AT2030 Case Study

Country Capacity Assessment for Assistive Technologies: Informal Markets Study, Indonesia

Prepared by
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KOTA KITA A CITY FOR ALL

AT2030

This study was undertaken by Julian Walker (Development Planning Unit, University College London), Ahmad Rifai, Fuad Jamil, Vindi Kurniawan, and Nina Asterina (Yayasan Kota Kita) and Fitria Ramadhini (Kaki Kota) on behalf of the Global Disability Innovation Hub. Analysis of the rATA survey was undertaken by Mark Carew of Leonard Cheshire

The **Global Disability Innovation Hub** was born out of the legacy of the London 2012 Paralympic Games and launched by Mayor of London Sadiq Khan in September 2016. Its mission is to change how we think about disability through co-design, collaboration, and innovation. GDI Hub provides a platform for the talents of disabled people and the expertise of practitioners, academics, and local communities.

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

Kota Kita is a non-profit organisation based in the Indonesian city of Solo with expertise in urban planning and citizen participation in the design and development of cities. Kota Kita provides education, facilitates citizen participation and collective action, and works with governments to build bridges between officials and their constituencies.

Kaki Kota is a non-profit organization based in Banjarmasin, Indonesia, committed to co-production of knowledge and ideas from citizens. Kaki Kota works with communities to generate innovative knowledge and practices to build sustainable cities and regions.

Leonard Cheshire is a non-profit organisation which has supported disabled people for more than 70 years. In the UK and around the world, Leonard Cheshire works with partners to open doors to opportunity and break down barriers that deny disabled people their basic rights.

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Executive summary

This study was conducted as part of the AT2030 Research Programme, funded by the UK Foreign, Commonwealth & Development Office (FCDO) and delivered by the Global Disability Innovation Hub (GDI Hub). It was carried out by a team from the Indonesian NGOs Kota Kita and Kaki Kota, and from the Development Planning Unit (DPU) of University College London (UCL).

This study supplements the Country Capacity Assessment for Indonesia undertaken by the Clinton Health Access Initiative (CHAI), using the World Health Organization (WHO) Assistive Technology Assessment – Capacity (ATA-C) tool, which was developed with support from the GDI Hub. The ATA-C tool assesses the capacity within countries to make the most effective, high-quality assistive technology (AT) available at affordable yet sustainable prices.

The focus of this study is to understand existing practices of AT provision through informal markets and social institutions, and the experiences of AT users on low incomes and with somewhat ‘informal’ citizenship status. We examine how informal markets can be supported and improved and how formal sector actors working in AT provision, including the Ministry of Health and the Ministry of Social Welfare, can best work with and influence informal AT markets and reach citizens who lack formal status.

The research was conducted in four cities—Jakarta, Surakarta, Yogyakarta and Banjarmasin—and included data from a household survey that reached approximately 2,000 individuals in Banjarmasin, as well as focus group discussions (FGD) and semi-structured interviews with AT users, disabled people’s organisations (DPOs), informal and formal AT enterprises, and state stakeholders working in the AT sector.

Our findings suggest that the government of Indonesia is committed to AT provision and has worked to expand access to assistive products (AP) over recent decades. Nonetheless, there remain key areas of under-coverage in the urban and peri-urban communities involved in our research. The under-coverage affects many people on low incomes who live in these communities, particularly those who are unable to meet eligibility requirements to access state programmes that government agencies including the Ministry of Social

Welfare offer at different levels. Low-income users in need of specific APs—for example, more expensive and complex APs such as hearing aids—that local informal markets are unable to develop are even more likely to be underserved.

There are, however, some emerging approaches, such as the Jamkesus scheme in Yogyakarta and the SIMDP registration database, that have the scope to streamline registration and expand inclusion in state-led AT programming, ensuring that this programming is more accessible to groups at risk of being overlooked.

From the AP user perspective, this study also shows that the official AP priorities are not always in line with user priorities. For example, despite users listing motorbike tricycles and smartphone apps as highly important for wellbeing, neither AP is the focus of official provision or training programmes.

In addition, our study highlights that informal AT enterprises in Indonesia, and in particular those led by AT users, make important contributions to the development and delivery of low-cost AT, as well as innovations in product development to make APs that are more suitable for and attractive to users. Such enterprises create employment and avenues for the political participation of disabled people, but face barriers to scaling up and expanding provision due to administrative and legal challenges.

In response to these challenges, we highlight areas for further investigation, which we broadly group into three areas: registering low-income AT users, incorporating users' perspectives into AT strategy, and supporting local start-up AT enterprises to scale up.

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Acronyms

AP	Assistive product
APBD	Regional Budget
AT	Assistive technology
BPS	National Bureau of Statistics
BST	Integrated basic data system
BJPS	Badan Penyelenggara Jaminan Sosial (Social Insurance Administration Organization)
CHAI	Clinton Health Access Initiative
CRPD	Convention of the Rights of Disabled People
CSO	Civil Society Organisation
DoH	Department of Health
DoT	Department of Transport
DP	Disabled people
DPO	Disabled people's organisation
DSW	Department of Social Welfare
FCDO	UK Foreign, Commonwealth & Development Office
FGD	Focus group discussion
GATE	Global Cooperation on Assistive Technology (World Health Organization programme)
GDI Hub	Global Disability Innovation Hub
HWDI	Indonesian disabled women's organisation
IDR	Indonesian rupiah
ILO	International Labour Organisation
IOPI	Indonesian Association of Orthotics and Prosthetics
ISWP	International Society of Wheelchair Provision
KIS	Kartu Indonesia Sehat (health insurance card)
KMD	Komunitas Motobike Difable (Disabled Motorbike Community)
KTP	Kartu Tanda Penduduk (national identity card)
LKPP	The Government Agency for Procurement of Goods & Services
LKS	Lembaga Kesejahteraan Sosial (Social Welfare Institution)
MoH	Ministry of Health

MoU	Memorandum of Understanding
MSW	Ministry of Social Welfare
NGO	Non-governmental organisation
P&O	Prosthetics and orthotics
PKH	Program Keluarga Harapan
PPD	Pendamping Penyandang Disabilitas (State Disability Social Workers)
PPDI	Persatuan Penyandang Disabilitas Indonesia (Umbrella disabled people’s organisation in Indonesia)
rATA	Rapid Assistive Technology Appraisal
RO	Refraction Optician
RT	Local residence unit
RW	Second level administrative unit
SIM-D	Disabled driving licence
SIMDP	Data collection system for disabled people
SNI	Minimum product standards
SUPAS	In-Between Census Survey
UCL	University College London
UCP	United Cerebral Palsy - Wheels for Humanity (NGO)
UGM	Gadjah Mada University, Yogyakarta
USD	United States dollars
UST	Sarjanawiyata Tamansiswa University
WHO	World Health Organization

1. Introduction

The purpose of this study is to supplement the Country Capacity Assessments currently being piloted using the WHO ATA-C tool working alongside CHAI with the support of the GDI Hub. The ATA-C tool assesses the capacity within countries to make the most effective, high-quality AT available at affordable yet sustainable prices, and to raise awareness of the steps needed to achieve that goal. It is focused on capacity assessments through Ministries of Health in partnership with other key ministries in the pilot countries.

As defined by the WHO[1]:

- "Assistive technology is an umbrella term covering the systems and services related to the delivery of assistive products and services.
- Assistive products maintain or improve an individual's functioning and independence, thereby promoting their well-being. Hearing aids, wheelchairs, communication aids, spectacles, prostheses, pill organizers and memory aids are all examples of assistive products."

This study was conducted as part of the AT2030 Research Programme[2] which is funded by FCDO and delivered by the GDI Hub[3]. Given the limited reach of formal health service interventions in many countries of the global south, including the provision of APs, this study supplements the ATA-C studies with parallel research to understand existing practices of AT provision through informal markets and social institutions, and the user satisfaction and quality of AT for users who have somewhat informal citizenship status. The purpose is to determine how informal markets can be supported and improved and how formal sector actors working with AT provision, including Ministries of Health, can best work with and influence informal AT markets to reach citizens who lack formal status.

The focus of this report is on informal markets and access to AT in Indonesia, with a particular emphasis on low-income urban and peri-urban citizens. The fieldwork was conducted by the Indonesian NGOs Kota Kita and Kaki Kota in partnership with the DPU at UCL.

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[1] See WHO factsheet at https://www.who.int/news-room/fact-sheets/detail/assistive-technology
[2] https://at2030.org/
[3] https://www.disabilityinnovation.com/

2. Scope and methodology

Though this project was national in scope, time and resources meant that the research team was only able to undertake field research in four urban and peri-urban sites. Appendix 4 profiles the trajectories of these sites as AT provision hubs. The sites were:

- **Jakarta (Java)**, chosen because it is where the key national government agencies as well as key informal AT producers are located;
- **Yogyakarta (Java)** is a national hub for Disabled People's Organisations (DPOs) and AP producers, and is also the location of the Jamkesus, an innovative provincial mechanism that streamlines access to AT for people on low incomes;
- **Surakarta**, also known as **Solo (Java)**, is another key site of AP production and the location of one of the Ministry of Health's (MoH) national rehabilitation centres or balai; and
- **Banjarmasin (South Kalimantan)** which was selected because it is more representative of locations outside Java that may have less access to AT interventions. Banjarmasin was also chosen as it is the focus of another AT2030 Programme intervention in which UCL, Kota Kita, and Kaki Kota teams for this study are involved. These links allowed the team to draw on existing contacts with AT users and previously collected data.

Whilst we sought to gather a broad, national perspective on AT access using secondary data, the primary research on which this report is based is unlikely to be representative of the diverse conditions determining access to AT across the Indonesian archipelago, and in particular the experiences of those living in less well-served provinces in the east of the country and in rural areas who are likely to be even more reliant on informal AT providers and services than disabled people (DP) in the four study sites.

Methods

The main data collection for this report was through semi-structured interviews and focus group discussions (FGDs) with a range of stakeholders; a sample survey of AT users in two low-income urban settlements, conducted using a smartphone app based on an adapted version of the WHO Rapid Assistive Technology Appraisal (r-ATA) tool; and analysis of secondary data. The semi-structured questionnaires and interview guides used are included for reference in Appendix 2.

Stakeholder	Activity (Location)	Sub-Group (by impairment)/Specific Organisation	Numbers by gender
AT users	FGD (Yogykarta)	Wheelchairs and mobility AT users; visual; hearing	7 Female 11 Male
	FGD (Banjarmasin)	Mobility; visual; cognitive; hearing	3 Female 5 Male
	Interviews (Yogyakarta)	Mobility; visual; hearing	3 Male 3 Female
	Interviews (Banjarmasin)	Mobility; visual	2 Female 5 Male
	Interviews (Solo)	Mobility; visual; hearing	1 female 3 Male
			Location
NGOs	Interviews and site visits	Yakuum, Ohana, United Cerebral Palsy - Wheels for Humanity (UCP)	Yogyakarta
DPOs	Interviews and site visits	Disabled women's DPO (HWDI), Disabled Motorbike Community (KMD), State Disability Social Workers (PPD), Pertuni, Gerkatin, Difabike	Yogyakarta Banjarmasin
Government stakeholders	Interviews and site visits	Ministry of Social Welfare (MSW) Jamkesus Department of Social Affairs, Hospital Director, Kelurahan Leader of Department of Social Affairs, Bakti Chandrasa for blind disability.	Jakarta Yogyakarta Banjarmasin Solo
Formal Private Sector Providers	Interviews and site visits	Audiotone, ABDI (hearing aid providers) CV Mulyoharjo and Optik Melawai (opticians) , and Ulin Hospital	Yogyakarta Banjarmasin
Informal Private Sector Providers	Interviews and site visits	Bengkel Peralatan Tuna Netra Kaiden Dwidjo Leksono Medical equipment shops and opticians at Cempaka Market Mr Rubiyanto the founder of R-WIN; Mr Sentot Joko Purwanto, founder of Redita Kacamata (informal spectacle enterprises); Mr Agus, a spectacles merchant in a traditional market; Mr Kardi, a provider of prosthetics and orthotics (P&O)	Jakarta Banjarmasin Solo

Figure 1. Summary of research participants and methods

Interviews and FGDs were undertaken with AT users (and, where relevant, their carers), DPOs, NGOs involved in AT provision and advocacy, formal and informal enterprises involved in AT provision and services, and government organisations. A breakdown of interview and FGD participants is provided above in Figure 1.

Sample survey: This was conducted in Banjarmasin using the WHO rATA tool as part of the UK FCDO-funded AT2030 Programme. Data for the rATA survey was collected using KoBoToolbox,[4] a suite of tools for data collection and analysis in challenging environments, with data collection on smartphones. A number of adaptations were made to the original rATA tool, including adding a question on informal providers and ensuring that the skip logic allowed evaluations to be linked to specific AT in the instance that respondents used multiple AT.[5] The rATA survey was undertaken by a team from Kota Kita, with a team of enumerators from their city-level partner organization Kaki Kota.

The surveys were carried out in two low-income urban communities in Banjarmasin. These communities are in two Kelurahan (the lowest level of urban local government in Indonesia): Kelayan Barat and Pelambuan. The survey team approached N = 2167 individuals to complete the survey, split evenly between the two communities of Kelayan Barat and Pelambuan (i.e. N = 1084 and 1083, respectively). All but four of the households surveyed were recorded as having adults residing therein. Overall, data were collected from 94% of respondents (N = 2046) who were asked to participate in the survey. Just over 5% of cases declined to provide consent (N = 117) and the survey was not undertaken where no adults were present (N = 4).

Secondary data: Secondary data, both published and grey material, include the results of research and academic articles, regional and national policy documents related to AT, and information taken from the presentation of related materials obtained online and offline. Reference material also includes initial findings from the CHAI Country Capacity Assessment.

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4. https://www.kobotoolbox.org/
5. The rATA tool was modified and trialled by Ignacia Ossul (Development Planning Unit, University College London) and adapted for the KOBO app by Giulia Barbareschi and Cathy Holloway (Department of Computer Science, University College London) , and codes were adapted an updated in the field by Wesley Pryor (Nossal Institute for Global Health) Mark Carew (Leonard Cheshire) cleaned the data and performed statistical analysis.

3. Informality and AT

For the purposes of this study, we define *informal citizenship* as, on one hand, the state of lacking the registrations and official recognition that entitles people to the full range of citizenship rights for which they would otherwise be eligible (e.g. the right to social services, legal protection, or democratic participation) and, on the other, the informal connections through which people access their rights and navigate complex bureaucracy.

A key cause of this lack of status is residence in informal settlements as, in most contexts, one of the primary factors in determining women and men's citizenship status is the registration of their domicile/place of residence. Informal settlements have been defined (UN, 1997) as:

- Areas where groups of housing units have been constructed on land that the occupants have no legal claim to, or occupy illegally;
- Unplanned settlements and areas where housing is not in compliance with current planning and building regulations (unauthorised housing).

In terms of the practice of informal citizenship as a strategy to use connections to access rights, Berenschot and van Klinken (2018; 99) define informality of citizenship as, "…a particular mode of state-citizen interaction marked by the use of personal connections as a means to influence the implementation of state regulations," and argue that in Indonesia, informal citizenship works through three core mechanism: accessing citizenship rights through third-party mediation, appealing to social norms (or informal institutions) that delineate socially accepted rights of particular groups, and fostering social affiliations or membership groups that facilitate access to rights.

The other area of informality that is central to this study is the *informal economy* and, specifically, *informal enterprise*. The key ILO Resolution on informality states that the "… 'informal economy' refers to all economic activities by workers and economic units that are – in law or in practice – not covered or insufficiently covered by formal arrangements" (ILO, 2002, para 3). While this definition's focus on lack of formal arrangements seems tautological, the Resolution goes on to clarify that lack of coverage by formal arrangements implies economics activities and enterprises not included in the law, or not covered in practice by the law. The linked term of “informal enterprises” refers to all economic activities or entities that are, in law or practice, not subject to government regulations or insufficiently covered by formal arrangements (Angelini & Hirose, 2014; Gallaway & Bernasek, 2002; Castells & Portes, 1989).

We note, however, that although both informal citizenship status and informal enterprise/economy are characterised by an absence of state regulation, in reality there are multiple, overlapping systems of regulation in effect that are partial in their coverage and enforcement. Thus, the idea of a clear dichotomy between formal and informal in which the state is either present or absent in activities and spaces does not hold up well to empirical scrutiny. Both economic sectors and citizens are regulated and registered by different branches of the state. For example, economic activities may be regulated in some ways (e.g. taxation) but not in others (e.g. social protection of workers or quality control of output) and, as we will discuss below, may be characterised by the regulatory presence of some state actors and the absence of others. ‘Informal’ enterprises and citizens, then, are likely to be regulated and recognised by the state in some ways, but may nonetheless still be considered informal if key gaps in their relationship with the state affect their operations or citizenship entitlements.

In this vein, rather than seeing the distinction between formality and informality as binary, it is more useful to understand it as a “continuum of the reach of official intervention in different economic activities” whilst emphasising that “‘more’ or ‘less’ reach is not necessarily ‘better’ or ‘worse’” (Guha-Khasnobis et al., 2006; 1). For the purpose of this study, we distinguish in broad terms between AT markets and citizenship arrangements which tend towards being more or less informal, rather than demarcating a sharp division between the two.

This study explores the relationship between assistive technology (AT) and informality. It was based on the working hypothesis that there are two key linkages between the two.

Firstly, we explore the theory that disabled people whose citizenship status is relatively 'informal' are more likely to be excluded from access to formal AT interventions and systems of distribution because (a) formal state-led AT interventions and policy frameworks require registrations and documentation associated with formal citizenship status, and (b) formal private sector AT are likely to be more expensive and informal citizenship status is highly associated with poverty.

Secondly, we explore the role that AT delivered by informal enterprises and civil society organisations fulfils in meeting the needs of underserved AT users and people who would benefit from AT. We also assess the pros and cons of informal AT provision. Given the ways in which informality is defined, a characteristic of informal AT providers is that they are unregulated. As such, the capacity of informal AT providers to address unmet need at low cost must be weighed against the danger that unregulated provision could result in low quality APs that function poorly and could harm users' health and wellbeing. A key concern of this study, therefore, is to explore how the positive capacity of informal AT providers can be nurtured at the same time that the dangers of unregulated AT provision to users can be addressed.

Informal enterprise in Indonesia

In Indonesia, the Ministry of Labour and Transmigration defines informal enterprises as businesses that are unregistered and lack a formal structure. Informal enterprises in Indonesia are also characterised by: irregularity in terms of times of operation; failure to observe rules set by the government; family ownership; low turnover; low-income operators and clientele; and the lack of formal banking and accounting (Nasip & Pradipto, 2016). That said, many of the informal AT enterprises covered in this report do not fit this typology, with, for example, some skilled AT practitioners working beond a local scale, as in the cases of Kaiden and Kuspito/Comfiware (Boxes 5 and 6).

Two factors may contribute to the persistence of informal employment in Indonesia. First, the informal sector is still seen as a means of generating income for those who do not have access to formal employment. Second, the developing online/digital technology sector has triggered a rapid increase in the number of online and independent informal enterprises often associated with informal employment relationships (ibid).

Three main reasons may account for why enterprises in Indonesia do not formalise. Firstly, the proprietors of many informal enterprises do not have access to clear information about registration requirements and are perplexed about which level of government is responsible for managing the permit registration process. Secondly, informal enterprises that are relatively profitable may not register to avoid to paying tax (Rothenberg et al., 2015). Finally, many informal enterprises choose to maintain their relatively small scale to avoid registration requirements and because they often rely on local sociocultural ties (see, for example, the 2003 study by Turner on small entrepreneurs in Makassar).

Informal tenure and citizenship status in Indonesia

The formality of citizenship status in Indonesia, and the claims that people can make on state social transfers, including AT, relies on a range of formal documents, such as a birth certificate, an ID card (KTP - Kartu Tanda Penduduk), or a Family Card (Kartu Keluarga).

There are several reasons why people may lack these forms of registration. Based on the experience of the NGO Kota Kita, key reasons for low-income urban citizens to be unregistered include:

- Difficulty for groups such as disabled people, elderly people, very poor people, or people in remote rural areas to physically access government offices where registrations are conducted;
- Administrative barriers to registration, such as applicants having unclear residential addresses, illegal or informal tenure status, or lacking a birth certificate. Another administrative barrier is that, even if people are registered with one local government, because of local autonomy in public service provision, some groups of migrants who live in cities cannot access certain local public services because their ID cards do not match their current place of residence. Officially, Indonesians can register as residents after living somewhere for more than 6 months, but many

migrants fail to do this and some cities (e.g. Jakarta) do not allow for temporary registration; and

- State discrimination against people with stigmatised identities which, in some cases, blocks the possibility of registration.

These obstacles to registration likewise emerged during our research in relation to access to AT in Indonesia. Eligibility for government AT initiatives generally requires that beneficiaries have a Kartu Keluarga (family card) and KTP. As a result, many disabled people who lack these cards are not registered with government AT services.

Another issue that was raised repeatedly in our study regarding the official status of disabled AT users was that of Department of Transport (DoT) registrations for adapted motorbike tricycle users. On the one hand, while disabled driving licences (SIM-D) are available, many disabled drivers do not have them due to cost or the difficulty of registration. Moreover, since the adapted vehicles are not formally recognised, drivers do not pay road tax. On the other hand, our respondents told us that the informal practice amongst the police is not to fine or arrest disabled drivers during routine checks. Many disabled drivers told us that they were let off by the police when the officer realised they were disabled and one interviewee said that PPDI (the umbrella DPO in Indonesia) members refer to their PPDI card as the ‘magic card’ because it ‘solves any problems with the police’. Whilst disabled drivers may escape from problems with the police, however, they may struggle to access driving protection programmes such as insurance.

4. Population

The prevalence of disability in Indonesia is the subject of different official data collection models, outlined briefly below.

The Indonesian population is 265 million, with 56% of the population living in urban areas and 44% in rural areas (BPS, 2018). According to SUPAS 2015 (the 'In-between Census Survey') the number of disabled people in Indonesia is 21.8 million, equivalent to 8.6% of the total population), of whom almost half have multiple disabilities.

DPOs have maintained that these figures are too low, which has prompted a cadre of specialist disability social workers at the MSW PPD (Pendamping Penyandang Disabilitas, State Disability Social Workers) to collect more accurate, specific data on disability. This initiative aims to build a more accurate database of disabled people enhanced with personal details including the nature of each person's disability and a photo, which will be archived in the new SIMPD data system. The data that will populate the new system is being collected from a range of sources including disability balai (training centres), social welfare institutions (LKS), rehabilitation centres, and local social welfare departments. The initiative responds to the 2016 Law No. 8/2016 on Disabilities which has provisions concerning data collection on disability. The data is being collected incrementally, however, and, as of 2019, the database only included records on 163,000 disabled people. Until the SIMDP is up and running, operational data on disabled people (as opposed to census data) is collated by the MSW using the existing integrated basic data system (BST) collected by the PPD to record all of the 26 categories of 'vulnerable groups' defined by the MSW, including disabled people. Inclusion in the BST allows access to MSW social protection interventions.

As we describe above in section 2, as part of the AT2030 programme, the rATA survey was conducted in 2019, covering 2,046 individuals in the neighbourhoods of Kelayan Barat and Pelambuan in Banjarmasin. The survey data offers insight into patterns of disability prevalence and access to AT in low-income urban Indonesian communities.

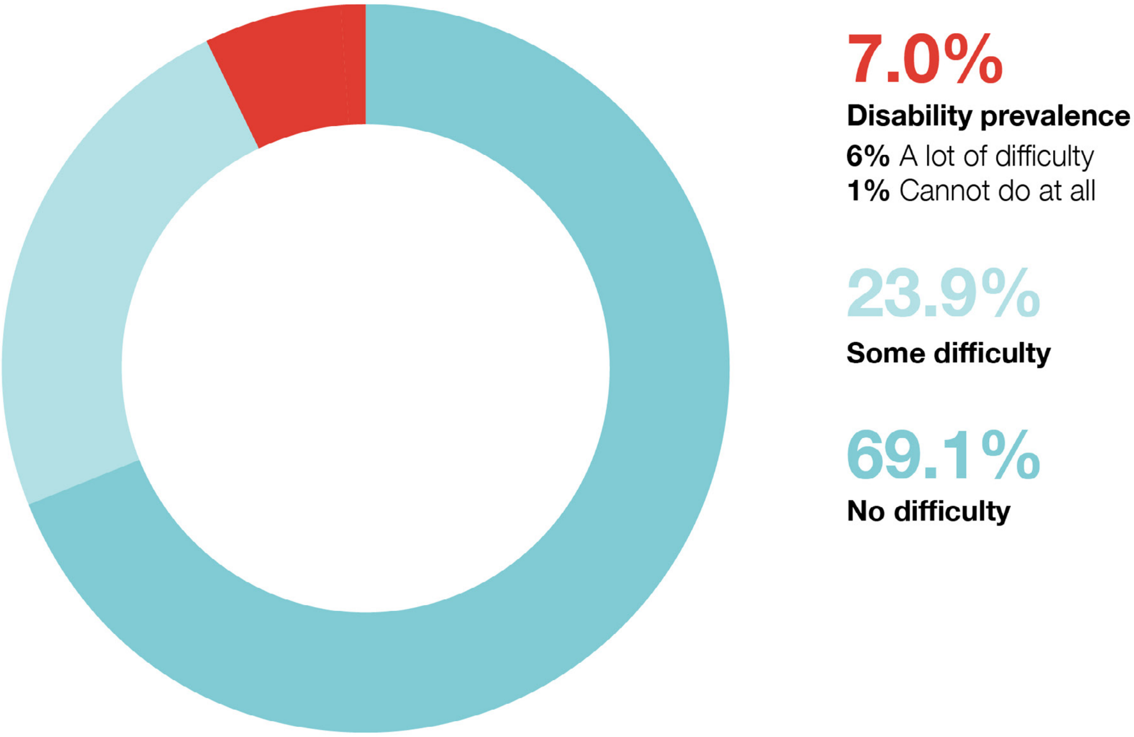

Figure 2. Disability prevalence in Kelayan Barat and Pelambuan (rATA survey)

Based on the rATA survey, Figure 2 shows the percentage of people reporting different levels of difficulty across the functioning domains. If people reporting ‘a lot of difficulty’ or ‘cannot do at all’ in relation to one or more functioning domain in this survey are categorised as disabled, this shows prevalence of disability in the two communities of 7%. Figure 3 breaks down the distribution of this 7% across the different functioning domains.

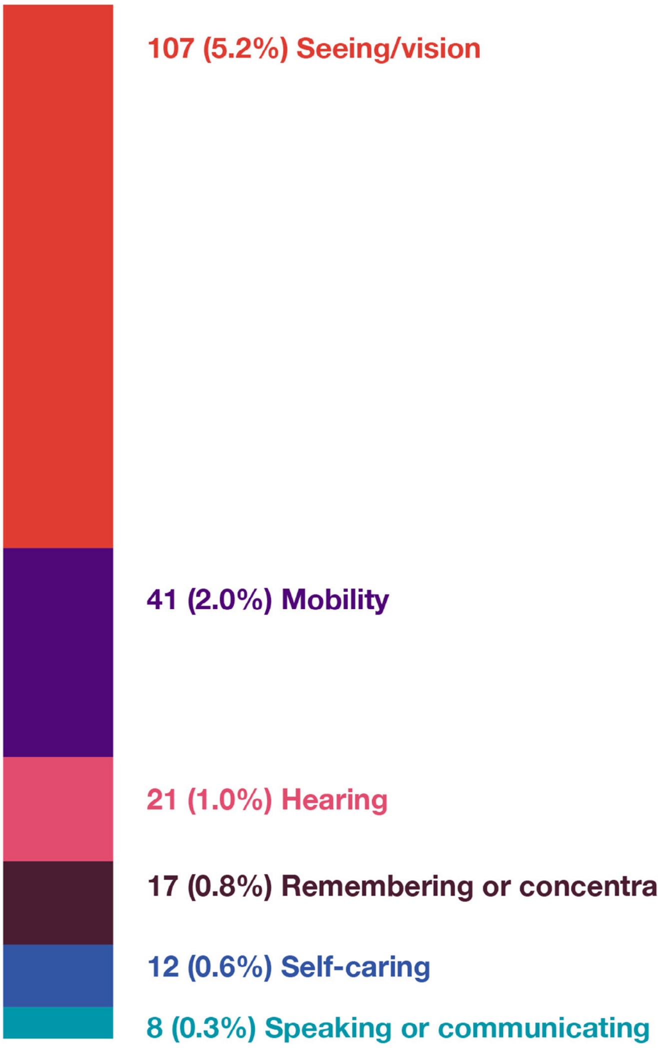

Figure 3: Disability prevalence by type in Pelambuan and Kelayan Barat (rATA survey).
Number of respondents (and % of total research population)

In terms of access to AT amongst this population, the rATA survey indicates that, amongst the individuals surveyed within the two communities, less than three-quarters of those who experience ‘a lot of difficulty’ in any one domain and less than two-thirds who ‘cannot function at all’ in any one domain have access to a single AP. Figure 4 shows ‘unmet need’ broken down by the level of difficulty that respondents express in relation to the six functioning domains. Unmet need in this figure refers to the percentage of respondents from the rATA survey in Kelayan Barat and Pelambuan who answered ‘A lot of difficulty’ or ‘Cannot do at all’ in relation to any of the six functioning domains (vision, hearing, mobility, cognition, self-care, or communication) AND indicated that they needed, but did not have, any one of the APs in the rATA questionnaire poster. Figure 5 breaks down unmet need by functioning domain.

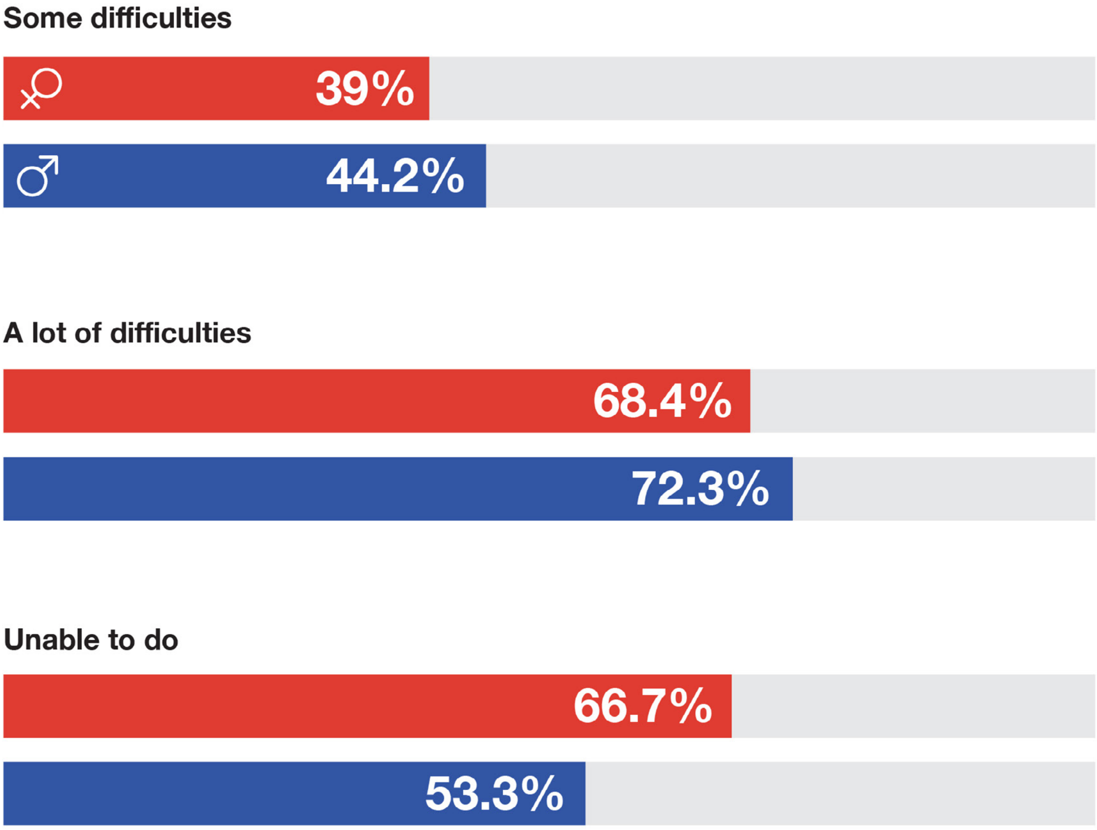

Figure 4: Unmet need by level of difficulty in Pelambuan and Kelayan (rATA survey)

Of the 117 individuals with an unmet need for AP, the most common reason given was lack of affordability (N = 63; 53.8%). About 15% of the sample (N = 18) cited lack of awareness as the key reason. Figure 4, below, indicates that unmet need is particularly high for communication—which may reflect poor access to and the high price of hearing aids, as we will discuss below—as well as self-care and mobility.

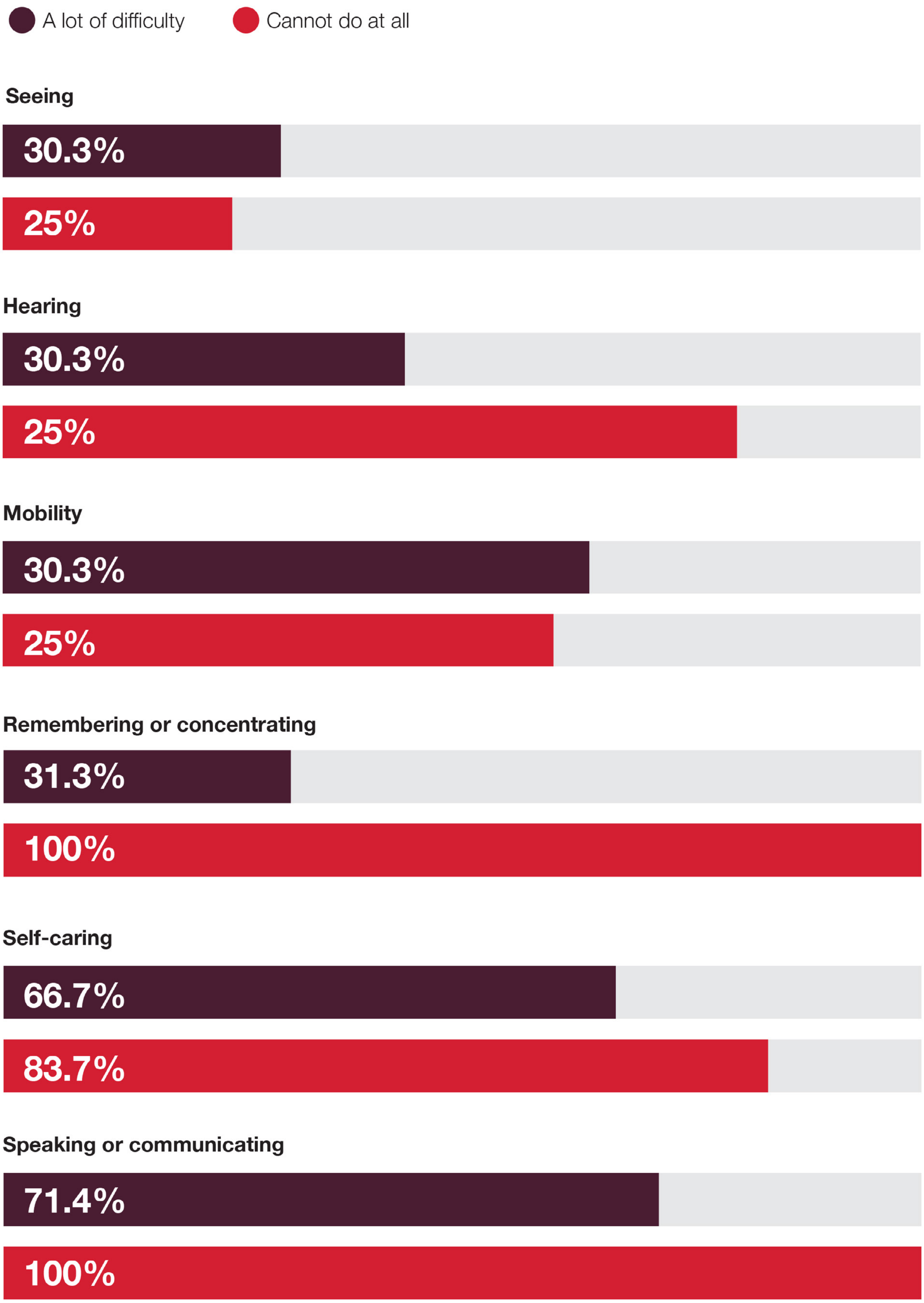

Figure 5: Unmet need by functioning domain in Pelambuan and Kelayan (rATA survey)

5. Products and services

In this section, we start by looking at what our disabled respondents understood AT to mean and explore why different APs are important to them. We then do an overview of APs and associated services most commonly used by low-income citizens in Indonesia, as well as those which are not currently used but are desired by AT users. Finally, we look at AT users' qualitative assessments of their APs, including the differences between those from official and more 'informal' sources.

User perspectives on AT

According to Law No.8/2016, AP refers to the Indonesian term *alat bantu* which is literally translated as "assistive tools": the products and objects that assist people with disabilities in carrying out daily activities. The law also refers more specifically to *alat bantu kesehatan*, or "medical assistive tools," as products that optimise the function of limbs with disabilities based on recommendations from medical personnel.

AT users define alat bantu as items used to help or assist people with disabilities in moving and supporting their daily activities, an understanding that is broader than the WHO's list of 50 Priority APs, the 25 APs used as a reference point in the rATA survey. Whilst AT users include many standard AP items such as such as wheelchairs, white canes, and crutches, they also refer to equipment not officially regarded as APs, such as motorbike tricycles, lipstick, and computers, and non-disability specialist phone apps such as WhatsApp, or Facebook. Furthermore, some of the equipment that respondents define as AP is not designed to directly mediate users' impairments, but are instead linked to the experience of disability. For example, in the context of massage being a very common form of employment for blind people in Indonesia, many blind respondents refer to their massage equipment as an AT for enabling the generation of livelihood. Furthermore, some respondents' perceptions of what constitutes an AP differ from what they perceive to be the 'official' definition. For example, many respondents consider their motorbike tricycle to be crucial AP, but feel that this would not be considered official AP as, in their opinion, the official understanding of AT only includes equipment "which attaches to the body."

Some respondents also emphasise the importance of their own role in developing, adapting, or using APs. Kaiden Dwidjo Leksono, a blind AT user and producer from Jakarta (see Box 5) defines alat bantu as "what I can create to help and assist me to do activities properly." He gives examples of many things that he has created in his own home to assist his daily activities. In his view, APs work better when users create them.

Other AT users view APs not only as tools to mediate their disability, but as part of their person—an extension of the user's body that attaches to their consciousness. They reinforce the importance of AT being customised and adapted to individuals as much as possible to reflect the diversity of the individuals to which they become integral. Participants also stress the importance of APs in improving users' self-esteem by enabling them to do anything that non-disabled people can do.

Box 1. Mr R: The multiple means and functions of APs

Mr. R is a multiple AP user with a wheelchair, crutches, a motorbike tricycle, a prosthesis, and glasses. He also has a hearing problem in his left ear and would like a hearing aid, but says it is too expensive. After having one of his legs amputated due to a road accident in 1986, he had his first crutch and prosthesis donated from the NGO Yakkum in 1987 and more recently has had other crutches donated by the Rotary Club. The NGO UCP gave him a wheelchair in 2015, which was paid for by the Yogyakarta provincial government through its Jamkesus program for AT users on low incomes. His current prosthesis and his glasses are from the Yakkum and were paid for through the Jamkesus scheme.

For day-to-day activities around his home and when volunteering in his village for the local emergency and disaster response group, Mr R uses his wheelchair, but he uses crutches inside his home and in his booth where he works as an electrical goods repairman. He finds his prosthesis less comfortable, explaining, "I only use a prosthesis when I travel to other cities by bus because it is not easy to get the wheelchair on the bus or any other public transportation in Indonesia."

In 2008, Mr R bought a motorbike tricycle with his own money. It cost him IDR 1.2 million (USD 82) at a local mechanic to have a motorbike adapted by attaching a side car. Using his tricycle allowed Mr R to join the DPO KMD (Komunitas Motorbike Difable), which functions as a disabled motorbike community, a social club, and a space for political activism (with mass ride-outs on the International Day of Disability and collective trips to tourist attractions to check if they are accessible). Mr R sees KMD as a place that gives him meaning as an active part of society.

Photo 1: Mr. R at home in his KMD uniform (left) and on his motorbike tricycle (right). Photos: Julian Walker

APs and AP services most commonly used and desired in Indonesia and users’ qualitative assessments of their APs

In terms of the AT that low-income people are more likely to use, and the extent to which these come from providers that they consider to be ‘informal,’ the findings of the rATA survey indicate patterns in two low-income settlements in Banjarmasin (see Figure 6 below).

		Private facility / hospital clinic	Non-Govt. Non-profit facility / Charity	Informal sector	Govt. facility / public hospital	Formal sector / Business
1	Canes / sticks, Tripod and quadripod			100%		
1	Magnifiers, optical digital			100%		
2	Manual wheel-chairs – basic type for active users			100%		
1	Manual wheelchairs - push type			100%		
284	Spectacles	5.3%	1.4%	65.1%	3.2%	25%
2	White canes			100%		
17	Other	5.9%	11.8%	52.9%	5.9%	23.5%

Figure 6: APs in use by type and provider type in Kelayan Barat and Pelambuan (rATA Survey)

Figure 6 lists the APs in use amongst our survey population in Kelayan Barat and Pelambuan by provider type. These APs represent a small number of the 50 priority APs listed by the WHO Global Cooperation on Assistive Technology (GATE) programme. In addition, all of the APs chosen relate to visual or mobility impairments, whereas none were chosen for hearing, self-care, communication, or remembering or concentration, despite the fact that people with disabilities in all of these domains participated in the survey. Glasses and spectacles were disproportionately the most widely used AP.

This could be partly due to the fact that visual disabilities were the most widely reported in the survey and/or that glasses are more widely and cheaply available in local informal markets.

In addition to the rATA survey, our qualitative research with AT users in Yogyakarta, Solo, and Banjarmasin provides an overview of some of the APs that disabled women and men on low incomes can access , commonly use, and consider to be most important in their daily lives. We describe these findings below.

Glasses: As illustrated by Figure 6, glasses are the most commonly used AP in the two communities in Banjarmasin that we surveyed using the rATA tool, and they are important for a broad group of peo-ple, including both people with severe visual impairments, who may use low-vision glasses, and people with less serious eyesight issues. Access to glasses and optician services for people on low incomes includes a range of informal options, among them optician shops without registered or qualified oph-thalmologists, and itinerant opticians who offer door-to-door eye testing and fitting of glasses for residents of low-income settlements, and may offer glasses on credit with monthly collection of pay-ments.

Wheelchairs: Mobility impaired respondents identify wheelchairs as one of the most important APs for their day-to-day lives. The only official wheelchairs produced in Indonesia are hospital wheelchairs and all official adaptive wheelchairs (i.e. those that appear in the LKPP catalogue) are imported. NGOs such as UCP and Ohana play a critical role in wheelchair provision and provide added value by adapting wheelchairs to individual users and their needs. Staff from NGOs working on wheelchair provision note that the minimum standards used by the MoH are generic, referring only to basic factors such as minimum seat width. Wheelchair users we interviewed confirm this, pointing out the failure of generic wheelchair designs to meet specific users' needs, e.g. wheelchairs that can accommodate parents with their babies or wheelchairs adapted for the specific size and shape needs of individual users.

More informal institutions and markets tend to offer wheelchair services (especially repairs and modi-fication) rather than wheelchairs themselves, filling an important gap in formal AT programmes. As an example, MSW staff describe the case of Roteng municipality where the local government distributed a large quantity of wheelchairs, but many users subsequently abandoned them due to the lack of re-pair workshops. Similarly, Municipal Social Welfare staff in Banjarmasin explain that they have no budget for wheelchair repairs and respondents in Central Java confirm that wheelchair users are ex-pected to fund and arrange their own repairs; only in Yogyakarta can wheelchair users obtain assis-tance with repair costs through the Jamkesta system (see Box 9). In this context, most wheelchair us-ers interviewed report adapting or repairing their wheelchairs themselves or seeking assistance from informal tradespeople such as vehicle mechanics and welders. Only 50% of wheelchair users are able to pay for full repairs, however, according to a 2019 UCP survey in Yogyakarta and Central Java. In both locations, some NGOs, notably UCP, are addressing this by building capacity for wheelchair mainte-nance; UCP staff have trained around 70 people in repairs, 80% of whom are disabled people, and have supported them in setting up workshops. Whilst these NGOs are broadly formal in that they are registered organisations, they link informal workshops to wheelchair users and state bodies that sup-port wheelchair users.

Crutches, walking sticks, and braces: Like wheelchairs, respondents rank these mobility devices as very important for their daily activities and quality of life. Whilst users of these APs often obtained them from formal government sources including the MSW (provincial and local MSW or the national balai in Solo) or donations or purchases from NGOs, others use more informal sources, including small local shops and markets like the Cempaka Market in Banjarmasin, and some users make or commission their own sticks and crutches. The main quality issues that users raise regarding walking sticks and crutches is durability, in particular that the rubber foot of crutches and sticks tends to wear down very quickly, resulting in instability and increased risk of slipping. Most users replace, or commission local tradespeople to replace, the rubber foot of their stick or crutch, normally with refashioned parts from car tyres. In addition, respondents criticise crutches made of light aluminium (which are typically avail-able from the Dinas Sosial (Social Welfare Department) or in informal medical supply shops) for being very weak and liable to breaking. They prefer heavier metal crutches such as those provided by Yak-kum or the MSW balai in Solo, but these are not available in Banjarmasin. An issue with leg braces that some users highlight is that their sharp hinges can tear users' trousers and in some cases hinge locks come loose, making users trip and fall. Such simple design flaws could be easily addressed, but be-cause users typically handle repairs themselves or through informal channels, there is no feedback to formal providers or producers of AT (apart from some, like Yakkum, who provide their own repair ser-vices).

Prostheses: Respondents note the importance of prostheses—which are less commonly used than crutches or braces—for users with mobility impairments, and value both their functionality and their appearance. The main formal producers of prosthetics are government (MSW) balai or hospitals such as the public hospital in Banjarmasin. In Java, some NGOs, such as Yakkum, have P&O workshops, and the semi-formal private enterprise Kuspito/Comfiware also produces prosthetics (see Box 6).

Photo 2: A disabled P&O employee (left) and prosthetics (right) at the Yakkum office.
Photos: Julian Walker

Hearing aids: Hearing impaired respondents emphasise hearing aids as an important AT, but they tend to use them only in certain contexts and in combination with other means of communication, including sign language, writing, and communication apps. Some users report using hearing aids

Box 2: Quality concerns with low-cost hearing aids

The Jamkesta in Yogyakarta (see Box 9) is the only government scheme in Indonesia that routinely covers the full cost of hearing aids, but accessing the scheme is complex and eligibility requires proofs of poverty. As a result, many hearing impaired people find their own ways to access affordable APs, including using amplifiers, which cost between IDR 200,000 and 300,000 each (USD 12-13). Many people using amplifiers complain about their quality, faulting their lack of durability—some may last as little as three months—comfort, and sound quality, with some reporting that the poor sound causes dizziness. As a result, many stop relying on hearing aids or amplifiers and opt to instead learn sign language and use a hearing app on their phones on a daily basis.

Mrs A, a hearing impaired woman from Yogyakarta who is 36 years old, obtained a hearing aid for the first time in Surabaya when she was in elementary school in 1991 for IDR 100,000 (USD 6), which her family paid. It was an inexpensive model with an earpiece attached to an audio box and when she tried it, she found it too noisy and it made her dizzy. She rarely used it as a result and subsequently bought a higher quality hearing aid from the private company ABDI for IDR 6 million (USD 380). Despite having a better hearing aid, Mrs A only uses it if she is in public space or at a special event—for example when she goes to PPDI meetings—because it does not work properly. She still cannot hear clearly, but the sounds she does hear improves her ability to read lips. She does not need a hearing aid at home because she speaks to her family in sign language and her mother always helps her to communicate with strangers. She would like to have a better hearing aid that she can use more often, but, she says, "Good quality hearing aids in the current market cost IDR 14 million (USD 900). It is simply unaffordable for us." In addition to sign language, Mrs A also relies on her smartphone and laptop, which she uses for video calls, WhatsApp, Facebook, and Telegram to communicate with her friends from PPDI, co-workers, and family. She considers her phone to be more useful than a hearing aid to communicate with the wider community.

infrequently because many aids, especially cheaper ones, have bad sound quality and can cause dizziness. Hearing aids are not manufactured in Indonesia and are imported by private enterprises. Users typically ac-quire them from formal institutions, including private enterprises such as ABDI and Auditone, whether through private purchase (with or without state or insurance subsidy), donations from NGOs such as the Starkey Foundation, from hospitals, or the Dinas Sosial. Some hearing impaired people use or re-fashion earphones, which are not intended as AP, as basic amplifiers or buy amplifiers which are avail-able from informal markets selling AP such as Cempaka Market in Banjarmasin.

Smartphone applications: Respondents mention smartphone apps as particularly important for deaf people, who make use of free communication apps such as WhATApp or Telegram, and blind people who rely on screen reader apps to read text. According to participants, such screen reader apps are now widely available and improving in quality; many were initially created for English-speakers and spoke Indonesian badly, but now there are more apps designed for Bahasa Indonesian. Some users report that apps were initially expensive and that some apps still are, but many are now free or users share information on how to download apps illegally for free. Again, because such smartphone apps are not officially recognised as AP, users note that state actors and NGOs working with hearing im-paired people do not provide support or training on their use. Communication apps such as WhATApp groups or Facebook are important for disabled groups more widely in facilitating connections between AT users across Indonesia, serving as an important source of information on AT availability and how to access it, amongst other topics.

Folding sticks for the blind: Every blind participant discusses their use of a folding stick, classifying this AP as key in their daily lives. Most obtain their sticks from the local MSW or NGOs for the blind or buy them themselves from shops via the internet. The main quality issue is that the elastic that holds the stick together is not durable, typically lasting for less than a year, which compels users to repair it themselves. In addition, the ball at the base of the stick tends to break off and some sticks have a flawed design in which the number of folds means that the soiled bottom end of the stick folds into users' hands. Many blind respondents had heard about, and mentioned, a new stick for the blind with embedded sensors designed by students from the university of Bandung, but they reportedly cost around IDR 500,000 (USD 30) and none of our respondents had managed to acquire one.

Box 3: Mr S, training in AP use for the blind as a space for networking

Mr. S, 46 years old, is the head of PPDI in Banjarmasin. He is blind and uses several APs, including a folding cane and the screen reader apps Vocalizer and NVDA to communicate on a daily basis. He also relies on massage equipment such as a bed, cabinet, and fan, which are important for him to do the massage work that is his main source of income. His first cane was a wooden stick that he made for himself in 1989, and in 1993, the balai in Martapura gave him an aluminium cane. He replaces his cane frequently since they rarely last longer than a year. He recently obtained a cane from Kaiden (see Box 5) in Jakarta which he was able to order online. Mr. S notes that,

> *I only use a cane for outdoors activities; I rarely use it at home. During my time at the rehabilitation centre in Martapura, I got training from the balai Fajar Harapan, which means "the light of hope," on how to use a cane in public space. Having an opportunity to participate at the balai also opened up my horizons and I understood that that the main function of balai was actually more than providing training for disabled people, but also to galvanize our minds to be tough. Moreover, I was happy to get to know all the blind people in Banjarmasin who were all trained at the balai in Martapura—unless their parents didn't allow them to do so.*

In his work as a massage therapist, Mr S relies on a smartphone to promote his work and reach customers, make friends, network, and so on. Unlike most of his blind friends who use a phone screen reader called "Jaws," Mr S prefers to use another app called NVDA because he finds it easier to use and it runs on Windows 10, the operating system he has on his laptop.

Other vision-related AP: Blind and visually impaired interviewees also highlight other AP that they use or would like to acquire for their work as massage therapists including 'talking' medical equipment that gives verbal readings of health data, such as scales, blood pressure gauges, and thermometers. The blind AP innovator Kaiden (see Box 5) makes a range of talking equipment, including equipment for home and leisure. Other devices for the blind include reglets (braille writers) which institutions work-ing with blind people often distribute and which are the subject of training in specialist institutions de-spite being a less common AP.

Motorbike tricycles: Mobility impaired respondents rank motorbike tricycles as extremely important for their ability to work, go out in public and move around their cities, and be visible and socially active. For drivers supported by the NGO Difabike (see Box 8), the bikes themselves become a source of live-lihood for drivers who work as tour guides, delivery people, or motorbike taxi drivers. The KMD in Java serves a social function for members and also advocates for the needs of tricycle users. Though Difa-bike has an MoU with the provincial government in Yogyakarta (see Box 8), motorbike tricycles are not officially recognized as AP. As a result, users acquire them through Difabike or, especially outside of Java, by commissioning adaptations to motorbikes at mechanic workshops. The cost of these informal adaptations ranges from IDR 2 million to 8 million (USD 130 to 500).

Photo 3: H: A motorbike tricycle user in Banjarmasin who commissioned a mechanic to adapt his motorbike
Photo: Angus Stewart

6. Stakeholders

Stakeholders in AT programming include state institutions, large private businesses, community groups, small DPOs, and semi- or unregistered small businesses and traders, amongst others, which exist along a formality continuum rather than being strictly formal or informal. Our respondents highlight the lack of product standards, brand trademarks, professional qualifications of staff, and state licencing as aspects of informality. This section gives an overview of these stakeholders, their roles, and their level of coverage.

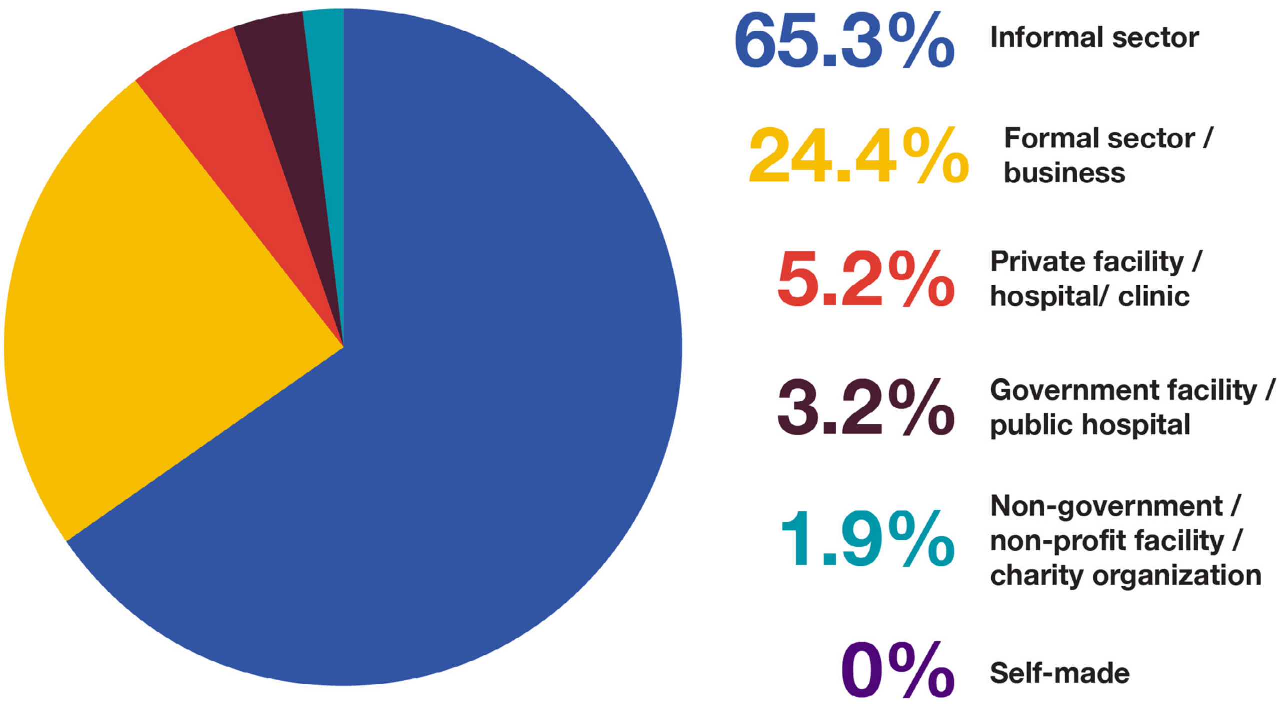

Figure 7: Proportion of APs supplied by different provider types in Kelayan Barat and Pelambuan (rATA survey)

In the absence of national level quantitative data on AP use and sources, we draw upon the rATA survey that we conducted in Banjarmasin. As Figure 7 illustrates, in the two low-income settlements covered by this survey, informal providers were the largest source of APs, followed by formal private sector businesses. Data collectors defined ‘informal providers’ as shops or enterprises that are not legally registered as AT providers.

This data demonstrates the importance of the informal sector as an AP distributor in the surveyed settlements. That said, the overall prominence of informal providers as a source of AP is a result of the over-representation of glasses and spectacles—which mostly come from informal providers—in the AP that respondents report using (see Figure 6). Hearing aids, prosthetics, and other types of AP are much less likely to be acquired from an informal business according to our qualitative fieldwork.

In addition, while the rATA survey distinguishes between source types, there is often significant cooperation between sources. For example, local government bodies that distribute APs frequently acquire them from informal AP producers such as Kaiden.

State stakeholders

Government interventions in disability and AT are primarily through the MoH, the MSW, and state insurance schemes, primarily the BJPS. The Indonesian government is structured in three levels: the central government in Jakarta, the 34 provincial governments, and 512 municipalities. Five of the provinces, including Yogyakarta, have 'special status' which affords them greater autonomy in making policy and budgets. This autonomy affects Yogyakarta's approach to and innovation in AT provision (see Box 9).

The MoH plays two key roles in relation to AT. One is the direct provision of APs through hospitals and, in the case of P&O, the manufacture of some APs in workshop in hospitals, such as the P&O workshop at the Ulin Hospital in Banjarmasin. The other role is the establishment of minimum product standards (SNI) for AP, which the government has developed for some AP, including wheelchairs and hearing aids, but not for others, such as prostheses.

The MSW plays a bigger role in the provision of AP through producing APs and conducting AP-related training through three of its 19 national balai, which are supported by regional balai. In Central Java, for example, there are 54 total balai.[6] One balai in Solo produces P&O and another in Cibinong produces wheelchairs and tricycles.

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6. According to an interview with the Head of Bhakti Chandrasa Rehabilitation Center in Surakarta.

As we discuss in Section 6 below, the MSW provides AP to users through different avenues. To identify eligible beneficiaries, they have a cadre of social workers (the PPD) at the local government level who identify disabled people for referrals but are not in a position to prescribe AT. The PPD officers are often assisted by community volunteers.

Formal private sector businesses

A range of formal private businesses are involved in AP distribution and provision, though our participants note their limited geographical coverage. Some of the largest and most well represented businesses across the country are ABDI and Audiotone for hearing aids, and commercial chains such as Optik Melawi for glasses, in addition to commercial pharmacies that sell wheelchairs, crutches, and other APs.

These enterprises are required to have official registrations and documented expertise to act as formal AT providers. For example, Optik Melawai in Banjarmasin must have a Refraction Optician (RO) working across the shops throughout the city, and are required to be certified by the Department of Public Health.

Civil society organisations

A range of NGOs and DPOs are involved in the AT sector in Indonesia. Some of the larger NGOs providing APs include UCP and Ohana (wheelchairs) and Yakkum (P&O). The main national level DPOs are PPDI, HWDI (a DPO for disabled women), Gerkatin, NPC, and SAPDA. While there is a range of disability NGOs and DPOs in Indonesia, many of them are in Java, especially in Yogyakarta—a national hub of DPOs—Solo (Surakarta), and Jakarta. In contrast, there are few NGOs or DPOs in Banjarmasin and no NGOs working on wheelchair provision in the province. SAPDA previously worked on wheelchair access in South Kalimantan, but they closed their office and the local legacy organisation Sahabat Difable does not have the same capacity.

International foundations also provide AT in Indonesia, but DPOs participating in our research criticised them for donating lower quality APs and focusing primarily on wheelchairs for their symbolic importance at the expense of other less emblematic APs.

Disability NGOs including Ohana, UCP, and Yakkum play a key role in AT production, provision, and associated services such as prescription, fitting, and maintenance. Another critical role that DPOs in particular play is acting as an information network about AT. DPOs can also recommend eligible beneficiaries for AP distribution to the Dinas Sosial.

While these NGOs and DPOs constitute formal sector organisations to the extent that they are registered as civil society organisations, they are relatively informal in their AT work in terms of, for example, compliance with minimum product standards and staff qualifications. DPOs may have formal working relationships with government institutions, including the MSW, if they are registered as LKS. They may also have an MoU to provide AP to local government entities; Yakkum, for example, has an MoU with the provincial governments of Yogyakarta, Sumba, Kalimantan Barat, Lombok, and Central Java.

Alongside DPOs and NGOs are local volunteers who work with local social and health departments in different ways across the country. In Yogyakarta, community volunteers play a key role in facilitating registration with state services, including through the Jamkesus, as well as in providing assistance with filling out forms and negotiating bureaucracy. Volunteers may also assist with data collection on disability, rapid response to identified beneficiaries, and disseminating information about government programmes, including AP provision for poor people. These volunteers are neither civil society organisations nor are they a part of the formal public sector.

Informal private enterprises

The informal private sector involved in AP provision range from partially informal businesses to fully informal often self-employed actors.

Traditional markets are an alternative AP provider that complement the ‘modern’ retail sector. Traders are broadly classified as part of the formal sector as they comply with administrative requirements, but tend to manage their businesses more informally in two key ways. Firstly, they operate on a sliding scale that allows for bargaining between the seller and the buyer. Secondly, a complex credit balance network binds large and small traders together by integrating a hierarchical classification of traders in which large traders give credit to small traders. This credit balance is important for accessing capital and to share risk among traders in the traditional market.

Traditional markets sell products that there is demand and supply for, including APs like glasses and hearing aids, though often without the licences and qualifications required. Unlike supermarkets, traditional market spaces are owned and managed by local governments and usually pay less in taxes, rent, and operating costs, enabling them to provide AP more cheaply than supermarket and chain stores can in large and medium cities.

The Cempaka Market in central Banjarmasin is a key site for AP access: about 10 small shops trade mobility devices, hearing aids, glasses, and other types of AP. Though these shops are licensed premises, not all of them have the professional qualifications and licences to provide AP and related services. For example, an owner of one glasses shop explains that he is a trained RO, which means that he has an MoU to provide glasses to BPJS or workplace insurance schemes. In other stalls where customers pay for glasses from their own funds, however, glasses may be prescribed and sold without a trained RO.

Photo 4: Cempaka Market in Banjarmasin: mobility APs (left) and glasses shop (right)
Photos: Julian Walker

Another key group of informal AT providers are businesses that offer AP services but are not officially part of the AT sector and may not have AP-related knowledge or training. An example is car mechanics who adapt motorbikes into tricycles for wheelchair users and repair and adapt crutches and sticks.

Respondents in low-income settlements note that they buy from itinerant informal opticians and glasses sellers. Such traders are often people who worked with registered opticians and can operate the equipment but are not themselves qualified. One respondent paid IRD 85,000 (USD 5) per lens to be fixed into his old glasses frames from such a trader, a sum that will take him 3 or 4 months to pay back. The itinerant optician visits the community and collects payment from him every Monday.

Another part of the informal AT sector is businesses established by disabled people based on their personal experience of AT use and other users' needs and interests. Such businesses may lack staff with formal qualifications or business structures, but they make an important contribution to AP innovation due to their willingness to customise APs for users' needs. Notable examples of DP-led enterprises include Kaiden, which makes products for the blind, and Difabike, which makes motorbike tricycles. Other enterprises that began as informal DP-run AP enterprises have since transitioned into formal business; Kuspito/Comfiware, profiled in Box 6, is an example.

Box 4. Mr Sugiyanto, a small-scale user and producer of motorbike tricycles

Mr Sugiyanto, from Surakarta, now 46 years old, contracted polio in his left leg when he was a child. His first leg brace was donated by Yakkum and since then he has replaced his brace every two years. He also uses a wheelchair that he received from the orthopaedic hospital in Surakarta. In 2004, after completing training at the MSW balai in Surakarta, he asked his brother for assistance in obtaining a motorbike tricycle in addition to his wheelchair. He explains that, "The use of the AP depends on what kind of activities I want and need to do, and activities such as undertaking daily activities at home, visiting my mother-in-law, and meeting with the community require different kinds of AP."

Since obtaining a motorbike tricycle, Mr Sugiyanto has learned from his brother and friends how to modify tricycle motorbikes using second-hand materials. He is now well-known amongst the disabled community in Surakarta as a motorbike tricycle supplier. He sells these vehicles for about IDR 8.5 million (USD 540) and up to IDR 10 million (USD 640). Vehicle customisation costs about IDR 3.5 million (USD 220) for a non-automatic motorbike and IDR 4.5 million (USD 290) for an automatic motorbike.

Photo 5: Mr Sugiyanto outside his workshop
Photo: Fuad Jamil

Mr Sugiyanto argues that any mechanic who works in a bike shop is capable of making a motorbike tricycle, but not everyone can make a comfortable one for disabled people. Users who are also providers are more capable of knowing what kind of motorbike is suitable in terms of comfort and safety.

Box 5. Kaiden: Innovations for vision impaired AT users

Kaiden Dwijo Leksono is an entrepreneur who manufactures good quality and relevant products for the blind from his workshop in his home in North Jakarta. He began developing APs for blind people when he suffered an eye injury at work in 1987. As a qualified engineer, he has always been interested in how to create things, especially tools that he or other blind people could use. In 1997 he created the first chess set for blind people as well as a ball for blind futsal (hard court football). He developed a reputation as he continued to create products for blind friends.

Today he manufactures and provides a range of products including white canes, balls for blind futsal, reglets, talking watches and clocks, chess sets for the blind, and maps and globes for the blind. He exports his products to Japan, Canada, and Singapore, and intermediary institutions and charities buy APs from him to distribute across Indonesia, especially his mobility products and white canes. Kaiden still operates informally without legal registrations and he often uses other organisations to assist him with contracts to provide APs. He notes that he has no official brand or trademark and his products are often sold under other brands. His wife and one employee assist him with administrative work and day-to-day operations.

Kaiden is also very active in Pertuni, a DPO for the blind, through which he markets his products and sells to government bodies, NGOs, and charity organisations in Indonesia and overseas.

Information about Kaiden can be found at: https://www.kompasiana.com/agungwebe/5528dc396ea83480748b45e3/tuhan-memang-sudah-merencanakan-saya-buta

Box 6. Kuspito/Comfiware, from informality to business enterprise

Kuspito is a formal enterprise that provides physical rehabilitation services and produces prosthetic aids (prosthetic and artificial limbs) and orthopaedic aids such as leg braces. They also provide medical devices and are involved in the procurement of medical devices.

Users consider Kuspito products to be good quality, comfortable, and attractive. Founder Winarno Kuspito, himself a disabled person, studied at the balai in Surakarta, where he was trained to craft prosthetic and orthotic products. After he graduated, he established his own business producing APs. Public demand for his products increased since few competitors were able to craft APs of the same quality, spurring Kuspito to establish a limited partnership company in 2010 that he and his family managed.

He passed down his knowledge and experience to his children and sent them to the Surakarta polytechnic to learn physiotherapy. PT Kuspito Prosthetic Orthotic was formally established in 2013 with the relevant operational permits from the government. These permits allow the company to sign medical device procurement contracts with the government and to collaborate with the BJPS national health insurance scheme.

Kuspito's son now runs the business and has expanded its reach in Indonesia. Kuspito APs are distributed across most of the archipelago, especially in Java, Borneo, Sumatra, Celebes, and Papua. The business has its headquarters in Surakarta and a branch office located in Bekasi, Western Java. They have partnered with several overseas companies and rebranded as Comfiware.

Self-made

Finally, AT users make or adapt their own AP at home. The most common practice is repairing or adapting APs produced by commercial or public providers, such as replacing the foot of crutches or mending the elastic in folding canes, but some respondents make their own walking stick, crutch, or other types of less complex APs. AT users generally make, mend, or adapt AP themselves when more formal AP are unaffordable or they are not eligible for APs provided for free by the state. Users may also make their own APs when the products available do not meet their needs.

Photo 6:
Mr Y: An AT user in Banjarmasin who made his own sticks from plastic piping
Photo: Angus Stewart

Box 6. Mrs B: Multiple sources of AP

Mrs B from Banjarmasin uses a crutch and a motorbike tricycle after polio in her legs left her disabled. After manufacturing her first crutch herself, she obtained two new crutches in 1993 from the local MSW and the balai in Makassar; the government paid for her travel from Banjarmasin to Makassar. As a member of HWDI, Mrs B has good access to information about disability programmes and AT schemes. She received a wheelchair through the local MSW, but she rarely uses it as she prefers using a crutch. She explains that, "I much prefer to use a crutch to do my daily tasks since I am more used to it than to a wheelchair. Whenever my crutch is broken, I get my husband to repair it. Moreover, mine is adjustable, although it hurts my shoulder since I never got an official training to use a crutch." Mrs B bought her first motorbike tricycle with her own money but it was not comfortable, so she went to a workshop in the neighbouring city of Banjar Baru to modify it. The vehicle has been vital for Mrs B to pick up her children from school, transport her husband, Mr S, who is blind (see Box 3), as well as to keep in touch with her social circle in HWDI.

User perspectives on formal and informal APs and AP service providers

Figure 8: Satisfaction with AP by provider type in Kelayan Barat and Pelambuan (rATA survey). Average (mean) satisfaction with AP from providers ranging from 1 (Very dissatisfied) to 5 (Very satisfied)

Figure 9: Satisfaction with AT service by provider type in Kelayan Barat and Pelambuan (rATA survey). Average (mean) satisfaction with the service given by AT providers ranging from 1 (Very dissatisfied) to 5 (Very satisfied)

Figures 8 and 9 show that, according to respondents to the rATA survey in Banjarmasin, the difference in level of satisfaction with APs (Figure 8) and related services (Figure 9) from the informal sector in comparison to other providers is not significant. Based on our research, the most common reasons for selecting informal providers include the following:

- *Cost:* This is a particularly important criterion for low-income AT users who must fully or partially finance their AT. Examples include the many AT users who buy glasses from unregistered opticians because these glasses are far cheaper than those from registered opticians employing ROs; and the hearing impaired people who opt to forego the expensive hearing aids whose cost is only partly covered by insurance schemes like the BJPS and instead purchase medically unapproved amplifiers.

- *Accessibility:* AT users often rely on informal providers due to the lack of local and easily accessible formal options. This is particularly the case outside of Java. For example, according to CHAI, there are only six wheelchair providers in the country, all in Java, that conform with WHO standards, but there are informal providers selling basic wheelchairs across the country.

- *Speed:* Due to the complex bureaucracy to determine eligibility for government schemes and the annual rhythms of government budgets, accessing AP through government programmes can be a slow process. As a result, it is often quicker to use private businesses.

- *Variety and customisation:* Many AT users find that informal businesses—particularly those enterprises established by disabled producers including Kaiden, Kuspito/Comfiware, and Difabike—manufacture the best quality and most suitable AT. In such cases it appears that AP design based on a lived experience of disability drives innovations resulting in good quality, suitable, and customisable AP that reflects users' needs and aspirations. This is not, however, the case with all APs; hearing aids have complex technical requirements for good performance, making them less open to local innovation and customisation.

AT users may also use informal providers due to a lack of knowledge. For example, basic hearing amplifiers are not compliant with hearing aid SNIs and may even cause damage, but people may use them anyway because they do not have access to information on quality or safety issues and/or because they are less expensive.

Linked to this, informally provided APs may have disadvantages:

- Lack of product standards: Informal APs and AP services are not formally assessed for their product standards or staff qualifications.
- Less accountability from providers: There is no consumer protection or recourse in case a product is faulty or harmful.
- Lack of assessment and medical treatment: Informal providers generally produce APs without medical assessment. Most informal providers do not include medical therapy, training, or mental encouragement as part of their service to AT users.
- Not available via insurance: Informal providers are not able to include their APs in national health insurance schemes, which limits their market share and affordability for users.

Bridging formal and informal AT sectors: Opportunities and barriers

Given some of the advantages offered by informal AT providers, the state may choose to work with them as providers of APs and AP services, effectively creating hybrid formal-informal AT systems.

Though formal and informal producers sell APs directly to AT users, in most cases, only formal enterprises can sell directly to the government—enabling inclusion in the government e-catalogue—or be included as partly reimbursable in the BJPS insurance scheme. There are two key aspects of formality here: meeting recognised product standards and being a formally registered entity. There is a new procurement rule being drafted for local government based on the MoH list of minimum AP standards. To sell to the government, informal producers use registered NGOs and DPOs as intermediary partners. For example, Kaiden in Jakarta (see Box 5) provides APs for the blind to government projects via the DPO Pertuni.

Similarly, in Yogyakarta, the Jamkesta card system only allows AT users in the scheme to claim payments to service providers that have an MoU with the health department, which requires AT providers to be registered as legal organisations. Yakkum, for example, is entitled to be a Jemkesus provider because they are registered with the Indonesian Association of Orthotics and Prosthetics (IOPI), and have a permit from DoH. The Yogyakarta health department accordingly has MoUs with a range of organisations including UCP, Yakkum, and Audiotone, but organisations with MoUs with the DoH, such as the wheelchair NGO UCP, can subcontract services from organisations that are not formally registered and would not be able to secure an MoU on their own. This means, for example, that wheelchair users can be reimbursed through the Jamkesta system for wheelchair repairs done by informal wheelchair repair shops by paying through UCP. UCP hopes that the Jamkesta will have a direct MoU with these repair centres beginning this year, something that has so far been impossible due to regulatory requirements. The case of Difabike (see Box 8) offers an example of some of the barriers in place despite ongoing cooperation between the formal and informal AT sectors.

Box 8: Difabike: Regulating and scaling up motorbike tricycle providers

While not officially recognised as an AP, motorbike tricycles are very important for many DP. They assist with mobility, enable livelihoods, serve a social purpose, and function as a platform for collective advocacy work through DPOs such as KMD.

Difabike was established in 2014 as a motorbike taxi service that employed disabled drivers to serve disabled customers and to support the production of motorbike tricycles. Difabike designed various models, suitable for a range of users, with help from two local universities (UGM and UST). This collaboration was important for the universities' design inputs and because the connection to the universities bolstered the status and legitimacy of the organisation.

Nonetheless, Difabike did not enjoy any formal support or recognition and even encountered active resistance from the DoT, the police, and the provincial government. Though the organisation generated its own income through selling motorbike taxis and providing city tours and courier delivery, it still needed permissions to operate from provincial authorities, including licensing courier deliveries with the tricycles from the provincial DoT.

In 2015, with the support of the UGM University Research Centre on Transport Studies, Difabike signed an MoU with the DoT. This MoU allows them to operate, but it has not secured the official recognition they need to scale up their operations so Difabike remains limited to providing services to disabled passengers. The organisation was in negotiations for a contract to work with GRAB (an Indonesian app-based motorbike driver and delivery service), but this is not yet possible for three reasons. Firstly, whilst drivers have SIM-D licenses, the DoT interprets the Land Transportation Act to mean that disabled drivers cannot take 'public'—which is to say, non-disabled—passengers. Secondly, the DoT cannot register Difabike tricycles as legal vehicles, as they are customised to fit the needs of specific disabled users and do not meet a uniform standard. Furthermore, according to regulations, modifications to motorbikes should only be done by the original bike manufacturer. Finally, as a small DPO, the process to register as a private limited company is complex.

Despite these challenges, Difabike recognises that Yogyakarta province takes a progressive approach to disability in their Disability Act, capitalising on the legislative autonomy they enjoy as a special province. Because of this, the Difabike model and the MoU they have with the MoT would be difficult to replicate elsewhere in Indonesia.

7. Finance and policy giving access to AT

Rights to AT in policy

Indonesia ratified the Convention on the Rights of Disabled People (CRPD) in 2011 through the enactment of Law No. 8 of 2016 concerning Persons with Disabilities, the purpose of which is to respect, protect, fulfil, and advance the rights of DP in Indonesia.

While the CRDP does not set out specific obligations for states to provide AT to DP, it does have provisions which require states to facilitate the development of suitable AT, as well as to *facilitate access to* and *information about* AT for DP.[7] Awareness of the provisions of the CPRD relating to AT is low even amongst DPOs, however. During our fieldwork, for example, the head of a national DPO working on shadow reporting on the convention told us that the CPRD contains nothing on access to AT (contrary to Article 4 (g) cited above which focuses on "promoting the availability of" AT.

According to a legal study conducted for this research by the legal firm Hogan Lovells, the current implementing regulations for Law No. 8 remain incomplete and there is no one institution responsible for the rights of DP in Indonesia. Pursuant to Presidential Regulation No. 46 of 2015 regarding the MSW ("MSW Regulation"), the Ministry is responsible for social rehabilitation, security, empowerment, and protection. Whilst the MSW Regulation uses broad language and does not specifically refer to DP or the MSW's obligations to DP, the context makes clear that in carrying out social rehabilitation, security, empowerment, and protection, DP will benefit and be protected.

One recent policy development which is important for AT finance is Law 23 (2014) relating to decentralisation which states that the entire budget for MSW procurement, apart from services related to HIV/AIDS and drug users, must go to local government rather than the national MSW. Furthermore, all municipalities must provide AT to beneficiaries according to Ministerial Decree Number 9: 2018.

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7. See CRPD Article 4 (General Obligations)

Key for citizens rendered 'informal' by the lack of official registrations are the social protection programmes managed by local government entities. The main bottleneck in translating policy on disability and AT into programmes and procedures is the bureaucratic process of registration which may be out of reach for groups such as DP on low incomes or migrants. A prominent example of an attempt to streamline that bureaucracy is the Yogyakarta Jamkesta scheme (see Box 9).

Box 9: Jamkesta: Streamlining public policy to enable better access for low-income citizens to AT

The Jamkesta was set up in the special province of Yogyakarta in collaboration with the city and regency (provincial) governments to make AT more accessible to users. It provides health insurance to poor people who are not covered by Jaminan Kesehatan Nasional (National Health Insurance) with a special focus on DP and AT users. It is based on the Pergup (Governors Regulation) No. 50 and 51 of 2014, which was developed with active participation by the provincial Disability Committee. The Pergup compels the use of budgets for AT, but it initially only covered a small percentage of the cost of purchasing AT, leaving AT out of reach for low-income AT users. A 2017 revision changed the coverage to 80% and also made repairs eligible for reimbursement.

In other provinces in Indonesia, efforts to subsidise poor people's access to the Indonesian health insurance card (KIS) is through the Jamkesprov at the provincial level and Jamkesda at the city level. Because Yogyakarta is a special administrative region, however, the province does not have to align itself with the KIS system and has developed its own approach.

An important part of the Jemkesda scheme is the Jamkesus, a public event which acts as a one-stop shop for AT provision and involves state actors working with NGOs, private sector partners, and volunteers. The Jamkesus is held at least twice per year in each city or regency. At the Jamkesus events, low-income AT users can go through the steps to register as a beneficiary, including medical assessment, AP prescription, fitting, and training, all in one place and in one day. AT providers discussed in this report have stalls at the Jamkesus including Yakkum (P&O), UCP and Ohana (wheelchairs), and private enterprises such as Audiotone (hearing aids) and Prambanan Optics (glasses).

Finance for AT

Law No. 8 of 2016 concerning Persons with Disabilities states that funding shall be sourced from the state budget, regional income and expenditure budgets, corporate budgets, or from legal entities that organise public services, and other legitimate and non-binding sources of funds. According to MSW staff, the planned national budget for AT for 2020 is IDR 36 billion (USD 2.3 million), including both funds for the direct provision of AT and funds for AT users to buy APs and be reimbursed through the Bantuan Sosial Alat Bantu scheme and the BJPS insurance scheme.

In 2019, the national MSW spent IDR 12 billion (USD 765,000) on AT provision. This takes a number of forms:

- Provision of funds from the MSW to local governments and local organisations mandated as services providers for DP (LKS) through a grant scheme for the provision of AT. This budget prioritises the allocation of wheelchairs and hearing aids. Through this scheme, municipalities and LKS must submit a proposal to the national MSW based on their BST and SIMDP data. From 2020, with the implementation of Law 23 (2014) on the decentralisation of local government as discussed above, this system will change and budgets for AT will be directly allocated to local governments who will be expected to use the new SIMDP data system to identify people in need of AT and procure AT for them using the national LKPP online catalogue procurement system. The national budget does not yet reach all local governments in the country, however. In 2018, for example, the national budget financed the distribution of 2,000 hearing aids for International Disability Day, but only in West Java.

- Another new scheme, the Bantuan Sosial Alat Bantu, disburses funds directly to DP to buy AT themselves. In this scheme, PPD staff provide a list of eligible people and may also assist DP in buying AT. The expenses incured can be reimbursed and recipients are verified through the new SIMDP online system. This scheme provided 1,178 people—of the 12,183 people registered in the SIMDP—with AT in 2019. The scheme aims to cover the full price of the AT with a ceiling based on the market price at minimum standard (e.g. IDR 2 million (USD 130) for a hearing aid using the ABDI price for a standard hearing aid).

The municipal MSW also directly provides AT to users through the local budget (APBD) in addition to obtaining AT through provincial and national budgets. Using Banjarmasin as an example, in 2019, the APBD budget for AT was IDR 87.9 million (USD 5,500), which included the provision of APs as well as AT-related training and workshops; 17 wheelchairs (3 adult wheelchairs, 2 children's wheelchairs, 1 special children's wheelchair, and 11 three function wheelchairs), 12 crutches, 11 sticks, and one hearing aid were provided. In addition, Banjarmasin received two wheelchairs from the provincial budget as well as ad hoc AP donations (e.g. 30 Banjarmasin residents received P&O in 2019 in celebration of HKSN social solidarity day as South Kalimantan was the host of the national HKSN ceremony). According to municipal MSW staff, the typical pattern with this kind of ad hoc donation is that the AP is identified and sourced and then users are found to receive it. Banjaramsin did not receive any funds from the main national MSW budget for AT. Municipal DSW staff explained that while they submit a proposal for this budget every year, they are never successful in securing funds.

Across the national and local levels, procurement of APs by government agencies is supposed to be through the LKPP online catalogue, presenting challenges for informal AT producers. Firstly, informal producers of AT (some of which are relatively established and high-quality producers, such as Kaiden see Box 5), may not be listed as AT providers due to the registrations required. Secondly, inclusion in the catalogue requires product standardisation, which does not allow for wheelchair customisation meaning that some providers, such as UCP, who focus on customising wheelchairs, are hesitant to be included. It is possible, however, for government entities to source AP from producers not included in the catalogue by signing an MoU with producers; Kuspito/Comfiware is an example (see Box 6). In general, exclusive use of the LKPP catalogue is limited to very large orders.

Another source of funding for AT is government insurance schemes, the main one being the BPJS. The BPJS has different levels of contribution linked to different KIS cards. Green KIS cards are for people on higher incomes who pay their own contributions. People on low incomes can be registered on a red KIS card. This designation requires that the beneficiary is classified as low income/vulnerable by their local residence unit (RT) leader and then registered by Dinas Sosial at the city (Kota) level. This covers access to some APs (glasses, hearing aids, prostheses, crutches, and corsets) but not others (e.g. wheelchairs). In 2018, 1.4 million APs were claimed through the BPJS nationally. Claimants can have the costs of APs covered to a maximum specified, and they can buy from any provider registered with the BPJS. According to our field survey, however, the BJPS is less helpful for low-income citizens seeking access to APs. This is firstly because the subsidies provided by the BJPS do not cover the full cost of good quality APs and people on low incomes would not be able to make up the difference. For example, we learned that BJPS offers a discount of IDR 1 million (USD 65) for hearing aids, but good quality hearing aids cost around IDR 8 million (USDD 500), so the cost remains unaffordable for the poor. In addition, staff at the Ulin Hospital in Banjarmasin who are making a prosthetic leg for a patient note that the patient will be charged IDR 12.5 million (USD 800), of which only IDR 2 million (USD 130) will be reimbursed by the BPJS.

Accessing the KIS red card, which is needed for subsidised BJPS provision and eligibility for free AP schemes from the Social Department involves up to 12 steps of registration and the process differs by municipality. To assist with the process in every RW (the second level of administrative unit), there is a PKH assistant in the social department who registers red KIS applicants. This requires household registration (Kartu Keluarga) and an ID card (KTP). As discussed previously, many low-income people do not have these cards or have cards that have expired (e.g. in the case of elderly people without relatives or families). Furthermore, although the KIS and BPJS are national and can be used anywhere in the country, cardholders must obtain their KIS initially in the RT where they are domiciled, making it challenging to register if you migrate since in many municipalities you must be registered for at least 6 months before you can register new domicile. It is intentionally more difficult to register in cities such as Jakarta and Balikpapan in order to discourage in-migration.

In terms of the scale of exclusion from these schemes, taking the case of Banjarmasin as an example, rATA survey data collectors excluded short-term renters who had not registered their domiciles in the two communities surveyed, amounting to 5-10% of the total residents. One of the RT leaders interviewed during this study confirms that there are around 12 households with domicile (Kartu Keluarga) out of a total of 80 in his RT. The RT leader cannot recommend that undomiciled households be eligible for benefits from schemes such as donation of AT from the municipality or Social Department.

Another issue which may lead to the exclusion of some AT users from eligibility to state schemes is the informal process of assessment for eligibility. For example, one RT leader explained that whilst RT leaders have a high level of autonomy in deciding who to include on the list of low-income residents eligible for the KIS, they do not receive any formal training to guide their decision-making and must rely on their local knowledge and familiarity with their neighbours. Moreover, official criteria for poverty—including not having a vehicle, covered floor, or TV—are not applicable in many communities. In Banjarmasin, for example, almost no household in the city would be classified as poor, despite the reality that many are.

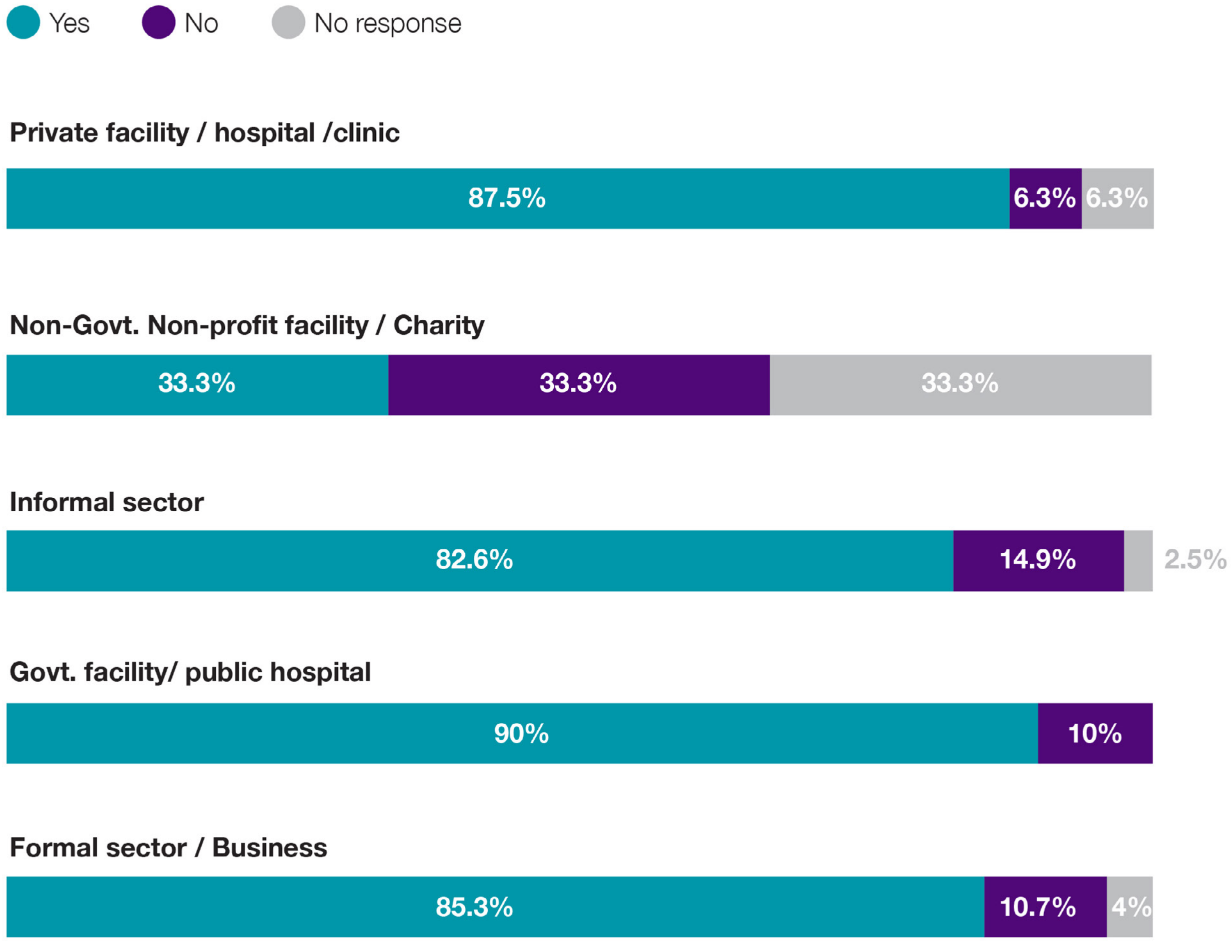

Figure 10: Whether AT users paid for their AP by provider type in Kelayan Barat and Pelambuan (rATA survey)

In the context of these limits to access public AP schemes, as well as the fact that many public schemes require partial payment by users, a significant area of finance for APs is self-finance by users and their households. Figure 10 shows the proportion of respondents to the rATA survey in Banjarmasin who paid for their AP broken down by provider type. The survey results show that most users pay for their APs from all sources with the exception of NGOs, where only about a third of respondents paid. Heavy reliance on self-finance accounts for the high level of unmet need. Of the 117 individuals with an unmet need for APs in the rATA survey, more than half of respondents (N = 63; 53.8%) cited affordability as an explanation.

In this context, many AT users who are not eligible for state schemes that offer free or subsidised access to AT rely on self-finance. Given the relative costs of APs from formal versus informal providers, low-income AT users who self-finance may be more likely to rely on less expensive informal providers for some APs.

Assistive Product	Informal provider (e.g. Cempaka Market, Kaiden, etc.)	Government provider (e.g. Hospital: RS ULIN Banjarmasin)	Online market (e.g. Shopee, Tokopedia, Lazada, Bukalapak, Blilbli.com)	Formal enterprises (e.g. ABDI, Audiotone, Kuspito/Comfiware Kimia Farma)
White canes	Kaiden from IDR 75,000 (USD 5) Cempaka Market from IDR 100,000 (USD 6)	Free for those eligible or able to get a donation from MSW or Jamkesus	From IDR 71,000 (USD 4.50) up to 160,000 (USD 10)	Not available
Wheelchair	From IDR 1 million (USD 65) up to 5 million (USD 320)	Free for those eligible or able to get a donation from MSW or Jamkesus	From IDR 750,000 (USD 50) up to 7.3 million, (USD 460)	From IDR 1.2 million (USD 75)
Crutches	From IDR 250,000 (USD 15)	Free for those eligible or able to get a donation from MSW or Jamkesus	From IDR 100,000 (USD 6) up to 180,000 (USD 11)	From IDR 290,000 (USD 18)
Hearing aids/ amplifiers	From IDR 250,000 (USD 15) up to 350,000 (USD 22)	Can be partly subsidised through the BJPS insurance up to IDR 2 million (USD 130)	From IDR 75,000 (USD 5) up to 2.3 million (USD 150)	From IDR 4 million (USD 250) up to 30 million (USD 1,900)
Stick	From 125,000 (USD 8) up to 400,000 (USD 25)	Not available	From IDR 70,000 (USD 4) up to 230,000 (USD 14)	From IDR 150,000 (USD 10)
Prosthetic	Not available	From IDR 17 million (USD 1,100)	From IDR 500,000 (USD 30) up to 4 million (USD 250)	From IDR 1 million (USD 65) up to 25,000,000 (USD 1,600)
Orthotic	Not available	From IDR 10 million (USD 640)	From IDR 150,000 (USD 10) up to 2.5 million (USD 160)	From IDR 1.6 million (USD 100) up to 2 million (USD 130)
Spectacles	From IDR 35,000 (USD 2) (reading glasses, penjual kaki lima) up to 200,000 (USD 12)	Not available	From IDR 30,000 (USD 1.50) up to 225,000 (USD 14)	In optician from IDR 150,000 (USD 10) up to 10 million (USD 640)
Motorcycle tricycle (modification)	From IDR 5 million (USD 320) up to 10 million (USD 640)	Not available	Not available	Not available

Figure 11: Typical price ranges for different APs by provider type

8. Knowledge and skills

Formal training and qualifications for AT and AT service provision

This section covers four overarching issues regarding skills and knowledge around AT in relation to informal markets and AT users. They are:

- *Formal skills requirements:* How training and accreditation requirements differ between formal and informal AT providers;
- *Outreach capacity for low-income AT users:* The extent to which the human resources can identify and reach low-income and unregistered AT users and potential AT users;
- *Informal producer skills:* How informal AT providers access skills and knowledge; and
- *Information amongst AT users:* How low-income AT users access information about AT provision.

Formal skills requirements

Participant producers highlight the formal skills requirements for accreditation as an AT provider which vary by AP and may be based on accreditation by the MoH or a recognised trade association. For example, employing a certified RO is a requirement for optician enterprises to prescribe glasses, but many businesses selling glasses prescribe without qualified ROs. For P&O provision to be formal, providers need staff with a diploma—requiring a 3-year course—and a government certificate to comply with the rules of the IOPI. That said, key providers such as Yakkum maintain that some of their best P&O staff studied overseas or are self-taught and are not officially qualified.

Other AT providers prefer to comply with international rather than national norms. For example, UCP train staff on the WHO's '8 steps' for wheelchair provisions, with instruction from the International Society of Wheelchair Provision (ISWP) and an online test. There are approximately five people in all of Indonesia who are accredited by the ISWP, however (all staff at UCP and the Jakarta School of Prosthetics and Orthotics), and the training and test are only available in English, a barrier to expanding access.

Outreach capacity for low-income AT users

Local government have some allocated staff to work with potential AT users and DP who lack formal citizenship registrations and/or are on low incomes. This staff includes the PPD social workers employed by the Dinas Sosial, who are supported by sometimes local volunteer networks. The team identifies potential beneficiaries, assesses their eligibility for state support, and facilitates their access to this support.

In Banjarmasin, as an example, the provincial government employs six PPD staff for the province, two of whom are assigned specifically to Banjarmasin city. Employees must have a bachelor's degree in social work or a related field. The six TKSPD staff who support them must have attained academic D3, equivalent to high school graduation.

At the community level, RT leaders play a role in identifying AT users and low-income residents who are eligible for state support, but the capacity building to support this role is limited.

Informal producer skills

Informal AT producers build skills and seek training from a variety of sources. The producers may be entirely self-taught or have formally recognised AT accreditations whilst working in an informal enterprise.

At one end of the spectrum are people making or repairing simple APs, such as walking sticks and crutches, or tradespeople such as motor mechanics adapting or repairing wheelchairs and motorbikes. These AP producers use trial and error based on knowledge gained in their trade and some complement this experience with additional information sources such as YouTube tutorials. They may also be individuals making AT for friends and family.

Other producers may have some training but lack formal certification. Among them are craftspeople who establish their own businesses after learning AT production, including equipment operation, whilst working at P&O workshops or opticians. Others receive training at balai (which can only provide training for disabled people) or through NGOs such as UCP which trains DP in wheelchair repairs.

Information amongst AT users

AT users access information about AT from two key sources: service providers for DP (NGOs or state rehabilitation centres) and DPOs or informal networks of DP.

State and Civil Society (CSO) rehabilitation centres play a key role in training people on how to use and maintain their AP. The Fajar Harapan centre for the blind in Martapura, South Kalimantan, is where most of the blind people in Banjarmasin learned how to use a white cane. The skills that these and other centres offer, however, may not reflect the priorities of users. For example, rehabilitation centres for the blind teach braille writing skills using the reglet rather than the computer or smartphone vocaliser apps that most blind people use.

In addition, participants learn about AP minimum standards, including wheelchair standards and norms for folding canes, from DPOs and disability training centres. AT users also gain knowledge on APs and AP sources from PPDs and their own social networks, especially WhatsApp and Telegram groups for DP such as Pertuni Banjarmasin Beriman, a group for blind people in Banjarmasin, as well as ethnicity-based groups across the country like Rumah Palui, a group for Banjar people.

9. Conclusions and recommendations

Our study suggests that the government of Indonesia is committed to AT provision and has worked to expand access to APs over recent decades. Nonetheless, key areas of under-coverage remain in the urban and peri-urban communities involved in our research, including many residents on low incomes and particularly those on low incomes who are not able to meet eligibility requirements for state programmes. In addition, low-income users in need of specific, more expensive, and/or more complex APs, such as hearing aids, are even more likely to be underserved because local informal markets are unable to develop.

Emerging approaches, such as the Jamkesus scheme in Yogyakarta and the SIMDP registration database, have the scope to streamline registration and expand access to state-led AT programming to groups at risk of being left out of subsidised AT schemes.

From the AP user perspective, our study highlights how the government's AP priorities are not always in line with user needs. Motorbike tricycles and smartphone apps, which AP users consistently rank as highly important for their wellbeing, are not the focus of official programmes or training.

In addition, informal AT enterprises, in particular those led by AT users, contribute to the development and delivery of low-cost AT, as well as innovations in product development to make APs that are more suitable for and attractive to users. These enterprises create employment and avenues for the political participation of DP, but administrative and legal challenges present barriers to scaling up and expanding provision.

In response to these challenges, we offer recommendations for future investigation which we group into three areas: **registering low-income AT users**, **incorporating users' perspectives into AT strategy**, and **supporting local start-up AT enterprises to scale up**.

Related to the concern that low-income citizens could miss out on publicly subsidised AT programmes, a productive area to explore is how to **streamline the registration of low-income, migrant, or hard-to-reach AT users** to ensure their inclusion in relevant schemes. Some specific entry points are:

- Using the new SIMDP database to facilitate portable registration as a KIS red card holder rather than linking registration to DP's original domiciles;
- Replicating the Jamkesus/Jamkesta model for public AT access which streamlines registration for AT access and increases the range of APs and AP services that the state can subsidise, including AP repairs; and
- Developing training and information resources for local leaders involved in identifying and checking eligibility of AT users for state schemes to prioritise users who are vulnerable or at risk of dropping out of state schemes.

A second area for further study is **incorporating users' perspectives into AT strategy and AP development**. This could entail:

- Looking for ways that the MSW could conduct research with AP users and DPOs in order to understand users' priorities and AP training needs, including APs absent from the official list such as motorbike tricycles and smartphone apps; and
- Building on this research to generate data on the needs and priorities of AT users and making that data available to AT providers, including state institutions (e.g. balai, hospitals, DSWs), private entities, and CSOs.

Finally, we recommend **scaling up informal AT enterprises by supporting their legal registration and their ability to implement minimum standards to protect AT users**. This could include:

- Addressing legal barriers to the registration of promising AT enterprises that currently hinder scaling up, prioritising enterprises led by DP;
- Building the capacity of DPOs and AT enterprises led by DP to share the business skills and knowledge needed scale up (e.g. patents, business and marketing skills) and meet the minimum technical standards for safe and good quality APs;

- Formalising minimum standards for AP and making them more accessible to AT users and informal enterprises to ensure safe and appropriate AT;

- Raising awareness of minimum standards to consumers, i.e. AT users, DPOs, and local government staff working in the AT sector; and

- Increasing informal AP producers’ market access by creating a central portal for small-scale producers.

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Appendix 2: FGD and semi-structured interview guide

Topic guide per research activity	
Activity/research respondents	Questions/methods per activities (spread across the domains in Table 1, above)
FGDs with AT users and those with unmet AT need	Divide respondents into groups according to functioning domain (e.g. hearing, mobility, visual, etc). 1. Ask each group to choose five pieces of 'equipment' that they think are most helpful or important for them to do their daily activities. Write them on five post-it notes. 2. Ask them to rank these five items from most to least important. *Output: one flipchart page with five items ranked most to least important.* Ask: Why did you chose the top one as the most important? 3. For the item(s) that they ranked as most important, ask them about all of the places/organisations in and around their city that they can acquire this item. *Output: flipchart with a list of all the organszations* Ask them how they heard about these organisations. 4. Write up a list of the criteria for What makes a service provider good or bad: price, convenience of location; speed of service; quality of product; product is customisable to individual needs; durability; easy to repair; good appearance; comfort. 5. Ask them to add any criteria that we did not list. 6. List the organisations from the last flipchart that score the best against each criterion. 7. Ask them to circle the three criteria that were most important to them when they were choosing their AT/this item. *Output: A flipchart with the list of criteria and who scores highest for each, with their top three criteria circled.* Ask: Why are these three criteria most important for you?
FGDs/interviews with groups that represent AT users: • DPOs • Organisations representing (potential and actual) AT user groups, e.g. older people's organizations, veterans' organisations • Urban poor community-based organisations	• How does the group define 'informal markets'? • What are the main ATs that users access through informal markets? • What kind of informal enterprises make, supply, or service (prescription, fitting, or repair) the key AP? • To what extent are public policies on AT access enacted for and accessible to low-income populations and are low-income populations aware of them? • How do people accessing or maintaining AT through informal markets finance the AP and related services?

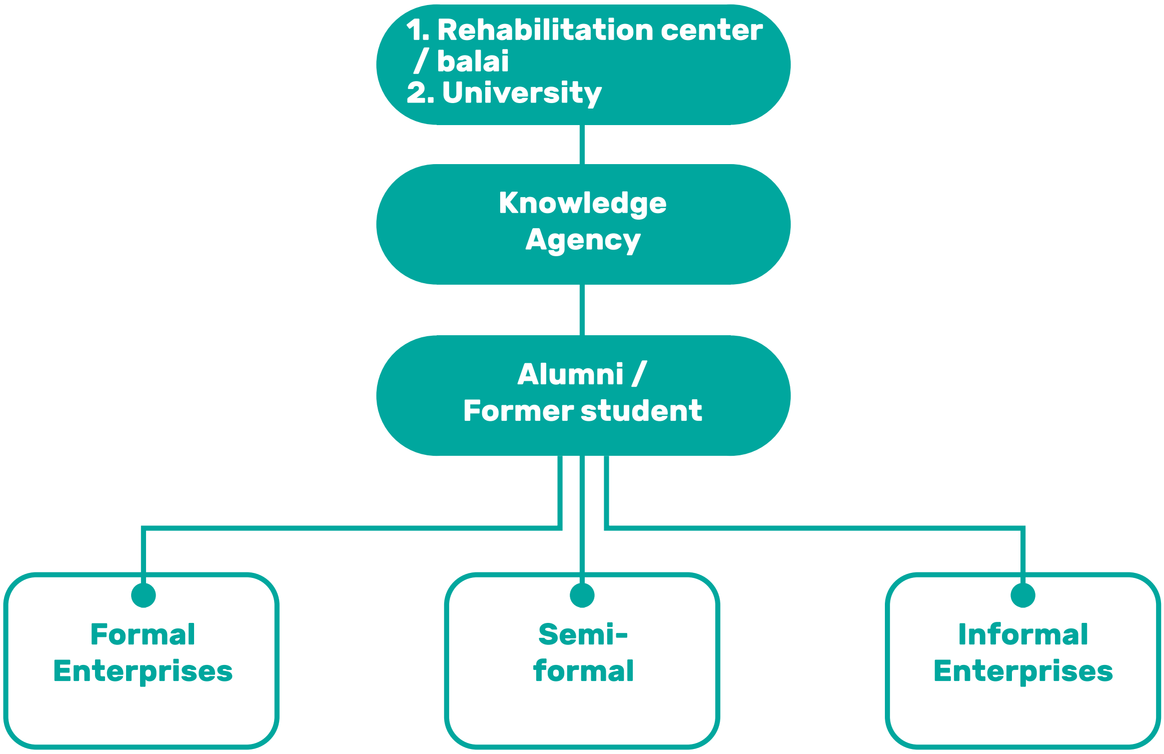
FGDs/interviews with formal government AT stakeholders; specific stakeholders identified through liaison with CHAI country teams	• How do participants define ‘informal markets’? • What are the main ATs that users access through informal markets? • Which government organisations work on the regulation of informal markets, including sectors related to AT (e.g. second-hand goods trade, manufacturing, traditional healers, etc.?) • What are the key public policies (including CRPD) that determine access to AT? • (How) do they extend access to those living in context of informality (e.g. residents of informal settlements, unregistered workers)? • Are there any norms or guidance on product standards/specifications that influence formal AT production and services? In what ways are these regulated (if at all)? • What are the key finance schemes for AP? (How) do official finance schemes for AP access and service allow for access to informal users (e.g. informal settlement residents, unregistered workers)? • What guidance (if any) is given to AT users about minimum AT product or service standards that they should look for from providers, including informal providers? • (How) does official government data collection on disability pick up or exclude AT users/potential users in informal settlements? • Does government data on AT recognise/cover informal markets? How?
Interviews with AT users spread across life course and product domains (vision, hearing, intellectual, mobility, communication). These focus groups will explore the quality of AT and AT-related services accessed through informal markets (for a defined number of core APs) and experience of use and relevance to context.	• What do participants understand as informal AT providers? • What are the main ATs that they access through informal markets? • Are they aware of any legal rights they have to support in accessing ATs? • Are they able to access these rights in practice? If not, why not? • Where did they access their main AT? • Where did they get AT services (prescription, fitting, repairs)? • What is their view of the quality of their AP and AP services from different distributors/providers? • How did they finance their AT and what help did they get?
Interviews with AT producers and services providers AT producers and services providers will be interviewed through the market mapping (above), but this section will also involve wider informal AT producers not linked to those specific market systems.	• In what ways do they interact with formal government stakeholders or other (e.g. NGO) actors? What forms of regulation are they subject to in practice? • Are they aware of any AT norms or standards? • Where do they acquire skills and training? • What, if anything, are they able to do to support access to low-income and vulnerable AT users?

Appendix 3: Disability and AP policies

No	Policy Type	Legal Framework
A	Law	1. Law 4/1997 concerning Persons with Disabilities 2. Law 39/1999 concerning Human Rights 3. Law 11/2009 concerning Social Welfare 4. Law 19/2011 concerning Ratification of the UN Convention on the Rights of Persons with Disabilities (CRPD) 5. Law 8/2016 concerning Persons with Disabilities
B	Government Regulation	1. Government Regulation 43/1998 concerning Efforts to Improve the Social Welfare of Persons with Disabilities 2. Government Regulation 39/2012 on Implementation of Social Welfare
C	Presidential Regulation	1. Presidential Regulation 33/2018 concerning the Amendment of Presidential Decree 75/2015 concerning the National Action Plan for Human Rights (RANHAM) 2015-2019 2. Presidential Regulation 28/2014 concerning Guidelines for Implementation of National Health Insurance Program 3. Presidential Regulation 82/2018 concerning Health Insurance
D	Presidential Decree	1. Presidential Decree 36/1990 concerning the Ratification of the Convention on the Rights of the Child 2. Presidential Decree 75/2015 concerning the National Action Plan for Human Rights 2015-2019
E	Ministerial Regulation	1. Regulation of the Minister of Finance's Director General of Treasury No. 20/2006 on Cash Disbursement for Severely Disabled People and for Vulnerable Elderly 2. Regulation of the Ministry of Women Empowerment and Child Protection No. 4/2017 concerning Special Protection for Children with Disabilities 3. Regulation of the Minister of Social Affairs No. 08/2012 concerning Guidelines for Data Collection and Data Management on Social Welfare Issues and Potential and Sources of Social Welfare 4. Regulation of the Ministry of Social Affairs No. 27/2015 concerning Ministry of Social Welfare Strategic Plan for 2015-2019 5. Regulation of Ministry of Social Affairs No. 21/2017 concerning Issuance of Persons with Disabilities Card 6. Regulation of Ministry of Health 62/2017 concerning Marketing Authorisation for Medical Devices, In Vitro Diagnostic Medical Devices, and Supplies
F	Ministerial Decree	
G	Regional Regulation	1. South Kalimantan Provincial Regulation 17/2013 concerning Protection and Fulfilment of the Rights of Persons with Disabilities 2. South Kalimantan Provincial Regulation 63/2018 concerning Protection and Fulfilment of Rights for Persons with Disabilities 3. Banjarmasin Regional Regulation 9/2013 concerning Protection and Fulfilment of the Rights of Persons with Disabilities 4. Mayor of Banjarmasin Decree No. 352/2016 concerning Establishment of Working-Unit Forum of Disability in Banjarmasin

Appendix 4: AT profiles of Surakarta, Yogyakarta, and Banjarmasin

1. Surakarta: Cultural ecosystem for DP and AT provision

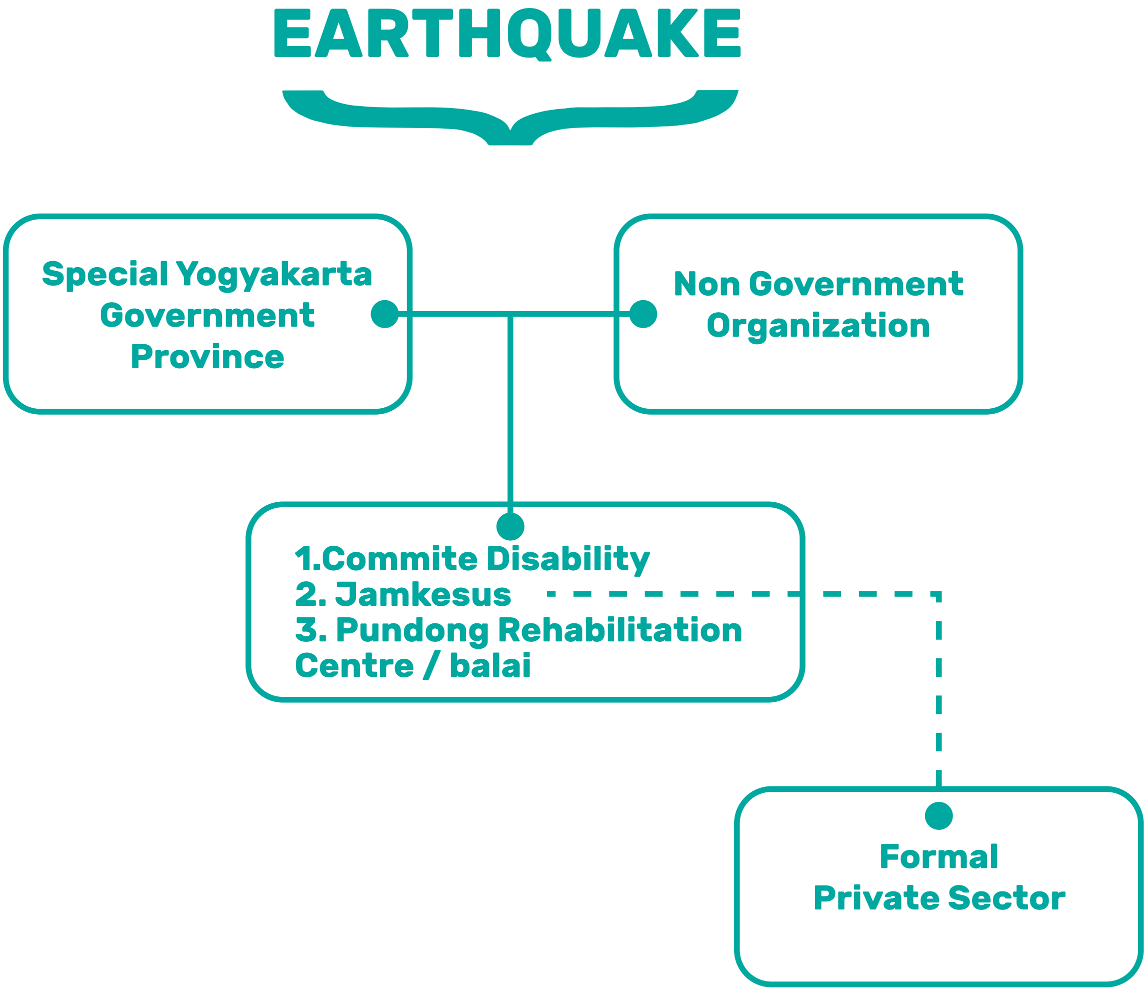


Surakarta is known in the local language as "pabrik sikil," or "the leg factory." The high number of P&O providers contributes to making Surakarta one of the friendliest cities for DP in Indonesia. The enabling environment, or 'ecosystem,' includes structural and cultural conditions that draw public attention to disability issues.

Surakarta's ecosystem is influenced by three key factors. First, the city is home to some of the largest balai in the country. Second, several universities in the city work extensively on disabilities issues including the Polytechnic Surakarta and the Psychotherapy Academy Surakarta. Finally, there are numerous DPOs and civil society organisations involved in disability advocacy.

The balai and universities attract DP from all over Indonesia and produce alumni who invent APs within the formal, semi-formal, and informal sectors. Some alumni opt to settle in Solo because it has better infrastructure, well-organised DPOs, and more inclusive public services.

2. Yogyakarta: government roles, DPOs, and the structural ecosystem



Civil society organisations and DPOs play a significant role in urging the Yogyakarta government to develop and implement policies that support DP. These activities had a structural impetus, beginning after the 2006 earthquake increased the number of people needing disability support and leading to the creation of three institutions in the city. First is the disability committee, which includes representatives from Yogyakarta's government, members of civil society, and DPOs and provides input, assessment, and recommendations to the government. Second, the Jamkesus is a provincial health insurance programme for DP. Third, the Pundong shelter was revitalised and transformed into a balai.

This system improves AP accessibility for DP in Yogyakarta, facilitating direct and indirect access to APs through the Jamkesus, NGOs (i.e. Yakuum, UCP, and Ohana), and formal enterprises.

3. Banjarmasin: When DP have to struggle from zero

The Banjarmasin government plays a major role in providing AT for DP. Using statistical data on DP living in the city, the local Social Department and the provincial hospital in Banjarmasin distribute APs such as wheelchairs, crutches, and braces, but the Social Department lacks the capacity for making assessments, fitting, measuring, or customising APs. The Banjarmasin hospital, in contrast, does provide these services, but access is through a complex bureaucratic system that takes too long to navigate in an emergency.

There is no ecosystem that drives informal providers to provide AT for DP. There are few NGOs and DPOs advocating for disability policies to the government, leaving DP to acquire AP from relatives and friends who live elsewhere in Java, including Surakarta, Bandung, and Surabaya. Other AT users in the city make their own AP without knowledge of fitting, measuring, and more.

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