and typing and navigating the phone.

Participants with disabilities related to seeing and mobility respectively experienced similar numbers of challenges on average. However, whereas a low proportion of people with mobility impairments reported their disability as a barrier to phone use, a high proportion of participants with visual impairments reported their disability to be a barrier.

CHALLENGES AND GENDER

The average number of challenges reported by male and female participants in Banjarmasin is similar (1 for men; 0.9 for women), but a much higher proportion of male participants than female participants reported cost and signal as challenges: respectively 91% and 36% of men, compared with 44% and 16% of women. 28% of female participants reported no difficulties, compared to 18% of male participants.

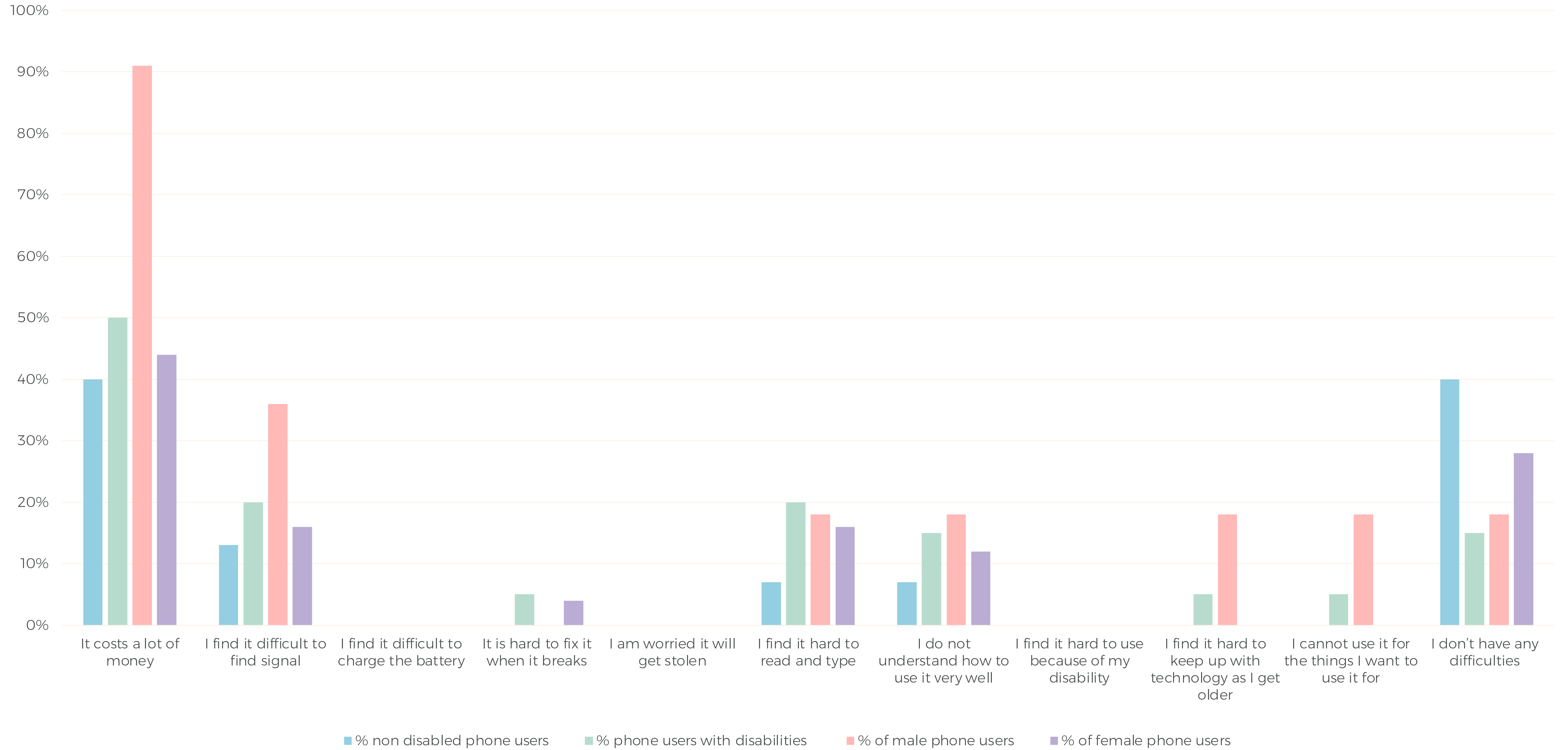
In contrast, female participants in Freetown on average reported experiencing a higher number of challenges than male participants: 4.4 challenges per women, compared with 3.9 challenges per man. However, as in Banjarmasin, a much higher proportion of men than women reported cost and signal as challenges: respectively 96% and 63% of men, compared with 71% and

42% of women. On the other hand, women were more than twice as likely to report challenges related to reading and typing and navigating the phone.

These divergent patterns along the lines of gender and disability suggest how the challenges experienced in relation to mobile phone use are indicative of particular patterns of inequality. In both settings, a higher proportion of men than women reported cost and signal as barriers, reflecting challenges of infrastructure and affordability. The higher proportion of women and people with disabilities in Freetown reporting reading and typing difficulties could reflect unequal technological and linguistic literacy levels for men and women in Sierra Leone.

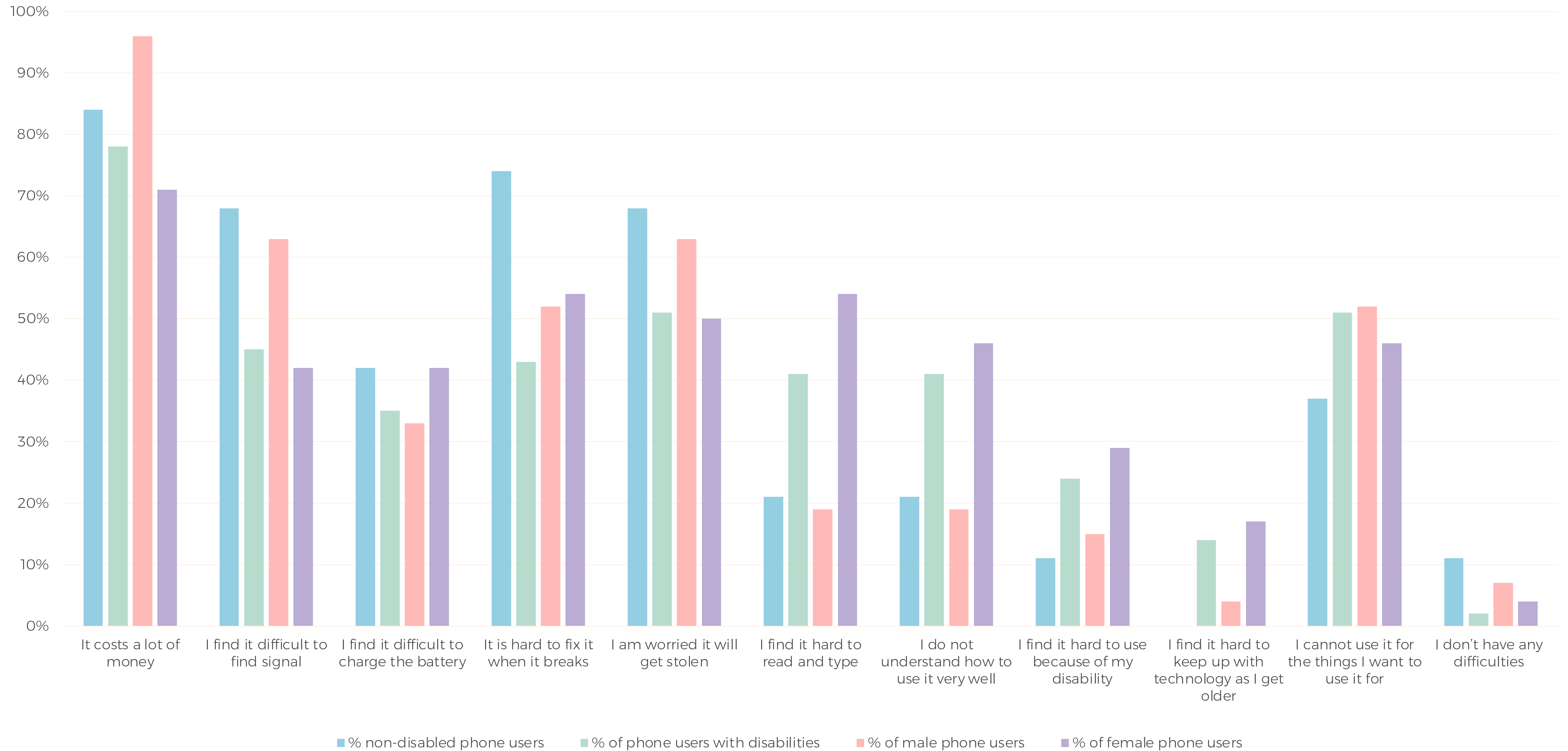
CHALLENGES AND BARRIERS

Challenges in Indonesia



CHALLENGES AND BARRIERS

Challenges in Sierra Leone



CHALLENGES AND BARRIERS

BARRIERS FOR PEOPLE WHO DO NOT USE PHONES REGULARLY

Of the 20% of participants in Banjarmasin and 16% in Freetown who do not use a mobile phone regularly, in both cities all of the participants have a disability.

In Banjarmasin, all but one of these participants are women over the age of 45, the majority of whom do not report earning an income, and just under half of this group have more than one disability. The most common disabilities among this group were difficulty in self-care, hearing, seeing and communication. The most commonly cited barriers they mentioned were not knowing how to use a phone and feeling too old for it.

This suggests that the challenges are primarily to do with technological literacy, and that the intersection of inequalities related to disability, gender, age and economics lead to more barriers to phone use for poor, older women with disabilities.

In Freetown, the majority of participants who reported not using phones regularly are men, across a wide range of ages and livelihoods. The most common disabilities among this group were mobility, seeing and communication. The most commonly cited barriers were not having access to a phone and the cost of topping up. This suggests that the primary challenges are to do with affordability and access.

CHARACTER PROFILES

People use mobile phones in many different ways - there is no fixed or universal standard. Behaviours and attitudes interact with individual needs, capabilities and aspirations, intersecting identities and vulnerabilities, as well as different social, cultural and economic contexts. When analysing how people use mobile phones, it is therefore important to take an intersectional approach in that analysis, embedding insights within day-to-day realities.

In adopting an intersectional approach in our analysis of the interview data in this study, we identified different commonly occurring patterns of use and access. In interpolating these patterns with the demographic data, we developed six "Character Profiles". These are archetypal figures that emerged in both Freetown and Banjarmasin. For each character, we have examined what role mobile phones play in their lives, the challenges they face and the aspirations they have for what they would like to use them for. This has helped us understand their general patterns of use, modes of access and the key barriers and enablers to ideal use.

These character profiles should not be seen as rigid, definitive or discrete categories, into which all participants fit neatly. Rather they demonstrate the varied relationships with mobile phones encountered in this study, and indicate how factors such as age, disability and gender interact with one another to shape different patterns of use.

CHARACTER PROFILES SUMMARY DASHBOARD

	Character Profile	Current use	Demographic Characteristics	Access	Barriers	Aspirations for mobile phone use are related to
1	<i>The community's technological super-user</i> Prominent community member whose phone helps them in lots of ways to remain active and connected	Extensive	Aged over 30	Owns their phone and lends it to others	Cost Signal	Community leadership
2	<i>The business owner who is eager to become tech-savvy</i> Business owner with a clear vision that the phone could be central to improving livelihood, but requiring better access and tech literacy	Aspirational	Earns income Has a family to support	Own an old or partially-working phone, or borrows from family and neighbours	Cost Knowledge Anxiety / shame	Livelihood
3	<i>The domestic care-giver willing to face their technology hesitancy</i> Housewife with low-medium phone use and access and feelings of ambivalence towards phones, but some appetite for more access and knowledge	Relational	Often female Care-giver of young children and ageing parents Household to manage	Borrows from family or neighbours	Cost Knowledge Anxiety / shame	Domestic labour and caregiving
4	<i>The family elder who feels 'too old' for phones</i> Elderly person with low appetite to engage with technology, but an appreciation of the practical benefits they offer	Apathetic	Elderly Potentially has age-related disability	Other people occasionally help them use a phone, or use it for them	Interest Useability Anxiety	Family and health
5	<i>The person with a disability whose access is limited</i> Person with a disability who is dependent on care-givers and has major difficulties using a mobile phone but often finds creative ways to overcome them, and uses phones as a way of countering isolation	Constricted	Has a disability Dependent on family	Shares with or borrows from a family member	Cost Useability Family / care-giver concerns	Connection and entertainment
6	<i>The tech native whose phone is an ally to their disability</i> Super-user living with a disability who uses their phone very efficiently and resourcefully as a tool to support various aspects of their daily life	Savvy	Aged 30 and under Has a disability	Owns their own phone	Cost Signal	Growth and social life

CHARACTER PROFILE: #1

THE COMMUNITY'S TECHNOLOGICAL SUPER-USER

Current use

The community's super-user is very comfortable using a mobile phone. They consider it a tool that can enhance their life across many areas, including personal, professional and social life. Their use of the phone is sophisticated - they use it for a range of activities such as virtual meetings, liaising with clients, reading ebooks, using its digital agenda and alarm, playing video games, and accessing social media. The phone is an integrated and now indispensable part of their lives.

Relationship with others regarding phones

This character has mastered using their phone to communicate with others. They use technology to keep in touch with distant relatives, to communicate with colleagues and to access social media. They are also the gateway for others in their community to access a mobile phone. They often lend their phone to neighbours or friends who don't have credit or access to a phone, which can bring anxieties over the cost of doing so. They might charge the borrower for the use of their phone.

Ambitions and aspirations

In Indonesia, this user feels completely satisfied with everything their phone could do for them. However, in Sierra Leone, this user considers that there is further opportunity to maximise their phone usage - they are keen to learn how their phone can help them to shop, manage their health, or find transport.

Barriers to access and use

Despite their tech literacy, this user faces practical challenges. Two challenges stand out: poor signal due to network issues and high cost of recharge. These challenges are further compounded in cases where they lend their phone to others in their community.



Useful support and infrastructure for increasing access

- Low-cost comprehensive packages that also allow for sharing with other community members
- Particularly in Sierra Leone, support with more advanced functionalities or apps
- Fostering of appetite to learn other IT devices, e.g. laptops, through provision of learning programmes

[My] phone is the substitute for watches, books, and other things...I have a dictionary app because I like to learn English. So if I'm listening to music or watching a video, and feel like the music suits me, I will search the words to know the meaning.

Cost of operating a phone is expensive in Sierra Leone because sometimes due to a bad network, the mobile company will charge you even when you are not able to communicate due to a bad network. And if it's really important that you have to make a call to communicate with relatives, clients etc., you will have to buy more airtime/data for your phone at your own expense.

CHARACTER PROFILE: #2

THE BUSINESS OWNER WHO IS EAGER TO BECOME TECH-SAVVY

Current use

This user owns a business that generally involves manual labour (e.g. selling food in the market, woodwork, tailoring). They are the breadwinners of the family and feel a sense of duty to succeed at work, in order to provide for their family. They often also take on caregiving roles when at home. Although they have had sporadic contact with phones over the years, their contact with phones has involved very basic activities such as receiving calls from family.

Relationship with others regarding phones

They may have owned a mobile phone, but it's either damaged or they can't afford to top it up. They borrow a phone from neighbours or friends when needed. However, they are aware that sometimes this bothers their peers, who are covering the costs or have other commitments, and so use of phones is often accompanied by a sense of shame.

Ambitions and aspirations

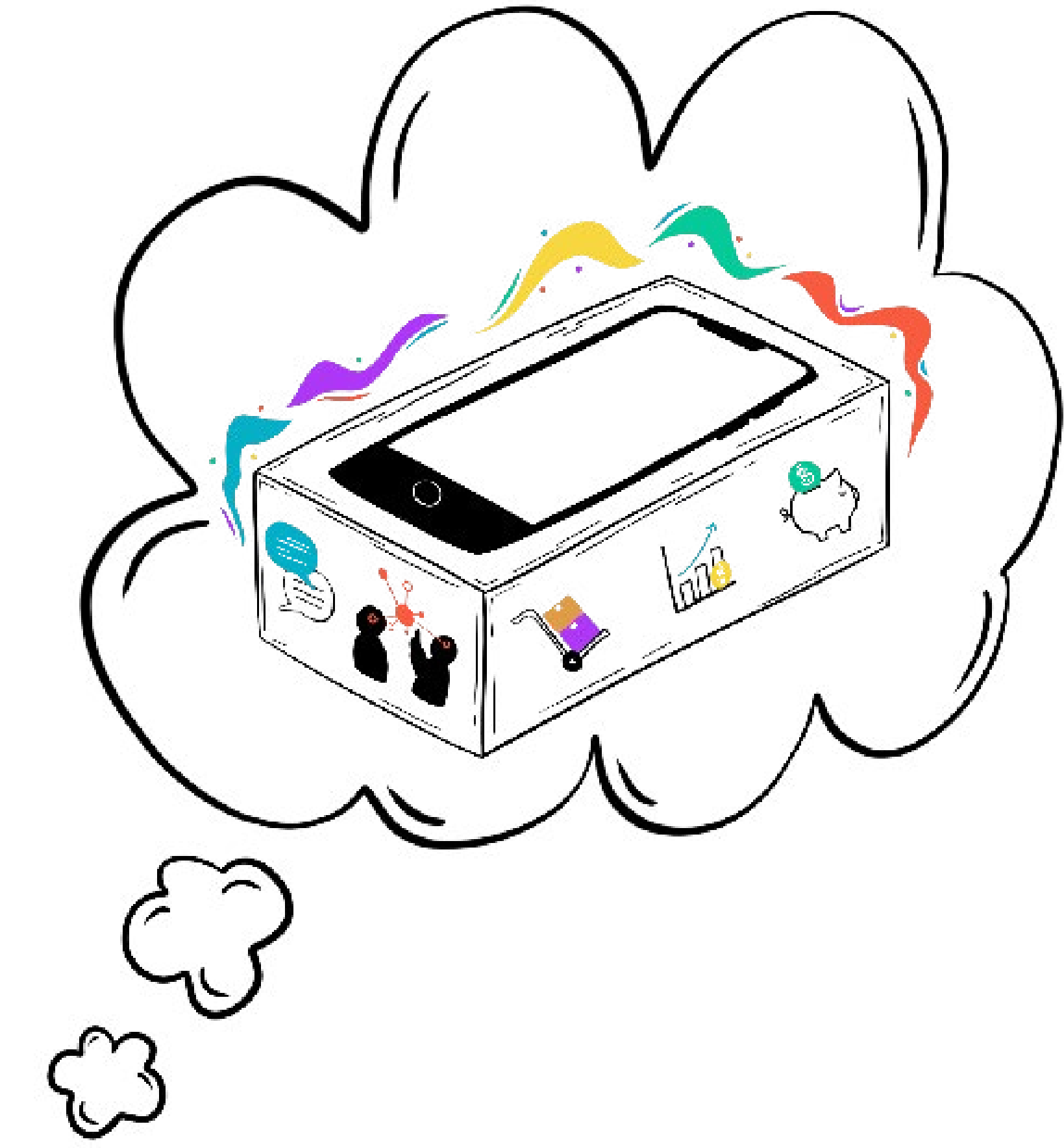
The greatest aspiration of this character is to own a phone that would allow them to carry out a range of activities to boost their business. A smartphone would be helpful as it would allow them to access the internet to develop their business, call customers, send photos, get ideas for their business and advertise on social media. Also, as they often take on a caregiver role within the household, a phone could help them keep in touch with those they look after, as well as family and friends that could support them in their caregiving.

Barriers to access and use

Owning their own phone, and having the appropriate recharge package for their needs, is expensive for this user who is eager to become tech-savvy. They also feel overwhelmed by the complexity of modern phones and feel insecure about learning how to use it. They feel embarrassed about not knowing how to use a phone but are open to learning it through family members like children.

Useful support and infrastructure for increasing access

- Personal mobile phone (with call + internet package) to fulfil business aspirations and allow easy connection to their community
- Tech literacy packages, which include peer support programmes
- Identification of the business skills that could support them in developing their business and matching these with apps that could support them (e.g camera, calculator, spreadsheet)



I can use [a phone] to advertise my work on social media platforms to get more customers but also to search for more furniture designs online.

If I had a phone like an android, I can do online business. For example, people can order food from me. You know, even the kids in this neighbourhood know how to use it, I'm ashamed I can't use it.

CHARACTER PROFILE: #3

THE DOMESTIC CARE-GIVER WILLING TO FACE THEIR TECHNOLOGY HESITANCY

Current use

This character is the main care-giver for the household, and most likely a woman. She does not own her own phone or know how to use one very well, and mobile phones are not a part of her daily life. However, when needing to talk to a distant relative or make an urgent call, she will borrow a family members' or neighbours' phone. This character was more common in Freetown.

Relationship with others regarding phones

Borrowing a phone from others is sometimes problematic for this user, as her peers complain about the additional cost it is for them to lend it to her, and this makes her feel guilty or anxious. She requires assistance from others to use it.

Ambitions and aspirations

This user is very family-oriented - she feels a strong sense of purpose looking after their family. The ideal use of the phone for her is therefore to enhance the moments she cherishes with their family via certain functions on the phone, such as taking pictures or listening to music with her children. In addition, the phone could also be used to assist her household chores. For example, she would like to listen to the radio or use the torchlight when carrying out household activities, such as cooking.

Barriers to access and use

Using a phone is a daunting task for this user. She is eager to learn but scared of the amount of content on the internet and of the complexity of a phone. Most of the financial resources of this character goes towards supporting her household, so the cost of a phone is also a barrier.



Useful support and infrastructure for increasing access

- Basic smartphone with a camera to enable social connection
- Using participatory approaches to understand main needs of this group and preferred support mechanisms for building technological literacy
- Support with phone setup that maximises visual components of the phone vs. text-based elements

I would love to listen to music or radio all day long. Because I love music. But I would love to do that more during cooking sessions to keep me relaxed and happy. My children always play music during our meals and I became a fan too. But I can't afford to buy my own.

If I have a phone, I can use it to take pictures. The pictures I would take would have to be of things my mother valued. With her level of difficulties in mobility, certain pictures I can show to her will make her happy and cheer her up. And her happiness is so important to me.

CHARACTER PROFILE: #4

THE FAMILY ELDER WHO FEELS 'TOO OLD' FOR PHONES

Current use

This user is an older member of the community. Although they may seem initially dismissive of technology, saying they are “too old” for phones, a more in-depth exchange with them reveals that this feeling is partly due to insecurity about their capacity to learn how to use one. Their occasional use of mobile phones centres around voice- or video-calling family members, particularly those that live far away.

Relationship with others regarding phones

They are dependent on another family member or neighbour to operate the phone for them in these situations, so they don't commonly deal with the logistics of topping up phone credit.

Ambitions and aspirations

In line with their current use of phones, the aspirations of this user are also related to the way phones can help stay connected with others. They recognise that a phone is important to help them communicate with friends and relatives who live distantly, and so their ideal phone would be one with video call functionalities and a good camera to take pictures and store memories on. Given their low tech literacy, they have some interest in learning to use a mobile phone more independently but this is not a priority for them.

Barriers to access and use

Although they don't feel shame around this, they require continuous support from their family and friends to use the phone. This user may have age-related disabilities and so may struggle to read and type, or to remember how to carry out certain activities on the phone. They find it hard to keep up with technology as they get older. As with other users, cost remains an issue, particularly as this user may no longer be actively working.

Useful support and infrastructure for increasing access

- Low-cost package that includes unlimited phone and video calls
- Participation in peer learning programmes, where a family member or friend can support phone use

I've never used a mobile phone, I don't intend to use a mobile phone. If necessary, I think my children can use it, and I'll just ask him. I know that it is convenient to have a mobile phone nowadays, especially when there's something important, you can call your family right away.

I doubt if I can learn that fast. But maybe if you train one of my grandchildren they will support me.



CHARACTER PROFILE: #5

THE PERSON WITH A DISABILITY WHOSE ACCESS IS LIMITED

Current use

This user is a young person living with a disability, and probably reliant on a carer. They might spend a lot of time at home, and so they consume a lot of media via mobile phone, and use it as a way of countering isolation. They may spend hours playing games or watching videos. However, due to accessibility barriers related to their disability, or to low literacy levels, they cannot use certain functions of the phone, such as texting. As a result, they share their phone with someone else (family member/carer) who helps them set up the phone each time they would like to use it.

Relationship with others regarding phones

Having someone nearby whom they can share their phone with is important for this user, as they will also need their close support in using the phone, for example, to open certain apps or check battery and storage levels. The caregiver may also constrict their access to the Internet and social media due to fears that they may access inappropriate content online.

Ambitions and aspirations

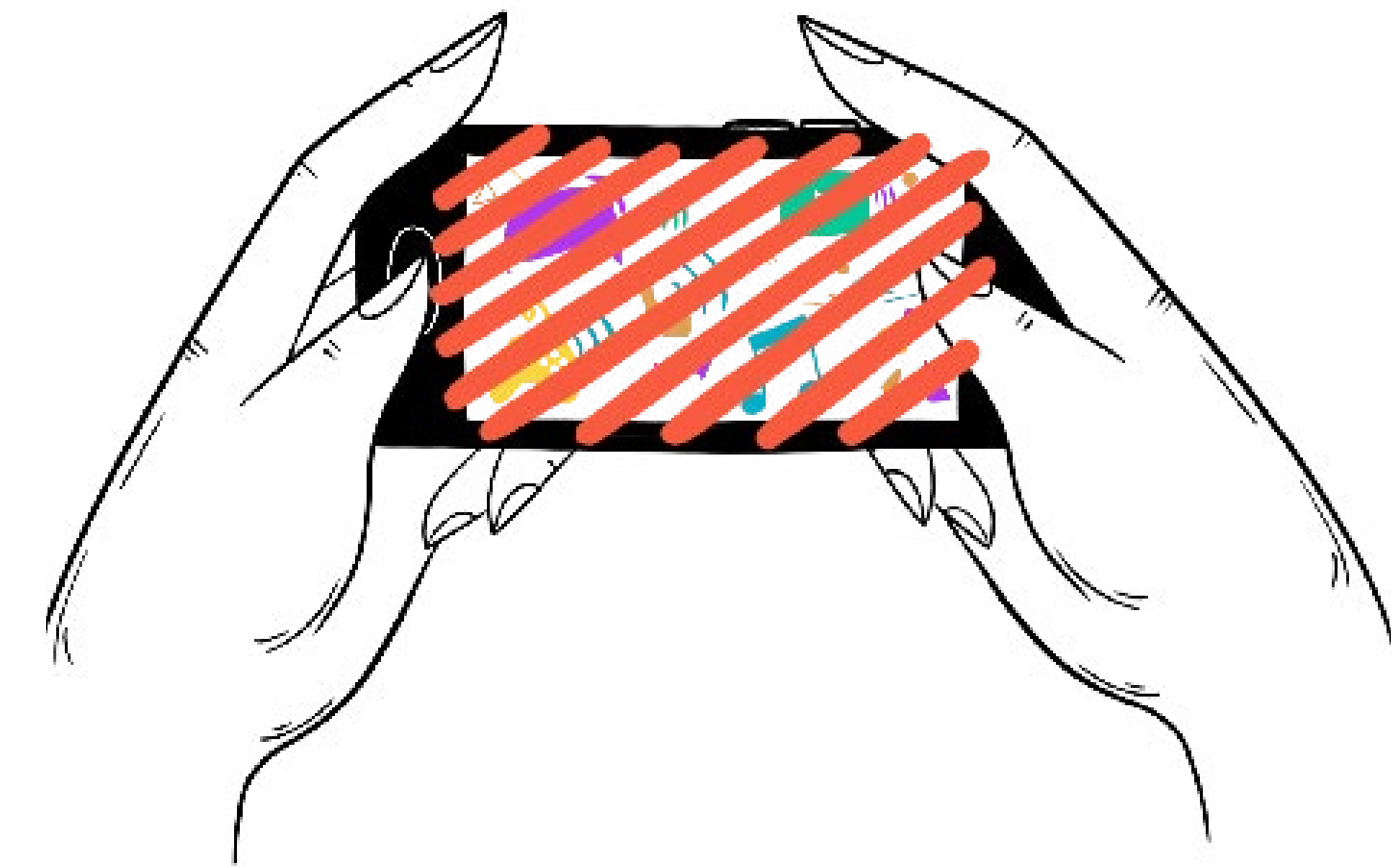
This user aspires to have their own device to access games and media content to consume at home. They hope to have a phone that is adapted to their disability, for example, including large icons to recognise apps or text-to-speech functionalities.

Barriers to access and use

Cost is an important barrier this user faces, given the higher price of recharge packages that allow frequent internet access. Smartphone interfaces are also very complex for this user, who may find it hard to read, type and navigate the phone because of their disability. Although they want to consume online games and media content, they struggle to navigate the internet.

Useful support and infrastructure for increasing access

- Phone with large RAM to allow for downloading of games/movies and good 3G capabilities
- Workshops that support caregivers with awareness of available safety settings and parental controls
- Engagement with educational / learning games
- Support in becoming well-versed with smart/AT elements that can assist them with texting or calling (such as voice command)
- Set up of personalised interface which helps cope disability-related barriers



I watch house renovations on television, and watch cartoons on YouTube. I watch SpongeBob on YouTube too. I play games on my phone too.

I've never taught my brother to operate a phone, maybe he saw me doing it and learned from it. He uses the icons to use the phone, because he can't read. I get afraid when [my brother] accesses YouTube because he can just type anything, and any sensitive content will appear and it may be bad for him. That's why I don't allow him to have any internet connection on his phone.

CHARACTER PROFILE: #6

THE TECH NATIVE WHOSE PHONE IS AN ALLY TO THEIR DISABILITY

Current use

This user is a young person living with a disability, usually physical, who leads an active life and is well-connected with the community. The phone is well-integrated into their everyday life for personal, professional and social purposes. They have probably found resourceful ways of dealing with challenges related to useability, affordability and literacy. The mobile phone is an important resource for them in overcoming other disability-related challenges.

Relationship with others regarding phones

While this user can mostly use the phone on their own, they need learning support when there is an upgrade in technology, for which they are willing to seek help from relatives.

Ambitions and aspirations

There is an appetite to learn more features on the current phone, and upgrade to a more sophisticated device, such as a laptop or tablet, so that they can use a wider range of functions and support activities such as studying, working and socialising.

Barriers to access and use

Poor signal and running out of Internet are the two major barriers faced by this user.

Useful support and infrastructure for increasing access

- Large data packages at reasonable cost
- Access to advanced tech literacy programmes
- Access to customised disability-specific support, e.g. tutorials, sophisticated phone, mentorship programme
- Awareness of more advanced user accessibility functions



I can't imagine living without a phone, even for an hour, we end up missing lots of information.

Mobile phones makes life easier.

RECOMMENDATIONS & CONCLUSION

This report has shared the findings of an intersectional disability analysis of mobile phone use and access across informal settlements in Banjarmasin and Freetown. This analysis has revealed the unequal nature of access and capacity to use mobile phones in both countries and has also recommended potential measures that can be implemented to address these gaps. We hope that our analysis can contribute to a growing research interest around these topics and the operationalising of intersectional approaches to understanding them, as exemplified in the character profile methodology.

For researchers

The insights in this research could inform future research directions and ignite collaborations between researchers and programme designers to inform future interventions. Further research to validate the character profiles, and to understand the mechanisms of intersectional inequalities for people with disabilities highlighted in this report, would be hugely valuable.

For implementers

Intersectional analysis of participant needs, capabilities and aspirations should be an essential first step of the process of designing any intervention that has a digital component, or indeed a digital product, in order to understand the capacity, needs and aspirations of your target participants or users.

For policy-makers

There is a growing move toward including digital tools in a range of health and social care infrastructures, often underpinned by an assumption that this will allow services to connect with “hard to reach” populations. This is not an unfounded assumption, but it is heavily caveated by the fact that there are many factors to take into consideration about how those “hard to reach” populations access digital tools. Using digital tech can exacerbate existing inequalities rather than overcoming them, unless adequate measures are taken to prevent that. When developing digital

policies, it is imperative to build on an understanding of that landscape and develop supplementary actions to help overcome the barriers to connecting with those digital services.

For mobile phone and data providers

This research highlights some of the gaps in the service provision of mobile data providers and some of the opportunities for reaching new potential customers who may not currently be able to access or use products. It suggests how specially-designed data packages could benefit particular potential customer groups not being served by current market offerings. There is scope to create more tailored packages and market offerings that fit the needs of different types of users.

LIMITATIONS

Conducting this research in the midst of the Covid-19 pandemic, with social distancing restrictions, stilted some research processes and meant it was not possible to include group elements in the research, such as focus groups. Additionally, the translation of responses from participants in Indonesia into English may have resulted in some loss of meaning.

This study involved a small sample size, which limits the reliability of the findings. A larger sample size would enable greater precision in the statistical analysis and the development of the character profiles. Future research could involve a validation of the character profiles. Additionally, it could include more in-depth comparative analysis of the patterns of use across different disabilities.

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